

5 Port Pilot Operated Solenoid Valve Metal Seal, Plug-in/Non Plug-in Series **VFS4000**

Model

Type of actuation		Model		Port size	Flow characteristics ⁽¹⁾						Max. operating cycle (cpm) ⁽¹⁾	Response time (ms) ⁽²⁾	Weight (kg) ⁽³⁾⁽⁴⁾
		Plug-in	Non plug-in		1 → 4/2 (P → A/B)			4/2 → 5/3 (A/B → R1/R2)					
					C [dm ³ /(s·bar)]	b	Cv	C [dm ³ /(s·bar)]	b	Cv			
2 position	Single	VFS4100	VFS4110	3/8	11	0.18	2.6	12	0.20	2.8	1,000	40 or less	0.63
				1/2	12	0.15	2.8	12	0.22	3.1			
	Double	VFS4200	VFS4210	3/8	11	0.18	2.6	12	0.20	2.8	1,200	15 or less	0.75
				1/2	12	0.15	2.8	12	0.22	3.1			
3 position	Closed center	VFS4300	VFS4310	3/8	10	0.18	2.5	10	0.14	2.3	600	50 or less	0.82
				1/2	11	0.18	2.7	11	0.22	2.6			
	Exhaust center	VFS4400	VFS4410	3/8	11	0.16	2.6	10	0.15	2.3	600	50 or less	0.82
				1/2	12	0.15	2.9	10	0.15	2.4			
	Pressure center	VFS4500	VFS4510	3/8	11	0.22	2.7	11	0.22	2.7	600	50 or less	0.82
				1/2	11	0.22	2.9	11	0.22	2.8			
	Double check	VFS4600	VFS4610	3/8	6.3	—	—	6.5	—	—	200	55 or less	1.71
				1/2	6.8	—	—	6.8	—	—			

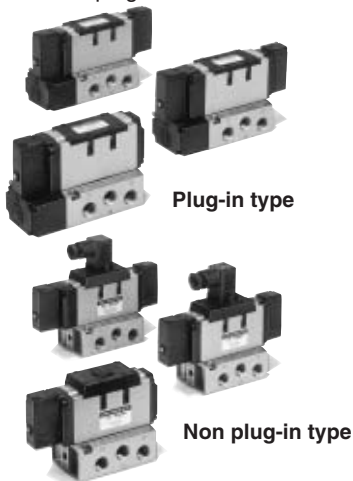
Note 1) Based on JIS B 8375 (once per 30 days) for the minimum operating frequency. Note 2) Based on JIS B 8375-1981 (The value at supply press. 0.5 MPa).
 Note 3) The figures in the above list are for without sub-plate. In the case of with plug-in sub-plate and with non plug-in sub-plate, add 0.50 kg and 0.43 kg respectively. Note 4) "Note 1)" and "Note 2)" are with controlled clean air.

Compact yet provides a large flow capacity
1/2: C: 12 dm³/(s·bar)

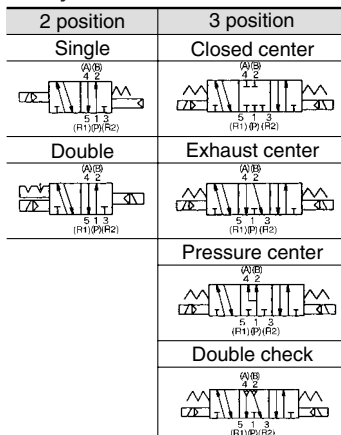
Low power consumption: 1.8 W DC

Easy maintenance

2 types of sub-plates:
Plug-in and non plug-in



JIS Symbol



Standard Specifications

Valve specifications		Fluid	
Maximum operating pressure		Air/Inert gas	
Minimum operating pressure		1.0 MPa	
Proof pressure		0.1 MPa	
Ambient and fluid temperature		0.15 MPa	
Lubrication		1.5 MPa	
Pilot valve manual override		Non-lube ⁽²⁾	
Shock/Vibration resistance		Non-locking push type (Flush)	
Enclosure		150/50 m/s ² ⁽³⁾	
Coil rated voltage		Type E: Dustproof (level 0), Type F: Dripproof (level 2), Type D: Splashproof (level 4) ⁽⁴⁾	
Allowable voltage fluctuation		100, 200 VAC, 50/60 Hz; 24 VDC	
Coil insulation type		-15 to +10% of rated voltage	
Apparent power (Power consumption) AC		Class B or equivalent (130°C) ⁽⁵⁾	
Electrical entry		5.6 VA/50 Hz, 5.0 VA/60 Hz	
Inrush		3.4 VA (2.1 W)/50 Hz, 2.3 VA (1.5 W)/60 Hz	
Holding		1.8 W (2.04 W: With light/surge voltage suppressor)	
Power consumption DC		1.8 W (2.04 W: With light/surge voltage suppressor)	
Electrical entry		Plug-in type: Conduit terminal	
Non plug-in type		Grommet terminal, DIN terminal	

Note 1) Use dry air at low temperatures.
 Note 2) Use turbine oil Class 1 (ISO VG32), if lubricated.
 Note 3) 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 4) Based on JIS C 0920.
 Note 5) Based on JIS C 4003.

Option Specifications

Pilot type	External pilot ^{Note)}	
Manual override	Main valve	Direct manual override
Pilot valve	Non-locking push type (Extended), Locking type (Tool required), Locking type (Lever)	
Coil rated voltage	110 to 120, 220, 240 VAC, 50/60 Hz	
Porting specifications	12, 100 VDC	
Option	Bottom ported	
	With light/surge voltage suppressor, Non-rotating DIN terminal	

Note) Operating pressure: 0 to 1.0 MPa
 Pilot pressure 2 position: 0.1 to 1.0 MPa, 3 position: 0.15 to 1.0 MPa

VK

VZ

VF

VFR

VP4

VZS

VFS

VS4

VQ7

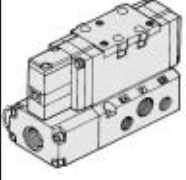
EVS

VFN

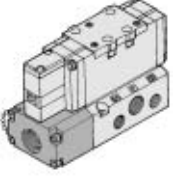
How to Order

Body type

O: Plug-in type sub-plate



F: Plug-in type conduit terminal



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	Rc 3/8
04*	Rc 1/2

* EA, EB: Rc 3/8

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

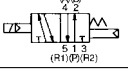
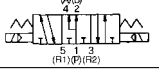
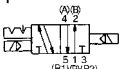
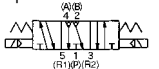
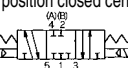
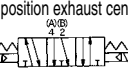
Plug-in

VFS4 2 0 0 [] 5 F [] [] [] 03 []

Non plug-in

VFS4 2 1 0 [] 1 E [] [] [] 03 []

Symbol

1	2 position single 	5	3 position pressure center 
2	2 position double 	6	3 position double check 
3	3 position closed center 		
4	3 position exhaust center 		

* Reverse pressure: Can be used by external pilot specifications.

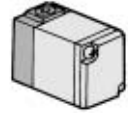
Option

Nil	None
Z	With light/surge voltage suppressor
P*	Non-rotating DIN terminal

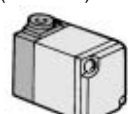
* In the case of w/ "Z", enter "ZP".
* Type "P" is available for DIN type only.

Pilot valve Manual override


Nil: Non-locking push type (Flush)




A*: Non-locking push type (Extended)



B*: Locking type (Tool required)



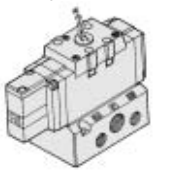
C*: Locking type (Lever)



* Option

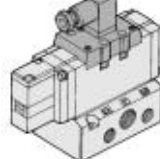
Body type

1: Non plug-in type sub-plate

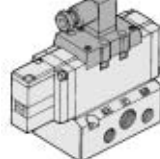


Electrical entry

E: Grommet terminal



D: DIN terminal



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

Body option

0	Standard
1*	Direct manual override

* Option

Pilot type

Nil	Internal pilot
R*	External pilot

* Option

How to Order Pilot Valve Assembly

SF4 - 1 F [] - 30

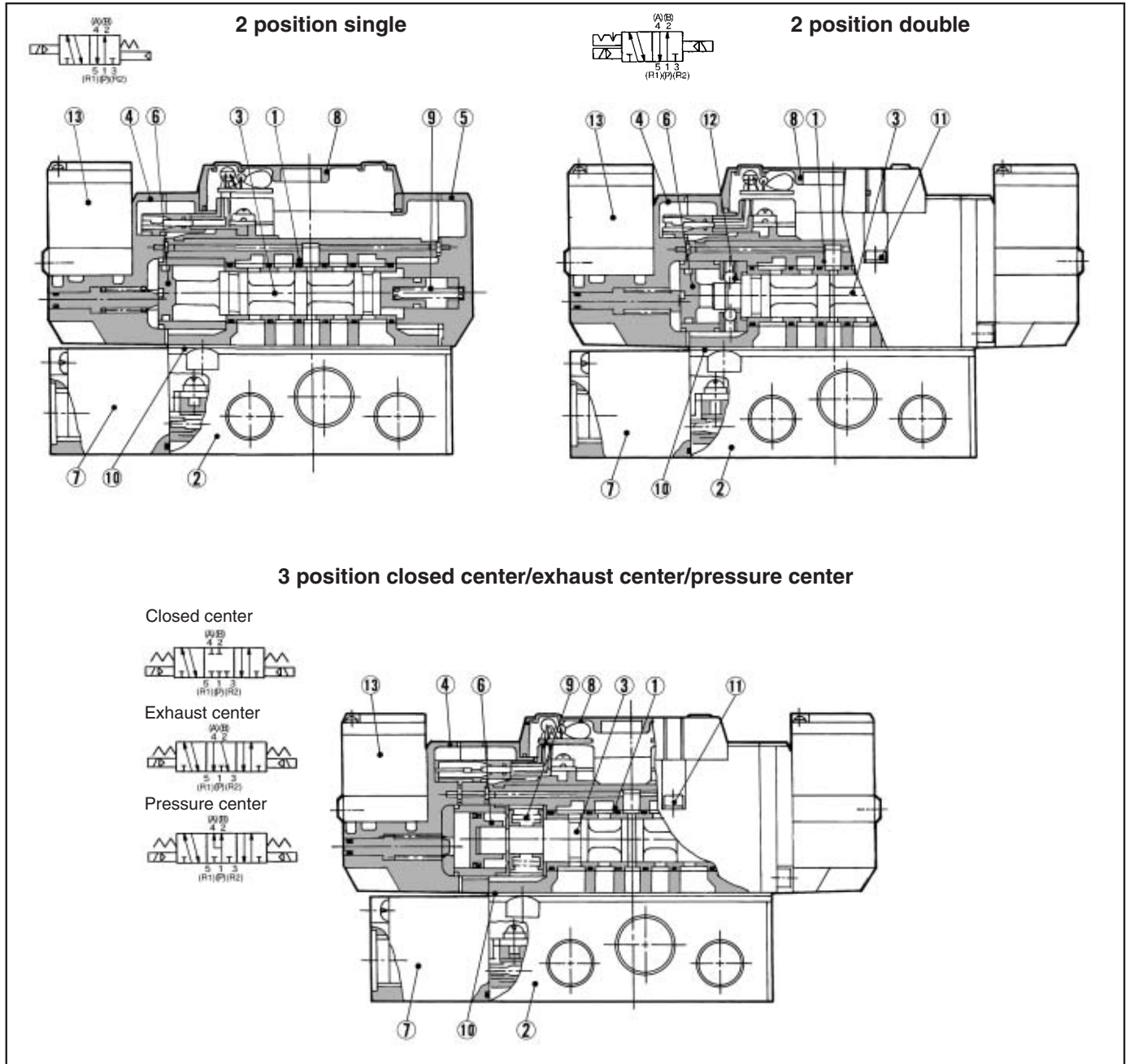
Coil rated voltage	Manual override
1	Nil
2	A*
3*	B*
4*	C*
5	
6*	
7*	
9*	

* Option

* Refer to page 3-8-5 for voltage conversion.

Series VFS4000

Construction




Component Parts

No.	Description	Material	Note
①	Body	Aluminum die-casted	Platinum silver
②	Sub-plate	Aluminum die-casted	Platinum silver
③	Spool/Sleeve	Stainless steel	—
④	Adapter plate	Aluminum die-casted	Black
⑤	End plate	Aluminum die-casted	Black
⑥	Piston	Resin	—
⑦	Junction cover	Resin	—
⑧	Light cover	Resin	—

Sub-plate Assembly Part No.

Plug-in	VFS4000-P- ⁰³ ₀₄
Non plug-in	VFS4000-S- ⁰³ ₀₄

 * Mounting bolt and gasket are not included.

Part no. for mounting bolt and gasket
BG-VFS4000

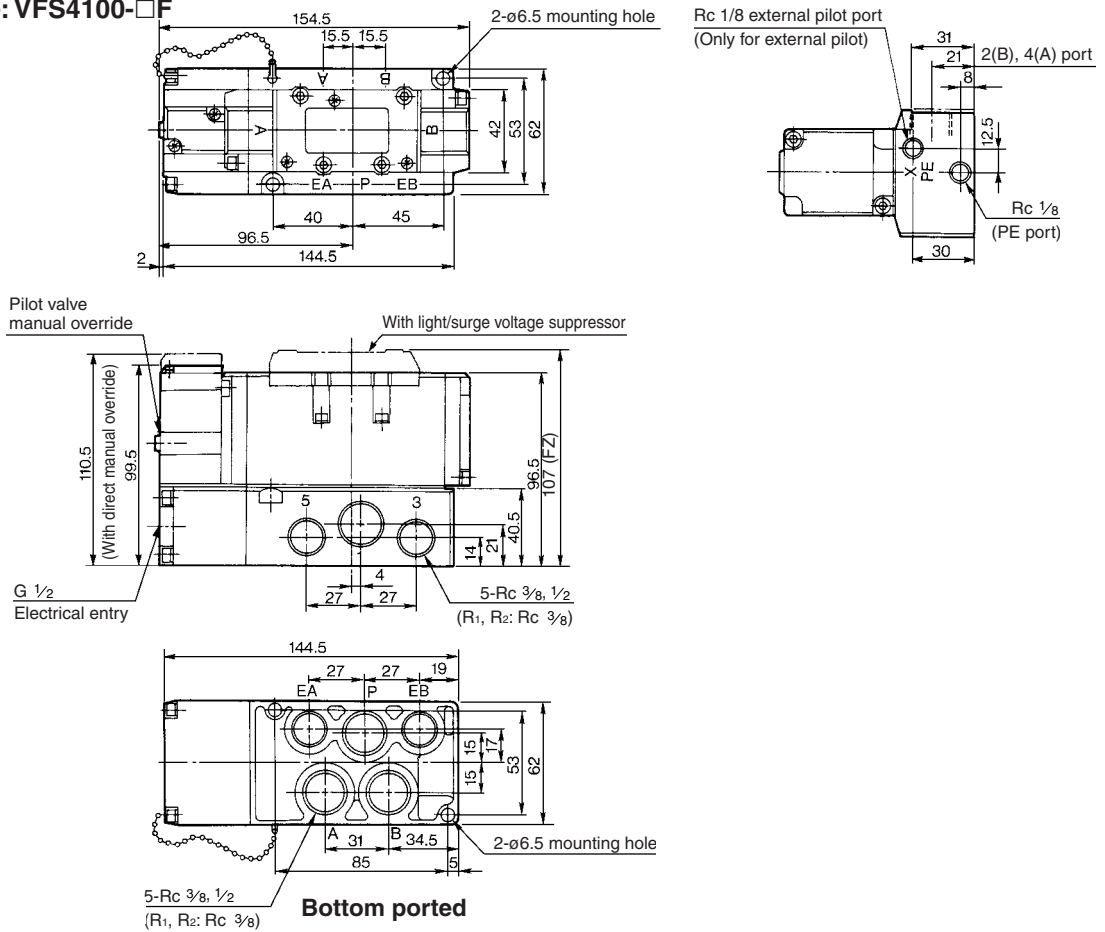
Replacement Parts

No.	Description	Material	Part no.		
			VFS41□□	VFS42□□	VFS43□□/44□□/45□□
⑨	Return spring	Stainless steel	VF4000-18-1	—	VF4000-18-2A
⑩	Gasket	NBR	VF4000-20-1	VF4000-20-1	VF4000-20-1
⑪	Hexagon socket head screw	Steel	M4 x 40	M4 x 40	M4 x 40
⑫	Detent assembly	—	—	VF4000-12A	—
⑬	Pilot valve assembly	—	Refer to "How to Order Pilot Valve Assembly" on page 3-8-70.		

5 Port Pilot Operated Solenoid Valve Metal Seal, Plug-in/Non Plug-in Series VFS4000

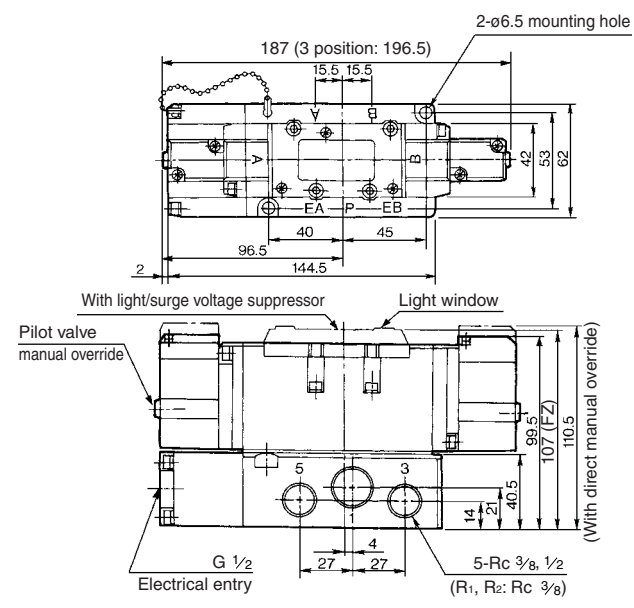
Plug-in 2 position single/double, 3 position closed center/exhaust center/pressure center/double check

2 position single: VFS4100-□F

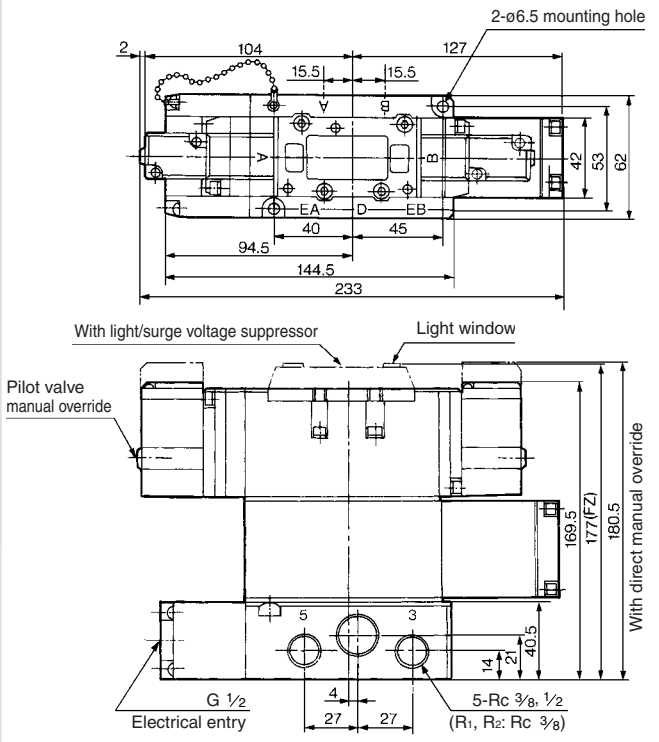


- VK
- VZ
- VF
- VFR
- VP4
- VZS
- VFS**
- VS4
- VQ7
- EVS
- VFN

- 2 position double: VFS4200-□F
- 3 position closed center: VFS4300-□F
- 3 position exhaust center: VFS4400-□F
- 3 position pressure center: VFS4500-□F



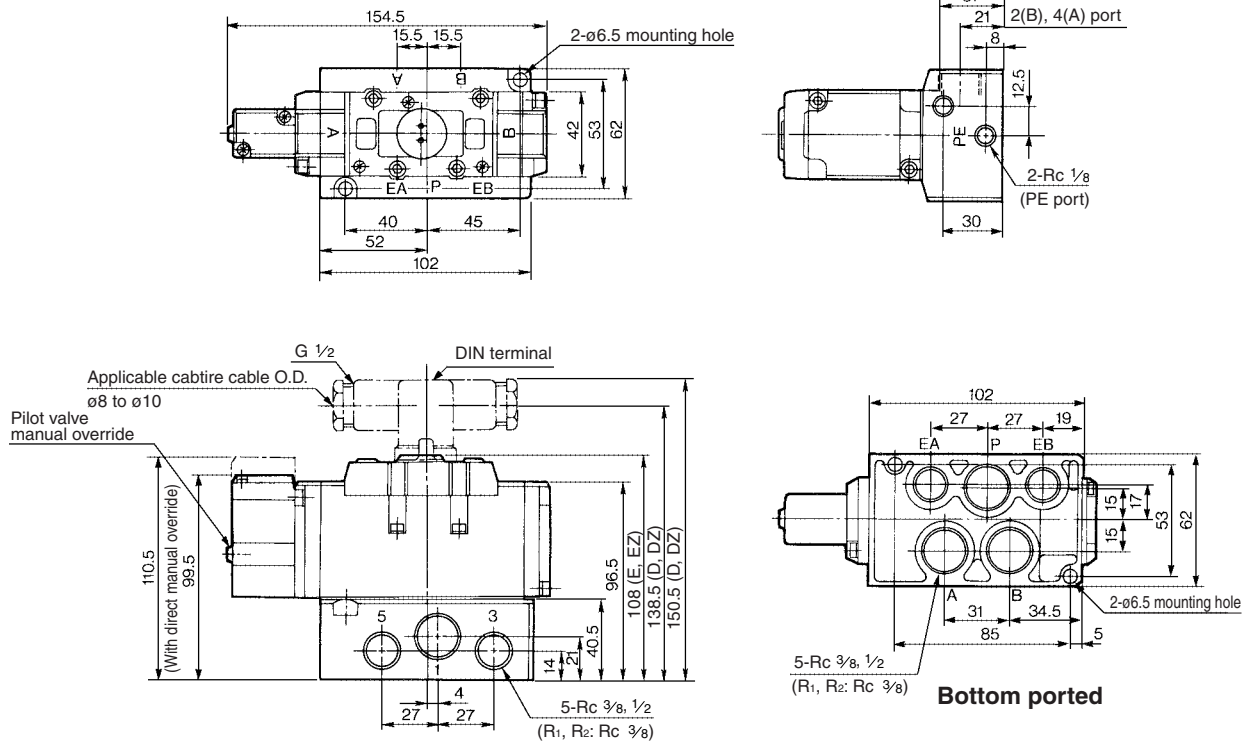
3 position double check: VFS4600-□F



Series VFS4000

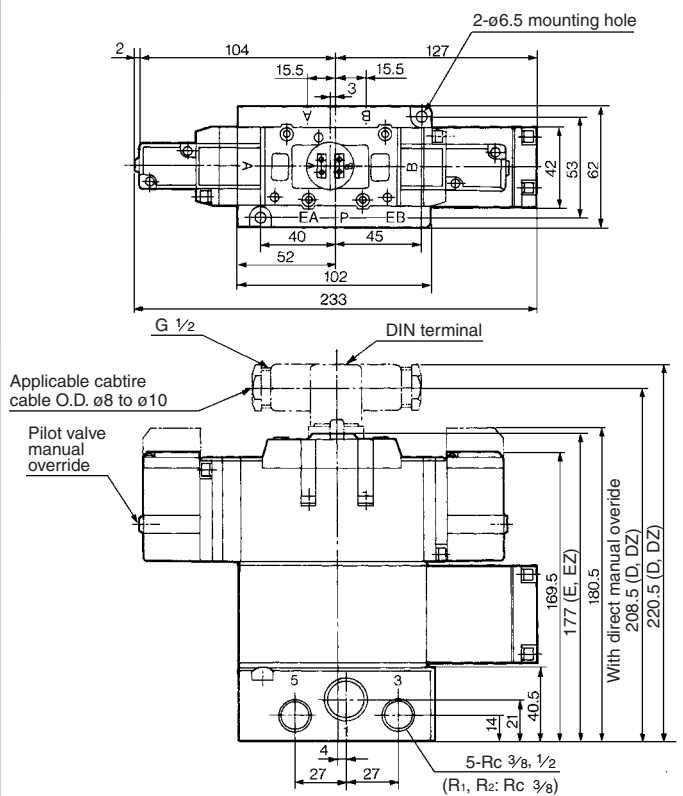
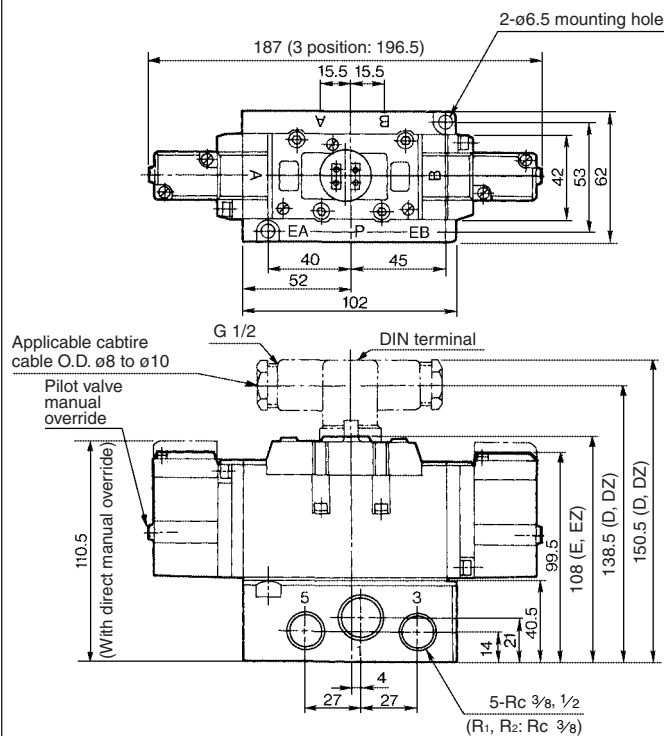
Non Plug-in 2 position single/double, 3 position closed center/exhaust center/pressure center/double check

2 position single: VFS4110-□E, VFS4110-□D



2 position double: VFS4210-□E, VFS4210-□D
3 position closed center: VFS4310-□E, VFS4310-□D
3 position exhaust center: VFS4410-□E, VFS4410-□D
3 position pressure center: VFS4510-□E, VFS4510-□D

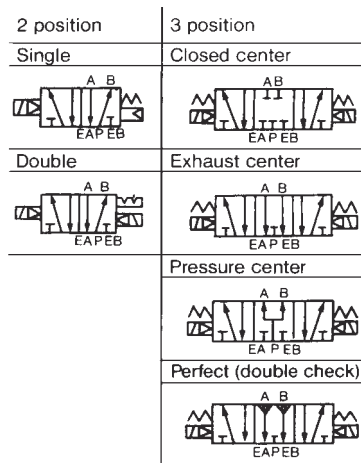
3 position double check: VFS4610-□E, VFS4610-□D



MODEL NVFS4000

Position	Number Of Solenoid	Type Plug-In	Port Size (NPTF)	Cv Factor	Response Time (ms)
2 Position	Single	NVFS4100	3/8	3.3	40 or less
			1/2	6	
	Double	NVFS4200	3/8	3.3	15 or less
			1/2	3.6	
3 Position	Closed Center	NVFS4300	3/8	2.8	50 or less
			1/2	3	
	Exhaust Center	NVFS4400	3/8	2.8	50 or less
			1/2	3	
	Pressure Center	NVFS4500	3/8	3.2	50 or less
			1/2	3.4	
Perfect (Double Check)	NVFS4600	3/8	1.7	55 or less	
		1/2	1.8		

SYMBOLS



TECHNICAL SPECIFICATIONS STANDARD

Fluid		Air and Inert Gas		
Valve	Max Operating Pressure	150 PSI (1MPa)		
	Min Operating Pressure	2 Position	15 PSI (0.1MPa)	
		3 Position	22 PSI (0.15MPa)	
	Ambient & Fluid Temperature	Note 1) 14~140°F (-10~60°C)		
	Lubrication	Note 2) Not Required		
	Pilot Operator Manual Override	Non Locking Push Type (Flush)		
Protection Construction		Dust Proof		
Electrical	Rated Voltage	AC	110VAC50/60Hz, 220V50/60Hz, 24V50/60Hz	
		DC	12V, 24V	
	Allowable Voltage Range	-15 ~ 10% Rated Voltage		
	Coil Insulation	Class B or Equivalent		
	Apparent Power AC (Power Consumption)	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)		

Note 1) Use Dry Air at Low Temperature

Note 2) Use Turbine Oil No 1 (ISOVG32), if lubricated

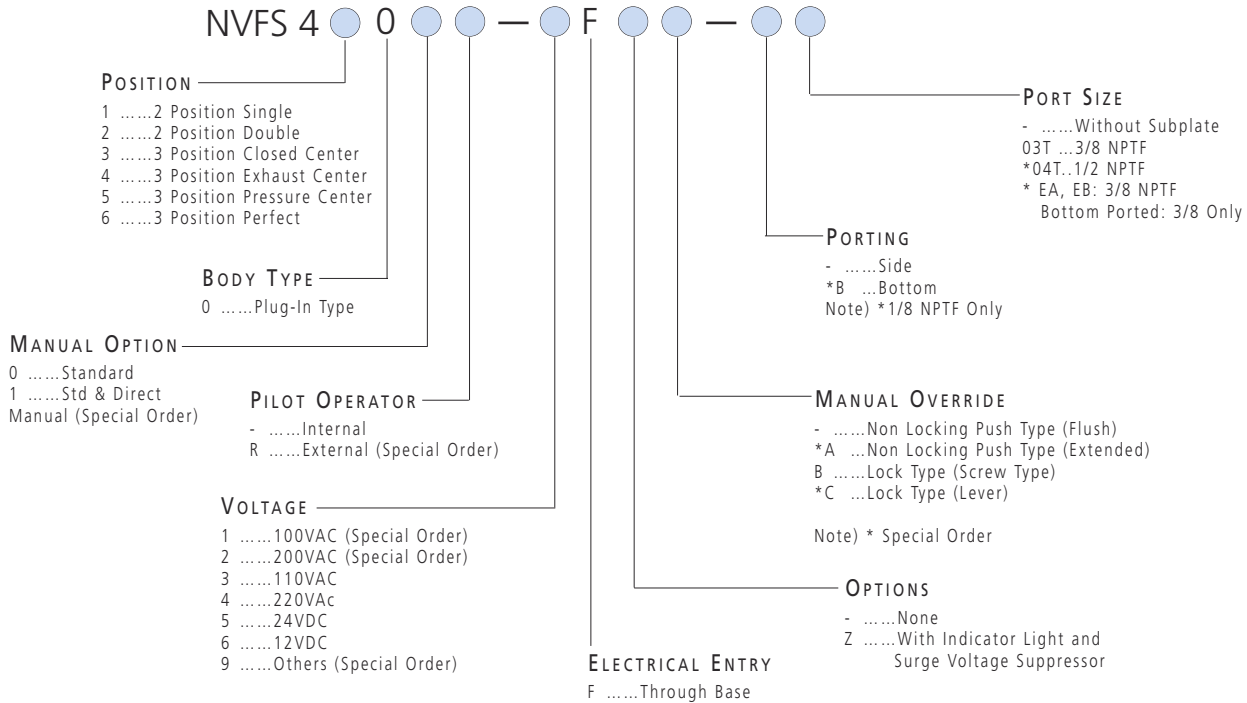
TECHNICAL SPECIFICATIONS OPTIONAL

Pilot Type		External Pilot Type
Manual Override	Main Valve	Direct Manual Override Type
	Pilot Operator	Non Locking Push Type (Extended), Lock Type (Tool), Lock Type (Lever)
Voltage	AC	100V50/60Hz, 200V50/60Hz
	DC	6V, 48V, 100V
Porting	Bottom Ported Subplate	
Option	W/Indicator Light & Surge Voltage Suppressor	



FOR FURTHER TECHNICAL DETAILS ON THIS PRODUCT, REQUEST CATALOG REFERENCE N233

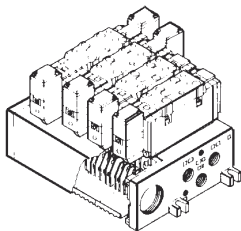
**HOW TO
ORDER
NVFS4000**



**HOW TO
ORDER
MANIFOLD**

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.



NVV5FS4-01T-061-03T

Series NVFS4000
Manifold valve

Plug-in type
With terminal block

Stations

02	2 stations
⋮	⋮
10	10 stations

● Port size

Suffix	P, EA, EB	A, B
03T	1/2 NPTF	3/8 NPTF
04T	1/2 NPTF	1/2 NPTF

* Bottom ported 3/8NPTF only.

● Symbol

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

* Special order.

SEE INSIDE FRONT COVER FOR
DETAILS OF YOUR LOCAL SALES OFFICE



FOR FURTHER TECHNICAL
DETAILS ON THIS
PRODUCT, REQUEST
CATALOG REFERENCE
N233

HOW TO
ORDER

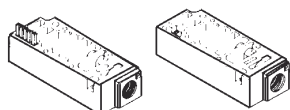
MANIFOLD / OPTION PARTS ASSEMBLY

Manifold / Option Parts

SUP Relocation spacer

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

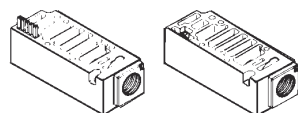
Body type	Plug-in type
Part No.	NVVFS4000-P-03T-1



EXH Relocation spacer

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

Body type	Plug-in type
Part No.	NVVFS4000-R-04T-1



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
Part No.	AXT634-10A



SUP block disc

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
Parts No.	AXT634-11A

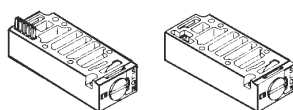


EXH block disc

Interface speed control

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

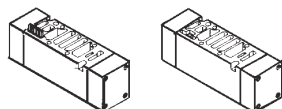
Body type	Plug-in type
Part No.	NVVFS4000-20A-1



Double Check "Perfect" spacer

The concurrent use of perfect spacer with built-in double check valve can stop the cylinder at mid-position and hold for extended time without being affected by normal air leakage across the spool seals.

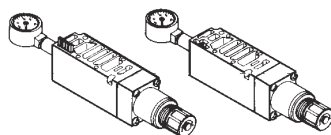
Body type	Plug-in type
Part No.	NVVFS4000-22A-1



Interface regulator

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

Body type	Plug-in type
Pressure Regulation P	NARBF4000-NO-P-1
Pressure Regulation A	NARBF4000-NO-A-1
Pressure Regulation B	NARBF4000-NO-B-1



Blank plate : VVFS4000-10A

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

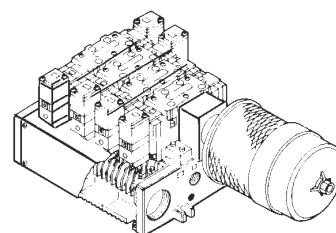
Body type	Plug-in type
Part No.	VVFS4000-10A

Manifold Options

With exhaust cleaner unit

Plug-in type

- Valve exhaust noise damping: 35db or more.
- Oil mist collection: Rate of collection 99.9% or more.
- Piping process reduced.

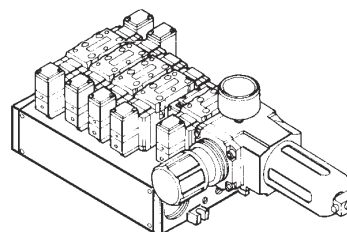


For more information,
refer to catalog N233

With Control Unit

Plug-in type

- Filter/Regulator, Pressure Switch, and Air shutoff valve all combine to form one unit.
- Piping work eliminated.



For more information,
refer to catalog N233



FOR FURTHER TECHNICAL
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N233