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



Non plug-in type

JIS Symbol



E	Operating	2 position single/3 position		0.2 to 0.9 MPa			
ați	pressure range	2 position double			0.1 to 0.9 MPa		
lice	Ambient and fluid temperature		-10 to 50°C (No freezing. Refer to page 5.)				
eci	Lubrication			Non-lube ⁽¹⁾			
g	Manual override		Non-locking push type				
۲e	Mounting orientation				Unrestricted		
Val	Shock/Vibration resistance			300/50m/s ^{2 (2)}			
-	Enclosure			Dustproof			
su	Coil rated voltage		100, 200 VAC (50/60 Hz), 24 VDC				
atio	Allowable voltage fluctuation			-15 to -10% of rated voltage			
cifi	Apparant nowar		Inrush	5.6 VA/50 Hz, 5.0 VA/60 Hz			
spe	Apparent power	(AC) (AC)	Holding	3.4 VA	/50 Hz, 2.3 VA/60 Hz		
city	Power consump	ower consumption (DC) ⁽³⁾		1.8 W			
ctri	Electrical entry			Plug-in type	Conduit terminal		
ш				Non plug-in type	type Grommet terminal, DIN termina		
$\overline{\mathcal{Q}}$	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)

Air

SJ

SY

SV

SYJ

SZ

VP4

S0700

VQ

VQ4

VQ5

Intion Specifications

Standard Specifications

Fluid

Option S	Specificat	ions		VQC				
Pilot type			External pilot Note)					
Manual	Main valve		Direct manual override					
override	Pilot valve	Non-locking pu	on-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						
			Bottom ported					
Option		With light/surge voltage suppressor		VFS				
Note)	Operating pre 2 position 0 to 3 position 0.1	ssure: 0 0.9 MPa 5 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)	VFR VQ7				

Model

т	in a af	Мо	Model Flow characteristics (1)								Max. (2)	Response (3)	(4)	
20	ype or	Plugin	Non	Port	1 –	$1 \rightarrow 4/2 (P \rightarrow A/B)$			$4/2 \rightarrow 5/3 (A/B \rightarrow EA/EB)$			time	Mass (*)	
au	luation	i iug-iii	plug-in	size	C [dm ³ /(s·bar)]	b	Cv	C [dm ³ /(s·bar)]	b	Cv	(Hz)	(ms)	(Kg)	
				3⁄8	17	0.36	4.7	18	0.40	5.0	5		4 77	
E	Single	VFR510	VFR511	1/2	20	0.28	5.2	23	0.32	6.2		60 or less	(1.72)	
sitio				3⁄4	23	0.27	5.8	25	0.21	6.2			(1.72)	
őd				3⁄8	16	0.37	4.6	18	0.41	5.1			1 00	
N	Double	VFR520□	VFR521	1/2	20	0.27	5.2	23	0.32	6.1	5	60 or less	1.88	
				3⁄4	23	0.26	5.8	25	0.20	6.1			(1.00)	
	Classed	VFR530 VFR53		3⁄8	15	0.38	4.1	16	0.31	4.3			1 07	
	Closed		sea VFR530□	′ VFR530□ VFR531□	1/2	17	0.31	4.6	20	0.33	5.4	3	80 or less	1.87
center	Center			3⁄4	18	0.28	4.7	21	0.30	5.4			(1.02)	
tio	Exhaust			3⁄8	14	0.38	3.6	17 [16]	0.39 [0.35]	4.8 [4.3]			1 07	
osi	contor	VFR540□	VFR541	1/2	17	0.29	4.6	21 [18]	0.31 [0.34]	5.6 [5.0]	3	80 or less	(1.82)	
Зþ	Center			3⁄4	18	0.29	4.6	23 [20]	0.27 [0.33]	5.9 [5.2]			(1.02)	
	D			3⁄8	16 [9.4]	0.39 [0.40]	4.2 [2.6]	17	0.36	4.5			1.07	
	Pressure	VFR550□	VFR551	1/2	18 [9.7]	0.32 [0.45]	5.0 [2.9]	20	0.31	5.3	3	80 or less	1.87	
center			3⁄4	19 [9.2]	0.35 [0.48]	5.4 [2.8]	21	0.29	5.6			(1.02)		

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



How to Order



How to Order Pilot Valve Assembly



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

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

Cylinder Speed Chart				Sizing	Program.			
					Bore size			
Series	Average speed (mm/s)	Series CS Pressure 0 Load facto Stroke 300	1/CS2 0.5 MPa r 50% 0 mm	_	_	_	_	
		ø125	ø140	ø160	ø180	ø200	ø250	ø300
VFR5100-06	800 700 600 500 400 300 200 100 0						Perpendicu Ipward acti Horizontal a	lar, uation actuation
* 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
	Tube x Length	SGP20A x 1 m
VFR5110-06	Speed controller	AS500-06
	Silencer	AN500-06

How to Order Sub-plate Assembly



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

Construction



3 position closed center/exhaust center/pressure center





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	Motorial	Part no.				
INO.	Description	Material	VFR51	VFR52	VFR5300/5400/5500		
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.				
	-						



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



3 position closed center: VFR530⁰₁-□F(Z) 3 position exhaust center: VFR540⁰₁-□F(Z) 3 position pressure center: VFR550⁰₁-□F(Z)



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



2 position double: VFR521⁰₁-□E, VFR521⁰₁-□D(Z)

3 position closed center: VFR531 $_1^0$ - \Box E, VFR531 $_1^0$ - \Box D(Z) 3 position exhaust center: VFR541 $_1^0$ - \Box E, VFR541 $_1^0$ - \Box D(Z) 3 position pressure center: VFR551 $_1^0$ - \Box E, VFR551 $_1^0$ - \Box D(Z)



Series VFR5000 **Manifold Specifications**

Manifold Specifications

Basa model	Wiring	Porting specifications	Port size Rc		Stations	Applicable	
Dase model	vviing	A, B port	P, EA, EB A, B		Stations	valve model	
Plug-in type	 With terminal block 		3⁄4	1/2, 3/4	2 to 10		
VV5FR5-01□(-Q)	With multi-connectorWith D-sub connector	Side/Bottom			2 to 8	VFR5⊡0⊡-□F(-Q)	
Non plug-in type VV5FR5-10(-Q)	Grommet terminalDIN 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-061-041 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)
*VFR5110-5D5 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 -01T 06 04 5FR5 are connected with the terminals on upper surface of terminal block **CE-compliant** Stations • corresponding lead wires from Series VFR5000 Nil power source can be wired at the 02 2 stations Manifold Q CE-compliant bottom of terminal block. Port size Plug-in type 10 10 stations Symbol P, EA, EB with terminal block A, B * Thread type Symbol 04 1/2 Nil Rc Porting 06 3⁄4 3⁄4 Passage F G Symbo ecification М Mixed Р EA, EB Ν NPT (A, B) For bottom ported: т NPTF 1 Side 1/2 only Common Common 2 Bottom ' * Option Terminal block Conduit porting Plug-in Type: With Multi-connector (For wiring specifications, refer to page 1326.) Master connection of power 04 -01C 5FR5 and solenoid valves. Quick wiring permits ease of **CE-compliant** installation. Stations Series VFR5000 Nil 02 2 stations Manifold Q CE-compliant Plug-in Type with multi-connector : 08 * 8 stations Connector mounting direction Thread type U side * Max: 8 D side mounting Nil Rc Port size stations U side mounting F G Plug assembly Symbol P, EA, EB A, B * Symbol 4 (Option) D side 1/2 Ν NPT 04 Passage Porting Refer to page 1326 Т NPTF 06 3/4 3⁄4 pecifications Ρ EA, EB М Mixed (A, B) Multi-connector Side For bottom ported: Common Common 2 Bottom 1/2 only. Option 1303 SMC

SY SV **SYJ** SZ VP4 S0700 VO **VQ4** VQ5 VQC VQZ SQ VFS VFR V07

SJ



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

Manifold/Option Parts Assembly

Individual SUP spacer

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

Body type	Plug-in type	Non plug-in type					
Part no.	VVFS5000-P-04-1	VVFS5000-P-04-2					
	~	100					



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
	~~~.	1



#### 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.	AXT62	28-12A

#### EXH block disk

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



EXH block disk



#### Throttle valve spacer

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





#### 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.	VVFS50	000-10A						

#### 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.





91J
SZ
VP4
S0700
VQ
VQ4
VQ5
VQC
VQZ
SQ
VFS
VFR
VQ7

SJ

SY

SV

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







**SMC** 

# 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.

### **Manifold Specifications**

Manifold	Plug-in type: VV5FR5	5-01□(-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				
Dorting		Common SUP/Common EXH					
Porting	A, B port	port Side: 1/2, 3/4, Bottom: 1/2 (Option)					
specifications	P port	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.							



∕∂SMC

# 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 < Example> Non plug-in type: 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.)
<u></u> <u>+</u> 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.

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.)
<u>*</u> AMC810-14	1 set (Exhaust cleaner part no.)
The asterisk denotes the symbol f	or 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.



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

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





34

48

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

### 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

**Replacement Parts: Sub Assembly** 

• 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.

Note)	Mani	fold	Base	/Cons	structio	n:	Plug-in	ty	be	with	ı te	ərmiı	nal	b	locł	۲.
-																

No.	Description	Assembly part no.	Component parts	Applicable manifold base
10	Manifold block assembly	VFR5000-20-1A-04	Manifold block ⁽¹ / ₀ , Metal joint ⁽¹ ), ⁽² ), Terminal block ⁽³ / ₀ , O-ring ⁽³ ), ⁽⁴ / ₀ , ⁽⁵ / ₀ , ⁽⁶ ), ⁽⁷⁾ / ₀ , Receptacle assembly	Plug-in type
		VVFS5000-1A-2-06	Manifold block 10, Metal joint 1, 2, O-ring 3, 4, 5, 6, 7	Non plug-in type
44	End plate (II side) assembly	VVFS5000-2A-1	End plate (U) $(1)$ , Metal joint $(1)$ , $(2)$	Plug-in type
	End plate (O side) assembly	VVFS5000-2A-2	End plate (U) $\textcircled{1}$ , Metal joint $\textcircled{1}$ , $\textcircled{2}$	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
	Life plate (D side) assembly	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.