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5 Port Solenoid Valve

Series VFR2000/3000/4000/5000/6000

Rubber Seal

Series Variations

* 2 position single type
Passage: 4/2 → 5/3 (A/B → EA/EB)

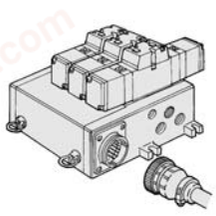
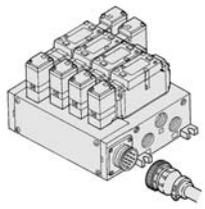
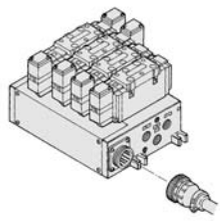
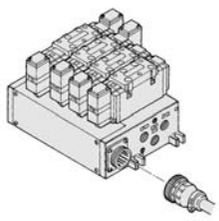
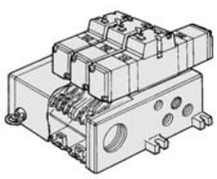
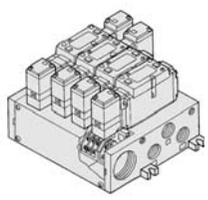
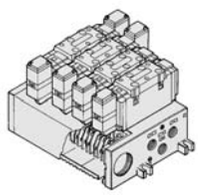
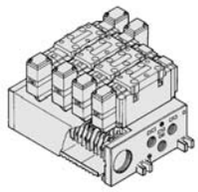
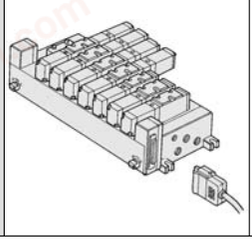
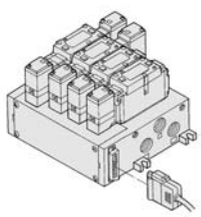
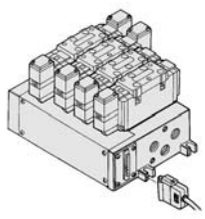
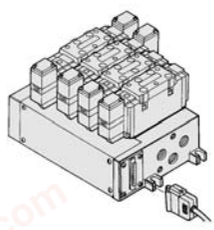
Series	Sonic conductance* C [dm³/(s·bar)]	Type of actuation	Voltage	Electrical entry	With light/surge voltage suppressor (Option)	Manual override
Base Mounted ***VFR2000*** Plug-in type Non plug-in type **P.1232**	1/8, 1/4: 3.0	2 position single 2 position double 3 position closed center 3 position exhaust center 3 position pressure center	(Standard) 100 VAC 50/60 Hz 200 VAC 50/60 Hz 24 VDC (Option) 110 to 120 V 50/60 Hz 220 VAC 50/60 Hz 240 VAC 50/60 Hz 12 VDC	**Plug-in** Conduit terminal (F) **Non plug-in** Grommet (G) Grommet terminal (E) Conduit terminal (T) DIN terminal (D, Y) L plug connector (L) M plug connector (M)	☐ With light/surge voltage suppressor • Plug-in type Conduit terminal (FZ) • Non plug-in type Grommet terminal (EZ) Conduit terminal (TZ) DIN terminal (DZ, YZ) L plug connector (LZ) M plug connector (MZ) ☐ With surge voltage suppressor • Non plug-in type Grommet (GS) Note) Surge voltage suppressor is equipped midway on the lead wire for grommet type.	Non-locking push type Non-locking push type A (Extended) Locking type B (Tool required) Locking type C (Lever)
VFR3000 Plug-in type Non plug-in type **P.1251**	1/4: 7.5 3/8: 8.7			**Plug-in** Conduit terminal (F) **Non plug-in** (VFR3□10/4□10) Grommet terminal (E) DIN terminal (D) **Non plug-in** (VFR3□40/4□40) Grommet (G) Grommet terminal (E) Conduit terminal (T) DIN terminal (D, Y)	☐ With light/surge voltage suppressor • Plug-in type Conduit terminal (FZ) • Non plug-in type (VFR3□10/4□10) DIN terminal (DZ) Grommet terminal (EZ) Conduit terminal (TZ) ☐ With surge voltage suppressor • Non plug-in type (VFR3□40/4□40) Grommet (GS) Note) Surge voltage suppressor is equipped midway on the lead wire for grommet type.	
VFR4000 Plug-in type Non plug-in type **P.1274**	3/8,1/2: 14					
VFR5000 Plug-in type Non plug-in type **P.1297**	3/8: 18 1/2: 23 3/4: 25			**Plug-in** Conduit terminal (F) **Non plug-in** Grommet terminal (E) DIN terminal (D)	☐ With light/surge voltage suppressor • Plug-in type Conduit terminal (FZ) • Non plug-in type DIN terminal (DZ) Grommet terminal (EZ)	
VFR6000 Plug-in type Non plug-in type **P.1312**	3/4: 41 1: (Effective area 191 mm²)			**Plug-in** Conduit terminal (F) **Non plug-in** Grommet terminal (E) DIN terminal (D)		Non-locking push type

SJ SY SV SYJ SZ VP4 S0700 VQ VQ4 VQ5 VQC VQZ SQ VFS VFR VQ7

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Series VFR2000/3000/4000/5000/6000

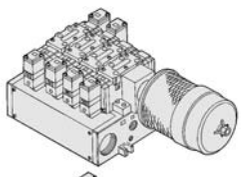
Manifold Variations

		Base Mounted Plug-in Type			
		VFR2000 P.1240	**VFR3000** P.1259	**VFR4000** P.1282	**VFR5000** P.1303
Manifold	With multi-connector				
	With terminal block				
	With D-sub connector				

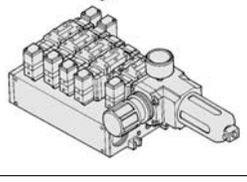
Manifold Option Parts					
	Individual SUP spacer	●	●	●	●
	Individual EXH spacer	●	●	●	●
	SUP block disk	●	●	●	●
	EXH block disk	●	●	●	●
	Throttle valve spacer	●	●	●	●
	Interface regulator	●	●	●	●
	Blanking plate	●	●	●	●
	Air release valve spacer	●	●	●	
	SUP stop valve spacer	● (1)	●		

Note 1) Used with the manifold base. Please contact SMC for details.
Note 2) There is no manifold base in Series VFR6000.

Manifold Option



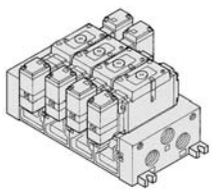
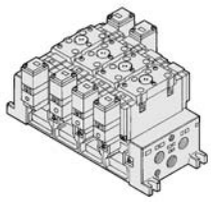
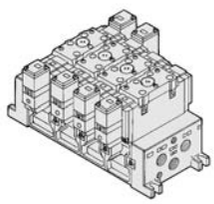
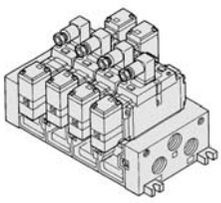
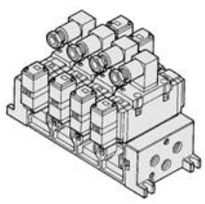
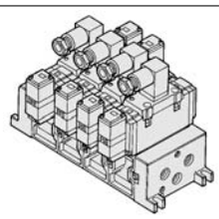
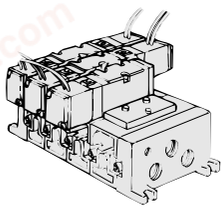
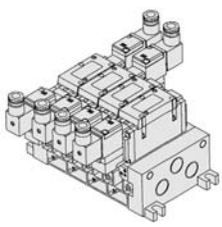
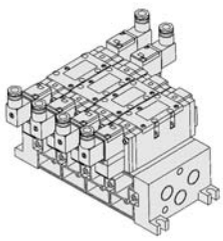
With exhaust cleaner
Plug-in type, Non plug-in type
- High noise reduction effect: 35 dB or more
- Collects oil mist: collecting rate 99.9% or more
- Piping work is reduced.



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.

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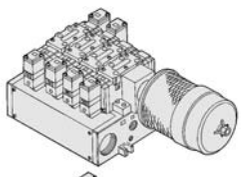
		Base Mounted Non Plug-in Type			
		VFR2000 P.1241	**VFR3000** P.1260	**VFR4000** P.1283	**VFR5000** P.1304
Manifold	Common electrical entry • Grommet terminal • DIN terminal	—			
					
	Individual electrical entry • Grommet • Grommet terminal • Conduit terminal • DIN terminal • L plug connector Note) • M plug connector Note)				

Note) Series VFR2000 only

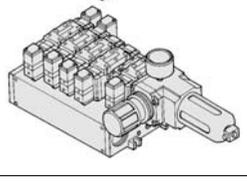
Manifold Option Parts					
	Individual SUP spacer	●	●	●	●
	Individual EXH spacer	●	●	●	●
	SUP block disk	●	●	●	●
	EXH block disk	●	●	●	●
	Throttle valve spacer	●	●	●	●
	Interface regulator	●	●	●	●
	Blanking plate	●	●	●	●
	Air release valve spacer	●	●	●	
	SUP stop valve spacer	● (1)	●		

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.

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

[Option] NRTL /C



Plug-in type



Non plug-in type

Standard Specifications

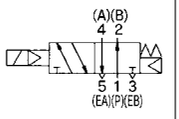
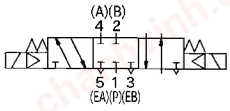
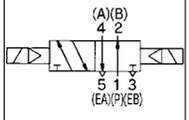
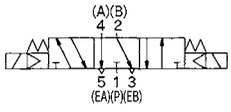
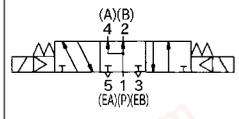
Valve specifications	Fluid		Air
	Operating pressure range	2 position single/3 position	0.2 to 0.9 MPa
		2 position double	0.1 to 0.9 MPa
	Ambient and fluid temperature		–10 to 50°C (No freezing. Refer to page 5.)
	Lubrication		Not required (1)
	Manual override		Non-locking push type
	Mounting orientation		Unrestricted
	Shock/Vibration resistance		300/50 m/s² (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
	Electrical entry	Plug-in type	Conduit terminal
		Non plug-in type	Grommet, Grommet terminal Conduit terminal, DIN terminal L plug connector, M plug connector

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)

JIS Symbol

2 position	3 position
Single	Closed center
	
Double	Exhaust center
	
	Pressure center
	

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

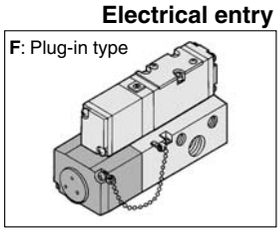
Type of actuation		Model: Plug-in	Model: Non plug-in	Port size Rc	Flow characteristics (1): 1 → 4/2 (P → A/B) C [dm³/(s·bar)]	b	Cv	Flow characteristics (1): 4/2 → 5/3 (A/B → EA/EB) C [dm³/(s·bar)]	b	Cv	Max. operating cycle (Hz) (2)	Response time (ms) (3)	Mass (kg) (4)
2 position	Single	VFR2100	VFR2110	1/8	2.5	0.18	0.58	3.0	0.27	0.70	10	20 or less	0.34 (0.32)
				1/4	2.8	0.24	0.62	3.0	0.27	0.70			
	Double	VFR2200	VFR2210	1/8	2.4	0.21	0.56	3.1	0.28	0.74	10	20 or less	0.42 (0.44)
				1/4	2.6	0.27	0.62	3.1	0.28	0.74			
3 position	Closed center	VFR2300	VFR2310	1/8	1.3	0.45	0.36	1.4	0.46	0.41	5	30 or less	0.43 (0.45)
				1/4	1.3	0.45	0.36	1.4	0.46	0.41			
	Exhaust center	VFR2400	VFR2410	1/8	0.79	0.53	0.24	3.1 [0.89]	0.24 [0.51]	0.74 [0.27]	5	30 or less	0.43 (0.45)
				1/4	0.79	0.53	0.24	3.1 [0.89]	0.24 [0.51]	0.74 [0.27]			
	Pressure center	VFR2500	VFR2510	1/8	2.8 [0.65]	0.24 [0.60]	0.68 [0.21]	0.89	0.53	0.27	5	30 or less	0.43 (0.45)
				1/4	3.2 [0.75]	0.26 [0.55]	0.73 [0.23]	0.89	0.53	0.27			

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-□FZ-$^{01}_{02}$, ( ): VFR2□10-□DZ-$^{01}_{02}$

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How to Order



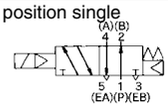
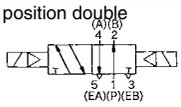
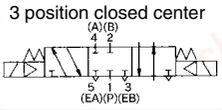
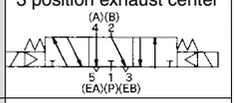
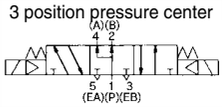


Plug-in VFR2 **1** 00 □ – **5** **F** □ □ – □ **01** □ – □

Non plug-in VFR2 **1** 10 □ – **1** **E** □ □ – □ **02** □ – □



Symbol

1	2 position single 
2	2 position double 
3	3 position closed center 
4	3 position exhaust center 
5	3 position pressure center 

Electrical entry

F: Plug-in type

Option

Nil	None
Z	With light/surge voltage suppressor

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

Nil	Side ported
B *	Bottom ported

* Option

Port size (P, A, B port)

Nil	Without sub-plate
01	1/8
02	1/4

EA, EB port: Rc 1/8

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

Pilot type

Nil	Internal pilot
R *	External pilot

* Option (External pilot is available only on sub-plate type.)

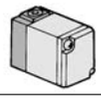
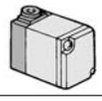
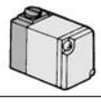
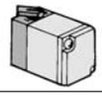
Coil rated voltage

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)
9 *	Other

* Option

Note) L and M plug connectors: Max. 220 VAC

Pilot valve manual override

Nil: Non-locking push type	A*: Non-looking push type A (Extended)	B*: Locking type B (Tool required)	C*: Locking type C (Lever)
			

* Option

Option

Nil	None
Z	With light/surge voltage suppressor
S *	With surge voltage suppressor

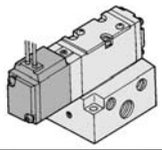
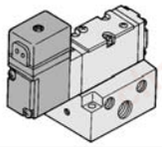
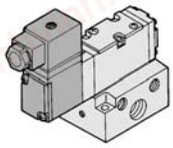
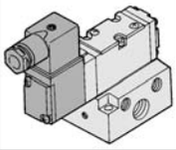
* Indicator light is not available for grommet type.
With surge voltage suppressor is available for grommet type only.

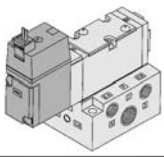
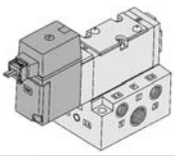
CE-compliant

Nil	—
Q	CE-compliant *

* Electrical entry: D/DO, Y/YO and F only

Electrical entry

G: Grommet	E: Grommet terminal	T: Conduit terminal	D, Y: DIN terminal
			

L: L plug connector	M: M plug connector
	

How to Order Pilot Valve Assembly

SF4– **1** **DZ** □ **–60 –** □

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)
9 *	Other

* Option

Note) L and M plug connectors: Max. 220 VAC

Manual override

Nil	Non-locking push type
A *	Non-looking push type A (Extended)
B *	Locking type B (Tool required)
C *	Locking type C (Lever)

* Option

CE-compliant

Nil	—
Q	CE-compliant *

* Electrical entry: D/DO, Y/YO and F only

Electrical entry, Light/Surge voltage suppressor

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

Symbol	Electrical entry	Indicator light	With surge voltage suppressor	Body type
T	Conduit terminal	—	—	Non plug-in type
TZ		●	●	
E	Grommet terminal	—	—	
EZ		●	●	
L	L plug connector	—	—	
LZ		●	●	
LO	L plug connector (Without connector)	—	—	
LOZ		●	●	
M	M plug connector	—	—	
MZ		●	●	
MO	M plug connector (Without connector)	—	—	
MOZ		●	●	

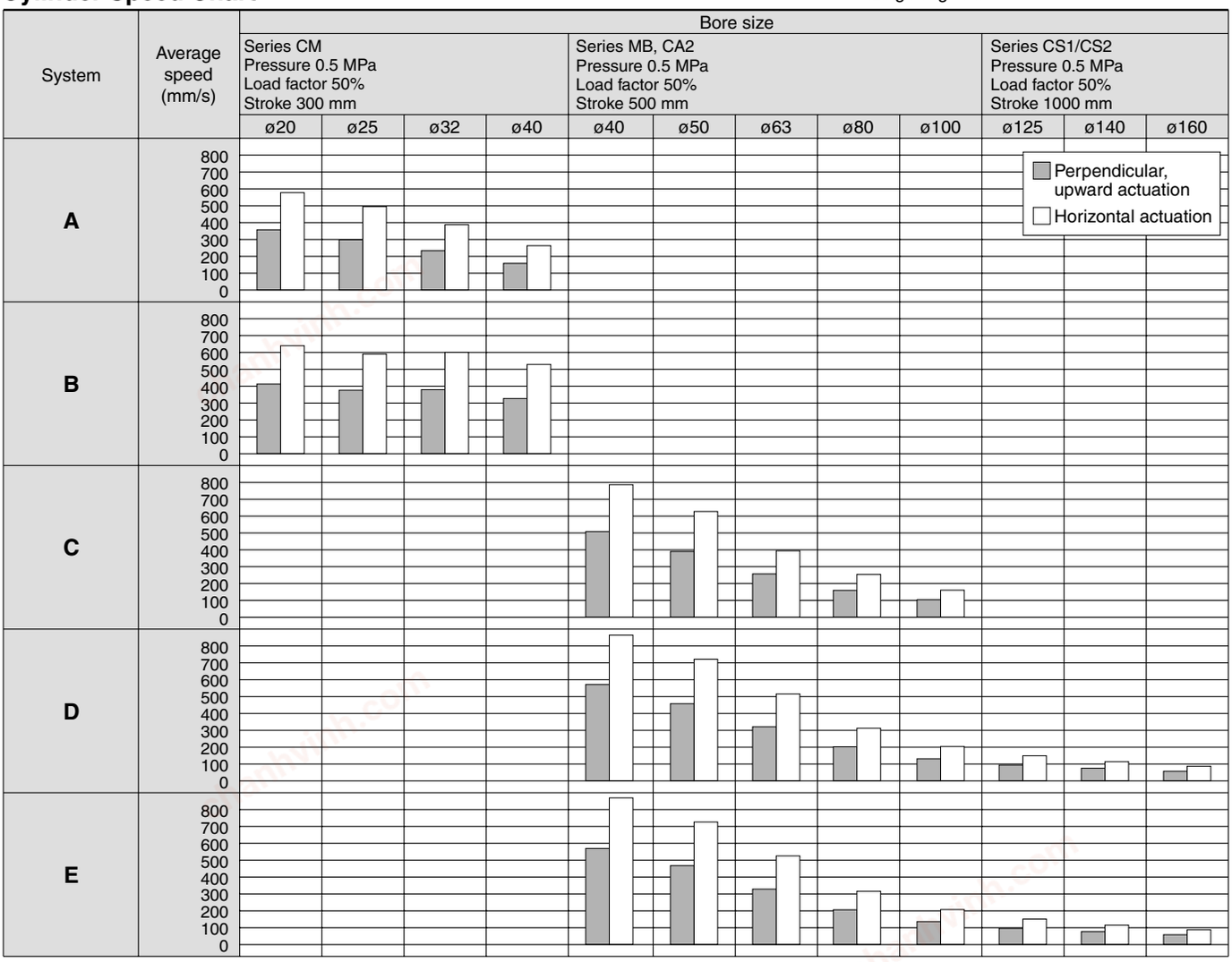
SJ
SY
SV
SYJ
SZ
VP4
S0700
VQ
VQ4
VQ5
VQC
VQZ
SQ
VFS
VFR
VQ7

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Series VFR2000

Cylinder Speed Chart

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

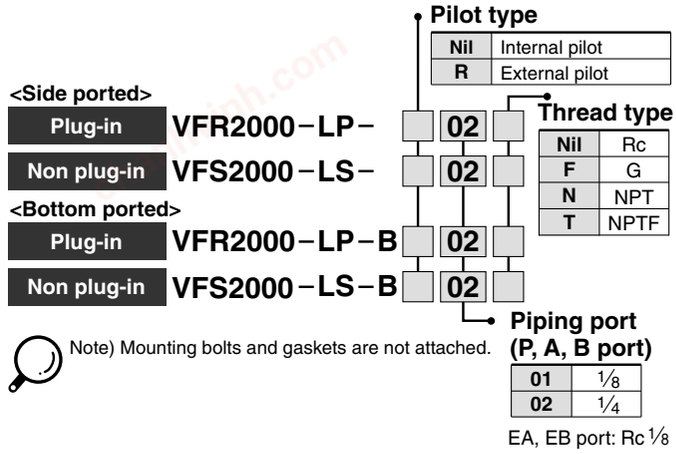


* It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
* The average velocity of the cylinder is what the stroke is divided by the total stroke time.
* Load factor: ((Load weight x 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 (S = 2.5 mm²)	AN110-01 (S = 35 mm²)	T0425 x 1 m
B		AS3000-02 (S = 12 mm²)	AN110-01 (S = 35 mm²)	T0604 x 1 m
C		AS3000-02 (S = 12 mm²)	AN110-01 (S = 35 mm²)	T0806 x 1 m
D	Series VFR2000 Rc 1/4	AS4000-02 (S = 21 mm²)	AN110-01 (S = 35 mm²)	T1075 x 1 m
E		AS4000-02 (S = 21 mm²)	AN110-01 (S = 35 mm²)	T1209 x 1 m

How to Order Sub-plate Assembly

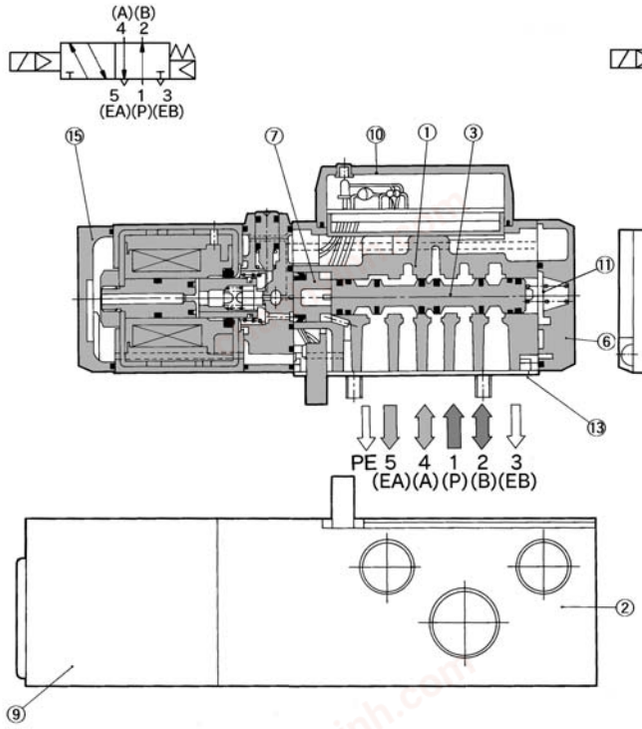


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Construction

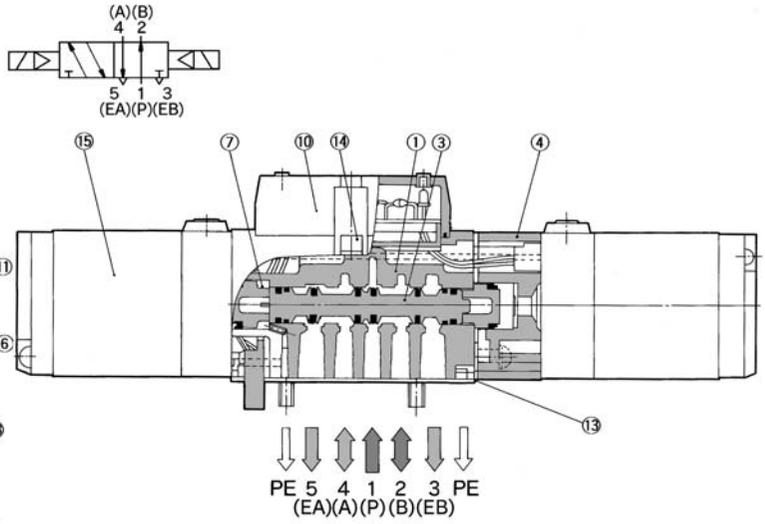
2 position single

VFR21□0



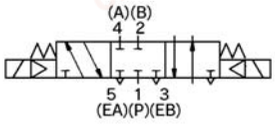
2 position double

VFR22□0

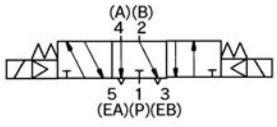


3 position closed center/exhaust center/pressure center

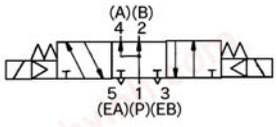
Closed center: VFR23□0

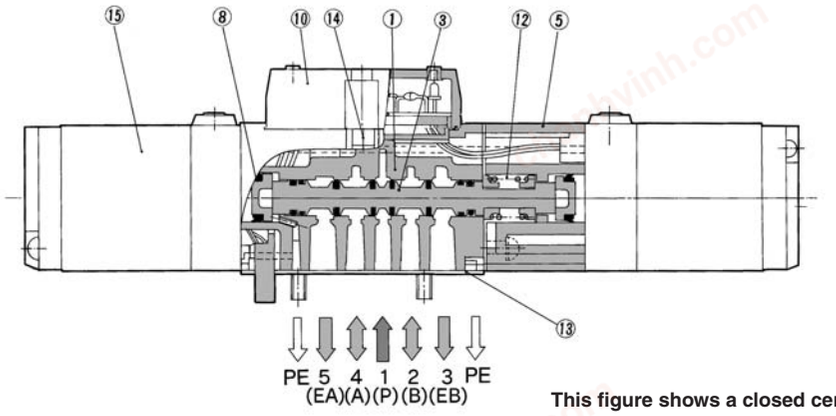


Exhaust center: VFR24□0



Pressure center: VFR25□0





This figure shows a closed center type.

Component Parts

No.	Description	Material	Note
1	**Body**	Aluminum die-casted	Platinum silver
2	**Sub-plate**	Aluminum die-casted	Platinum silver
3	**Spool valve**	Aluminum, NBR	
4	**Adapter plate**	Aluminum die-casted	Platinum silver
5	**Adapter plate**	Aluminum die-casted	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 assembly**	Resin	
11	**Spool spring**	Stainless steel	
12	**Return spring**	Stainless steel	

Replacement Parts

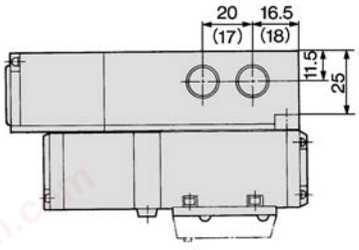
No.	Description	Material	Part no.		
			VFR21□0	**VFR22□0**	**VFR23□0/24□0/25□0**
13	**Gasket**	NBR	AXT624-20-2	AXT624-20-2	AXT624-20-2
14	**Hexagon socket head screw**	Steel	AXT624-26 (M3 x 31)	AXT624-26 (M3 x 31)	AXT624-26 (M3 x 31)
15	**Pilot valve assembly**	—	Refer to “How to Order Pilot Valve Assembly” on page 1233.		
—	**Sub-plate assembly**	—	Refer to “How to Order Sub-plate Assembly” on page 1234.		

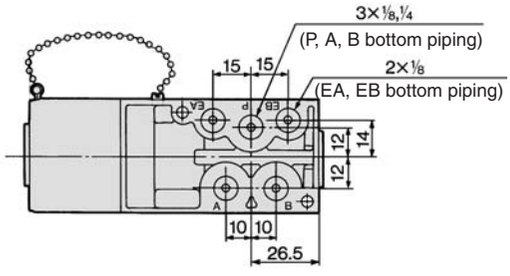
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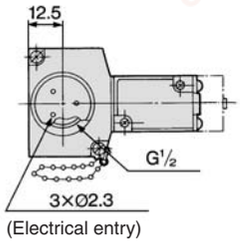
Plug-in: 2 Position Single/Double, 3 Position Closed Center/Exhaust Center/Pressure Center

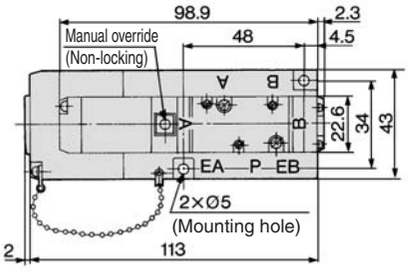
2 position single: VFR2100-□F-$^{01}_{02}$

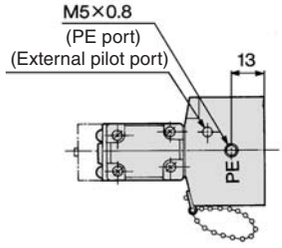


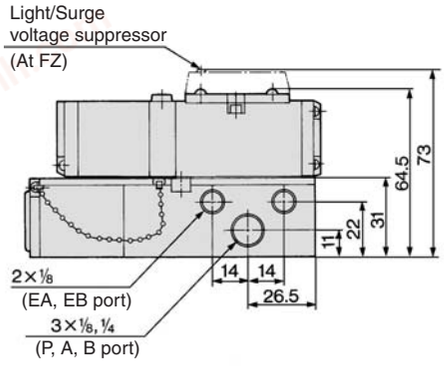


Bottom ported



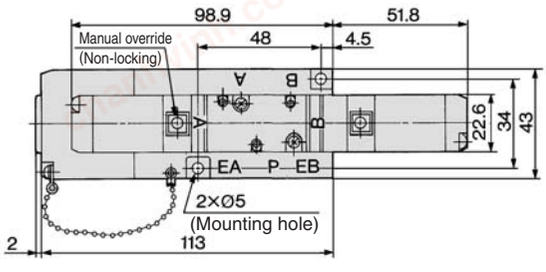






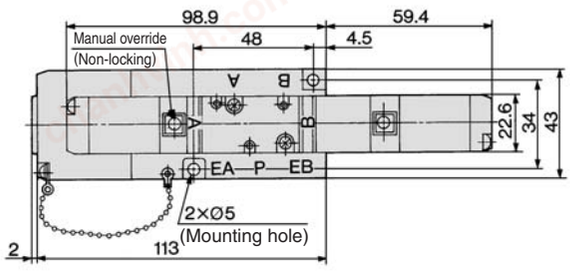
( ): Rc 1/8

2 position double: VFR2200-□F-$^{01}_{02}$



* Other dimensions are the same as the single type.

3 position closed center: VFR2300-□F-$^{01}_{02}$
3 position exhaust center: VFR2400-□F-$^{01}_{02}$
3 position pressure center: VFR2500-□F-$^{01}_{02}$

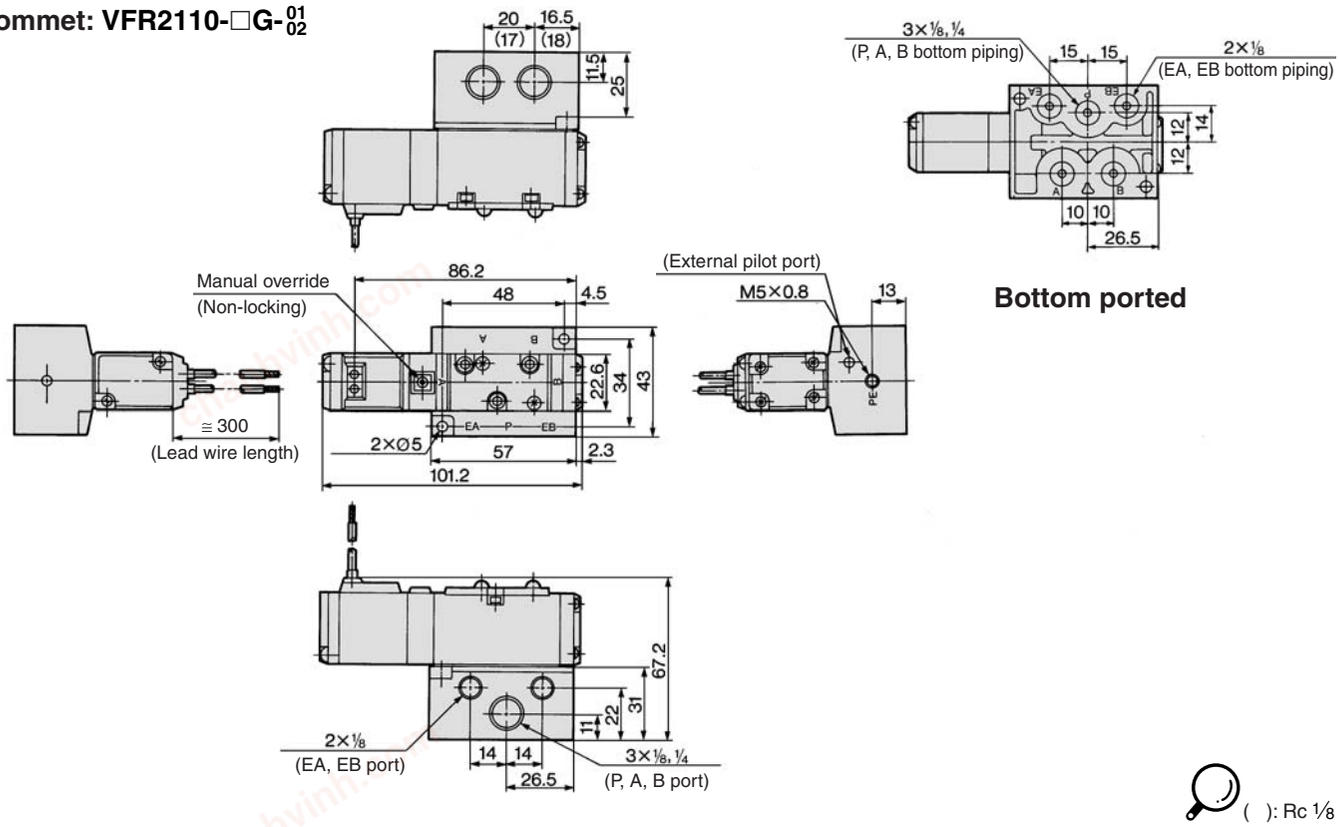


* Other dimensions are the same as the single type.

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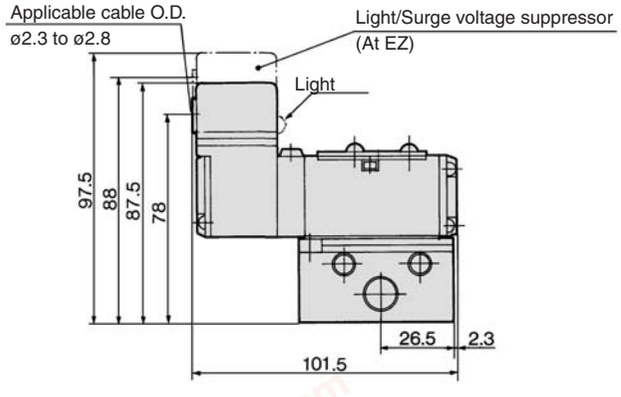
Non Plug-in: 2 Position Single

Grommet: VFR2110-□G-$^{01}_{02}$



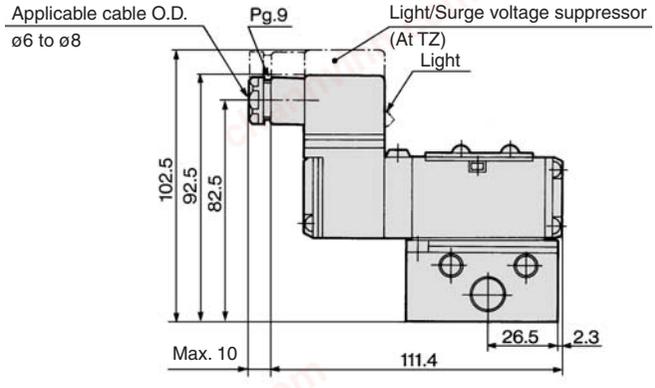
( ): Rc 1/8

Grommet terminal: VFR2110-□E-$^{01}_{02}$



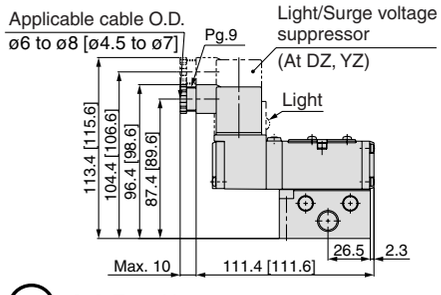
∗ Other dimensions are the same as the grommet type.

Conduit terminal: VFR2110-□T-$^{01}_{02}$



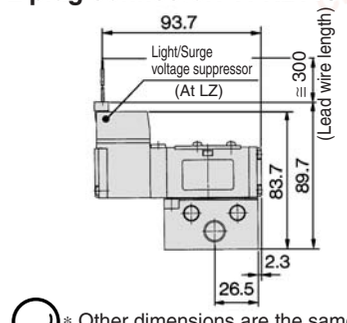
∗ Other dimensions are the same as the grommet type.

DIN terminal: VFR2110-□D-Y$^{01}_{02}$



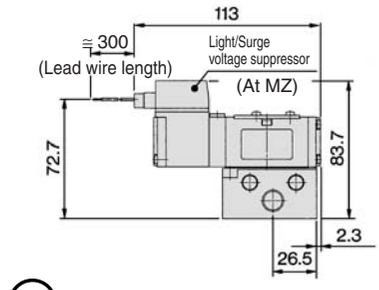
∗ [ ]: Type Y
∗ Other dimensions are the same as the grommet type.

L plug connector: VFR2110-□L-$^{01}_{02}$



∗ Other dimensions are the same as the grommet type.

M plug connector: VFR2110-□M-$^{01}_{02}$



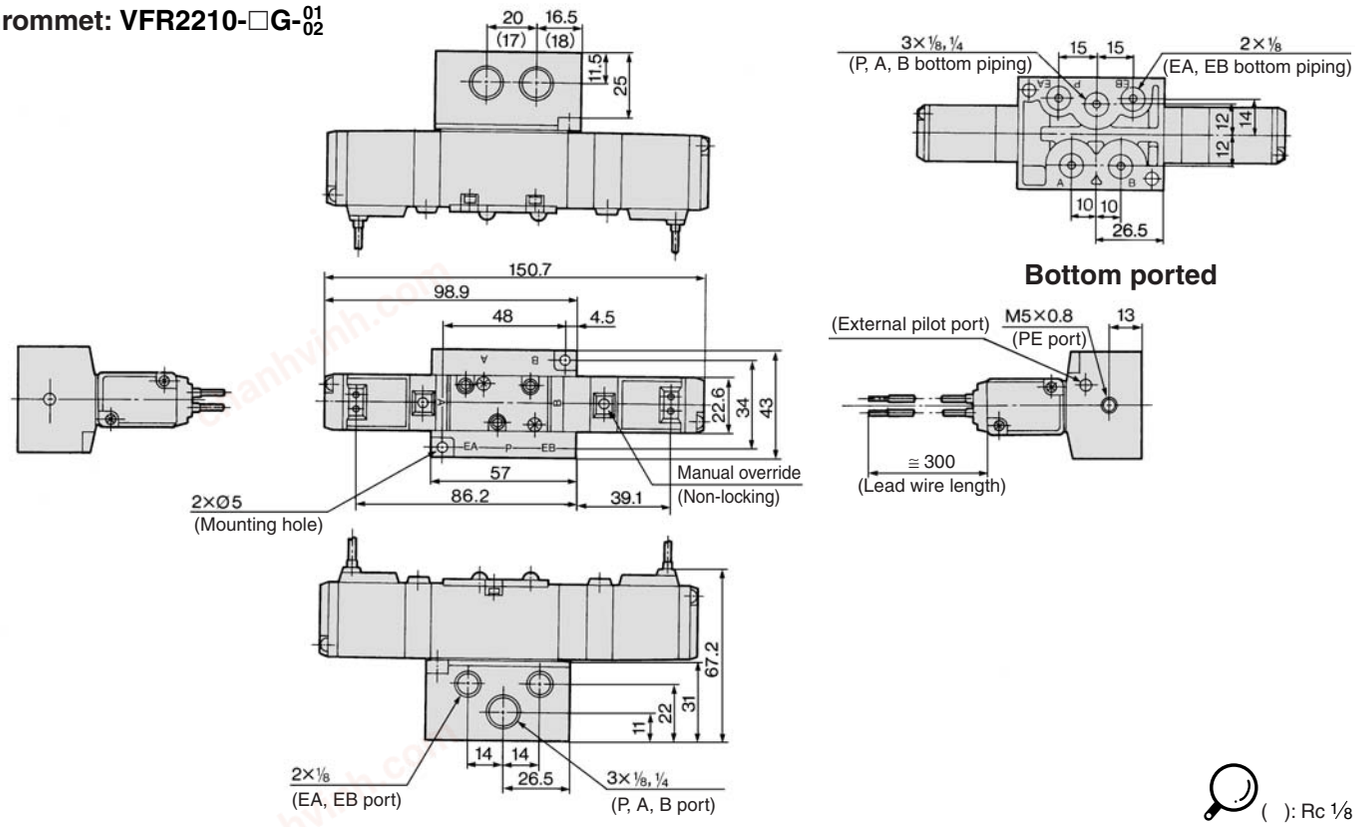
∗ Other dimensions are the same as the grommet type.

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Series VFR2000

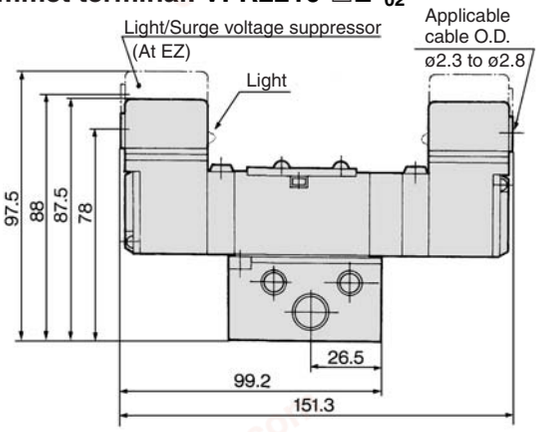
Non Plug-in: 2 Position Double

Grommet: VFR2210-□G-$^{01}_{02}$



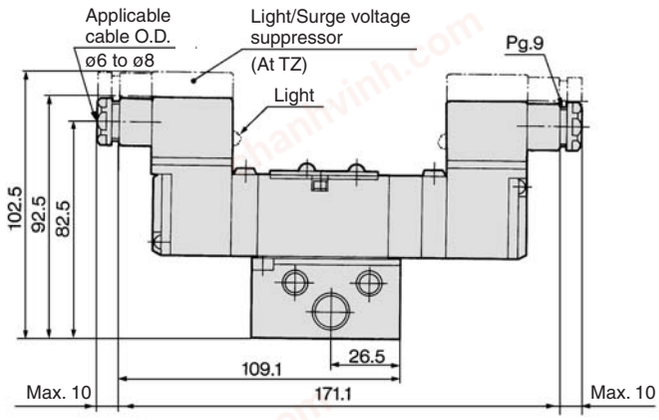
( ): Rc 1/8

Grommet terminal: VFR2210-□E-$^{01}_{02}$



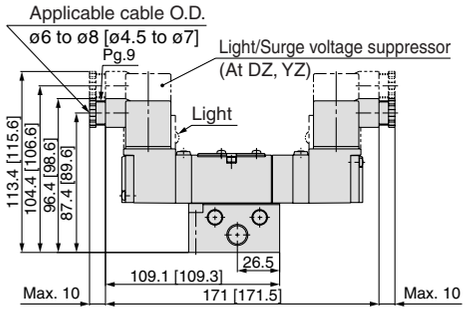
∗ Other dimensions are the same as the grommet type.

Conduit terminal: VFR2210-□T-$^{01}_{02}$



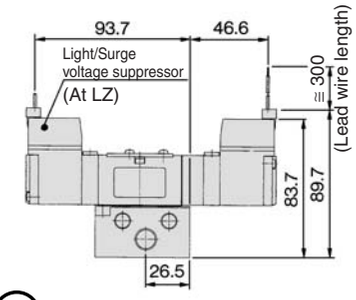
∗ Other dimensions are the same as the grommet type.

DIN terminal: VFR2210-□$^{D}_{Y}$-$^{01}_{02}$



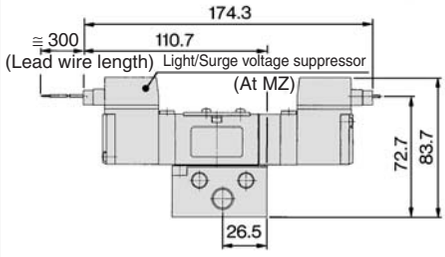
∗ [ ]: Type Y
∗ Other dimensions are the same as the grommet type.

L plug connector: VFR2210-□L-$^{01}_{02}$



∗ Other dimensions are the same as the grommet type.

M plug connector: VFR2210-□M-$^{01}_{02}$



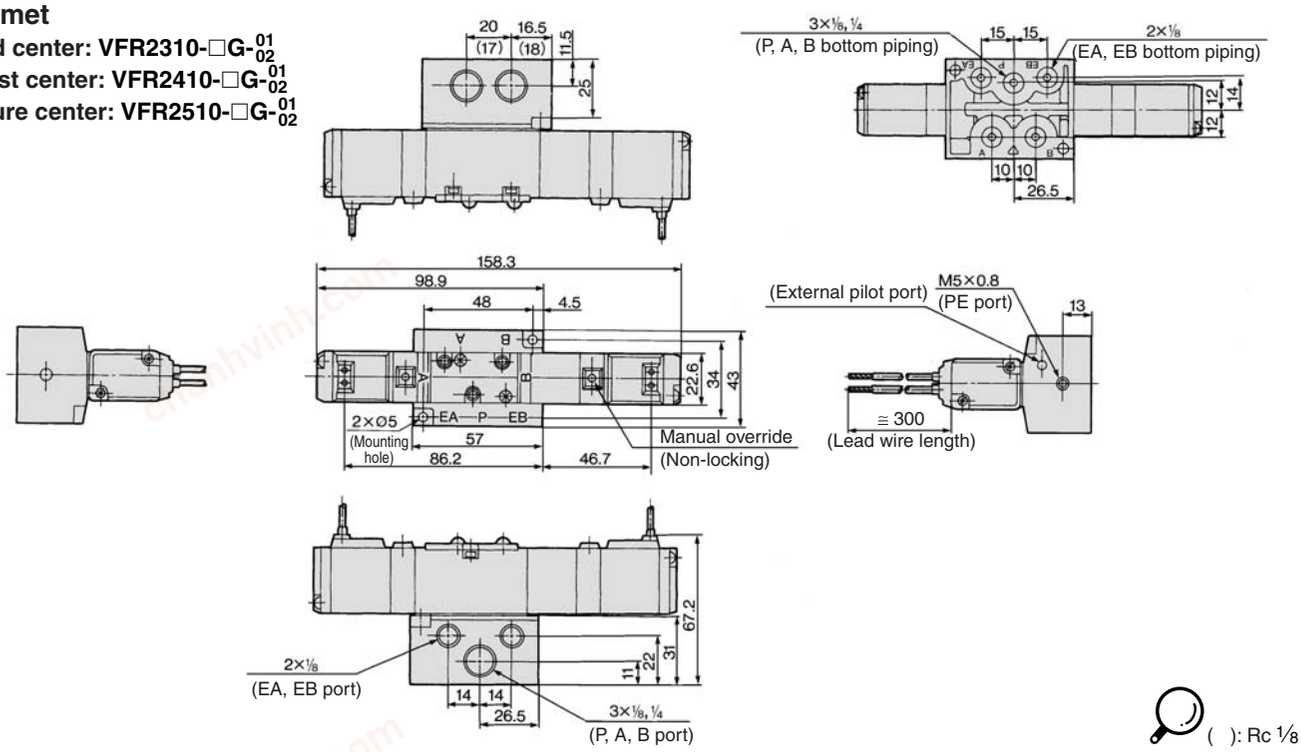
∗ Other dimensions are the same as the grommet type.

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

Grommet

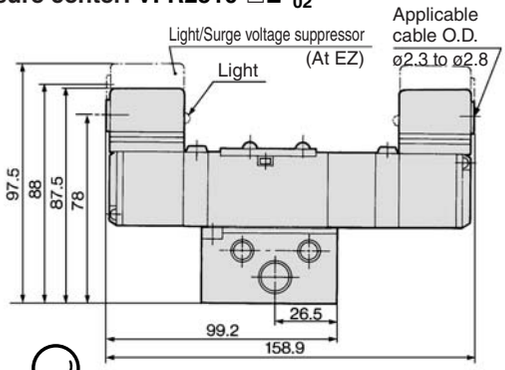
Closed center: VFR2310-□G-$^{01}_{02}$
Exhaust center: VFR2410-□G-$^{01}_{02}$
Pressure center: VFR2510-□G-$^{01}_{02}$



( ): Rc 1/8

Grommet terminal

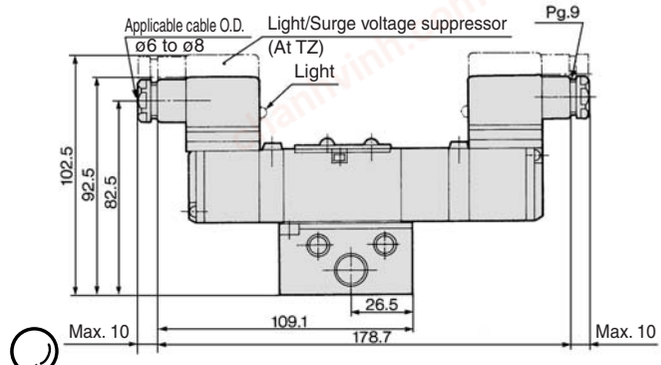
Closed center: VFR2310-□E-$^{01}_{02}$
Exhaust center: VFR2410-□E-$^{01}_{02}$
Pressure center: VFR2510-□E-$^{01}_{02}$



∗ Other dimensions are the same as the grommet type.

Conduit terminal

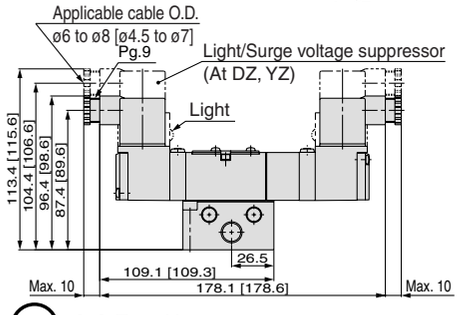
Closed center: VFR2310-□T-$^{01}_{02}$
Exhaust center: VFR2410-□T-$^{01}_{02}$
Pressure center: VFR2510-□T-$^{01}_{02}$



∗ Other dimensions are the same as the grommet type.

DIN terminal

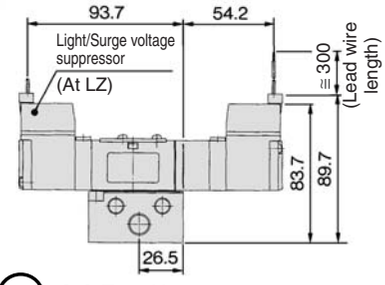
Closed center: VFR2310-□D-$^{01}_{Y\ 02}$
Exhaust center: VFR2410-□D-$^{01}_{Y\ 02}$
Pressure center: VFR2510-□D-$^{01}_{Y\ 02}$



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

L plug connector

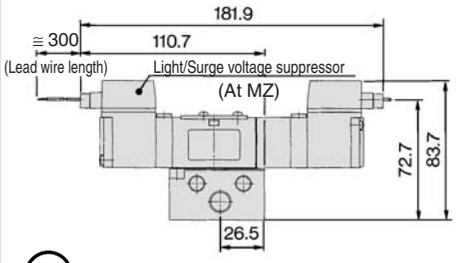
Closed center: VFR2310-□L-$^{01}_{02}$
Exhaust center: VFR2410-□L-$^{01}_{02}$
Pressure center: VFR2510-□L-$^{01}_{02}$



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

M plug connector

Closed center: VFR2310-□M-$^{01}_{02}$
Exhaust center: VFR2410-□M-$^{01}_{02}$
Pressure center: VFR2510-□M-$^{01}_{02}$



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

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Series VFR2000
Manifold Specifications

Manifold Specifications

Base model	Wiring	Porting specifications A, B port	Port size P, EA, EB	Port size A, B	Stations	Applicable valve model
Plug-in type **VV5FR2-01□(-Q)**	• With terminal block	Side/Bottom Note)	1/4	1/8, 1/4 C6, C8	2 to 15	VFR2□00-□F(-Q)
	• With multi-connector • With D-sub connector				2 to 8	
Non plug-in type **VV5FR2-10(-Q)**	• Grommet • Grommet terminal • Conduit terminal • DIN terminal • L plug connector • M plug connector				2 to 15	VFR2 10-□G VFR2□10-□E VFR2□10-□T VFR2□10-□D(-Q) VFR2□10-□L VFR2□10-□M

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 ..... **1 set (Manifold base part no.)**
***VFR2100-5FZ** ..... **3 sets (2 position single part no.)**
***VFR2200-5FZ** ..... **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.

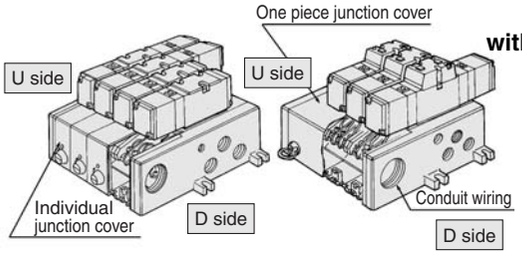
<Example> Non plug-in type: 6 stations

VV5FR2-10-061-01 ..... **1 set (Manifold base part no.)**
***VFR2110-5D** ..... **5 sets (2 position single part no.)**
***VFR2410-5D** ..... **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.**



VV5FR2 − 01T [1] − [08] [1] − [02] [ ] − [ ]

Series VFR2000 Manifold

Plug-in type with terminal block

Junction cover

Nil	Individual junction cover
1	One-piece junction cover

Stations

02	2 stations
⋮	⋮
15	15 stations

Symbol

Symbol	Passage P	Passage EA, EB	Porting specification A, B
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

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

Port size

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

* For bottom ported, 1/8 is only available.

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

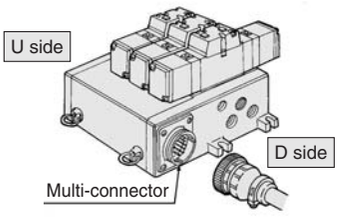
CE-compliant

Nil	—
Q	CE-compliant

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".

Plug-in Type: With Multi-connector (For wiring specifications, refer to page 1326.)

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



VV5FR2 − 01C [D] [1] − [05] [1] − [01] [ ] − [ ]

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

Symbol	Passage P	Passage EA, EB	Porting specification A, B
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

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

Port size

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

* For bottom ported, 1/8 is only available.

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

CE-compliant

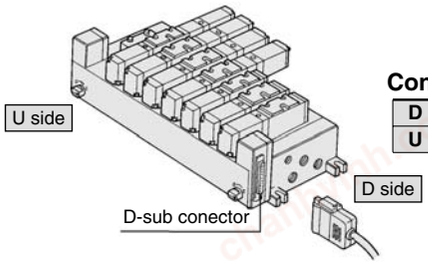
Nil	—
Q	CE-compliant

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".

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Plug-in Type: With D-sub Connector (For wiring specifications, refer to page 1326.)

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



VV5FR2 – 01F U 1 – 06 1 – 01 – CE-compliant

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

Symbol	Passage P	Passage EA, EB	Porting specification A, B
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

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

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

Port size

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

∗ For bottom ported, 1/8 is only available.

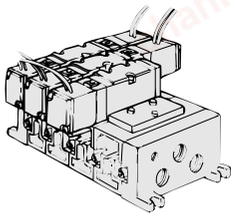
CE-compliant

Nil	—
Q	CE-compliant

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: Grommet, Grommet Terminal, Conduit Terminal, DIN Terminal

- **Wiring for every valve**



VV5FR2 – 10 – 05 1 – 01 – CE-compliant

Series VFR2000 Manifold

Non plug-in type

Stations

02	2 stations
⋮	⋮
15	15 stations

Symbol

Symbol	Passage P	Passage EA, EB	Porting specification A, B
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

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

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

Port size

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

∗ For bottom ported, 1/8 is only available.

CE-compliant

Nil	—
Q	CE-compliant

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”.

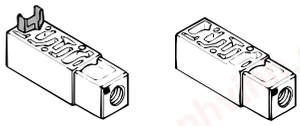
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Manifold/Option Parts Assembly

Individual SUP spacer

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

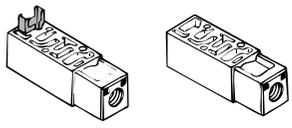
Body type		Plug-in type	Non plug-in type
Part no.	Rc 1/8	VVFS2000-P-01-1	VVFS2000-P-01-2
	Rc 1/4	VVFS2000-P-02-1	VVFS2000-P-02-2



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.

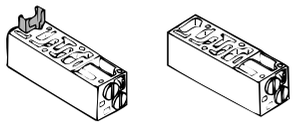
Body type	Plug-in type	Non plug-in type
Part no.	AXT625-12A	



Throttle valve spacer

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

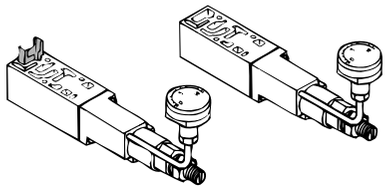
Body type	Plug-in type	Non plug-in type
Part no.	VVFS2000-20A-1	VVFS2000-20A-2



Interface regulator

Interface regulator set on the manifold block can regulate pressure for each valve. (Refer to "Flow Characteristics" on page 1324 before operation.)

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

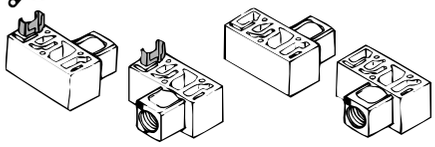


Air release valve spacer

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 L/R	VVFS2000-24A-2 L/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.

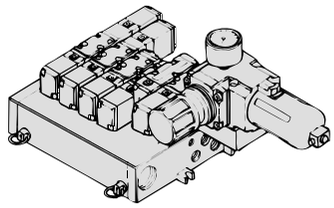
Body type	Plug-in type	Non plug-in type
Part no.	VVFS2000-10A	

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.

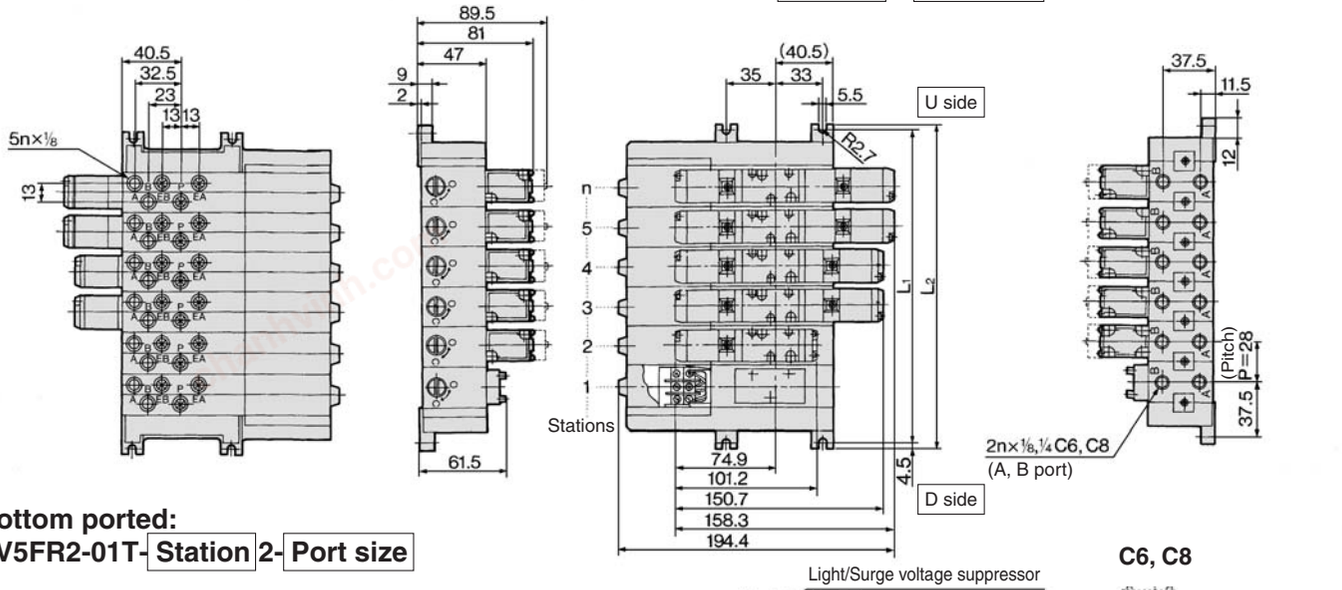


For details, refer to page 1247.

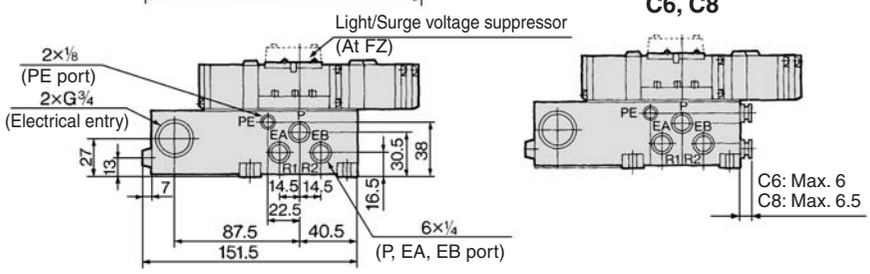
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Manifold/Plug-in Type

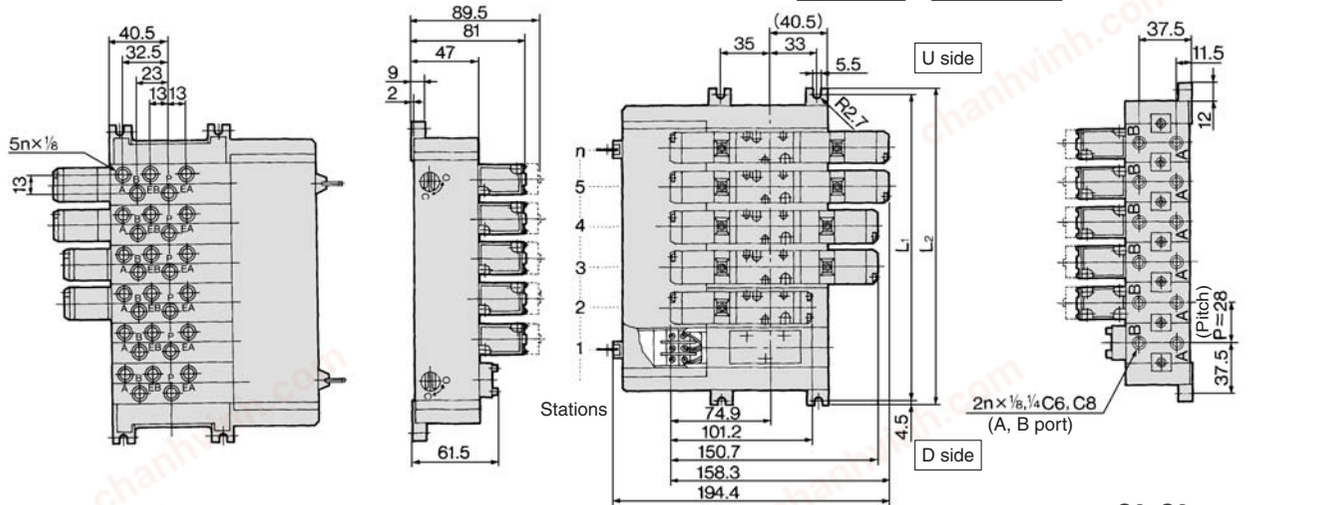
With terminal block (Individual junction cover): VV5FR2-01T- Station 1- Port size



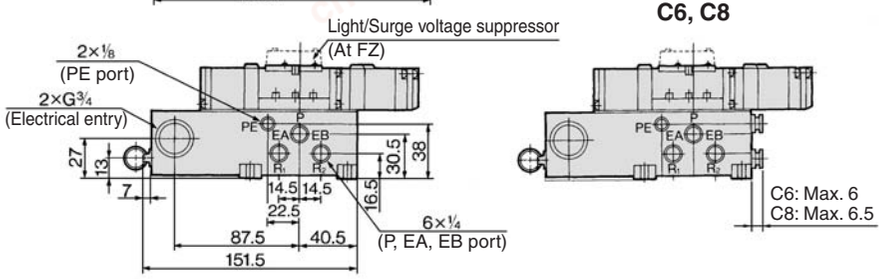
Bottom ported: VV5FR2-01T- Station 2- Port size



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



Bottom ported: VV5FR2-01T1- Station 2- Port size



n: Stations

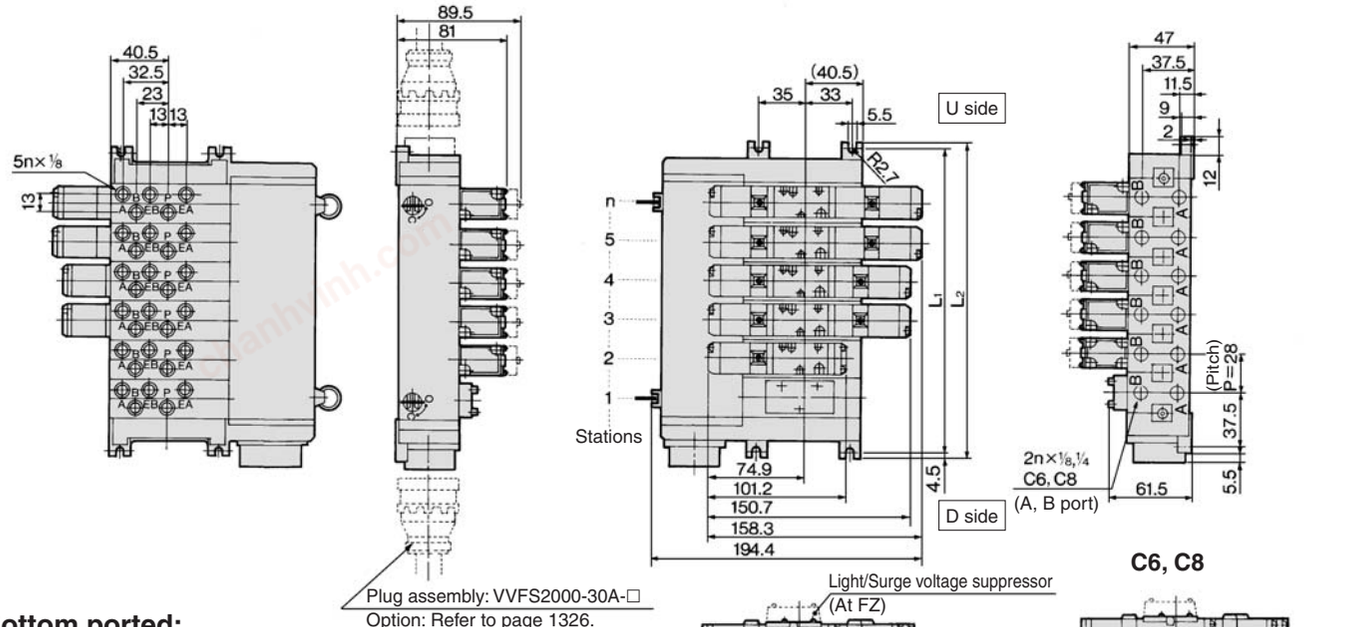
L / Stations	1	2	3	4	5	6	7	8	9	10	Formula
L1	75	103	131	159	187	215	243	271	299	327	L1 = 28 x n + 47
L2	84	112	140	168	196	224	252	280	308	336	L2 = 28 x n + 56

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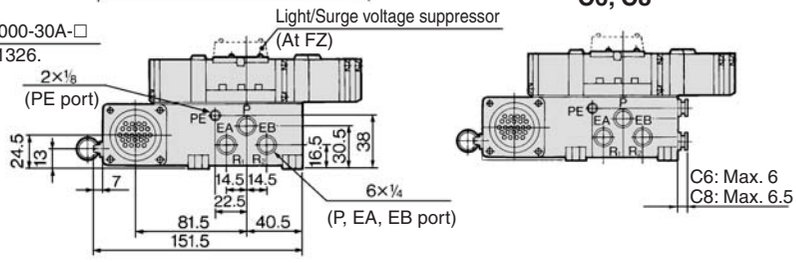
Series VFR2000

Manifold/Plug-in Type

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

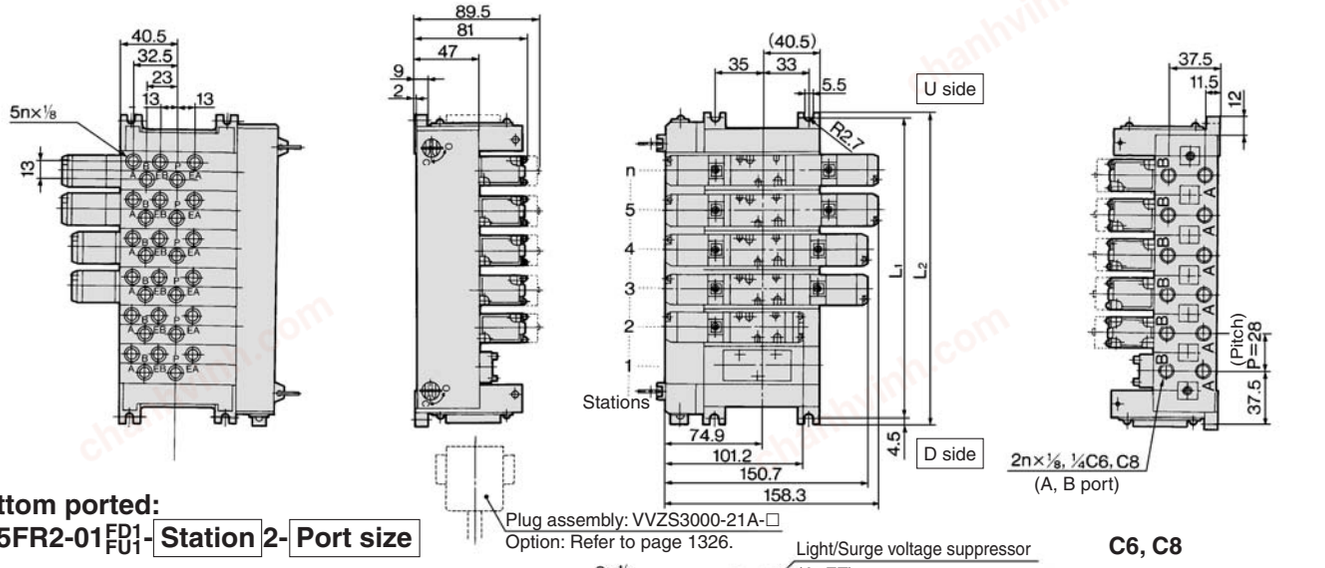


Bottom ported:
VV5FR2-01CD1/CU1-Station 2-Port size

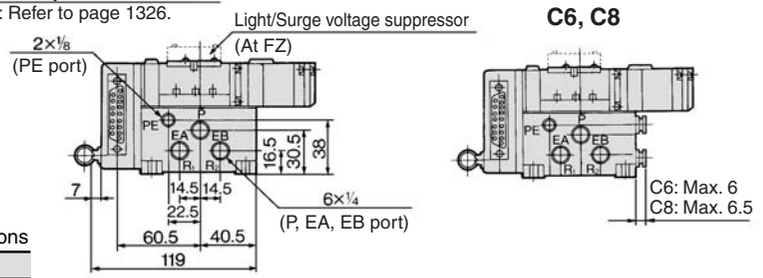


For wiring specifications, refer to page 1326.

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



Bottom ported:
VV5FR2-01FD1/FU1-Station 2-Port size



For wiring specifications, refer to page 1326.

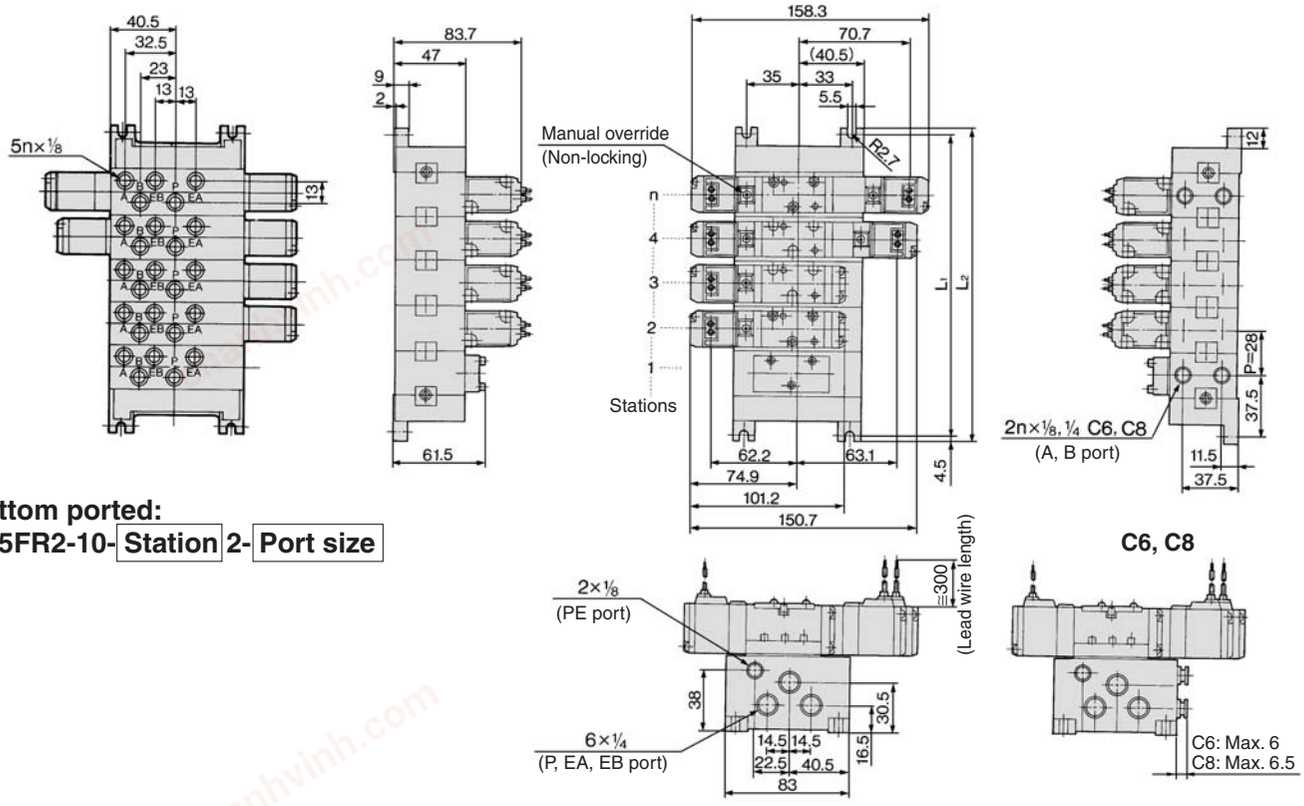
n: Stations

L / Stations	1	2	3	4	5	6	7	8	Formula
L1	75	103	131	159	187	215	243	271	L1 = 28 x n + 47
L2	84	112	140	168	196	224	252	280	L2 = 28 x n + 56

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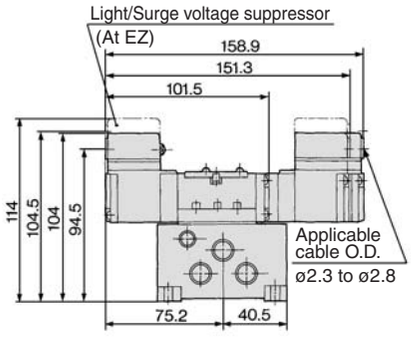
Manifold/Non plug-in type: VV5FR2-10-[Station]1-[Port size]

Grommet: G

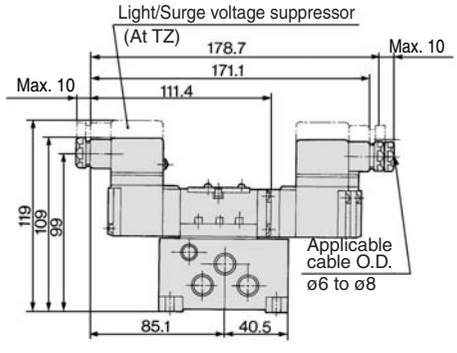


Bottom ported:
VV5FR2-10-[Station]2-[Port size]

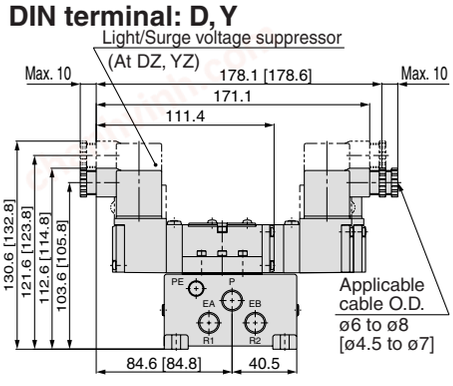
Grommet terminal: E



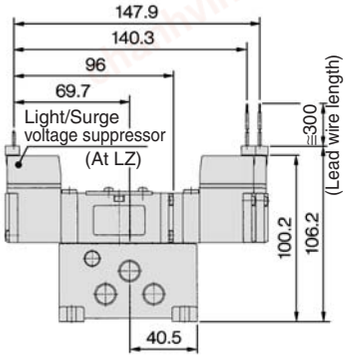
Conduit terminal: T



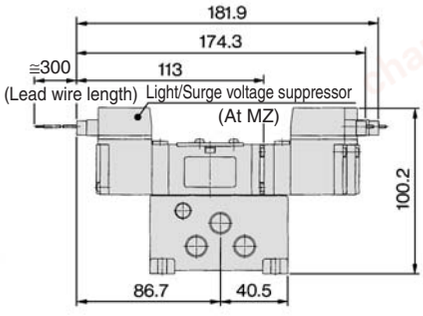
DIN terminal: D, Y



L plug connector: L



M plug connector: M




* [ ]: Type Y

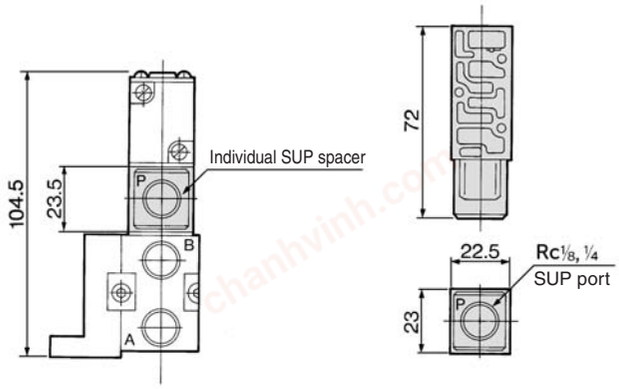
n: Stations

L / Stations	1	2	3	4	5	6	7	8	9	10	Formula
L1	75	103	131	159	187	215	243	271	299	327	L1 = 28 x n + 47
L2	84	112	140	168	196	224	252	280	308	336	L2 = 28 x n + 56

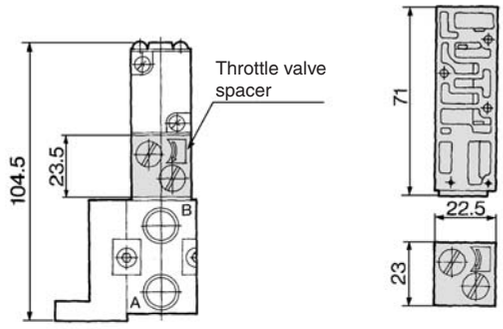
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Manifold/Option Parts Assembly: Plug-in Type/Non Plug-in Type

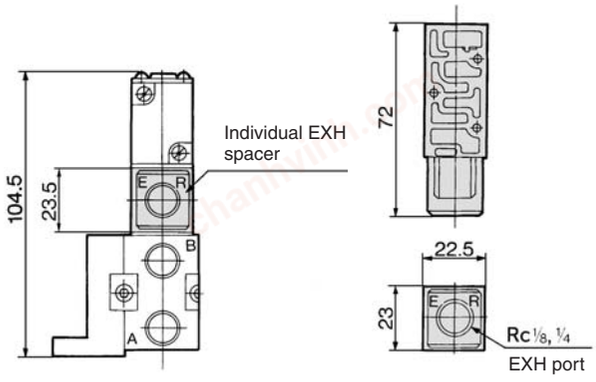
Individual SUP spacer:
VVFS2000-P-$^{01}_{02}$-1 (Plug-in type)
VVFS2000-P-$^{01}_{02}$-2 (Non plug-in type)



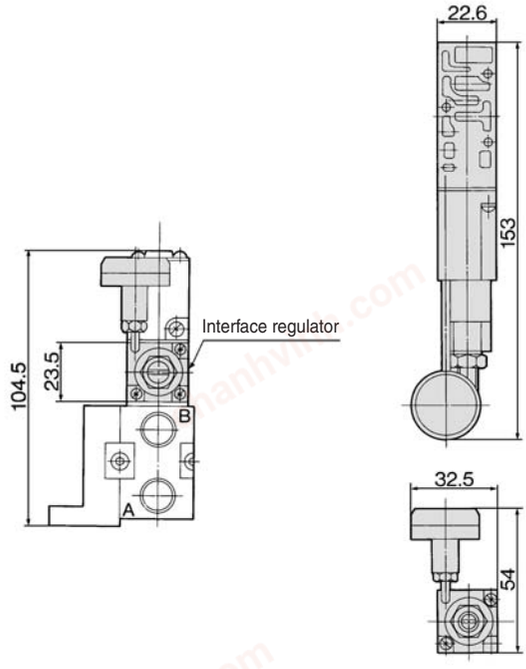
Throttle valve spacer:
VVFS2000-20A-1 (Plug-in type)
VVFS2000-20A-2 (Non plug-in type)



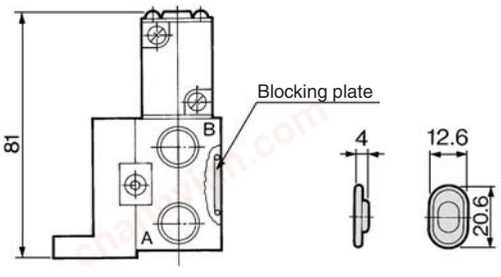
Individual EXH spacer:
VVFS2000-R-$^{01}_{02}$-1 (Plug-in type)
VVFS2000-R-$^{01}_{02}$-2 (Non plug-in type)



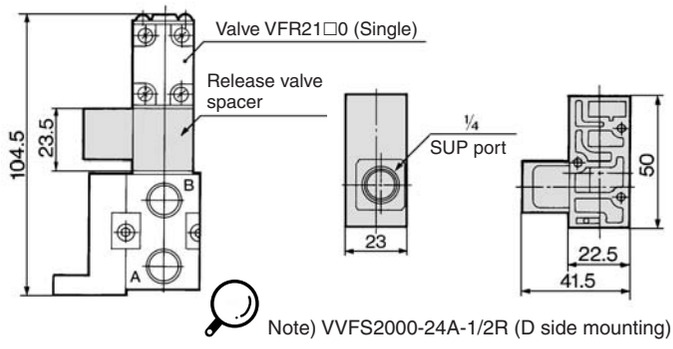
Interface regulator
ARBF2000-00-P-1 (Plug-in type)
ARBF2000-00-P-2 (Non plug-in type)



SUP block disk: AXT625-12A
EXH block disk: AXT625-12A



Release valve spacer
VVFS2000-24A-1$^{R}_{L}$ (Plug-in type)
VVFS2000-24A-2$^{R}_{L}$ (Non plug-in type)



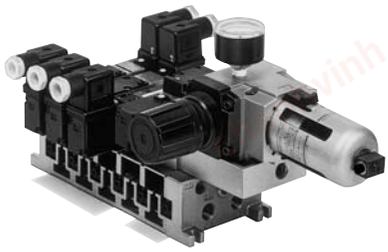
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Manifold with Control Unit

- **Control unit (Filter, Regulator, Pressure switch, Air release valve) are all standardized to the one unit, and can be mounted on the manifold base without any attachments.**
- **Piping processes are eliminated.**



Plug-in type



Non plug-in type

⚠ Caution

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

Manifold Specifications

Manifold	Plug-in type: **VV5FR2-01□(-Q)**		Non plug-in type: **VV5FR2-10(-Q)**
Wiring	With terminal block With multi-connector With D-sub connector		Grommet, Grommet terminal Conduit terminal, DIN terminal L plug connector, M plug connector
Applicable valve model	VFR2□00-□F(-Q)		VFR2□10-□G, VFR2□10-□E VFR2□10-□T, VFR2□10-□DY(-Q) VFR2□10-□L, VFR2□10-□M
Porting specifications Rc	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/With manual drain)	
Filtration degree	5 µm
Regulator	
Set pressure (Outlet pressure)	0.05 to 0.85 MPa
Pressure switch	
Set pressure range: OFF	0.1 to 0.6 MPa
Differential	0.08 MPa
Contact	1a
Indicator light	LED (RED)
Max. switch capacity	2 VA AC, 2 W DC
Max. operating current	24 VAC, DC or less: 50 mA 100 VAC, DC: 20 mA
Inside voltage drop	4 V or less
Air release valve (Single only)	
Operating pressure range	0.2 to 0.9 MPa

Control Unit/Option

Air release valve spacer (1)	<Plug-in type> VVFS2000-24A-1R (D side mounting) VVFS2000-24A-1L (U side mounting)	
	<Non plug-in type> VVFS2000-24A-2R (D side mounting) VVFS2000-24A-2L (U side mounting)	
Pressure switch (2)	IS1000P-2-1	
Blanking 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 page 1246.
Note 2) Pressure switch cannot be mounted later on non plug-in type.

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Series VFR2000

How to Order

VV5FR2 – 10 – 08 1 – 01 – AP – –

Series VFR2000 Manifold

Base model

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

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

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

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

Port size

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

* For bottom ported, 1/8 is only available.

Air release valve coil rating

Nil	None
1	100 VAC, 50/60 Hz
5	24 VDC
9	Other

Control unit type

Control equipment \ Symbol	Nil	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.

CE-compliant

Nil	—
Q	CE-compliant

How to Order Manifold Assembly

<Example> Plug-in type with terminal block

VV5FR2-01T1-091-02-MP5 ····· 1 set (Manifold base part no.)
***VFR2100-5FZ ····· 5 sets (2 position single part no.)**
***VFR2200-5FZ ····· 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 ····· 1 set (Manifold base part no.)
***VFR2110-5D ····· 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.

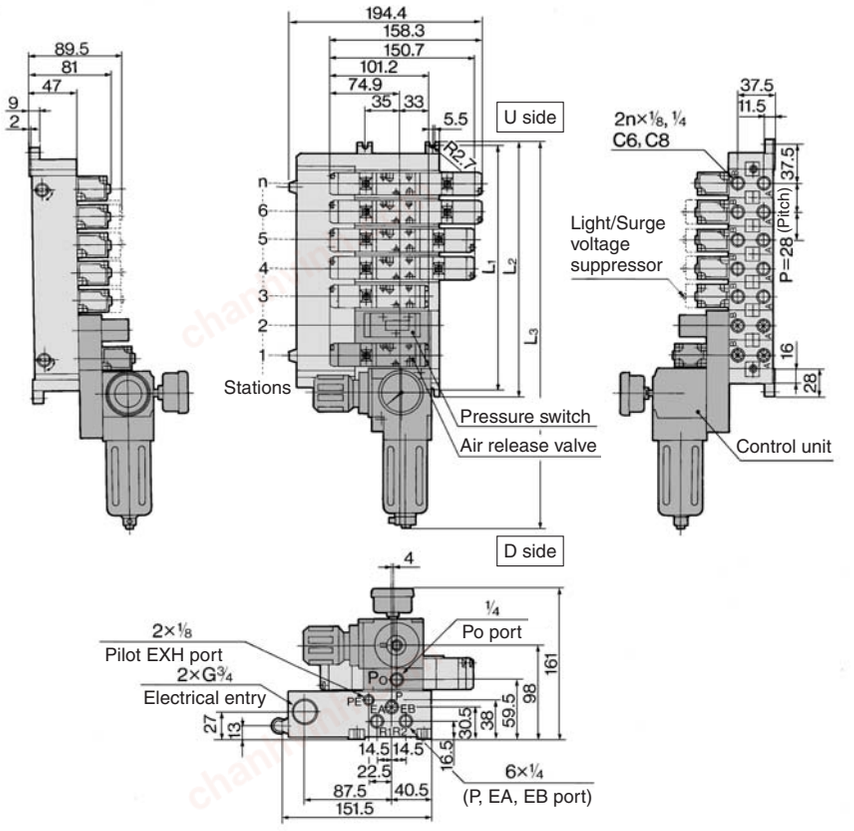
The 1st and 2nd station are used for control unit mounting.
When ordering, specify the part nos. in order from the 3rd. station in the D side.
When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

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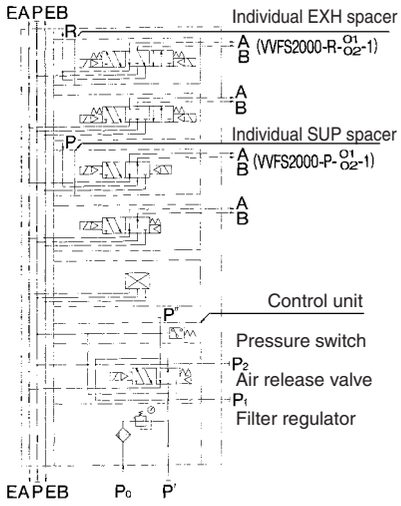
Manifold with Control Unit: Plug-in Type/Non Plug-in Type

Plug-in type:

VV5FR2-01T- Station **1-** Port size **-** Control unit Voltage of air release valve

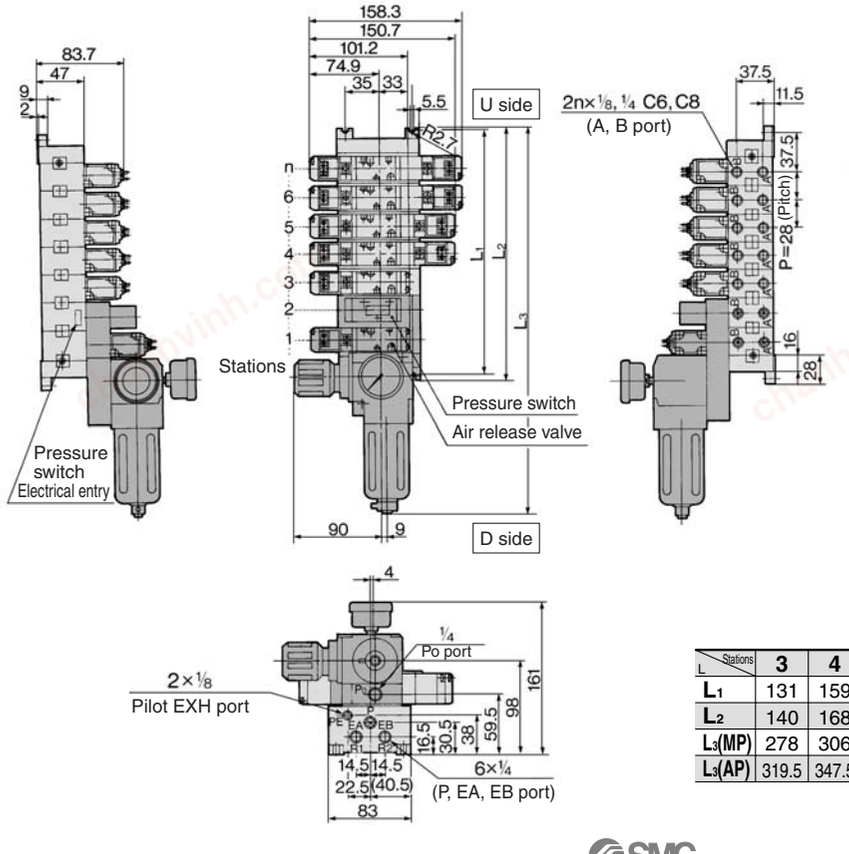


Example for manifold

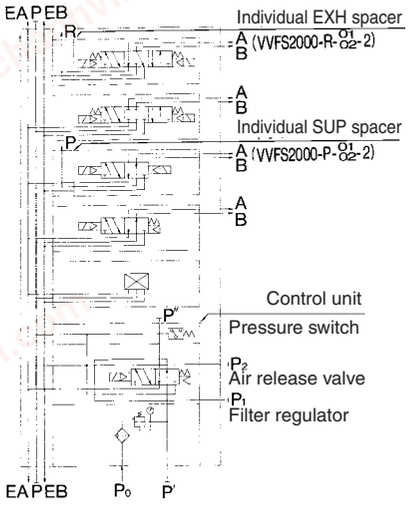


Non plug-in type:

VV5FR2-10- Station **1-** Port size **-** Control unit Voltage of air release valve



Example for manifold



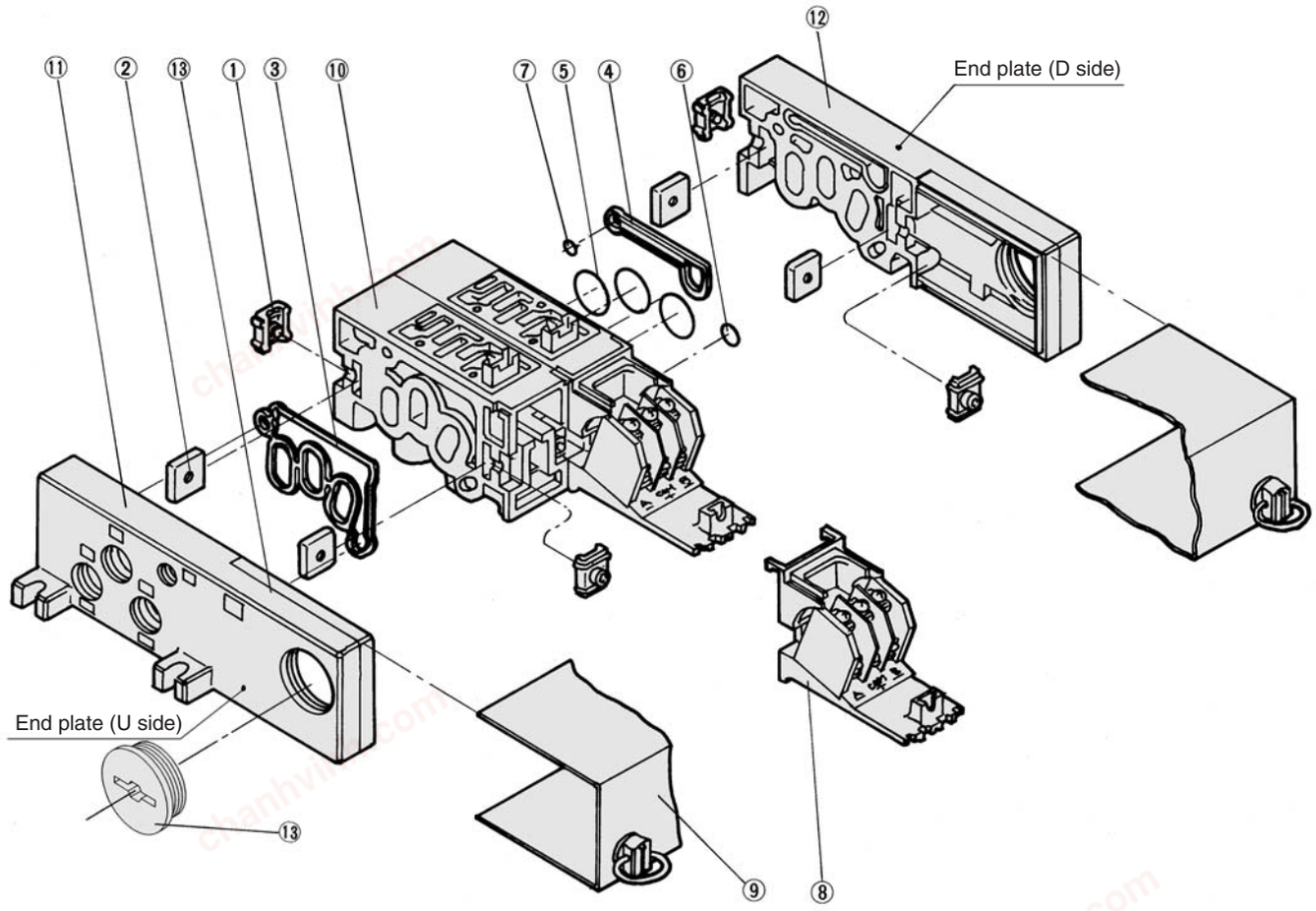
n: Stations

L / Stations	3	4	5	6	7	8	9	10	Formula
L1	131	159	187	215	243	271	299	327	L1 = 28 x n + 47
L2	140	168	196	224	252	280	308	336	L2 = 28 x n + 56
L3(MP)	278	306	334	362	390	418	446	474	L3 = 28 x n + 194
L3(AP)	319.5	347.5	375.5	403.5	431.5	459.5	487.5	515.5	L3 = 28 x n + 235.5

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Series VFR2000

Manifold Base Construction: Plug-in Type/Non Plug-in Type



Replacement Parts

No.	Description	Material	Part no.	
1	**Connection fitting A**	Steel plate		AXT625-4-1
2	**Connection fitting B**	Steel plate		AXT625-5
3	**Gasket A**	NBR		AXT625-17
4	**Gasket B**	NBR		AXT625-16
5	**O-ring**	NBR		18 x 15 x 1.5
6	**O-ring**	NBR		10.5 x 7.5 x 1.5
7	**O-ring**	NBR		8 x 5 x 1.5
8	**Adapter plate assembly**	—	For 01T	AXT625-28-1A
			For 01T1	(Terminal and adapter plate)
	Adapter plate	Resin	For 01C	AXT625-28-1
			For 01F	VVF2000-26-6

No.	Description	Material	Part no.	
9	**Junction cover assembly**	—	For 01T	AXT625-28-3A
			For 01T1	AXT625-28-7A-[Stations]
			For 01C	
			For 01F	VVF2000-26-5A-[Stations]
13	**Rubber plug**	NBR	For 01T	AXT623-22

Replacement Parts: Sub Assembly

Note) Manifold Base/Construction: Plug-in type with terminal block.

No.	Description	Assembly part no.	Component parts	Applicable manifold base
10	**Manifold block assembly** (1)	AXT625-20A-$^{1}_{2}{}^{C6}_{C8}$ (2)	Manifold block ⑩, Metal joint ①, ②, O-ring ⑤, ⑥, ⑦ Terminal ⑧, Junction cover ⑨, Adaptor plate, Pin housing, Guide	Plug-in type
		AXT625-10A-$^{1}_{2}{}^{C6}_{C8}$ (3)	Manifold block ⑩, Metal joint ①, ②, O-ring ⑤, ⑥, ⑦	Non plug-in type
11	**End plate (U side) assembly**	AXT625-2A-20	End plate (U) ⑪, Metal joint ①, ②, Gasket A ③, Guard ⑬	Plug-in type With terminal block (For 01T / 01T1) (3)
		AXT625-2A-10	End plate (U) ⑪, Metal joint ①, ②, Gasket A ③, Guard ⑬	Non plug-in type (For 10) (3)
12	**End plate (D side) assembly**	AXT625-3A-20	End plate (D) ⑫, Metal joint ①, ②, Gasket B ④, Guard ⑬, Steel ball	Plug-in type With terminal block (For 01T / 01T1) (3)
		AXT625-3A-10	End plate (D) ⑫, Metal joint ①, ②, Gasket B ④, Guard ⑬, Steel ball	Non plug-in type (For 10) (3)

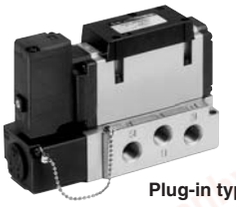
Note 1) For side ported
Note 2) 1: A, B port size Rc 1/8, 2: A, B port size Rc 1/4
Note 3) Please contact SMC if parts except for 10/01T/01T1 are needed.

∗ Contact SMC for CE-compliant products.

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

[Option] NRTL /C

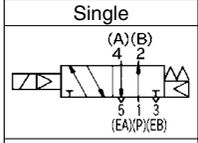
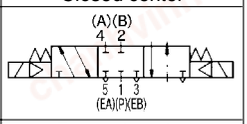
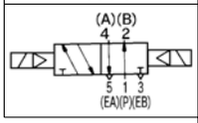
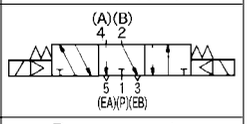
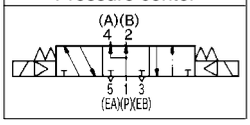


Plug-in type



Non plug-in type

JIS Symbol

2 position	3 position
Single	Closed center
	
Double	Exhaust center
	
	Pressure center
	

Standard Specifications

Valve specifications	Fluid		Air
	Operating pressure range	2 position single/3 position	0.2 to 0.9 MPa
		2 position double	0.1 to 0.9 MPa
	Ambient and fluid temperature		–10 to 50°C (No freezing. Refer to page 5.)
	Lubrication		Not required (1)
	Manual override		Non-locking push type
	Mounting orientation		Unrestricted
	Shock/Vibration resistance		300/50 m/s² (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
	Electrical entry	Plug-in type	Conduit terminal
		Non plug-in type	Grommet, Grommet terminal Conduit terminal, DIN terminal

Note 1) Use turbine oil Class 1 (ISO VG32), if lubricated. Note 3) At rated voltage

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

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

Option Specifications

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: Plug-in	Model: Non plug-in	Port size Rc	Flow characteristics (1): 1 → 4/2 (P → A/B) C [dm³/(s·bar)]	b	Cv	Flow characteristics (1): 4/2 → 5/3 (A/B → EA/EB) C [dm³/(s·bar)]	b	Cv	Max. (2) operating cycle (Hz)	(3) Response time (ms)	(4) Mass (kg)
2 position	Single	VFR310□	VFR311□	1/4	7.5	0.38	1.9	7.5	0.34	1.9	5	30 or less	0.61 (0.64) <0.58>
			VFR314□	3/8	8.4	0.39	2.2	8.7	0.38	2.2			
	Double	VFR320□	VFR321□	1/4	7.1	0.41	1.9	7.4	0.40	1.9	5	30 or less	0.71 (0.74) <0.69>
			VFR324□	3/8	7.9	0.36	2.0	8.6	0.37	2.2			
3 position	Closed center	VFR330□	VFR331□	1/4	6.8	0.40	1.8	6.3	0.38	1.6	3	50 or less	0.72 (0.75) <0.71>
			VFR334□	3/8	7.2	0.39	1.9	6.5	0.40	1.7			
	Exhaust center	VFR340□	VFR341□	1/4	6.5	0.42	1.7	7.9 [3.4]	0.41 [0.47]	2.0 [0.96]	3	50 or less	0.72 (0.75) <0.71>
			VFR344□	3/8	6.9	0.42	1.8	9.5 [3.4]	0.39 [0.46]	2.4 [0.96]			
	Pressure center	VFR350□	VFR351□	1/4	7.6 [2.4]	0.33 [0.48]	1.9 [0.69]	6.1	0.36	1.5	3	50 or less	0.72 (0.75) <0.71>
			VFR354□	3/8	9.3 [2.4]	0.34 [0.47]	2.2 [0.69]	6.5	0.41	1.7			

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-$^{02}_{03}$, ( ): VFR3□10-DZ□-$^{02}_{03}$, < >: VFR3□40-□G-$^{02}_{03}$

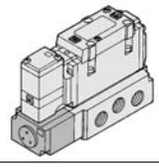
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Series VFR3000

How to Order

Electrical entry

F: Plug-in type, conduit terminal



Option

Nil	None
Z	With light/surge voltage suppressor

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

Nil	Side ported
B	Bottom ported *

* Option

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

Nil	Without sub-plate
02	1/4
03	3/8

* For bottom ported: Rc 1/4

CE-compliant

Nil	—
Q	CE-compliant *

* Electrical entry: D/DO, Y/YO and F only

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

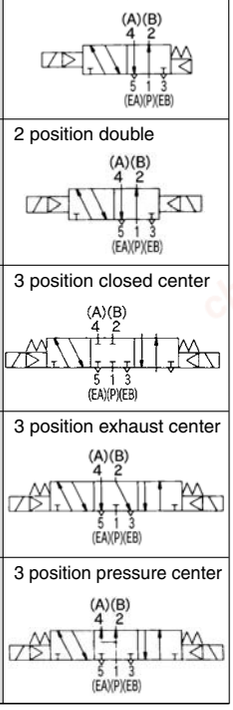
Plug-in VFR3 1 0 0 □ – 5 F □ □ – □ 02 □ – □

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

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

Symbol

1	2 position single
2	2 position double
3	3 position closed center
4	3 position exhaust center
5	3 position pressure center



Body option

0	Standard
1 *	Direct manual override

* Option

Pilot type

Nil	Internal pilot
R *	External pilot

* Option

Coil rated voltage

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

* Option

Option/VFR3□1□

Nil	None
Z	With light/surge voltage suppressor

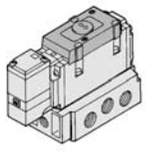
Option/VFR3□4□

Nil	None
Z *	With light/surge voltage suppressor
S *	With surge voltage suppressor

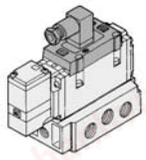
* Indicator light is not available for grommet type. With surge voltage suppressor is available for grommet type only.

Electrical entry: VFR3□1□

E: Grommet terminal

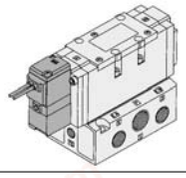


D: DIN terminal

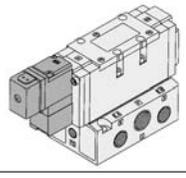


Electrical entry: VFR3□4□

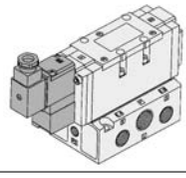
G: Grommet



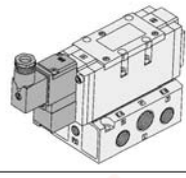
E: Grommet terminal



T: Conduit terminal

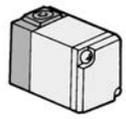


D, Y: DIN terminal

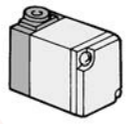


Pilot valve manual override

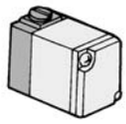
Nil: Non-locking push type



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



B *: Locking type B (Tool required)



C *: Locking type C (Lever)



* Option

How to Order Pilot Valve Assembly

SF4 – 1 F □ – 70 – □ – □

Coil rated voltage

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

* Option

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□
G	Grommet	—	—	VFR3□4□
GS		—	●	
E	Grommet terminal	—	—	
EZ		●	●	
T	Conduit terminal	—	—	
TZ		●	●	
D	DIN terminal	—	—	
DZ		●	●	
Y	DIN terminal (DIN43650B type)	—	—	
YZ		●	●	

Manual override

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

* Option

Symbol

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

CE-compliant

Nil	—
Q	CE-compliant *

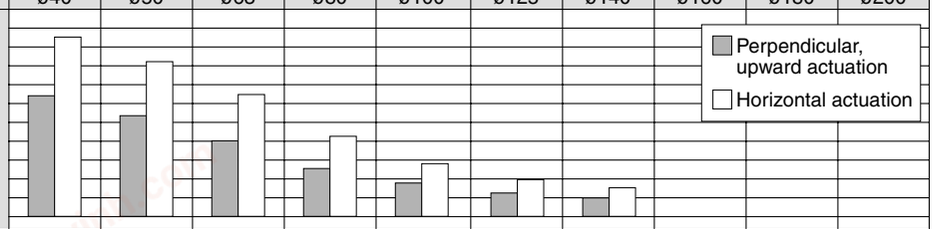
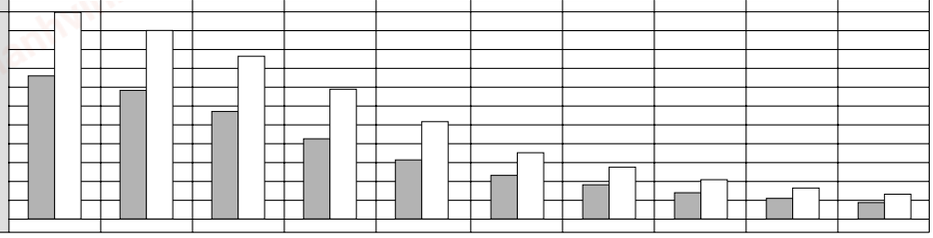
* Electrical entry: D, Y and F only

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

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Cylinder Speed Chart

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

System	Average speed (mm/s)	Bore size									
		Series MB, CA2 Pressure 0.5 MPa Load factor 50% Stroke 500 mm					Series CS1/CS2 Pressure 0.5 MPa Load factor 50% Stroke 1000 mm				
		ø40	ø50	ø63	ø80	ø100	ø125	ø140	ø160	ø180	ø200
A	1000 900 800 700 600 500 400 300 200 100 0										
B	1000 900 800 700 600 500 400 300 200 100 0										

* 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 weight x 9.8)/Theoretical force) x 100%

System Components

System	Solenoid valve	Speed controller	Silencer	SPG (Steel pipe) dia. x Length
A	Series VFR3000 Rc 1/4	AS4000-02 (S = 24 mm²)	AN200-02 (S = 35 mm²)	6A x 1 m
B	Series VFR3000 Rc 3/8	AS420-03 (S = 73 mm²)	AN300-03 (S = 60 mm²)	10A x 1 m

How to Order Sub-plate Assembly

Pilot type

Nil	Internal pilot
R	External pilot

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

02	1/4
03	3/8

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

<Side ported>

Plug-in: VFR3000−P− □ 02 □

Non plug-in: VFS3000−S− □ 02 □

<Bottom ported>

Plug-in: VFR3000−P−B □ 02

Non plug-in: VFS3000−S−B □ 02

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

02	1/4

Note) Mounting bolts and gaskets are not attached.

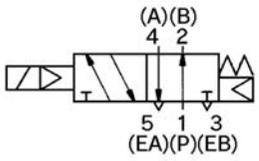
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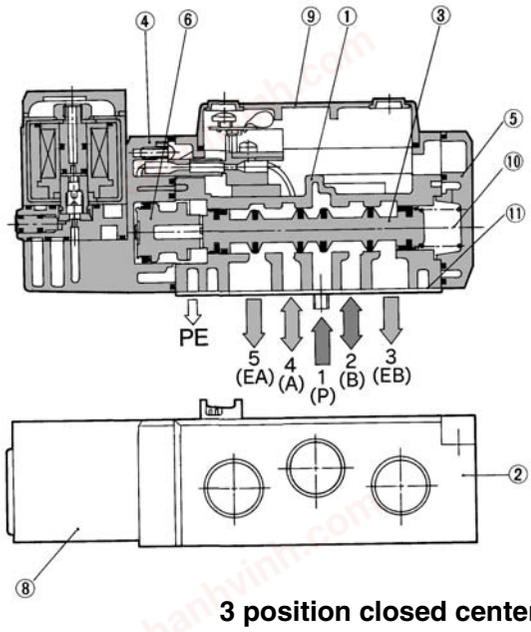
Series VFR3000

Construction

2 position single

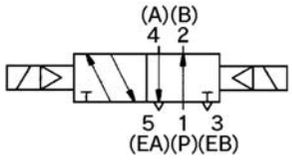
VFR31□0

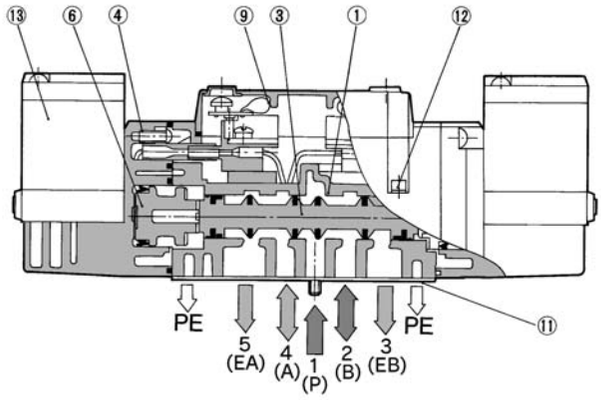




2 position double

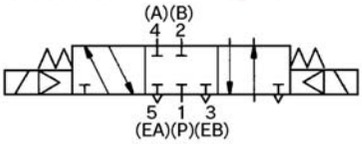
VFR32□0



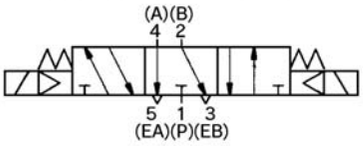


3 position closed center/exhaust center/pressure center

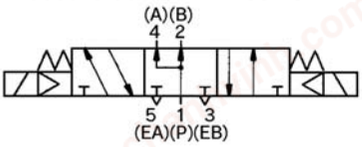
Closed center: VFR33□0

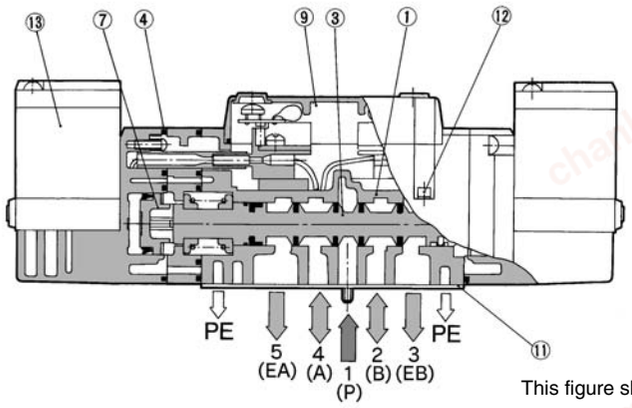


Exhaust center: VFR34□0



Pressure center: VFR35□0





This figure shows a closed center type.

Component Parts

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

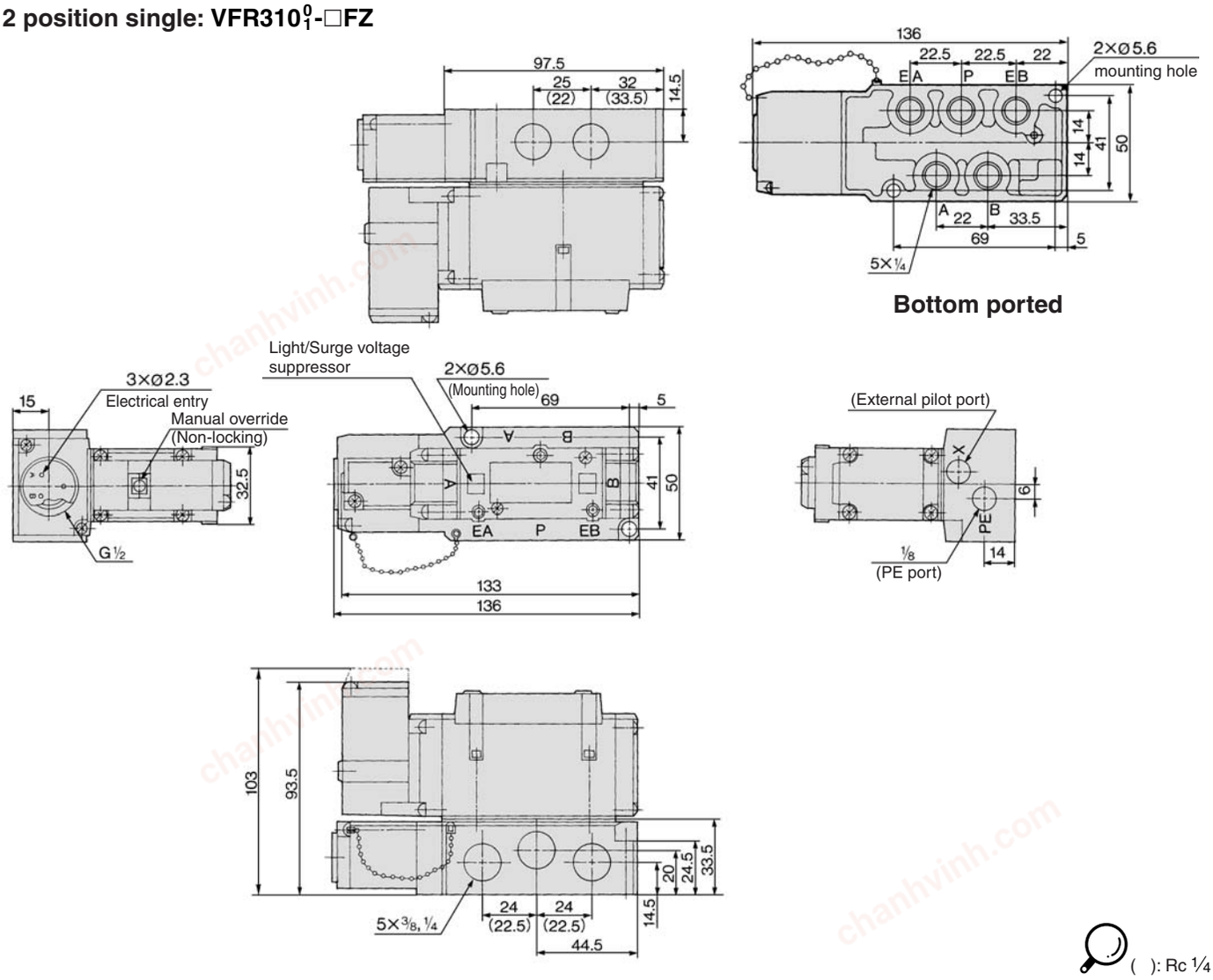
Replacement Parts

No.	Description	Material	Description		
			VFR31□□	**VFR32□□**	**VFR33□□/34□□/35□□**
11	**Gasket**	NBR	VFR3000-26-4	VFR3000-26-4	VFR3000-26-4
12	**Hexagon socket head screw**	Steel	AXT632-3 (M3 x 32)	AXT632-3 (M3 x 32)	AXT632-3 (M3 x 32)
13	**Pilot valve assembly**	—	Refer to “How to Order Pilot Valve Assembly” on page 1252.		
—	**Sub-plate assembly**	—	Refer to “How to Order Sub-plate Assembly” on page 1253.		

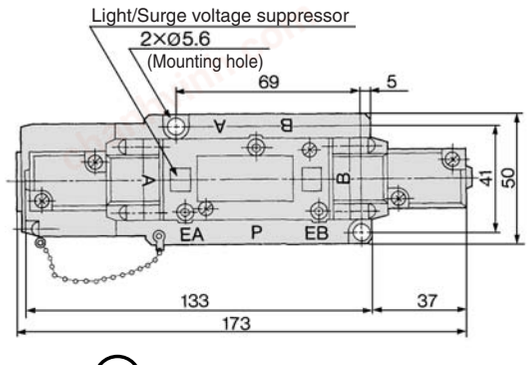
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Plug-in: 2 Position Single/Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position single: VFR310$^{0}_{1}$-□FZ

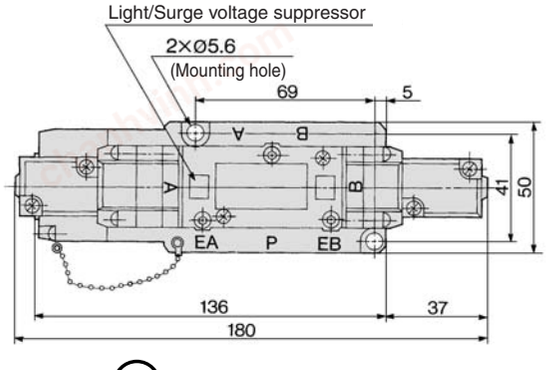


2 position single: VFR320$^{0}_{1}$-□FZ



∗ Other dimensions are the same as the single type.

3 position closed center: VFR330$^{0}_{1}$-□FZ
3 position exhaust center: VFR340$^{0}_{1}$-□FZ
3 position pressure center: VFR350$^{0}_{1}$-□FZ



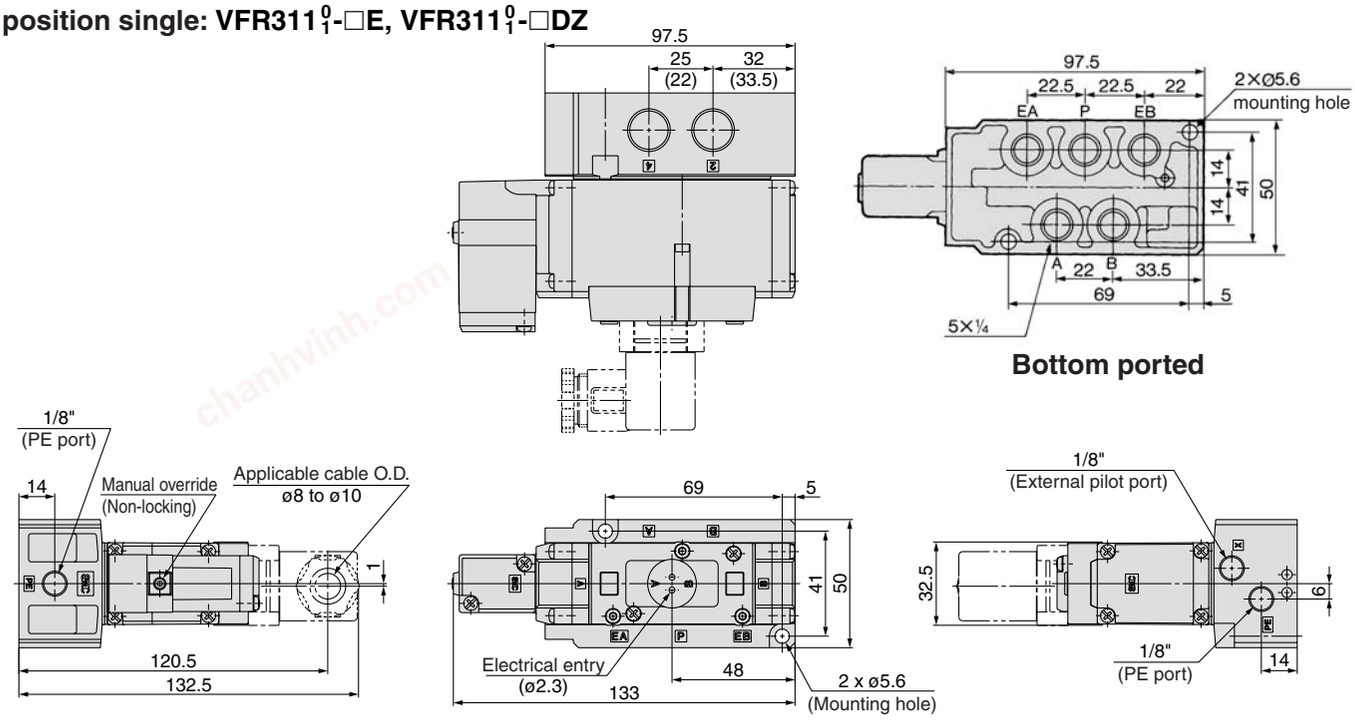
∗ Other dimensions are the same as the single type.

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Series VFR3000

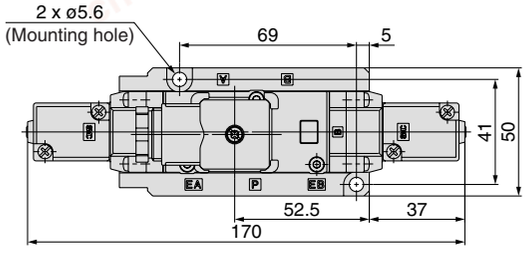
Non Plug-in: 2 Position Single/Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position single: VFR311$^{0}_{1}$-□E, VFR311$^{0}_{1}$-□DZ



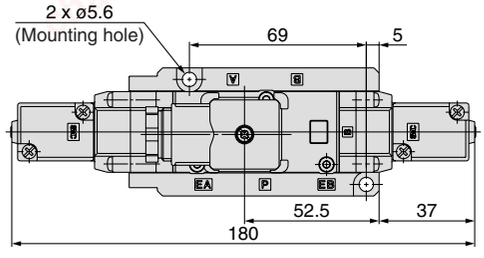
( ): Rc 1/4

2 position double: VFR321$^{0}_{1}$-□E, VFR321$^{0}_{1}$-□DZ



∗ Other dimensions are the same as the single type.

3 position closed center: VFR331$^{0}_{1}$-□E, VFR341$^{0}_{1}$-□DZ
3 position exhaust center: VFR341$^{0}_{1}$-□E, VFR341$^{0}_{1}$-□DZ
3 position pressure center: VFR351$^{0}_{1}$-□E, VFR351$^{0}_{1}$-□DZ

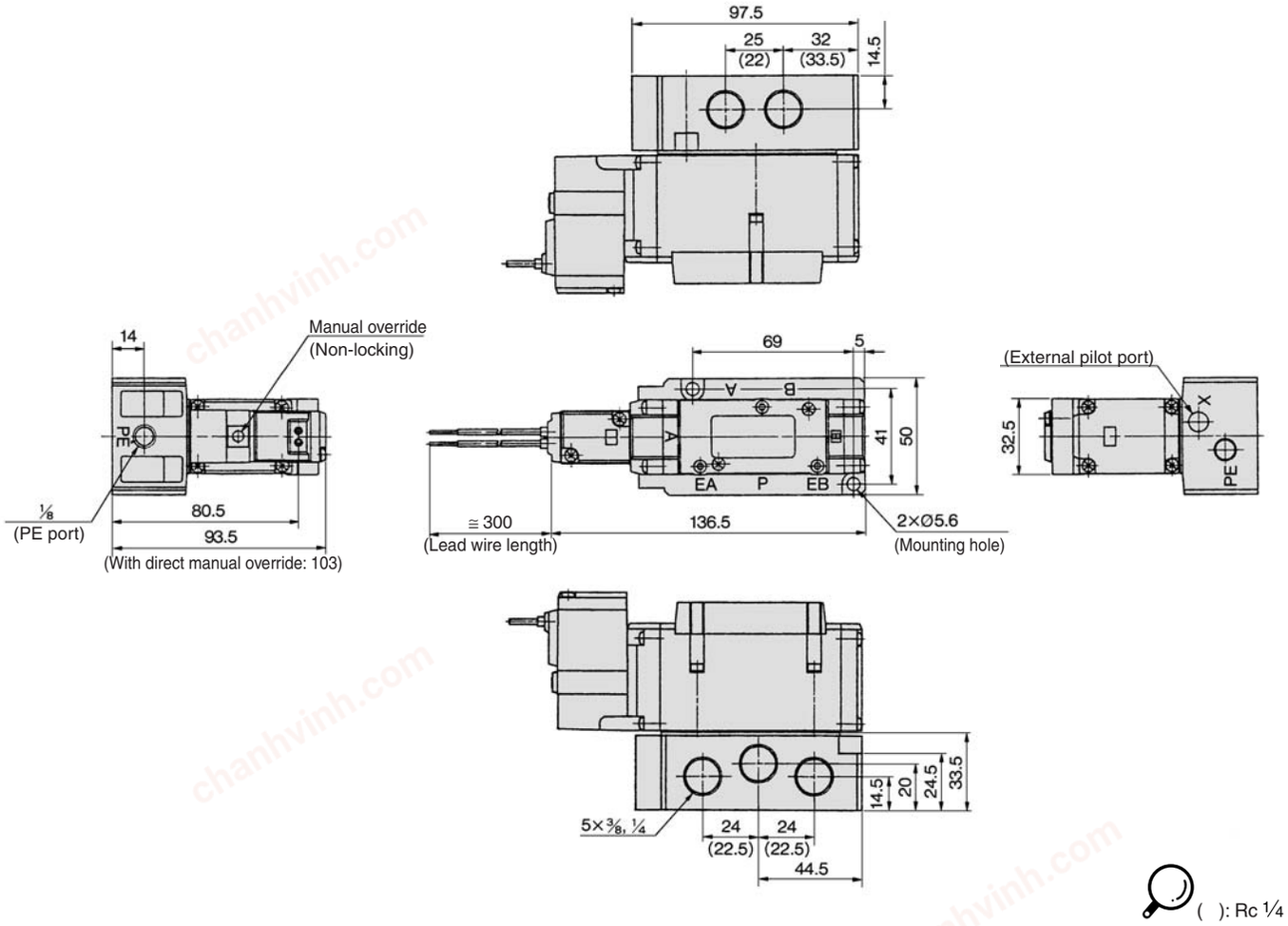


∗ Other dimensions are the same as the single type.

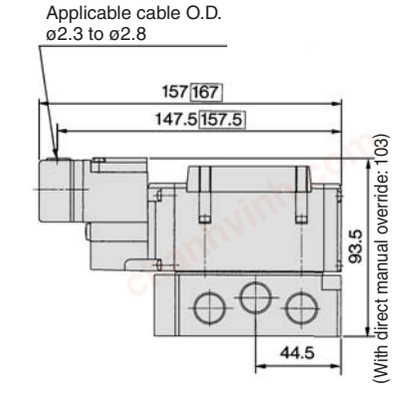
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Non Plug-in: 2 Position Single

2 position single: VFR314$^{0}_{1}$-□G

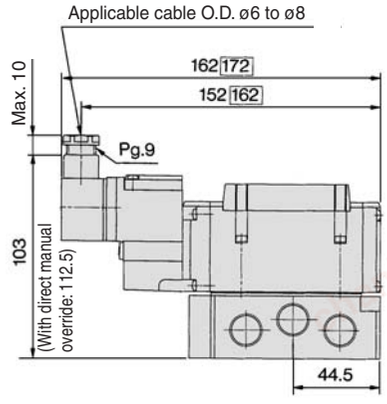


E: Grommet terminal



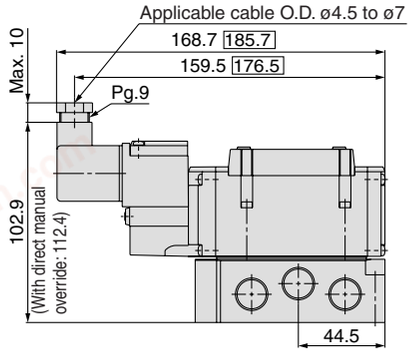
: With light/surge voltage suppressor

T: Conduit terminal



: With light/surge voltage suppressor

D, Y: DIN terminal



: With light/surge voltage suppressor

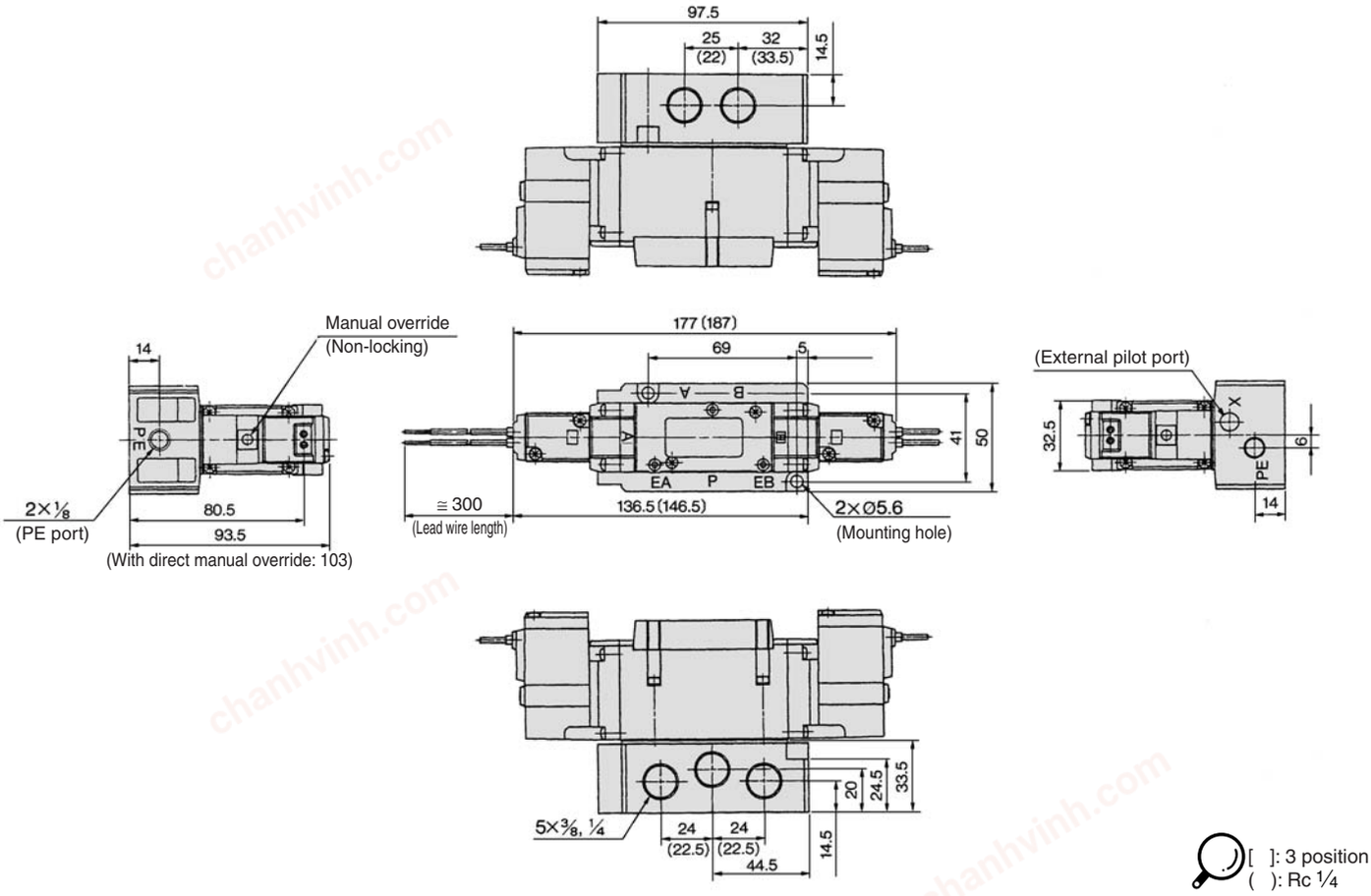
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Series VFR3000

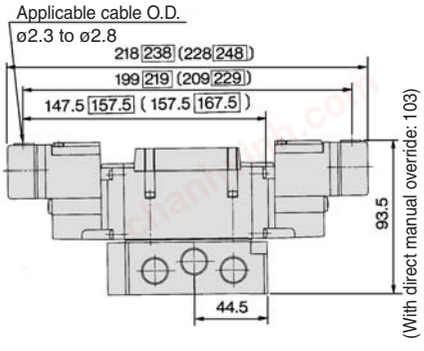
Non Plug-in: 2 Position Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position double: VFR324⁰₁-□G

3 position closed center: VFR334⁰₁-□G
3 position exhaust center: VFR344⁰₁-□G
3 position pressure center: VFR354⁰₁-□G

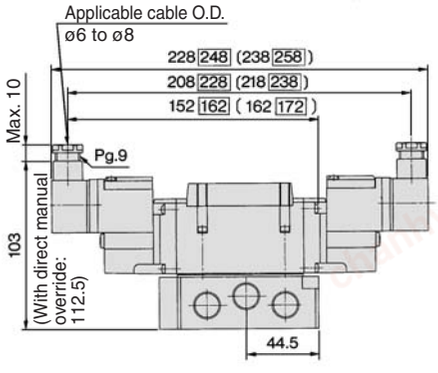


E: Grommet terminal



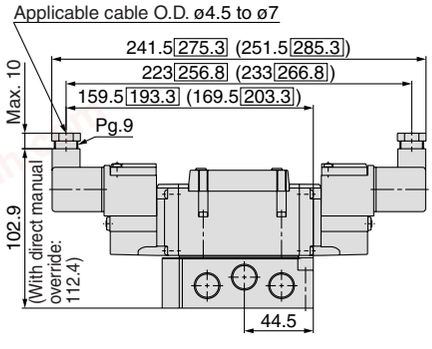
[ ]: 3 position
▭: With light/surge voltage suppressor

T: Conduit terminal



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

D, Y: DIN terminal



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

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Series VFR3000
Manifold Specifications

Manifold Specifications

Base mounted	Wiring	Porting specifications A, B port	Port size P, EA, EB	Port size A, B	Stations	Applicable valve model
Plug-in type **VV5FR3-01□(-Q)**	• With terminal block	Side/Bottom	Note) 1/2	1/4, 3/8 C8, C10	2 to 10	VFR3□00-□F(-Q)
	• With multi-connector • With D-sub connector				2 to 8	
Non plug-in type **VV5FR3-10(-Q)**	• Grommet terminal • DIN terminal				2 to 10	VFR3□1□-□E VFR3□1□-□D(-Q)
Non plug-in type **VV5FR3-40(-Q)**	• Grommet • Grommet terminal • Conduit terminal • DIN terminal					VFR3□4□-□G VFR3□4□-□E VFR3□4□-□T VFR3□4□-□D(-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 ..... **1 set (Manifold base part no.)**
***VFR3100-5FZ** ..... **3 sets (2 position single part no.)**
***VFR3200-5FZ** ..... **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.

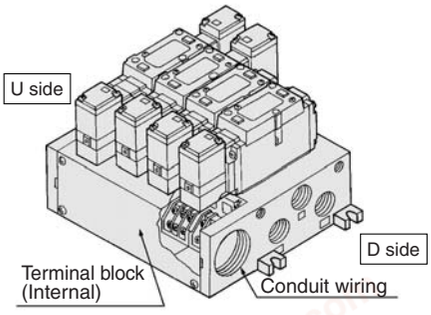
<Example> Non plug-in type: 6 stations

VV5FR3-10-061-03 ..... **1 set1 set (Manifold base part no.)**
***VFR3110-5D** ..... **5 sets (2 position single part no.)**
***VFR3410-5D** ..... **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 □ – □

- Series VFR3000 Manifold
- Plug-in type with terminal block
- Stations

02	2 stations
⋮	⋮
10	10 stations

- Symbol

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

* Option

- 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: Rc 1/4, 3/8 only.

- Thread type

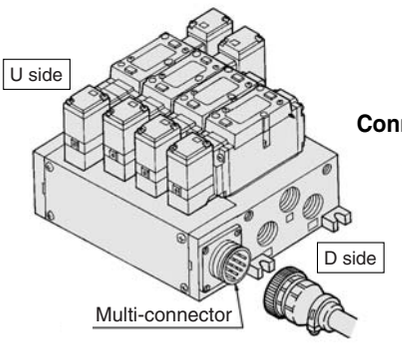
Nil	Rc
F	G
N	NPT
T	NPTF

- CE-compliant

Nil	—
Q	CE-compliant

Plug-in Type: With Multi-connector (For wiring specifications, refer to page 1326.)

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



VV5FR3 – 01C D – 05 1 – 02 □ – □

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

* Option

- 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: Rc 1/4, 3/8 only.

- Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

- CE-compliant

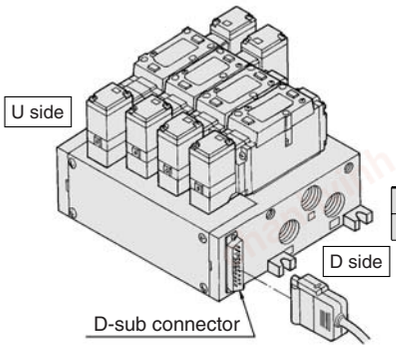
Nil	—
Q	CE-compliant

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Series VFR3000

Plug-in Type: With D-sub Connector (For wiring specifications, refer to page 1326.)

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



VV5FR3 – 01F D – 06 1 – 02 ☐ – ☐

- 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 *

* Option

- 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: Rc 1/4, 3/8 only.

- Thread type

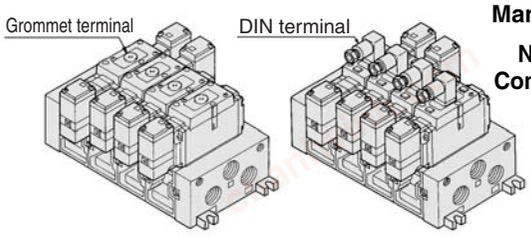
Nil	Rc
F	G
N	NPT
T	NPTF

- CE-compliant

Nil	—
Q	CE-compliant

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

- Individual wiring for every valve



VV5FR3 – 10 – 05 1 – 02 ☐ – ☐

- 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 *

* Option

- 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: Rc 1/4, 3/8 only.

- Thread type

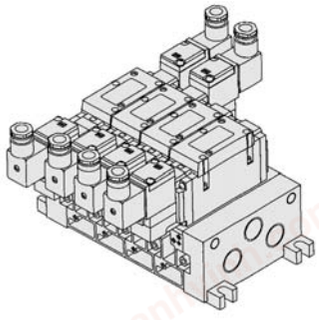
Nil	Rc
F	G
N	NPT
T	NPTF

- CE-compliant

Nil	—
Q	CE-compliant

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

- Individual wiring for every valve



VV5FR3 – 40 – 05 1 – 02 ☐ – ☐

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

- 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 *

* Option

- 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: Rc 1/4, 3/8 only.

- Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

- CE-compliant

Nil	—
Q	CE-compliant

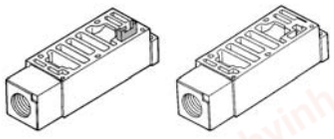
Note) Manifold base is in common with Series VFS3000.

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Manifold/Option Parts Assembly

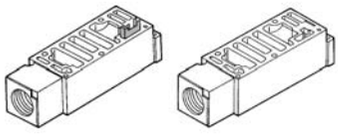
Individual SUP spacer
Setting individual SUP spacer on the manifold block enables individual SUP port for each valve.

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.

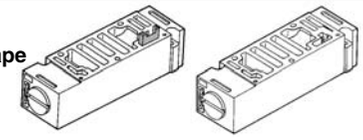
Body type	Plug-in type	Non plug-in type
Part no.	AXT636-1A	



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

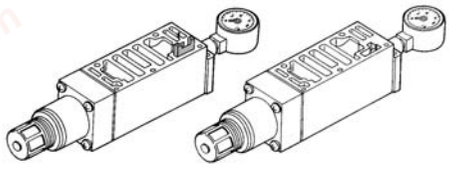
Body type	Plug-in type	Non plug-in type
Part no.	VVFS3000-20A-1	VVFS3000-20A-2

Shape



Interface regulator
Interface regulator set on the manifold block can regulate pressure for each valve. (Refer to “Flow Characteristics” on page 1324 before operation.)

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.)

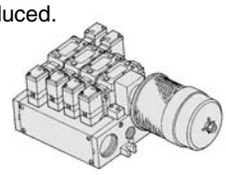
Blanking plate
It is used by attaching on the manifold block for being prepared for removing a valve for maintenance reasons or planning to mount a spare valve, etc.

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

∗ Mounting screws: 4 positions

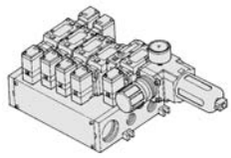
Manifold Option

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 1266.

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.



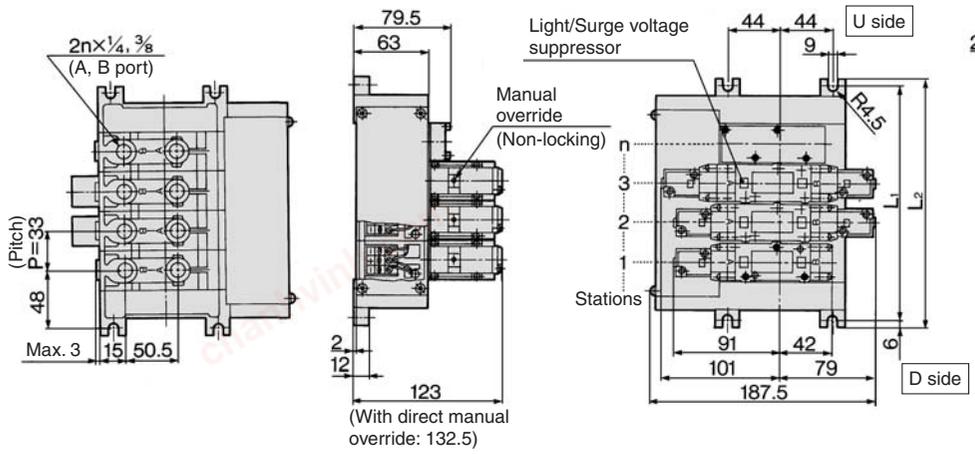
For details, refer to page 1269.

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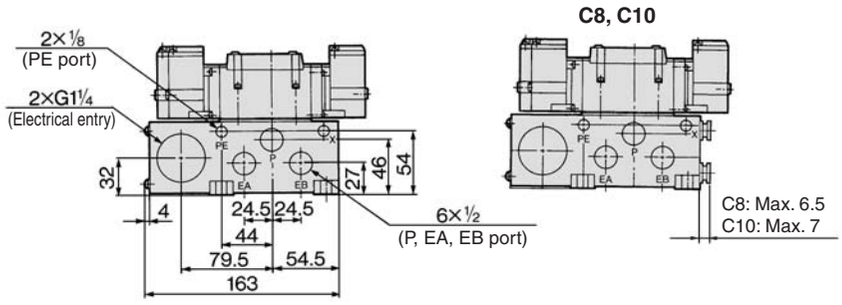
Series VFR3000

Manifold: Plug-in Type

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



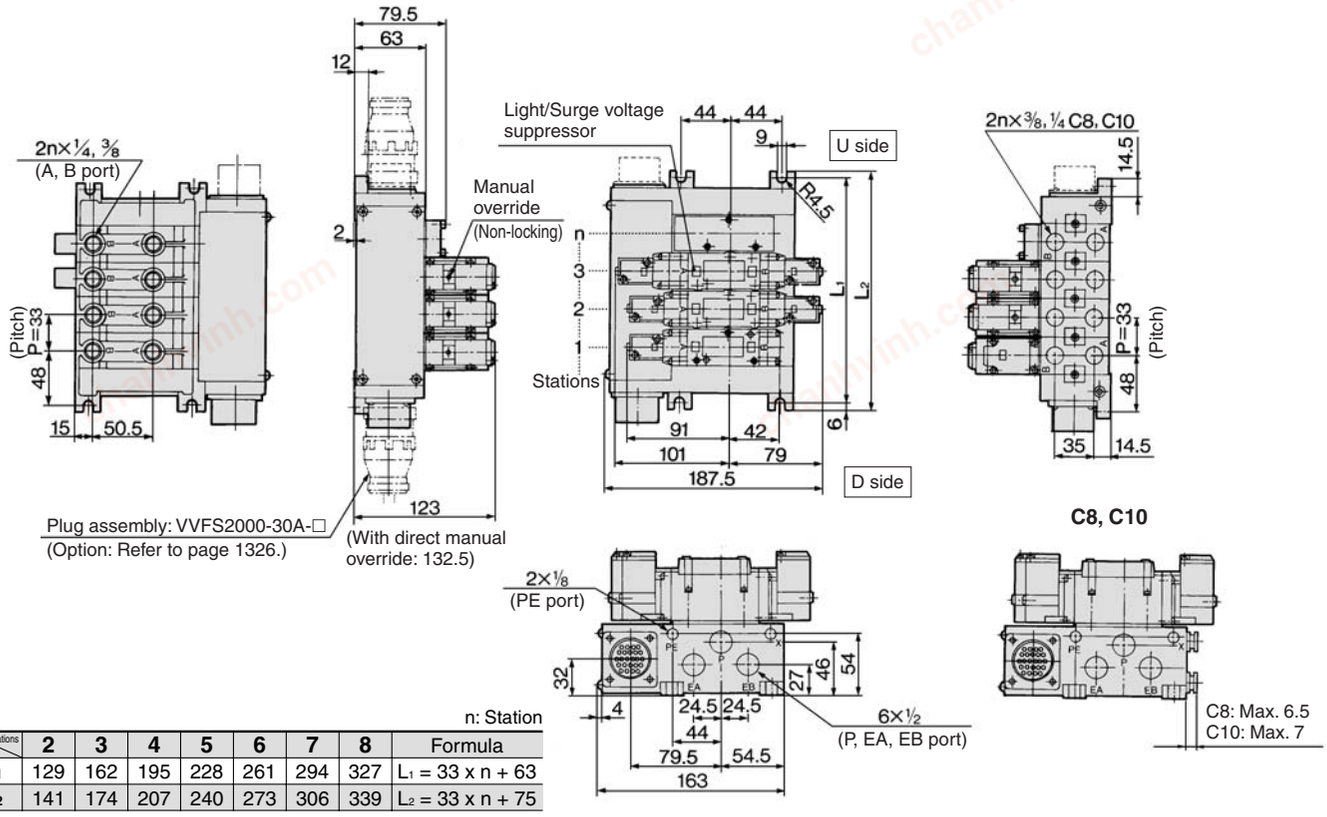
Bottom ported: VV5FR3-01T-Station 2-Port size



n: Station

L / Stations	2	3	4	5	6	7	8	9	10	Formula
L_1	129	162	195	228	261	294	327	360	393	$L_1 = 33 \times n + 63$
L_2	141	174	207	240	273	306	339	372	405	$L_2 = 33 \times n + 75$

With multi-connector: VV5FR3-01CD-Station 1-Port size, VV5FR3-01CU-Station 1-Port size



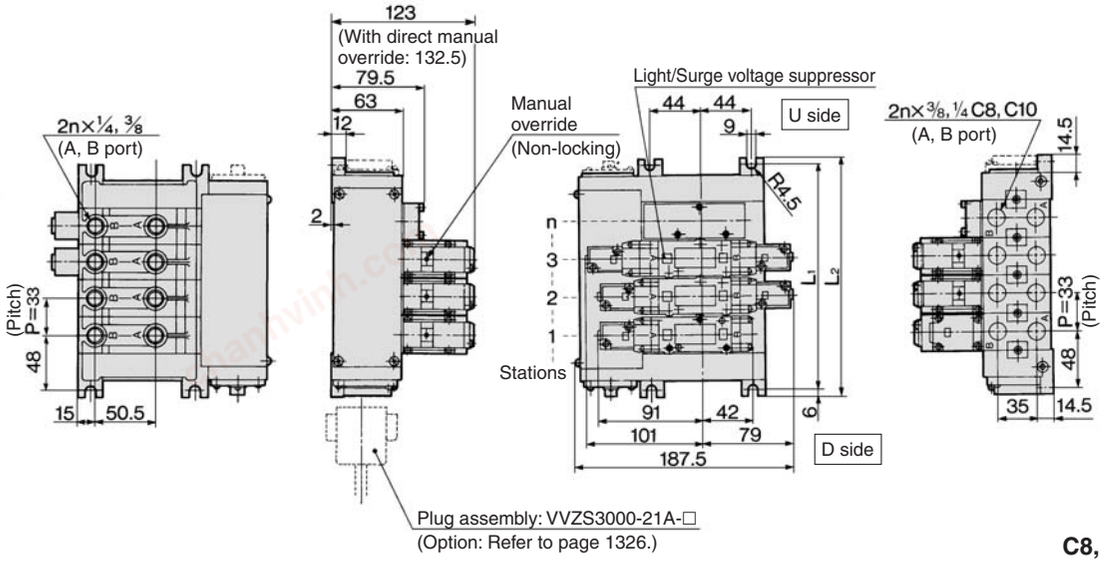
n: Station

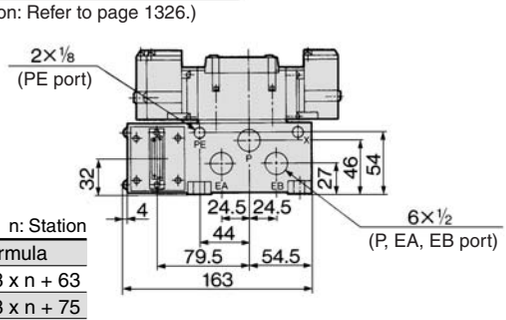
L / Stations	2	3	4	5	6	7	8	Formula
L_1	129	162	195	228	261	294	327	$L_1 = 33 \times n + 63$
L_2	141	174	207	240	273	306	339	$L_2 = 33 \times n + 75$

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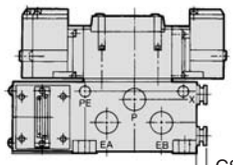
Manifold: Plug-in Type

With D-sub connector: VV5FR3-01FD-[Station]1-[Port size], VV5FR3-01FU-[Station]1-[Port size]





C8, C10



C8: Max. 6.5
C10: Max. 7

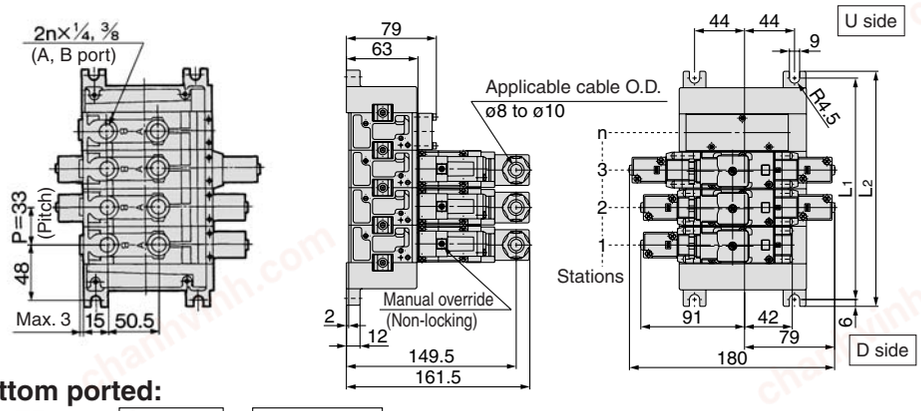
For wiring specifications, refer to page 1326.

n: Station

L / Stations	2	3	4	5	6	7	8	Formula
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

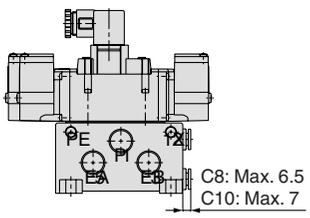
Manifold: Non Plug-in Type

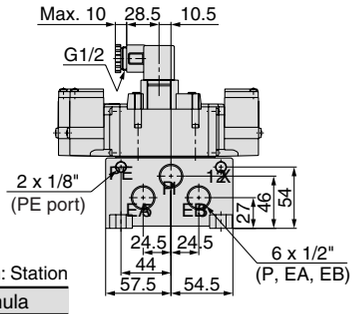
VV5FR3-10-[Station]1-[Port size]



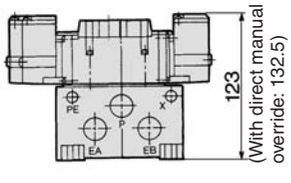
Bottom ported:
VV5FR3-10-[Station]2-[Port size]

C8, C10





Grommet with terminal



n: Station

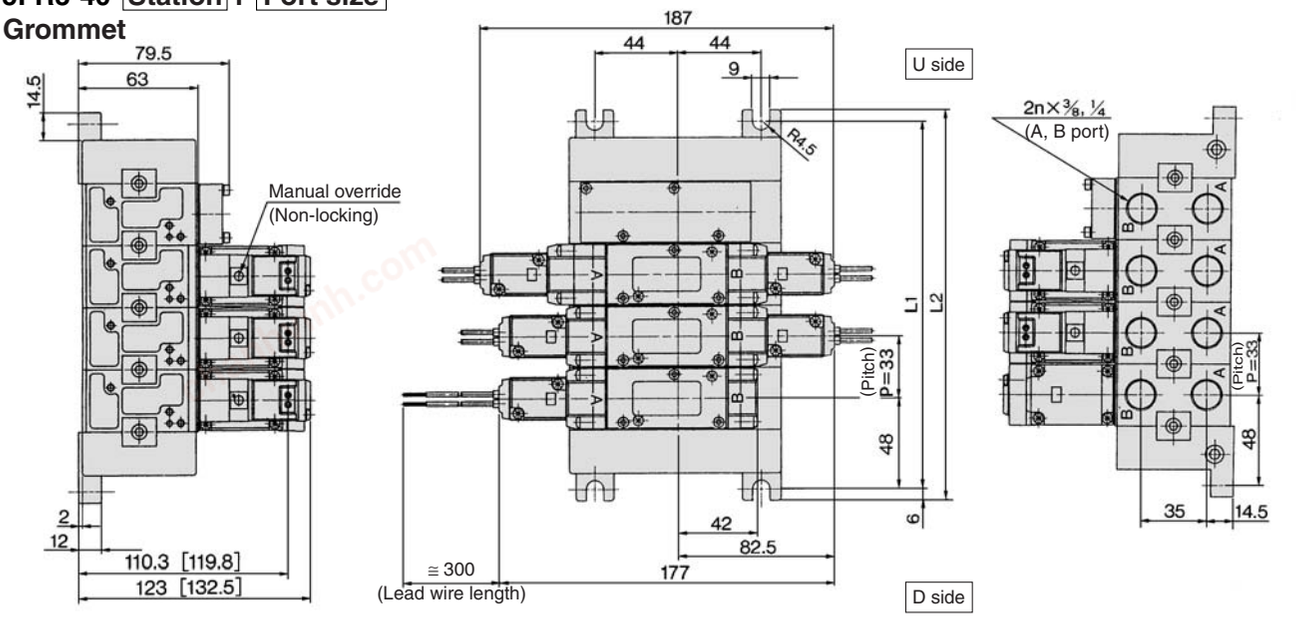
L / Stations	2	3	4	5	6	7	8	9	10	Formula
L1	129	162	195	228	261	294	327	360	393	L1 = 33 x n + 63
L2	141	174	207	240	273	306	339	372	405	L2 = 33 x n + 75

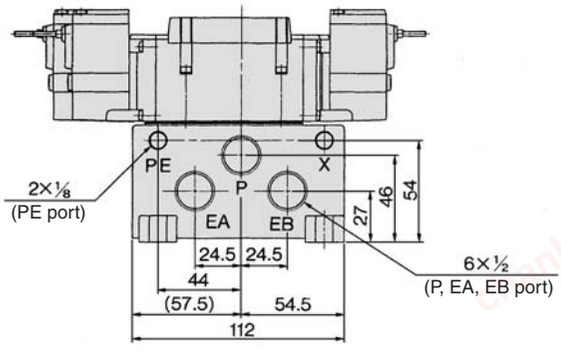
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Series VFR3000

Manifold: Plug-in Type

VV5FR3-40-Station 1-Port size
G: Grommet



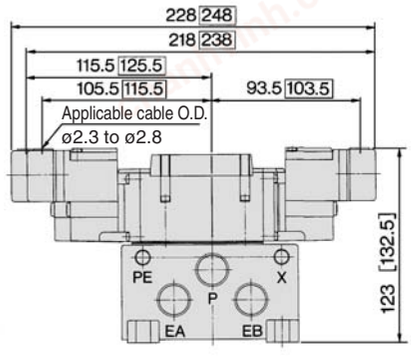


n: Station

L / Stations	2	3	4	5	6	7	8	9	10	Formula
L_1	129	162	195	228	261	294	327	360	393	$L_1 = 33 \times n + 63$
L_2	141	174	207	240	273	306	339	372	405	$L_2 = 33 \times n + 75$

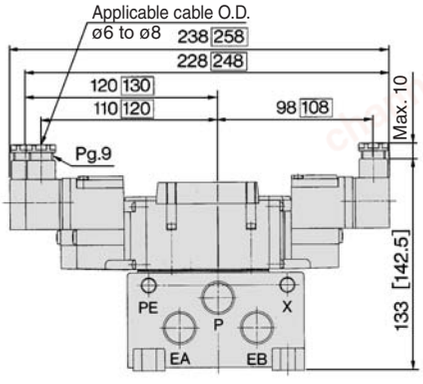
[ ]: With direct manual override

E: Grommet terminal



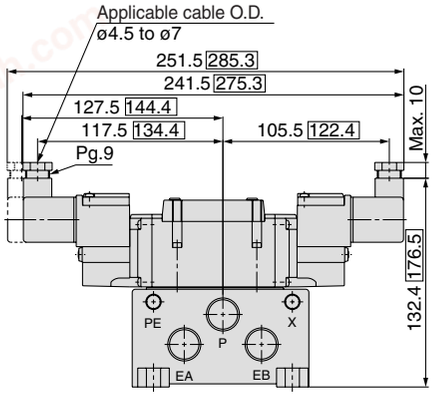
: With light/surge voltage suppressor

T: Conduit terminal



: With light/surge voltage suppressor

D, Y: DIN terminal

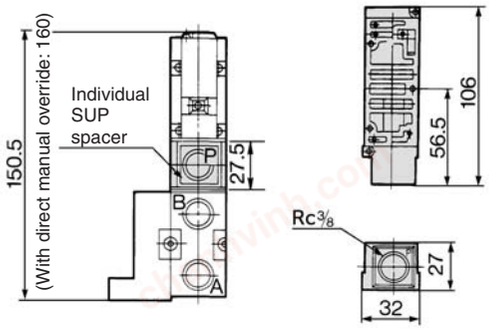


: With light/surge voltage suppressor

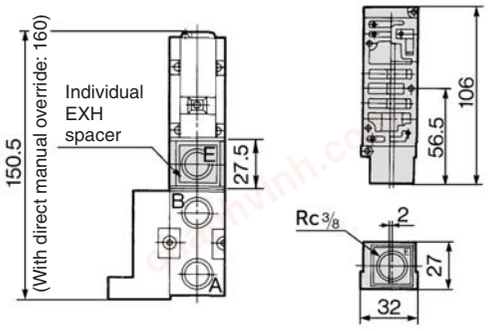
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Manifold/Option Parts Assembly: Plug-in Type/Non Plug-in Type

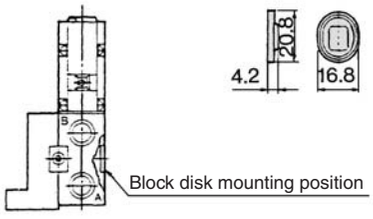
Individual SUP spacer:
VVFS3000-P-03-1 (Plug-in type)
VVFS3000-P-03-2 (Non plug-in type)



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

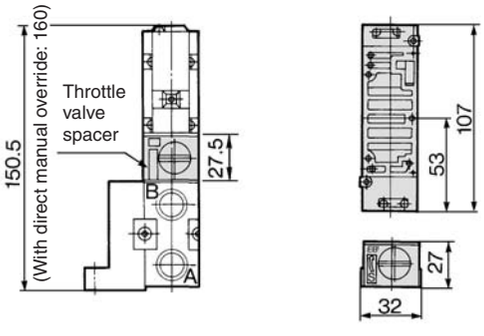


SUP/EXH block disk: AXT636-1A

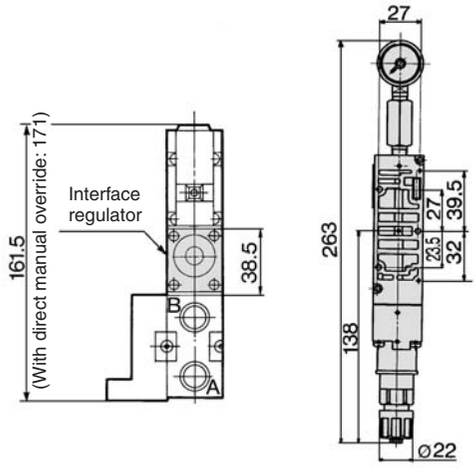


Note) Used with exclusive manifold block

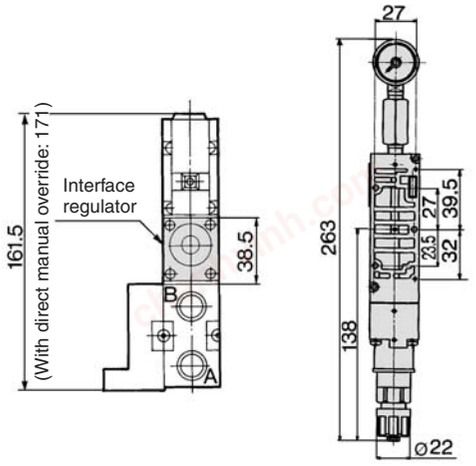
Throttle valve spacer:
VVFS3000-20A-1 (Plug-in type)
VVFS3000-20A-2 (Non plug-in type)



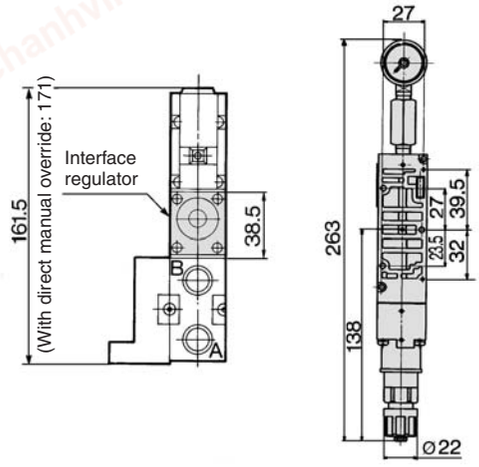
Interface regulator/P port regulation:
ARBF3050-00-P-1 (Plug-in type)
ARBF3050-00-P-2 (Non plug-in type)



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)

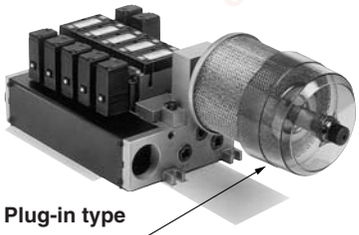


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Series VFR3000

Manifold with Exhaust Cleaner

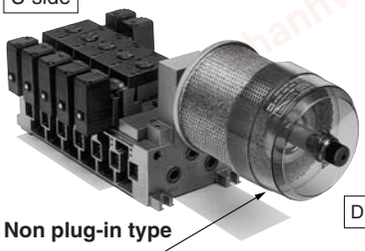
- **Serves to protect working environment.**
- **Valve exhaust noise dampening: 35 dB or more.**
- **Collection rate of drainage and oil mist: 99.9% or more**
- **Piping work is reduced.**



Plug-in type

Exhaust cleaner AMC610-10
(Option)

U side



D side

Non plug-in type

Exhaust cleaner AMC610-10
(Option)

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 Grommet terminal	Grommet, Grommet terminal Conduit terminal, DIN terminal
Applicable valve model	VFR3□0□-□F(-Q)	VFR3□1□-□D(-Q) VFR3□1□-□E	VFR3□4□-□G, VFR3□4□-□E VFR3□4□-□T, VFR3□4□-□D(-Q)
Porting specifications Rc	Common SUP, Common EXH		
	A, B port	Side: Rc 1/4, 3/8, C8, C10 Bottom: Rc 1/4, 3/8 (Option)	
	P port	Side: Rc 1/2 EXH port: Rc 1	
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 - □

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
Nil	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

Nil	Rc
F	G
N	NPT
T	NPTF

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: Rc 1/4, 3/8

Symbol

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

* Option

CE-compliant

Nil	—
Q	CE-compliant

Exhaust cleaner mounting direction

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

How to Order Manifold Assembly

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

VV5FR3-01T-061-03-CD ..... **1 set (Manifold base part no.)**
***VFR3100-5FZ** ..... **3 sets (2 position single part no.)**
***VFR3200-5FZ** ..... **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.

<Example> Non plug-in type: 6 stations

VV5FR3-10-061-03-CU ..... **1 set (Manifold base part no.)**
***VFR3110-5E** ..... **3 sets (2 position single part no.)**
***VFR3210-5E** ..... **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.

⚠Caution

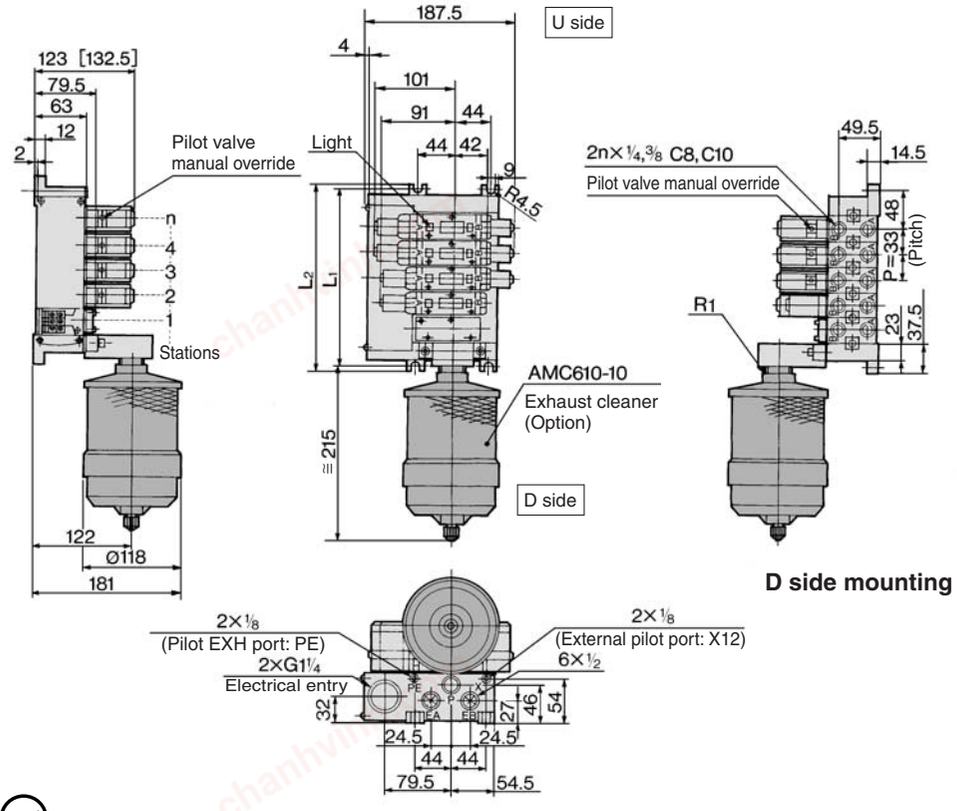
When using an exhaust cleaner, mount it downwards.

Refer to Best Pneumatics No. 6 for Exhaust Cleaner details.

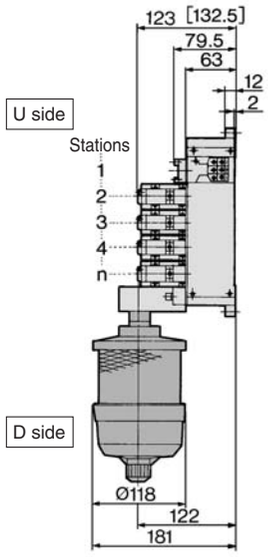
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Manifold with Exhaust Cleaner: Plug-in Type/Non Plug-in Type

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



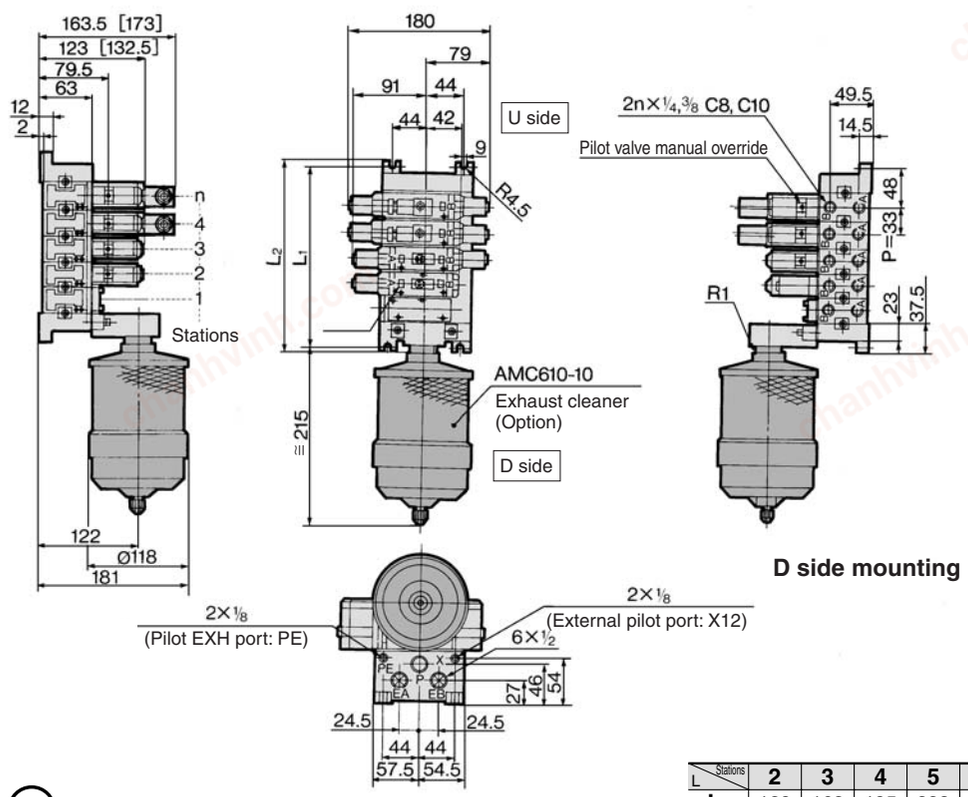
D side mounting



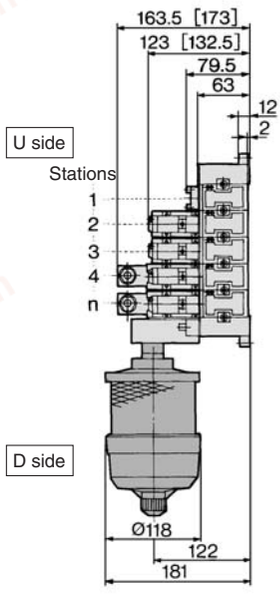
U side mounting

[ ]: With direct manual override

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



D side mounting



U side mounting

[ ]: With direct manual override

n: Station

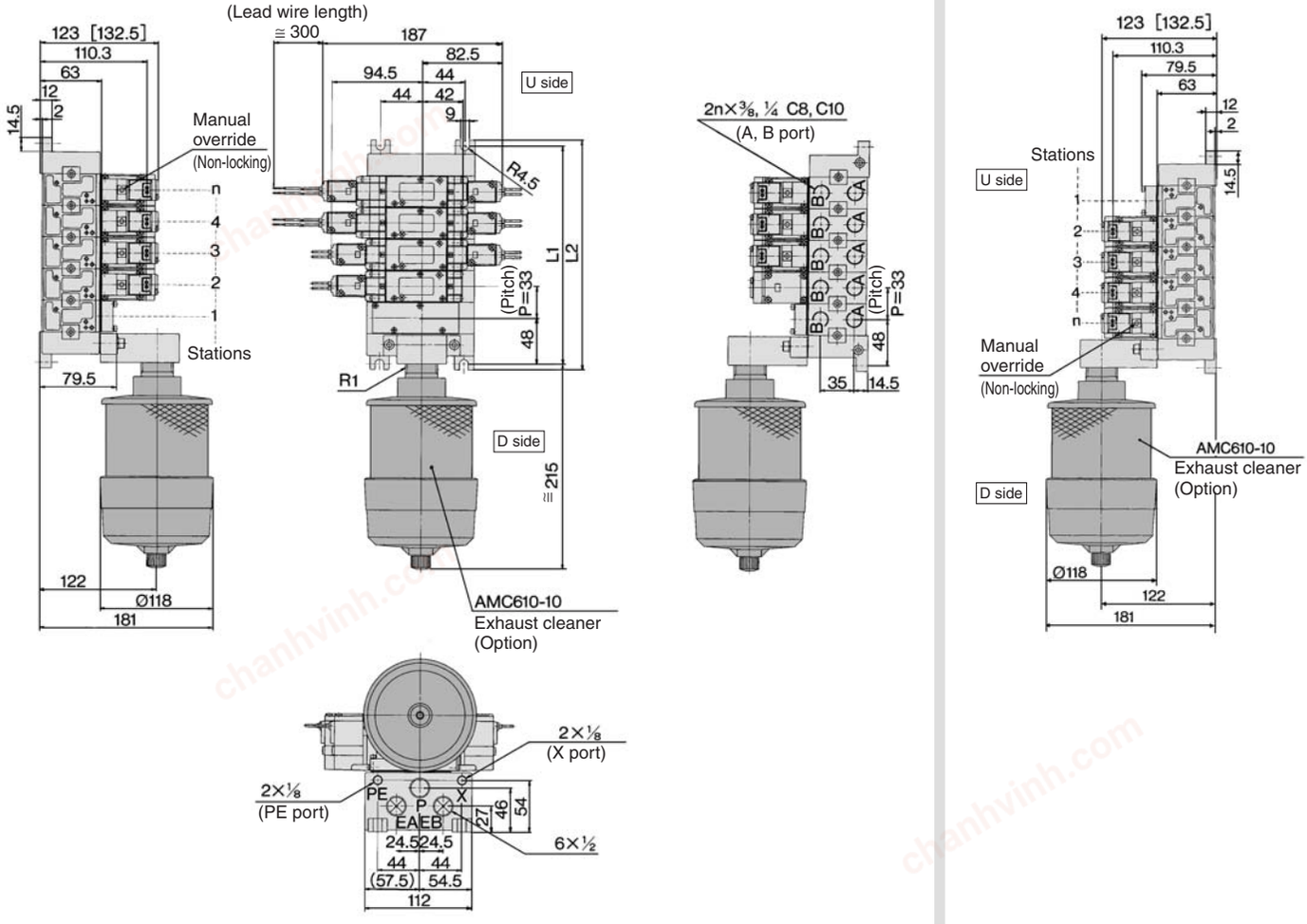
L \ Stations	2	3	4	5	6	7	8	9	10	Formula
L_1	129	162	195	228	261	294	327	360	393	$L_1 = 33 \times n + 63$
L_2	141	174	207	240	273	306	339	372	405	$L_2 = 33 \times n + 75$

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Series VFR3000

Manifold with Exhaust Cleaner: Non Plug-in Type

Non plug-in type: VV5FR3-40-[Station]1-[Port size]-$^{CD}_{CU}$



n: Station

L \ Stations	2	3	4	5	6	7	8	9	10	Formula
L_1	129	162	195	228	261	294	327	360	393	$L_1 = 33 \times n + 63$
L_2	141	174	207	240	273	306	339	372	405	$L_2 = 33 \times n + 75$

[ ]: With direct manual override

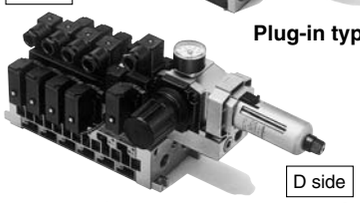
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Manifold with Control Unit

- **Control unit (Filter, Regulator, Pressure switch, Air release valve) are all standardized to the one unit, and can be mounted on the manifold base without any attachments.**
- **Piping processes are eliminated.**



Plug-in type



Non plug-in type

⚠ Caution

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

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 Grommet terminal	Grommet, Grommet terminal Conduit terminal, DIN terminal
Applicable valve model	VFR3□0□-□F(-Q)	VFR3□1□-□D(-Q) VFR3□1□-□E	VFR3□4□-□G, VFR3□4□-□E VFR3□4□-□T, VFR3□4□-□ D/Y (-Q)
Porting specifications	Common SUP, Common EXH		
	A, B port	Side: Rc 1/4, 3/8, C8, C10 Bottom: Rc 1/4, 3/8 (Option)	
	P, EA, EB port	Side: Rc 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/With manual drain)	
Filtration degree	5 μm
Regulator	
Set pressure (Outlet pressure)	0.05 to 0.85 MPa
Pressure switch	
Set pressure range: OFF	0.1 to 0.6 MPa
Differential	0.08 MPa
Contact	1a
Indicator light	LED (RED)
Max. switch capacity	2 VA AC, 2 W DC
Max. operating current	24 VAC, DC or less: 50 mA 100 VAC, DC: 20 mA
Inside voltage drop	4 V or less
Air release valve (Single only)	
Operating pressure range	0.2 to 0.9 MPa

Control Unit/Option

Air release valve spacer (1)	<Plug-in type> VVFS3000-24A-1R (D side mounting)	
	<Non plug-in type> VVFS3000-24A-2R (D side mounting)	
Pressure switch (2)	IS1000P-2-1	
Blanking plate	For filter regulator	MP2-3
	For pressure switch	MP3-2
	For air release valve	VVFS3000-24A-10
Filter element	INA-13-854-12-5B	

Note 1) Combining valve "VFR31□□" (single) and release valve spacer makes it possible to use this as an air release valve.
Note 2) Pressure switch cannot be mounted later on non plug-in type.

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Series VFR3000

How to Order

VV5FR3 – 10 ☐ – 08 1 – 02 ☐ – AP ☐ – ☐

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
Nil	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 *

* Option

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

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

Control unit type

Control equipment \ Symbol	Nil	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.

CE-compliant

Nil	—
Q	CE-compliant

Control unit type

Nil	None
1	100 VAC, 50/60 Hz
5	24 VDC
9	Other

How to Order Manifold Assembly

<Example> Plug-in type with terminal block

VV5FR3-01T-081-03-AP5 ..... **1 set (Manifold base part no.)**
***VFR3100-5FZ** ..... **4 sets (2 position single part no.)**
***VFR3200-5FZ** ..... **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 ..... **1 set (Manifold base part no.)**
***VFR3110-5D** ..... **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.

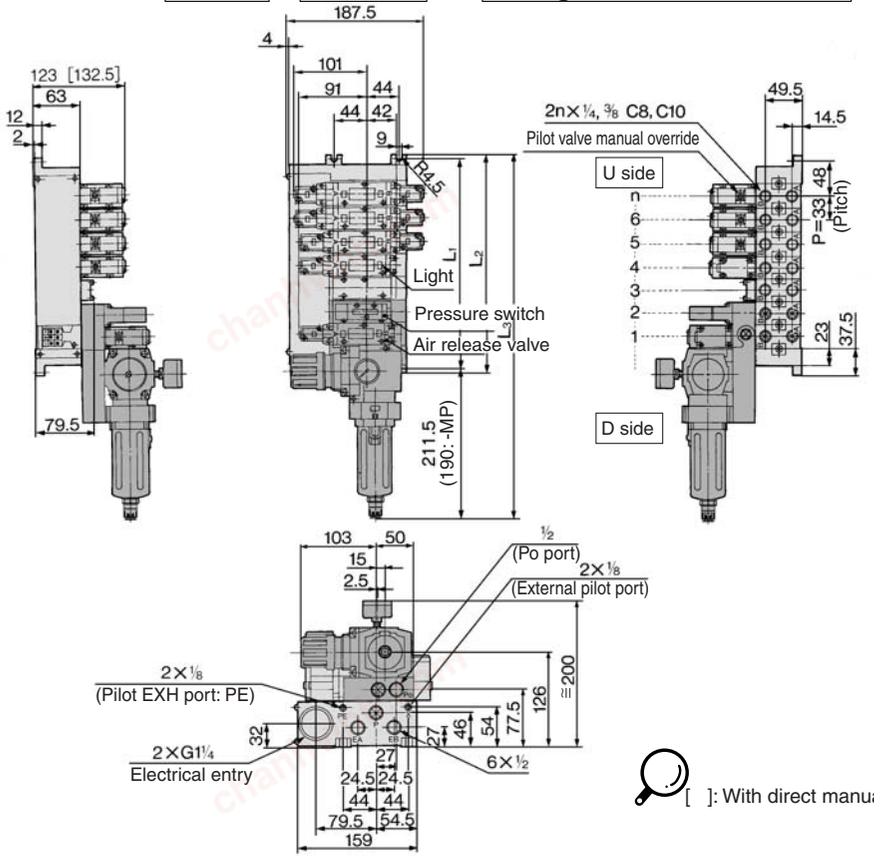
The 1st and 2nd station are used for control unit mounting.
When ordering, specify the part nos. in order from the 3rd. station in the D side.
When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

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

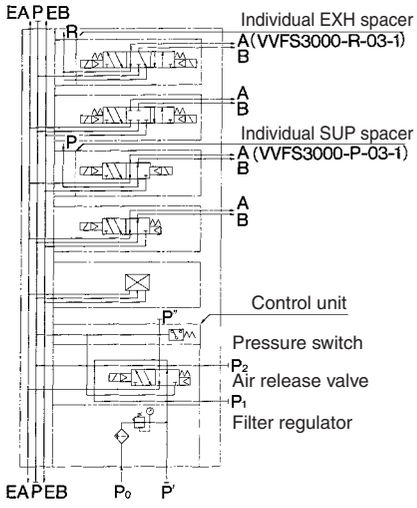
Plug-in type:

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



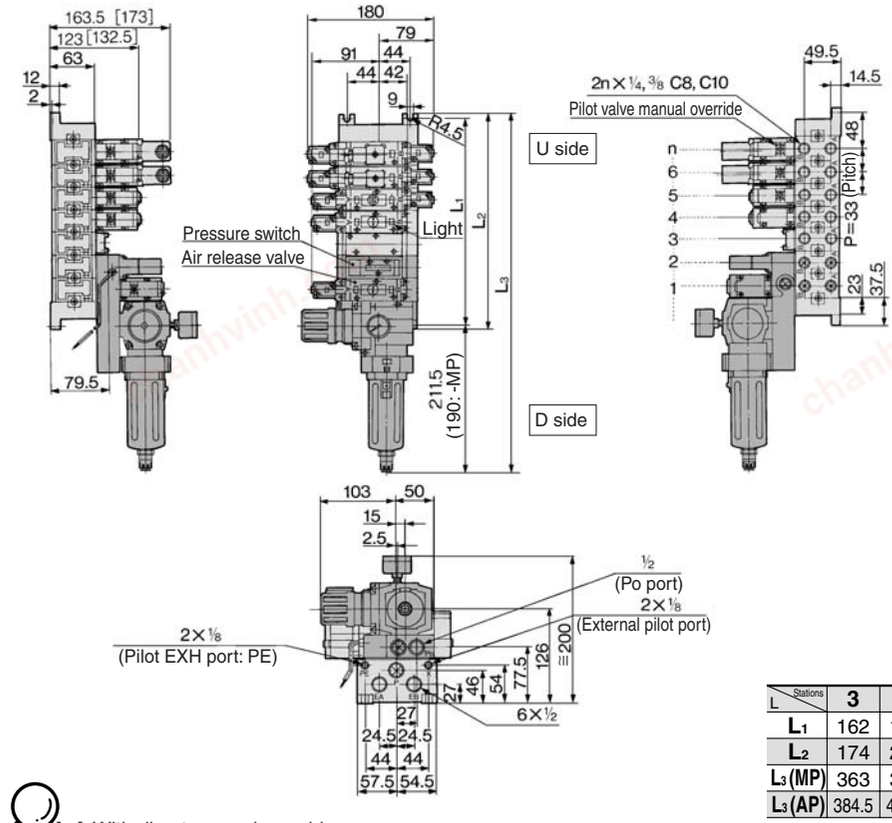
[ ]: With direct manual override

Example for manifold



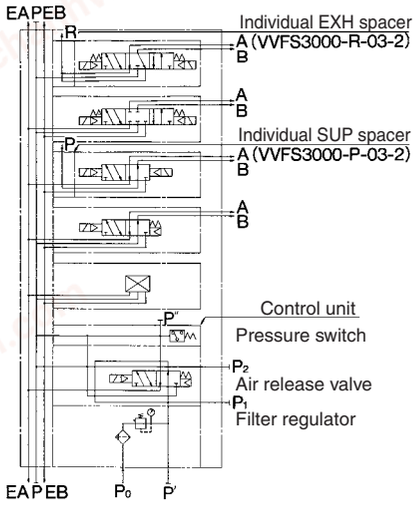
Non plug-in type:

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



[ ]: With direct manual override

Example for manifold



n: Station

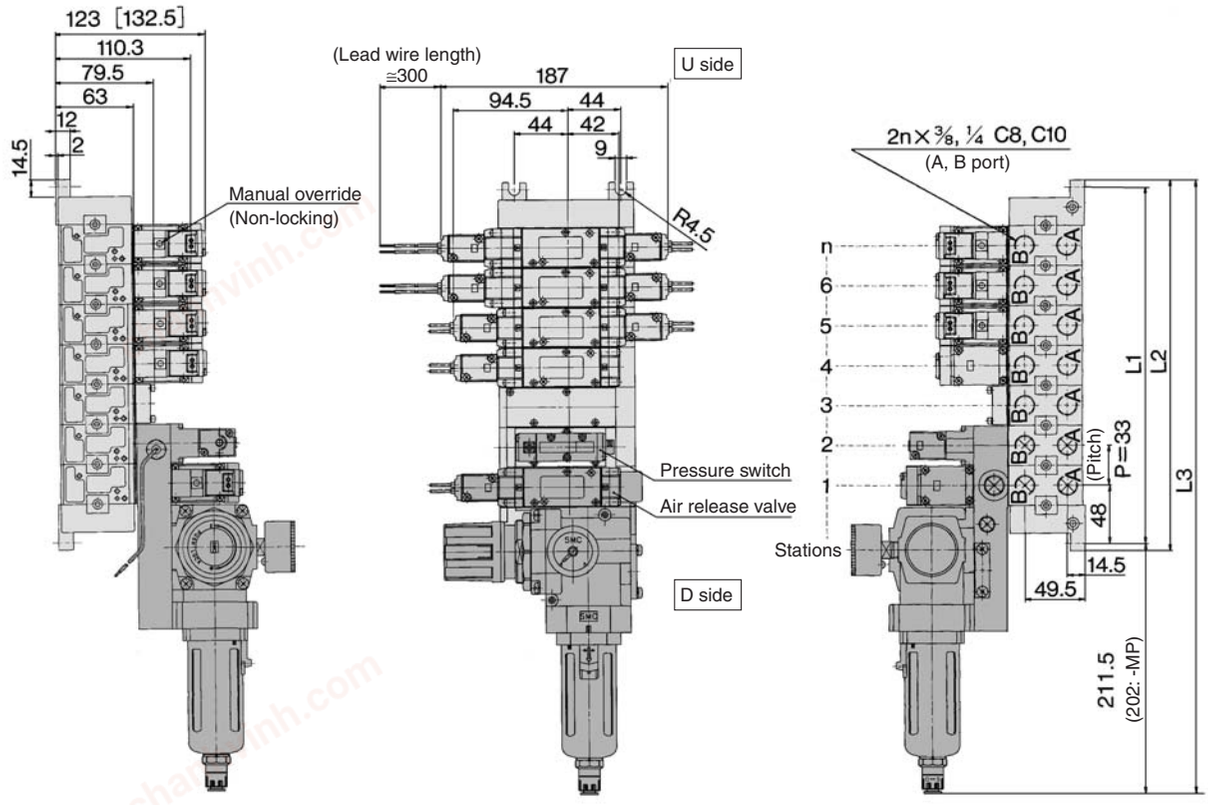
L / Stations	3	4	5	6	7	8	9	10	Formula
L1	162	195	228	261	294	327	360	393	L1 = 33 x n + 63
L2	174	207	240	273	306	339	372	405	L2 = 33 x n + 75
L3 (MP)	363	396	429	462	495	528	561	594	L3 = 33 x n + 264
L3 (AP)	384.5	417.5	450.5	483.5	516.5	549.5	582.5	615.5	L3 = 33 x n + 285.5

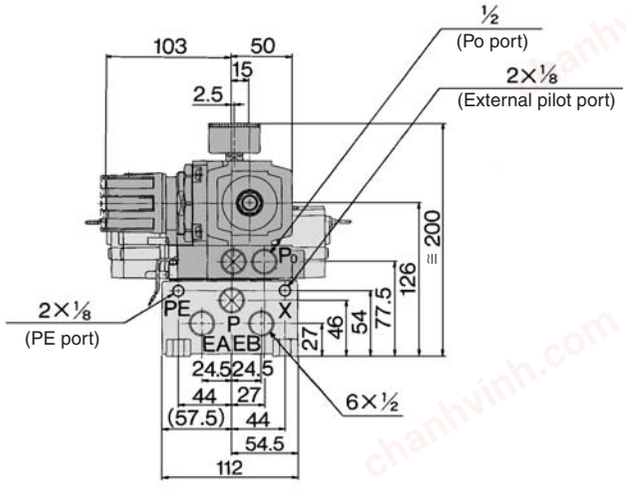
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Series VFR3000

Manifold with Control Unit: Non Plug-in Type

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





n: Station

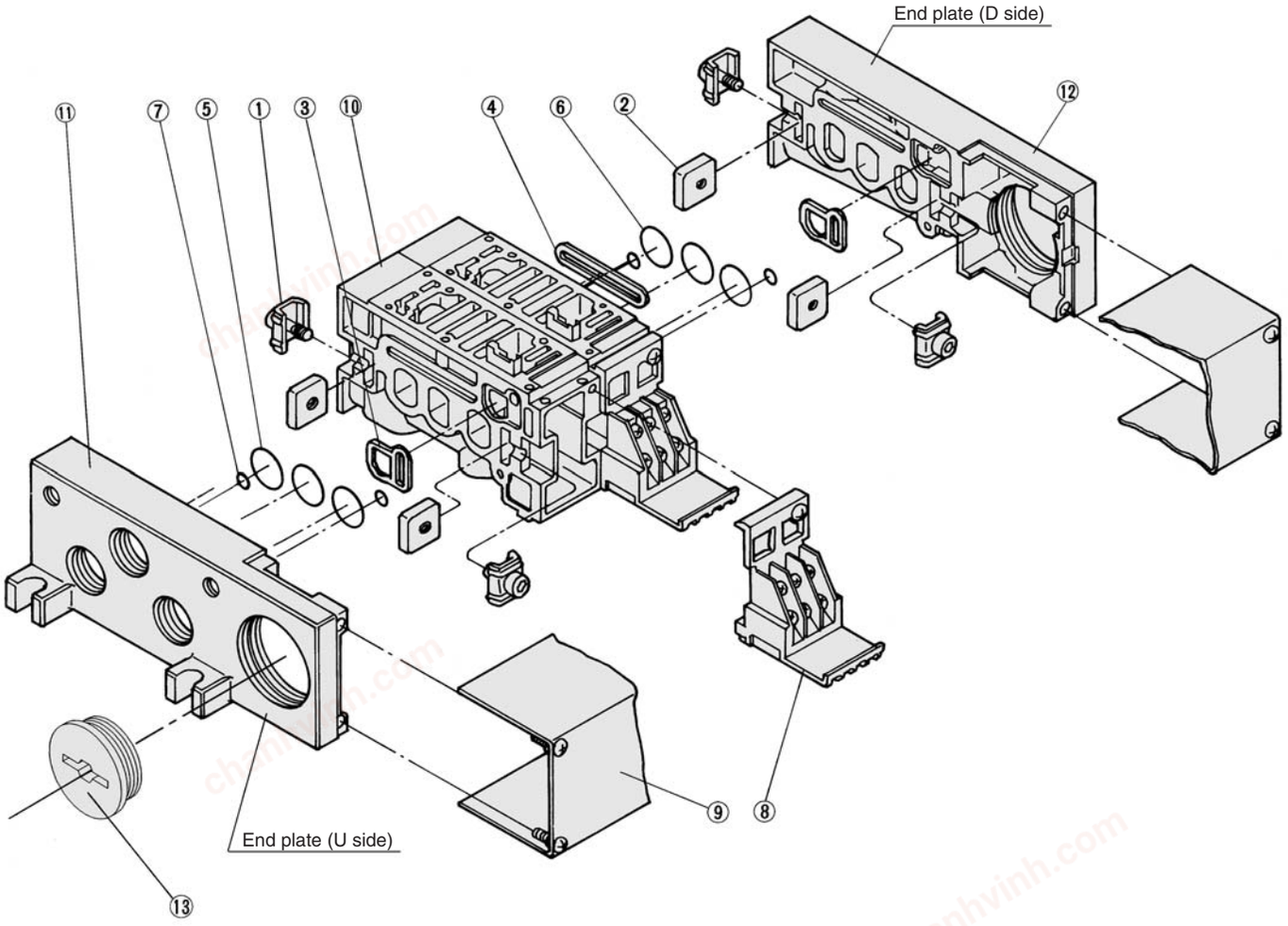
L Stations	3	4	5	6	7	8	9	10	Formula
L1	162	195	228	261	294	327	360	393	L1 = 33 x n + 63
L2	174	207	240	273	306	339	372	405	L2 = 33 x n + 75
L3 (MP)	363	396	429	462	495	528	561	594	L3 = 33 x n + 264
L3 (AP)	384.5	417.5	450.5	483.5	516.5	549.5	582.5	615.5	L3 = 33 x n + 285.5

[ ]: With direct manual override

( ): MP

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Manifold Base Construction: Plug-in Type/Non Plug-in Type



Replacement Parts

No.	Description	Material	Part no.
1	**Connection fitting A**	Steel	VVFS3000-5-1A
2	**Connection fitting B**	Steel	VVFS3000-5-2
3	**Gasket**	NBR	VVFS3000-7-1
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-Stations
13	**Rubber plug**	NBR	AXT336-9

Note) Manifold Base/Construction: Plug-in type with terminal block.

Replacement Parts: Sub Assembl

No.	Description	Assembly part no.	Component parts	Applicable manifold base
10	**Manifold block assembly** Note)	VVFS3000-1A-1-02/03/C8/C10	Manifold block ⑩, Terminal ⑧, Connection bracket ①, ②, Gasket ③, ④, O-ring ⑥, ⑦, Receptacle assembly	Plug-in type
		VVFS3000-1A-2-02/03/C8/C10	Manifold block ⑨, Connection bracket ①, ②, Gasket ③, ④, O-ring ⑥, ⑦	Non plug-in type
11	**End plate (U side) assembly**	VVFS3000-2A-1	End plate (U) ⑪, Connection bracket ①, ②, Gasket ④, O-ring ⑤, ⑦	Plug-in type
		VVFS3000-2A-2	End plate (U) ⑪, Connection bracket ①, ②, Gasket ④, O-ring ⑤, ⑦	Non plug-in type
12	**End plate (D side) assembly**	VVFS3000-3A-1	End plate (D) ⑫, Connection bracket ①, ②, Gasket ③	Plug-in type
		VVFS3000-3A-2	End plate (D) ⑫, Connection bracket ①, ②, Gasket	Non plug-in type

Note) For side ported

∗ Contact SMC for CE-compliant products.

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5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in
Series VFR4000

[Option] NRTL /C

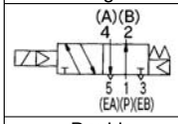
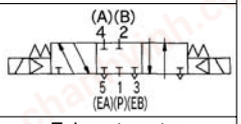
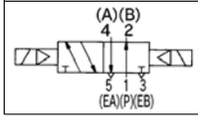
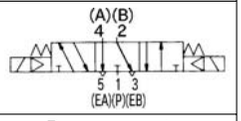
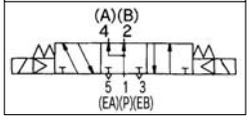


Plug-in type



Non plug-in type

JIS Symbol

2 position	3 position
Single	Closed center
	
Double	Exhaust center
	
	Pressure center
	

Standard Specifications

Valve specifications	Fluid		Air
	Operating pressure range	2 position single/3 position	0.2 to 0.9 MPa
		2 position double	0.1 to 0.9 MPa
	Ambient and fluid temperature		–10 to 50°C (No freezing. Refer to page 5.)
	Lubrication		Non-lube (1)
	Manual override		Non-locking push type
	Mounting orientation		Unrestricted
	Shock/Vibration resistance		300/50 m/s² (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
	Electrical entry		Plug-in type: Conduit terminal
			Non plug-in type: Grommet, Grommet terminal, Conduit terminal, DIN terminal

Note 1) Use turbine oil Class 1 (ISO VG32), if lubricated.
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)
Note 3) At rated voltage

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		Model: Plug-in	Model: Non plug-in	Port (1) size	Flow characteristics (2): 1 → 4/2 (P → A/B) C [dm³/(s·bar)]	b	Cv	Flow characteristics (2): 4/2 → 5/3 (A/B → EA/EB) C [dm³/(s·bar)]	b	Cv	Max.(3) operating cycle (Hz)	(4) Response time (ms)	(5) Mass (kg)
2 position	Single	VFR410□	VFR411□	3/8	13	0.30	3.2	14	0.28	3.4	5	50 or less	1.10 (1.04) <1.04>
			VFR414□	1/2	15	0.30	3.8	14	0.30	3.8			
	Double	VFR420□	VFR421□	3/8	14	0.31	3.4	14	0.26	3.4	5	50 or less	1.20 (1.16) <1.16>
			VFR424□	1/2	15	0.30	4.0	14	0.30	3.7			
3 position	Closed center	VFR430□	VFR431□	3/8	13	0.32	3.2	13	0.25	3.0	3	50 or less	1.20 (1.16) <1.16>
			VFR434□	1/2	14	0.28	3.5	13	0.29	3.4			
	Exhaust center	VFR440□	VFR441□	3/8	13	0.31	3.2	14 [13]	0.32 [0.30]	3.6 [3.2]	3	70 or less	1.20 (1.16) <1.16>
			VFR444□	1/2	14	0.30	3.7	14 [13]	0.32 [0.30]	3.6 [3.2]			
	Pressure center	VFR450□	VFR451□	3/8	13 [5.0]	0.27 [0.42]	3.2 [1.3]	13	0.28	3.1	3	70 or less	1.20 (1.16) <1.16>
			VFR454□	1/2	15 [5.3]	0.22 [0.42]	3.7 [1.5]	13	0.28	3.3			

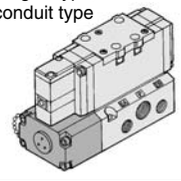
Note 1) EA, EB port: Rc 3/8
Note 2) [ ]: Normal position
Note 3) Min. operating frequency is once in 30 days.
Note 4) Based on dynamic performance test, JIS B 8375-1981. (0.5 MPa, Coil temperature: 20°C, at rated voltage, without surge voltage suppressor)
Note 5) For VFR4□00-□FZ-$^{03}_{04}$, ( ): VFR4□10- DZ□-$^{03}_{04}$, < >: VFR4□40-□G-$^{03}_{04}$

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How to Order

Electrical entry

F: Plug-in type, conduit type



Option

Nil	None
Z	With light/surge voltage suppressor

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

Nil	Side ported
B *	Bottom ported

* Option. no bottom piping for external pilot.

Port size (P, A and B port)

Nil	Without sub-plate
03	3/8
04 *	1/2

EA, EB port: Rc 3/8

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

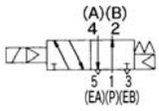
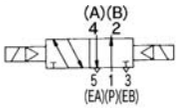
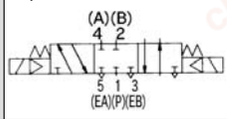
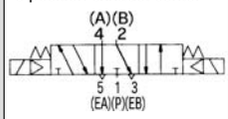
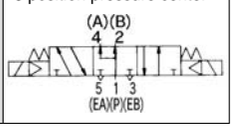
CE-compliant

Nil	—
Q	CE-compliant *

* Electrical entry: D, Y and F only

Plug-in	VFR4	□	0	0	□	–	5	F	□	□	–	□	03	□	–	□		
Non plug-in	VFR4	□	1	1	□	–	1	D	□	□	–	□	03	□	–	□		Common electrical entry
Non plug-in	VFR4	□	4	0	□	–	1	G	□	□	–	□	03	□	–	□		Individual electrical entry

Symbol

1	2 position single 
2	2 position double 
3	3 position closed center 
4	3 position exhaust center 
5	3 position pressure center 

Body option

0	Standard
1 *	Direct manual override

* Option

Pilot type

Nil	Internal pilot
R *	External pilot

* Option

Coil rated voltage

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

* Option

Option: VFR4□1□

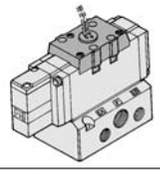
Nil	None
Z	With light/surge voltage suppressor

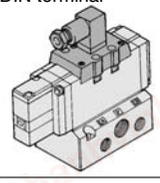
Option: VFR4□4□

Nil	None
Z *	With light/surge voltage suppressor
S *	With surge voltage suppressor

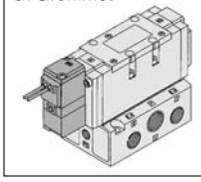
* Indicator light (Z) is not available for grommet type. Surge voltage suppressor (S) is available only on grommet.

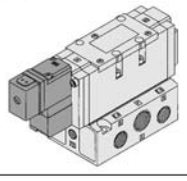
Electrical entry: VFR4□1□

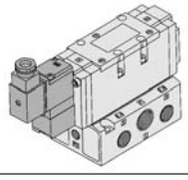
E: Grommet terminal 

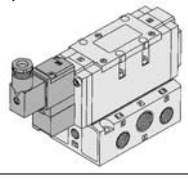
D: DIN terminal 

Electrical entry: VFR4□4□

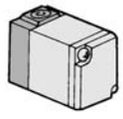
G: Grommet 

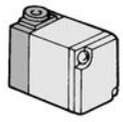
E: Grommet terminal 

T: Conduit terminal 

D, Y: DIN terminal 

Pilot valve Manual override

Nil: Non-locking push type 

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

B *: Locking type B (Tool required) 

C *: Locking type C (Lever) 

* Option

How to Order Pilot Valve Assembly

SF4 – 1 F □ – 70 – □ – □

Coil rated voltage

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

* Option

Electrical entry, Light/Surge voltage suppressor

Symbol	Electrical entry	Indicator light	With surge voltage suppressor	Applicable valve model
F *	Plug-in	—	—	VFR4□0□ VFR4□1□
G	Grommet	—	—	VFR4□4□
GS		—	●	
E	Grommet terminal	—	—	
EZ		●	●	
T	Conduit terminal	—	—	
TZ		●	●	
D	DIN terminal	—	—	
DZ		●	●	
Y	DIN terminal (DIN43650B type)	—	—	
YZ		●	●	

Manual override

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

* Option

CE-compliant

Nil	—
Q	CE-compliant *

* Electrical entry: D, Y and F only

Symbol

Symbol	Applicable valve model
Nil	VFR4□0□ VFR4□1□
1	VFR4□4□

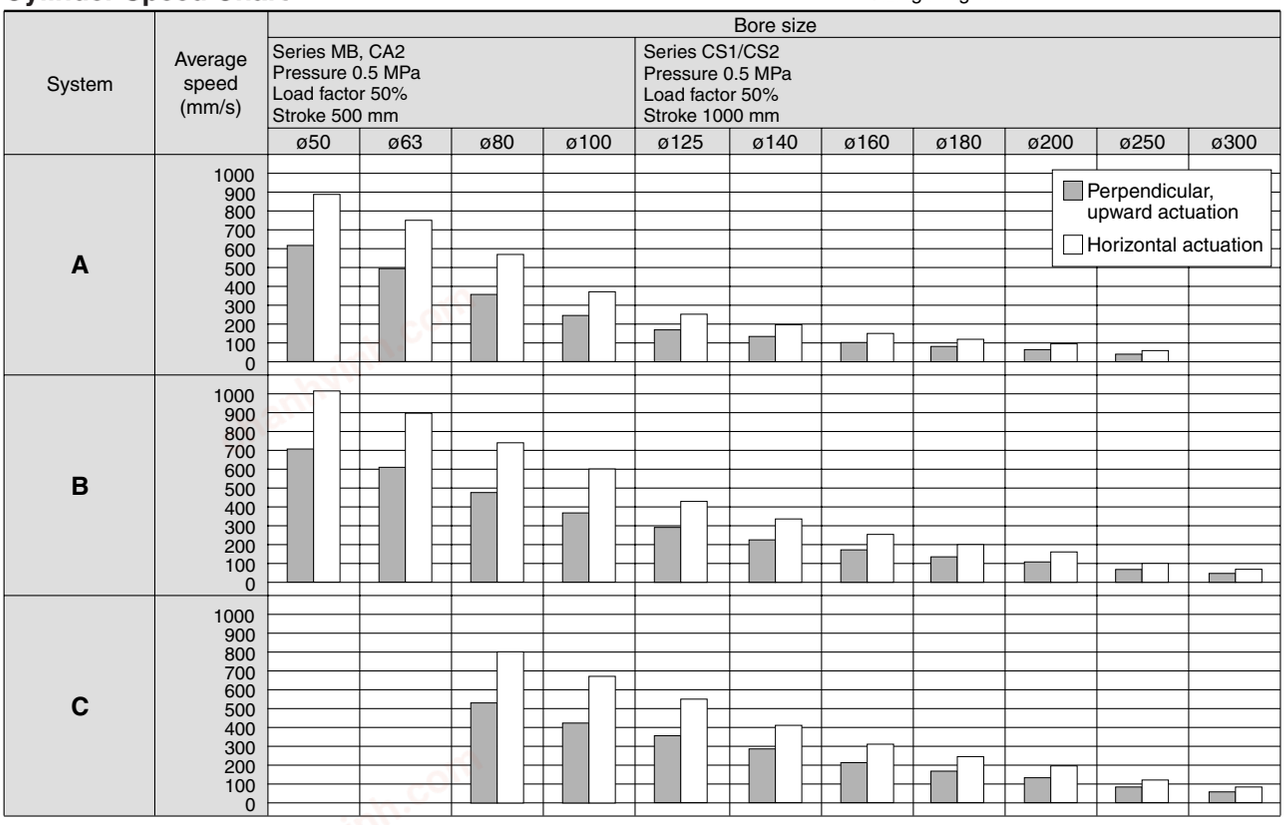
* VFR4□0□, VFR4□1□: Pilot valve assembly is all plug-in (F).

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Series VFR4000

Cylinder Speed Chart

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

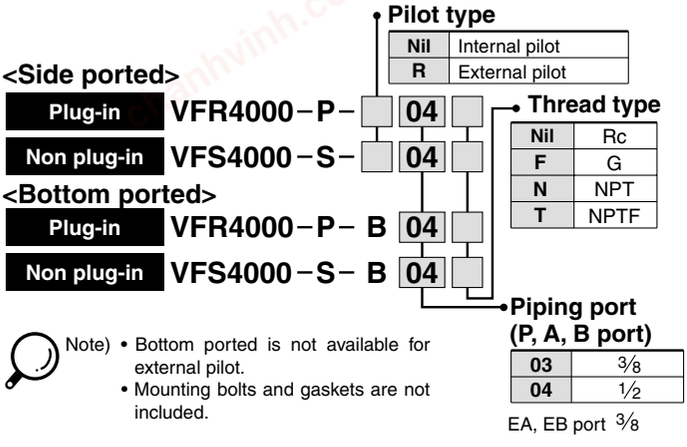


* It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
* The average velocity of the cylinder is what the stroke is divided by the total stroke time.
* Load factor: ((Load weight x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

System Components

System	Solenoid valve	Speed controller	Silencer	SPG (Steel pipe) dia. x Length
A	Series VFR4000 Rc 3/8	AS4000-03 (S = 21mm²)	AN300-03 (S = 60mm²)	10A x 1 m
B	Series VFR4000 Rc 3/8	AS420-03 (S = 73mm²)	AN300-03 (S = 60mm²)	10A x 1 m
C	Series VFR4000 Rc 1/2	AS420-04 (S = 97mm²)	AN400-04 (S = 90mm²)	15A x 1 m

How to Order Sub-plate Assembly



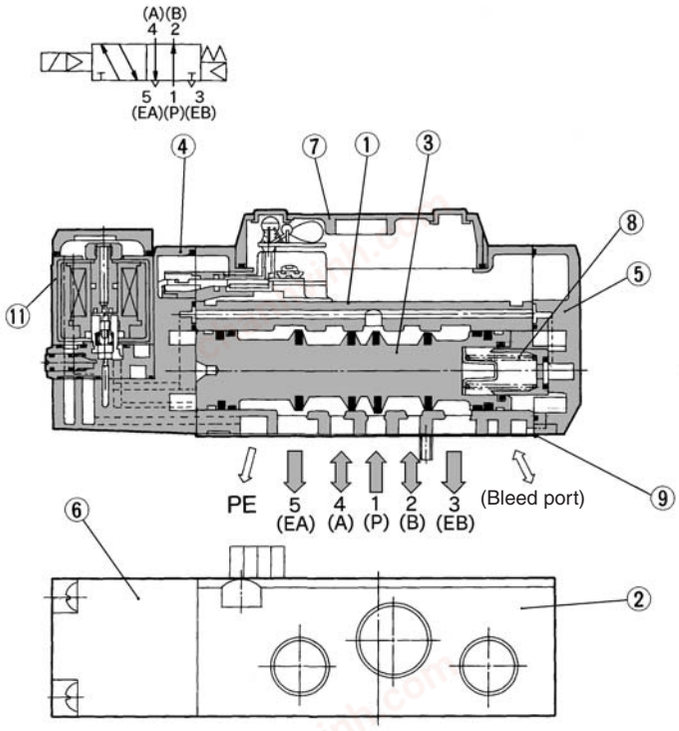
Note) • Bottom ported is not available for external pilot.
• Mounting bolts and gaskets are not included.

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Construction

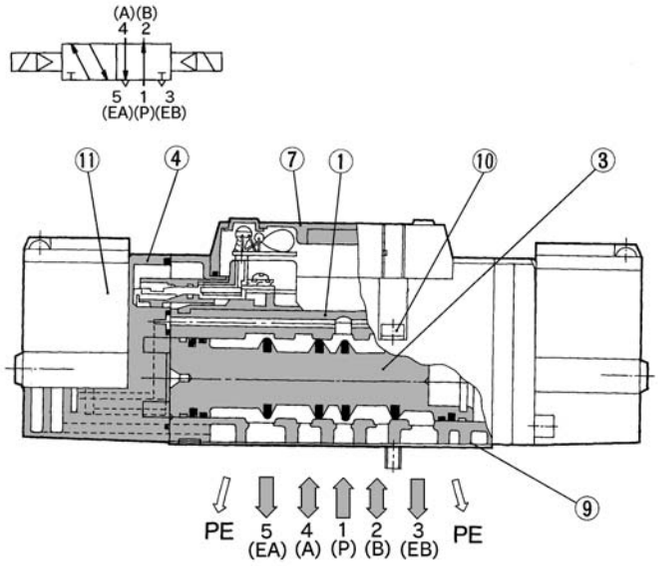
2 position single

VFR41□0



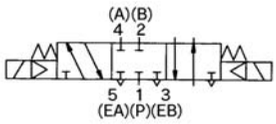
2 position double

VFR42□0

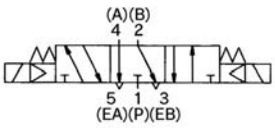


3 position closed center/exhaust center/pressure center

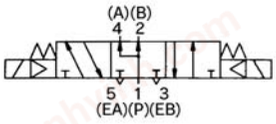
Closed center: VFR43□0

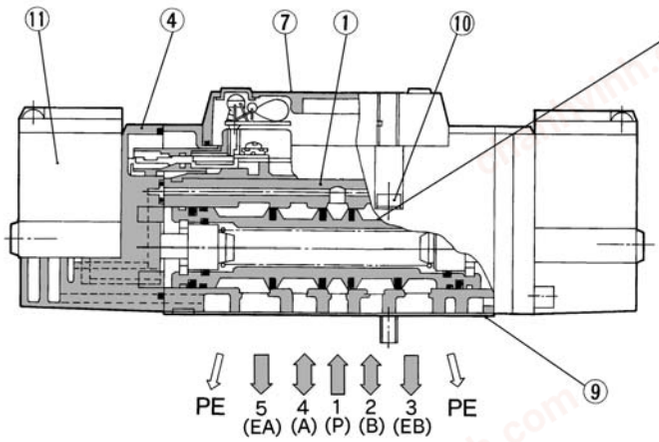


Exhaust center: VFR44□0



Pressure center: VFR45□0





This figure shows a closed center type.

Component Parts

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

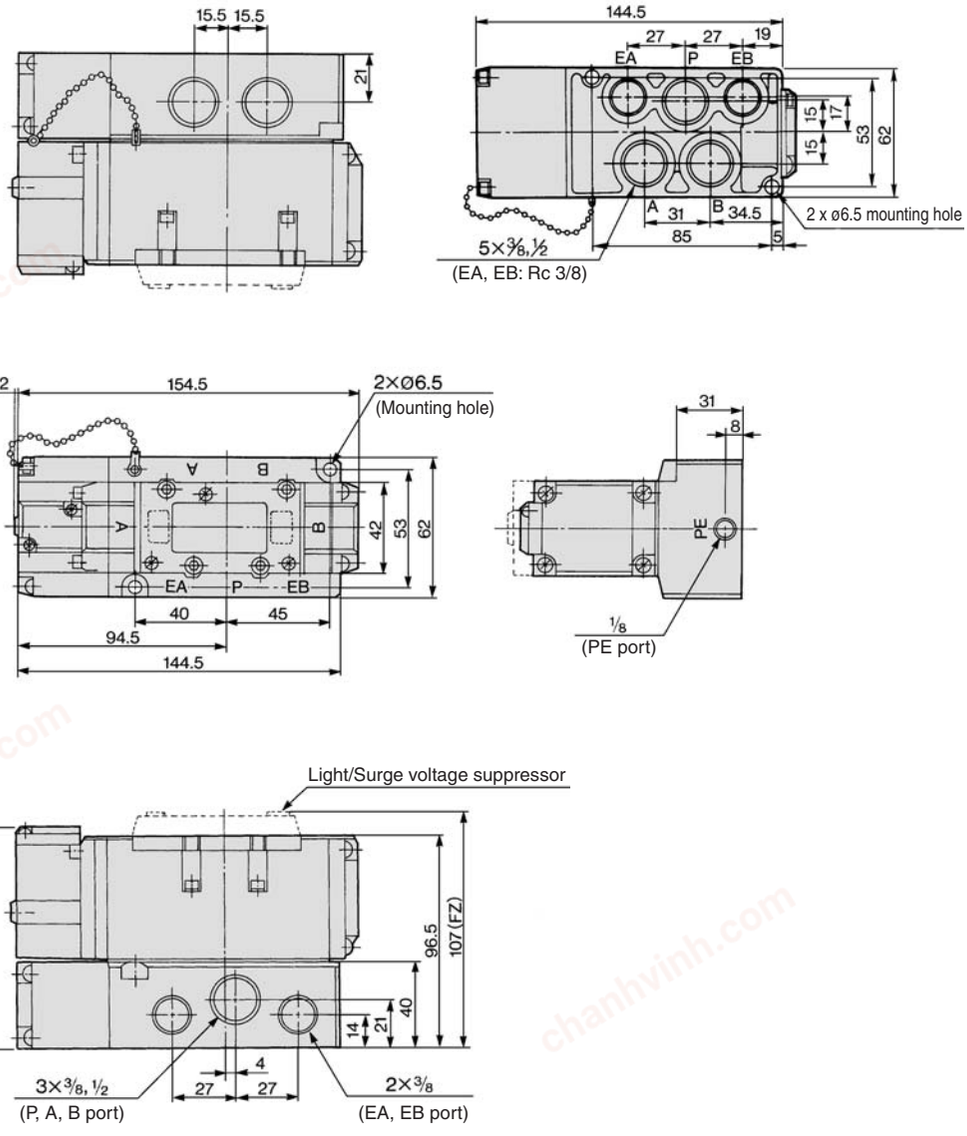
No.	Description	Material	Part no.		
			VFR41□□	**VFR42□□**	**VFR43□□/44□□/45□□**
9	**Gasket**	NBR	VFR4000-32-3	VFR4000-32-3	VFR4000-32-3
10	**Hexagon socket head screw**	Steel	AXT335-1-11 (M4 x 40)	AXT335-1-11 (M4 x 40)	AXT335-1-11 (M4 x 40)
11	**Pilot valve assembly**	—	Refer to “How to Order Pilot Valve Assembly” on page 1275.		
—	**Sub-plate assembly**	—	Refer to “How to Order Sub-plate Assembly” on page 1276.		

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Series VFR4000

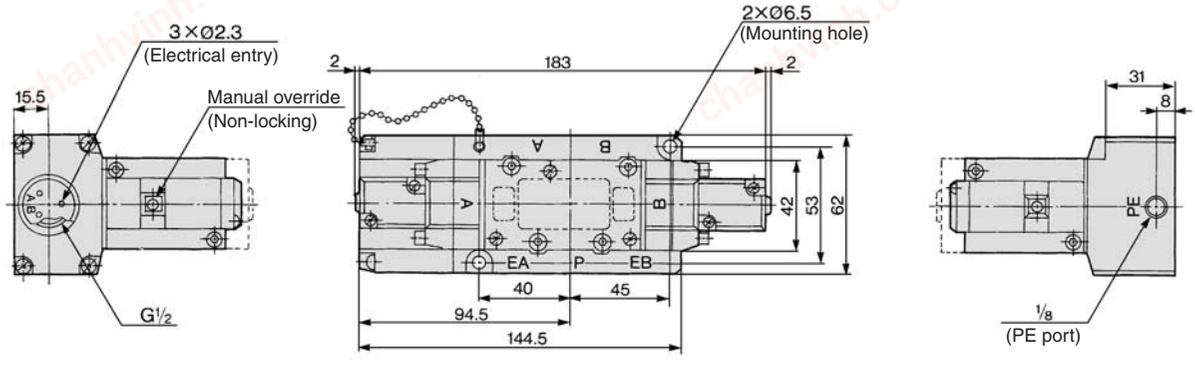
Plug-in: 2 Position Single/Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position single: VFR410$^{0}_{1}$-□F



2 position double: VFR420$^{0}_{1}$-□F

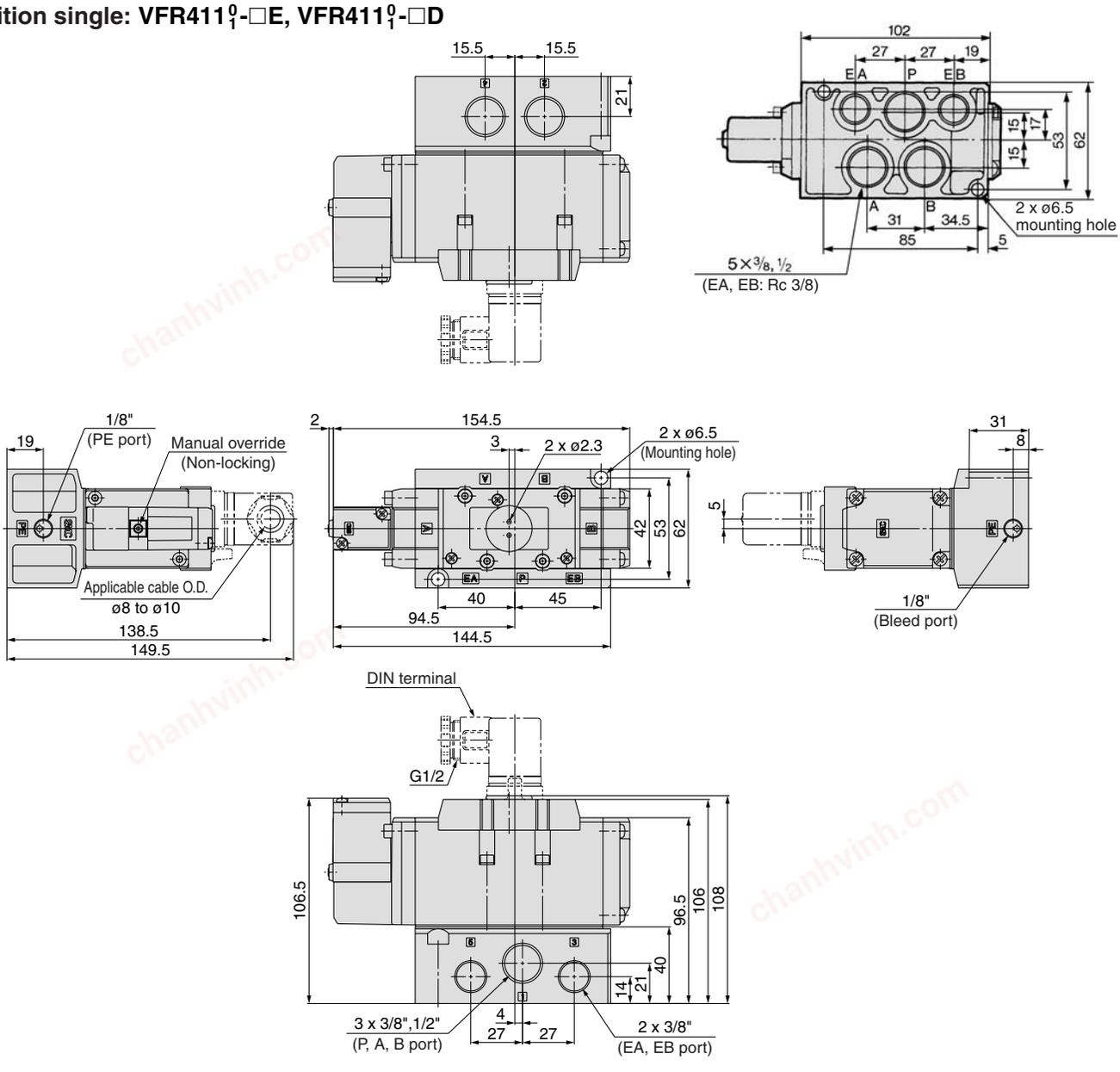
3 position closed center: VFR430$^{0}_{1}$-□F
3 position exhaust center: VFR440$^{0}_{1}$-□F
3 position pressure center: VFR450$^{0}_{1}$-□F



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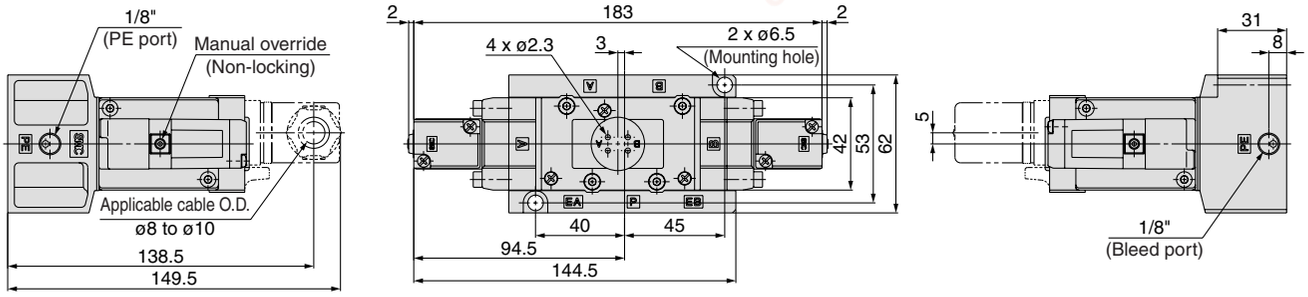
Non Plug-in: 2 Position Single/Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position single: VFR411$^{0}_{1}$-□E, VFR411$^{0}_{1}$-□D



2 position double: VFR421$^{0}_{1}$-□E, VFR421$^{0}_{1}$-□D

3 position closed center: VFR431$^{0}_{1}$-□E, VFR431$^{0}_{1}$-□D
3 position exhaust center: VFR441$^{0}_{1}$-□E, VFR441$^{0}_{1}$-□D
3 position pressure center: VFR451$^{0}_{1}$-□E, VFR451$^{0}_{1}$-□D



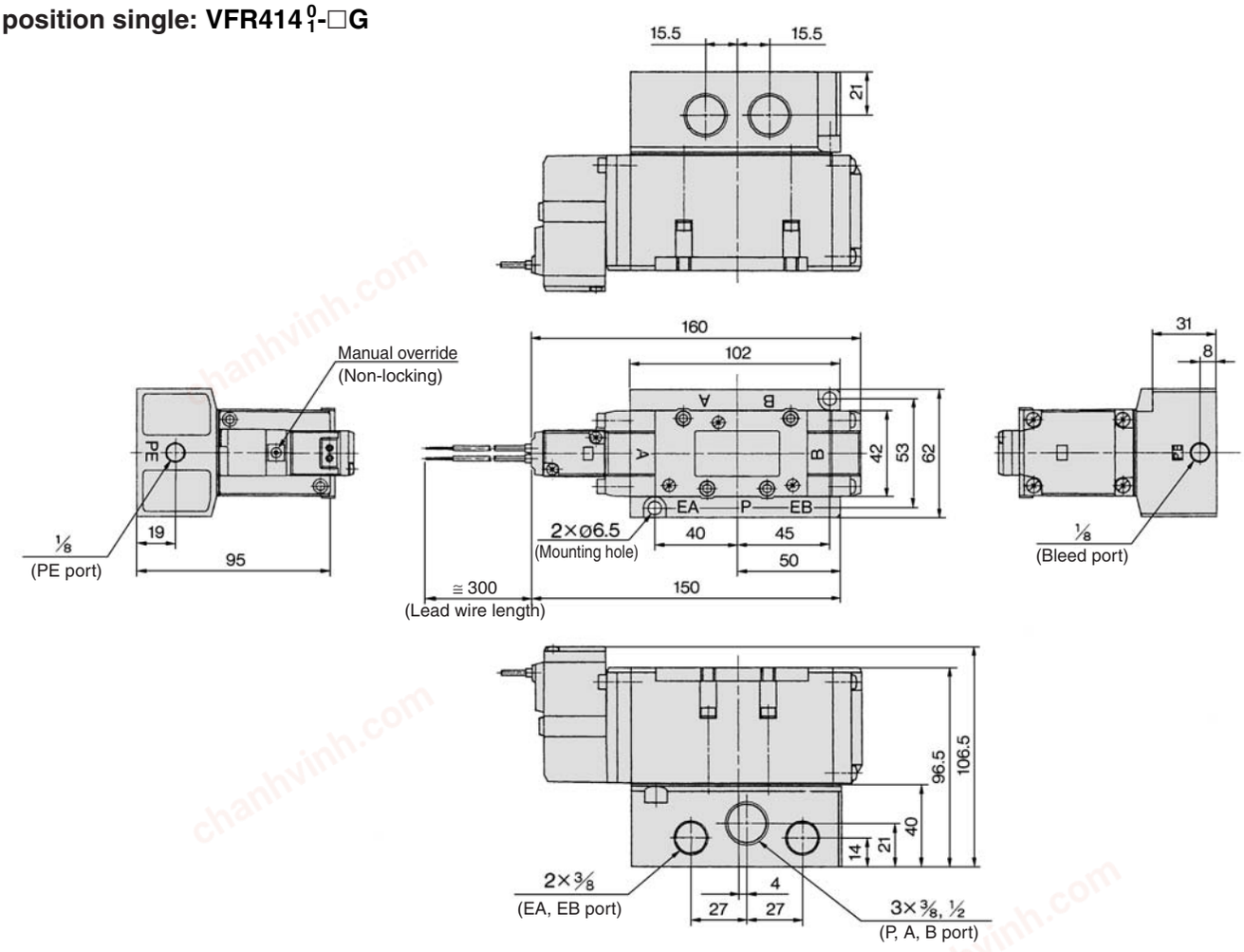
* Other dimensions are the same as the single type.

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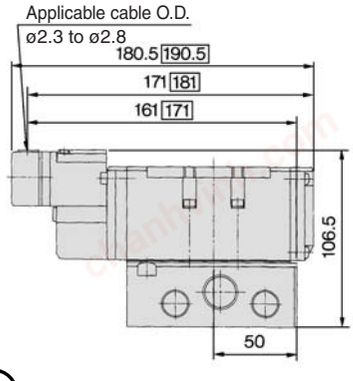
Series VFR4000

Non Plug-in: 2 Position Single

2 position single: VFR414$^{0}_{1}$-□G

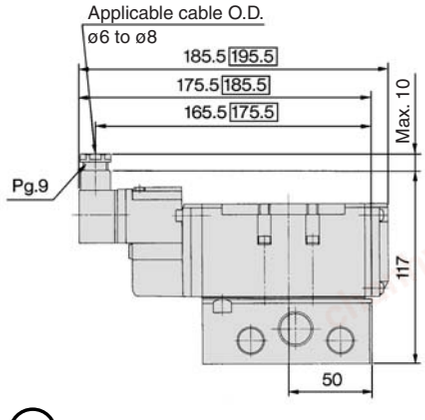


E: Grommet terminal



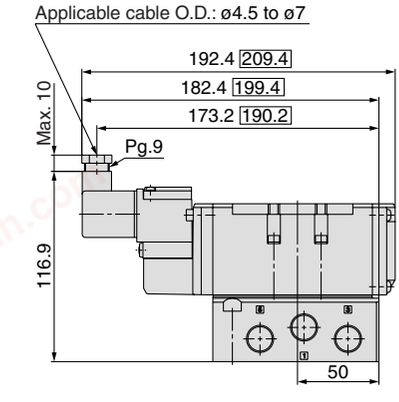
: With light/surge voltage suppressor

T: Conduit terminal



: With light/surge voltage suppressor

D, Y: DIN terminal



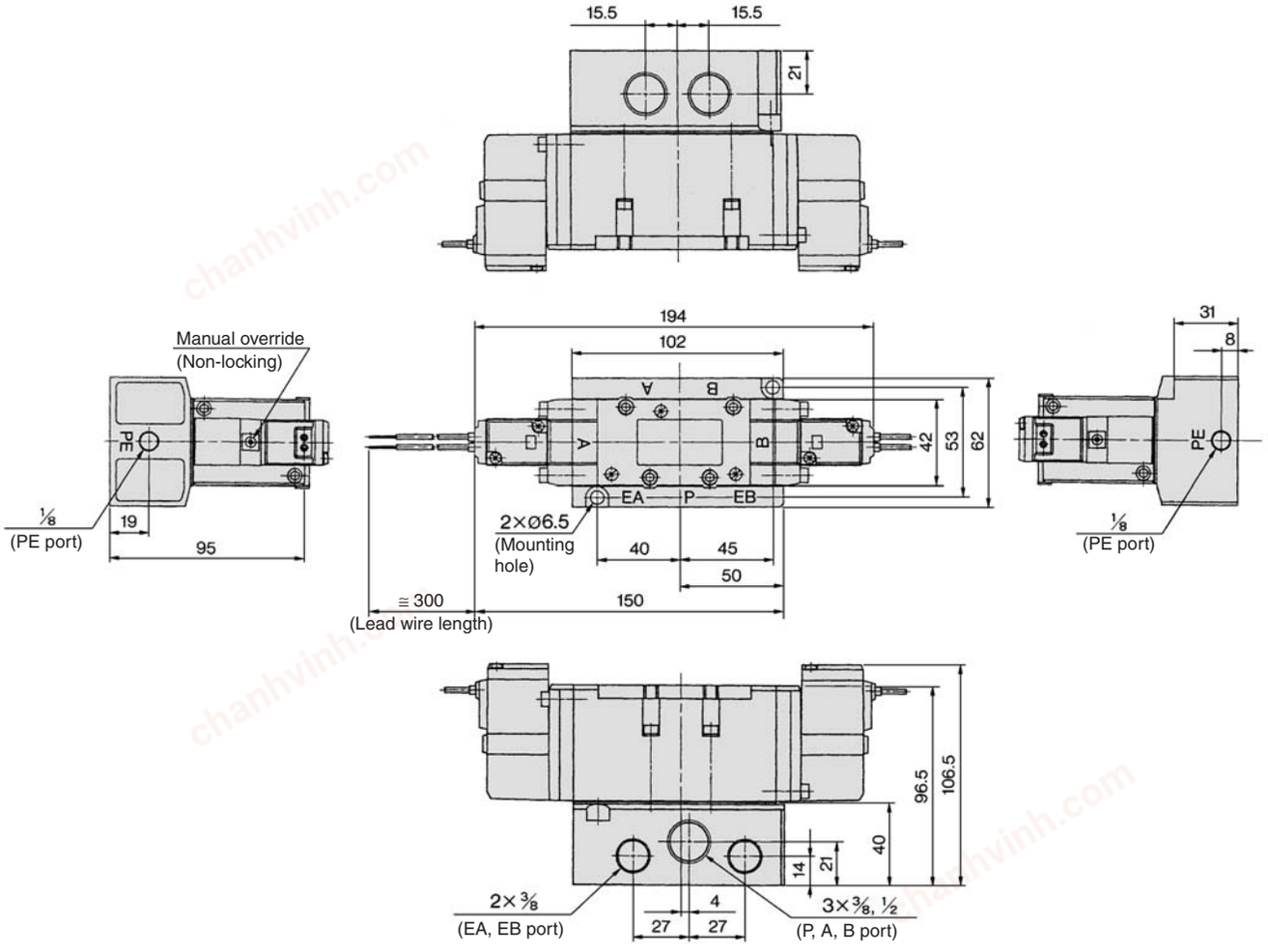
: With light/surge voltage suppressor

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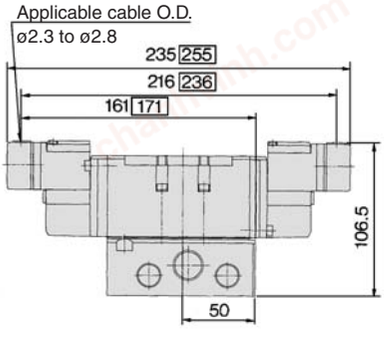
Non Plug-in: 2 Position Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position double: VFR424$^{0}_{1}$-□G

3 position closed center: VFR434$^{0}_{1}$-□G
3 position exhaust center: VFR444$^{0}_{1}$-□G
3 position pressure center: VFR454$^{0}_{1}$-□G

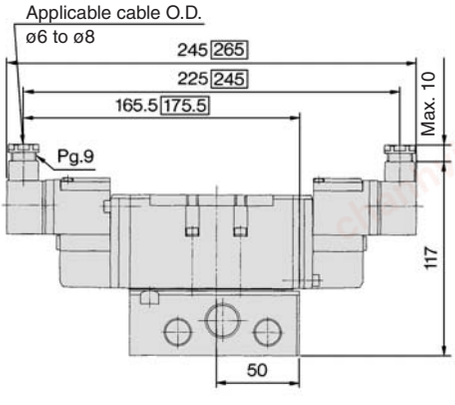


E: Grommet terminal



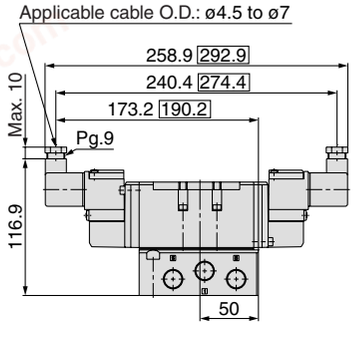
: With light/surge voltage suppressor

T: Conduit terminal



: With light/surge voltage suppressor

D: DIN terminal



: With light/surge voltage suppressor

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Series VFR4000
Manifold Specifications

Manifold Specifications

Base model	Wiring	Porting specifications	Port size		Stations	Applicable valve model
		A, B port	P, EA, EB	A, B		
Plug-in type **VV5FR4-01□(-Q)**	• With terminal block	Side/Bottom	1/2	3/8, 1/2	2 to 10	VFR4□0□-□F(-Q)
	• With multi-connector • With D-sub connector				2 to 8	
Non plug-in type **VV5FR4-10(-Q)**	• Grommet terminal • DIN terminal				2 to 10	VFR4□1□-□E VFR4□1□-□D(-Q)
Non plug-in type **VV5FR4-40(-Q)**	• Grommet • Grommet terminal • Conduit terminal • DIN terminal					VFR4□4□-□G VFR4□4□-□E VFR4□4□-□T VFR4□4□-□D(-Q)

How to Order Manifold Assembly

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

VV5FR4-01T-061-03 ····· **1 set (Manifold base part no.)**
***VFR4100-5FZ** ····· **3 sets (2 position single part no.)**
***VFR4200-5FZ** ····· **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.

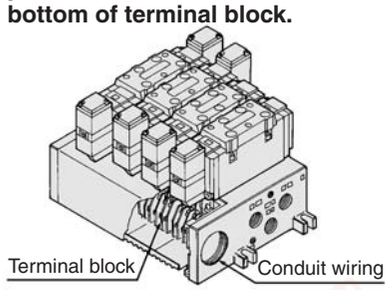
<Example> Non plug-in type: 6 stations

VV5FR4-10-061-03 ····· **1 set (Manifold base part no.)**
***VFR4110-5D** ····· **5 sets (2 position single part no.)**
***VFR4410-5D** ····· **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 − 06 1 − 03 □ − □

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			Bottom *

* Option

Thread type

Nil	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

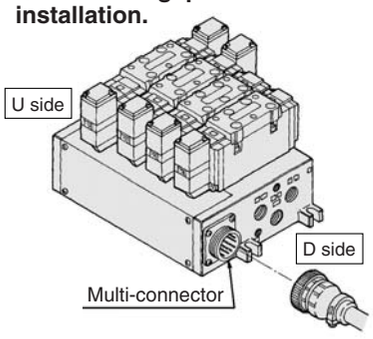
* For bottom ported: Rc 3/8 only.

CE-compliant

Nil	—
Q	CE-compliant

Plug-in Type: With Multi-connector (For wiring specifications, refer to page 1326.)

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



VV5FR4 − 01C D − 05 1 − 03 □ − □

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			Bottom *

* Option

Thread type

Nil	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.

CE-compliant

Nil	—
Q	CE-compliant

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Plug-in Type: With D-sub Connector (For wiring specifications, refer to page 1326.)

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

VV5FR4 – 01F D – 06 1 – 03 □ – □

- 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

- Symbol

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

* Option

- Port size

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

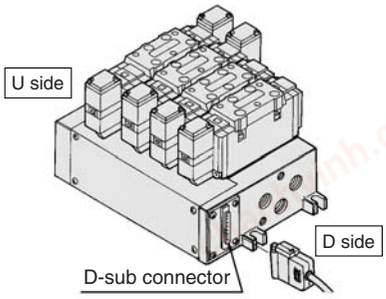
* For bottom ported: Rc 3/8 only.

- Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

- CE-compliant

Nil	—
Q	CE-compliant



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

- Individual wiring for every valve

VV5FR4 – 10 – 05 1 – 03 □ – □

- Series VFR4000 Manifold
- Non plug-in type Common electrical entry
- Stations

02	2 stations
⋮	⋮
10	10 stations

- Symbol

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

* Option

- Port size

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

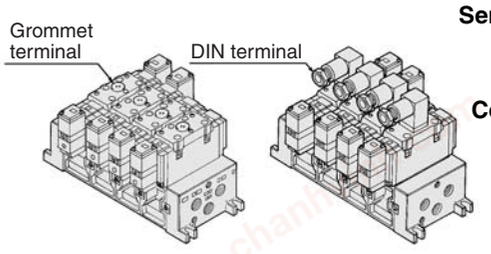
* For bottom ported: Rc 3/8 only.

- Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

- CE-compliant

Nil	—
Q	CE-compliant



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

- Individual wiring for every valve

VV5FR4 – 40 – 05 1 – 03 □ – □

- Series VFR4000 Manifold
- Non plug-in type Individual electrical entry
- Stations

02	2 stations
⋮	⋮
10	10 stations

- Symbol

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

* Option

- Port size

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

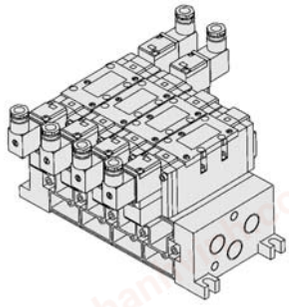
* For bottom ported: Rc 3/8 only.

- Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

- CE-compliant

Nil	—
Q	CE-compliant



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

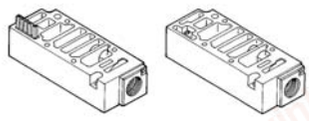
Note) Manifold base is in common with Series VFS4000 but the connection of terminal block for plug-in type is different.

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Manifold/Option Parts Assembly

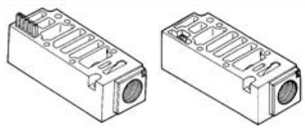
Individual SUP spacer
Setting individual SUP spacer on the manifold block enables individual SUP port for each valve.

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	



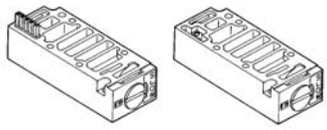
EXH block disk



SUP block disk

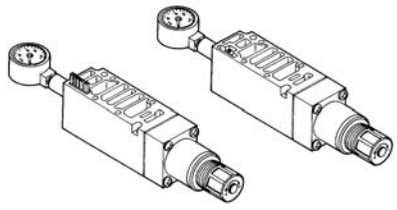
Throttle valve spacer
Needle valve set on the manifold block can control cylinder speed by throttling exhaust.

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” on page 1324 before operation.)

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

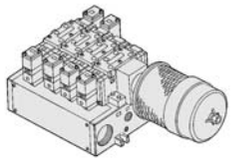


Blanking plate
It is used by attaching on the manifold block for being prepared for removing a valve for maintenance reasons or planning to mount a spare valve, etc.

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

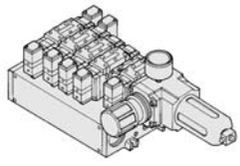
Manifold Option

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 1289.

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.

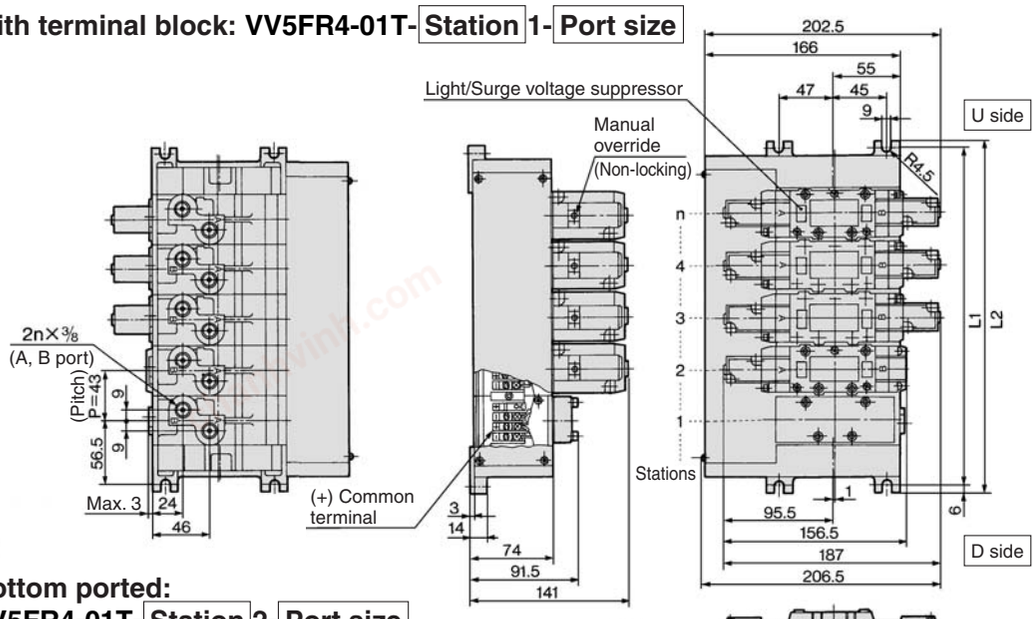


For details, refer to page 1292.

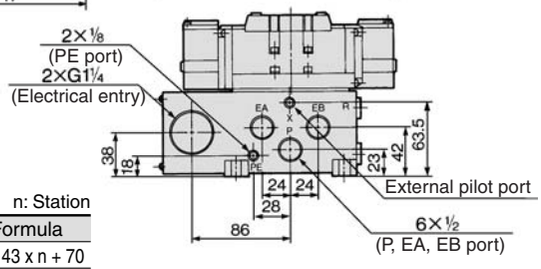
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Manifold/Plug-in Type

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



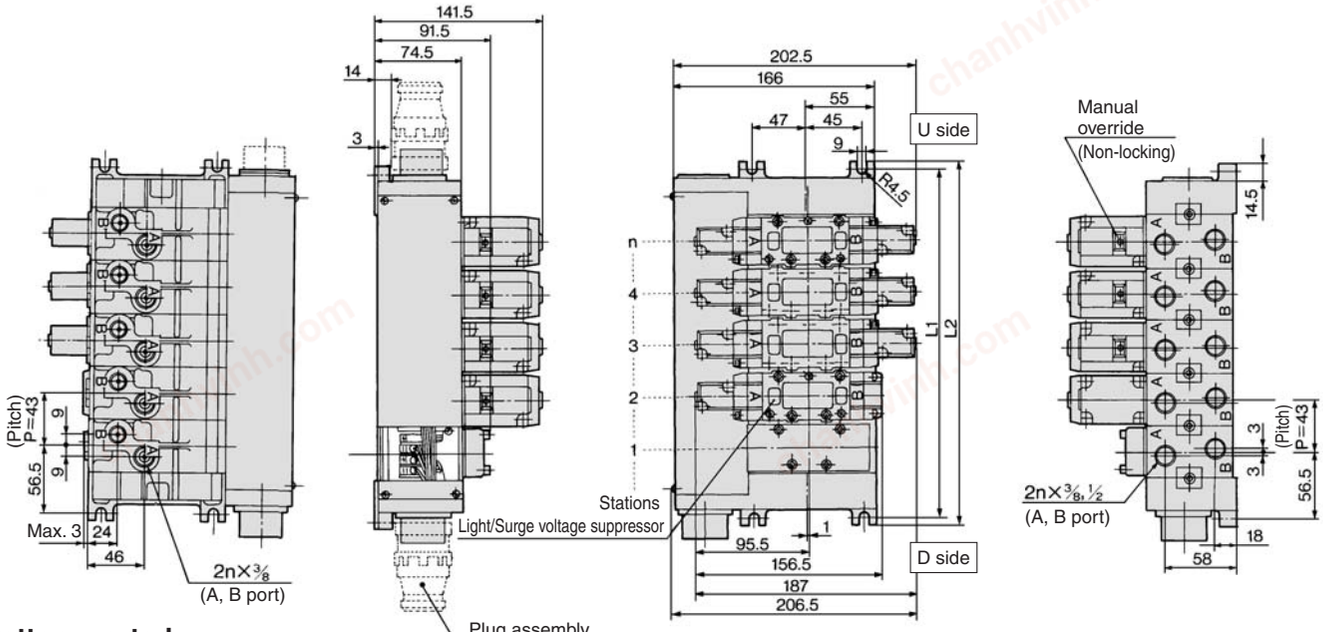
Bottom ported: VV5FR4-01T-Station 2-Port size



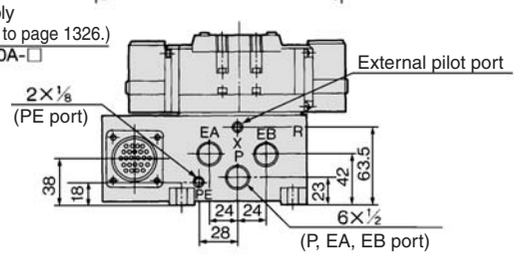
n: Station

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

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



Bottom ported: VV5FR4-01CD/CU-Station 2-Port size



For wiring specifications, refer to page 1326.

n: Station

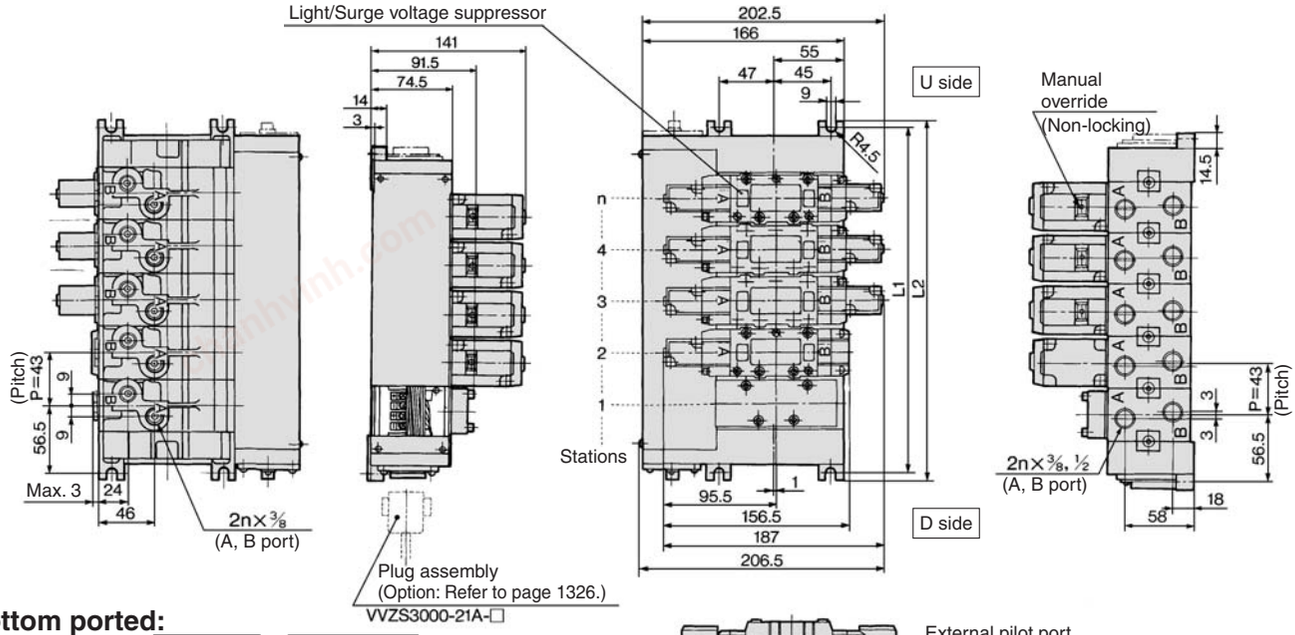
L \ Stations	2	3	4	5	6	7	8	Formula
L1	156	199	242	285	328	371	414	L1 = 43 x n + 70
L2	168	211	254	297	340	383	426	L2 = 43 x n + 82

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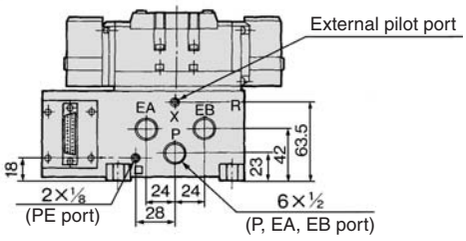
Series VFR4000

Manifold/Plug-in Type

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



Bottom ported:
VV5FR4-01CDCU-Station 2-Port size



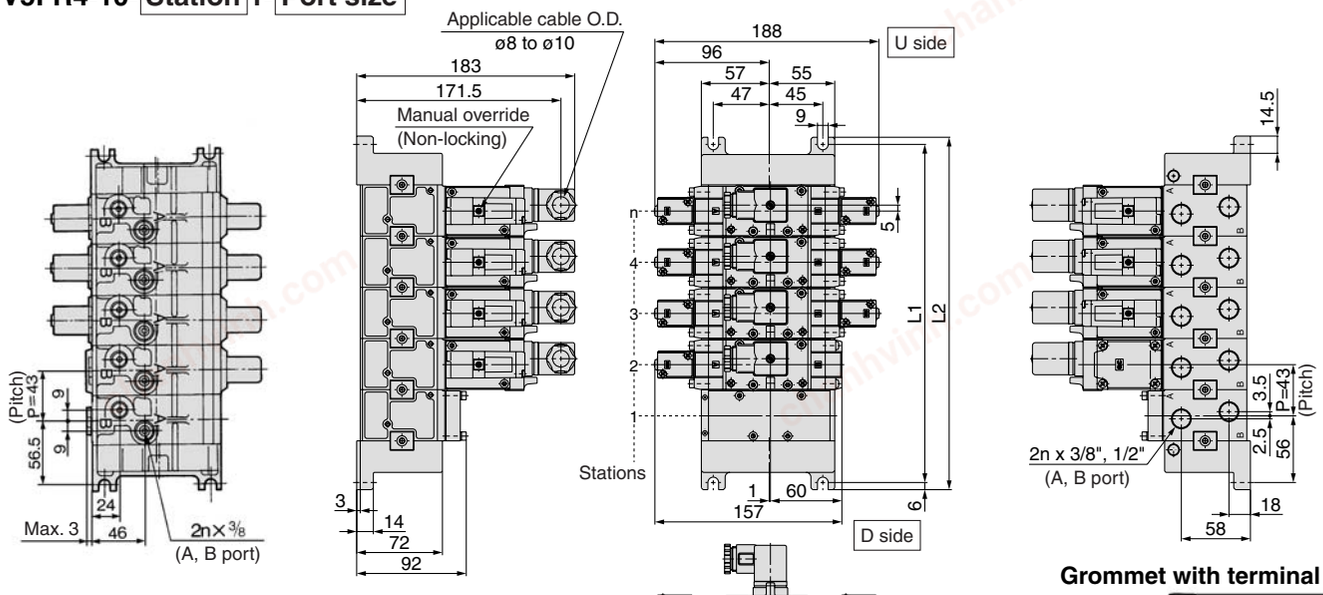
For wiring specifications, refer to page 1326.

n: Station

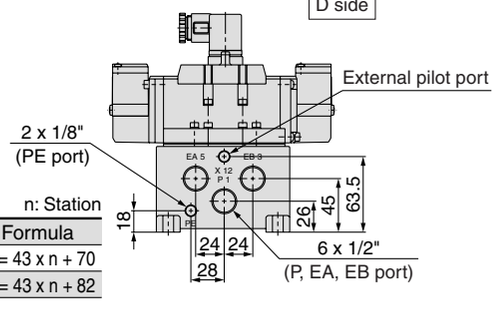
L \ Stations	2	3	4	5	6	7	8	Formula
L1	156	199	242	285	328	371	414	L1 = 43 x n + 70
L2	168	211	254	297	340	383	426	L2 = 43 x n + 82

Manifold/Non Plug-in Type

VV5FR4-10-Station 1-Port size



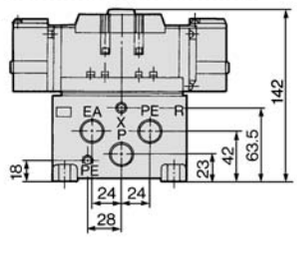
Bottom ported:
VV5FR4-10-Station 2-Port size



n: Station

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

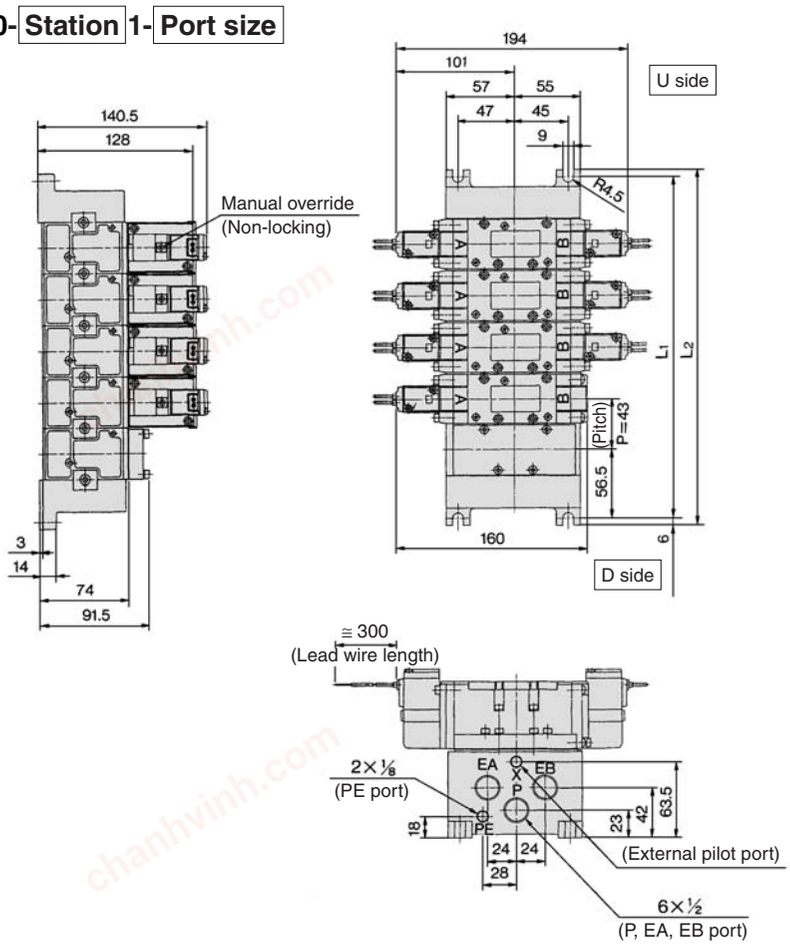
Grommet with terminal



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Manifold/Non Plug-in Type

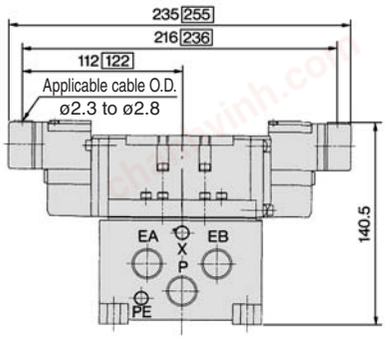
VV5FR4-40-Station 1-Port size



n: Stations

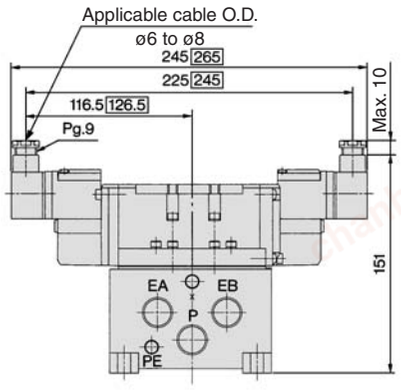
L \ Stations	2	3	4	5	6	7	8	9	10	Formula
L1	156	199	242	285	328	371	414	457	500	L1 = 43 x n + 70
L2	168	211	254	297	340	383	426	469	512	L2 = 43 x n + 82

E: Grommet terminal



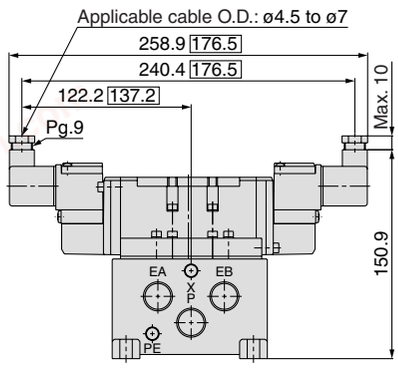
: With light/surge voltage suppressor

T: Conduit terminal



: With light/surge voltage suppressor

D, Y: DIN terminal

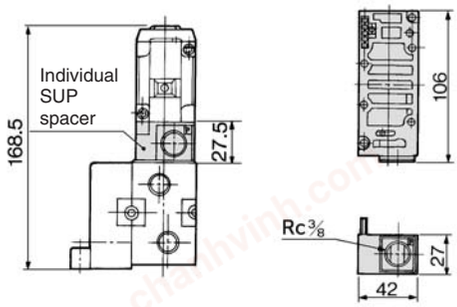


: With light/surge voltage suppressor

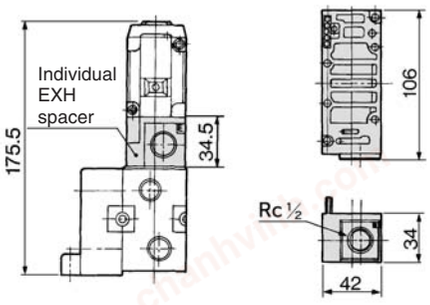
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Manifold/Option Parts Assembly: Plug-in Type/Non Plug-in Type

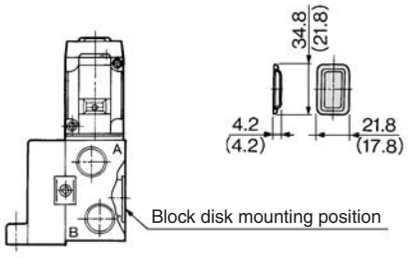
Individual SUP spacer:
VVFS4000-P-03-1 (Plug-in type)
VVFS4000-P-03-2 (Non plug-in type)



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



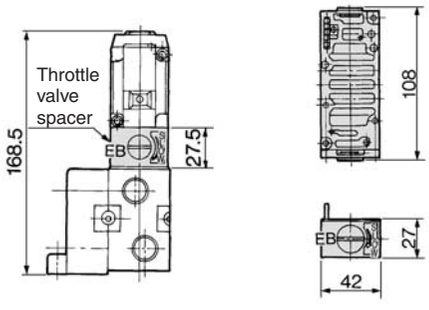
SUP block disk: AXT634-10A
EXH block disk: AXT634-11A



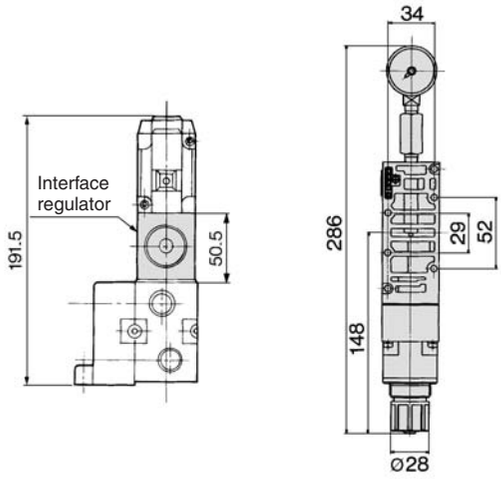
Note) Used with exclusive manifold block

( ): EXH block disk

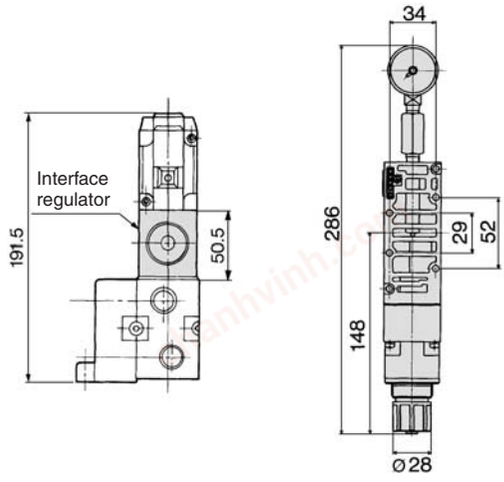
Throttle valve spacer:
VVFS4000-20A-1 (Plug-in type)
VVFS4000-20A-2 (Non plug-in type)



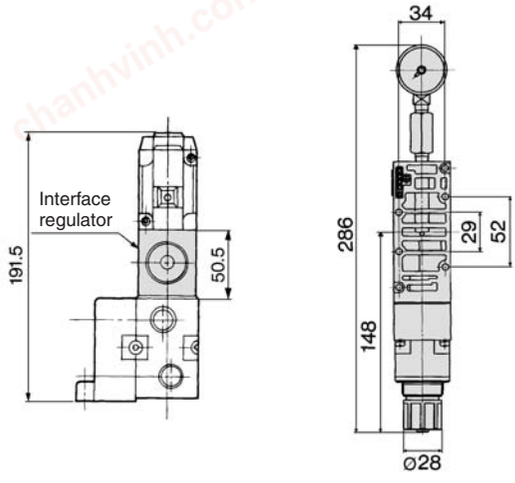
Interface regulator/P port regulation:
ARBF4050-00-P-1 (Plug-in type)
ARBF4050-00-P-2 (Non plug-in type)



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



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

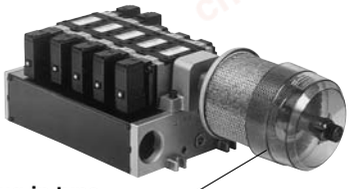


Dimensions: FZ type dimensions of direct manual style are also the same.

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Manifold with Exhaust Cleaner

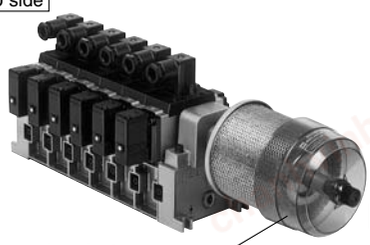
- **Serves to protect working environment.**
- **Valve exhaust noise dampening: 35 dB or more.**
- **Collection rate of drainage and oil mist: 99.9% or more.**
- **Piping work is reduced.**



Plug-in type

Exhaust cleaner
(Option)

U side



D side

Non plug-in type

Exhaust cleaner
(Option)

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 Grommet terminal	Grommet, Grommet terminal, Conduit terminal, DIN terminal
Applicable valve model	VFR4□0□-□F(-Q)	VFR4□1□-□D(-Q) VFR4□1□-□E	VFR4□4□-□G, VFR4□4□-□E VFR4□4□-□T, VFR4□4□-□D(-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 $1^1/_2$	
Stations	2 to 10 stations (With multi-connector/D-sub connector: 2 to 8 stations)		
Applicable exhaust cleaners	AMC610-10 (Port size: R 1), AMC810-14 (Port size: R $1^1/_2$) (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 – □

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
Nil	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

Nil	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.

Symbol

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

* Option

CE-compliant

Nil	—
Q	CE-compliant

Exhaust cleaner mounting direction

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

* Please indicate size or port size of exhaust cleaner.

How to Order Manifold Assembly

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

VV5FR4-01T-061-03-CD ····· **1 set (Manifold base part no.)**
***VFR4100-5FZ** ····· **3 sets (2 position single part no.)**
***VFR4200-5FZ** ····· **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 ····· **1 set (Manifold base part no.)**
***VFR4110-5E** ····· **3 sets (2 position single part no.)**
***VFR4210-5E** ····· **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.

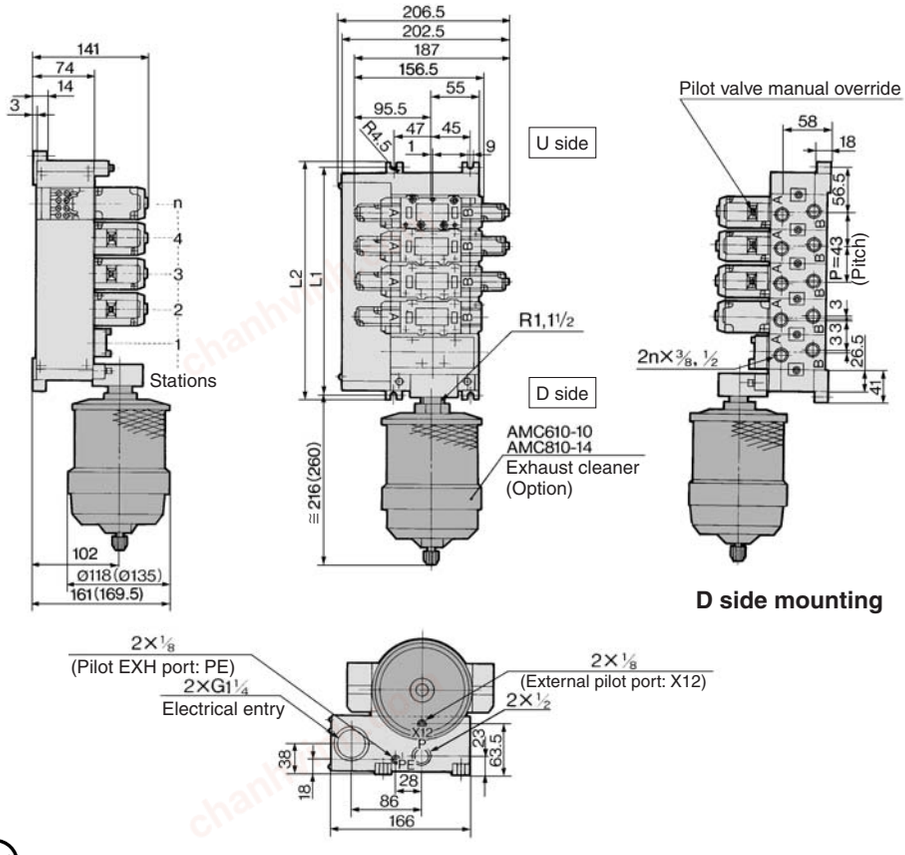
Refer to Best Pneumatics No. 6 for Exhaust Cleaner details.

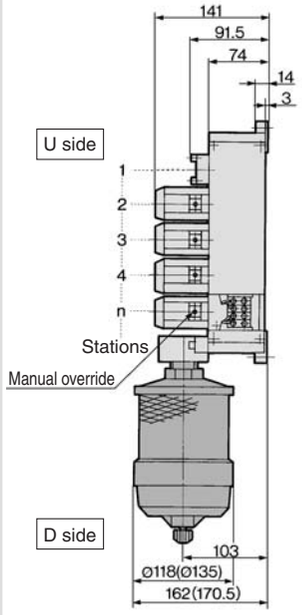
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Series VFR4000

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

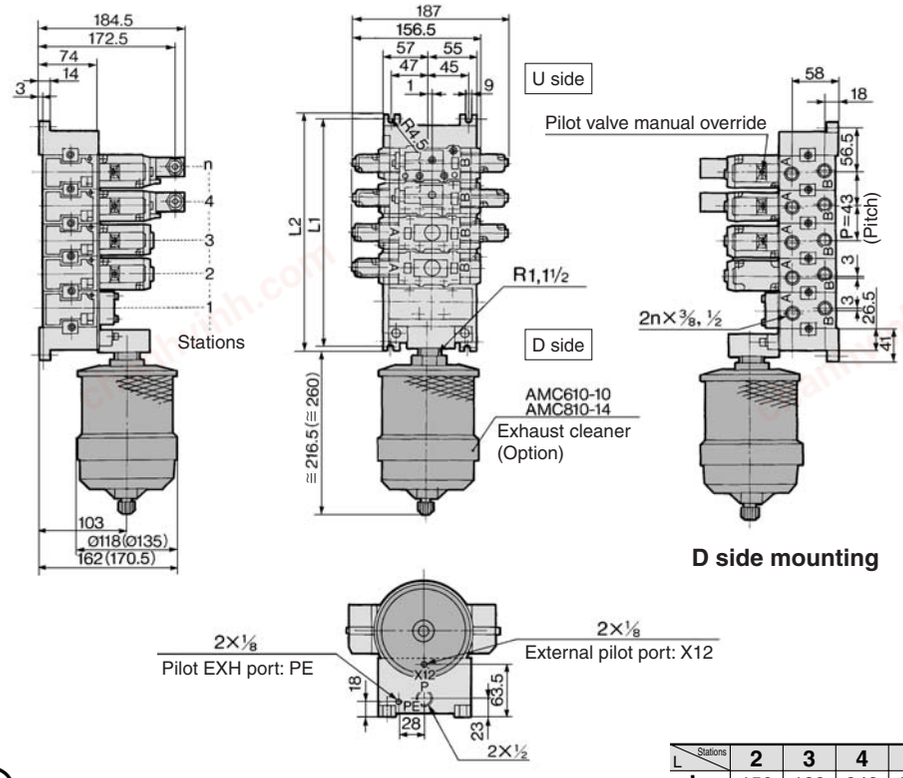
Plug-in type: VV5FR4-01T-[Station]1-[Port size]-[C/D/U]

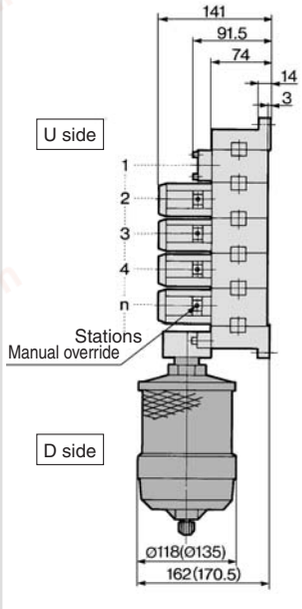




( ): AMC810

Non plug-in type: VV5FR4-10-[Station]1-[Port size]-[C/D/U]





( ): AMC810

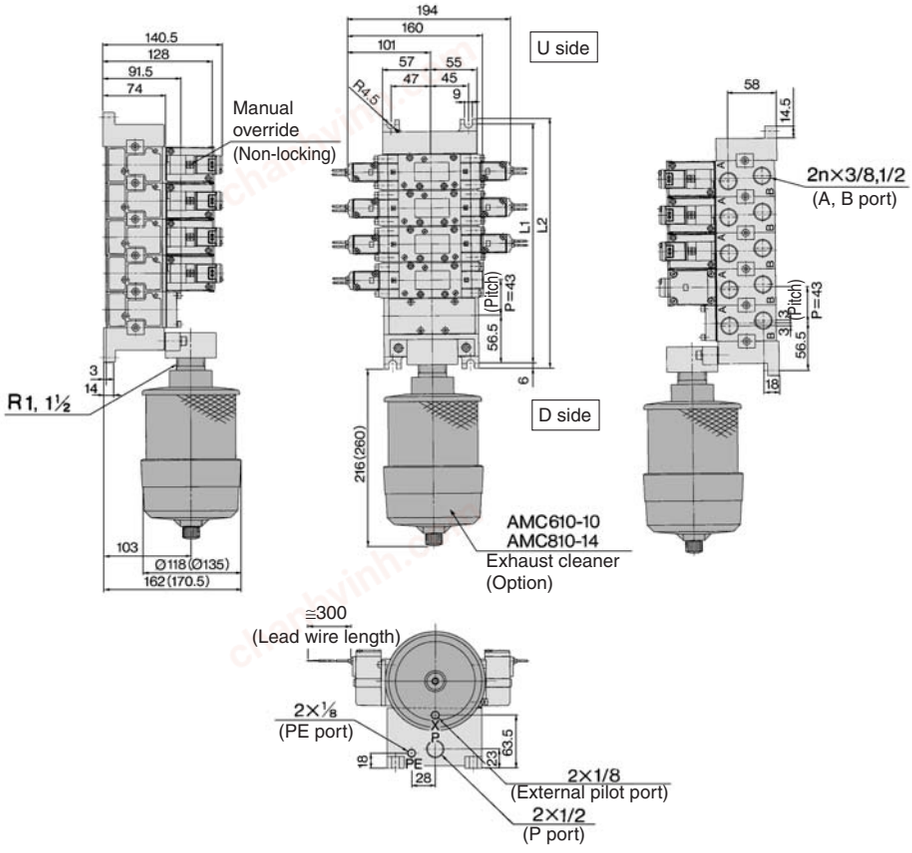
n: Station

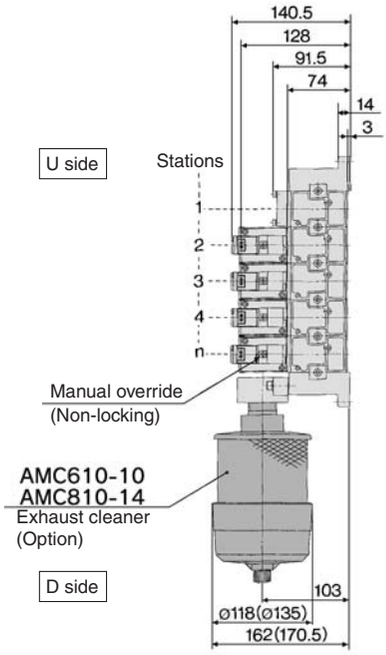
L \ Stations	2	3	4	5	6	7	8	9	10	Formula
L1	156	199	242	285	328	371	414	457	500	L1 = 43 x n + 70
L2	168	211	254	297	340	383	426	469	512	L2 = 43 x n + 82

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Manifold with Exhaust Cleaner: Non Plug-in Type

Non plug-in type: VV5FR4-40-Station 1-Port size-$\frac{C D}{C U}$





U side mounting

( ): AMC810

n: Station

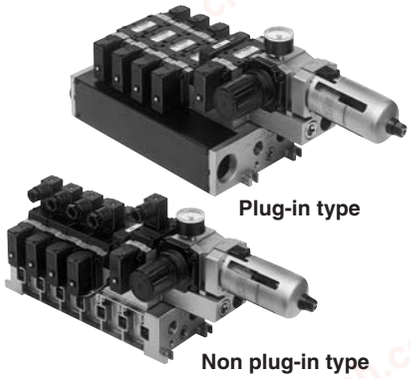
L \ Stations	2	3	4	5	6	7	8	9	10	Formula
L_1	156	199	242	285	328	371	414	457	500	$L_1 = 43 \times n + 70$
L_2	168	211	254	297	340	383	426	469	512	$L_2 = 43 \times n + 82$

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Series VFR4000

Manifold with Control Unit

- **Control unit (Filter, Regulator, Pressure switch, Air release valve) are all standardized to the one unit, and can be mounted on the manifold base without any attachments.**
- **Piping processes are eliminated.**



Plug-in type

Non plug-in type

⚠ Caution

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

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 Grommet terminal	Grommet, Grommet terminal, Conduit terminal, DIN terminal
Applicable valve model	VFR4□0□-□F(-Q)	VFR4□1□-□D(-Q) VFR4□1□-□E	VFR4□4□-□G, VFR4□4□-□E VFR4□4□-□T, VFR4□4□-□D(-Q)
Porting specifications	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/With manual drain)	
Filtration degree	5 μm
Regulator	
Set pressure (Outlet pressure)	0.05 to 0.85 MPa
Pressure switch	
Set pressure range: OFF	0.1 to 0.6 MPa
Differential	0.08 MPa
Contact	1a
Indicator light	LED (RED)
Max. switch capacity	2 VA AC, 2 W DC
Max. operating current	24 VAC, DC or less: 50 mA 48 VAC, DC: 40 mA 100 VAC, DC: 20 mA
Inside voltage drop	4 V or less
Air release valve (Single only)	
Operating pressure range	0.2 to 0.9 MPa

Control Unit/Option

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

Note 1) Combining valve "VFR41□□" (single) and release valve spacer makes it possible to use this as an air release valve.
Note 2) Pressure switch cannot be mounted later on non plug-in type.

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How to Order

VV5FR4 – 01C D – 08 1 – 03 [ ] – AP [ ] – [ ]

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

* Option

Port size

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

* For bottom ported: only 3/8

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

Control unit type

Control equipment \ Symbol	Nil	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.

CE-compliant

Nil	—
Q	CE-compliant

Air release valve coil rating

Nil	None
1	100 VAC, 50/60 Hz
5	24 VDC
9	Other

How to Order Manifold Assembly

<Example> Plug-in type with terminal block

VV5FR4-01T-081-03-AP5 **1 set (Manifold base part no.)**
***VFR4100-5FZ** **5 sets (2 position single part no.)**
***VFR4200-5FZ** **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 **1 set (Manifold base part no.)**
***VFR4110-5D** **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.

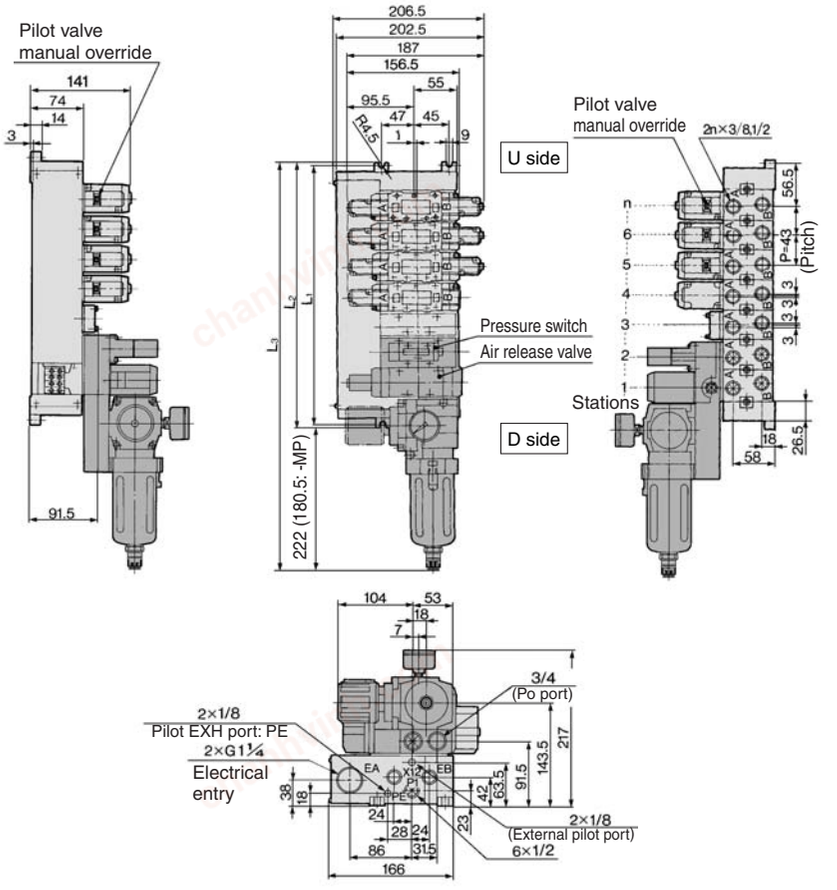
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Series VFR4000

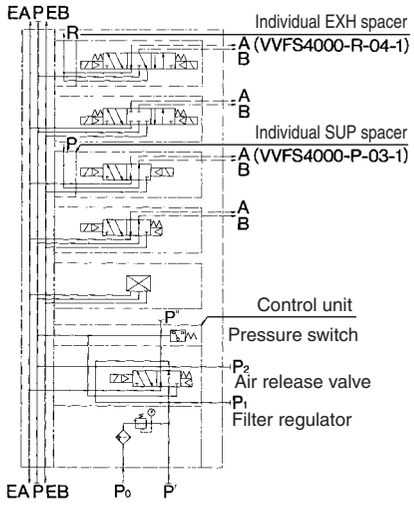
Manifold with Control Unit: Plug-in Type/Non Plug-in Type

Plug-in type:

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

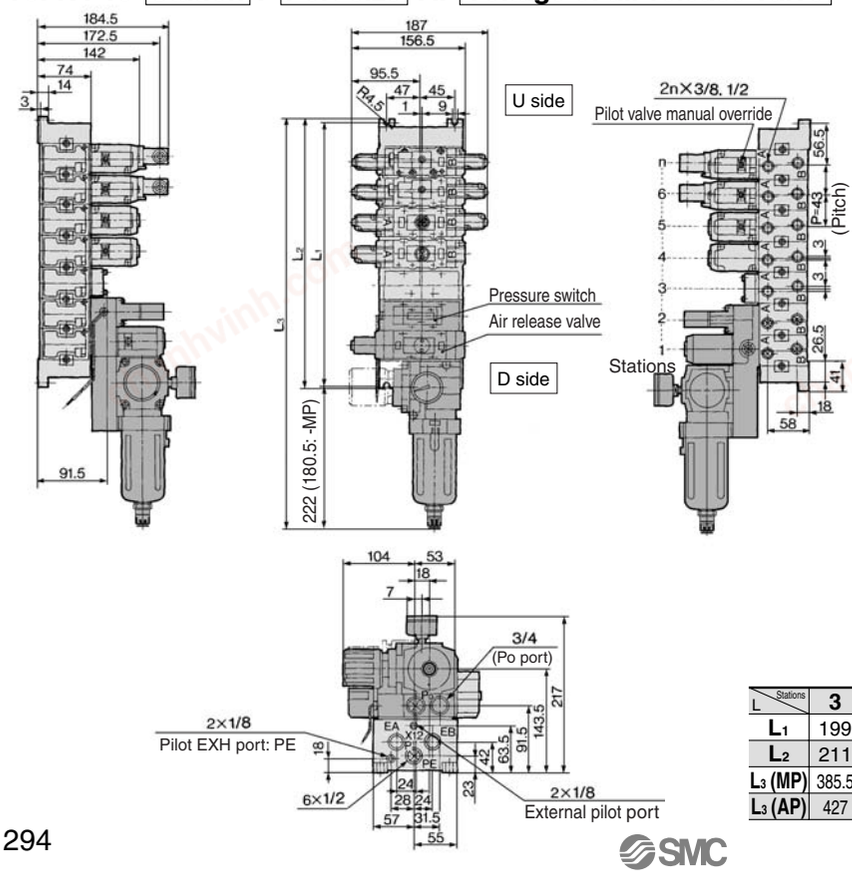


Example for manifold

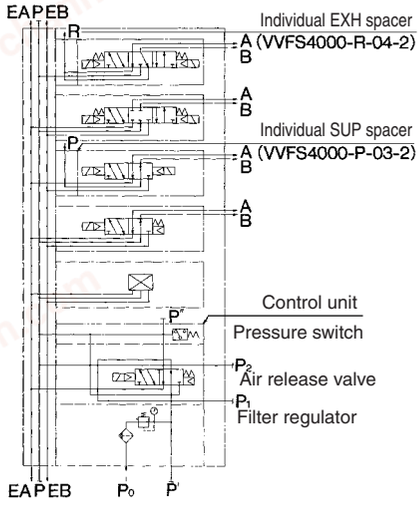


Non plug-in type:

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



Example for manifold



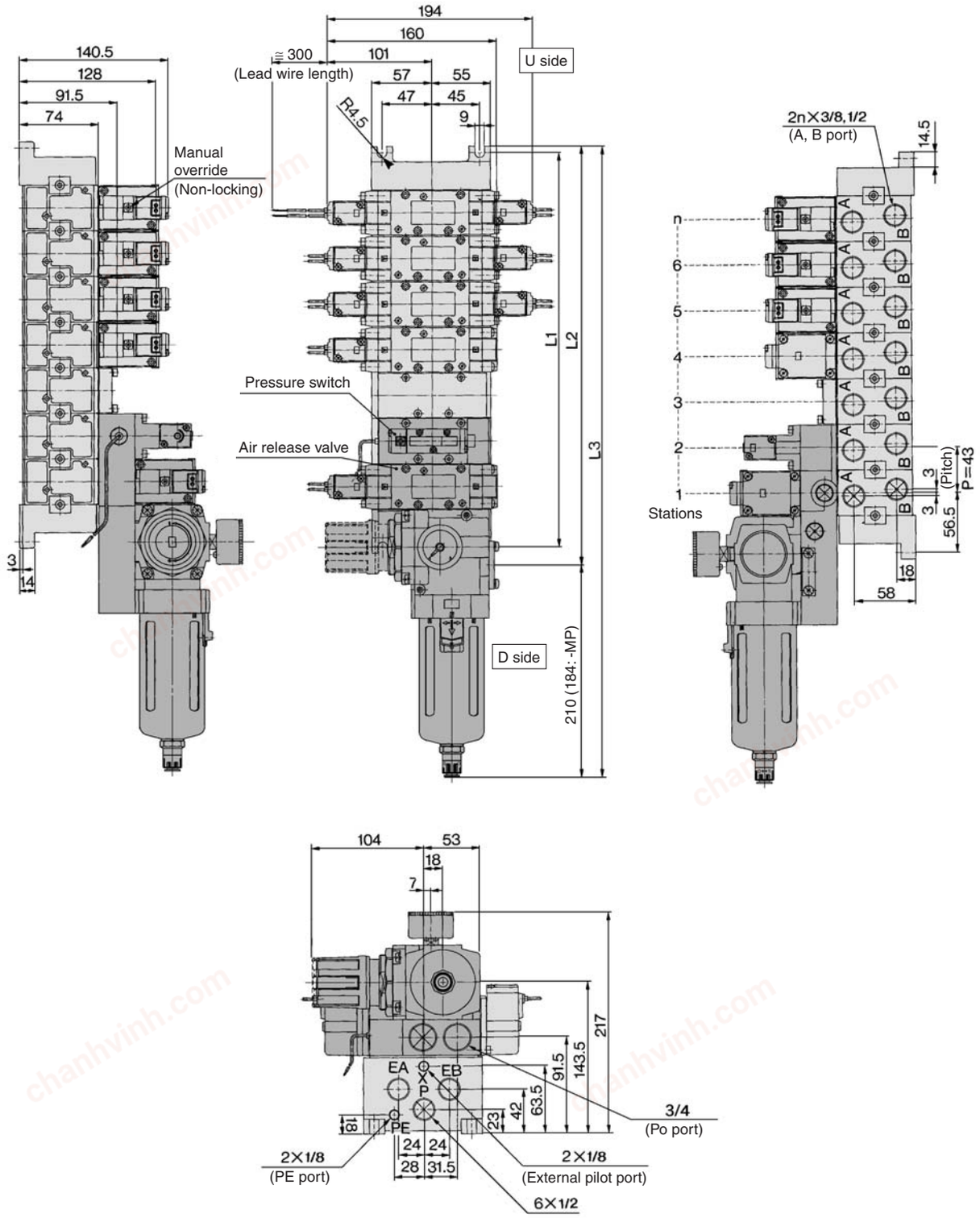
n: Station

L \ Stations	3	4	5	6	7	8	9	10	Formula
L_1	199	242	285	328	371	414	457	500	$L_1 = 43 \times n + 70$
L_2	211	254	297	340	383	426	469	512	$L_2 = 43 \times n + 82$
L_3 (MP)	385.5	428.5	471.5	514.5	557.5	600.5	643.5	686.5	$L_3 = 43 \times n + 256.5$
L_3 (AP)	427	470	513	556	599	642	685	728	$L_3 = 43 \times n + 298$

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Manifold with Control Unit: Non Plug-in Type

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



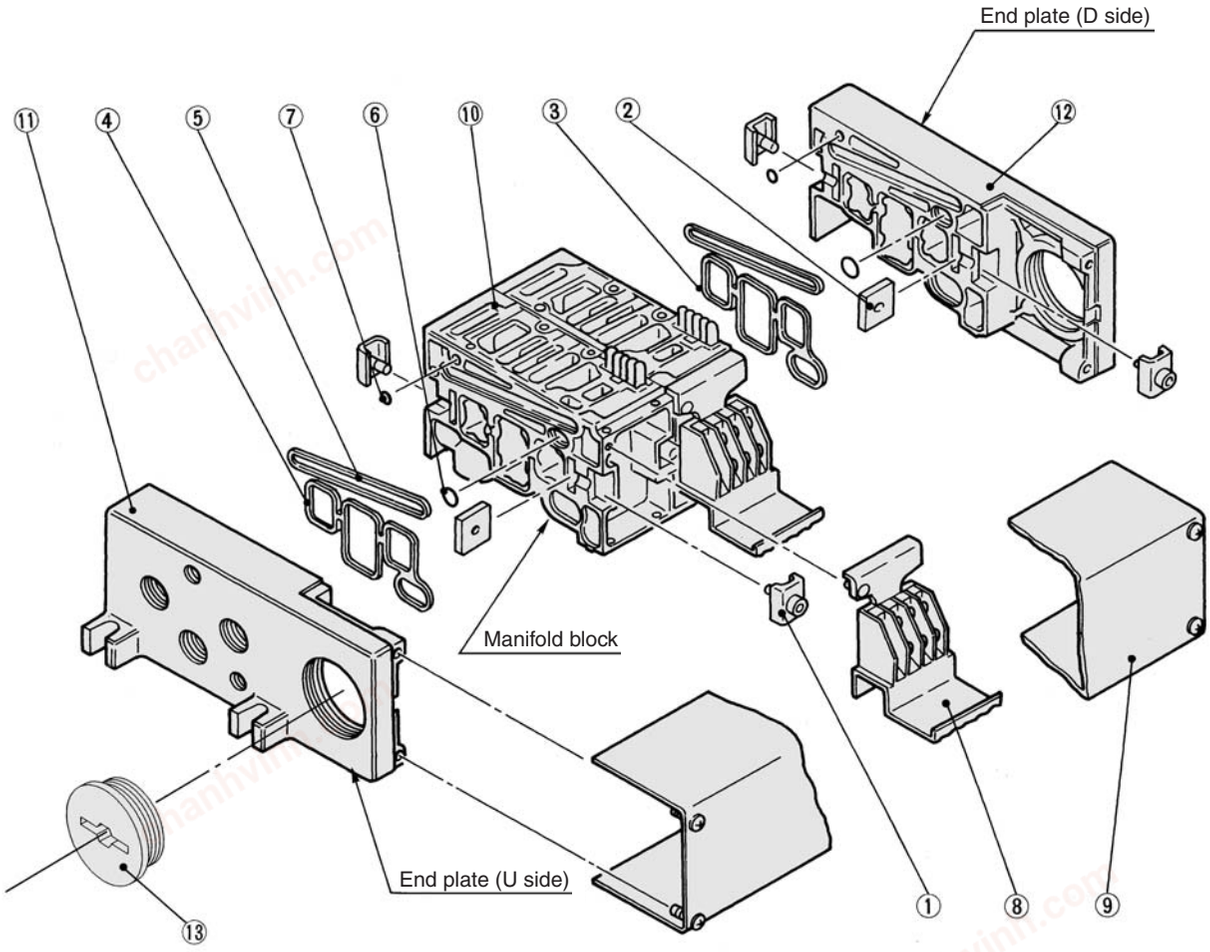
n: Station

L / Stations	3	4	5	6	7	8	9	10	Formula
L_1	199	242	285	328	371	414	457	500	$L_1 = 43 \times n + 70$
L_2	211	254	297	340	383	426	469	512	$L_2 = 43 \times n + 82$
L_3 (MP)	385.5	428.5	471.5	514.5	557.5	600.5	643.5	686.5	$L_3 = 43 \times n + 256.5$
L_3 (AP)	427	470	513	556	599	642	685	728	$L_3 = 43 \times n + 298$

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Series VFR4000

Manifold Base Construction: Plug-in Type/Non Plug-in Type



Replacement Parts

No.	Description	Material	Part no.
1	**Connection fitting A**	Steel	VVF4000-5-1A
2	**Connection fitting 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-[Stations]
13	**Rubber plug**	NBR	AXT336-9

Note) Manifold Base/Construction: Plug-in type with terminal block.

Replacement Parts: Sub Assembly

No.	Description	Assembly part no.	Component parts	Applicable manifold base
10	**Manifold block assembly** Note)	VFR4000-19-1A-$^{03}_{04}$	Manifold block ⑩, Terminal ⑧, Connection bracket ①, ②, Gasket ④, ⑤, O-ring ⑥, ⑦, Receptacle assembly	Plug-in type
		VFR4000-19-2A-$^{03}_{04}$	Manifold block ⑩, Connection bracket ①, ②, Gasket ④, ⑤, O-ring ⑥, ⑦	Non plug-in type
11	**End plate (U side) assembly**	VVF4000-2A-1	End plate (U) ⑪, Metal joint ①, ②	Plug-in type
		VVF4000-2A-2	End plate (U) ⑪, Metal joint ①, ②	Non plug-in type
12	**End plate (D side) assembly**	VVF4000-3A-1	End plate (D) ⑫, Connection bracket ①, ②, Gasket ③, ④, O-ring ⑥, ⑦	Plug-in type
		VVF4000-3A-2	End plate (D) ⑫, Connection bracket ①, ②, Gasket ③, ⑤, O-ring ⑥, ⑦	Non plug-in type

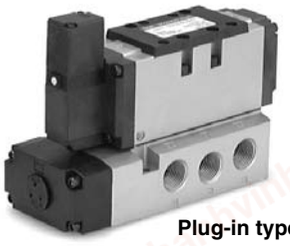
Note) For side ported

∗ Contact SMC for CE-compliant products.

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5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in
Series VFR5000

CE [Option]



Plug-in type



Non plug-in type

Standard Specifications

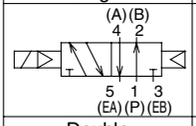
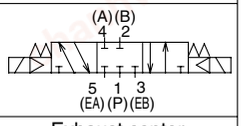
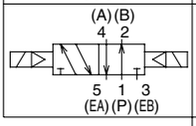
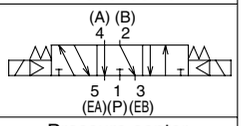
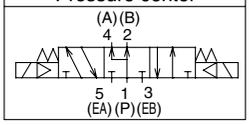
Valve specifications	Fluid		Air
	Operating pressure range	2 position single/3 position	0.2 to 0.9 MPa
		2 position double	0.1 to 0.9 MPa
	Ambient and fluid temperature		–10 to 50°C (No freezing. Refer to page 5.)
	Lubrication		Non-lube (1)
	Manual override		Non-locking push type
	Mounting orientation		Unrestricted
	Shock/Vibration resistance		300/50m/s² (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/50 Hz, 2.3 VA/60 Hz
	Power consumption (DC) (3)		1.8 W
	Electrical entry		Plug-in type: Conduit terminal; Non plug-in type: Grommet terminal, DIN terminal

Note 1) Use turbine oil Class 1 (ISO VG32), if lubricated. Note 3) At rated voltage

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

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

JIS Symbol

2 position	3 position
Single	Closed center
	
Double	Exhaust center
	
	Pressure center
	

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 0.3 x P + 0.1 to 0.9 MPa
(P: Operating pressure)

Model

Type of actuation		Model: Plug-in	Model: Non plug-in	Port size	Flow characteristics (1): 1 → 4/2 (P → A/B) C [dm³/(s·bar)]	b	Cv	Flow characteristics (1): 4/2 → 5/3 (A/B → EA/EB) C [dm³/(s·bar)]	b	Cv	Max. (2) operating cycle (Hz)	Response time (3) (ms)	Mass (4) (kg)
2 position	Single	VFR510□	VFR511□	3/8	17	0.36	4.7	18	0.40	5.0	5	60 or less	1.77 (1.72)
				1/2	20	0.28	5.2	23	0.32	6.2			
				3/4	23	0.27	5.8	25	0.21	6.2			
	Double	VFR520□	VFR521□	3/8	16	0.37	4.6	18	0.41	5.1	5	60 or less	1.88 (1.83)
				1/2	20	0.27	5.2	23	0.32	6.1			
				3/4	23	0.26	5.8	25	0.20	6.1			
3 position	Closed center	VFR530□	VFR531□	3/8	15	0.38	4.1	16	0.31	4.3	3	80 or less	1.87 (1.82)
				1/2	17	0.31	4.6	20	0.33	5.4			
				3/4	18	0.28	4.7	21	0.30	5.4			
	Exhaust center	VFR540□	VFR541□	3/8	14	0.38	3.6	17 [16]	0.39 [0.35]	4.8 [4.3]	3	80 or less	1.87 (1.82)
				1/2	17	0.29	4.6	21 [18]	0.31 [0.34]	5.6 [5.0]			
				3/4	18	0.29	4.6	23 [20]	0.27 [0.33]	5.9 [5.2]			
	Pressure center	VFR550□	VFR551□	3/8	16 [9.4]	0.39 [0.40]	4.2 [2.6]	17	0.36	4.5	3	80 or less	1.87 (1.82)
				1/2	18 [9.7]	0.32 [0.45]	5.0 [2.9]	20	0.31	5.3			
				3/4	19 [9.2]	0.35 [0.48]	5.4 [2.8]	21	0.29	5.6			

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

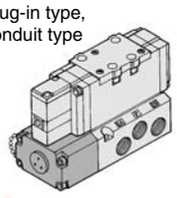
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Series VFR5000

How to Order

Electrical entry

F: Plug-in type, conduit type



Option

Nil	None
Z *	With light/surge voltage suppressor

Porting specifications

Nil	Side ported
B *	Bottom ported

* In the case of external pilot (Option), bottom piping is not available.

Port size

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

Thread type

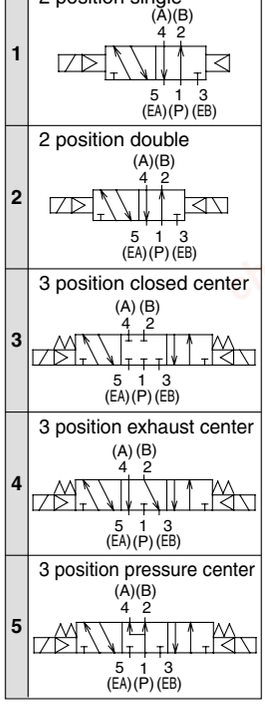
Nil	Rc
F	G
N	NPT
T	NPTF

Plug-in VFR5 ☐ 0 **0** ☐ – 5 F ☐ ☐ – ☐ **06** ☐ – ☐

Non plug-in VFR5 ☐ 1 **1** ☐ – 1 **D** ☐ ☐ – ☐ **06** ☐ – ☐

Symbol

1	2 position single
2	2 position double
3	3 position closed center
4	3 position exhaust center
5	3 position pressure center



Body option

0	Standard
1 *	Direct manual override

* Option

Pilot type

Nil	Internal pilot
R *	External pilot

* Option

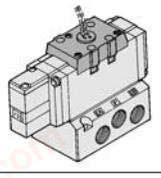
Coil rated voltage

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

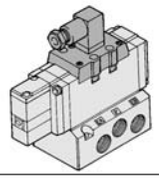
* Option

Electrical entry

E: Grommet terminal

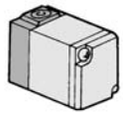


D: DIN terminal

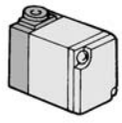


Pilot valve Manual override

Nil: Non-locking push type



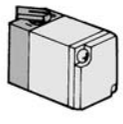
A *: Non-locking push type A (Extended)



B *: Locking type B (Tool required)



C *: Locking type C (Lever)



* Option

CE-compliant

Nil	—
Q	CE-compliant *

* Electrical entry: D and F only

How to Order Pilot Valve Assembly

SF4 – 1 F ☐ – 70 – ☐

Coil rated voltage

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

* Option

Manual override

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

* Option

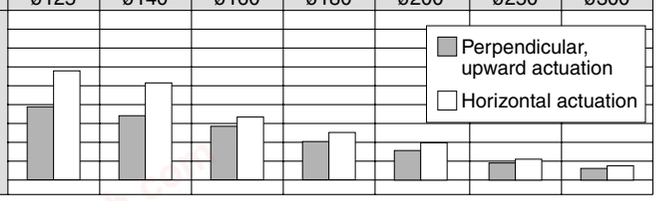
CE-compliant

Nil	—
Q	CE-compliant

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Cylinder Speed Chart

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

Series	Average speed (mm/s)	Bore size: Series CS1/CS2, Pressure 0.5 MPa, Load factor 50%, Stroke 300 mm						
		ø125	ø140	ø160	ø180	ø200	ø250	ø300
VFR5100-06	800 700 600 500 400 300 200 100 0							

* 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 weight 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

Pilot type

Nil	Internal pilot
R	External pilot

<Side ported>

Plug-in VFR5000−P− □ **06** □

Non plug-in VFS5000−S− □ **06** □

<Bottom ported>

Plug-in VFR5000−P− **B** **06** □

Non plug-in VFS5000−S− **B** **06** □

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

Piping port

03	3/8
04	1/2
06	3/4

Note) • Bottom ported is not available for external pilot.
• Mounting bolts and gaskets are not included.

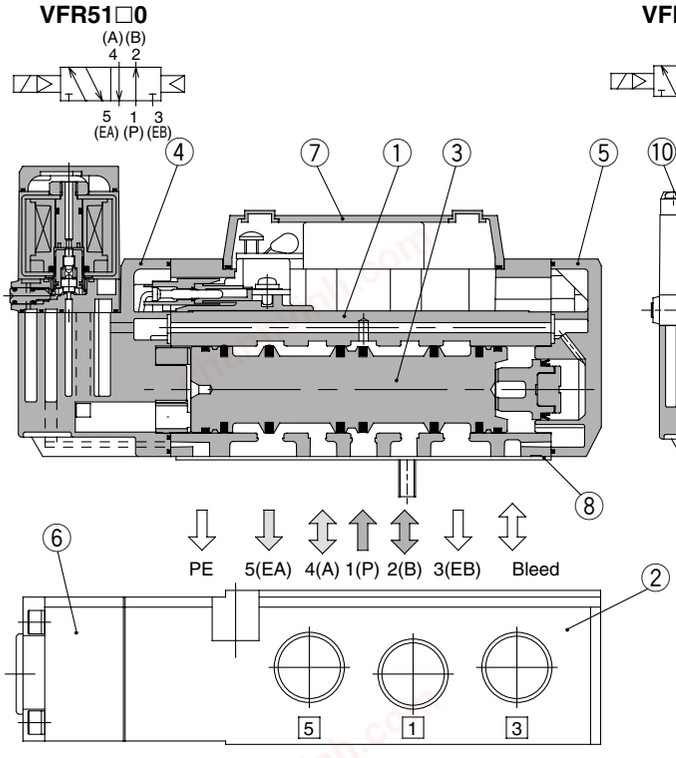
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Series VFR5000

Construction

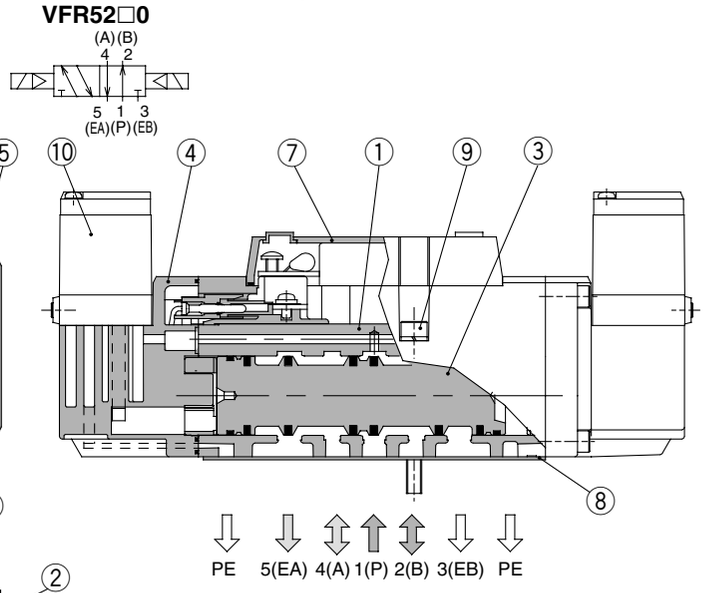
2 position single

VFR51□0



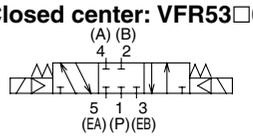
2 position double

VFR52□0

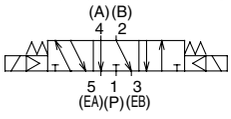


3 position closed center/exhaust center/pressure center

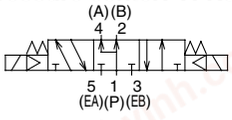
Closed center: VFR53□0

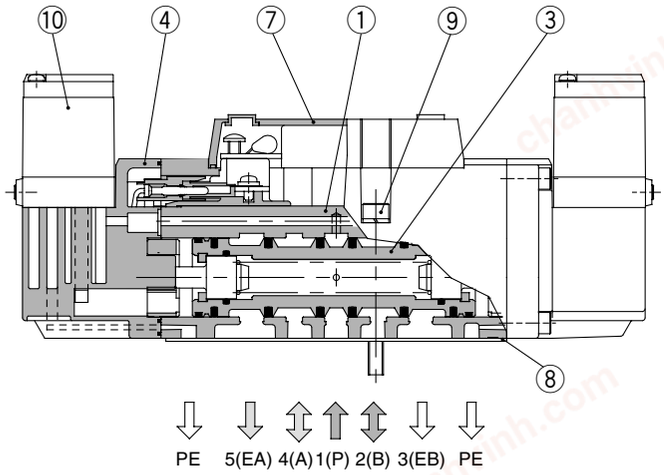


Exhaust center: VFR54□0



Pressure center: VFR55□0





This figure shows a closed center type.

Component Parts

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

Component Parts

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

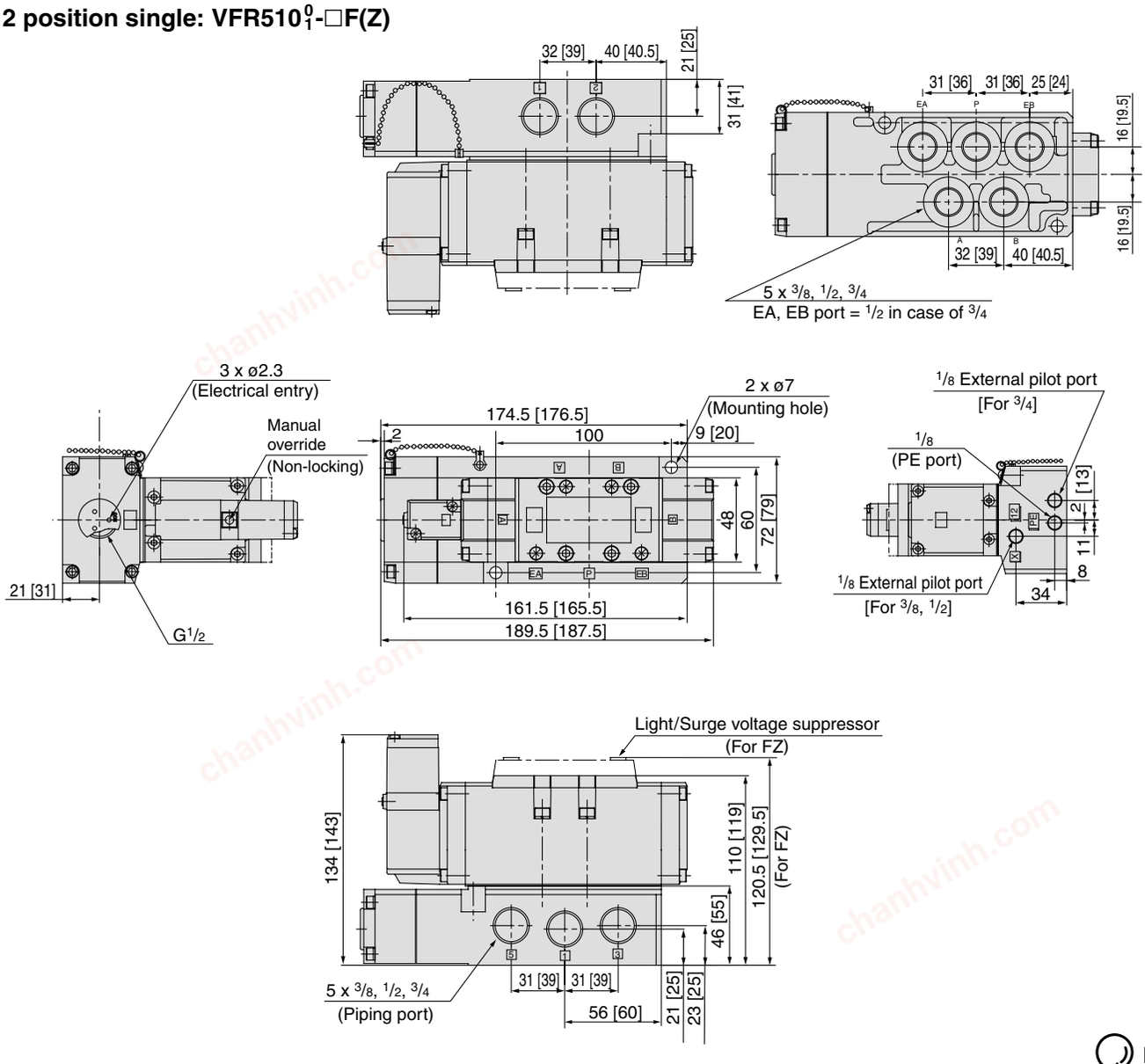
Replacement Parts

No.	Description	Material	Part no.		
			VFR51□□	**VFR52□□**	**VFR53□□/54□□/55□□**
8	**Gasket**	NBR	AXT627-10-1	AXT627-10-1	AXT627-10-1
9	**Hexagon socket head screw**	Steel	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 page 1298.		

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

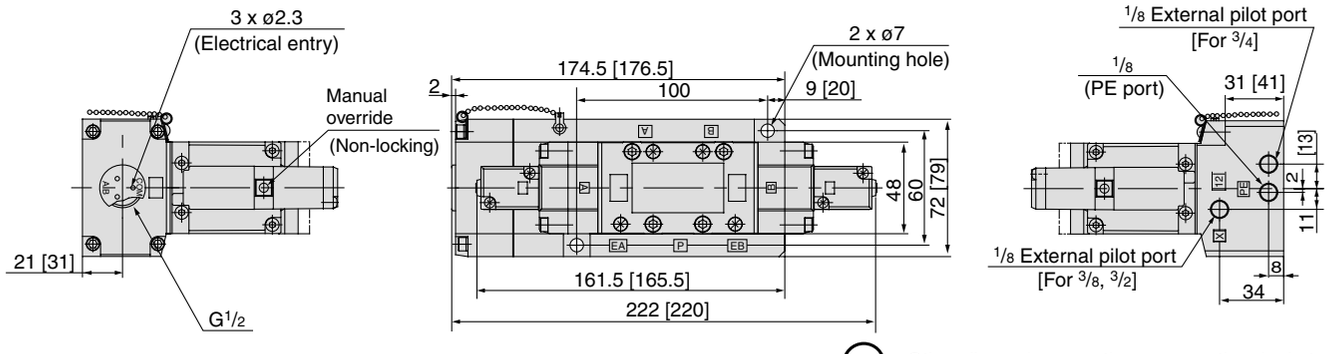
2 position single: VFR510$^{0}_{1}$-□F(Z)



[ ] = 3/4

2 position double: VFR520$^{0}_{1}$-□F(Z)

3 position closed center: VFR530$^{0}_{1}$-□F(Z)
3 position exhaust center: VFR540$^{0}_{1}$-□F(Z)
3 position pressure center: VFR550$^{0}_{1}$-□F(Z)

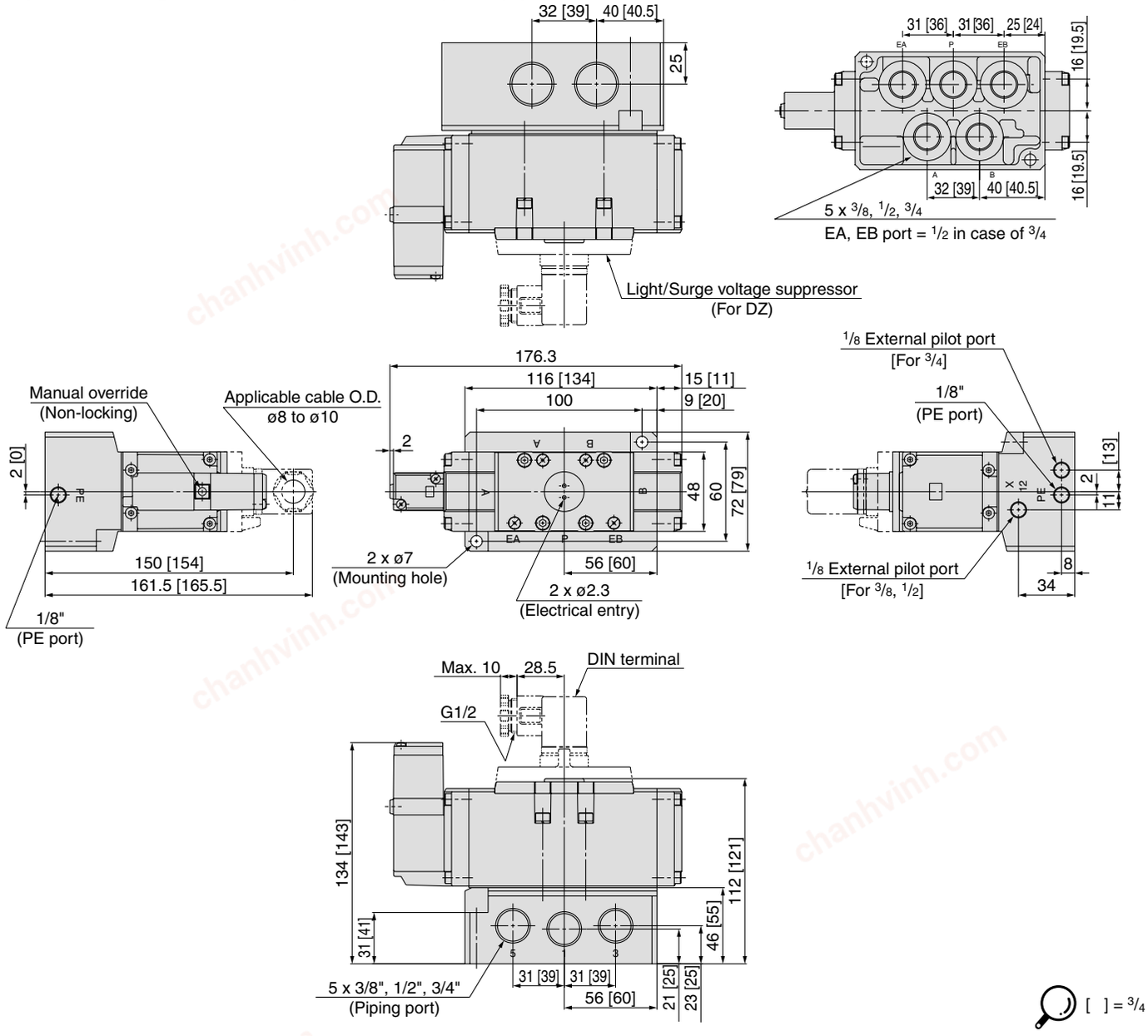


∗ Other dimensions are the same as the single type.
[ ] = 3/4

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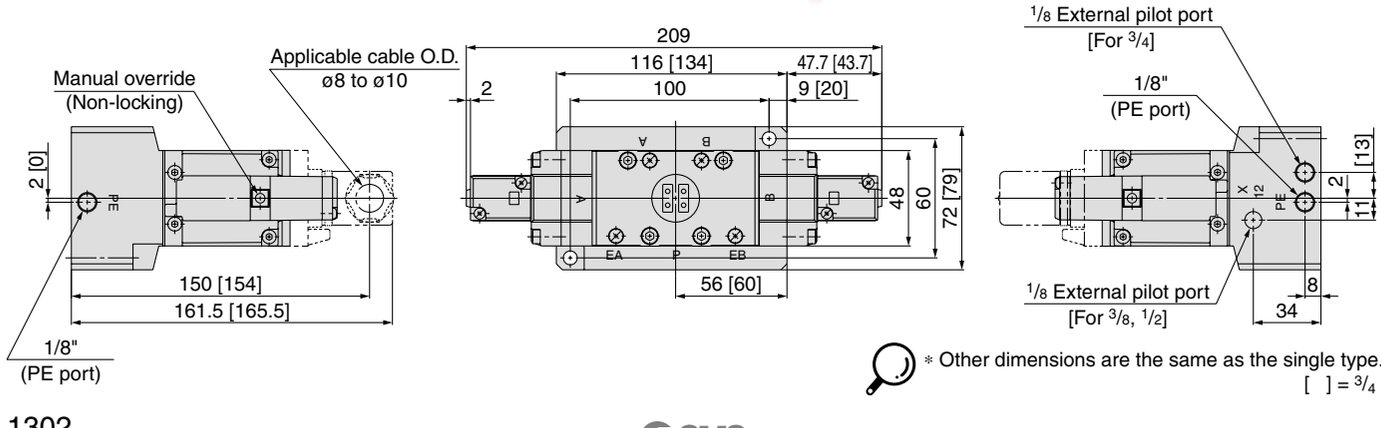
Plug-in: 2 Position Single/Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position single: VFR511$^{0}_{1}$-□E, VFR511$^{0}_{1}$-□D(Z)



2 position double: VFR521$^{0}_{1}$-□E, VFR521$^{0}_{1}$-□D(Z)

3 position closed center: VFR531$^{0}_{1}$-□E, VFR531$^{0}_{1}$-□D(Z)
3 position exhaust center: VFR541$^{0}_{1}$-□E, VFR541$^{0}_{1}$-□D(Z)
3 position pressure center: VFR551$^{0}_{1}$-□E, VFR551$^{0}_{1}$-□D(Z)



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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)**	• With terminal block	Side/Bottom	3/4	1/2, 3/4	2 to 10	VFR5□0□-□F(-Q)
	• With multi-connector • With D-sub connector				2 to 8	
Non plug-in type **VV5FR5-10(-Q)**	• Grommet terminal • DIN terminal				2 to 10	VFR5□1□-□E 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 ..... **1 set (Manifold part number)**
***VFR5100-5FZ** ..... **3 sets (2 position single)**
***VFR5200-5FZ** ..... **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.

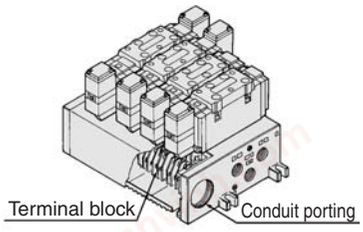
<Example> Non plug-in type: 6 stations

VV5FR5-10-061-04 ..... **1 set (Manifold part number)**
***VFR5110-5D** ..... **5 sets (2 position single)**
***VFR5410-5D** ..... **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.**



VV5FR5 – 01T – 06 1 – 04 – CE-compliant

- **Series VFR5000 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			Bottom *

* Option

- **Port size**

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

* For bottom ported: 1/2 only.

- **Thread type**

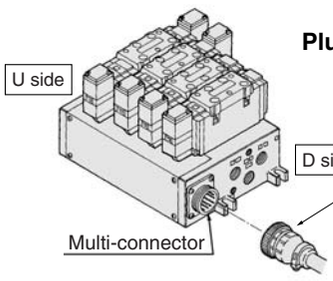
Nil	Rc
F	G
N	NPT
T	NPTF

- **CE-compliant**

Nil	—
Q	CE-compliant

Plug-in Type: With Multi-connector (For wiring specifications, refer to page 1326.)

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



Plug assembly (Option)
Refer to page 1326.

VV5FR5 – 01C D – 05 1 – 04 – CE-compliant

- **Series VFR5000 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			Bottom *

* Option

- **Port size**

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

* For bottom ported: 1/2 only.

- **Thread type**

Nil	Rc
F	G
N	NPT
T	NPTF

- **CE-compliant**

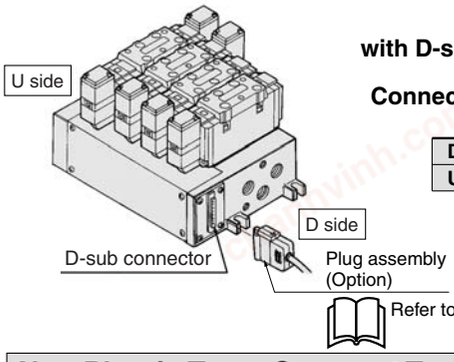
Nil	—
Q	CE-compliant

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Series VFR5000

Plug-in Type: With D-sub Connector (For wiring specifications, refer to page 1326.)

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



Refer to page 1326.

VV5FR5 – 01F D – 06 1 – 04 [ ] – [ ]

- **Series VFR5000 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 *

* Option

- **Thread type**

Nil	Rc
F	G
N	NPT
T	NPTF

- **Port size**

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

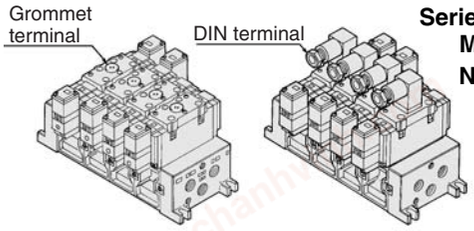
* For bottom ported: 1/2 only.

- **CE-compliant**

Nil	—
Q	CE-compliant

Non Plug-in Type: Grommet Terminal, DIN Terminal

- **Wiring for every valve**



VV5FR5 – 10 – 05 1 – 04 [ ] – [ ]

- **Series VFR5000 Manifold**
- **Non plug-in type**
- **Stations**

02	2 stations
⋮	⋮
10	10 stations

- **Symbol**

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

* Option

- **Thread type**

Nil	Rc
F	G
N	NPT
T	NPTF

- **Port size**

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

* For bottom ported: 1/2 only.

- **CE-compliant**

Nil	—
Q	CE-compliant

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

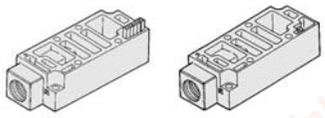
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Manifold/Option Parts Assembly

Individual SUP spacer

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

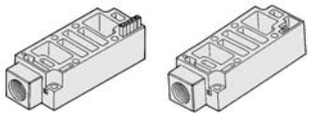
Body type	Plug-in type	Non plug-in type
Part no.	VVFS5000-P-04-1	VVFS5000-P-04-2



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	

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

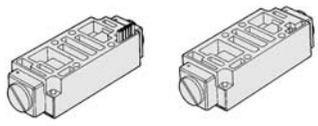


SUP block disk

Throttle valve spacer

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

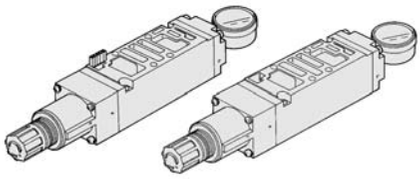
Body type	Plug-in type	Non plug-in type
Part no.	VVFS5000-20A-1	VVFS5000-20A-2



Interface regulator

When interface regulator is mounted on manifold block, regulation to that valve is possible.
(Refer to “Flow Characteristics” on page 1324 before operation.)

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.

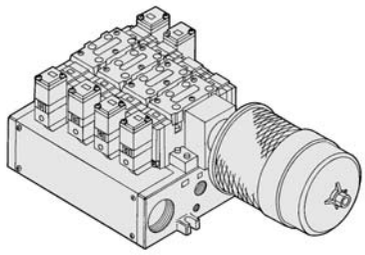
Body type	Plug-in type	Non plug-in type
Part no.	VVFS5000-10A	

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.



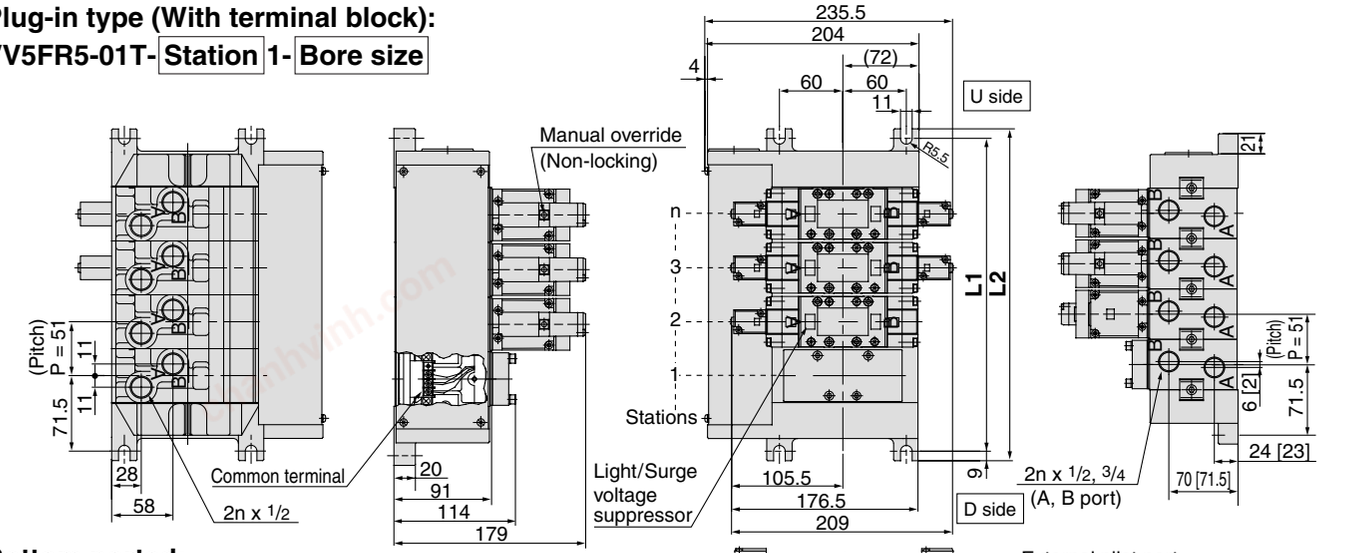
For details, refer to page 1308.

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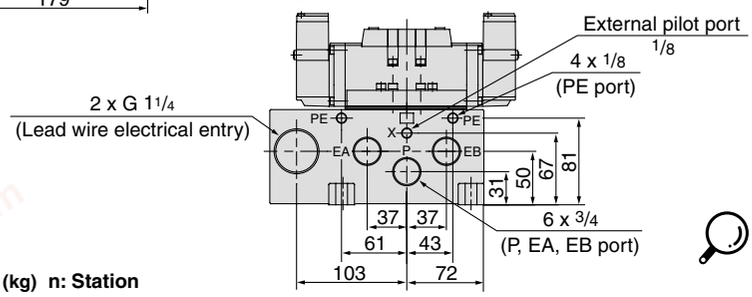
Series VFR5000

Manifold: Plug-in Type/Non Plug-in Type

Plug-in type (With terminal block):
VV5FR5-01T-[Station]1-[Bore size]



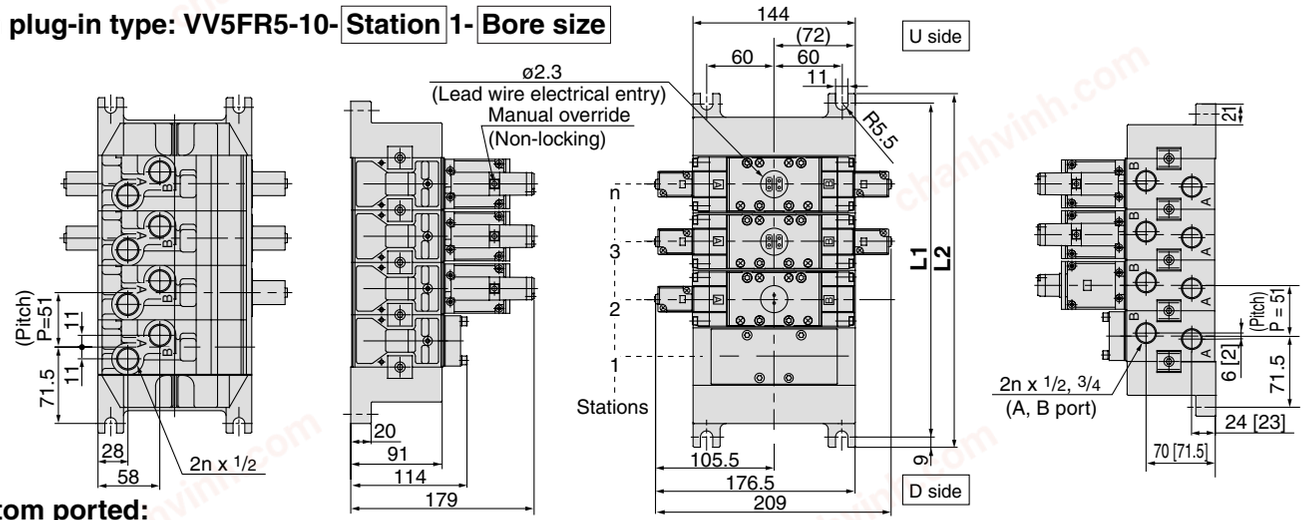
Bottom ported:
VV5FR5-01T-[Station]2-[Bore size]



[ ] = A, B port 3/4

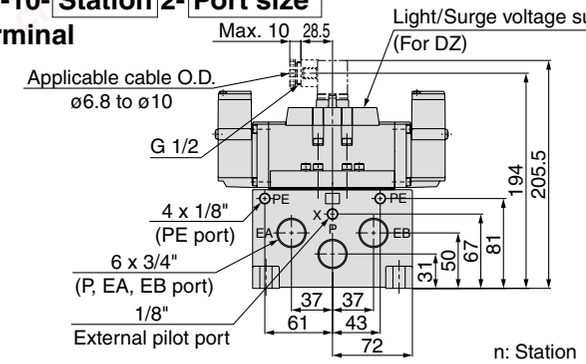
Formula for manifold weight M = 0.911n + 1.621 (kg) n: Station

Non plug-in type: VV5FR5-10-[Station]1-[Bore size]



Bottom ported:
VV5FR5-10-[Station]2-[Port size]

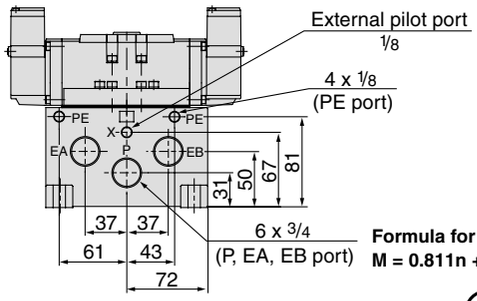
DIN terminal



n: Station

Stations / L	2	3	4	5	6	7	8	9	10	Formula
L_1	194	245	296	347	398	449	500	551	602	$L_1 = 51 \times n + 92$
L_2	212	263	314	365	416	467	518	569	620	$L_2 = 51 \times n + 110$

Grommet with terminal



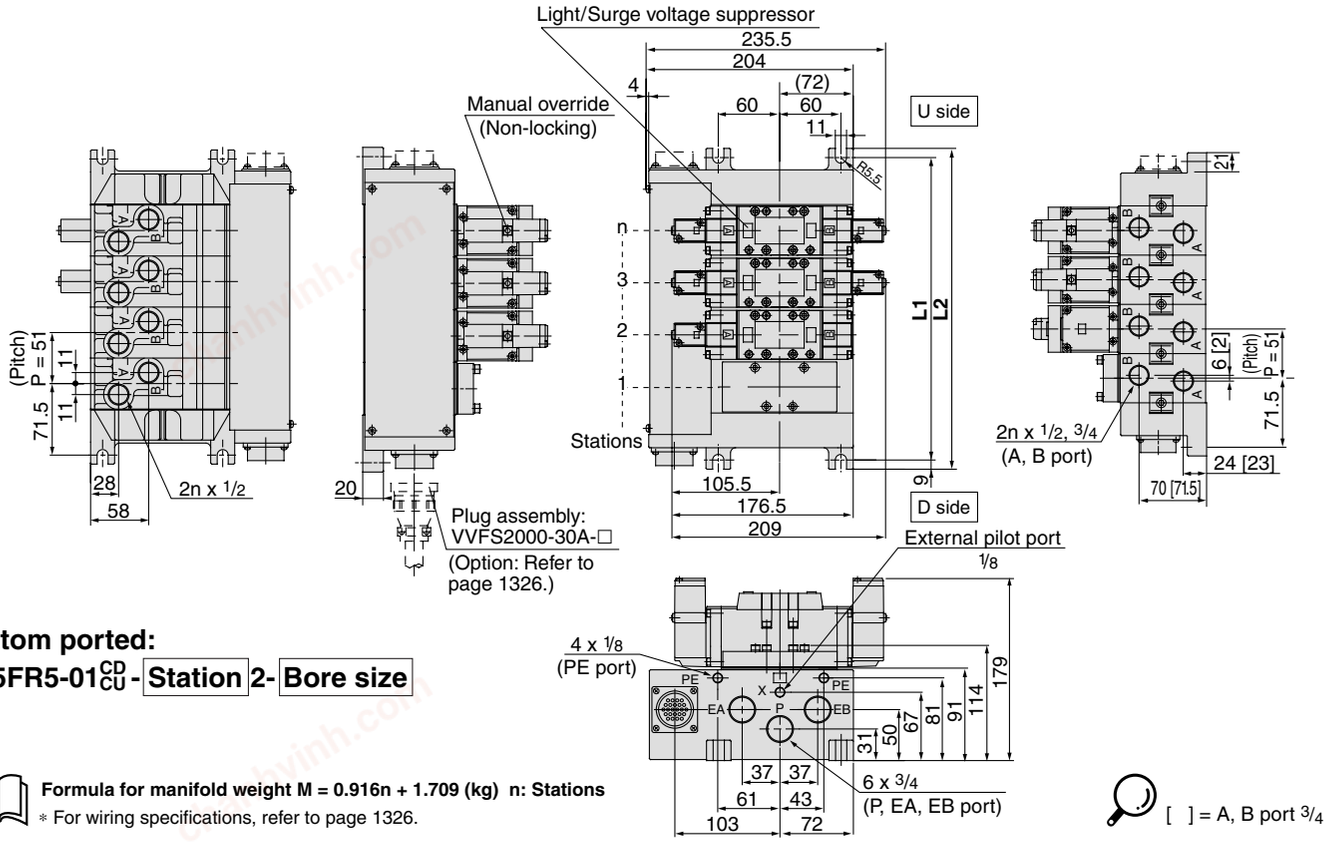
Formula for manifold weight M = 0.811n + 1.231 (kg) n: Stations

[ ] = A, B port 3/4

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Manifold/Plug-in type: With Multi-connector/With D-sub connector

Plug-in type/With multi-connector: VV5FR5-01CD-[Station]1-[Bore size], VV5FR5-01CU-[Station]1-[Bore size]

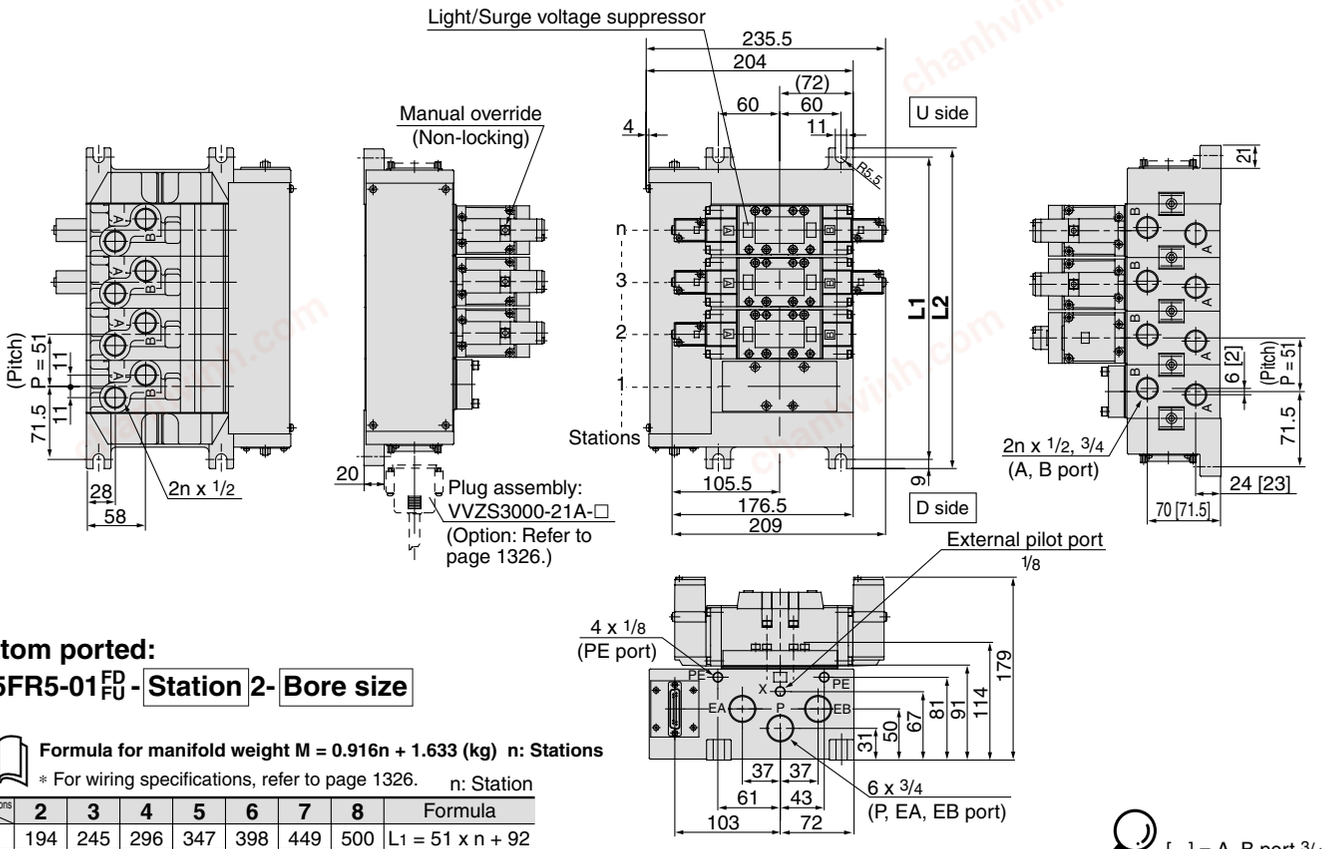


Bottom ported:
VV5FR5-01$^{CD}_{CU}$-[Station]2-[Bore size]

Formula for manifold weight M = 0.916n + 1.709 (kg) n: Stations
∗ For wiring specifications, refer to page 1326.

[ ] = A, B port 3/4

Plug-in type/With D-sub connector: VV5FR5-01FD-[Station]1-[Bore size], VV5FR5-01FU-[Station]1-[Bore size]



Bottom ported:
VV5FR5-01$^{FD}_{FU}$-[Station]2-[Bore size]

Formula for manifold weight M = 0.916n + 1.633 (kg) n: Stations
∗ For wiring specifications, refer to page 1326.

n: Station

L / Stations	2	3	4	5	6	7	8	Formula
L1	194	245	296	347	398	449	500	L1 = 51 x n + 92
L2	212	263	314	365	416	467	518	L2 = 51 x n + 110

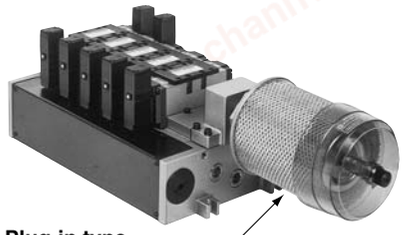
[ ] = A, B port 3/4

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Series VFR5000

Manifold with Exhaust Cleaner

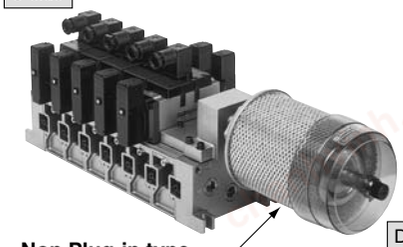
- **Protection of work environment**
- **Reduction of valve exhaust noise of 35 dB or more**
- **Drainage and mist are collected. (99.9% or more)**
- **Piping work is reduced.**



Plug-in type

Exhaust cleaner (Option)

U side



D side

Non Plug-in type

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 Grommet terminal
Applicable valve model	VFR5□00-□F(-Q)	VFR5□10-□D(-Q), VFR5□10-□E
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 - □

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
Nil	None	01T, 10
D	D side mounting	01C, 01F
U	U side mounting	

Stations

02	2 stations
⋮	⋮
10	10 stations

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

Port size

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

* Option

CE-compliant

Nil	—
Q	CE-compliant

Exhaust cleaner mounting direction

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

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

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	**1 set (Manifold part no.)**
***VFR5100-5FZ**	**3 sets (2 position single part no.)**
***VFR5200-5FZ**	**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	**1 set (Manifold part no.)**
***VFR5110-5E**	**3 sets (2 position single part no.)**
***VFR5210-5E**	**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.

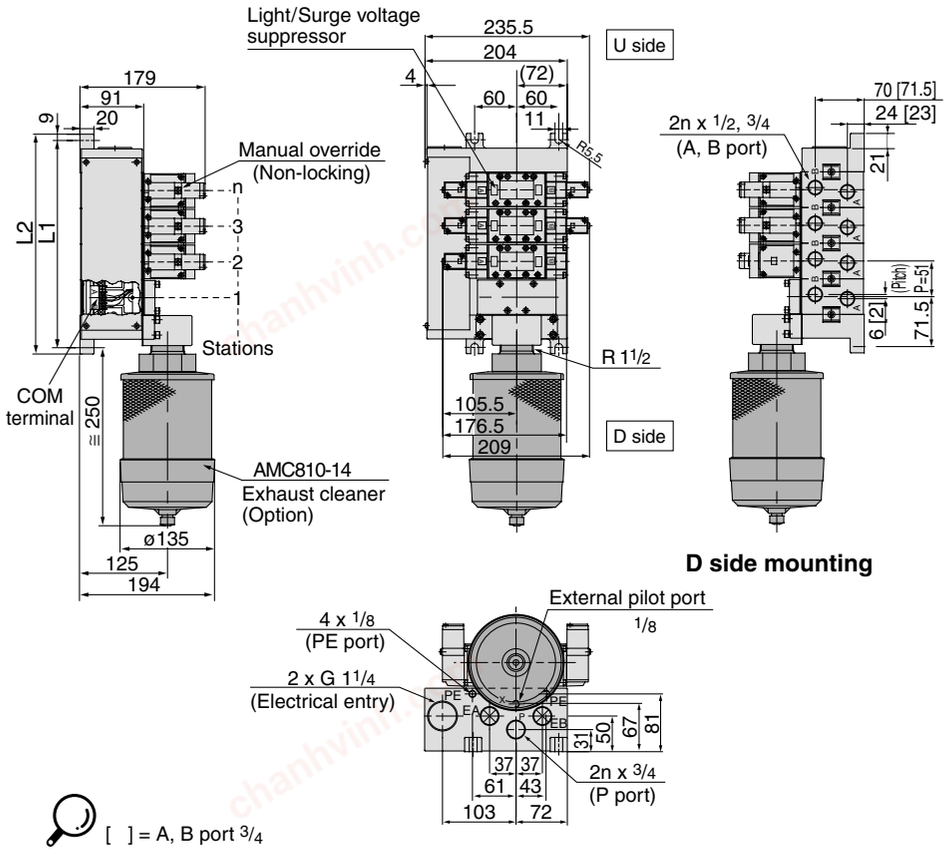
⚠ Caution

When using exhaust cleaner, mount it downwards.

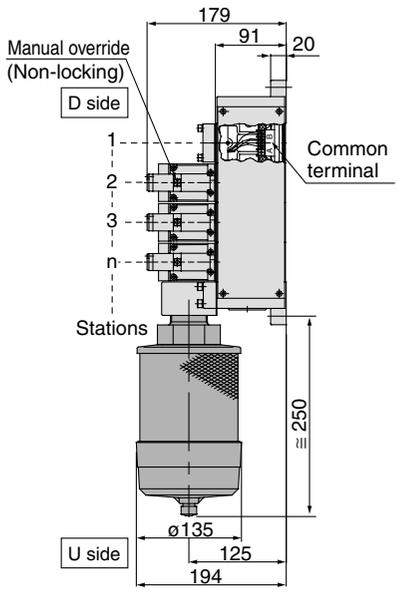
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Manifold with Exhaust Cleaner: Plug-in Type/Non Plug-in Type

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



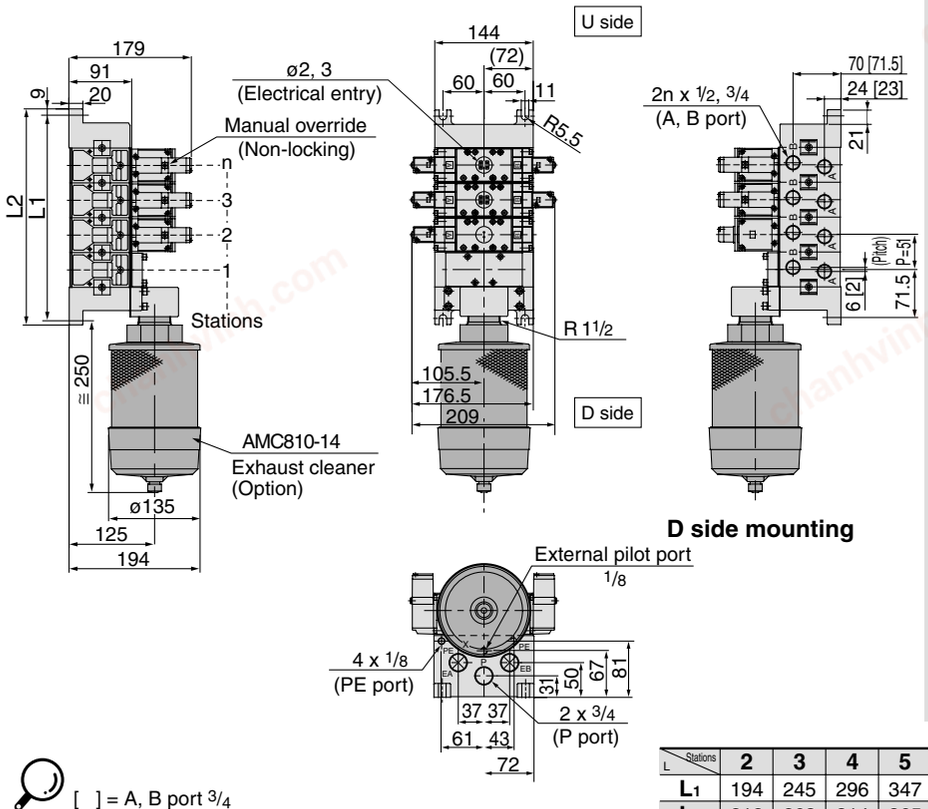
D side mounting



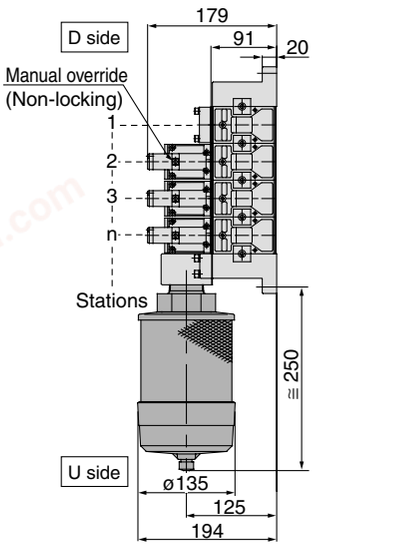
U side mounting

[ ] = A, B port 3/4

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



D side mounting



U side mounting

[ ] = A, B port 3/4

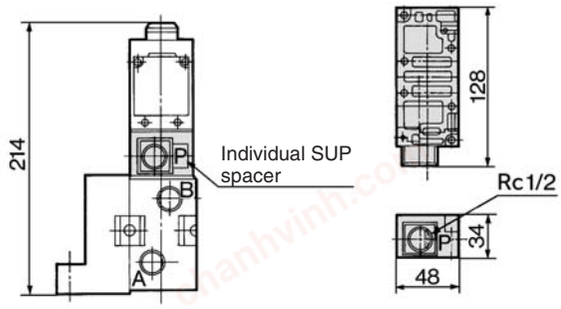
n: Stations

L \ Stations	2	3	4	5	6	7	8	9	10	Formula
L1	194	245	296	347	398	449	500	551	602	L1 = 51 x n + 92
L2	212	263	314	365	416	467	518	569	620	L2 = 51 x n + 110

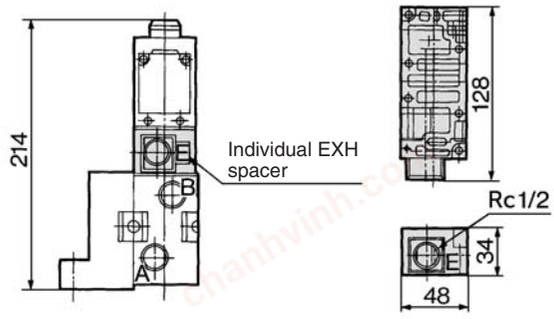
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Manifold Option Parts Assembly/Plug-in Type, Non Plug-in Type

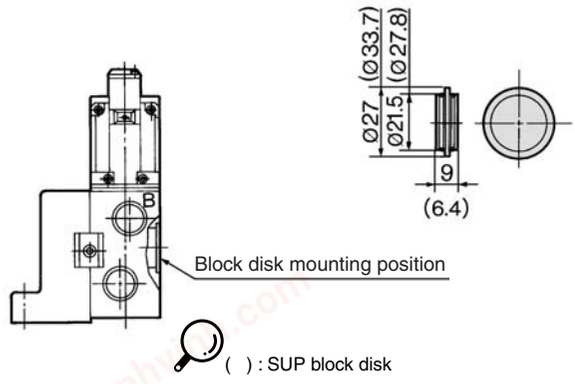
Individual SUP spacer
VVFS5000-P-04-1 (Plug-in type)
VVFS5000-P-04-2 (Non plug-in type)



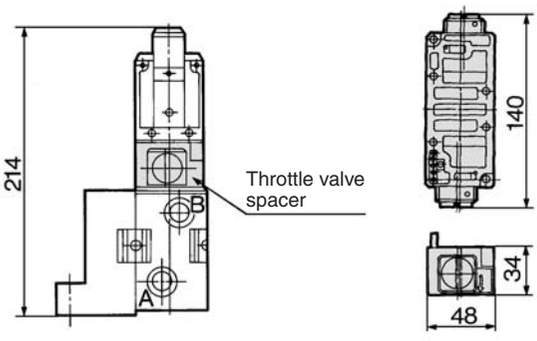
Individual EXH spacer
VVFS5000-R-04-1 (Plug-in type)
VVFS5000-R-04-2 (Non plug-in type)



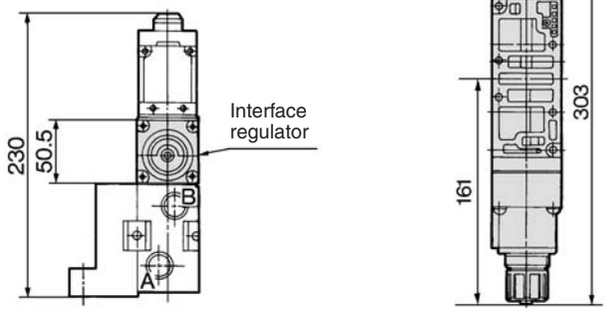
SUP block disk: AXT628-12A
EXH block disk: AXT512-14-1A



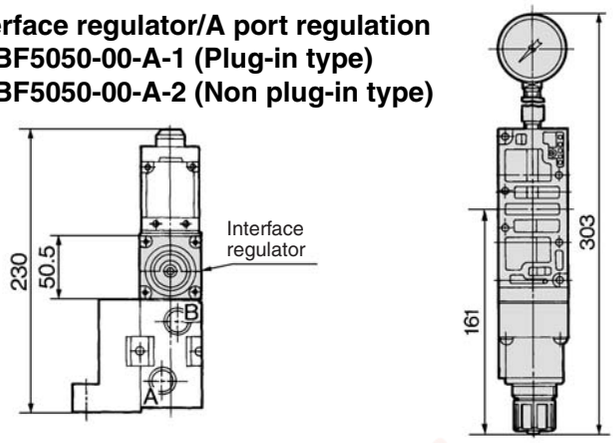
Throttle valve spacer
VVFS5000-20A-1 (Plug-in type)
VVFS5000-20A-2 (Non plug-in type)



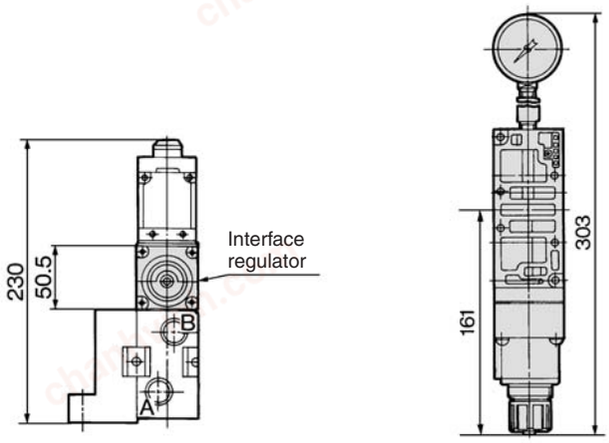
Interface regulator/P port regulation
ARBF5050-00-P-1 (Plug-in type)
ARBF5050-00-P-2 (Non plug-in type)



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

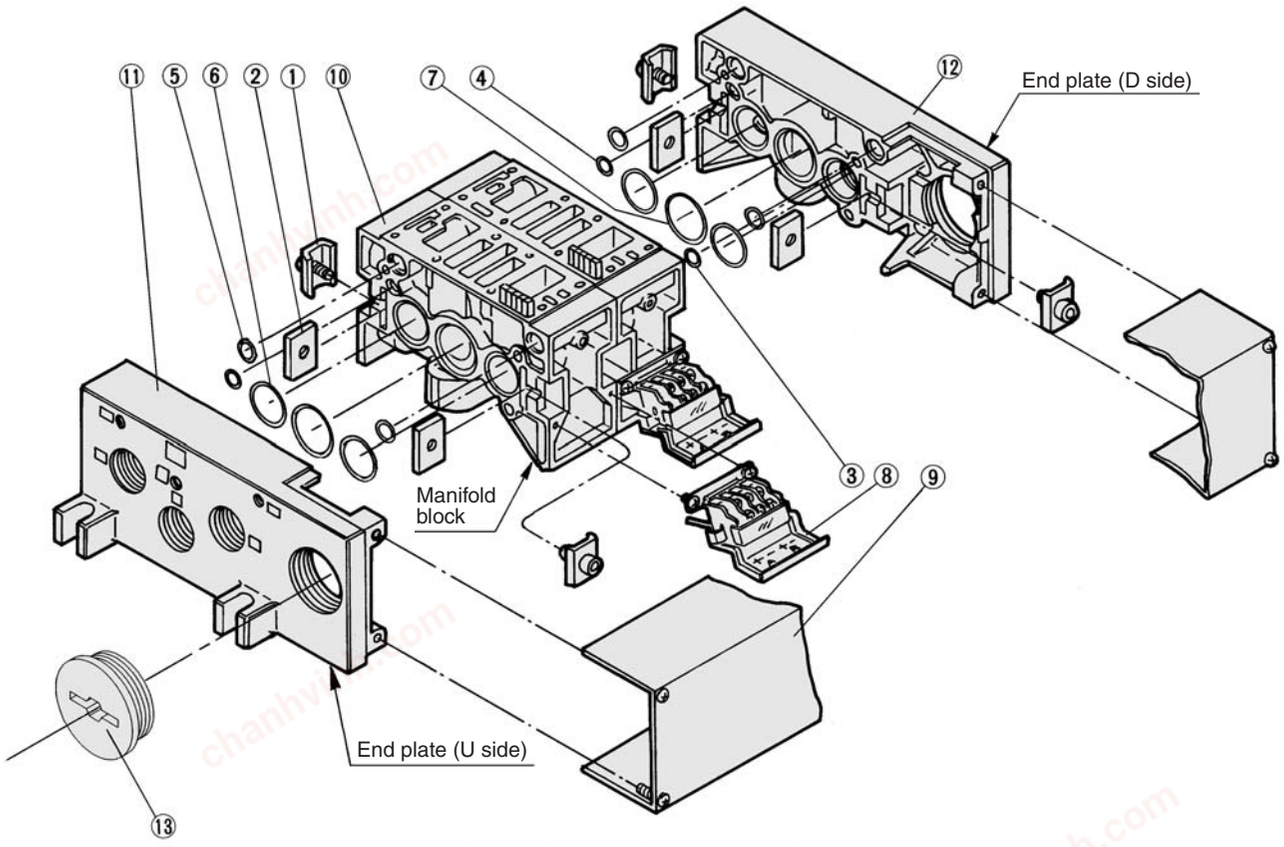


Interface regulator/B port regulation
ARBF5050-00-B-1 (Plug-in type)
ARBF5050-00-B-2 (Non plug-in type)



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Manifold Base Construction: Plug-in Type/Non Plug-in Type



Replacement Parts

No.	Description	Material	Part no.
1	**Connection fitting A**	Steel plate	AXT628-6-1A
2	**Connection fitting 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	VVFS5000-4A-Stations
13	**Rubber plug**	NBR	AXT336-9

- When requiring replacement manifold stations, order replacement parts assembly no. ⑩: manifold block assembly part.
  For plug-in type: The manifold base with terminal stand (integrated with a junction cover) is required with the ⑨ junction cover assembly.

Replacement Parts: Sub Assembly

Note) Manifold Base/Construction: Plug-in type with terminal block.

No.	Description	Assembly part no.	Component parts	Applicable manifold base
10	**Manifold block assembly**	VFR5000-20-1A-$^{04}_{06}$	Manifold block ⑩, Metal joint ①, ②, Terminal block ⑧, O-ring ③, ④, ⑤, ⑥, ⑦, Receptacle assembly	Plug-in type
		VVFS5000-1A-2-$^{04}_{06}$	Manifold block ⑩, Metal joint ①, ②, O-ring ③, ④, ⑤, ⑥, ⑦	Non plug-in type
11	**End plate (U side) assembly**	VVFS5000-2A-1	End plate (U) ⑪, Metal joint ①, ②	Plug-in type
		VVFS5000-2A-2	End plate (U) ⑪, Metal joint ①, ②	Non plug-in type
12	**End plate (D side) assembly**	VVFS5000-3A-1	End plate (D) ⑫, Metal joint ①, ②, O-ring ③, ④, ⑤, ⑥, ⑦	Plug-in type
		VVFS5000-3A-2	End plate (D) ⑫, Metal joint ①, ②, O-ring ③, ④, ⑤, ⑥, ⑦	Non plug-in type

∗ Contact SMC for CE-compliant products.

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

CE [Option]



Plug-in type



Non plug-in type

Standard Specifications

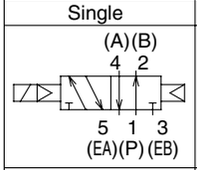
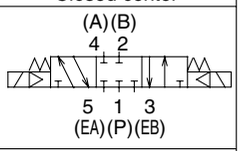
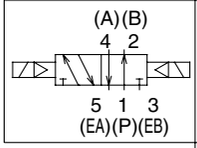
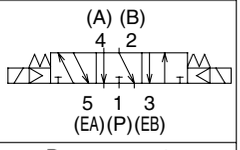
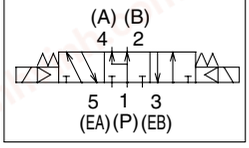
Valve specifications	Fluid		Air
	Operating pressure range	2 position single/3 position	0.2 to 0.9 MPa
		2 position double	0.1 to 0.9 MPa
	Ambient and fluid temperature		–10 to 50°C (No freezing. Refer to page 5.)
	Lubrication		Non-lube (1)
	Manual override		Non-locking push type
	Shock/Vibration resistance		300/50m/s² (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
	Electrical entry		Plug-in type: Conduit terminal; Non plug-in type: Grommet terminal, DIN terminal

Note 1) Use turbine oil Class 1 (ISO VG32), if lubricated.
Note 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)
Note 3) At rated voltage

Option Specifications

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

JIS Symbol

2 position	3 position
Single	Closed center
	
Double	Exhaust center
	
	Pressure center
	

Caution

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

Model

Type of actuation		Model: Plug-in	Model: Non plug-in	Port size	Flow characteristics (1): 1 → 4/2 (P → A/B) C [dm³/(s·bar)]	b	Cv	Flow characteristics (1): 4/2 → 5/3 (A/B → EA/EB) C [dm³/(s·bar)]	b	Cv	Max. operating cycle (2) (Hz)	Response time (3) (ms)	Mass (4) (kg)
2 position	Single	VFR610□	VFR611□	3/4	40	0.12	9.1	41	0.15	9.6	2	100 or less	4.73 (4.56)
2 position	Double	VFR620□	VFR621□	3/4	40	0.14	9.2	41	0.17	9.7	2	100 or less	4.78 (4.61)
3 position	Closed center	VFR630□	VFR631□	3/4	39	0.17	9.3	39	0.15	9.3	1	150 or less	4.72 (4.55)
3 position	Exhaust center	VFR640□	VFR641□	3/4	38	0.14	8.9	42 [40]	0.12 [0.15]	9.6 [9.4]	1	150 or less	4.72 (4.55)
3 position	Pressure center	VFR650□	VFR651□	3/4	38 [20]	0.10 [0.44]	8.7 [5.7]	40	0.16	9.3	1	150 or less	4.72 (4.55)

Type of actuation		Model: Plug-in	Model: Non plug-in	Port size	Effective area (mm²)
2 position	Single	VFR610□	VFR611□	1	191
2 position	Double	VFR620□	VFR621□	1	191
3 position	Closed center	VFR630□	VFR631□	1	180
3 position	Exhaust center	VFR640□	VFR641□	1	P → A, B: 178 A, B → EA, EB: 212 Normal position: 193
3 position	Pressure center	VFR650□	VFR651□	1	P → A, B: 183 Normal position: 82 A, B → EA, EB: 199

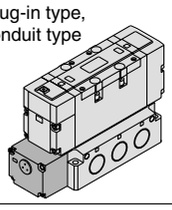
Note 1) [ ]: Denotes the normal position.
Note 2) Min. operating frequency is once in 30 days.
Note 3) Based on dynamic performance test, JIS B 8375-1981. (Coil temperature: 20°C, at rated voltage, without surge voltage suppressor)
Note 4) For VFR6□00-□FZ-06, ( ): VFR6□10-□DZ-06

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How to Order

Electrical entry

F: Plug-in type, conduit type



Option

Nil	None
Z	With light/surge voltage suppressor

Port size

Nil	Without sub-plate
06	3/4
10	1

Plug-in VFR6 □ 0 **0** – **5** **F** □ – **10** □ – □

Non plug-in VFR6 □ 1 **1** – **1** **D** □ – **10** □ – □

Symbol

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

Body option

0	Standard
1*	Direct manual override

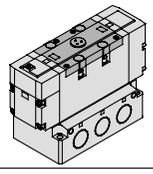
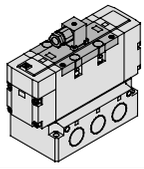
* Option

Coil rated voltage

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

* Option

Electrical entry

E: Grommet terminal	**D:** DIN terminal
	

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

CE-compliant

Nil	—
Q	CE-compliant *

* Electrical entry: D and F only

How to Order Pilot Valve Assembly

SF4 – 1 F – 22 – □

Coil rated voltage

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

* Option

CE-compliant

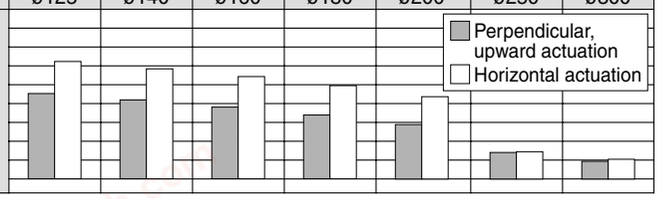
Nil	—
Q	CE-compliant

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Series VFR6000

Cylinder Speed Chart

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

Series	Average speed (mm/s)	Bore size: Series CS1/CS2, Pressure 0.5 MPa, Load factor 50%, Stroke 300 mm						
		ø125	ø140	ø160	ø180	ø200	ø250	ø300
VFR6100-10	800 700 600 500 400 300 200 100 0							

∗ 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 weight 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

Plug-in **VFR6000−P−** **10** □
Non plug-in **VFS6000−S−** **10** □

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

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

06	3/4
10	1

Thread type

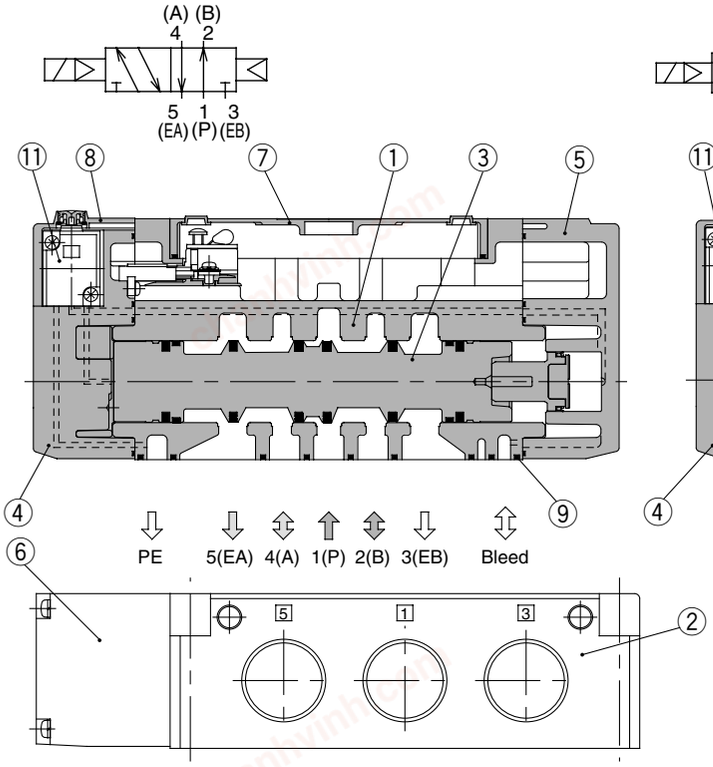
Nil	Rc
F	G
N	NPT
T	NPTF

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Construction

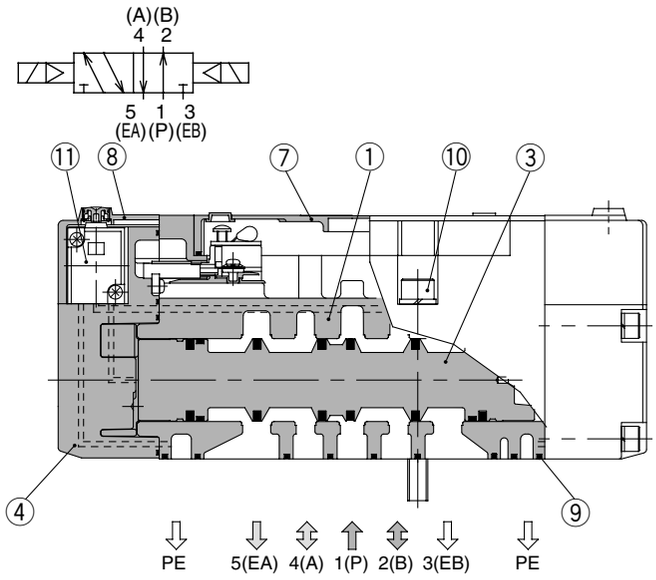
2 position single

VFR61□0



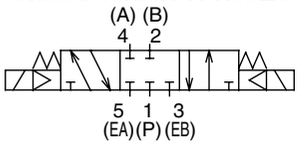
2 position double

VFR62□0

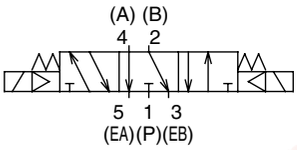


3 position closed center/exhaust center/pressure center

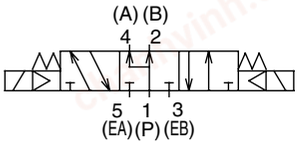
Closed center: VFR63□0

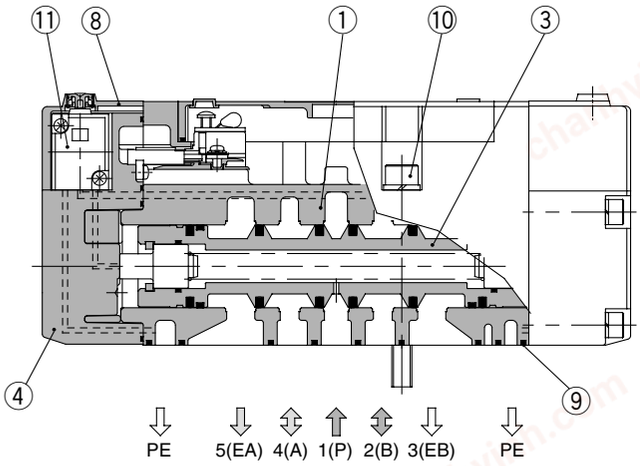


Exhaust center: VFR64□0



Pressure center: VFR65□0





This figure shows a closed center type.

Component Parts

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

Component Parts

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

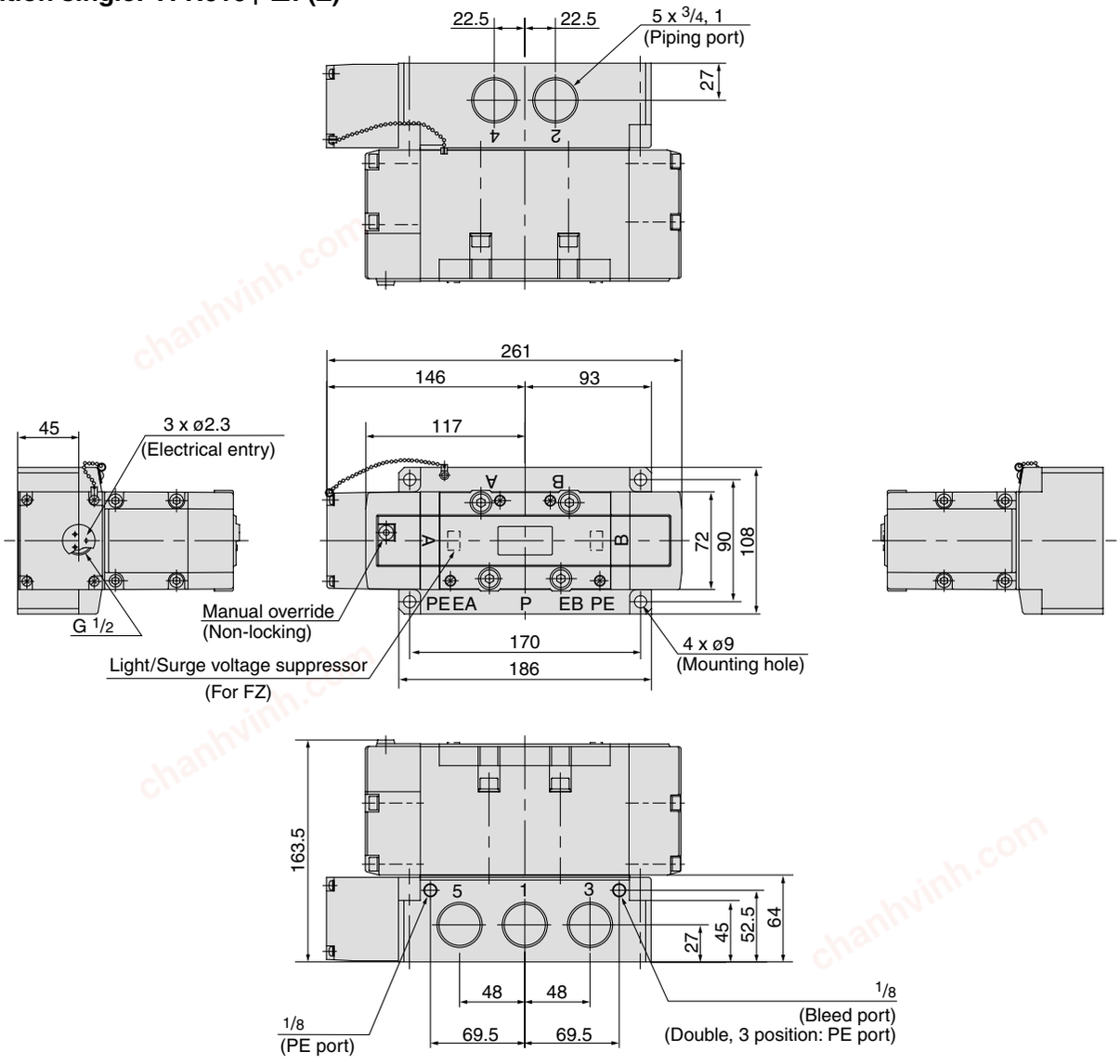
Replacement Parts

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

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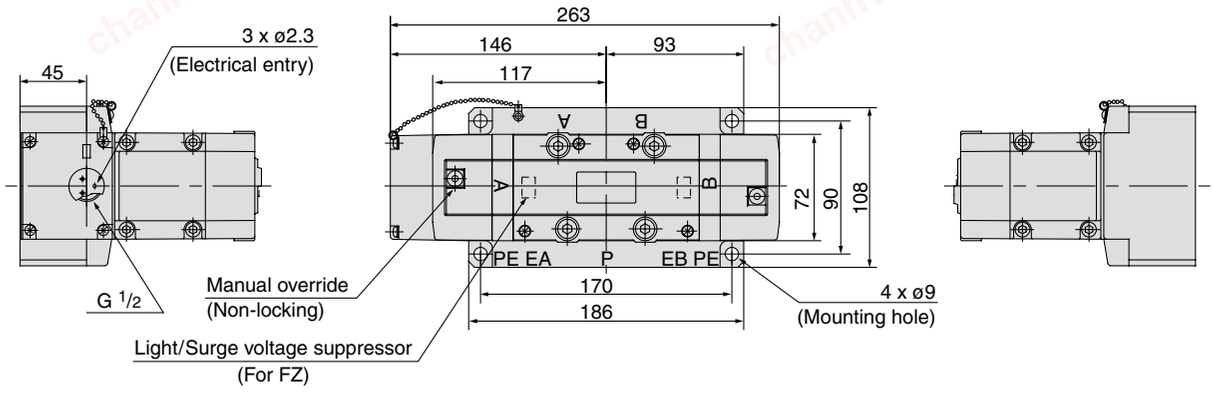
Plug-in: 2 Position Single/Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position single: VFR610$^{0}_{1}$-□F(Z)



2 position double: VFR620$^{0}_{1}$-□F(Z)

3 position closed center: VFR630$^{0}_{1}$-□F(Z)
3 position exhaust center: VFR640$^{0}_{1}$-□F(Z)
3 position pressure center: VFR650$^{0}_{1}$-□F(Z)

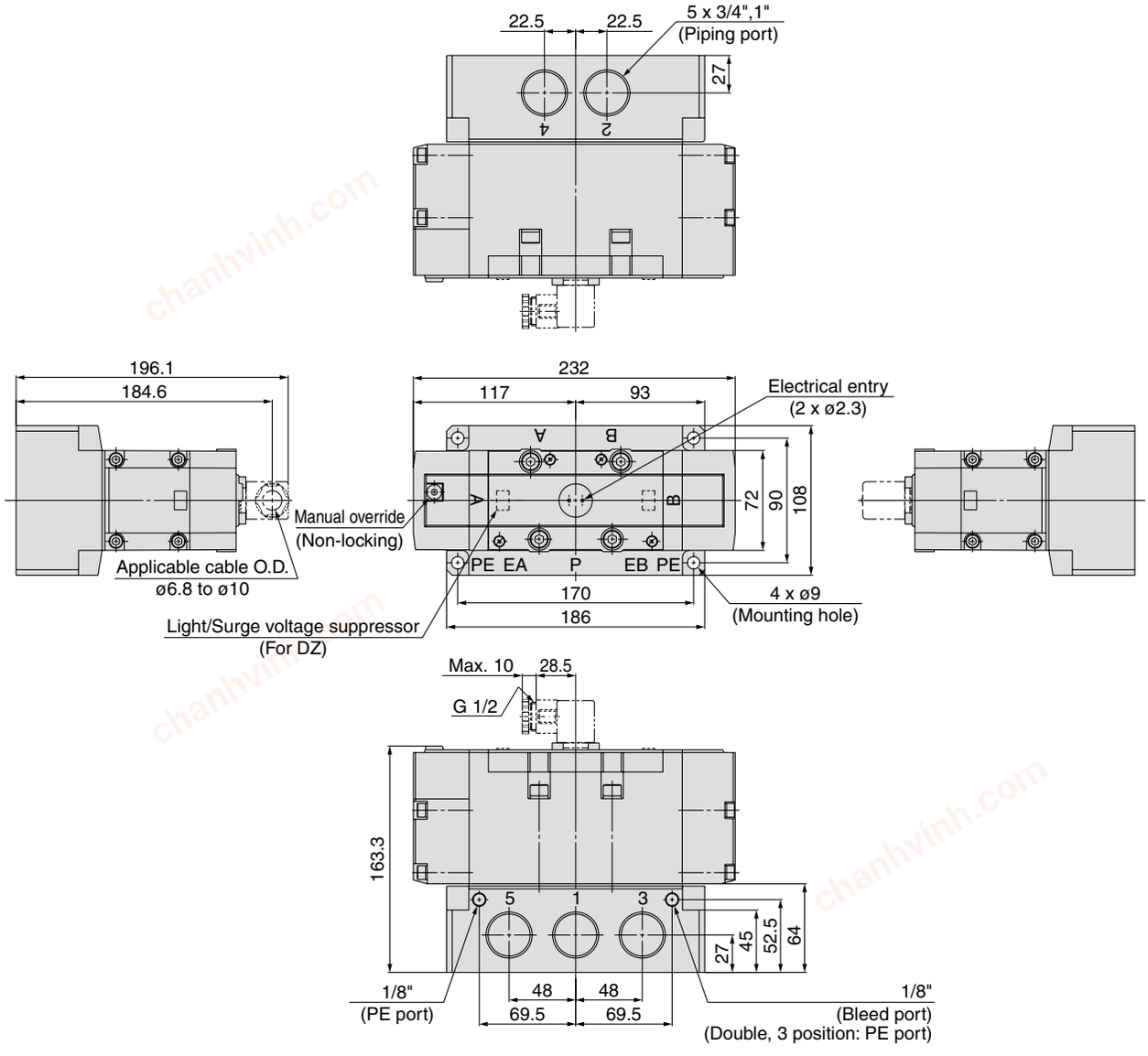


∗ Other dimensions are the same as the single type.

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

2 position single: VFR611$^{0}_{1}$-□E, VFR611$^{0}_{1}$-□D(Z)

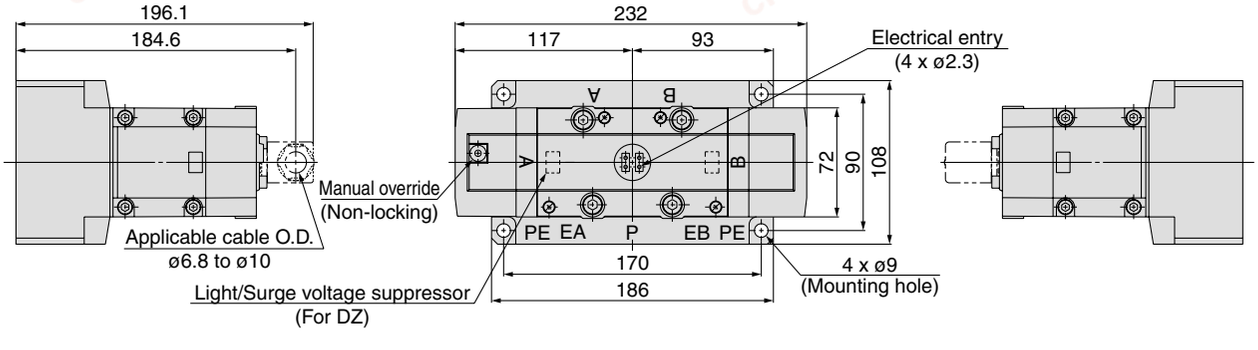


2 position double: VFR621$^{0}_{1}$-□E, VFR621$^{0}_{1}$-□D(Z)

3 position closed center: VFR631$^{0}_{1}$-□E, VFR631$^{0}_{1}$-□D(Z)

3 position exhaust center: VFR641$^{0}_{1}$-□E, VFR641$^{0}_{1}$-□D(Z)

3 position pressure center: VFR651$^{0}_{1}$-□E, VFR651$^{0}_{1}$-□D(Z)



∗ Other dimensions are the same as the single type.

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

NRTL /C



Non plug-in type

How to Order

Non plug-in **30** – **VFR2** [1] **10** [ ] – [1] [D] [ ] [ ] – [ ] [02] [ ]



Conforming to CSA standard

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

Nil	Side ported

* Option

Port size (P, A, B port)

Nil	Without sub-plate
01	1/8
02	1/4

EA, EB port: 1/8

Thread type

Nil	Rc
N	NPT
T	NPTF
F	G

Symbol

1	2 position single
2	2 position double
3	3 position closed center
4	3 position exhaust center
5	3 position pressure center

Pilot type

Nil	Internal pilot
R *	External pilot

* Option (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

* Option

Pilot valve manual override

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

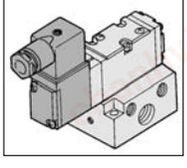
* Option

Option

Nil	None
Z	With light/surge voltage suppressor

Electrical entry

D: DIN terminal



⚠ Refer to the standard product for product specifications, dimensions and model selection procedures.

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

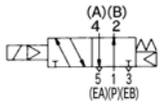
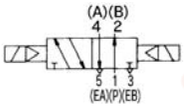
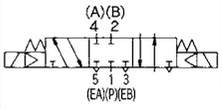
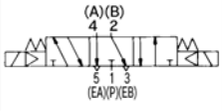
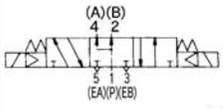
NRTL /C

How to Order

Non plug-in **30** – **VFR3** **1** **4** **0** □ – **1** **D** □ □ – □ **02** □ **Individual electrical entry**

Conforming to CSA standard

Symbol

1	2 position single 
2	2 position double 
3	3 position closed center 
4	3 position exhaust center 
5	3 position pressure center 

Body option

0	Standard

Pilot type

Nil	Internal pilot
R *	External pilot

* Option

Coil rated voltage

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

* Option

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

Nil	Side ported
B *	Bottom ported

* Option

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

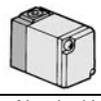
Nil	Without sub-plate
02	1/4
03	3/8

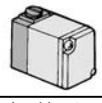
* For bottom ported: 1/4

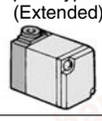
Thread type

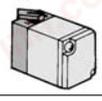
Nil	Rc
N	NPT
T	NPTF
F	G

Pilot valve manual override

Nil: Non-locking push type 

B*: Locking type B (Tool required) 

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

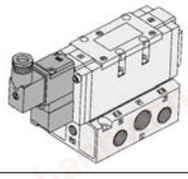
C*: Locking type C (Lever) 

* Option

Option

Nil	None
Z	With light/surge voltage suppressor

Electrical entry

D: DIN terminal 

⚠ Refer to the standard product for product specifications, dimensions and model selection procedures.

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

Series VFR4000

NRTL /C

How to Order

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

Nil	Side ported
B *	Bottom ported

* Option: Bottom ported is not available for external pilot.

Port size (P, A, B port)

Nil	Without sub-plate
03	3/8
04 *	1/2

EA, EB port: 3/8

Non plug-in **30** – **VFR4** [ ] **4** **0** [ ] – **1** **D** [ ] [ ] – [ ] **03** [ ] **Individual electrical entry**

Conforming to CSA standard

Symbol

1	2 position single
2	2 position double
3	3 position closed center
4	3 position exhaust center
5	3 position pressure center

Body option

0	Standard
1 *	Direct manual override

* Option

Pilot type

Nil	Internal pilot
R *	External pilot

* Option

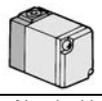
Coil rated voltage

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

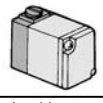
* Option

Pilot valve manual override

Nil: Non-locking push type



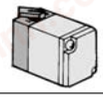
B*: Locking type B (Tool required)



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



C*: Locking type C (Lever)



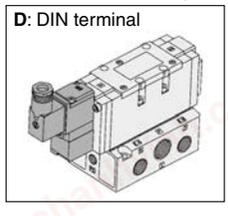
* Option

Option

Nil	None
Z	With light/surge voltage suppressor

Electrical entry

D: DIN terminal



Thread type

Nil	Rc
N	NPT
T	NPTF
F	G

⚠ Refer to the standard product for product specifications, dimensions and model selection procedures.

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Series VFR2000/3000/4000/5000/6000
Specific Product Precautions 1

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions Instructions and pages 3 to 7 for 3/4/5 Port Solenoid Valve Precautions.

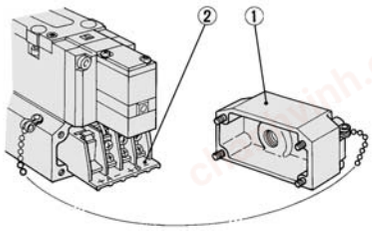
⚠ Caution

Lead Wire Connection

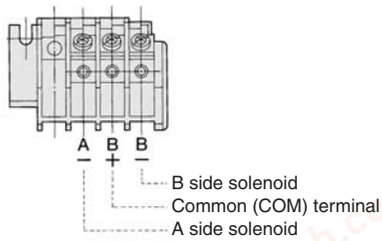
Plug-in type (With terminal block)

Series VFR2000/3000/4000

• If you remove the junction cover ① on the sub-plate, you will see the plug-in terminal block ② attached to the inside of sub-plate.



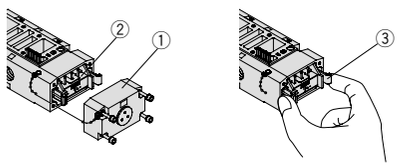
• The following markings are on the terminal block. Connect with corresponding power side.



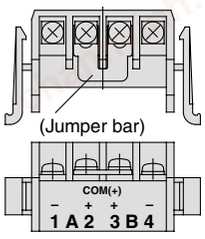
• Although "A–", "B+" and "B–" marks are indicated on the terminal block, this can be used as either "+COM" or "–COM".
• Applicable terminal:
VFR2000, VFR3000: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S
VFR4000: 1.25-3.5M, 1.25Y-3L, 1.25Y-3M

Series VFR5000

• Remove junction cover for sub-plate ①, depress levers ③ of terminal block assembly ②, pull out terminal block assembly.



• Terminal block assembly is marked as below. Connect it to power supply side.

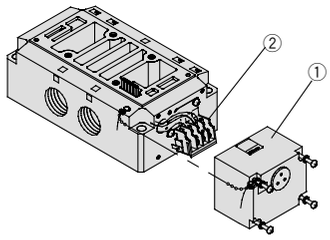


Model \ Terminal block marking	A– (1)	B+ (3)	B– (4)
VFR510□	A side	COM	
VFR520□	A side	COM	B side
VFR3/4/5540□	A side	COM	B side

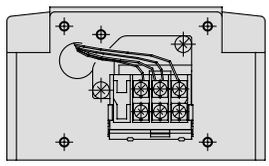
• Terminal block assembly can be used as "+" and "–" common regardless of markings. Do not remove jumper bar because it is used for common connection.
• Applicable terminal:
1.25-4, 1.25-4M

Series VFR6000

• If you remove the junction cover ① on the sub-plate, you will see the plug-in terminal block ② attached to the inside of sub-plate.



• Terminal block assembly is wired like the following figure. Connect it to each power supply side.



Model \ Position	Left	Center	Right
VFR610□	A side	COM	
VFR620□	A side	COM	B side
VFR3/4/5640□	A side	COM	B side

• Can be used as either "+COM" or "–COM".
• Applicable terminal:
1.25-4, 1.25-4M

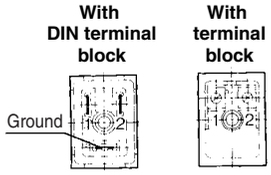
Non plug-in type

Series VFR2000
Series VFR3000/4000 (VFR3□40/4□40)

• Type G: Lead wire comes directly from the solenoid part. Connect it with the power source. Grommet with DC voltage surge voltage suppressor has polarity. Connect red lead wire to + (positive) side and black to – (negative) side.

Surge voltage suppressor	
DC	AC
Red (+) / Black (–)	Varistor

• Type E, T, D, Y: In the case of DIN terminal block and terminal block, there is no polarity of positive [+] and negative [–]. Connect no. 1 and no. 2 terminals with corresponding power side.

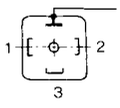


• Applicable cable O.D.
Type T: ø6 to ø8 mm
Type E: ø2.3 to ø2.8 mm
Type D (Series VFR2000): ø6 to ø8 mm
Type D (Series VFR3000/4000): ø4.5 to ø7 mm
Type Y: ø4.5 to ø7 mm
• Applicable crimp terminal
Type E, T: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S
(Round shape or Y shape crimp terminal cannot be used for Type D.)

Series VFR3000/4000/5000/6000 (VFR3□10/4□10)

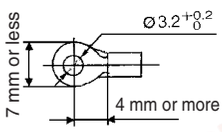
DIN terminal block type

• Male pin terminal of DIN terminal block of solenoid valves are wired as shown below. Connect to corresponding terminal on the connector.

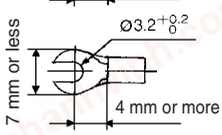


Terminal no.	Internal wiring
1	SOL. A side
2	SOL. B side
3	COM
⏚	Ground

• Can be used as either "+COM" or "–COM".
• Applicable cable
Cross section of the wire: 0.5 to 1.5 mm²
Cable O.D.: ø8 to ø10
• Applicable crimp terminal shown below.



Corresponding to R1.25-3 of JIS C 2805

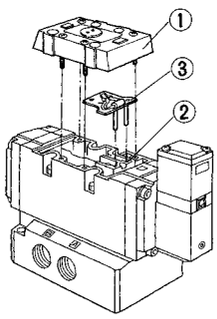


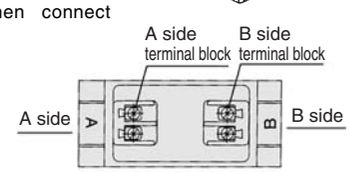
J.S.T. Mfg. Co., Ltd. Equivalent to R1.25-3

• Proper tightening torque of the connector
Connector set screw 0.5 to 0.6 N·m
Terminal screw 0.5 to 0.6 N·m
• Incorrect connection of "COM terminal" (DIN terminal no. 3) can cause damage on power source circuit.

Terminal block type

• Remove cover ①, over terminal block ② attached to the inside of body. Connect with corresponding power side. For a style with light and surge voltage suppressor, straightly pull out the light and surge voltage suppressor substrate ③ and then connect them.





• Applicable terminal:
VFR3000: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S
VFR4000: 1.25-3.5M, 1.25Y-3L, 1.25Y-3M
VFR5000/6000: 1.25-3.5M, 1.25-3L, 1.25-3M

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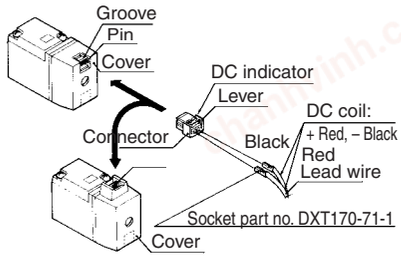
Series VFR2000/3000/4000/5000/6000
Specific Product Precautions 2

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions Instructions and pages 3 to 7 for 3/4/5 Port Solenoid Valve Precautions.

⚠ Caution

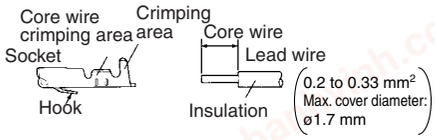
Attaching and Detaching Connectors

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



Attaching and Detaching Lead Wires with Sockets

Peel 3.2 to 3.7 mm of the tip of lead wire, enter the core wires neatly into a socket and crimp it with a special crimp tool. Be careful so that the cover of lead wire does not enter into the crimping part.



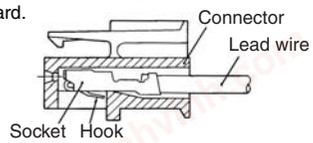
Attaching and Detaching Lead Wires with Sockets

1. Attaching

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

2. Detaching

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

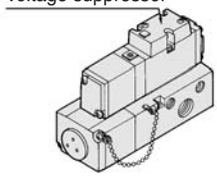


Light/Surge Voltage Suppressor

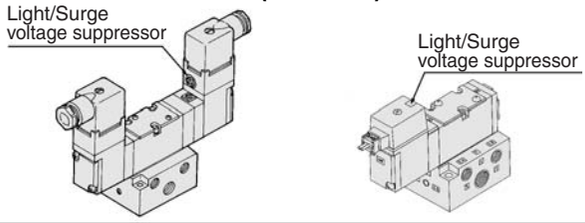
Refer to table 1 for "Series VFR2000 Plug-in type", "VFR3□⁰₁0, VFR4□⁰₁0 type of Series VFR3000/4000" and "VFR5000/6000", and table 2 for "Series VFR2000 Non plug-in type" and "VFR3□40, VFR4□40 type of Series VFR3000/4000".

Series VFR2000

Plug-in type (VFR2□00)

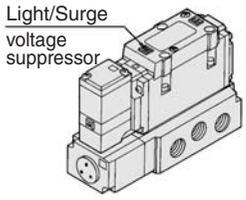


Non plug-in type (VFR2□10)

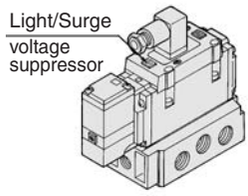


Series VFR3000, 4000

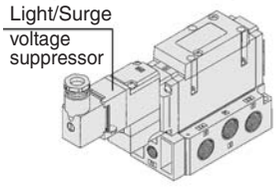
Plug-in type (VFR3□00/4□00)



Non plug-in type (VFR3□10/4□10)

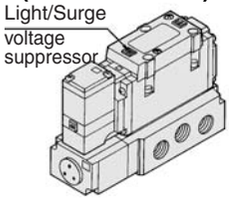


Non plug-in type (VFR3□40/4□40)



Series VFR5000/6000

Plug-in type (VFR5□00/6□00)



Non plug-in type (VFR5□10/6□10)

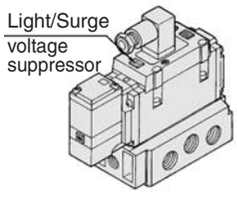


Table (1) Series VFR2000 (VFR2□00)
Series VFR3000/4000 (VFR3□⁰₁0/4□⁰₁0)
Series VFR5000/6000

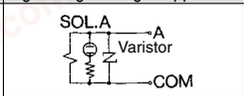
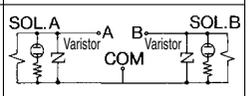
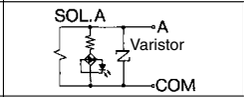
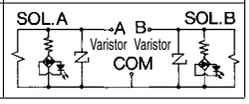
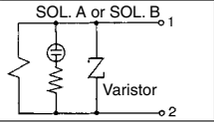
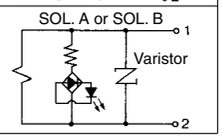
Voltage		Light/Surge voltage suppressor
AC	Single solenoid	
	Double solenoid	
24 VDC or less	Single solenoid	
	Double solenoid	

Table (2) Series VFR2000 (VFR2□10)
Series VFR3000/4000 (VFR3□⁰₁40/4□⁰₁40)

Voltage	Light/Surge voltage suppressor
AC	
24 VDC or less	

∗ Light/Surge voltage suppressor is not available for grommet type.
For grommet type with surge voltage suppressor, refer to page 1321.

Plug Connector Lead Wire Length

Standard length is 300 mm, but the following lengths are also available.

How to Order Connector Assembly

DXT170 – 80 – □ A – □

Lead wire color

Symbol	Lead wire with socket	Note
Nil	Sockets (2 pcs.) only	Without lead wire
1	Blue (2 pcs.)	For 100 VAC
2	Red (2 pcs.)	For 200 V AC
3	Gray (2 pcs.)	Other VAC
4	Red: + Black: –	For DC

Lead wire length

Symbol	Lead wire length (L mm)
Nil	300
6	600
10	1000
15	1500
20	2000
25	2500
30	3000

How to Order

Include the connector assembly part number together with the part number for the plug connector's solenoid valve without a connector.

<Example> For lead wire length 2000 mm
VFR2210-5MO-02 ····· 3 pcs.
DXT170-80-4A-20 ····· 6 pcs.

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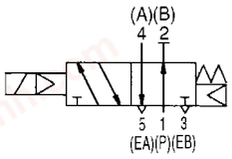
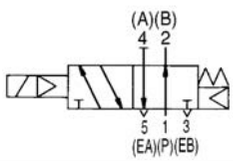
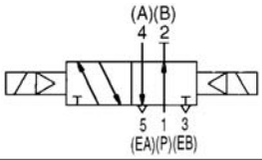
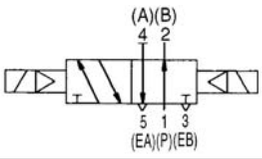
Series VFR2000/3000/4000/5000/6000
Specific Product Precautions 3

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions Instructions and pages 3 to 7 for 3/4/5 Port Solenoid Valve Precautions.

⚠ Caution

Used as a 3 Port Valve

Plugging one of the cylinder ports (A or B) enables use as a normally closed (N.C.) or normally open (N.O.) 3 port valve.
It is convenient when 3 port valve is needed on a manifold, etc., but it can't be used in special applications such as using as a non-leakage valve. Use it with the exhaust port leaving open.

Plug		B port	A port
Type of actuation		N.C.	N.O.
Number of solenoids	Single		
	Double		

How to Exchange Solenoid Valves, Pilot Valve Assemblies

How to exchange solenoid valves

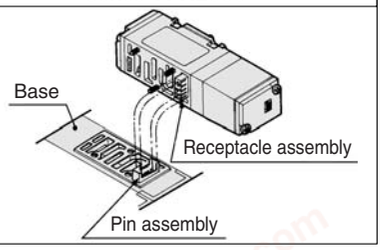
- Loosen set screw and take solenoid valve out vertically, otherwise it may cause damage to the solenoid valve. Never remove valve at an angle.
- When mounting solenoid valve on to the base, plug pin assembly (base-side) into receptacle assembly (body-side) vertically.

Tightening Torque for Mounting Bolt

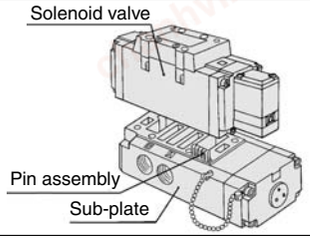
Model	Thread	Tightening torque
Pilot valve assembly	M3 (2 pcs.)	0.6 N·m
VFR2000	M3 (3 pcs.)	0.9 N·m
VFR3000	M3 (3 pcs.)	1.1 N·m
VFR4000	M4 (4 pcs.)	1.4 N·m
VFR5000	M5 (4 pcs.)	2.8 N·m
VFR6000	M8 (4 pcs.)	16 N·m

Note) For more information about the procedure, refer to the instruction manual.

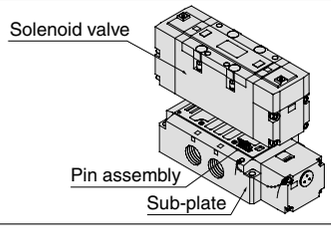
Series VFR2000



Series VFR3000/4000/5000



Series VFR6000

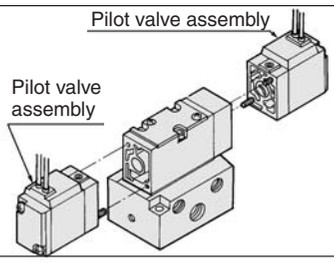


How to exchange pilot valve assemblies

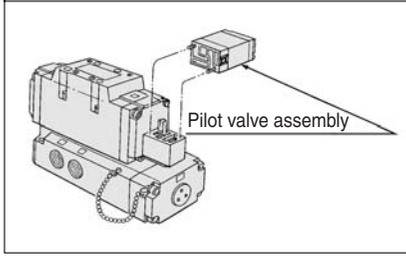
- Possible to exchange pilot valve assemblies like the following figures.

Note) Do not change the rated voltage.

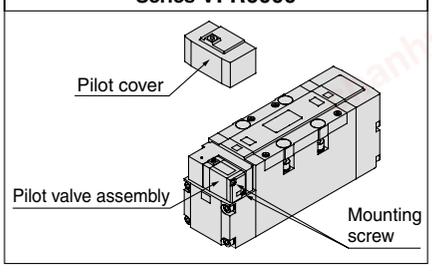
Series VFR2000



Series VFR3000/4000/5000



Series VFR6000



Change Direction of DIN Connector/Cable Entry

- Unscrew retaining screw, pull off outer cover, rotate connector block through 180°. Replace cover and tighten screw.

How to Calculate the Flow Rate

For obtaining the flow rate, refer to front matter 44 to 47.

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Series VFR2000/3000/4000/5000/6000
Specific Product Precautions 4

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions Instructions and pages 3 to 7 for 3/4/5 Port Solenoid Valve Precautions.

Interface Regulator

⚠ Caution

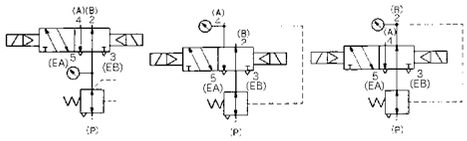
Specifications

Interface regulator		ARBF2000	ARBF3050			ARBF4050			ARBF5050		
Applicable solenoid valve series		VFR2000	VFR3000			VFR4000			VFR5000		
Regulating port		P	A	B	P	A	B	P	A	B	P
Maximum operating pressure		1.0 MPa (1)									
Set pressure range		0.05 to 0.83 MPa	0.1 to 0.83 MPa (2)								
Ambient and fluid temperature		–5 to 60°C (No freezing) (3)									
Port size for connection of pressure gauge		M5 x 0.8	Rc 1/8								
Weight (kg)		0.16	0.46			0.72			0.83		
Effective area at supply side (mm^2) S at P_1 = 0.7 MPa/P_2 = 0.5 MPa	P → A	5.5	21	18.5	11	35	31	26	44	38	32
	P → B	5.1	18.5	22	12	31	31	24	38	40	31
Effective area at exhaust side (mm^2) S at P_2 = 0.5 MPa	A → EA	12	40			55			90		
	B → EB	11	36			45			77		

Note 1) Maximum operating pressure of solenoid valve is 0.9 MPa.
Note 2) Set the pressure within operating pressure range of solenoid valve.
Note 3) Solenoid valve: Max. 50°C
Note 4) Synthesized effective area with 2 position.
Note 5)
- Operate an interface regulator only by applying pressure from the "P" port of the base, except when using it as a reverse pressure valve.
- To combine a pressure center valve and the A and B port pressure reduction interface regulator, use the ARBF3000, ARBF4000, or the ARBF5000 model.
- To combine a reverse pressure valve and an interface regulator, use the ARBF3000, ARBF4000, or the ARBF5000 model. The P port pressure reduction cannot be used.
- When combining a double check valve and an interface regulator, use a manifold or subplate as a basis, and stack them in the following order; the perfect spacer → the interface regulator → the valve.
- When a closed center valve is combined with the interface regulator's A, B port regulation, note that it cannot be used for intermediate stops of a cylinder because there is leakage from relief port on the regulator.

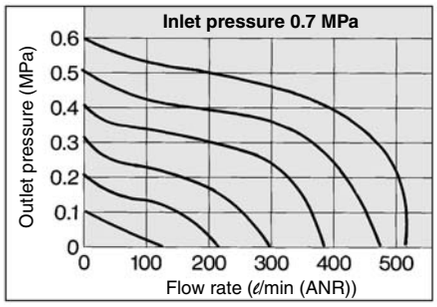
Flow Characteristics (P → A) (Condition: Inlet pressure 0.7 MPa when 2 position solenoid valve is mounted.)

JIS Symbol

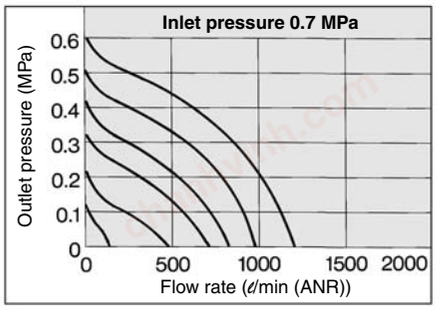


P port regulation A port regulation B port regulation

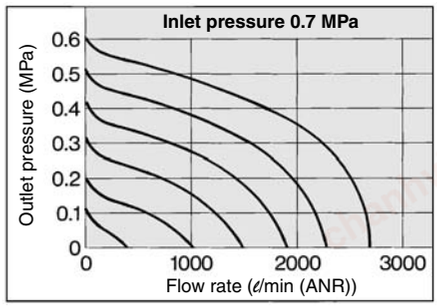
ARBF2000-00-P



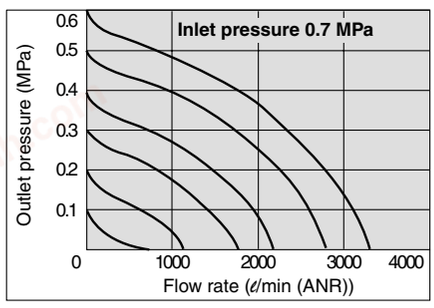
ARBF3050-00-P



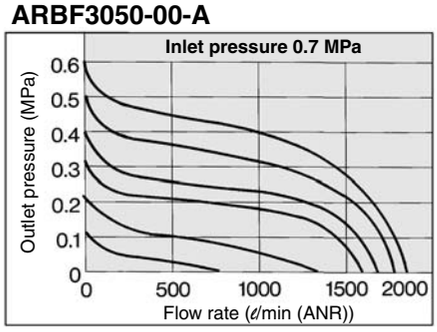
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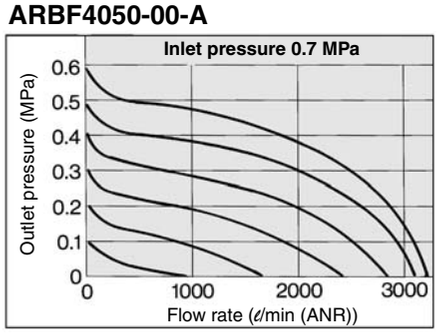
ARBF5050-00-P



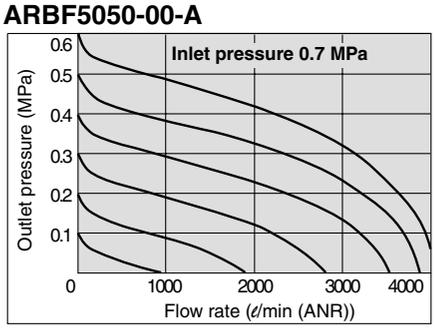
ARBF3050-00-A



ARBF4050-00-A



ARBF5050-00-A



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Series VFR2000/3000/4000/5000/6000
Specific Product Precautions 5

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions Instructions and pages 3 to 7 for 3/4/5 Port Solenoid Valve Precautions.

Lead Wire Connection

⚠ Caution

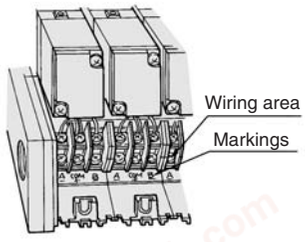
Type 01T with Terminal Block

Series VFR2000

• Remove junction cover of manifold, exposing terminal block attached to the manifold block. Lead wires from solenoid valve are connected with the terminals on upper side of terminal block. (On the terminal block, lead wire is connected with both A and B sides of solenoid valve in accordance with the corresponding markings A and B on the block.)
Connect each lead wire of power side corresponding to respective solenoid valve on the lower terminal block.
Terminal block wiring specifications is in accordance with COM.

Model \ Terminal block marking	A –	B +	B –
VFR2100	A side	COM	
VFR2200	A side	COM	B side
VFR2$^{3}_{5}$00	A side	COM	B side

• Applicable terminal:
1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S
• Although “A–”, “B+” and “B–” marks are indicated on the terminal block, VFR2000 can be used as either “+COM” or “–COM”.



Series VFR3000

Model \ Terminal block marking	A –	COM +	B –
VFR3100	A side	COM	
VFR3200	A side	COM	B side
VFR3$^{3}_{5}$00	A side	COM	B side

• Applicable terminal:
1.25-3.5M, 1.25Y-3L, 1.25-3M
• Although “A–”, “COM+” and “B–” marks are indicated on the terminal block, VFR3000 can be used as either “+COM” or “–COM”.

Series VFR4000

Model \ Terminal block marking	A –	B +	B –
VFR4100	A side	COM	
VFR4200	A side	COM	B side
VFR4$^{3}_{5}$00	A side	COM	B side

• Applicable terminal:
1.25-3.5M, 1.25Y-3L, 1.25-3M
• Although “A–”, “B+” and “B–” marks are indicated on the terminal block, VFR4000 can be used as either “+COM” or “–COM”.

Series VFR5000

Model \ Terminal block marking	A –	B +	B –
VFR5100	A side	COM	
VFR5200	A side	COM	B side
VFR5$^{3}_{5}$00	A side	COM	B side

• Applicable terminal:
1.25-3.5M, 1.25Y-3L, 1.25-3M
• Although “A–”, “B+” and “B–” marks are indicated on the terminal block, VFR5000 can be used as either “+COM” or “–COM”.

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Series VFR2000/3000/4000/5000/6000
Specific Product Precautions 6

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions Instructions and pages 3 to 7 for 3/4/5 Port Solenoid Valve Precautions.

⚠ Caution

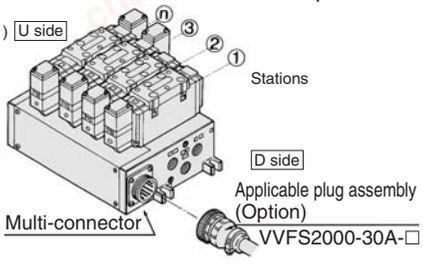
Lead Wire Connection | **Manifold/Plug-in Type**

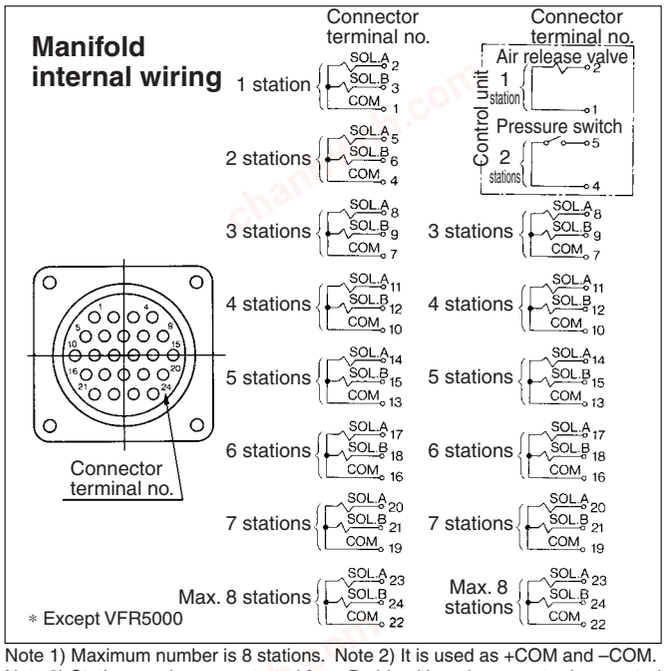
Type 01C Circular Connector

Series VFR2000/3000/4000/5000

- When multi-connector is used, mass-termination between power supply side and solenoid valve can be done. This saves the wiring connection labor.
- Wire connection specifications
  Lead wire for both solenoid A and B sides in manifold are connected to connector terminal as COM specifications.

Fig. (1) U side





Note 1) Maximum number is 8 stations. Note 2) It is used as +COM and –COM.
Note 3) Station numbers are started from D side although connector is mounted

Applicable Plug Assembly (Option)

Assembly part no.	Cable length	Component parts
VVFS2000-30A-1	1.5 m	Plug 206837-1 1 pc. Cable clamp 206138-1 1 pc. Socket 66101-2 24 pcs. Cable VCTF 24 cores x 0.75 mm² made by Tyco Electronics AMP K.K.
VVFS2000-30A-2	3 m	
VVFS2000-30A-3	5 m	
VVFS2000-30A-4 ∗	7 m	
VVFS2000-30A-5 ∗	10 m	
VVFS2000-30A-6 ∗	15 m	
VVFS2000-30A-7 ∗	20 m	

∗ Option

Cable Color List of Each Terminal No.

Terminal no.	1	2	3	4	5	6	7	8	9	10	11	12	13
Lead wire color	Orange	Orange	Black	Black	Green	Green	Red	Red	Blue	Blue	Yellow	Yellow	Brown
Dot marking	—	Yes	—	Yes	—	Yes	—	Yes	—	Yes	—	Yes	—

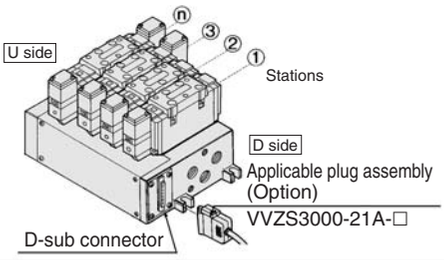
Terminal no.	14	15	16	17	18	19	20	21	22	23	24
Lead wire color	Brown	White	White	Pink	Pink	Gray	Gray	Sky blue	Sky blue	Light green	Light green
Dot marking	Yes	—	Yes	—	Yes	—	Yes	—	Yes	—	Yes

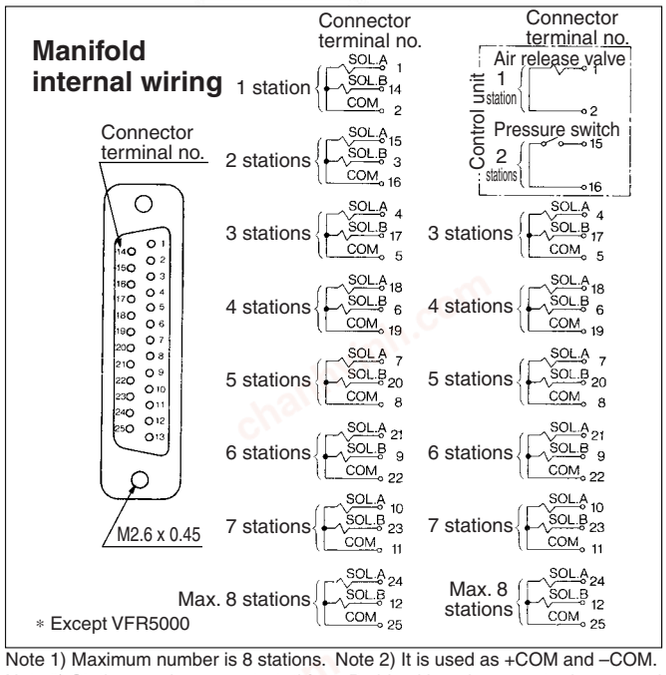
Type 01F D-sub Connector

Series VFR2000/3000/4000/5000

- MIL standard type D connector (Terminal: 25 pins) has wide exchangeability and saves wiring labor.
- Wire connection specifications
  Lead wire for both solenoid A and B sides in manifold are connected to connector terminal as COM specifications.

Fig. (2) U side





Note 1) Maximum number is 8 stations. Note 2) It is used as +COM and –COM.
Note 3) Station numbers are started from D side although connector is mounted

Applicable Plug Assembly (Option)

Assembly part no.	Cable length	Component parts
VVZS3000-21A-1	1.5 m	Plug MIL standard type D connector Number of terminals: 25 pins Cable: 25 cores x 0.3 mm²
VVZS3000-21A-2	3 m	
VVZS3000-21A-3	5 m	
VVZS3000-21A-4 ∗	8 m	
VVZS3000-21A-5 ∗	10 m	
VVZS3000-21A-6 ∗	15 m	
VVZS3000-21A-7 ∗	30 m	
VVZS3000-21A-8 ∗	20 m	

∗ Option

Cable Color List of Each Terminal No.

Terminal no.	1	2	3	4	5	6	7	8	9	10	11	12
Lead wire color	Black	Brown	Red	Orange	Yellow	Pink	Blue	Purple	Gray	White	White	Yellow
Dot marking	—	—	—	—	—	—	—	White	Black	Black	Red	Red

Terminal no.	13	14	15	16	17	18	19	20	21	22	23	24	25
Lead wire color	Orange	Yellow	Pink	Blue	Purple	Gray	Orange	Red	Brown	Pink	Gray	Black	White
Dot marking	Red	Black	Black	White	—	—	Black	White	White	Red	Red	White	—

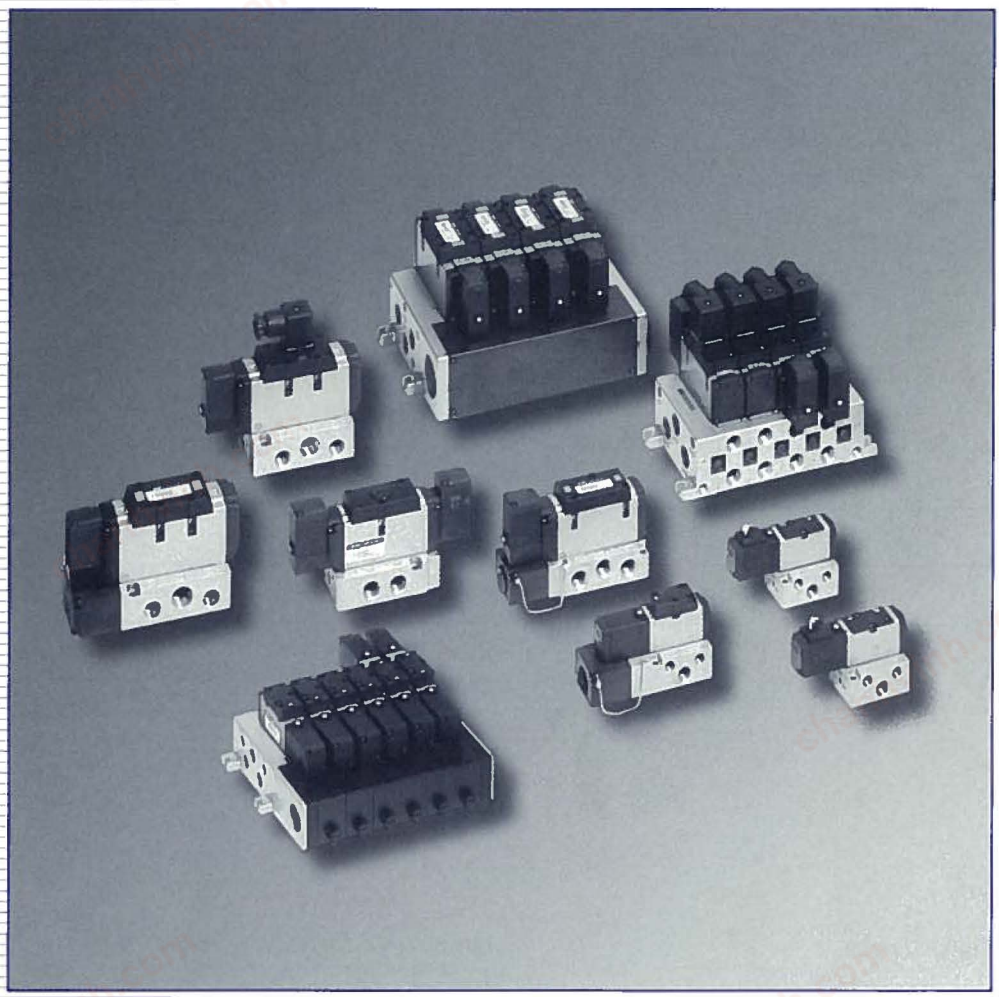
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SMC

4 Way • 5 Port / Solenoid/Pilot Operated

NVFR Series

Rubber Seal Models 2000/3000/4000

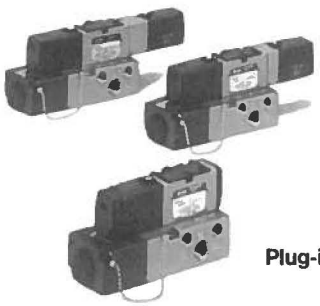


Large Flow Capacity - Cv 0.9 ~ 3.7
Low Power Consumption
Block Type Manifold
Plug-in and Non Plug-in Styles
Wide Variety of Options and Accessories

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Cv:0.9

5 Port Pilot Type/Rubber Seal
Series NVFR2000
Plug-in Type, Non Plug-in Type

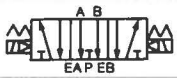


Plug-in Type



Non Plug-in Type

Symbol

2 position	3 position
Single	Closed center
	
Double	Exhaust center
	
	Pressure center
	

(Additional functions achieved by using external pilot option).

Model

Position/No. of solenoid		Type		Port size (NPTF)	Cv factor	Max.Operating cycle CPM	Response time (ms)	Weight lbs (kgf)
		Plug-in	Non Plug-in					
2 position	Single	**NVFR2100**	**NVFR2110**	1/8 1/4	0.9	300	20 or less	0.75 (0.34)
	Double	**NVFR2200**	**NVFR2210**	1/8 1/4	0.9	300	20 or less	0.92 (0.42)
3 position	Closed center	**NVFR2300**	**NVFR2310**	1/8 1/4	0.7	180	30 or less	0.95 (0.43)
	Exhaust center	**NVFR2400**	**NVFR2410**	1/8 1/4	0.7	180	30 or less	0.95 (0.43)
	Pressure center	**NVFR2500**	**NVFR2510**	1/8 1/4	0.7	180	30 or less	0.95 (0.43)

※ In case of NVFR2○00-OFZ-01T
† Special Order

Standard Specifications

Valve	Fluid		Air
	Max. operating pressure		130 PSI (9.0kgf/cm²)
	Min. operating pressure	2·3 position	30 PSI (2.0kgf/cm²)
		2 pos. dbl.	15 PSI (1.0kgf/cm²)
	Ambient and fluid temperature		32~120°F (0~+50°C)
	Lubrication		Not required
	Pilot operator manual override		Non-locking push type (Flush)
	Protection construction		Dust proof
	Rated voltage	AC	110VAC 5%0Hz, 220V 5%0Hz, 24V 5%0Hz
		DC	12V, 24V.
	Allowable voltage range		−15~+10% rated voltage
	Coil insulation		Class B or equivalent
	Apparent power (Power consumption) AC	Inrush	5.0VA/60Hz, 5.6VA/50Hz
		Holding	2.3VA(1.5W)/60Hz,3.4VA(2.1W)/50Hz
	Power consumption DC		1.8W
	Electrical entry	Plug-in	Conduit terminal (base access)
		Non plug-in	Grommet, DIN connector (Conduit terminal, grommet terminal)

*Optional Specifications**

Pilot type		Note) External pilot type
Manual override	Pilot operator	Non-locking push type (extended), Lock type (tool), Lock type (lever)
Voltage	AC	100V 5%0Hz, 200V 5%0Hz
	DC	6V, 48V, 100V
Porting		Bottom ported subplate
Option		With indicator light and surge voltage suppressor

Note) Operating pressure: 0~130PSI (0~9.0kgf/cm²)
Pilot operating pressure 2 position double: 15~150PSI (1~9.9kgf/cm²)
2 position single; 3 position: 30~130PSI (2.0~9.0kgf/cm²)
*Some options listed as "Special Order" items.

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How To Order

Porting

—	Side
※B	Bottom

※1/8NPTF only

Port size

	Without subplate	
01T	1/8NPTF	Plug-in (With Terminal block std.)
02T	1/4NPTF	

※Bottom ported 1/8 NPTF only.
(See pg. 16 for individual subplate part nos.)

Option

—	None
Z	With indicator light and surge voltage suppressor

Body type / **Electrical entry**

O-Plug in

F-Through base

Plug-in NVFR2 (2) 00 ( ) – (5) F ( ) ( ) – ( ) (01T)

Non plug-in NVFR2 (2) 10 ( ) – (5) (D) ( ) ( ) – ( ) (02T)

Pilot operator manual Override/classification

— Non-locking push type (Flush)	B-Lock type (Screw type)
※A—Non-locking Push type (Extended)	※C—lock type (Lever)

※ Special Order

Port size

	Without subplate	
01T	1/8 NPTF	Non plug-in
02T	1/4 NPTF	

※Bottom ported 1/8 NPTF only.
(See pg. 16 for individual subplate part nos.)

Symbol

1	2 position single
2	2 position double
3	3 position closed center
4	3 position exhaust center
5	3 position pressure center

Body type

1-Non plug-in

Pilot operator

—	Internal
※R	External

※Special Order

Voltage

※1	100VAC 5% Hz
※2	200VAC 5% Hz
3	110VAC +5% -10% Hz
4	220VAC +5% -10% Hz
5	24VDC
6	12VDC
※9	Others Note 1)

※ Special Order

Note 1) Indicate in parentheses at end of part no.
Ex. (AC24V).

Option

—	None
Z†	With indicator light and surge voltage suppressor
※S	With surge voltage suppressor

※ Special for grommet type G only.
†Z option N/A for grommet type G.

Electrical entry

G-Grommet

D-DIN Connector

※ T-Conduit (1/4") terminal

※E-Grommet terminal

※ Special Order

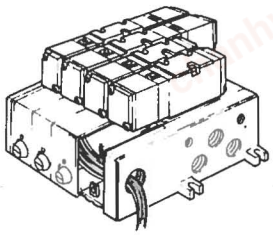
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Series NVFR2000:Base Mounted Type

Manifold Specifications

Plug in Type: Connector with Lead Wire ("wire harness")

●The insert plug is attached to the manifold block and is connected with valve side. Connect leads with corresponding power supply.



NVV5FR2-01-06 1-01T

Series NVFR2000 Manifold valve

Plug-in Type Connector with Lead wire
(AXT624-52A-D1-3)

Stations

02	2 stations
⋮	⋮
15	15 stations

Symbol

Symbol	Port specifications P	Port specifications EA, EB	Porting Specifications (A,B)
1	Common	Common	Side
※2†			Bottom
※M	Mixed		See pg. 46

※Special Order
† Bottom porting specification with "-02T" is 1/8" P,A,B bottom and 1/4" A,B side. (MBF2612-01-1B; see pg. 16)

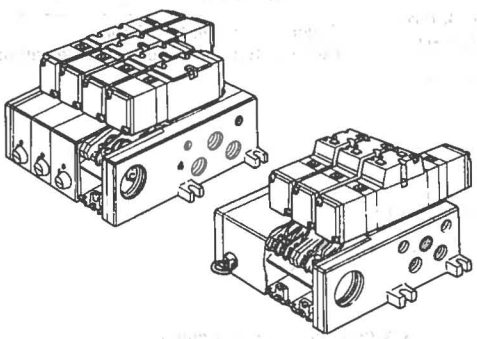
Unit type conduit cover: AXT625-28-3A
Unit type conduit retainer: AXT625-87

Port size

Symbol	P, EA, EB	A, B
01T	1/4NPTF	1/8NPTF
02T		1/4NPTF

Plug-in Type: With Terminal Blocks

●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.



NVV5FR2-01T 1-08 1-02T

Series NVFR2000 Manifold valve

Plug-in type With terminal block

Junction cover/ classification

–	Unit type individual station cover
1	One-pc. type cover

Note: Individual cover part no. above. One-piece type, see pg. 16

Stations

02	2 stations
⋮	⋮
15	15 stations

Symbol

Symbol	Port specifications P	Port specifications EA, EB	Porting Specifications (A,B)
1	Common	Common	Side
※2†			Bottom
※M	Mixed		See pg. 46

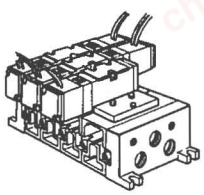
※Special Order
† Bottom porting specification with "-02T" is 1/8" P,A,B bottom and 1/4" A,B side. (MBF2612-01-1A; see pg. 16)

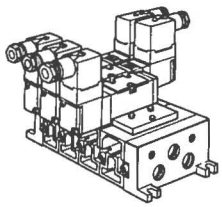
Port size

Symbol	P, EA, EB	A, B
01T	1/4NPTF	1/8NPTF
02T		1/4NPTF

Non Plug-in Type: Grommet, DIN Connector, Grommet Terminal, Conduit Terminal

●Individual wiring for each valve





NVV5FR2-10-05 1-01T

Series NVFR2000 Manifold valve

Non plug-in type

Stations

02	2 stations
⋮	⋮
15	15 stations

Symbol

Symbol	Port specifications P	Port specifications EA, EB	Porting Specifications (A,B)
1	Common	Common	Side
※2†			Bottom
※M	Mixed		See pg. 46

※Special Order
† Bottom porting specification with "-02T" is 1/8" P,A,B bottom and 1/4" A,B side. (MB2612-01-1; see pg. 16)

Port size

Symbol	P, EA, EB	A, B
01T	1/4NPTF	1/8NPTF
02T		1/4NPTF

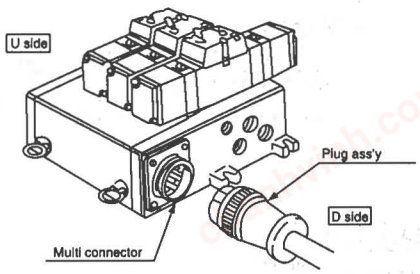
See "How to Order Manifold Assemblies," p. 39

NVFR manifold base is the same as for NVFS Series.

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Plug-in Type: With Multi-Connector

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



NVV5FR2 — 01C (D) — (05) (2) — (01T)

Series NVFR2000
Manifold valve

Plug-in type
With multi connector

Mounting direction of connector

D	D side mounting
U	U side mounting

Port size

Symbol	P, EA, EB	A, B
01T	¼ NPTF	⅛ NPTF
02T		¼ NPTF

Symbol

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

* Bottom porting: ⅛ only

Stations

02	2 stations
:	:
08	8 stations

* Max: 8 stations

Plug-in Type: With D-Sub Connector

- Wide range of interchangeability (MIL Spec DIN type connector terminal-25 pin.)
- Quick wiring permits ease of installation.

D-Subconnector for 2000 Series

Orientation of D-Sub connector for 2000 Series manifold is parallel with mounting surface. For other manifold sizes the connector receptacle is perpendicular to the mounting surface.

NVV5FR2 — 01F (U) — (06) (1) — (01T)

Series NVFR2000
Manifold valve

Plug-in type
With D sub connector

Mounting direction of connector

D	D side mounting
U	U side mounting

Port size

Symbol	P, EA, EB	A, B
01	¼ NPTF	⅛ NPTF
02		¼ NPTF

Symbol

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

* Bottom porting: ⅛ only

Stations

02	2 stations
:	:
08	8 stations

* Max: 8 stations

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Series NVFR2000: Base Mounted Type

Plug-in Type: Serial Interface Manifold

NVV5FR2 — 01SU — 08 1 — 02T — X200

- The use of serial interface technology offers advantages such as reduced wiring, quicker installation time, easier start-up and simplified maintenance.

Stations

02	2 stations
:	:
*17	17 stations

* Includes 1 station to mount SI unit.

Symbol

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

* Bottom porting: 1/8 only

Port size

Symbol	P, EA, EB	A, B
01T	1/4 NPTF	1/8 NPTF
02T		1/4 NPTF

***SI option**

–	For standard **1 type modules
X200	For AB2 module

*SI module must be orderd separately

Series IN313 Serial Interface Modules

IN313 — AB 1

Protocal

AB	Allen Bradley
DN	DeviceNet
MB	Mitsubishi
PR	Profibus
TA	Omron

Output/Inputs

1	16 outputs
2	32 outputs/32 inputs (Available on Allen Bradley only)

AB2 Accessories

Part #	Description
VVZR3000-21A-6-X2	D-sub cable with connectors on both ends
EX300-IB1-AB	Input Base Unit
EX300-IE1-AB	Input Expander Unit

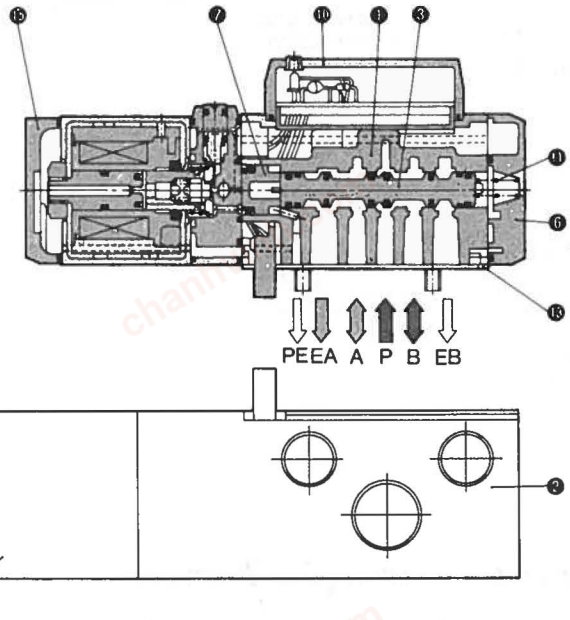
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Construction/Parts List

NVFR21○0



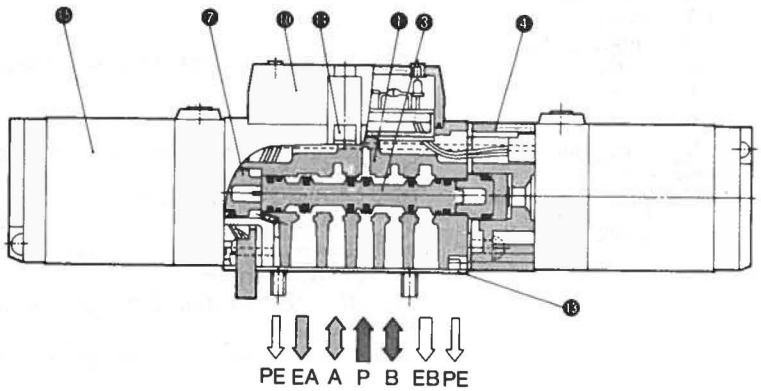
2 position single



NVFR22○0



2 position double

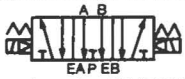


3 position Closed center/Exhaust center/Pressure center

Closed center/NVFR23○0

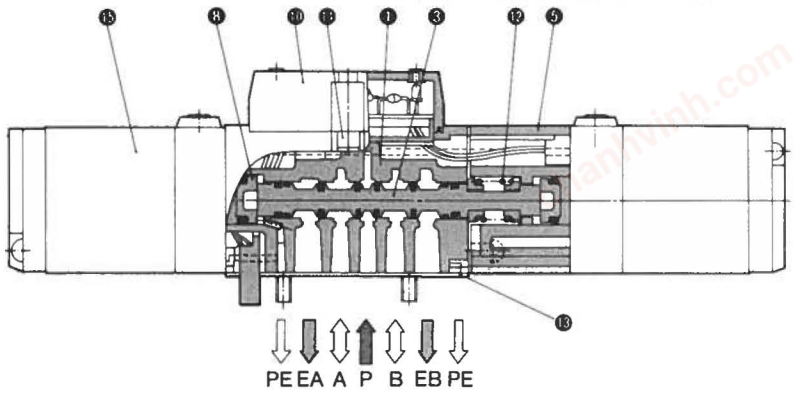


Exhaust center/NVFR24○0



Exhaust center/NVFR25○0





Main Parts

No.	Description	Material	Note
❶	Body	Aluminum diecast	Platinum silver
❷	Subplate	Aluminum diecast	Platinum silver
❸	Spool	Aluminum/NBR	
❹	Adapter plate	Aluminum diecast	Platinum silver
❺	Adapter plate	Aluminum diecast	Platinum silver
❻	End plate	Resin	Black

No.	Description	Material	Note
❼	Piston	Resin	
❽	Piston	Resin	
❾	Junction cover	Resin	
❿	Light cover	Resin	
⓫	Spool spring	SUS	
⓬	Return spring	SUS	

Spare Parts

No.	Description	Material	Part Nos.		
			NVFR21○0	**NVFR22○0**	**NVFR23○0, 24○0, 25○0**
⓭	Gasket	NBR	AXT624-20-2	AXT624-20-2	AXT624-20-2
⓮	Valve mounting bolt	Steel	AXT624-26 (M3X31)	AXT624-26 (M3X31)	AXT624-26 (M3X31)
⓯	Pilot Ass'y	–	Refer to "Pilot Operator Ass'y/How to Order" on page 8.		

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Series NVFR2000:Base Mounted Type

Pilot Operator Ass'y/How to Order

SF4— 3 DZ ○ - 60

● Voltage

※1	100VAC 50/60Hz
※2	200VAC 50/60Hz
3	110VAC 50/60Hz
4	220VAC 50/60Hz
5	24VDC
6	12VDC
※9	Others Note 1)

※ Special Order

Note 1) Indicate in parentheses at end of part no.
Ex. (AC24V)

● Electrical entry and indicator light and surge voltage suppressor

F	Plug-in	plug-in type
G	Grommet	Non plug-in type
†GS	Grommet with surge voltage suppressor	
D	DIN connector	
DZ	DIN connector with indicator light and surge voltage suppressor	
†DO	※DIN connector	
†DOZ	※DIN connector with indicator light and surge voltage suppressor	
†T	Conduit terminal	
†TZ	Conduit terminal with indicator light and surge voltage suppressor	
†E	Grommet terminal	
†EZ	Grommet terminal with indicator light and surge voltage suppressor	

※ Without DIN top
† Special Order

● Manual override /classification

—	Non-locking push type (Flush type)
※A	Non-locking push type (Extended type)
B	Lock type (Screw type)
※C	Lock type (Lever type)

※ Special Order

● Valve Series

60	NVFR2000 Series

Manifold stations vs. Effective Orifice Area (Cv-Factor)

Porting/No. of stations	First station	Fifth station	Tenth station	Fifteenth station
P→A or B	0.72	0.72	0.71	0.70
A→EA, B→EB	0.9	0.9	0.9	0.9

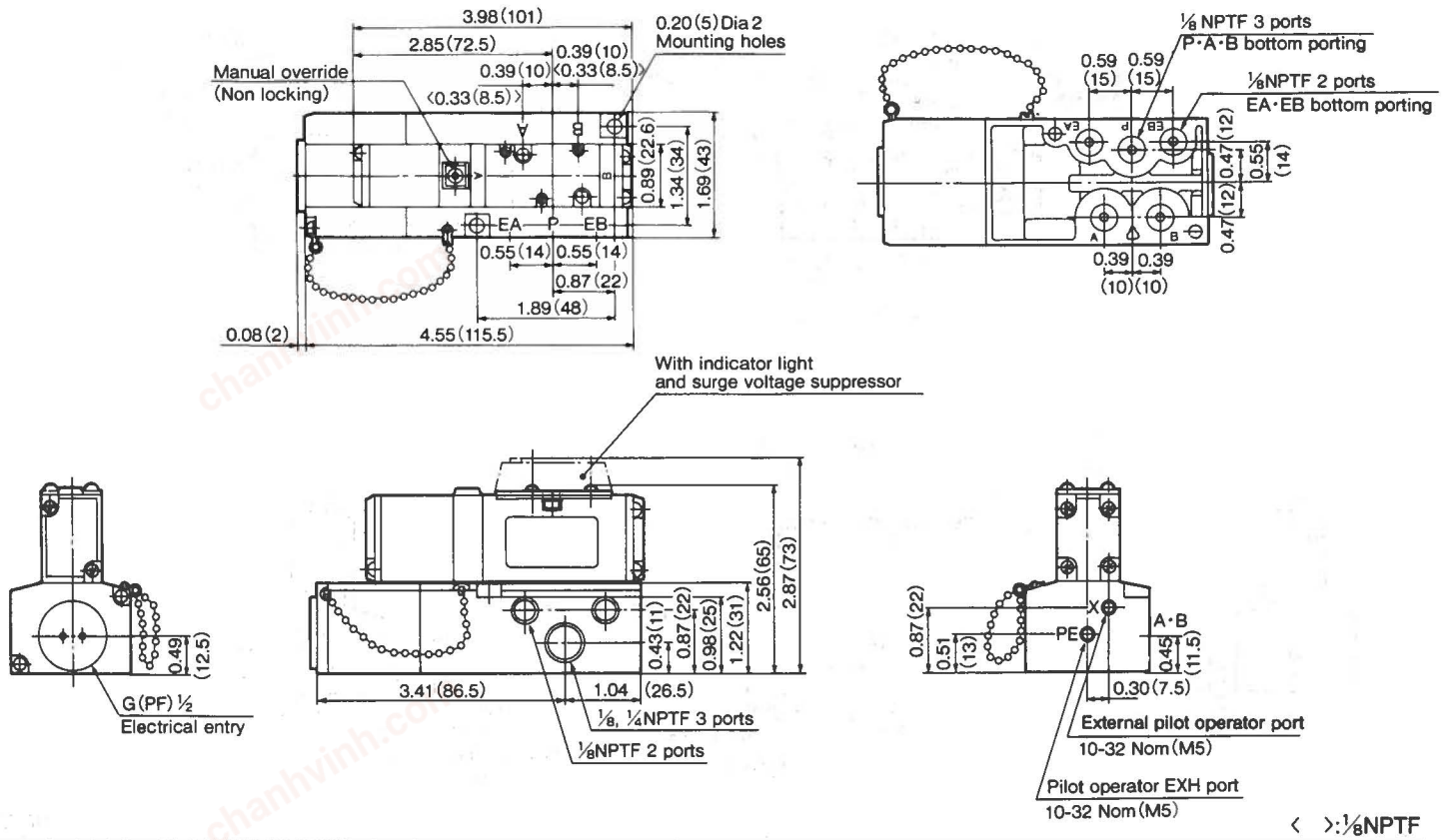
2 position single. Port size : 1/4 NPTF

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Plug-in type 2 position single, double, 3 position/Dimensions

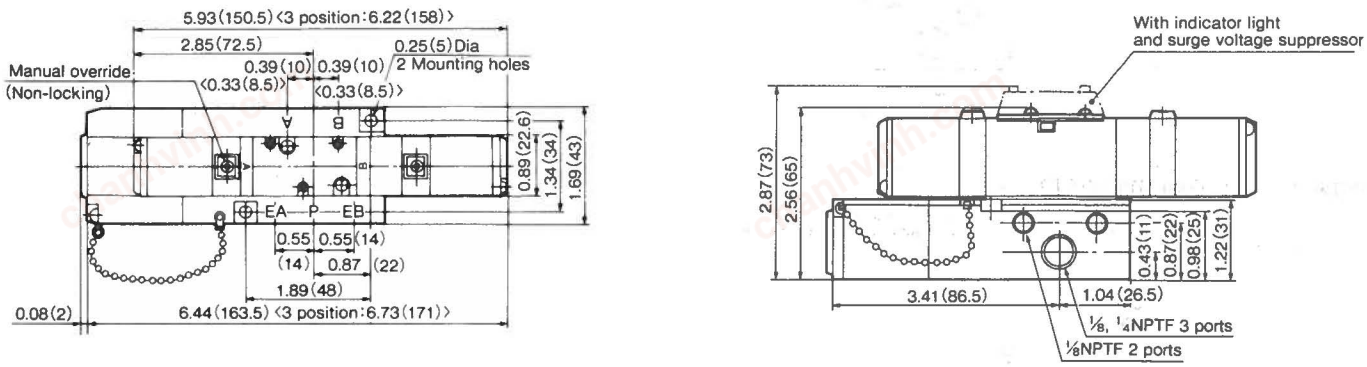
inch (mm)

2 position single:NVFR2100-○F



〈 〉:⅛NPTF

2 position double:NVFR2200-○F
3 position closed center:NVFR2300-○F
3 position exhaust center:NVFR2400-○F
3 position pressure center:NVFR2500-○F



〈 〉:⅛NPTF

〈 〉:⅛NPTF

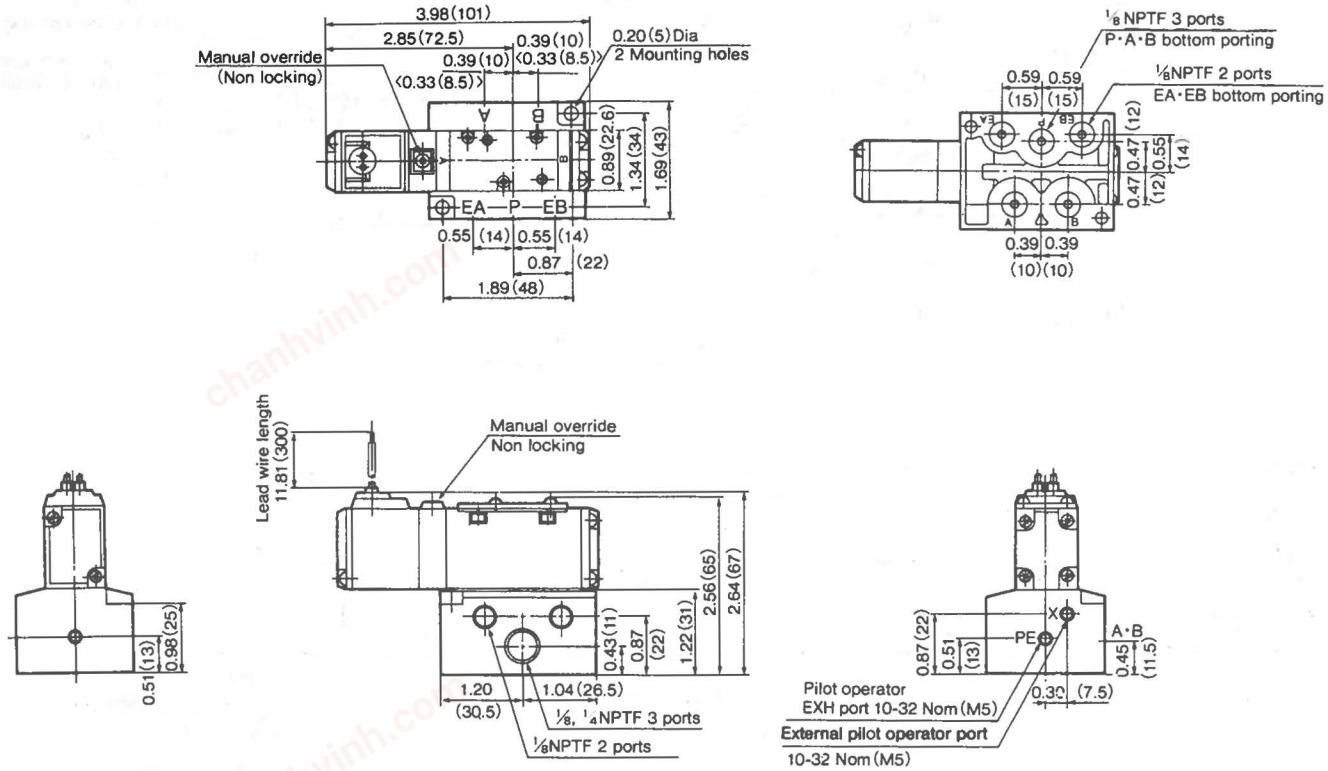
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Series NVFR2000:Base Mounted Type

Non Plug-in type 2 position single/Dimensions

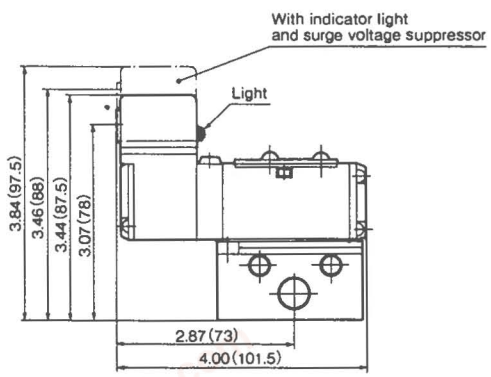
inch (mm)

Grommet:NVFR2110-○G

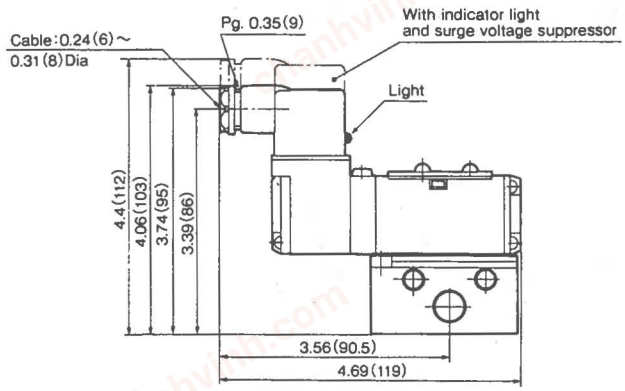


〈 〉:⅛NPTF

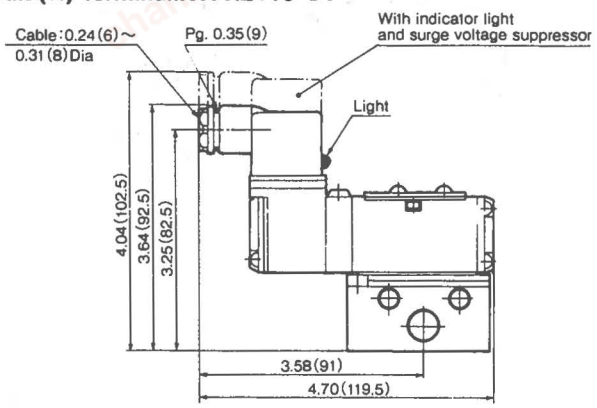
Grommet Terminal:NVFR2110-○E



DIN Connector:NVFR2110-○D



Conduit (¼) Terminal:NVFR2110-○T

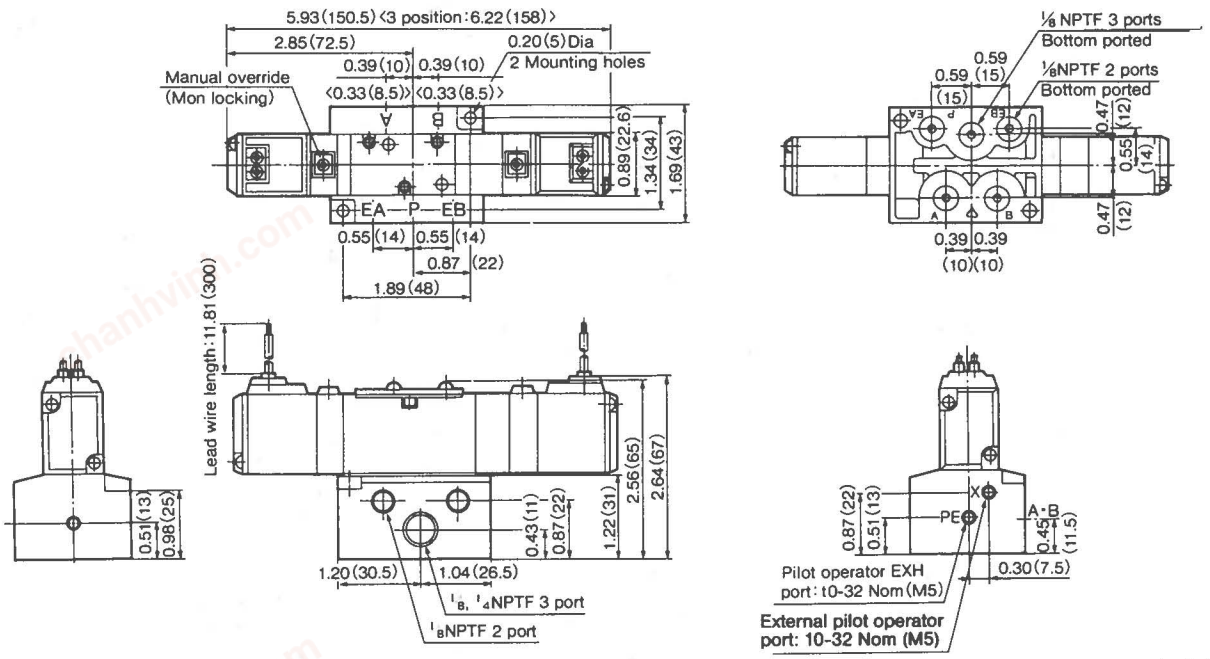


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Non Plug-in type 2 position double, 3 position/Dimensions

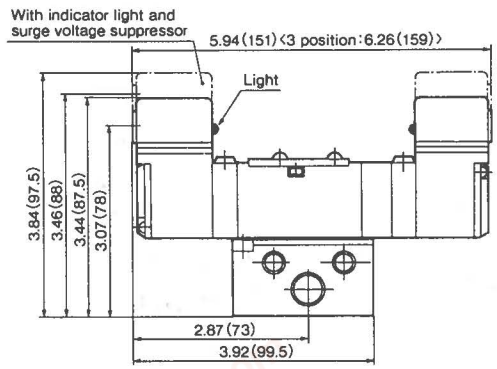
inch (mm)

Grommet:2 position double/NVFR2210-○G 3 position closed center/NVFR2310-○G
3 position exhaust center/NVFR2410-○G 3 position pressure center/NVFR2510-○G

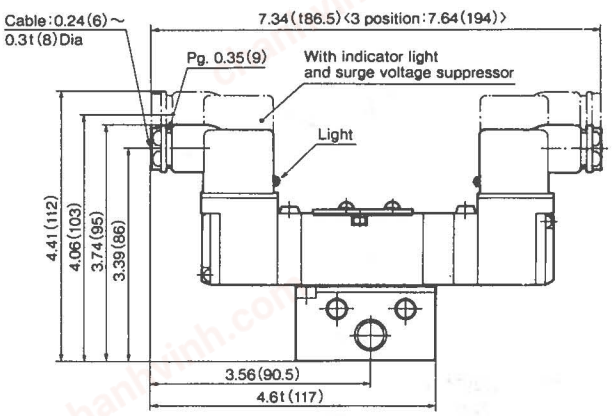


〈 〉:⅛NPTF

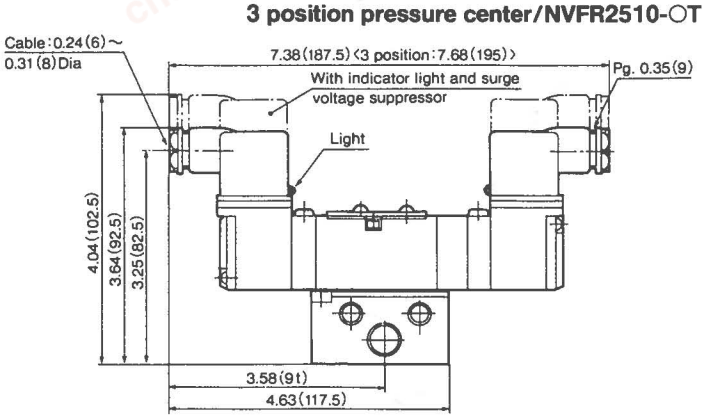
Grommet Terminal:2 position double/NVFR2210-○E
3 position closed center/NVFR2310-○E
3 position exhaust center/NVFR2410-○E
3 position pressure center/NVFR2510-○E



DIN connector:2 position double/NVFR2210-○D
3 position closed center/NVFR2310-○D
3 position exhaust center/NVFR2410-○D
3 position pressure center/NVFR2510-○D



Conduit (¼) Terminal:2 position double/NVFR2210-○T
3 position closed center/NVFR2310-○T
3 position exhaust center/NVFR2410-○T
3 position pressure center/NVFR2510-○T



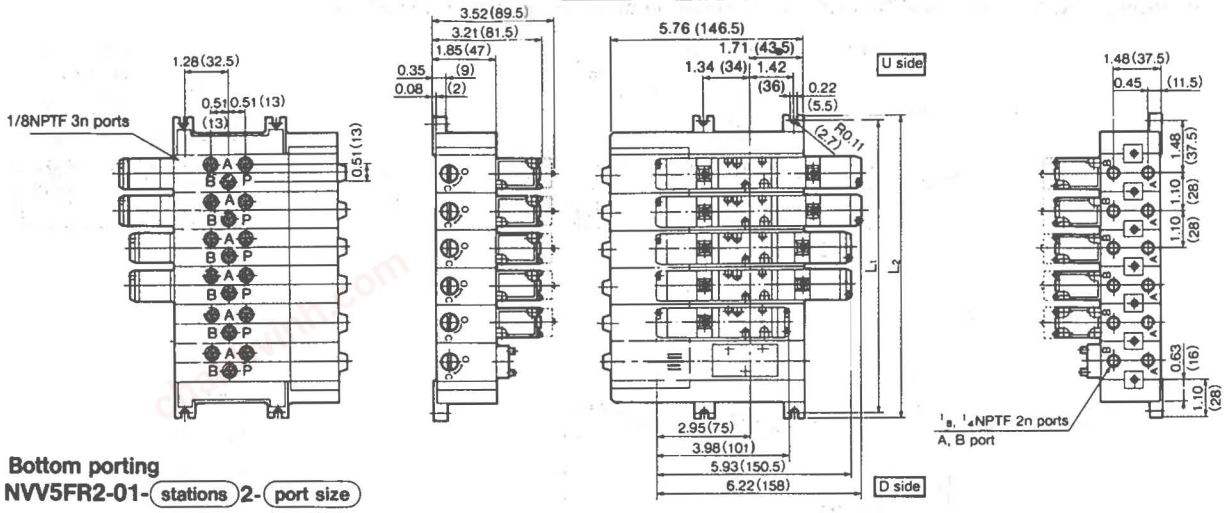
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Series NVFR2000:Base Mounted Type

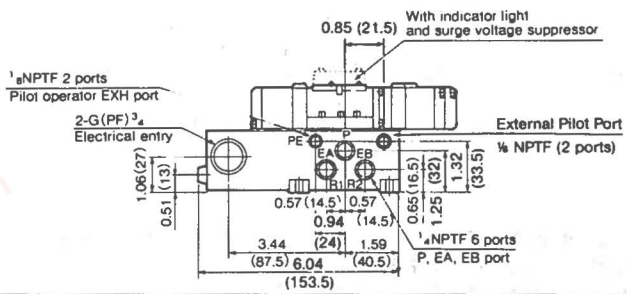
Manifold Plug-in Type/Non Plug-in Type/Dimensions

inch(mm)

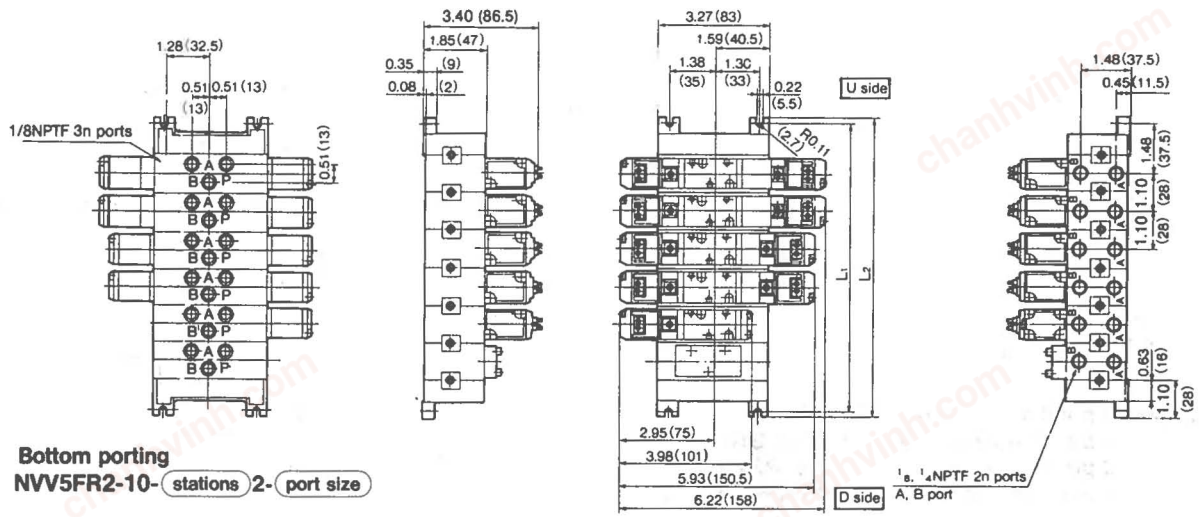
Plug-in type (connector plug with lead wire):NVV5FR2-01- (stations) 1- (port size)



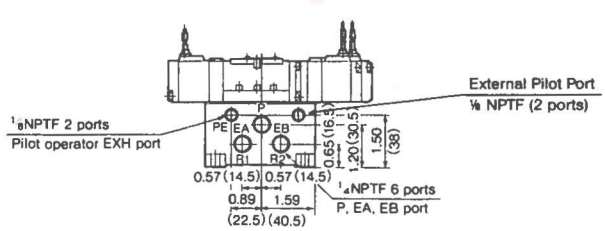
Bottom porting
NVV5FR2-01- (stations) 2- (port size)



Non plug-in type:NVV5FR2-10- (stations) 1- (port size)



Bottom porting
NVV5FR2-10- (stations) 2- (port size)



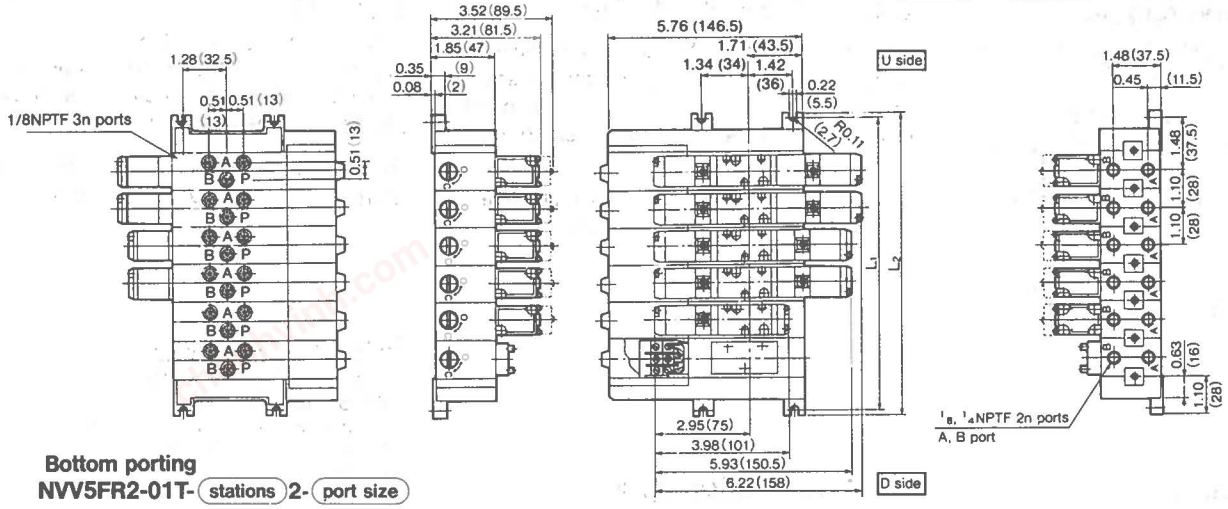
inch(mm) n: stations

L station	1	2	3	4	5	6	7	8	9	10	Equation
L_1	2.95 (75)	4.06 (103)	5.16 (131)	6.26 (159)	7.36 (187)	8.46 (215)	9.57 (243)	10.67 (271)	11.77 (299)	12.87 (327)	$L_1=1.10\times n+1.85$ ($L_1=28\times n+47$)
L_2	3.31 (84)	4.41 (112)	5.51 (140)	6.61 (168)	7.72 (196)	8.82 (224)	9.92 (252)	11.02 (280)	12.13 (308)	13.23 (336)	$L_2=1.10\times n+2.20$ ($L_2=28\times n+56$)

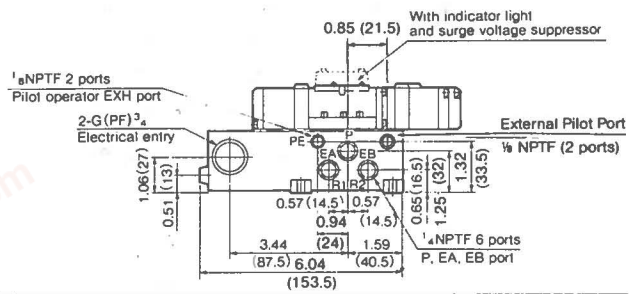
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Manifold Plug-in Type: One-piece type, Unit type of junction cover/Dimensions inch (mm)

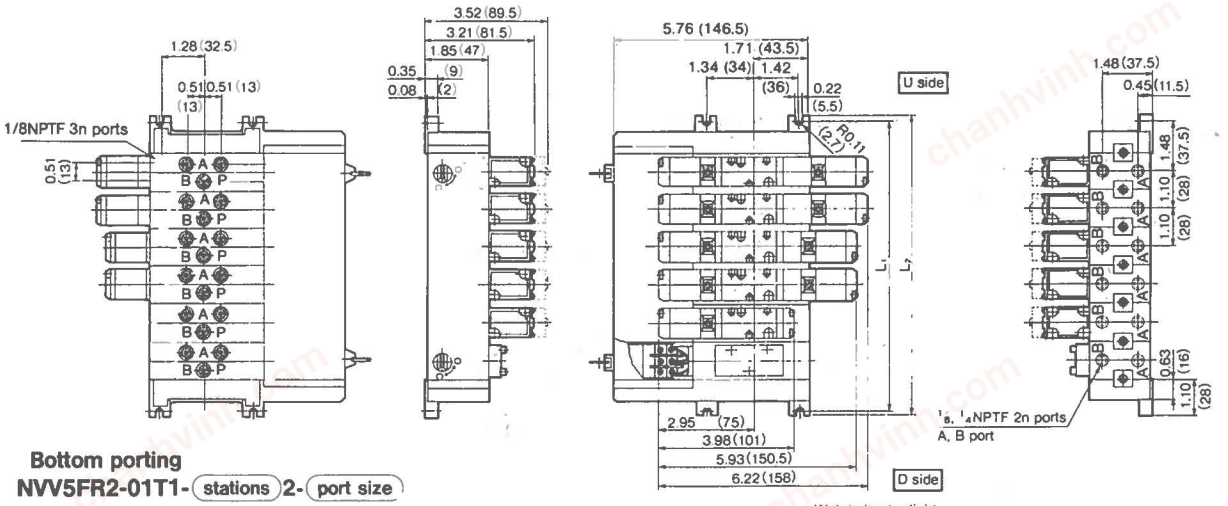
Plug-in type with terminal block (unit type individual junction covers):NVV5FR2-01T- (stations) 1- (port size)



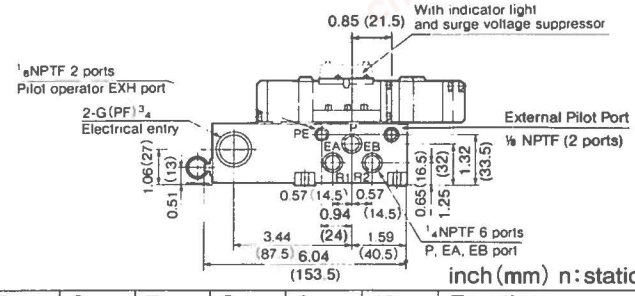
Bottom porting
NVV5FR2-01T- (stations) 2- (port size)



Plug-in type with terminal block (one-pc. type junction cover):NVV5FR2-01T1- (stations) 1- (port size)



Bottom porting
NVV5FR2-01T1- (stations) 2- (port size)



inch (mm) n: stations

station	1	2	3	4	5	6	7	8	9	10	Equation
L_1	2.95 (75)	4.06 (103)	5.16 (131)	6.26 (159)	7.36 (187)	8.46 (215)	9.57 (243)	10.67 (271)	11.77 (299)	12.87 (327)	$L_1=1.10\times n+1.85$ ($L_1=28\times n+47$)
L_2	3.31 (84)	4.41 (112)	5.51 (140)	6.61 (168)	7.72 (196)	8.82 (224)	9.92 (252)	11.02 (280)	12.13 (308)	13.23 (336)	$L_2=1.10\times n+2.20$ ($L_2=28\times n+56$)

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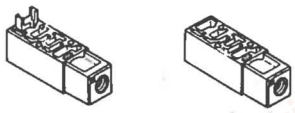
Series NVFR2000:Base Mounted Type

Manifold/Option Parts Ass'y

SUP Relocation spacer

An individual SUP spacer on manifold block can form individual P port for the valve.

Body type		Plug-in type	Non plug-in type
Part No.	1/8NPTF	NVVFS2000-P-01T-1	NVVFS2000-P-01T-2
	1/4NPTF	NVVFS2000-P-02T-1	NVVFS2000-P-02T-2



EXH gallery block disc

When valve exhaust affects the other stations on the circuit or when the reverse pressure valve is used on a standard manifold, insert EXH block disc(s) in between stations to isolate valve exhaust.

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



Blank plate

When disassembling valve for maintenance purposes or when spare manifold stations are required, install Blank plate on the manifold block.

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

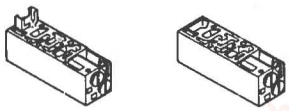
Other Options Available:

(See NVFS Series Catalog)
- Air Shutoff Valve spacer
- Single-check Drop Guard spacer
- Double-check "Perfect" spacer
- Control Unit

Interface speed control

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

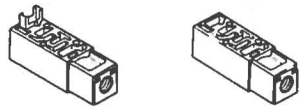
Body type	Plug-in type	Non plug-in type
Part No.	VVFS2000-20A-1	VVFS2000-20A-2



EXH Relocation spacer

An individual EXH spacer on manifold block can form individual EXH port for the valve.

Body type		Plug-in type	Non plug-in type
Part No.	1/8NPTF	NVVFS2000-R-01T-1	NVVFS2000-R-01T-2
	1/4NPTF	NVVFS2000-R-02T-1	NVVFS2000-R-02T-2



SUP gallery block disc

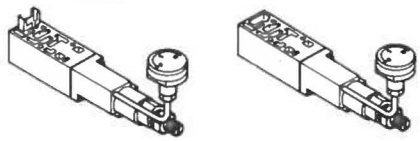
When supplying manifold with more than one pressure, insert block disc in between stations subjected to different pressures.

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

Interface regulator

Spacer type regulating valve on manifold block can regulate the pressure to the valve. Available with standard gauge.

Body type	Plug-in type	Non plug-in type
Pressure Regulation P	NARBF2000-00-P-1	NARBF2000-00-P-2



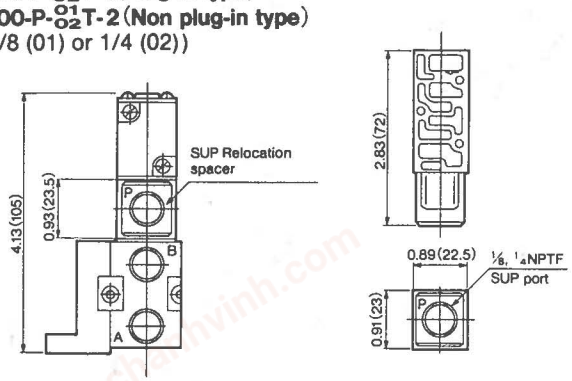
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Manifold/Option Parts Plug-in Type/Non Plug-in Type/Dimensions

inch (mm)

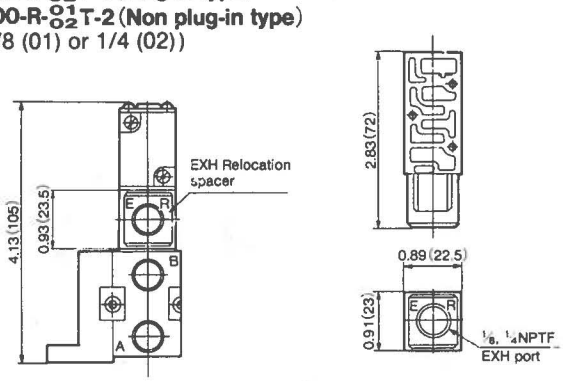
SUP Relocation spacer

NVVFS2000-P-$^{01}_{02}$T-1 (Plug-in type)
NVVFS2000-P-$^{01}_{02}$T-2 (Non plug-in type)
(Specify 1/8 (01) or 1/4 (02))



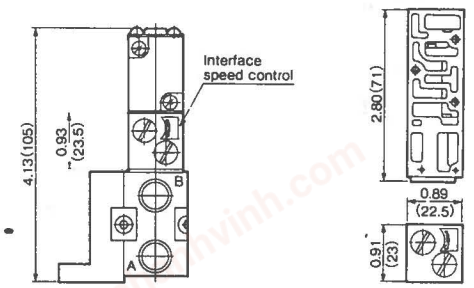
EXH Relocation spacer

NVVFS2000-R-$^{01}_{02}$T-1 (Plug-in type)
NVVFS2000-R-$^{01}_{02}$T-2 (Non plug-in type)
(Specify 1/8 (01) or 1/4 (02))



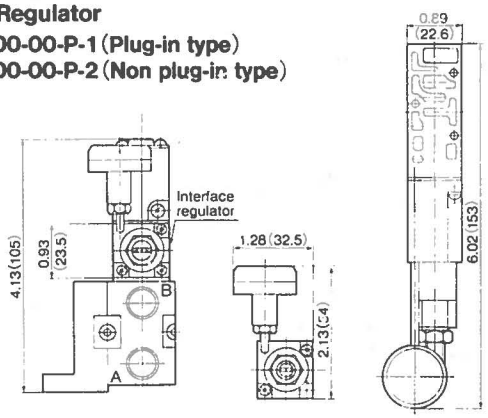
Interface Speed Control

VVFS2000-20A-1 (Plug-in type)
VVFS2000-20A-2 (Non plug-in type)



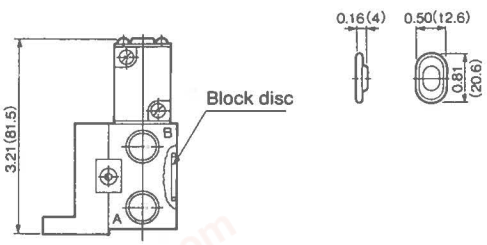
Interface Regulator

NARBF2000-00-P-1 (Plug-in type)
NARBF2000-00-P-2 (Non plug-in type)



SUP/EXH gallery block disc

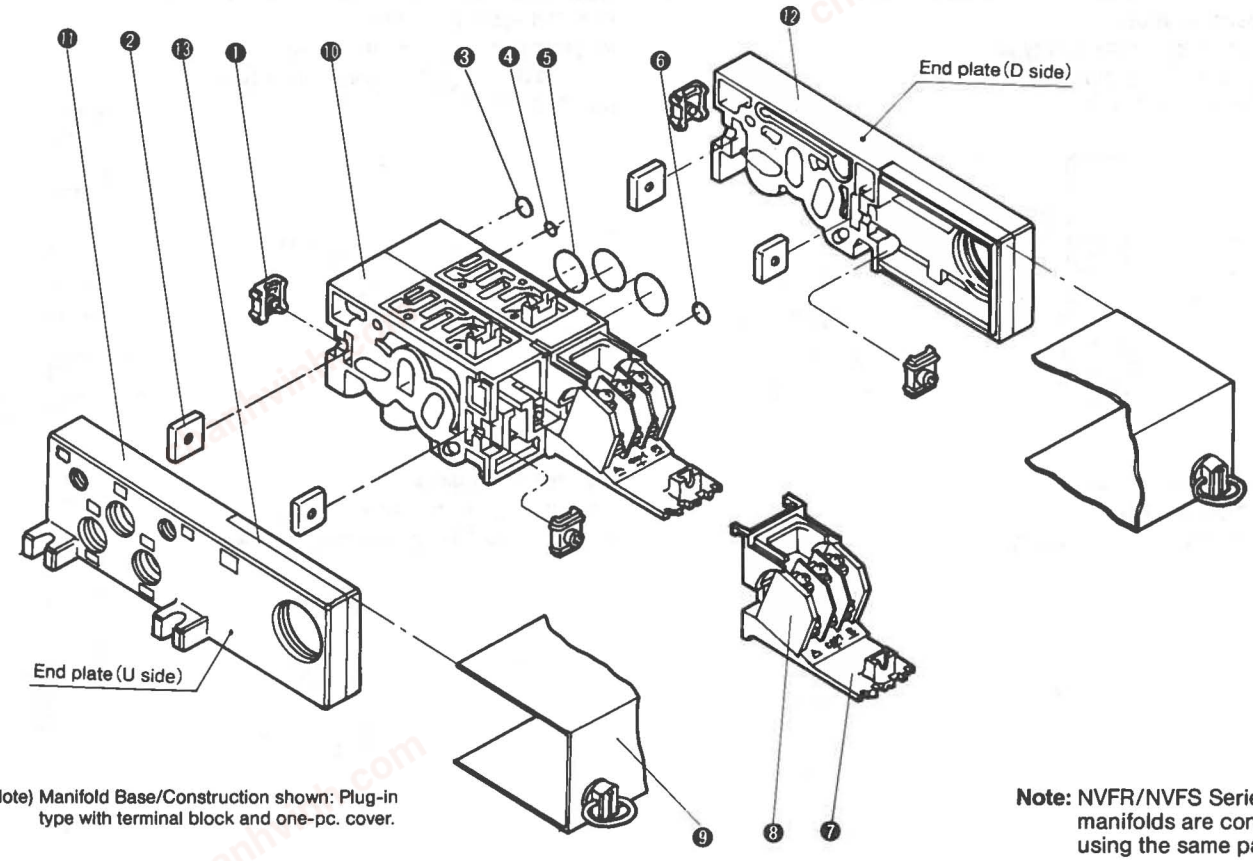
AXT 625-12A



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Series NVFR2000:Base Mounted Type

Manifold Base/Construction Plug-in Type/Non Plug-in Type



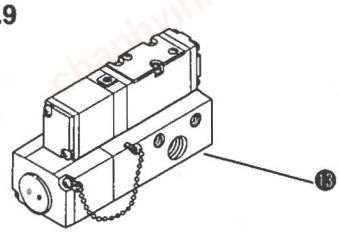
Note) Manifold Base/Construction shown: Plug-in type with terminal block and one-pc. cover.

Note: NVFR/NVFS Series manifolds are constructed using the same parts.

Parts List

No.	Description	Material	Part No.
❶	Clamp A	Steel plate	AXT625-4A
❷	Clamp B	Steel plate	
❸	O-ring	NBR	AXT050-031
❹	O-ring	NBR	AXT625-36
❺	O-ring (3 req'd)	NBR	AXT625-34
❻	O-ring	NBR	AXT625-35
❼	Adapter	–	AXT625-28-1
❽	Terminal ass'y	–	AXT625-28-2A
❾	Conduit cover ass'y	–	NVVF2000-4A- (stations)

Subplate Base
Cv:0.9



Note) Subplate shown: Plug-in type with terminal.

Main Parts sub-ass'y

No.	Description	Part No. **Note)**	Component parts			Applicable manifold base
❿	Manifold block ass'y *: **0**-side ports A, B **1**-1/8 P, A, B bottom **2**-1/8 P, A, B bottom w/ (1/4 A, B side)	MBF261*-$^{01}_{02}$-1B	Manifold block ❿, Clamp ❶, ❷. O-ring ❸, ❹, ❺, ❻ Adapter ❼, Pin housing. Guide. Insert plug lead wire			Plug-in type Connector lead wires
		MBF261*-$^{01}_{02}$-1A	Manifold block ❿, Clamp ❶, ❷. O-ring ❸, ❹, ❺, ❻ Adapter ❼. Terminal ❽. Pin housing. Guide.			Plug-in type With terminal block
		MB261*-$^{01}_{02}$-1	Manifold block ❿. Metal joint ❶. ❷. O-ring ❺, ❻, ❼			Non plug-in type
⓫	End plate (kit) ass'y	ME263LR-02-1	End plate (U) ⓫, End plate (D) ⓬, Clamp ❶, ❷. O-ring ❸, ❹, ❺, ❻. Conduit Plug.			Plug-in type Connector lead wires With terminal block.
⓬		ME272LR-02-1	End Plate (U) ⓫, End plate (D) ⓬, Clamp ❶, ❷. O-ring ❸, ❹, ❺, ❻.			Non plug-in type
⓭	Subplate ass'y †	SPF0191-$^{01}_{02}$	Plug-in type with terminal block	SP0191-$^{01}_{02}$	Non Plug-in type	⅛, ¼ NPTF Side Ports
		SPF0193-$^{01}_{02}$		SP0193-$^{01}_{02}$		1/8NPTF side & 1/4NPTF bottom ports

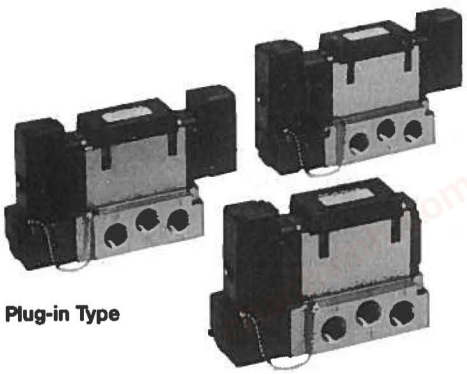
⓰ †External pilot type order SPF0191R–**

Note) A,B ports:
01 (1/8NPTF); **02** (1/4NPTF)

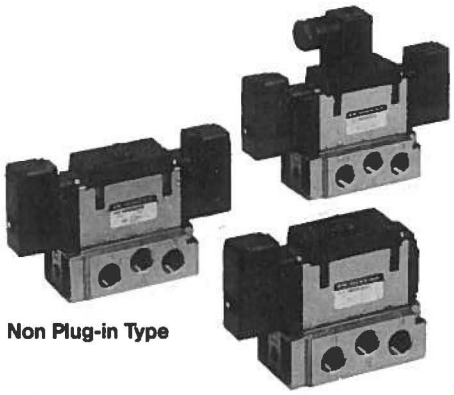
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Cv: 2.1 / 2.3

5 Port Pilot Type/Rubber Seal
Series NVFR3000
Plug-in Type, Non Plug-in Type

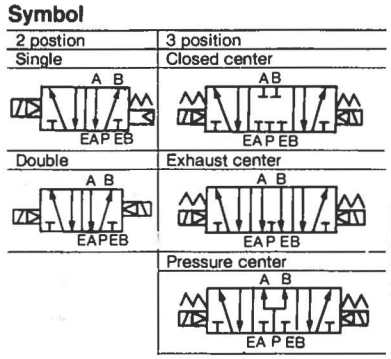


Plug-in Type



Non Plug-in Type

Symbol



(Additional function achieved by using external pilot option).

Model

Position / No. of solenoid		Type		Port size (NPTF)	Cv factor	Max. Operating cycle CPM	Response time (ms)	Weight lbs (kgf)
		Plug-in	Non Plug-in					
2 position	Single	**NVFR3100**	**NVFR3110**	1/4	2.1	300	30 or less	0.68 (0.31)
				3/8	2.3			
	Double	**NVFR3200**	**NVFR3210**	1/4	2.1	300	30 or less	0.90 (0.41)
				3/8	2.3			
3 position	Closed center	**NVFR3300**	**NVFR3310**	1/4	1.9	180	50 or less	0.95 (0.43)
				3/8	2.0			
	Exhaust center	**NVFR3400**	**NVFR3410**	1/4	1.9	180	50 or less	0.95 (0.43)
				3/8	2.0			
	Pressure center	**NVFR3500**	**NVFR3510**	1/4	2.2	180	50 or less	0.95 (0.43)
				3/8	2.3			

※ The figures listed are without subplate. In case of plug-in subplate or non plug-in subplate, and 0.65 lbs., and 0.59 lbs. respectively.
† Special Order

Standard Specifications

Valve	Fluid		Air
	Max. operating pressure		130 PSI (9.0kgf/cm²)
	Min. operating pressure		30 PSI (2.0kgf/cm²)
	Ambient and fluid temperature		32~120°F (0~+50°C)
	Lubrication		Not required
	Pilot operator manual override		Non-locking push type (Flush)
	Protection construction		Dust proof
Electrical	Rated voltage	AC	110V 5%₀Hz 220V 5%₀Hz, 24V 5%₀Hz
		DC	12V, 24V
	Allowable voltage range		−15 ~ +10% rated voltage
	Coil insulation		Class B or equivalent
	Apparent power (Power consumption) AC	Inrush	5.0VA/60Hz, 5.6VA/50Hz
		Holding	2.3VA(1.5W)60Hz,3.4VA(2.1W)50Hz
	Power consumption DC		1.8W
	Electrical entry	Plug-in	Conduit terminal (base access)
		Non plug-in	DIN connector, Grommet terminal

*Optional Specifications**

Pilot type		Note) External pilot type
Manual override	Pilot operator	Non-locking push type (extended), Lock type (screw), Lock type (lever)
Voltage	AC	100V 5%₀Hz, 200V 5%₀Hz
	DC	6V, 48V, 100V
Porting		Bottom ported subplate
Option		With indicator light and surge voltage suppressor

Note) Operating pressure: 0~130PSI (0~9.0kgf/cm²)
Pilot operating pressure: 30~130PSI (2~9.0kgf/cm²)
*Some options listed as "Special Order" items.

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Series NVFR3000: Base Mounted Type

How to Order

Body type
O-Plug in



Electrical entry
F-Through base



Porting

—	Side
※B	Bottom

※ Special order

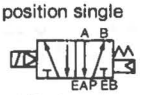
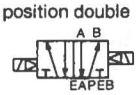
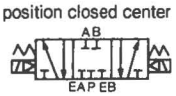
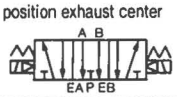
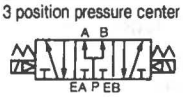
Port size

—	Without subplate
02T	1/4 NPTF
※03T	3/8 NPTF

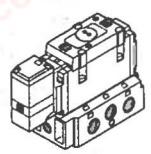
※ Not available for bottom ported.
(See pg. 28 for individual subplates)

Plug-in	NVFR3	1	0	0			3	F												02T		
Non Plug-in	NVFR3	2	1	1			4	D												02T		

Symbol

1	2 position single 
2	2 position double 
3	3 position closed center 
4	3 position exhaust center 
5	3 position pressure center 

Body type
1—Non plug-in



Manual option

0	Standard
※1	Std. + Direct-manual

※ Special order

Pilot operator

—	Internal
※R	External

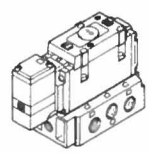
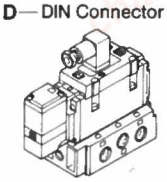
※ Special order

Voltage

※1	100VAC50/60HZ
※2	200VAC50/60HZ
3	110VAC50/60HZ
4	220VAC50/60HZ
5	24VDC
6	12VDC
※9	Others Note 1)

※ Special order
Note 1) indicate in parentheses at end of part no.
Ex. (AC24V).

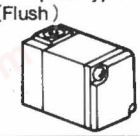
Electrical entry

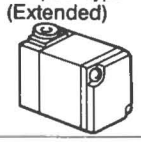
E—Grommet terminal	D—DIN Connector
	

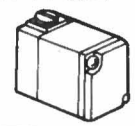
Option

—	Note
Z	With indicator light and surge voltage suppressor

Pilot operator manual override/ classification

二 —Non-locking push type (Flush)


※A—Non-locking push type (Extended)


B-Lock type (Screw type)


※C—Lock type (Lever type)

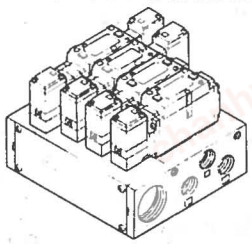

※ Special Order.

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Manifold Specifications

Plug-in Type: With Terminal Blocks

●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.



NVV5FR3 — 01T — 06 1 — 02T

Series NVFR3000 Manifold valve

Plug-in type With terminal block

Stations

02	2 stations
⋮	⋮
10	10 stations

Porting Symbol

Symbol	Port specifications P	Port specifications EA, EB	Porting Specifications (A,B)
1	Common	Common	Side
※2			Bottom
※M	Mixed		See pg. 46

※Special Order

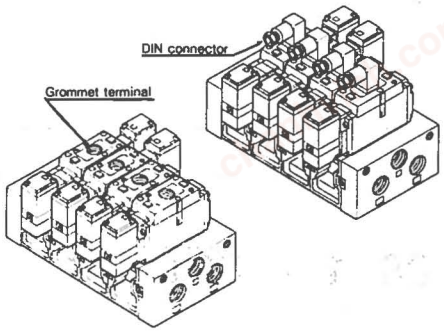
Port size

Symbol	P,EA,EB
02T	1/4NPTF
03T	3/8NPTF

Bottom ported 1/4NPTF only.

Non Plug-in Type: Grommet Terminal/ DIN Connector

● Individual wiring for each valve



NVV5FR3 — 10 — 05 1 — 02T

Series NVFR3000 Manifold valve

Non plug-in type

Stations

02	2 stations
⋮	⋮
10	10 stations

Porting Symbol

Symbol	Port specifications P	Port specifications EA, EB	Porting Specifications (A,B)
1	Common	Common	Side
※2			Bottom
※M	Mixed		See pg. 46

※Special Order

Port size

Symbol	P,EA,EB
02T	1/4NPTF
03T	3/8NPTF

Bottom ported 1/4NPTF only

See "How to Order Manifold Assemblies," pg. 46

Manifold Specifications

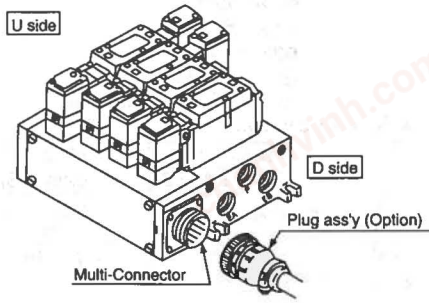
Base mounted type	Wiring	Porting specifications A,B port	Port size P,EA,EB	Port size A,B	No. of Stations	Applicable solenoid valve
Plug-in type NVV5FR3-01T	With terminal blocks	Side, Bottom	½ NPTF	¼,⅜ NPTF	2-10	NVFR3○00-OF
Non plug-in type NVV5FR3-10	DIN Connector Grommet terminal				2-10	NVFR3○10-OD NVFR3○10-OE

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Series NVFR2000: Base Mounted Type

Plug-in Type: With Multi-Connector

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



NVV5FR3 — 01C D — 05 1 — 02T

Series NVFR3000 Manifold valve

Plug-in type With multi connector

Mounting direction of connector

D	D side mounting
U	U side mounting

Stations

02	2 stations
:	:
08	8 stations

※ Max: 8 stations

Symbol

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

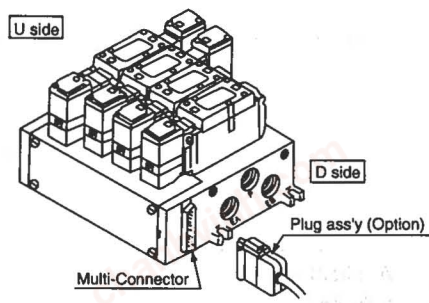
※ Bottom porting: ¼ only

Port size

Symbol	P,EA,EB	A,B
02T	½ NPTF	¼ NPTF
03T		⅜ NPTF

Plug-in Type: With D-Sub Connector

- Wide range of interchangeability (MIL Spec DIN type connector terminal 25 pin.)
- Quick wiring permits ease of installation



NVV5FR3 — 01F D — 06 1 — 02T

Series NVFR3000 Manifold valve

Plug-in type With D-sub connector

Mounting direction of connector

D	D side mounting
U	U side mounting

Stations

02	2 stations
:	:
08	8 stations

※ Max: 8 stations

Symbol

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

※ Bottom porting: ¼ only

Port size

Symbol	P,EA,EB	A,B
02T	½ NPTF	¼ NPTF
03T		⅜ NPTF

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Plug-in Type: Serial Interface Manifold

NVV5FR3 — 01SU — (08) (1) — (02T) — (X200)

- The use of serial interface technology offers advantages such as reduced wiring, quicker installation time, easier start-up and simplified maintenance.

Stations

02	2 stations
:	:
*11	11 stations

* Includes 1 station to mount SI unit.

Symbol

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

* Bottom porting: ¼ only

Port size

Symbol	P, EA, EB	A, B
02T	½ NPTF	¼ NPTF
03T		⅜ NPTF

***SI option**

–	For standard ✳✳1 type modules
X200	For AB2 modules

*SI module must be orderd separately

Series IN313 Serial Interface Modules

IN313 — (AB) (1)

Protocal

AB	Allen Bradley
DN	DeviceNet
MB	Mitsubishi
PR	Profibus
TA	Omron

Output/Inputs

1	16 outputs
2	32 outputs/32 inputs (Available on Allen Bradley only)

AB2 Accessories

Part #	Description
VVZR3000-21A-6-X2	D-sub cable with connectors on both ends
EX300-IB1-AB	Input Base Unit
EX300-IE1-AB	Input Expander Unit

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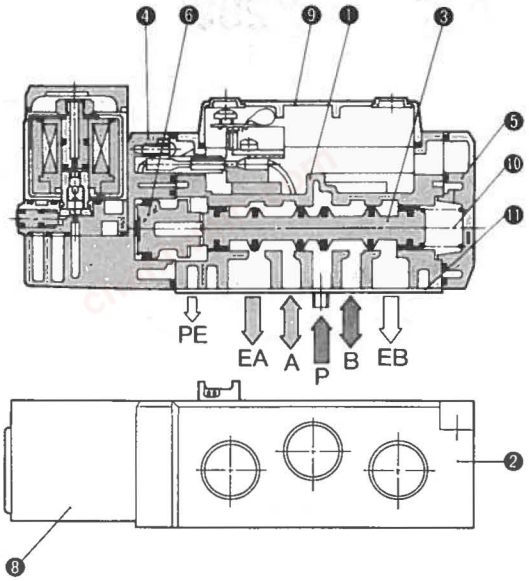
Series NVFR3000:Base Mounted Type

Construction/Parts List

NVFR31○0



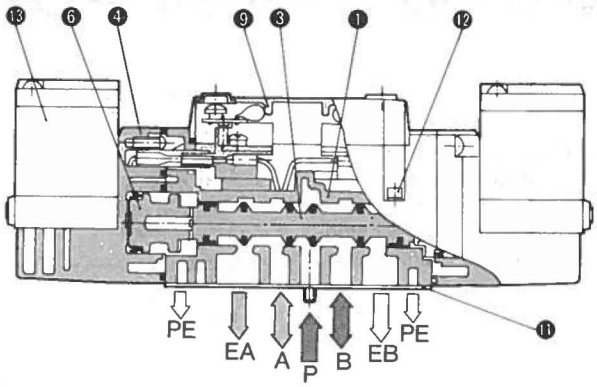
2 position single



NVFR32○0

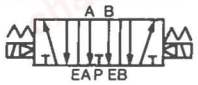


2 position double





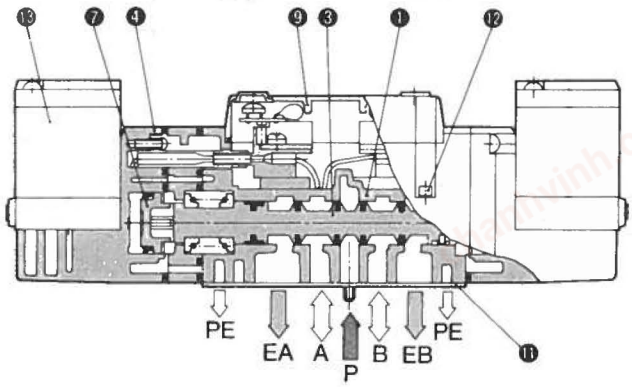
Exhaust center/NVFR34○0



Pressure center/NVFR35○0



3 position closed center／Exhaust center／Pressure center



Main Parts

No.	Description	Material	Note
❶	Body	Aluminum diecast	Platinum silver
❷	Subplate	Aluminum diecast	Platinum silver
❸	Spool	Aluminum/NBR	
❹	Adapter plate	Resin	Black
❺	End plate	Resin	Black

No.	Description	Material	Note
❻	Piston	Resin	
❼	Piston	Resin	
❽	Junction cover	Resin	
❾	Lamp cover	Resin	
❿	Return spring	SUS	

Spare Parts

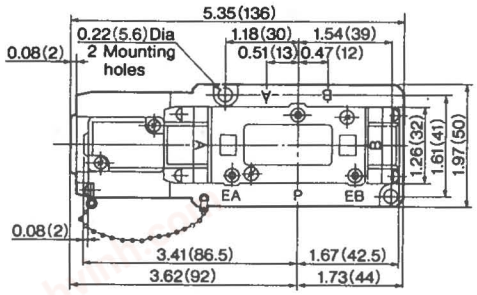
No.	Description	Material	Part Nos.		
			NVFR31○0	**NVFR32○0**	**NVFR33○0, 34○0, 35○0**
⓫	Gasket	NBR	VFS3000-20	VFS3000-20	VFS3000-20
⓬	Valve mounting bolt	Steel	AXT632-3 (M3X32)	AXT632-3 (M3X32)	AXT632-3 (M3X32)
⓭	Pilot Ass'y	–	SF4-※F※-70		

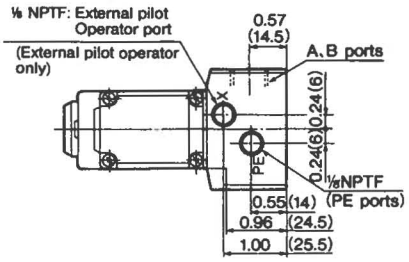
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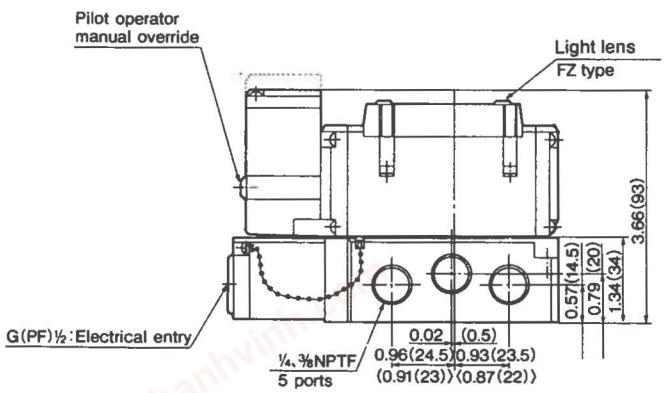
Plug-in type 2 Position Single, 3 Position/Dimensions

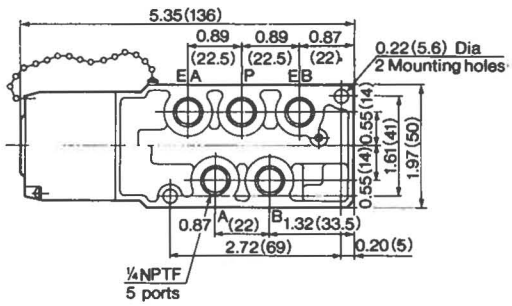
inch(mm)

2 position single:NVFR3100-○F







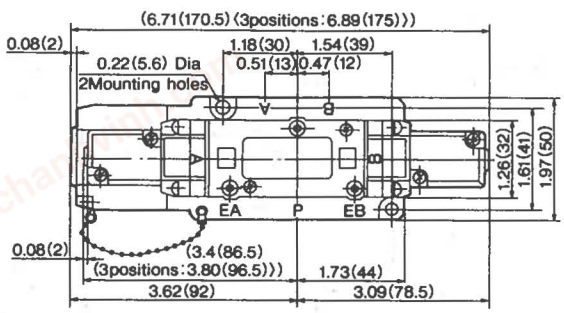


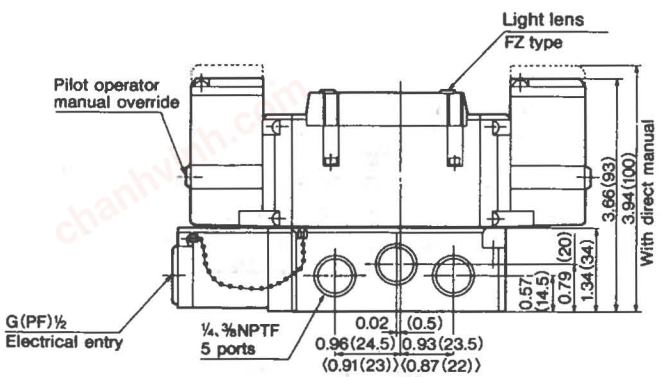
Bottom Ported

〈 〉:¼NPTF

---

2 position double:NVFR3200-○F
3 position closed center:NVFR3300-○F
3 position exhaust center:NVFR3400-○F
3 position pressure center:NVFR3500-○F





〈 〉:1/4NPTF

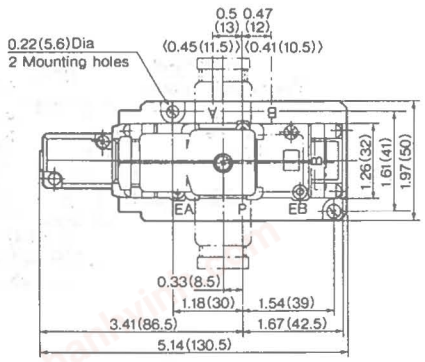
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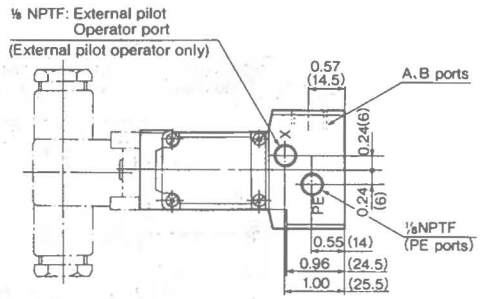
Series NVFR3000:Base Mounted Type

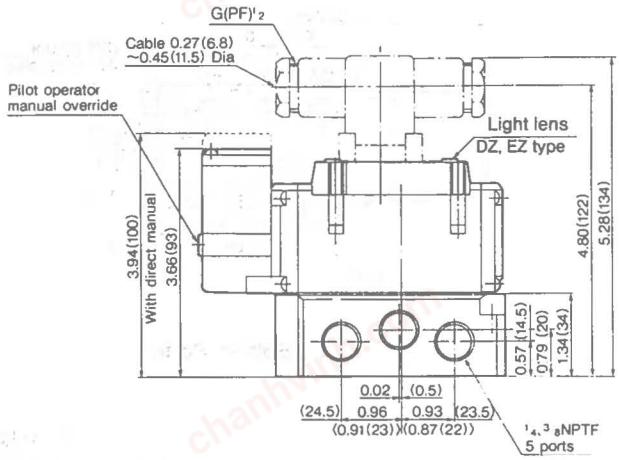
Non plug-in type 2 position single, double, 3 position/Dimensions

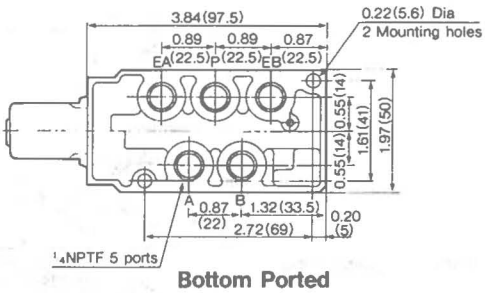
inch(mm)

2 position single:NVFR3110-○E, NVFR3110-○D



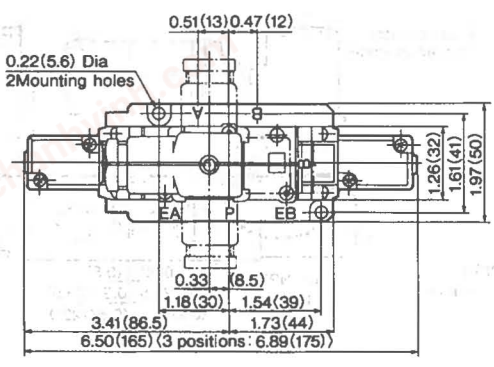


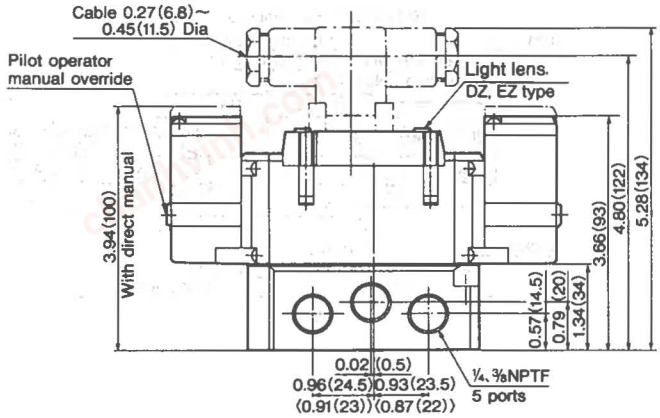




⟨ ⟩:¼NPTF

2 position double:NVFR3210-○E, NVFR3210-○D
3 position closed center:NVFR3310-○E, NVFR3310-○D
3 position exhaust center:NVFR3410-○E, NVFR3410-○D
3 position pressure center:NVFR3510-○E, NVFR3510-○D





⟨ ⟩:¼NPTF

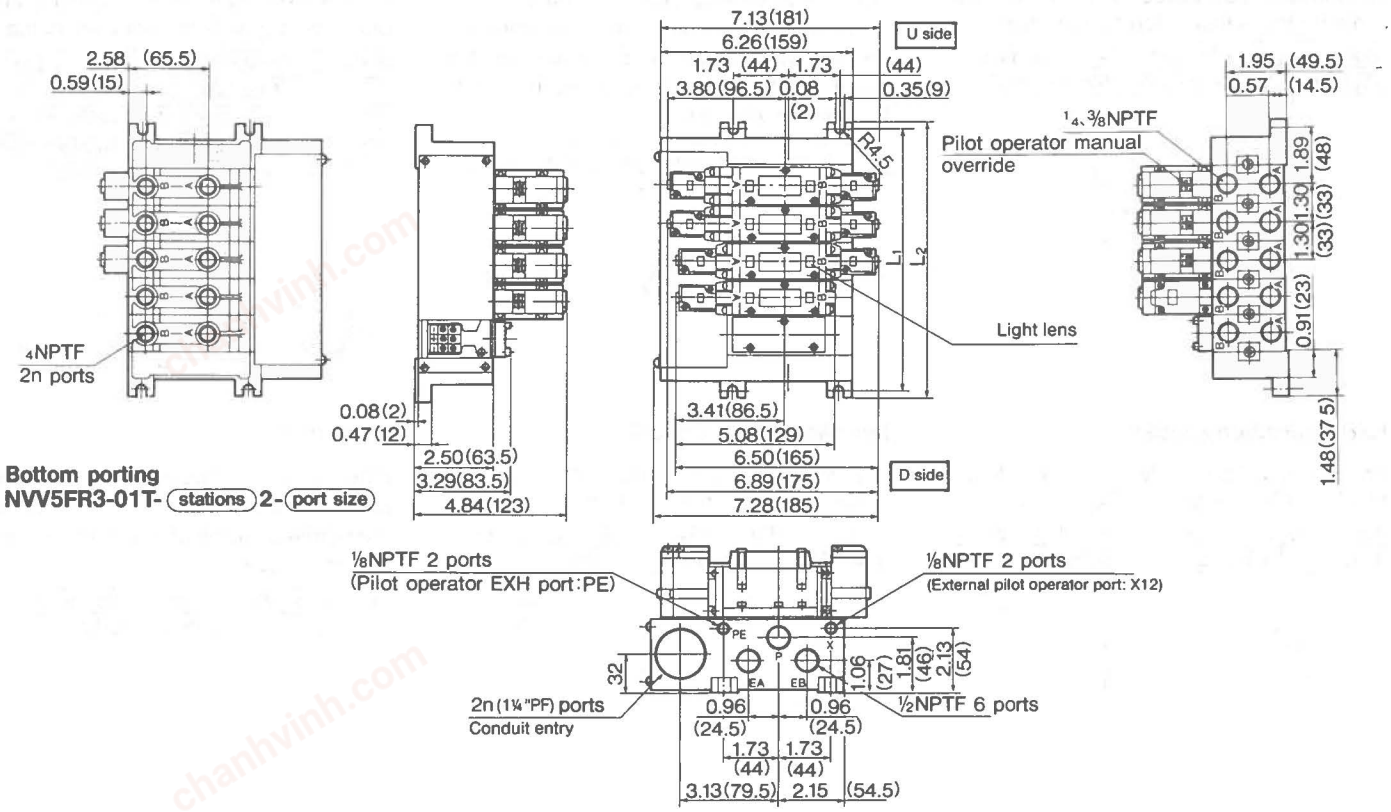
⟨ ⟩:¼NPTF

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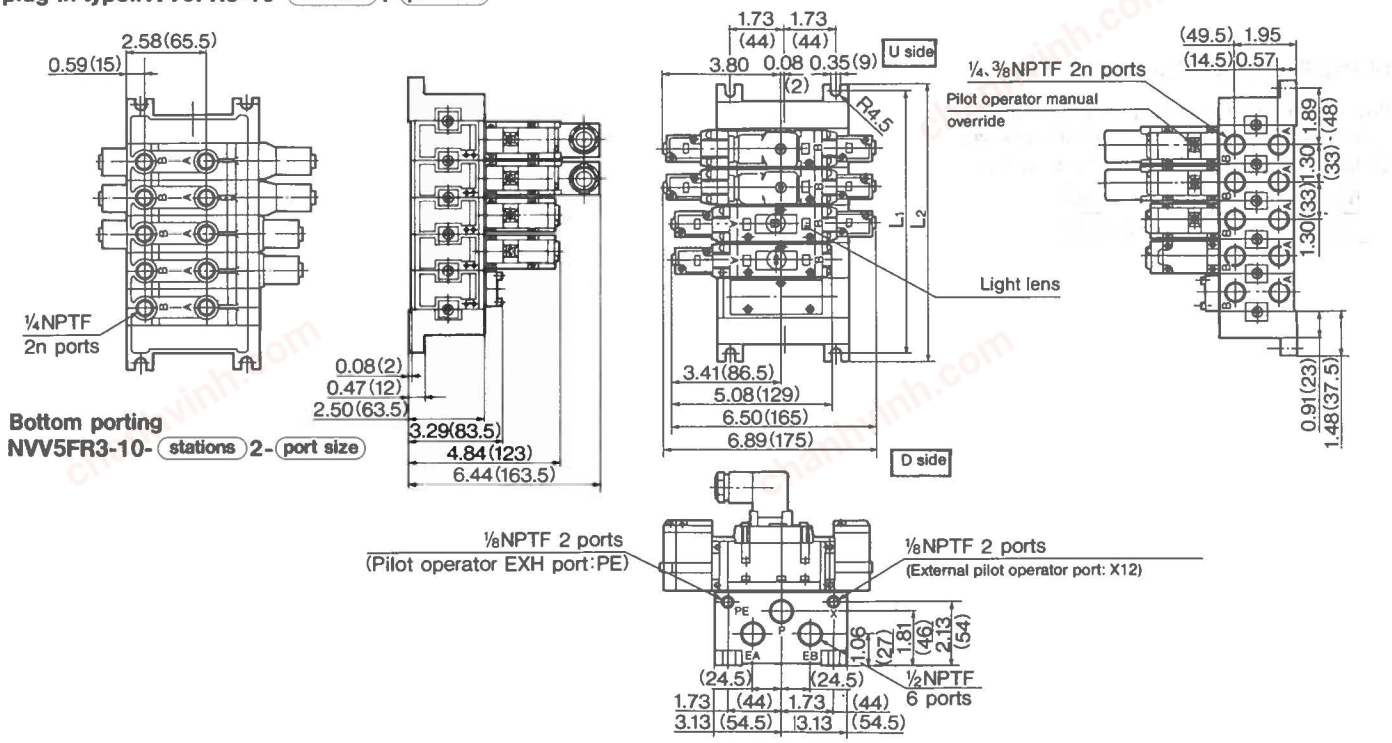
Manifold Plug-in Type / Non Plug-in Type / Dimensions

inch(mm)

Plug-in type (with terminal block):NVV5FR3-01T- stations 1- port size



Non plug-in type:NVV5FR3-10- stations 1- port size



inch(mm), n: stations

L \ stations	2	3	4	5	6	7	8	9	10	Equation
L_1	5.08 (129)	6.38 (162)	7.68 (195)	8.98 (228)	10.28 (261)	11.57 (294)	12.87 (327)	14.17 (360)	15.47 (393)	$L_1=1.30\times n+2.48$ ($L_1=33\times n+63$)
L_2	5.55 (141)	6.85 (174)	8.15 (207)	9.45 (240)	10.75 (273)	12.05 (306)	13.35 (339)	14.65 (372)	15.94 (405)	$L_2=1.30\times n+2.95$ ($L_2=33\times n+75$)

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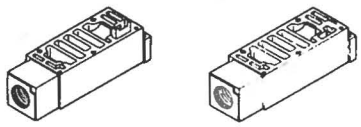
Series NVFR3000:Base Mounted Type

Manifold/ Option Parts

SUP Relocation spacer

An individual SUP spacer on manifold block can form individual P port for the valve.

Body type	Plug-in type	Non plug-in type
Part No.	NVVFS3000-P-03T-1	NVVFS3000-P-03T-2



EXH gallery block disc

When valve exhaust affects the other stations on the circuit or when the reverse pressure valve is used on a standard manifold, insert EXH block disc(s) in between stations to separate valve exhaust.

Body type	Plug-in type	Non plug-in type
Part No.	AZ703-59A	

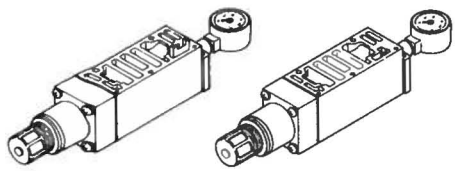


Interface regulator

Spacer type regulating valve on manifold block can regulate the pressure to the valve.

Body type	Plug-in type	Non plug-in type
Pressure regulation P	NARBF3050-N0-P-1	NARBF3050-N0-P-2
Pressure regulation A	NARBF3050-N0-A-1	NARBF3050-N0-A-2
Pressure regulation B	NARBF3050-N0-B-1	NARBF3050-N0-B-2

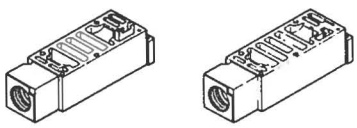
Note) For pressure center type valves, use p/n NARBF3000.



EXH Relocation spacer

An individual EXH spacer on the manifold block can form individual R port for the valve.

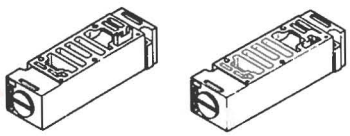
Body type	Plug-in type	Non plug-in type
Part No.	NVVFS3000-R-03T-1	NVVFS3000-R-03T-2



Interface Speed Control

Needle valve 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



Blank plate

When disassembling valve for maintenance purposes or when spare manifold stations are required, install Blank plate on the manifold block.

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

SUP gallery block disc

When supplying manifold with more than one pressure, insert block disc in between stations subjected to different pressures.

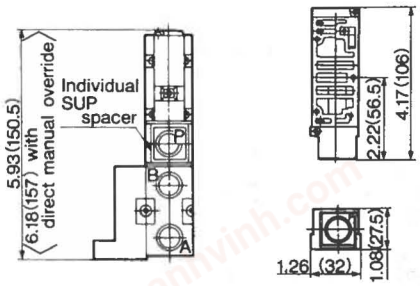
Body type	Plug-in type	Non plug-in type
Part No.	AZ703-59A	

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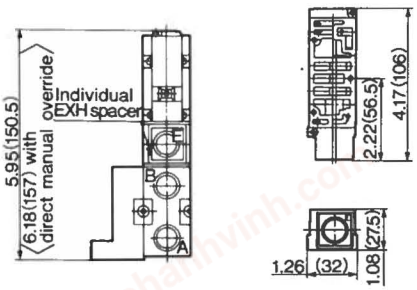
Manifold / Option Parts Plug-in Type / Non Plug-in Type / Dimensions

inch(mm)

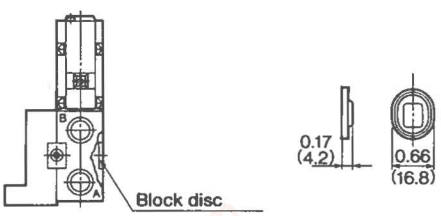
SUP Relocation spacer
NVVFS3000-P-03T-1 (Plug-in type)
NVVFS3000-P-03T-2 (Non plug-in type)



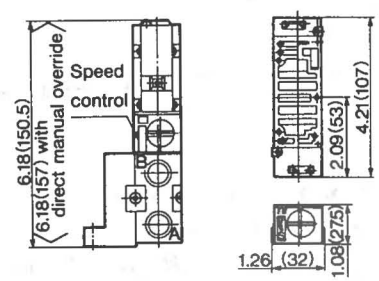
EXH Relocation spacer
NVVFS3000-R-03T-1 (Plug-in type)
NVVFS3000-R-03T-2 (Non plug-in type)



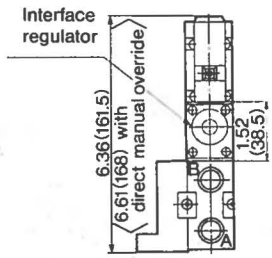
SUP/EXH gallery block disc: AZ703-59A

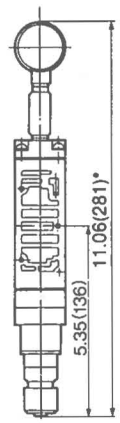


Interface speed control
VVFS3000-20A-1 (Plug-in type)
VVFS3000-20A-2 (Non plug-in type)

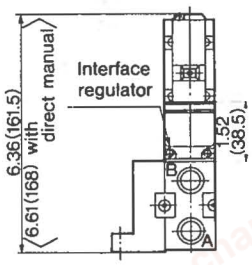


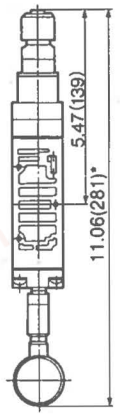
Interface regulator/regulation to P
NARBF3050-N0-P-1 (Plug-in type)
NARBF3050-N0-P-2 (Non plug-in type)



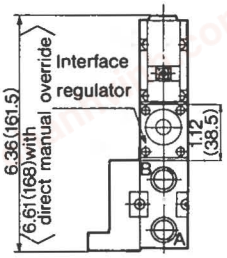


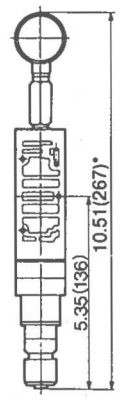
Interface regulator/regulation to A
NARBF3050-N0-A-1 (Plug-in type)
NARBF3050-N0-A-2 (Non plug-in type)





Interface regulator/regulation to B
NARBF3050-N0-B-1 (Plug-in type)
NARBF3050-N0-B-2 (Non plug-in type)



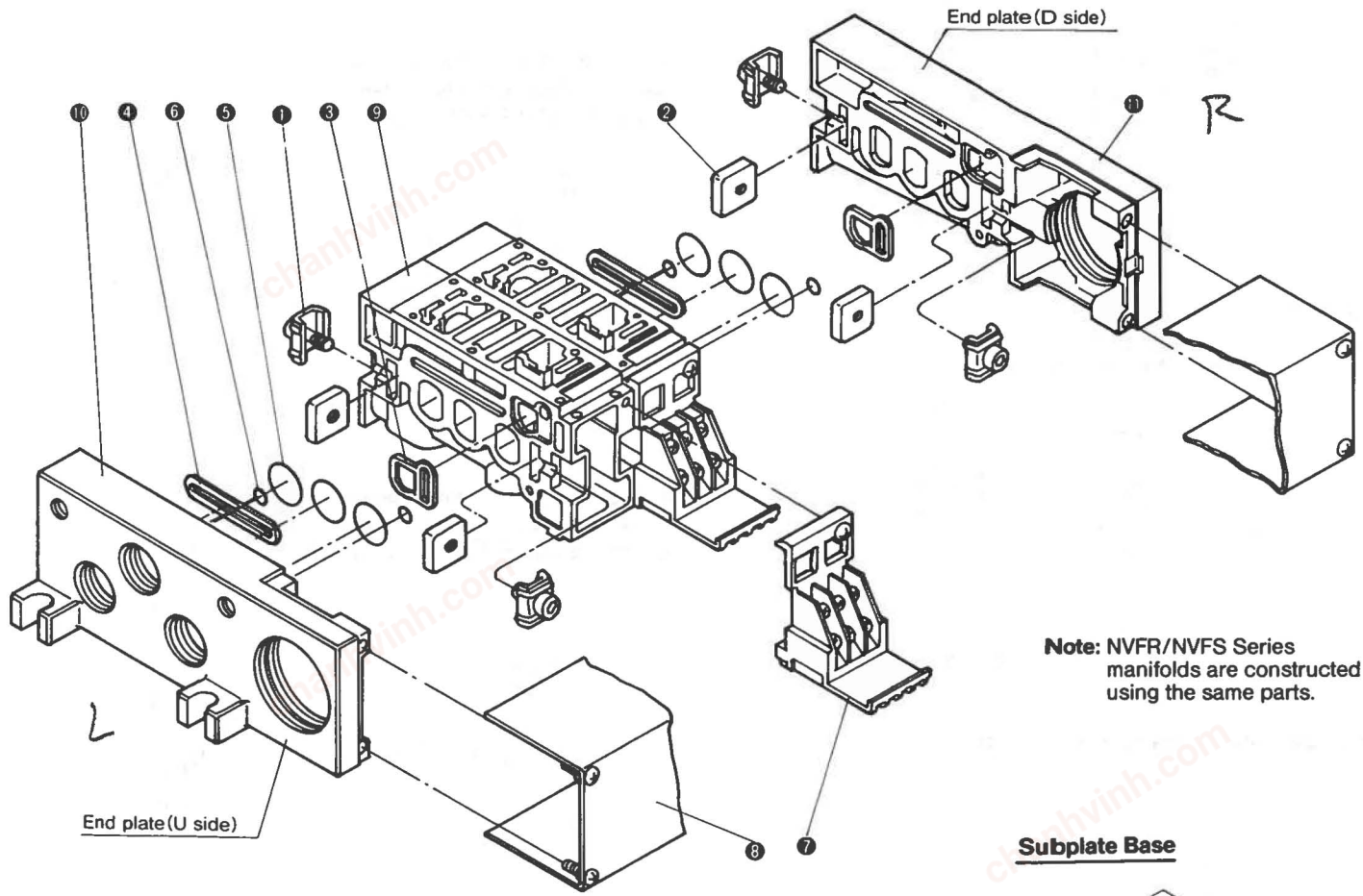


*gauge nipple sizes may vary slightly.

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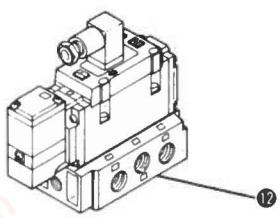
Series NVFR3000:Base Mounted Type

Manifold Base / Construction Plug-in Type / Non plug-in Type



Note: NVFR/NVFS Series manifolds are constructed using the same parts.

Subplate Base



Cv: 2.3
(⅜ NPTF)

Note) Subplate shown: Non plug-in type.

Parts List

No.	Description	Material	Part No.
❶	Metal clamp A	Steel plate	VVFS3000-5-2A
❷	Metal joint B	Steel plate	
❸	Gasket	NBR	VVFS3000-7
❹	Gasket	NBR	VVFS3000-8
❺	O-ring	NBR	19.8×16.6×1.6
❻	O-ring	NBR	6×3×1.5
❼	Terminal ass'y		VVFS3000-6A
❽	Conduit cover ass'y		VVFS3000-4A-(stations)

Note) Manifold Base/Construction shown: Plug-in type with terminal block.

Main Parts sub-ass'y

No.	Description	Part No. **Note)**	Component parts	Applicable valve
❾	Manifold block ass'y	MBF3610-$^{02}_{03}$-1 MBF3611-02-1	Manifold block ❾, Terminal ❼, Metal joint/clamp ❶,❷ Gasket ❸,❹ . O-ring ❺,❻ . Receptacle ass'y ❻	Plug-in type
		MBF371*-$^{02}_{03}$-1	Manifold block ❾. Joint/clamp ❶,❷ . Gasket ❸,❹ . O-ring ❺,❻	Non plug-in type
❿ ⓫	End plate (kit) ass'y	MEF363LR-04-1	End plates ⓫ . Joint/clamp ❶,❷ . Gasket ❸,❹ . O-ring ❺,❻	Plug-in type
		MEF373LR-04-1	End plates ⓫ . Joint/clamp ❶,❷ . Gasket ❸,❹ . O-ring ❺,❻	Non plug-in type
⓬	Subplate ass'y †	SPF028*-$^{02}_{03}$-D	Subplate Ass'y (see note below)	Plug-in type
		SPF027*-$^{02}_{03}$	Subplate Ass'y (see note below)	Non Plug-in type

Note) Manifold; **0**=side ports; **1**=bottom ports. Subplate: **1**=side ports; **2**=bottom ports (1/4" only).
All Bases: **02**=1/4"NPTF; **03**=3/8"NPTF.

†External pilot type order SPF02$^{7}_{8}$*R–**

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Cv: 3.6 / 3.7

5 Port Pilot Type/Rubber Seal
Series NVFR4000
Plug-in Type, Non Plug-in Type

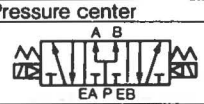


Plug-in type



Non plug-in type

Symbol

2 position	3 position
Single	Closed center
	
Double	Exhaust center
	
	Pressure center
	

(Additional functions achieved by using external pilot option).

Model

Position / No. of solenoid		Type		Port size (NPTF)	Cv factor	Max. Operating cycle CPM	Response time (ms)	Weight lbs (kgf)
		Plug-in	Non Plug-in					
2 position	Single	**NVFR4100**	**NVFR4110**	3/8	3.6	300	50 or less	1.35 (0.61)
				1/2	3.7			
	Double	**NVFR4200**	**NVFR4210**	3/8	3.6	300	50 or less	1.61 (0.73)
				1/2	3.7			
3 position	Closed center	**NVFR4300**	**NVFR4310**	3/8	3.2	180	70 or less	1.61 (0.73)
				1/2	3.2			
	Exhaust center	**NVFR4400**	**NVFR4410**	3/8	2.8	180	70 or less	1.61 (0.73)
				1/2	2.8			
	Pressure center	**NVFR4500**	**NVFR4510**	3/8	3.6	180	70 or less	1.61 (0.73)
				1/2	3.6			

※ The Figures listed are without subplate. In the case of plug-in subplate and non plug-in subplate, add 1.10lbs. (0.50kgf) and 0.95lbs. (0.43kgf) respectively.
† Special Order

Standard Specifications

Valve	Fluid		Air
	Max. operating pressure		130 PSIG (9.0kgf/cm²)
	Min. operating pressure	2•3 position	30 PSIG (2.0kgf/cm²)
		2 pos. dbl.	15 PSIG (1.0kgf/cm²)
	Ambient and fluid temperature		Note 1) 32~120°F (0~+50°C)
	Lubrication		Note 2) Not required
	Pilot operator manual override		Non-locking push type (Flush)
	Protection construction		Dust proof
Electrical	Rated voltage	AC	110V 50/60Hz 220 50/60Hz, 24V 50/60Hz
		DC	12V, 24V.
	Allowable voltage range		−15~+10% rated voltage
	Coil insulation		Class B or equivalent
	Apparent power (Power consumption) AC	Inrush	5.0VA/60Hz, 5.6VA/50Hz
		Holding	2.3VA(1.5W)60Hz, 3.4VA(2.1W)50Hz
	Power consumption DC		1.8W
	Electrical entry	Plug-in type	Conduit terminal (base access)
		Non plug-in type	Grommet terminal DIN connector

Note 1) Use dry-air at low temperature.
Note 2) Use turbine oil No. 1 (ISO VG32), if lubricated.

*Optional Specifications**

Pilot type		Note) External pilot type
Manual override	Pilot operator	Non-locking push type (extended), Lock type (screw), Lock type (lever)
Voltage	AC	100V 50/60Hz, 200V 50/60Hz
	DC	6V, 48V, 100V
Porting		Bottom ported subplate
Option		With indicator light and surge voltage suppressor, reinforced type DIN connector

Note: Operating pressure: 0~130PSI (0~9.0kgf/cm²)
Pilot operating pressure 2 position double: 15~150PSI (1~9.0kgf/cm²)
2 position single; 3 position: 30~130PSI (2.0~9.0kgf/cm²)
*Some options listed as "Special Order" items.

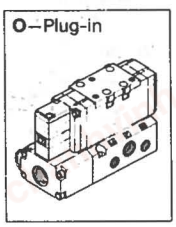
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Series NVFR4000: Base Mounted Type

How to Order

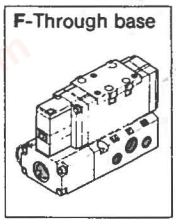
Body type

O—Plug-in



Electrical entry

F-Through base



Porting

—	Side
※B	Bottom

※ Special order

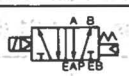
Port size

—	Without sub plate
03T	3/8 NPTF
※04T	1/2 NPTF

※ EA, EB: 3/8 NPTF
Bottom ported: 3/8 only
(See pg. 40 for part no. of individual subplates)

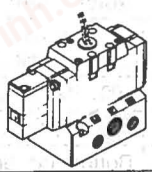
Plug-in	NVFR4	2	0	0		5	F				03T
Non Plug-in	NVFR4	2	1	1		3	E				03T

Symbol

Single	
1	
Double	
2	
Closed center	
3	
Exhaust center	
4	
Pressure center	
5	

Body type

1—Non plug-in



Manual option

0	Standard
※1	Std. + Direct-manual

※ Special order

Pilot operator

—	Internal
※R	External

※ Special order

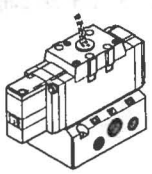
Voltage

※1	100VAC50/60HZ
※2	200VAC50/60HZ
3	110VAC50/60HZ
4	220VAC50/60HZ
5	24VDC
6	12VDC
※9	Others Note 1)

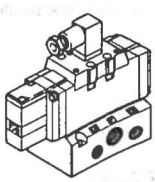
※ Special order
Note 1) indicate in parentheses at end of part no.
Ex. (AC24V).

Electrical entry

E—Grommet terminal



D—DIN connector



Option

—	Note
Z	With indicator light and surge voltage suppressor
※P	non-rotating DIN connector

※P, ZP: Only DIN type.

Pilot operator manual override/ classification

—Non-locking push type (Flush)



※A—Non-locking push type (Extended)



B—Lock type (Screw)



※C—Lock type (Lever)



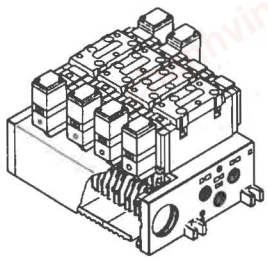
※Special order

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Manifold Specifications

Plug-in Type:With Terminal Block

●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.



NVV5FR4 - 01T — 06 (1) — 03T

- **Series NVFR4000 Manifold valve**
- **Plug-in type With terminal block**
- **Stations**

02	2 stations
⋮	⋮
10	10 stations

- **Symbol**

Symbol	Port specifications P	Port specifications EA, EB	Porting Specifications (A,B)
1	Common	Common	Side
※2			Bottom
※M	Mixed		See pg. 46

※Special Order

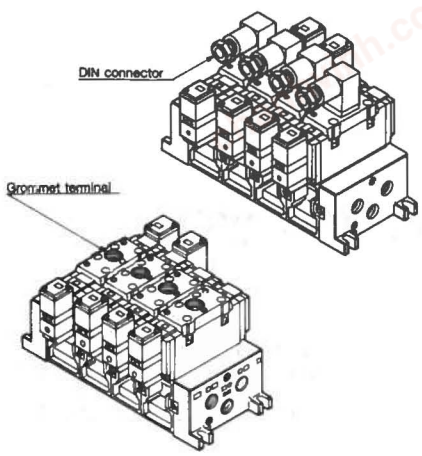
- **Port size**

Suffix	P, EA, EB	A, B
03T	½ NPTF	⅜ NPTF
04T		½ NPTF

Bottom ported 3/8NPTF only.

Non Plug-in Type:Grommet Terminal/DIN Connector

●Individual wiring for each valve.



NVV5FR4 — 10 — 05 (1) — 03T

- **Series NVFR4000 Manifold valve**
- **Non Plug-in type**
- **Stations**

02	2 stations
⋮	⋮
10	10 stations

- **Symbol**

Symbol	Port specifications P	Port specifications EA, EB	Porting Specifications (A,B)
1	Common	Common	Side
※2			Bottom
※M	Mixed		See pg. 46

※Special Order

- **Port size**

Symbol	P, EA, EB	A, B
03T	½ NPTF	⅜ NPTF
04T		½ NPTF

Bottom 3/8NPTF only.

See "How to Order Manifold Assemblies," pg. 46

Manifold Specifications

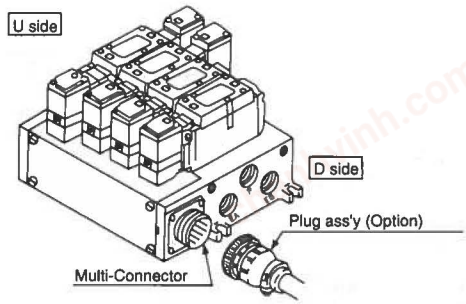
Base mounted type	Wiring	Porting specifications A,B port	Port size P,EA,EB	Port size A,B	No. of Stations	Applicable solenoid valve
Plug-in type **NVV5FR4-01T**	With terminal blocks	Side, Bottom	½ NPTF	⅜・½ NPTF	2-10	NVFR4○00-○F
Non Plug-in type **NVV5FR4-10**	DIN Connector Grommet terminal					NVFR4○10-○D NVFR4○10-○E

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Series NVFR4000: Base Mounted Type

Plug-in Type: With Multi-Connector

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



NVV5FR4 — 01C D — 05 2 — 03T

Series NVFR4000 Manifold valve

Plug-in type With multi connector

Mounting direction of connector

D	D side mounting
U	U side mounting

Stations

02	2 stations
:	:
08	8 stations

* Max: 8 stations

Port size

Symbol	P,EA,EB	A,B
03T	½ NPTF	⅜ NPTF
04T		½ NPTF

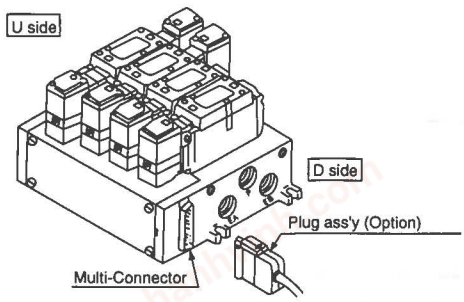
Symbol

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

* Bottom porting: ⅜ only

Plug-in Type: With D-Sub Connector

- Wide range of interchangeability (MIL Spec DIN type connector terminal 25 pin.)
- Quick wiring permits ease of installation



NVV5FR4 — 01F D — 06 1 — 03T

Series NVFR4000 Manifold valve

Plug-in type With D-sub connector

Mounting direction of connector

D	D side mounting
U	U side mounting

Stations

02	2 stations
:	:
08	8 stations

* Max: 8 stations

Port size

Symbol	P,EA,EB	A,B
03T	½ NPTF	⅜ NPTF
04T		½ NPTF

Symbol

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

* Bottom porting: ⅜ only

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Plug-in Type: Serial Interface Manifold

NVV5FR4 — 01SU — (08) (1) — (02T) — (X200)

- The use of serial interface technology offers advantages such as reduced wiring, quicker installation time, easier start-up and simplified maintenance.

Stations

02	2 stations
:	:
*11	11 stations

* Includes 1 station to mount SI unit.

Symbol

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

* Bottom porting: 3/8 only

Port size

Symbol	P, EA, EB	A, B
03T	1/2 NPTF	3/8 NPTF
04T		1/2 NPTF

***SI option**

–	For standard **1 type modules
X200	For AB2 modules

*SI module must be orderd separately

Series IN313 Serial Interface Modules

IN313 — (AB) (1)

Protocal

AB	Allen Bradley
DN	DeviceNet
MB	Mitsubishi
PR	Profibus
TA	Omron

Output/Inputs

1	16 outputs
2	32 outputs/32 inputs (Available on Allen Bradley only)

AB2 Accessories

Part #	Description
VVZR3000-21A-6-X2	D-sub cable with connectors on both ends.
EX300-IB1-AB	Input Base Unit
EX300-IE1-AB	Input Expander Unit

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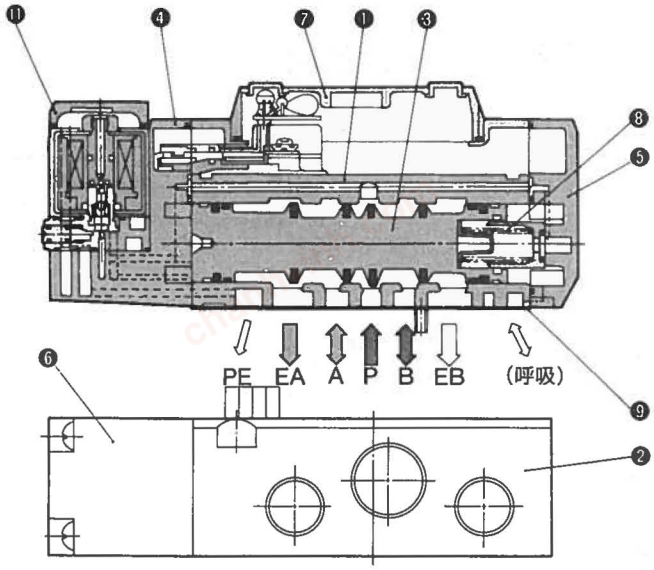
Series NVFR4000:Base Mounted Type

Construction/Parts List

NVFR41○0



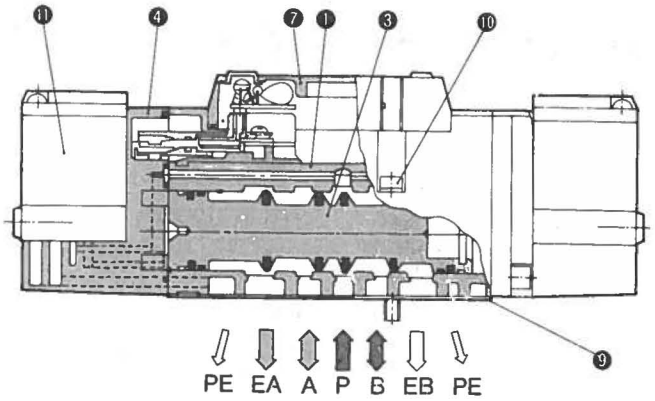
2 position single



NVFR42○0



2 position double

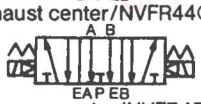


3 position Closed center/Exhaust center/Pressure center

Closed center/NVFR43○0

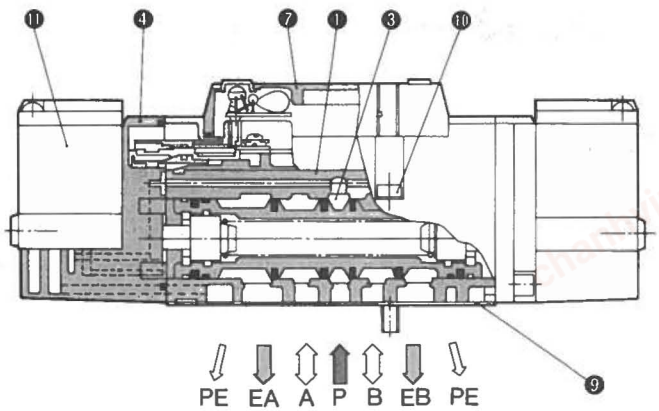


Exhaust center/NVFR44○0



Pressure center/NVFR45○0





Main Parts

No.	Description	Material	Note
❶	Body	Aluminum diecast	Platinum silver
❷	Subplate	Aluminum diecast	Platinum silver
❸	Spool	Aluminum/NBR	
❹	Adapter plate	Aluminum diecast	Black

No.	Description	Material	Note
❺	End plate	Aluminum diecast	Black
❻	Junction cover	Resin	
❼	Lamp cover	Resin	
❽	Return spring	SUS	

Spare Parts

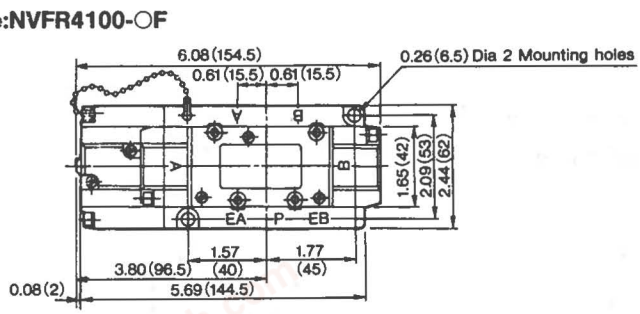
No.	Description	Material	Part Nos.		
			NVFR41○0	**NVFR42○0**	**NVFR43○0, 44○0, 45○0**
❾	Gasket	NBR	VF4000-20	VF4000-20	VF4000-20
❿	Valve mounting bolt	Steel	AXT335-1-11 (M4X40)	AXT335-1-11 (M4X40)	AXT335-1-11 (M4X40)
⓫	Pilot Ass'y	–	SF4- ✱F ✱-70		

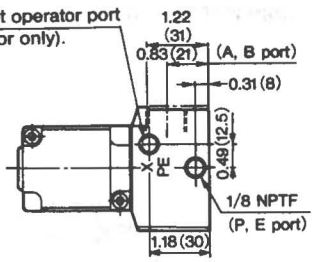
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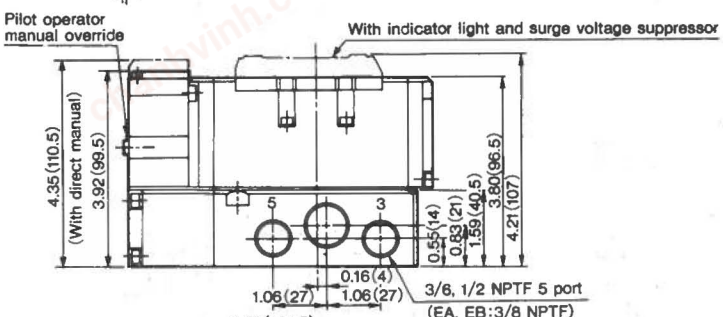
Plug-in type 2 Position Single, Double, 3 Position/Dimensions

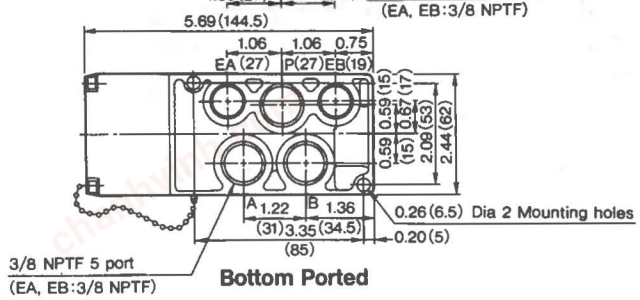
inch (mm)

2 position single:NVFR4100-○F

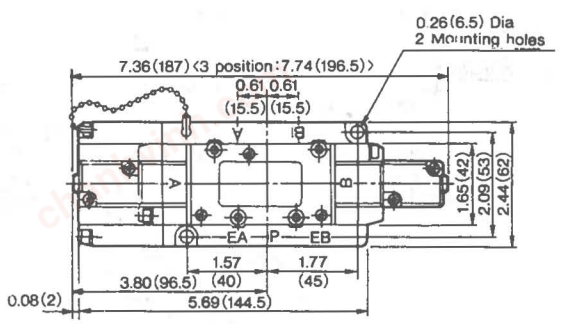


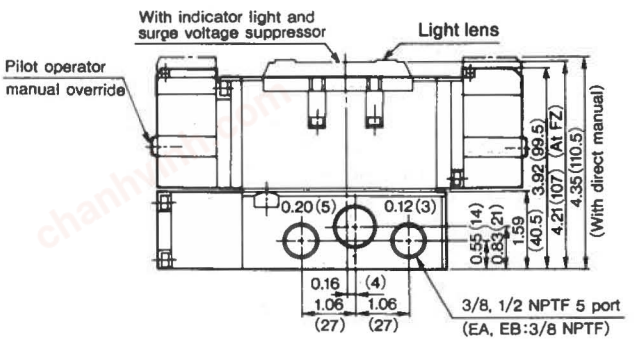






2 position double:NVFR4200-○F
3 position closed center:NVFR4300-○F
3 position exhaust center:NVFR4400-○F
3 position pressure center:NVFR4500-○F





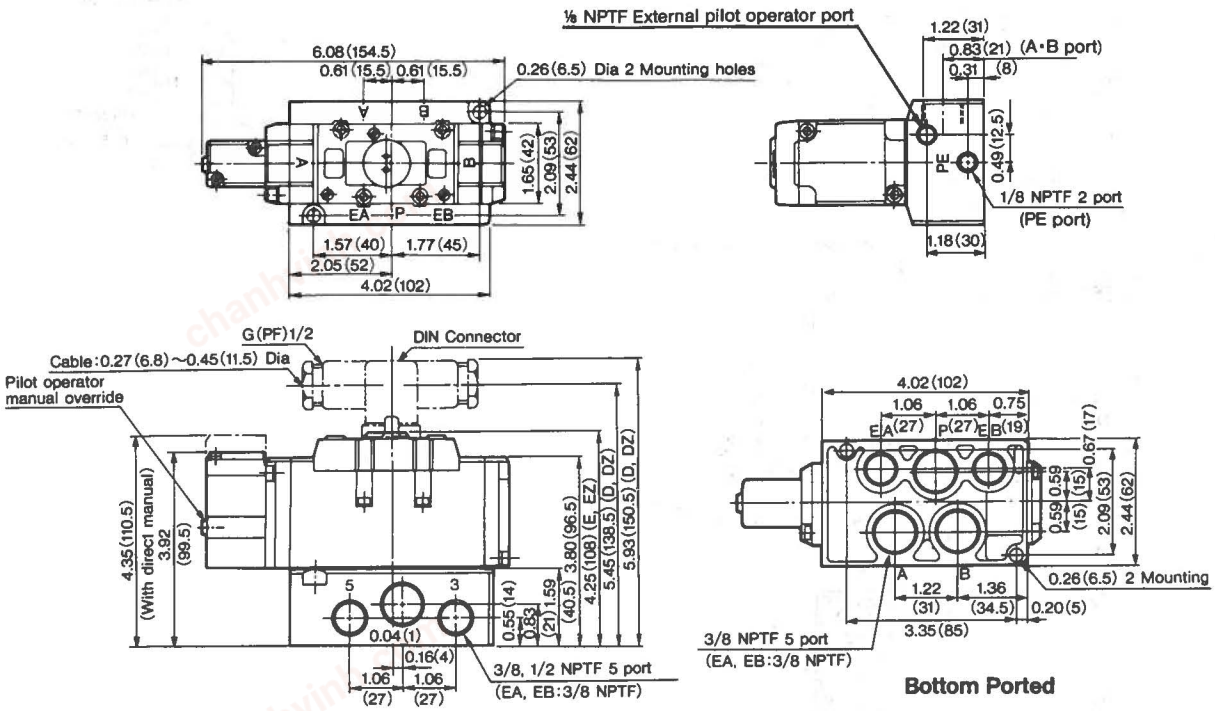
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Series NVFR4000:Base Mounted Type

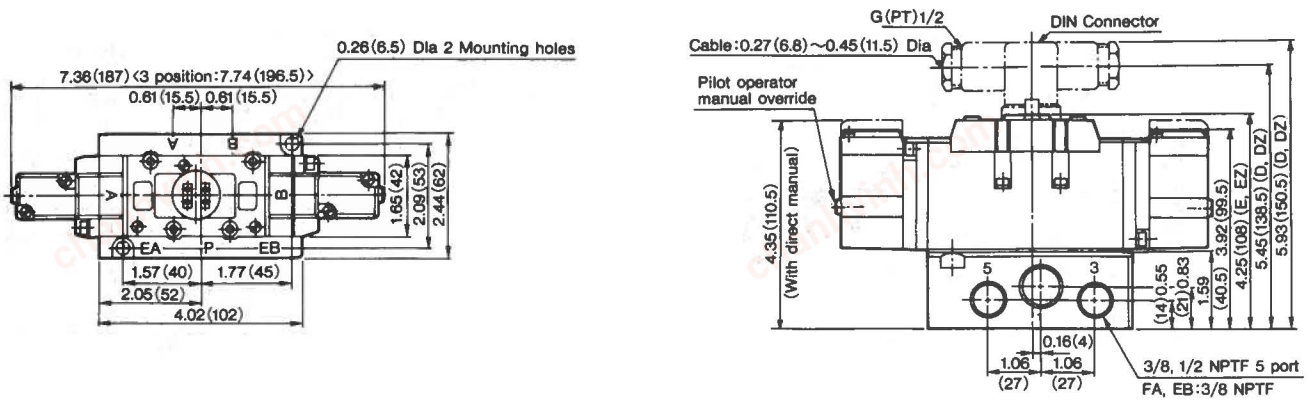
Non Plug-in type: 2 position Single, Double, 3 position/Dimensions

inch (mm)

2 position single:NVFR4110-○E, NVFR4110-○D



2 position double:NVFR4210-○E, NVFR4210-○D
3 position closed center:NVFR4310-○E, NVFR4310-○D
3 position exhaust center:NVFR4410-○E, NVFR4410-○D
3 position pressure center:NVFR4510-○E, NVFR4510-○D

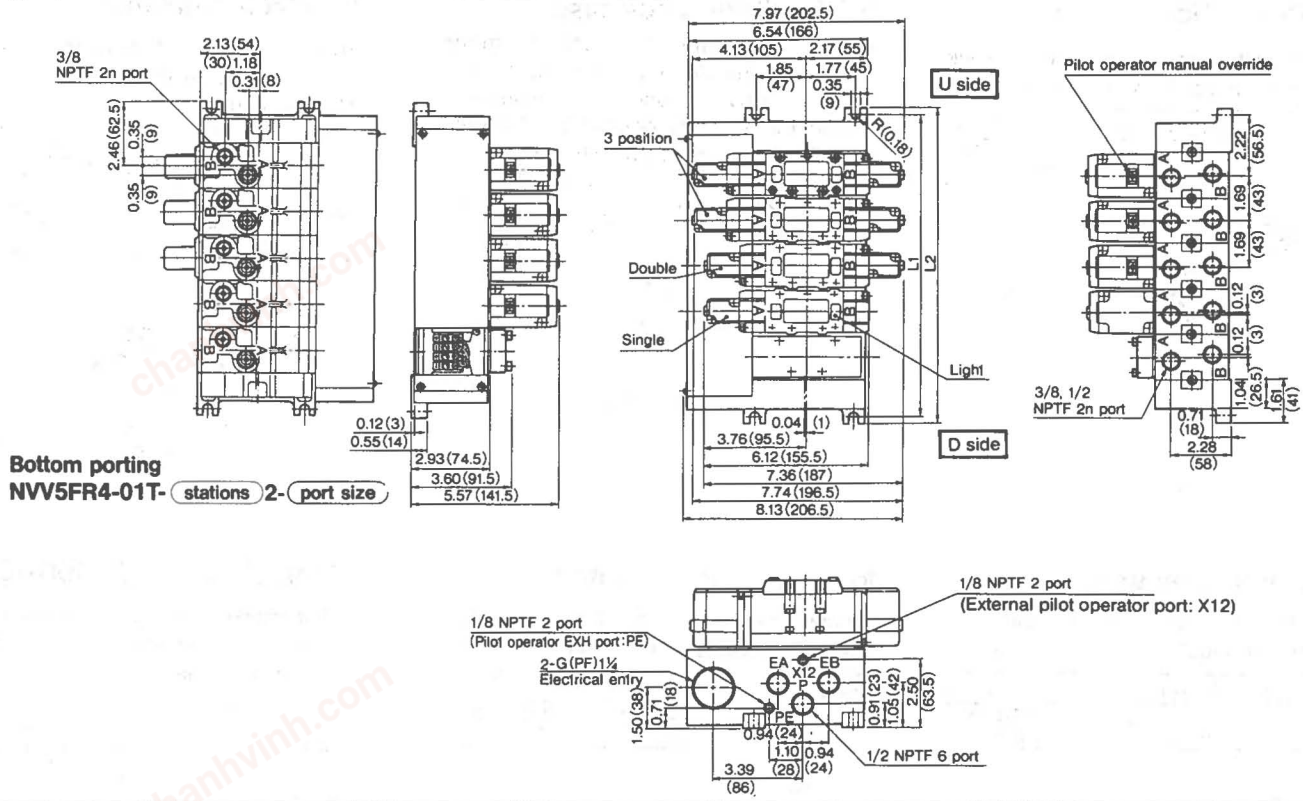


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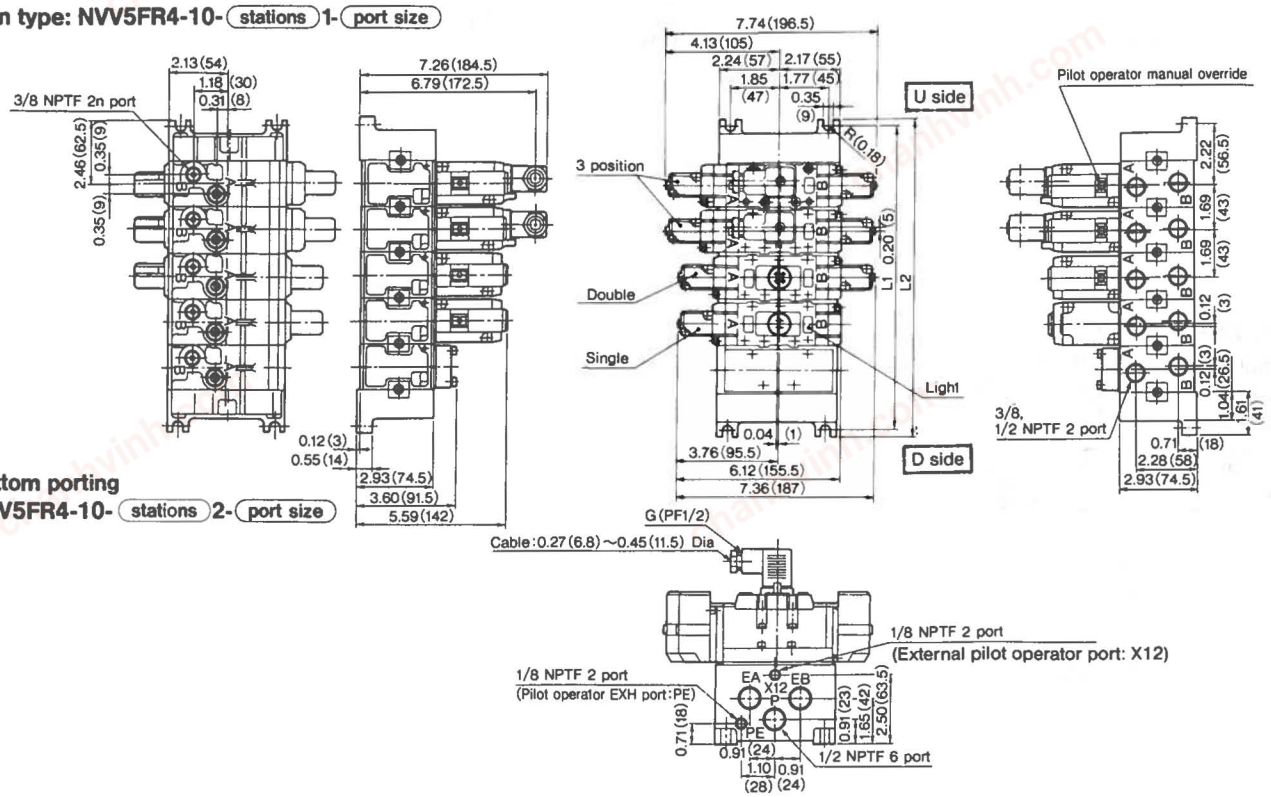
Manifold Plug-in Type/ Non Plug-in Type/ Dimensions

inch(mm)

Plug-in type (with terminal block): NVV5FR4-01T- (stations) 1- (port size)



Non plug-in type: NVV5FR4-10- (stations) 1- (port size)



inch(mm), n:stations

L \ stations	2	3	4	5	6	7	8	9	10	Equation
L_1	6.14 (156)	7.83 (199)	9.53 (242)	11.22 (285)	12.91 (328)	14.61 (371)	16.30 (414)	17.99 (457)	19.69 (500)	$L_1=1.69\times n+2.76$ ($L_1=43\times n+70$)
L_2	6.61 (168)	8.31 (211)	10.00 (254)	11.69 (297)	13.39 (340)	15.08 (383)	16.77 (426)	18.46 (469)	20.16 (512)	$L_2=1.69\times n+3.23$ ($L_2=43\times n+82$)

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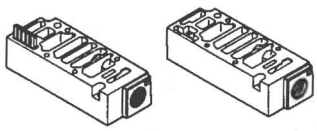
Series NVFR4000:Base Mounted Type

Manifold/Option Parts

SUP Relocation spacer

An individual SUP spacer on manifold block can form individual P port for the valve.

Body type	Plug-in type	Non plug-in type
Part No.	NVVFS4000-P-03T-1	NVVFS4000-P-03T-2



EXH gallery block disc

When valve exhaust affects the other stations on the circuit or when the reverse pressure valve is used on a standard manifold, insert EXH block disc(s) in between stations to separate valve exhaust.

Body type	Plug-in type	Non plug-in type
Parts No.	AXT634-11A	



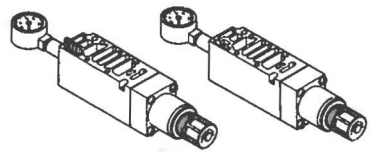
EXH block disc

Interface regulator

Spacer type regulating valve on manifold block can regulate the pressure to the valve. With std. gauge.

Body type	Plug-in type	Non plug-in type
Pressure regulation P	NARBF4050-N0-P-1	NARBF4050-N0-P-2
Pressure regulation A	NARBF4050-N0-A-1	NARBF4050-N0-A-2
Pressure regulation B	NARBF4050-N0-B-1	NARBF4050-N0-B-2

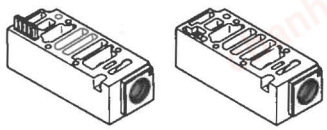
Note) For pressure center type valves, use p/n NARBF3000.



EXH Relocation spacer

An individual EXH spacer on manifold block can form individual R port for the valve.

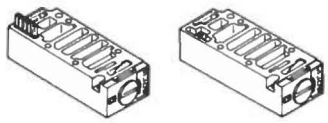
Body type	Plug-in type	Non plug-in type
Part No.	NVVFS4000-R-04T-1	NVVFS4000-R-04T-2



Interface speed control

Needle valve 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



Blank plate: VVFS4000-10A

When disassembling valve for maintenance purposes or when spare manifold stations are required, install Blank plate on the manifold block.

Body type	Plug-in type Non Plug-in type
Part No.	VVFS4000-10A

SUP gallery block disc

When supplying manifold with more than one pressure, insert block disc in between stations subjected to different pressures.

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



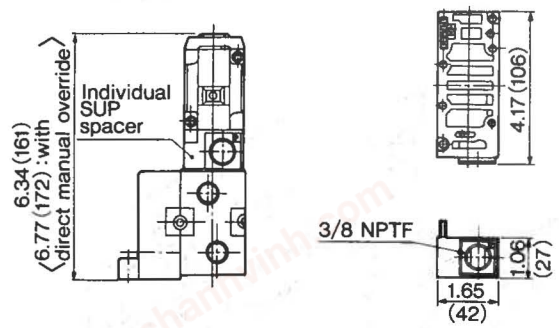
SUP block disc

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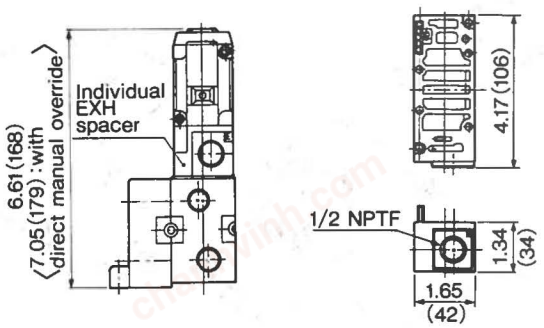
Manifold/Option Parts Plug-in Type/Non plug-in Type/Dimensions

inch (mm)

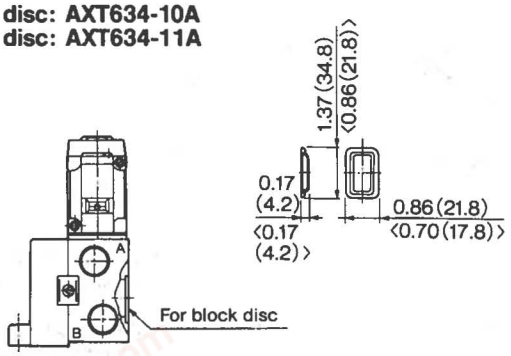
SUP Relocation spacer
NVVFS4000-P-03T-1(Plug-in type)
NVVFS4000-P-03T-2(Non Plug-in type)



EXH Relocation spacer
NVVFS4000-R-04T-1(Plug-in type)
NVVFS4000-R-04T-2(Non Plug-in type)

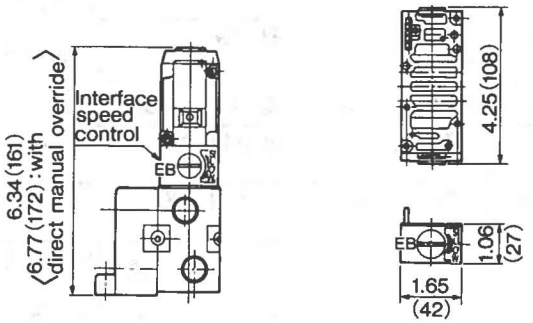


SUP gallery block disc: AXT634-10A
EXH gallery block disc: AXT634-11A

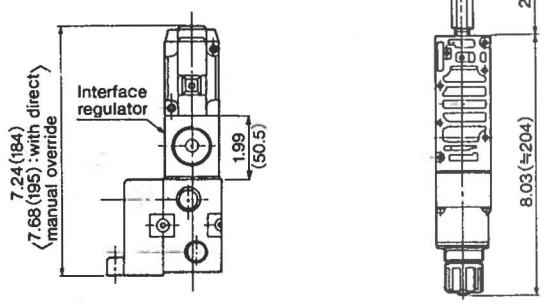


〈 〉:EXH block disc

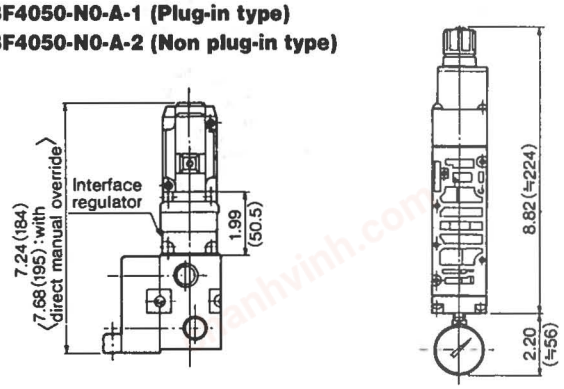
Interface speed control
VVFS4000-20A-1(Plug-in type)
VVFS4000-20A-2(Non plug-in type)



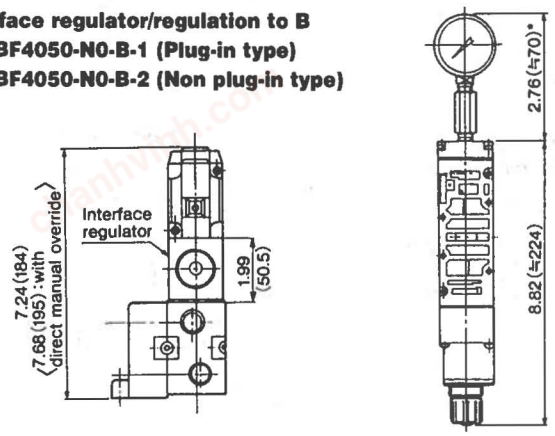
Interface regulator/regulation to P
NARBF4050-N0-P-1 (Plug-in type)
NARBF4050-N0-P-2 (Non plug-in type)



Interface regulator/regulation to A
NARBF4050-N0-A-1 (Plug-in type)
NARBF4050-N0-A-2 (Non plug-in type)



Interface regulator/regulation to B
NARBF4050-N0-B-1 (Plug-in type)
NARBF4050-N0-B-2 (Non plug-in type)

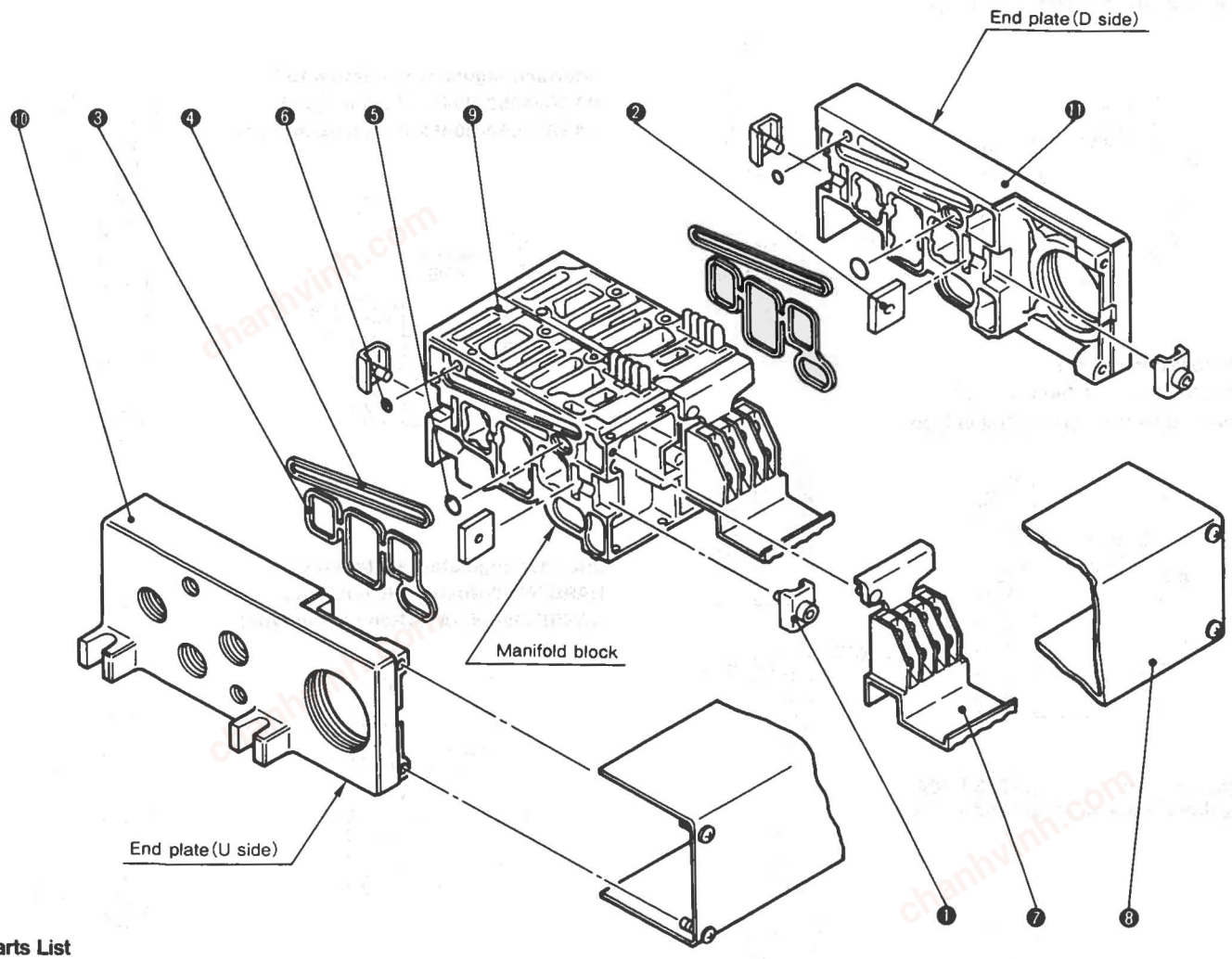


*gauge nipple size may vary slightly.

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Series NVFR4000:Base Mounted Type

Manifold Base/Construction Plug-in Type/Non plug-in Type



Parts List

No.	Description	Material	Parts No.
❶	Metal clamp A	Steel plate	VVFS4000-5-2A
❷	Metal joint B	Steel plate	
❸	Gasket	NBR	VVF4000-7
❹	Gasket	NBR	VVF4000-8
❺	O-ring	NBR	AS568-001
❻	O-ring	NBR	AS568-006
❼	Terminal ass'y	—	VVF4000-6A
❽	Conduit cover ass'y	—	VVFS4000-4A- stations

Note) Manifold Base/Construction shown: Plug-in type with terminal block.

Note) NVFR/NVFS Series manifolds are constructed using the same parts

Main Parts sub-ass'y

No.	Description	Part No. **Note)**	Component parts	Applicable valve
❾	Manifold block ass'y	MBF4610-$^{03}_{04}$-1 MBF4611-03-1	Manifold block ❾, Terminal ❼, Metal joint/clamp ❶, ❷. Gasket ❸, ❹. O-ring ❺, ❻. Receptacle ass'y	Plug-in type
		MBF471*-$^{03}_{04}$-1	Manifold block ❾. Metal joint ❶, ❷. Gasket ❸, ❹. O-ring ❺, ❻	Non plug-in type
❿ ⓫	End plate (kit) ass'y	MEF463LR-04-1	End plate (U) ❿, End plate (D) ⓫. Metal joint/clamp ❶, ❷. Gasket ❸, ❹, O-ring ❺, ❻	Plug-in type
		MEF473LR-04-1	End plate (U) ❿, End plate (D) ⓫. Metal joint/clamp ❶, ❷. Gasket ❸, ❹, O-ring ❺, ❻	Non plug-in type
	Subplate ass'y †	SPF038*-$^{03}_{04}$-D	Subplate (see note below)	Plug-in type
		SPF037*-$^{03}_{04}$	Subplate (see note below)	Non plug-in type

Note) Manifolds: **0**=side ports; **1**=bottom ports. Subplate: **1**=side ports; **2**=bottom ports (3/8" only).
All bases: **03**=3/8" NPTF; **04**=1/2"NPTF.

†External pilot type order SPF03 $^{7}_{8}$*R–**

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Light/Surge Voltage Surge Suppressor/Electrical Entry

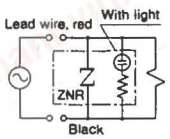
Base Mounted Type (NVFR2000 only)

Light/Surge Voltage Suppressor

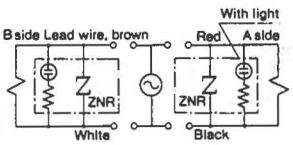
- In the case of surge voltage suppressor, voltage absorption element ZNR is attached to AC power.
- A directional diode is attached for DC power. (24 VDC or less)

AC and 100VDC

Single

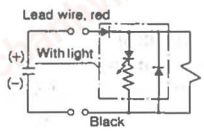


Double

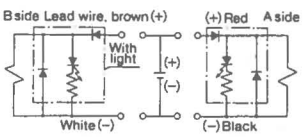


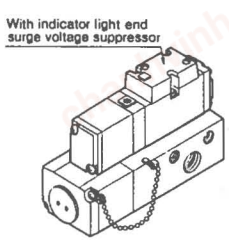
24VDC or less

Single

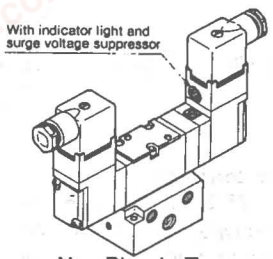


Double





Plug-in Type

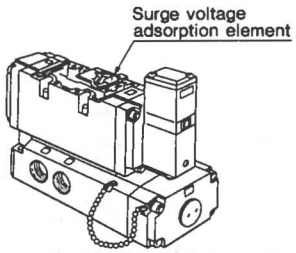


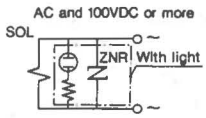
Non Plug-in Type

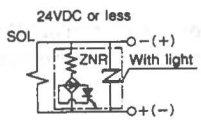
Base Mounted Types (NVFR3/4000)

Light/ Surge Voltage Suppressor

In the case of Voltage suppressor, surge voltage adsorption element is attached to terminal block board on body area.





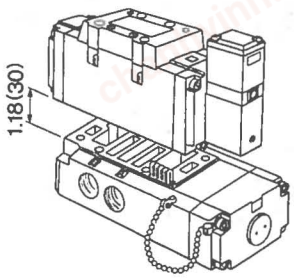


Note) No polarity

Valve Removal/Replacement

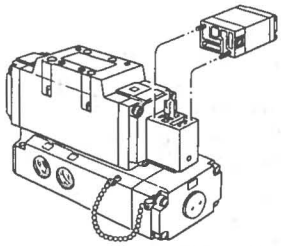
Solenoid valve

●Loosen set screw and pull solenoid valve out vertically to avoid damage. Never remove valve at an angle.



Pilot operator

●When mounting pilot operator to the valve, plug pin ass'y (valve side) into receptacle ass'y vertically.



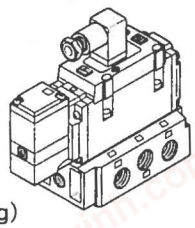
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Operational Guide For Series NVFR

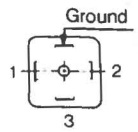
Electrical Entry

DIN connector type

● Male pin terminals of DIN connector type solenoid valves are wired as shown below.
Connect wires to corresponding terminal on the connector.



DIN connector (Wiring)

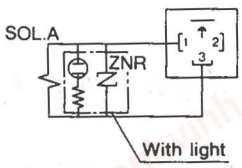


1	A side −
2	B side −
3	COM +
⏚	Ground

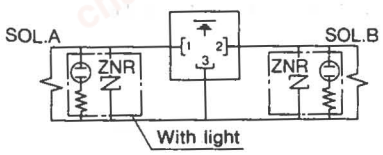
● (+,−) indicate the direction of DC Solenoid valve with light, surge voltage suppressor. NVFS valves can be used negative (−) COM.

AC and 100VDC or more

Single

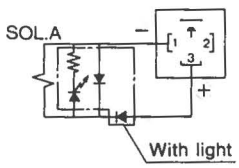


Double

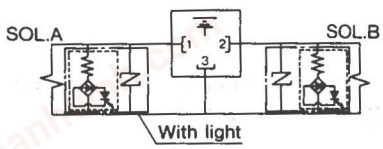


24VDC or less

Single



Double



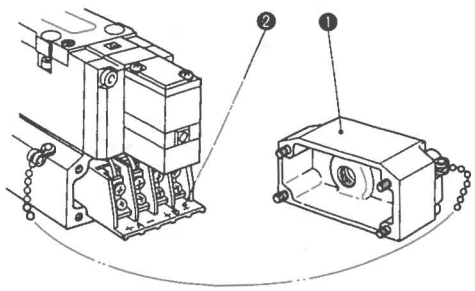
● Cable
Applicable cable O.D.: 0.27 (6.8) Dia ~ 0.45 (11.5) Dia
● Applicable terminal
Applicable terminal on block board: (3 kinds)
1.25Y-3L, 1.25-3.5S, 1.25-4M (1.25mm centers)
(spade or ring type, size 4, 22-16 AWG)
● Connector/Clamping torque
Set screw (5.2 in-lbs)
Terminal screw (7.8 in-lbs)
● Incorrect common (DIN connector terminal No. 3) causes damage on power side circuit.

Plug-in type (with terminal)

● Remove the junction cover ❶ on the subplate to expose the plug-in valve terminal block ❷ attached to the interior of subplate.
● The following are the markings on the terminal block. Connect with corresponding power side.

Designation	Solenoid A side	Solenoid B side
Terminal block	A	B
Marking	+ −	+ −

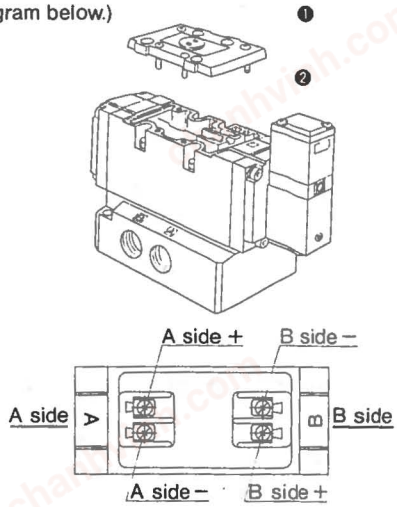
● (+, −) indicate the direction of DC solenoid valve with light or with surge voltage suppressor.
However reverse direction wiring is also possible in some cases.



● When using COM terminal, jumper contacts (Part No. AZ683-56A (NVFR3000); AZ683-56A (NVFR4000) allow easy specification of stations COM.

Non plug-in type (with terminal)

● Remove cover ❶ over terminal block ❷ attached to the inside of body. Connect with corresponding power supply.
(See diagram below.)



● **Applicable terminal**
NVFR3000: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S
(spade or ring type, size 4, 22-16 AWG)
NVFR4000, 5000: 1.25-3.5M, 1.25Y-3L, 1.25Y-3M
● (+, −) indicate the direction of DC solenoid valve with light or with surge voltage suppressor.

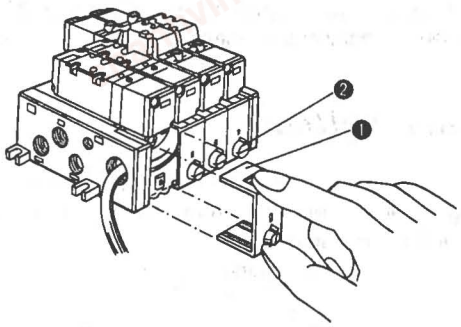
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Lead Wire/ Wiring Manifold/ Plug-in Type

Type 01 Insert Plug Type Lead Wires

How to Remove Junction Cover (Type 01)

• Turn the knob ❷ of Junction cover ❶ on the manifold block side by hand or slotted screwdriver in the C→O direction (closed-to open) 90 degrees. While holding the knob and upper part of junction cover, pull outward to remove it.
When reassembling, do the opposite.



Wiring

The connector plug 1 is inserted into the manifold block and lead wires are connected with valve side as shown in the following list. Please connect with corresponding power supply.

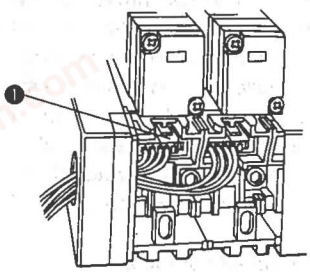
AC power/Lead wire color identification

Solenoid	A side	B side
Lead wire color	Red, Black	Brown, White

DC power/Lead wire color identification

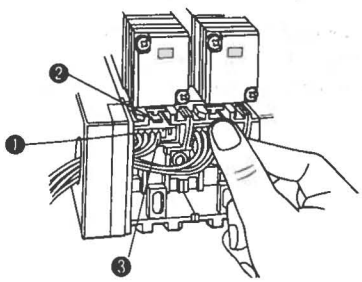
Solenoid	A side		B side	
	+	−	+	−
Lead wire color	Red	Black	Brown	White

• When ground wiring is required, use green wire.
• (+,−) indicate the wiring polarity of solenoid valve with light, surge voltage suppressor.

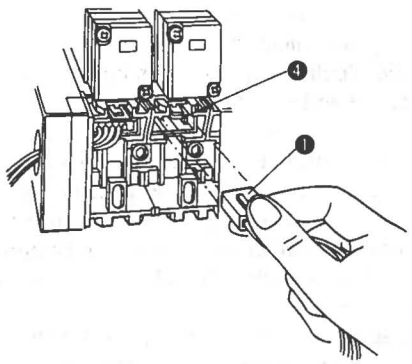


How to Use Connector Plug

• When removing plug ❶ from manifold base, push the lever area ❷ of plug downward with thumb and pull it out together with the lead wires ❸ .



• When inserting the plug ❶ into the manifold base, push the lever area of plug with thumb and place in the receptacle housing ❹ horizontally.
After plugging in, pull lead wires taut to ensure that connection is secure.



Type 01T With Terminal Block

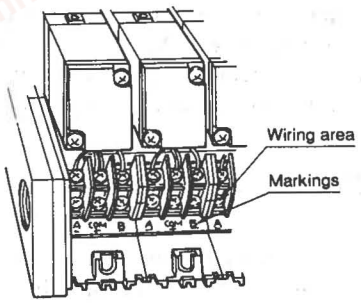
• Remove junction cover of manifold to expose terminal block attached to the manifold block. Lead wires from solenoid valve are connected with the terminals on the upper side of the terminal block.

Connect lead wires of power supply corresponding to each respective solenoid valve on the lower terminal block board.

Terminal block wiring specification is in accordance with +COM. Please consult SMC about specifying −COM.

Model \ Block board marking	A−	COM+	B−
NVFR✱100	A side −	COM+	
NVFR✱200	A side −	COM+	B side −
NVFR✱300	A side −	COM+	B side −

• Recommended terminals NVFR 2000, 3000: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S (1.25mm centers) (spade type, size 4, 22-16 AWG).
• NVFR4000: 1.25-3.5M, 1.25Y-3L, 1.25Y-3M.
• Plugging COM bridge in between each + COM on the block boards will make the specifications of all the stations +COM and enables you to rationalize the wiring process. (+,−) indicates the polarity of DC solenoid valve with light/surge voltage suppressor.



COM bridge part nos.:
NVFR 2000: AXT625-73
NVFR 3000: AZ683-56A
NVFR 4000: AZ683-56A

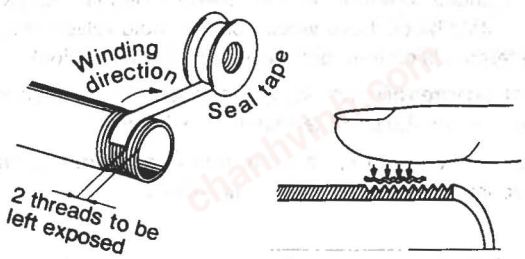
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Operational Guide For Series NVFR

Precautions

Piping

❶Use appropriate I.D. piping.
❷Before piping, flush out to remove dust, scale, chips, seal tape, etc. in the pipeline both on the supply side (supply pressure port side) and secondary side (operational equipment port side).
❸In the case of 3 position closed center valve, check leakage from piping and fittings between the valve and cylinder by means of soapy water to ensure that there is no leakage. Also, check the leakage from cylinder rod seal and piston seal. If there is any leakage, sometimes the cylinder, when valve is deenergized, can move without stopping at mid-position. Therefore, leakage from piping and fittings should be avoided.
❹When applying teflon sealing tape to the thread area, wind it around the thread area 1-2 times and fasten it with finger nail. Be sure the thread extends one or two screw pitches beyond the taped area. Also, when applying liquid seal materials, leave 1-2 threads from the end dry, and avoid over-application.
Never apply to the female side of the equipment.



Clamping torque

Thread	Correct clamping torque inch-lbs (kgf/cm²)
10-32 Nom (M5)	13.0-17.3 (15-20)
1/8 NPTF	60.7-78.0 (70-90)
1/4 NPTF	104-121 (120-140)
3/8 NPTF	190-208 (220-240)
1/2 NPTF	242-260 (280-300)
3/4 NPTF	242-260 (280-300)

Mounting

Single-acting valves can be mounted in any direction. In the case of a double solenoid valve or 3 position valve in a place subject to vibration, the valve should be aligned perpendicular to the vibration. (Never use in a vibration condition of more than 5G.)

Environmental Conditions

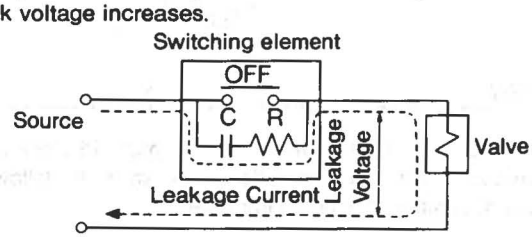
❶When the valve is installed in a dusty area, protect the cylinder rod area to prevent dust from entering the secondary piping via the rod area. Install a silencer or elbow fitting with its outlet downwards to prevent dust from entering the exhaust port of the valve.
❷When used in environmental conditions such as corrosive gas, chemicals or chemical solutions, steam, sea water, or temperatures higher than 140°F (60°C), etc., contact the SMC factory.

Lubrication

Valves are pre-lubricated. No further lubrication is necessary.
If a lubricant is used (if required for cylinder, etc.), install lubricator in the supply side piping.
Also, please note that the recommended lubricant is turbine oil #1 (ISO VG32). (Never use spindle oil or machine oil.) In addition, when valve is used at low temperature, low temperature oil should be used. The use of turbine oil at temperatures lower than 32°F (0°C) leads to increased viscosity and causes the valve to malfunction.

Leakage Voltage

It must be noted that in case of connecting C-R element parallel to switching element, leakage current flows through C-R element and the leak voltage increases.



Ensure that any voltage leakage across the coil is as follows:
AC coil : No more than 20% of the rated voltage
DC coil : No more than 3% of the rated voltage

Maintenance

❶Excessive carbon powder and oil waste from air source (mostly from compressor) entering into the valve can lead to increased spool seal resistance and cause valve malfunction.
In the worst case the spool can adhere to the valve. It is important to check the quality of air often.
Please note that if SUP pressure is left under pressurization for a long time with inferior quality air, carbon powder and oil waste in the compressed air can deposit in the clearance between the spool and sleeve, build up, and cause the spool to adhere to the valve.
To remedy this case, check the compressor oil and use the appropriate least oxidizing compressor oil.
A high filtration Mist Separator (Series NAFM) installed behind a regular filter (Series NAF) can prevent foreign particles from entering the valve.
❷If waste from air source adheres to spool and sleeve, disassemble adaptor plate area and end plate area (return spring insert area). Remove spool and sleeve from valve and cleanse them with trichlorane or freon solutions. When cleaning, prevent O-rings from contacting cleaning solutions. **Be sure to keep each spool and sleeve assembly paired.**
❸When disassembling and re-assembling, please ensure that all components are in their proper positions.
Prevent gaskets from slipping, and tighten bolts equally.

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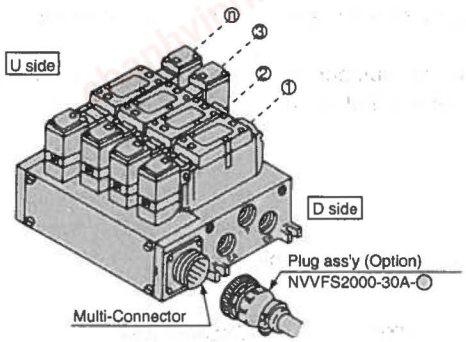
Operation Guide For Series NVFR

Type 01C With Multi-Connector

Series VFR2000, 3000, 4000, 5000

● The use of multi-connector in wiring enables mass-termination between the power supply and solenoid valves, and leads to the elimination of wiring labor.

● Manifold interior wiring is in accordance with +COM specifications and is connected with both A side and B side of solenoid valve through means of receptacle terminal as shown below.

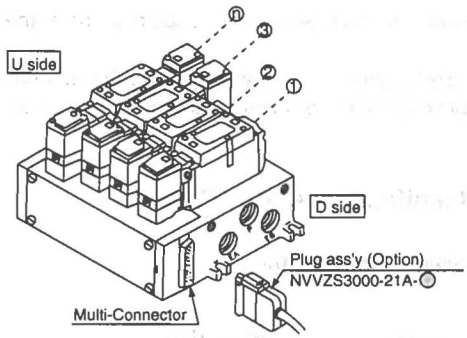


Type 01F With D Sub Connector

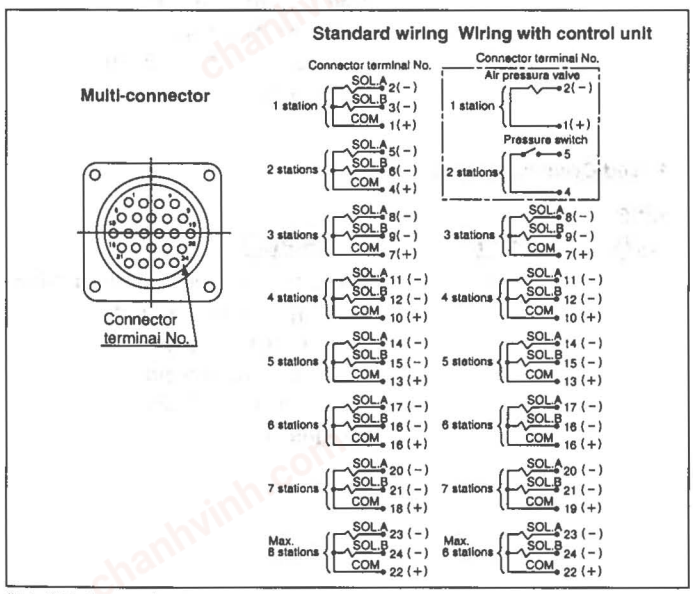
Series VFR2000, 3000, 4000, 5000

● The use with D sub connector when wiring enables the elimination of wiring labor.
Also connectors with MIL Specification DIN type connector (terminal 25 pcs) provides them with a wide range of interchangeability.

● Manifold interior wiring is in accordance with +COM specifications and is connected with both A side and B side of solenoid valve through the receptacle terminal as shown below.

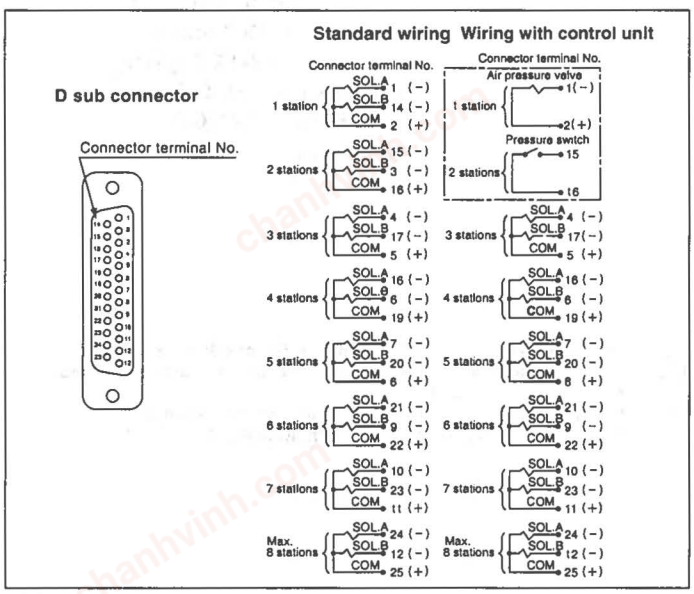


Manifold Interior Wiring



(Note 1) Maximum station: 8
(Note 2) (+) and (–) indicate the direction of DC solenoid valve with light, surge voltage suppressor.
(Note 3) Series VFS3000—COM is also possible

Manifold Interior Wiring



(Note 1) Maximum station: 8
(Note 2) (+) and (–) indicate the direction of DC solenoid valve with light, surge voltage suppressor.
(Note 3) Series VFS3000—COM is also possible

Compatible Plug Ass'y (Option)

Ass'y No.	Cable length	Components
VVFR2000-30A-1	1.5m	Plug-206837-1…1pc Cable clamp 206128-1…1pc Socket 66105-2…24pcs. Nippon AMP's cable VCTF 24 pcs x 0.75mm²
VVFR2000-30A-2	3m	
VVFR2000-30A-3	5m	
VVFR2000-30A-4	7m	

Compatible Plug Ass'y (Option)

Ass'y No.	Cable length	Components
VVFR2000-21A-1	1.5m	Plug-206837-1…1 pc Cable clamp 206138-1…1 pc Socket 66105-2…24 pcs. Nippon AMP's cable VCTF 24 pcs x 0.75mm²
VVFR2000-21A-2	3m	
VVFR2000-21A-3	5m	
VVFR2000-21A-4	8m	

Wire Color Table by Terminal Number of Cable

Terminal No.	1	2	3	4	5	6	7	8	9	10	11	12
Lead wire color	Orange	Orange	Black	Black	Green	Green	Red	Red	Blue	Blue	Yellow	Yellow
Dot marking	–	Blue	–	White	–	White	–	Blue	–	White	–	Blue

13	14	15	16	17	18	19	20	21	22	23	24
Brown	Brown	White	White	Pink	Pink	Gray	Gray	Sky blue	Sky blue	Bright green	Bright green
–	Blue	–	Blue	–	Blue	–	Blue	–	Blue	–	Blue

Wire Color Table by Terminal Number of Cable

Terminal No.	1	2	3	4	5	6	7	8	9	10	11	12
Lead wire color	Black	Brown	Red	Orange	Yellow	Pink	Blue	Violet	Gray	White	White	Yellow
Dot marking	–	–	–	–	–	–	–	White	Black	Black	Red	Red

13	14	15	16	17	18	19	20	21	22	23	24	25
Orange	Yellow	Pink	Blue	Violet	Gray	Orange	Red	Brown	Pink	Gray	Black	White
Red	Black	Black	White	–	–	Black	White	White	Red	Red	White	–

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NVFR Manifold Assemblies

HOW TO ORDER MANIFOLD ASSEMBLIES

1) Begin the manifold specification process from the LEFT going to the right facing the 'B' end of the valves (and the cylinder ports normally). The first valve on the left is considered Station #1.

2) For each station, specify the valve model number (or blank station kit no.), interface accessories if desired, and lastly, gallery blocking discs if desired. (Blocking discs will be placed between this station and the next one).

3) For identical stations in sequence, specify these at the same time. However, they must be in sequence to avoid confusion.

4) The last specification for the assembly is the manifold base. Specify the entire part number below the last station section. If the manifold is a complex assembly or mixture of block types, please refer carefully to the examples below and specify similarly.

Example Manifold Assembly Orders:

Standard Configuration Manifold:

LINE ITEM	QTY.	DESCRIPTION
1	1	Four Station Manifold Ass'y as follows: Sta. 1) NVFR3100-5FZ Sta. 2) NVFR3200-5FZ NARBF3000-00-P-1 VVFS3000-20A-1 AXT636-1A (P gallery) Sta. 3-4) NVFR3100-5FZ NVV5FR3-01T-041-03T See Note 1)

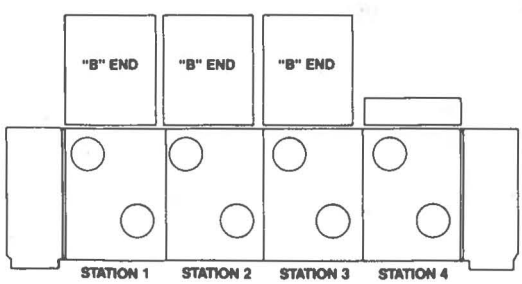
Mixed Configuration Manifold:

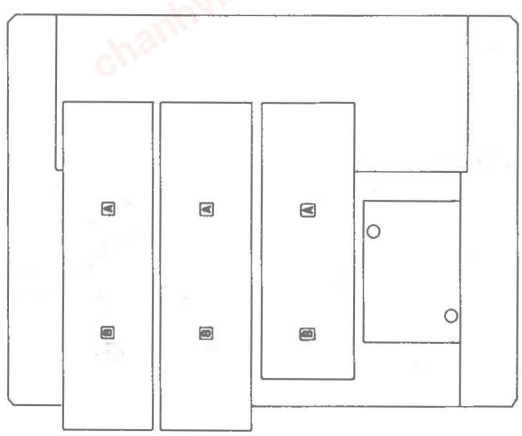
LINE ITEM	QTY.	DESCRIPTION
1	1	Six Station Manifold Ass'y as follows: Sta. 1) NVFR2110-3G Sta. 2-6) NVFR2210-3G NVV5FR2-10-06M-02T Mix: sta. 1) 1/4 side sta. 2-6) 1/8 bottom See Note 2)

Mixed Configuration Manifold:

LINE ITEM	QTY.	DESCRIPTION
1	2	Four Station Manifold Ass'y as follows: Sta. 1-4) NVFR4100-3FZB NVV5FR4-01T-041-M Mix: sta. 1-2) 3/8 side sta. 3-4) 1/2 side See Note 3)

Note 1) Indicate gallery for all blocking discs (P, EA, or EB), or any combination.
Note 2) "-02T" for manifold number is always side port size unless manifold is exclusively bottom-ported.
Note 3) If mixture is both port size and location, follow this example: NVV5FR3-01T-04M-M; then specify individually. (See note 2.)





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