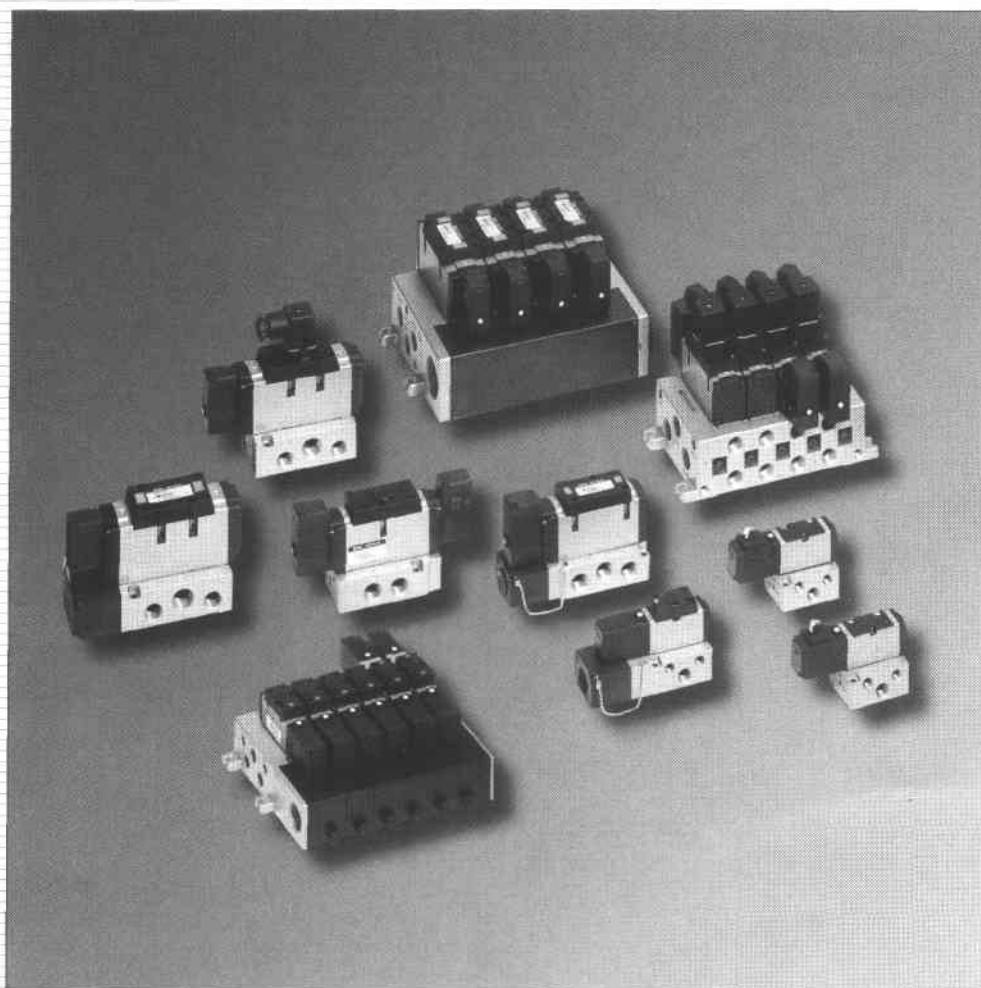




4 Way • 5 Port / Solenoid/Pilot Operated

NVFR Series

Rubber Seal Models 2000/3000/4000



Large Flow Capacity - Cv 0.9 ~ 3.7

Low Power Consumption

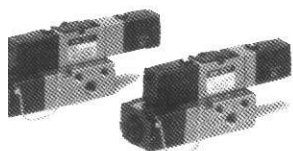
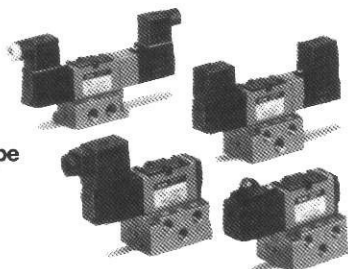
Block Type Manifold

Plug-in and Non Plug-in Styles

Wide Variety of Options and Accessories

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)
				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)
				1/8 1/4	0.7	180	30 or less	0.95 (0.43)

* In case of NVFR2000-OFZ-01T

† Special Order

Standard Specifications

Valve	Fluid		Air	
	Max. operating pressure		130 PSI (9.0kgf/cm ²)	
	Min. operating pressure	2~3 position	30 PSI (2.0kgf/cm ²)	
		2 pos. dbl.	15 PSI (1.0kgf/cm ²)	
	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 ⁵⁰ Hz, 220V ⁵⁰ Hz, 24V ⁵⁰ Hz		
	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 ^{50/60} Hz, 200V ^{50/60} Hz
	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.

Series NVFR2000:Base Mounted Type

How To Order

Porting		Port size	
	Side	Without subplate	
※B	Bottom	01T	1/8 NPTF Plug-in (With Terminal) block std.
※1/8NPTF only		02T	1/4 NPTF

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

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	
2 position single	
2 position double	
3 position closed center	
3 position exhaust center	
3 position pressure center	

Body type	
1-Non plug-in	

Pilot operator	
	Internal
※R	External
※Special Order	

Voltage	
※1	100VAC ^{50/60} Hz
※2	200VAC ^{50/60} Hz
3	110VAC ^{50/60} Hz
4	220VAC ^{50/60} Hz
5	24VDC
6	12VDC
※9	Others Note 1)
※Special Order	

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	

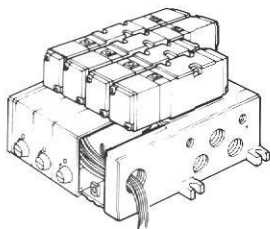
Note 1) Indicate in parentheses at end of part no.
Ex. (AC24V).

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

Port size

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

● Symbol

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

* Special Order

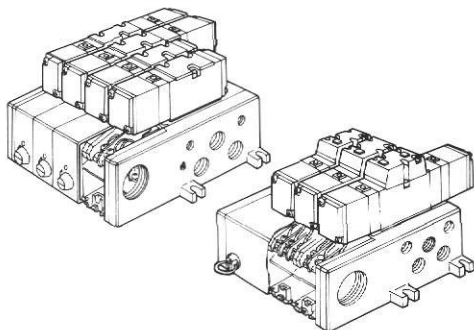
† Bottom porting specification with
"02T" is 1/8" P,A,B bottom and 1/4" A,B side.
(MBF2612-01-1B; see pg. 16)

Unit type conduit cover: AXT625-28-3A

Unit type conduit retainer: AXT625-87

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

Port size

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

● Symbol

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

* Special Order

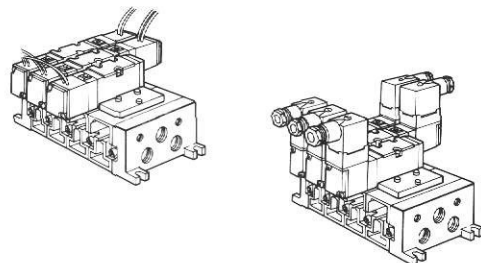
† Bottom porting specification with
"02T" is 1/8" P,A,B bottom and 1/4" A,B side.
(MBF2612-01-1A; see pg. 16)

● Stations

02	2 stations
⋮	⋮
15	15 stations

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

Port size

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

● Symbol

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

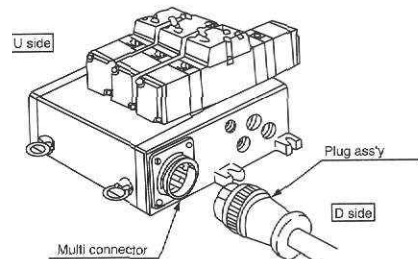
* Special Order

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

Series NVFR2000: Base Mounted Type

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	1/4 NPTF	1/8 NPTF
02T	1/4 NPTF	1/4 NPTF

Symbol

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

* Bottom porting: 1/8 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 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	1/4 NPTF	1/8 NPTF
02	1/4 NPTF	1/4 NPTF

Symbol

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

* Bottom porting: 1/8 only

Stations

02 2 stations

:

08 8 stations

* Max: 8 stations

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

*SI option

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

*SI module must be ordered separately

Port size

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

Series IN313 Serial Interface Modules

IN313 — AB 1

Protocol

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

Construction/Parts List

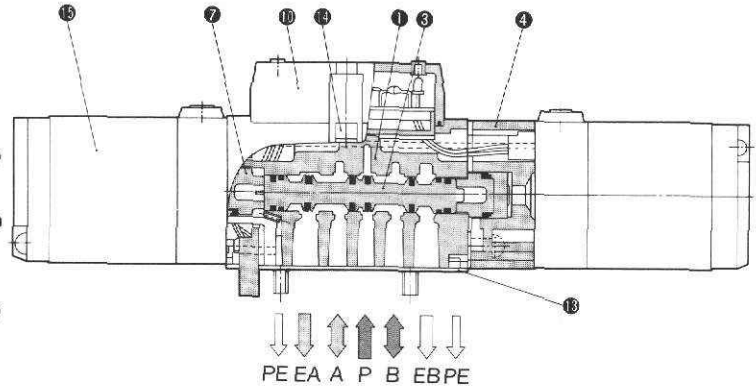
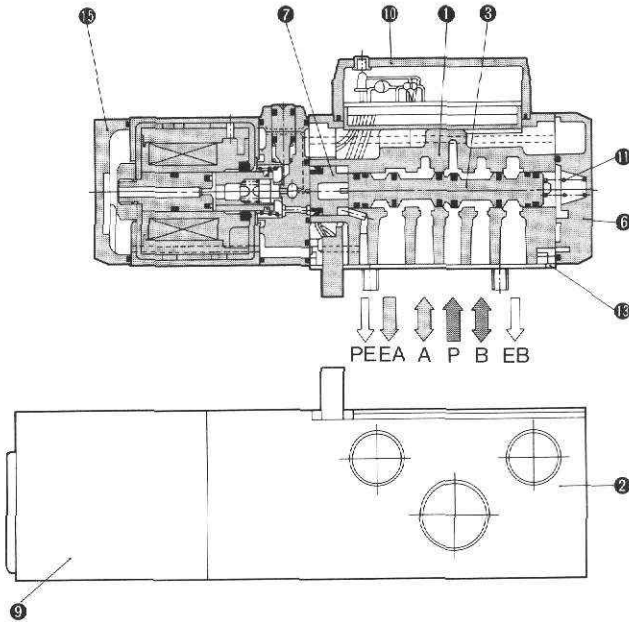
NVFR2100

2 position single



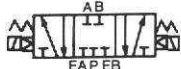
NVFR2200

2 position double

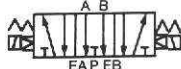


3 position Closed center/Exhaust center/Pressure center

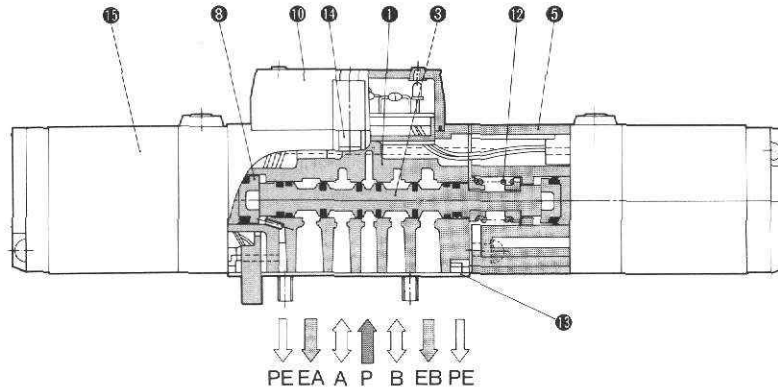
Closed center/NVFR2300



Exhaust center/NVFR2400



Exhaust center/NVFR2500



Main Parts

No.	Description	Material	Note
1	Body	Aluminum diecast	Platinum silver
2	Subplate	Aluminum diecast	Platinum silver
3	Spool	Aluminum/NBR	
4	Adapter plate	Aluminum diecast	Platinum silver
5	Adapter plate	Aluminum diecast	Platinum silver
6	End plate	Resin	Black

No.	Description	Material	Note
7	Piston	Resin	
8	Piston	Resin	
9	Junction cover	Resin	
10	Light cover	Resin	
11	Spool spring	SUS	
12	Return spring	SUS	

Prepare Parts

No.	Description	Material	Part Nos.		
			NVFR2100	NVFR2200	NVFR2300, 2400, 2500
1	Gasket	NBR	AXT624-20-2	AXT624-20-2	AXT624-20-2
2	Valve mounting bolt	Steel	AXT624-26 (M3X31)	AXT624-26 (M3X31)	AXT624-26 (M3X31)
3	Pilot Ass'y	—	Refer to "Pilot Operator Ass'y/How to Order" on page 8.		

Series NVFR2000:Base Mounted Type

Pilot Operator Ass'y/How to Order

SF4—3 DZ 60

• Voltage

※ 1	100VAC $\frac{50}{60}$ Hz
※ 2	200VAC $\frac{50}{60}$ Hz
3	110VAC $\frac{50}{60}$ Hz
4	220VAC $\frac{50}{60}$ Hz
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

		plug-in type
F	Plug-in	
G	Grommet	
† GS	Grommet with surge voltage suppressor	
D	DIN connector	
DZ	DIN connector with indicator light and surge voltage suppressor	
† DO	※ DIN connector	Non plug-in type
† 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

• Valve Series

60	NVFR2000 Series
----	-----------------

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

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

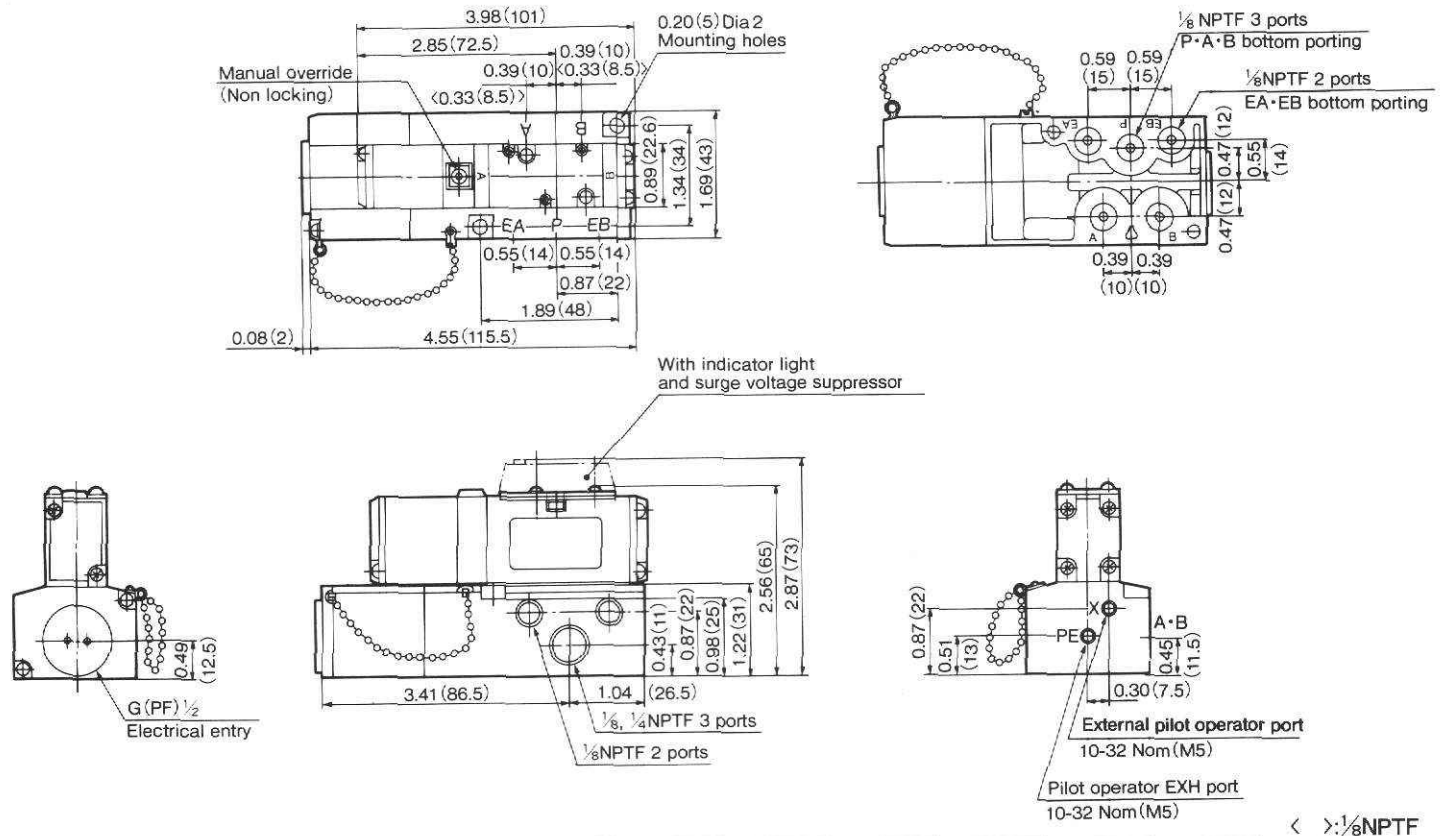
Porting/No. of stations	First station	Fifth station	Tenth station	Fifteenth station
P→A or B	0.72	0.72	0.71	0.70
A→EA, B→EB	0.9	0.9	0.9	0.9

2 position single. Port size: $\frac{1}{4}$ NPTF

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

inch (mm)

position single:NVFR2100-OF

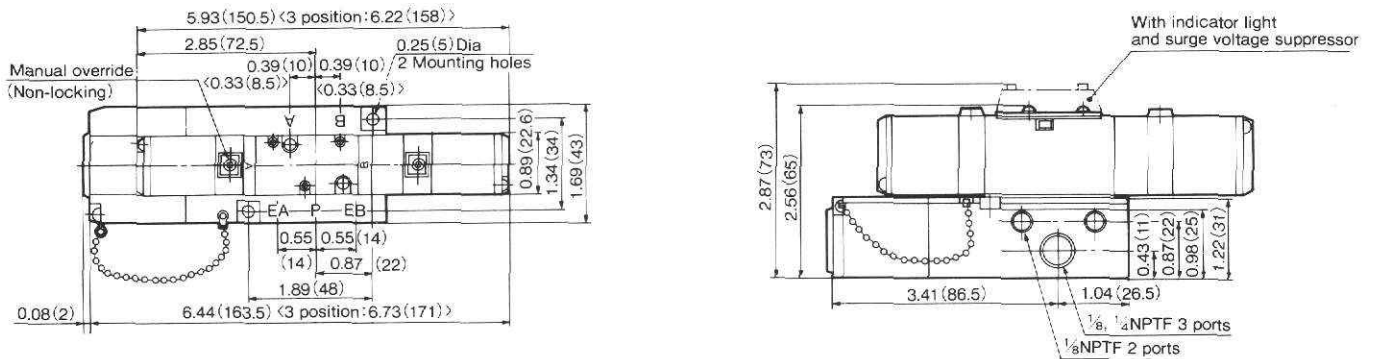


position double:NVFR2200-OF

position closed center:NVFR2300-OF

position exhaust center:NVFR2400-OF

position pressure center:NVFR2500-OF



< >: 1/8 NPTF

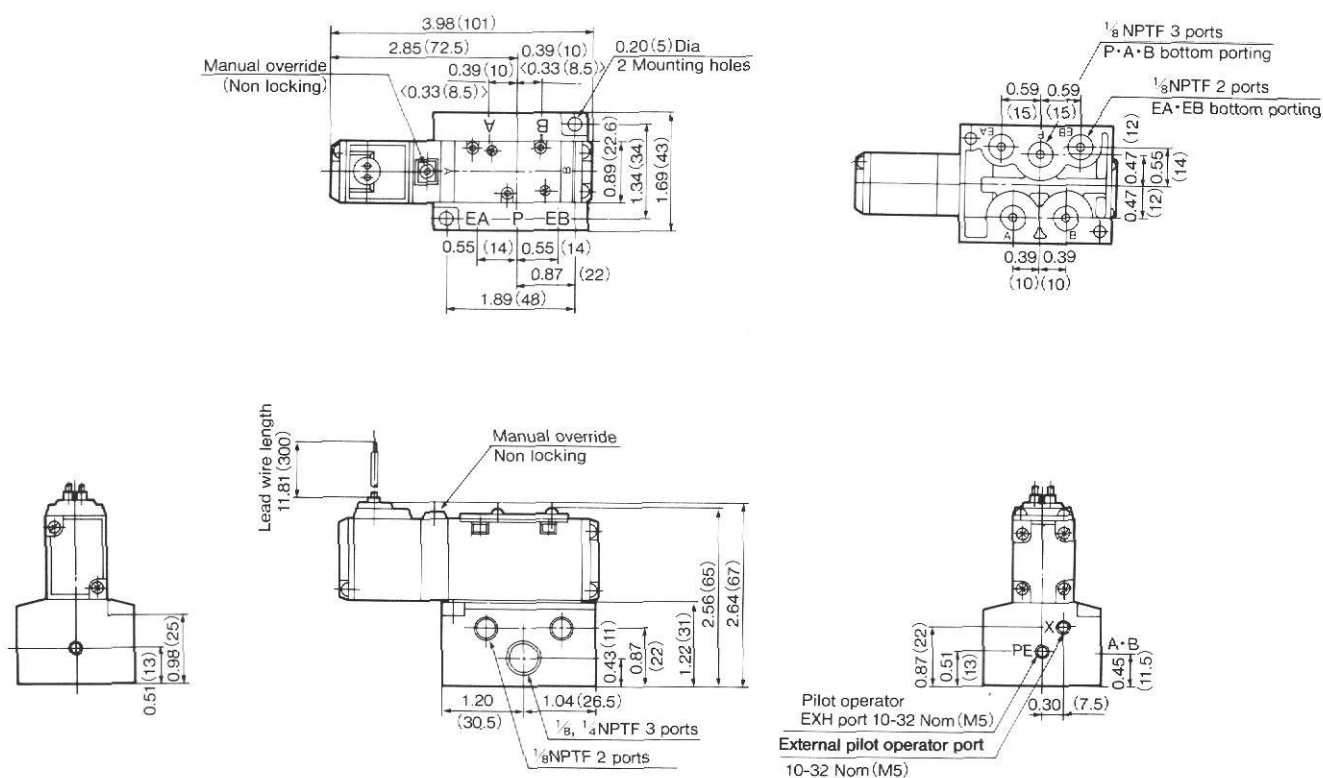
< >: 1/8 NPTF

Series NVFR2000:Base Mounted Type

Non Plug-in type 2 position single/Dimensions

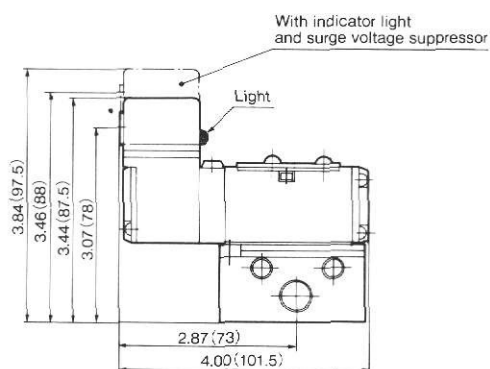
inch (mm)

Grommet:NVFR2110-OG

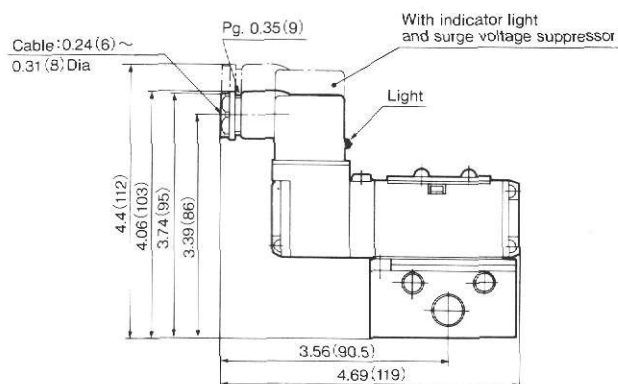


< >: $\frac{1}{8}$ NPTF

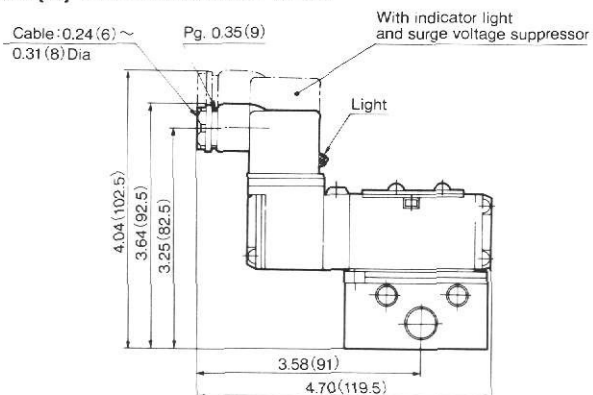
Grommet Terminal:NVFR2110-OE



DIN Connector:NVFR2110-OD



Conduit ($\frac{1}{4}$) Terminal:NVFR2110-OT



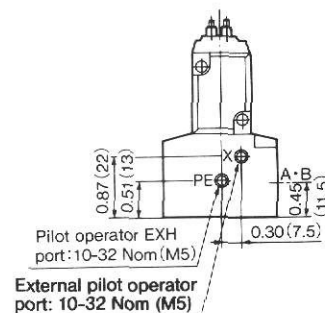
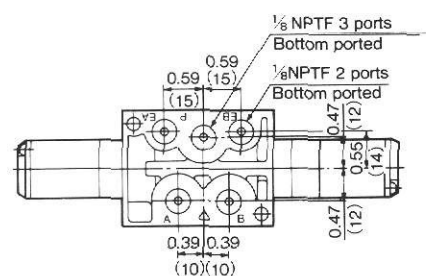
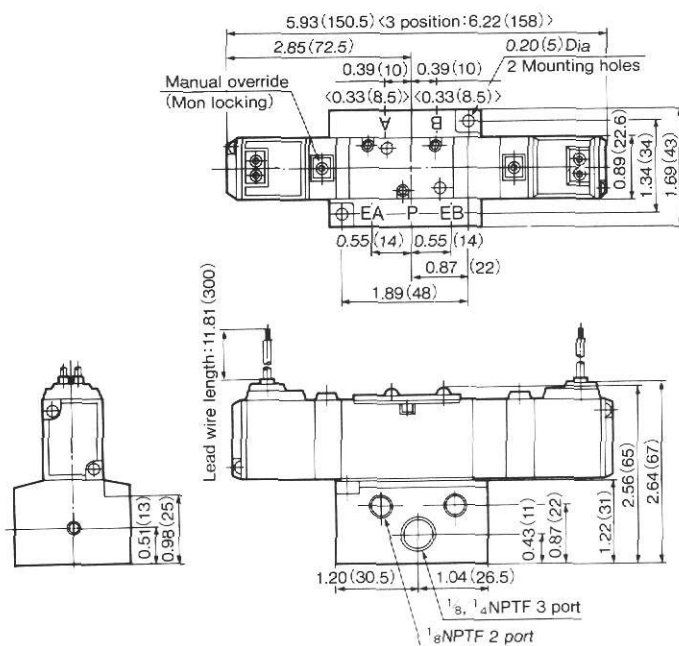
Series NVFR2000:Base Mounted Type

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

inch (mm)

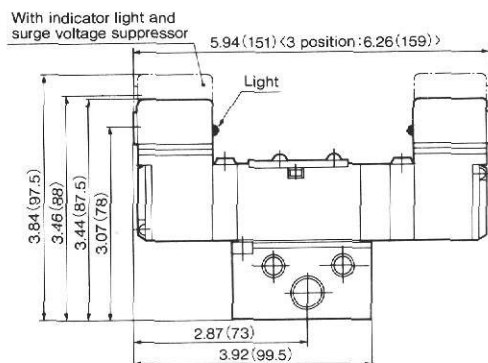
Frommet: 2 position double/NVFR2210-OG 3 position closed center/NVFR2310-OG

3 position exhaust center/NVFR2410-OG 3 position pressure center/NVFR2510-OG

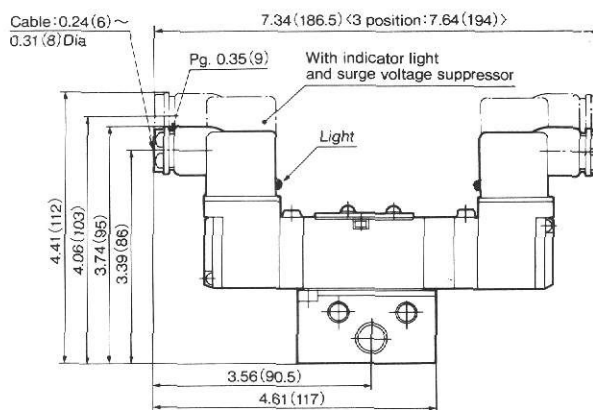


< > 1/8 NPTF

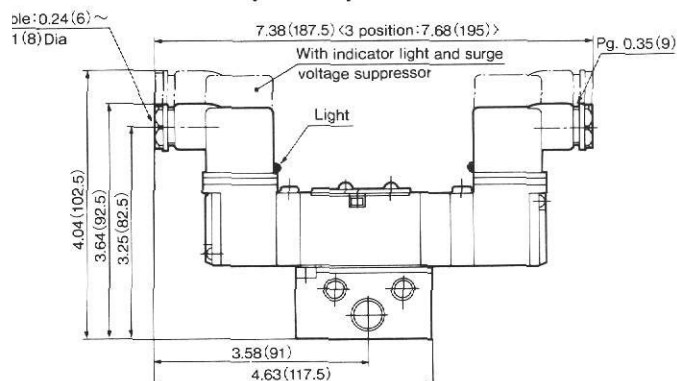
Frommet Terminal: 2 position double/NVFR2210-OE
3 position closed center/NVFR2310-OE
3 position exhaust center/NVFR2410-OE
3 position pressure center/NVFR2510-OE



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



Conduit (1/4) Terminal: 2 position double/NVFR2210-OT
3 position closed center/NVFR2310-OT
3 position exhaust center/NVFR2410-OT
3 position pressure center/NVFR2510-OT

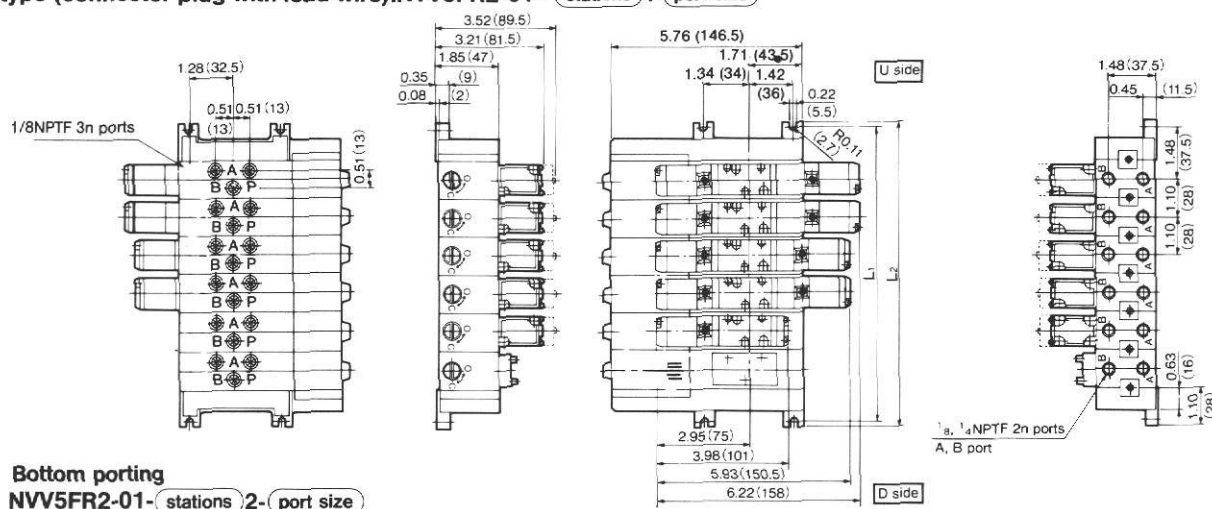


Series NVFR2000:Base Mounted Type

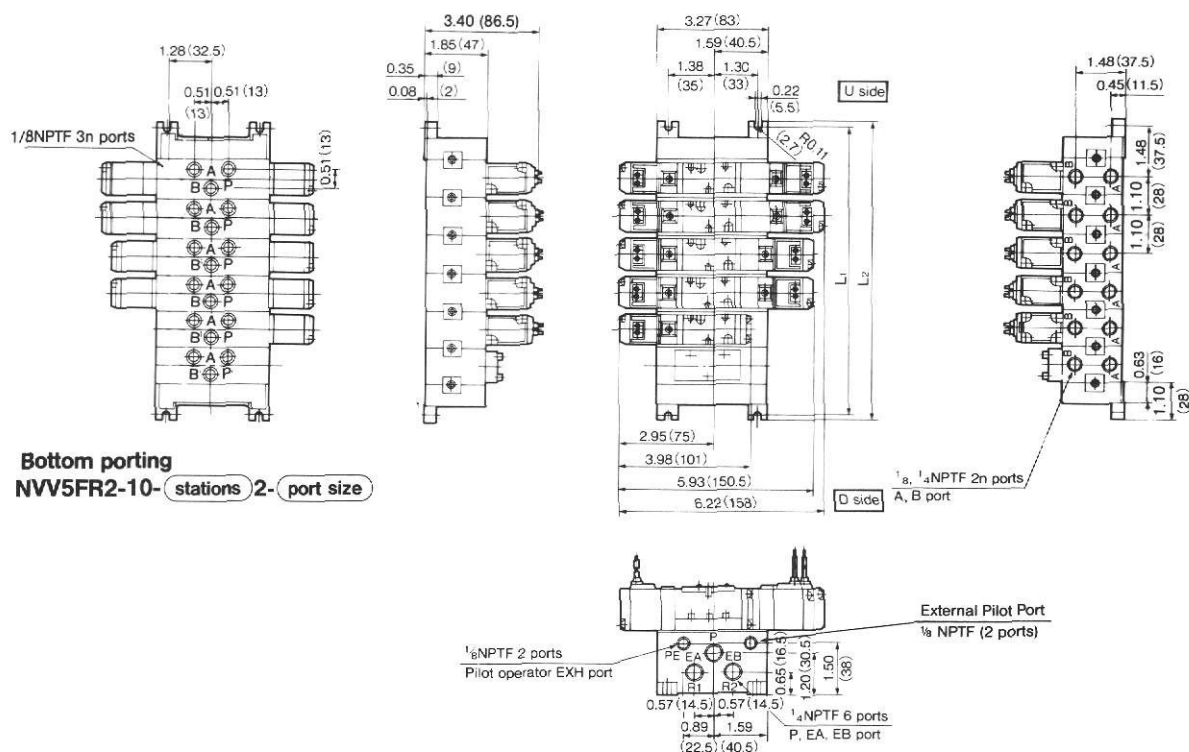
Manifold Plug-in Type/Non Plug-in Type/Dimensions

inch (mm)

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



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

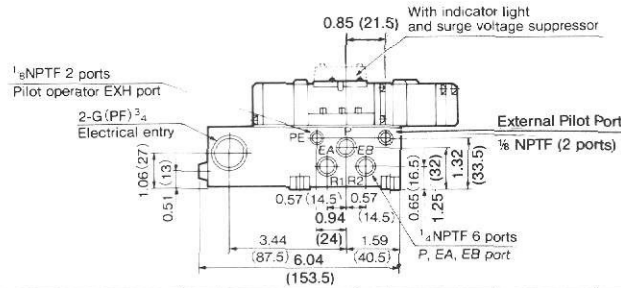
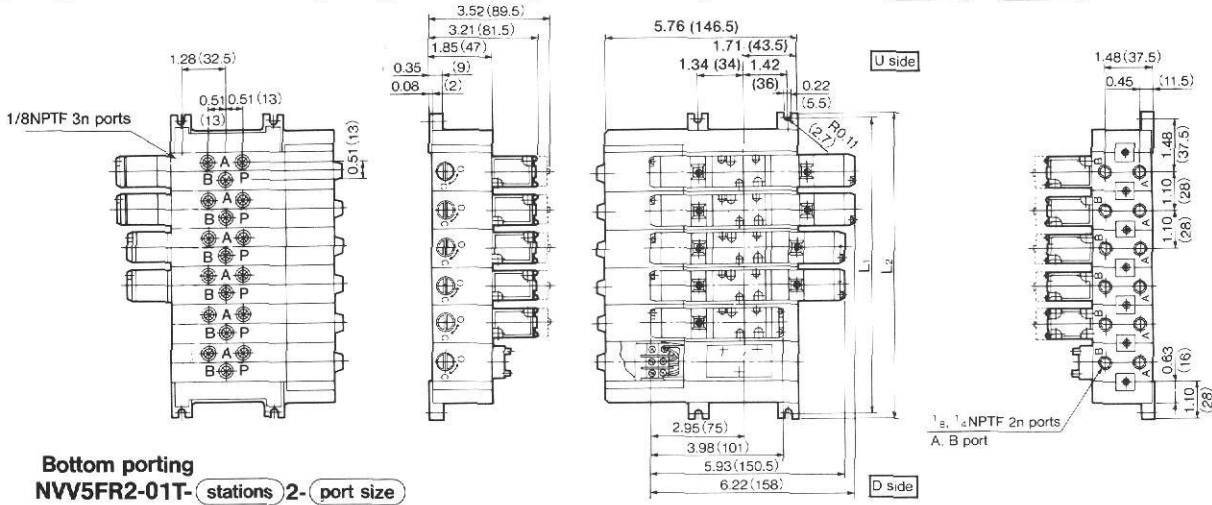


		inch (mm) n: stations										Equation
L	station	1	2	3	4	5	6	7	8	9	10	
L ₁		2.95 (75)	4.06 (103)	5.16 (131)	6.26 (159)	7.36 (187)	8.46 (215)	9.57 (243)	10.67 (271)	11.77 (299)	12.87 (327)	$L_1 = 1.10 \times n + 1.85$ $(L_1 = 28 \times n + 47)$
L ₂		3.31 (84)	4.41 (112)	5.51 (140)	6.61 (168)	7.72 (196)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

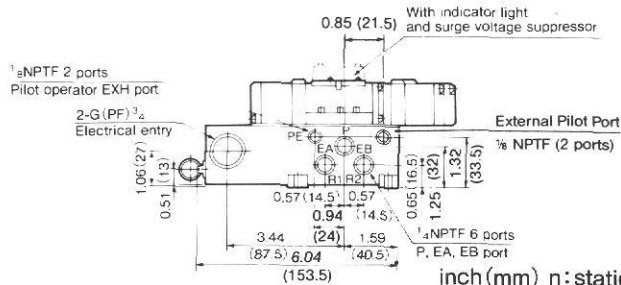
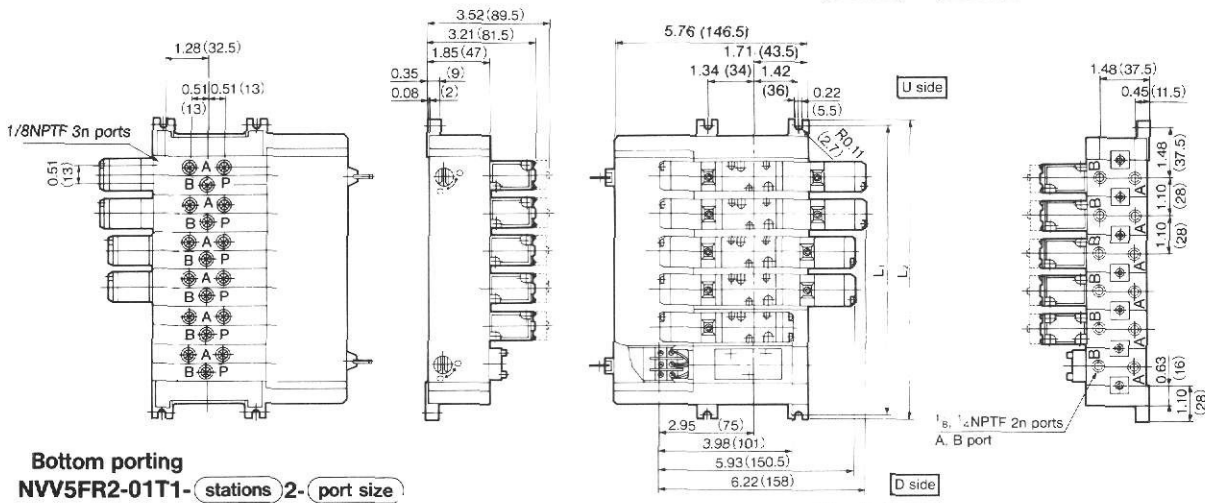
Series NVFR2000:Base Mounted Type

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



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



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×n+1.85 (L ₁ =28×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×n+2.20 (L ₂ =28×n+56)

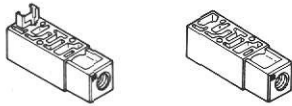
Series NVFR2000:Base Mounted Type

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

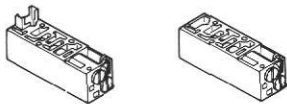
When disassembling valve for maintenance purposes or when spare manifold stations are required, install Blank plate on the manifold block.

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

Interface speed control

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

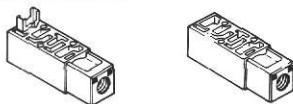
Body type	Plug-in type	Non plug-in type
Part No.	VVFS2000-20A-1	VVFS2000-20A-2



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

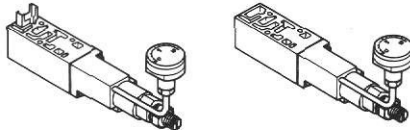
When supplying manifold with more than one pressure, insert block disc in between stations subjected to different pressures.

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



Other Options Available:

(See NVFS Series Catalog)

- Air Shutoff Valve spacer
- Single-check Drop Guard spacer
- Double-check "Perfect" spacer
- Control Unit

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

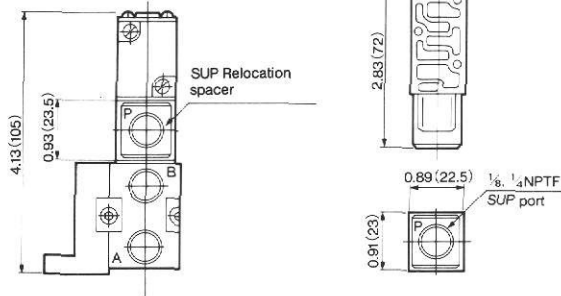
inch (mm)

SUP Relocation spacer

NVVFS2000-P- $\frac{1}{8}$ "T-1 (Plug-in type)

NVVFS2000-P- $\frac{1}{8}$ "T-2 (Non plug-in type)

Specify 1/8 (01) or 1/4 (02)

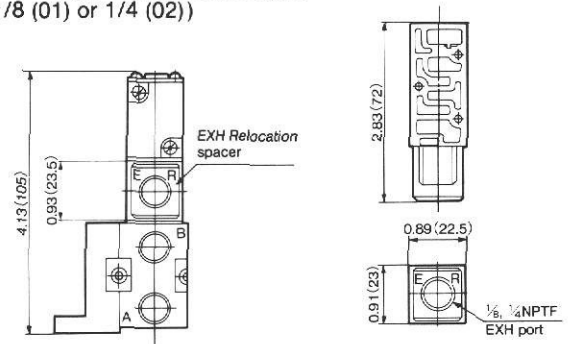


EXH Relocation spacer

NVVFS2000-R- $\frac{1}{8}$ "T-1 (Plug-in type)

NVVFS2000-R- $\frac{1}{8}$ "T-2 (Non plug-in type)

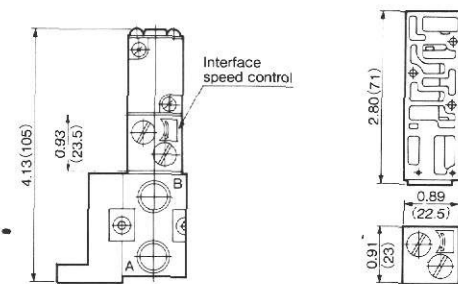
(Specify 1/8 (01) or 1/4 (02))



Interface Speed Control

NVFS2000-20A-1 (Plug-in type)

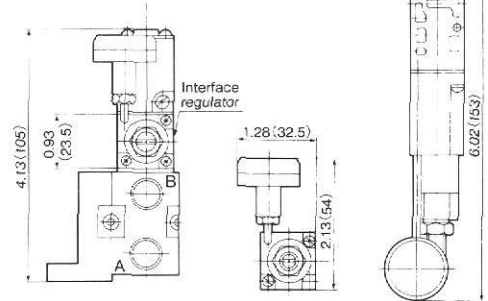
NVFS2000-20A-2 (Non plug-in type)



Interface Regulator

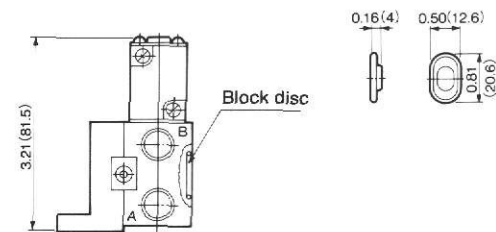
NARBF2000-00-P-1 (Plug-in type)

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



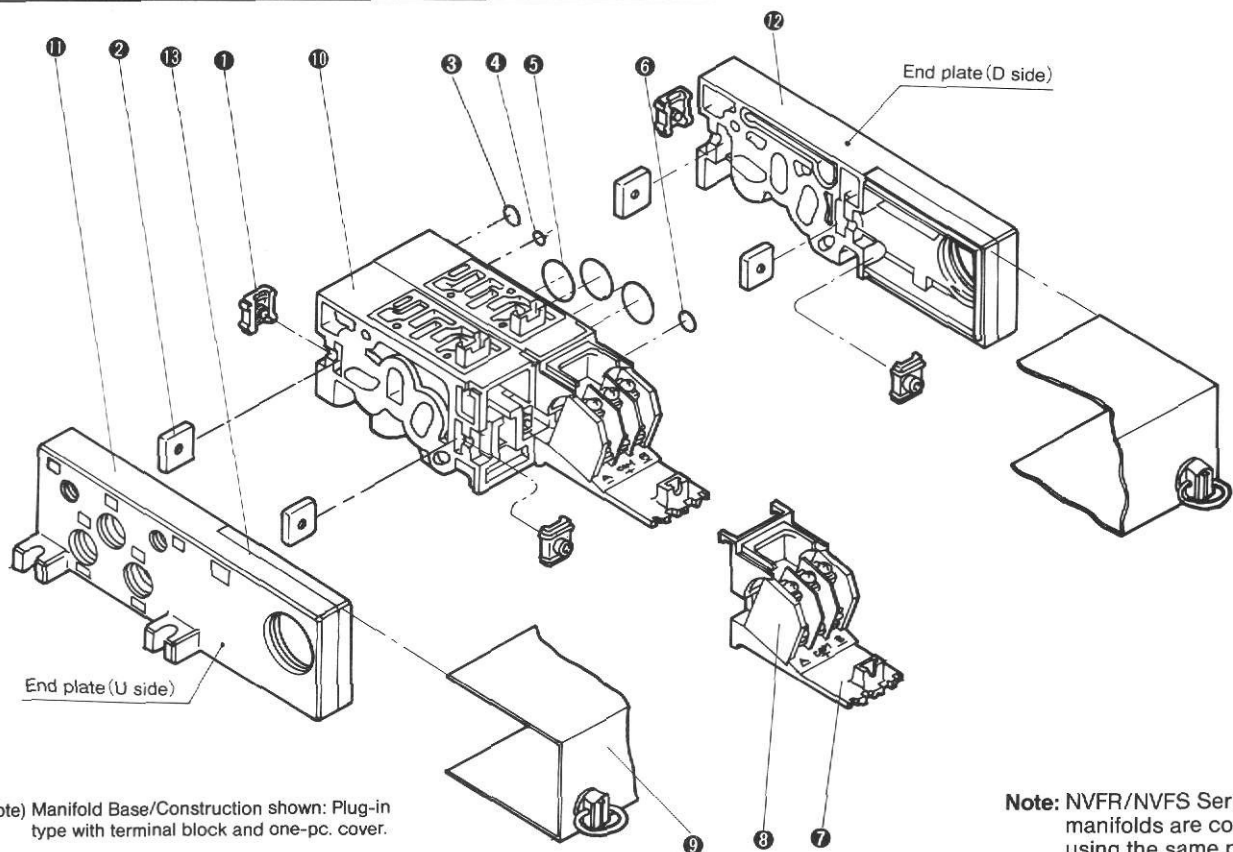
SUP/EXH gallery block disc

EXT 625-12A



Series NVFR2000:Base Mounted Type

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

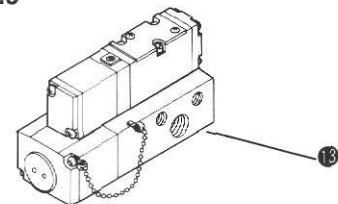


Note: NVFR/NVFS Series manifolds are constructed using the same parts.

Parts List

No.	Description	Material	Part No.
1	Clamp A	Steel plate	AXT625-4A
2	Clamp B	Steel plate	
3	O-ring	NBR	AXT050-031
4	O-ring	NBR	AXT625-36
5	O-ring (3 req'd)	NBR	AXT625-34
6	O-ring	NBR	AXT625-35
7	Adapter	—	AXT625-28-1
8	Terminal ass'y	—	AXT625-28-2A
9	Conduit cover ass'y	—	NVVF2000-4A- stations

Subplate Base Cv:0.9



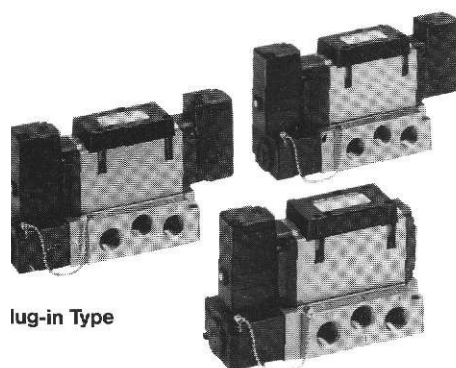
Note) Subplate shown:
Plug-in type
with terminal.

Main Parts sub-ass'y

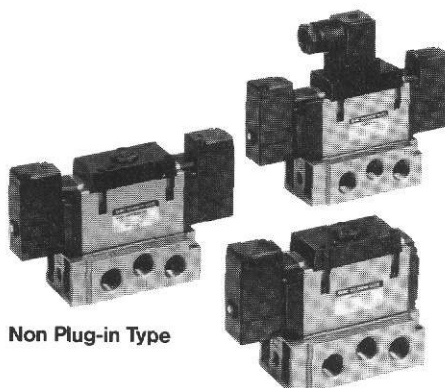
No.	Description	Part No.	Note)	Component parts	Applicable manifold base
10	Manifold block ass'y *: 0-side ports A, B 1-1/8 P, A, B bottom 2-1/8 P, A, B bottom w/ (1/4 A, B side)	MBF261*-01-1B		Manifold block 10, Clamp 1, 2, O-ring 3, 4, 5, 6, Adapter 7, Pin housing. Guide. Insert plug lead wire	Plug-in type Connector lead wires
		MBF261*-01-1A		Manifold block 10, Clamp 1, 2, O-ring 3, 4, 5, 6, Adapter 7, Terminal 8, Pin housing. Guide.	Plug-in type With terminal block
		MB261*-01-02-1		Manifold block 10, Metal joint 1, 2, O-ring 5, 6, 7	Non plug-in type
11	End plate (kit) ass'y	ME263LR-02-1		End plate (U) 11, End plate (D) 12, Clamp 1, 2, O-ring 3, 4, 5, 6, Conduit Plug.	Plug-in type Connector lead wires With terminal block.
		ME272LR-02-1		End Plate (U) 11, End plate (D) 12, Clamp 1, 2, O-ring 3, 4, 5, 6.	Non plug-in type
13	Subplate ass'y †	SPF0191-01-02	Plug-in type with terminal block	SP0191-01-02	1/8, 1/4 NPTF Side Ports
		SPF0193-01-02		SP0193-01-02	1/8NPTF side & 1/4NPTF bottom ports

Cv: 2.1
2.3

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

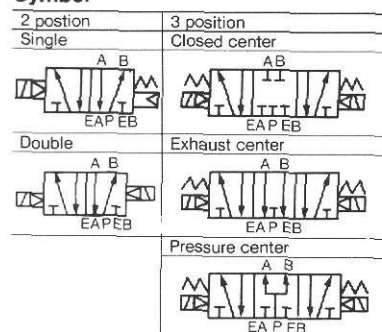


lug-in Type



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 3/8	2.1 2.3	300	30 or less	0.68 (0.31)
	Double	NVFR3200	NVFR3210	1/4 3/8	2.1 2.3	300	30 or less	0.90 (0.41)
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/cm ²)	
	Min. operating pressure	30 PSI (2.0kgf/cm ²)	
	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 ^{50/60} Hz 220V ^{50/60} Hz, 24V ^{50/60} Hz
		DC	12V, 24V
	Allowable voltage range	-15 ~ +10% rated voltage	
	Coil insulation	Class B or equivalent	
	Apparent power (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)
		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 ^{50/60} Hz, 200V ^{50/60} Hz
	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.

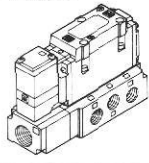
NVFR
3000

Series NVFR3000: Base Mounted Type

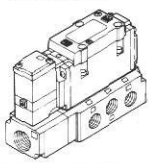
How to Order

Body type

O-Plug in



F-Through base



Porting

— Side

*B Bottom

* Special order

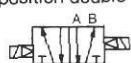
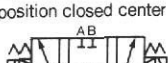
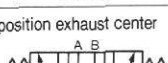
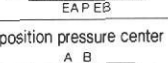
Port size

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

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

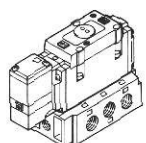
Plug-in	NVFR3	1	0	0	3	F				02T
Non Plug-in	NVFR3	2	1	1	4	D				02T

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

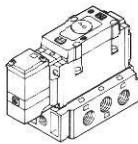


Option

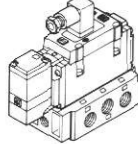
—	Note
Z	With indicator light and surge voltage suppressor

Electrical entry

E—Grommet terminal



D—DIN Connector



Pilot operator manual override/ classification

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

* Special Order.

Manual option

0	Standard
*1	Std. + Direct-manual

* 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).

Pilot operator

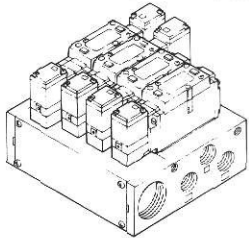
—	Internal
*R	External

* Special order

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

Port size

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

Bottom ported 1/4NPTF only.

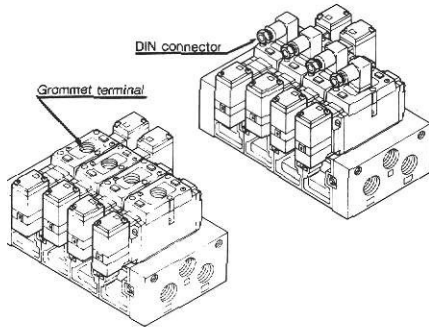
Porting Symbol

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

* Special Order

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

Port size

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

Bottom ported 1/4NPTF only

Porting Symbol

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

* Special Order

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

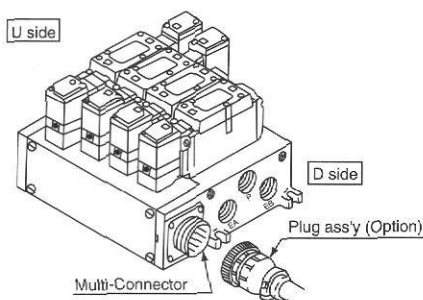
Manifold Specifications

Base mounted type	Wiring	Porting specifications	Port size		No. of Stations	Applicable solenoid valve
		A,B port	P,EA,EB	A,B		
Plug-in type NVV5FR3-01T	With terminal blocks	Side, Bottom	1/2 NPTF	1/4, 3/8 NPTF	2-10	NVFR3000-OF
Non plug-in type NVV5FR3-10	DIN Connector Grommet terminal				2-10	NVFR3010-OD NVFR3010-OE

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

● Port size

Symbol	P, EA, EB	A, B
02T	1/2 NPTF	1/4 NPTF
03T	1/2 NPTF	3/8 NPTF

● Symbol

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

* Bottom porting: 1/4 only

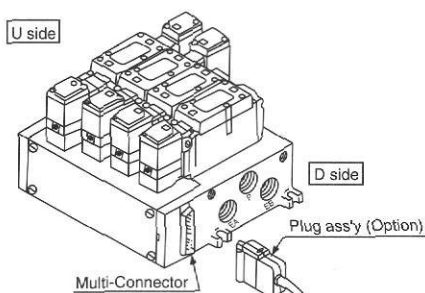
● Stations

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



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

● Port size

Symbol	P, EA, EB	A, B
02T	1/2 NPTF	1/4 NPTF
03T	1/2 NPTF	3/8 NPTF

● Symbol

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

* Bottom porting: 1/4 only

● Stations

02	2 stations
:	:
08	8 stations

* Max: 8 stations

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: 1/4 only

• SI option

—	For standard **1 type modules
X200	For AB2 modules

* SI module must be ordered separately

• Port size

Symbol	P, EA, EB	A, B
02T	1/2 NPTF	1/4 NPTF
03T		3/8 NPTF

Series IN313 Serial Interface Modules

IN313 — AB 1

Protocol •

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

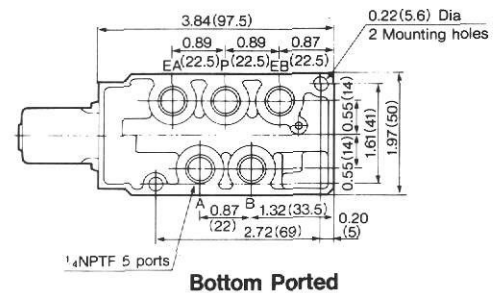
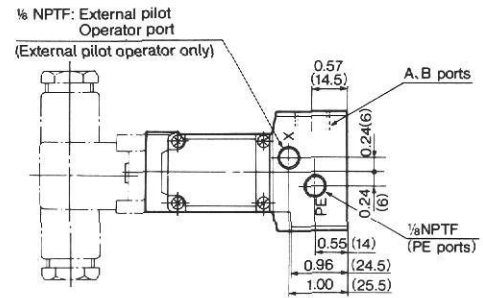
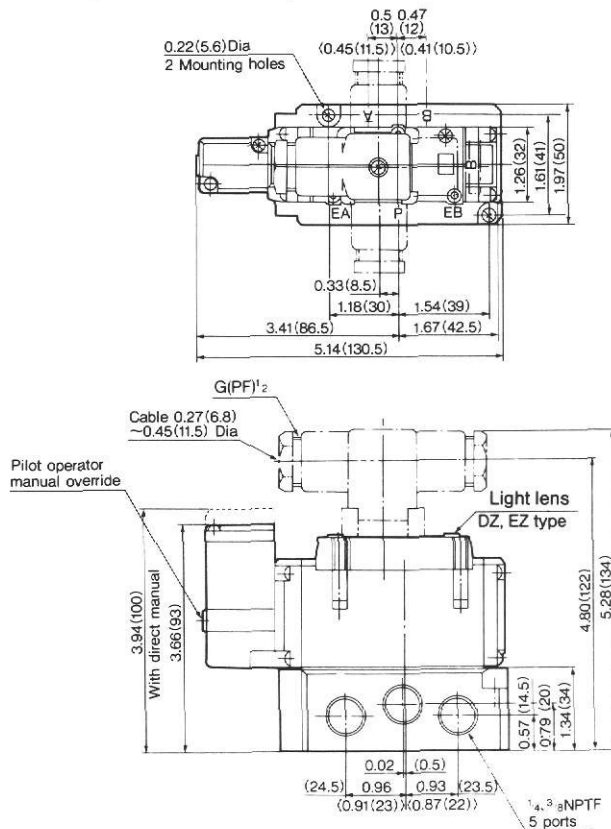
Part #	Description
VVZR3000-21A-6-X2	D-sub cable with connectors on both ends
EX300-IB1-AB	Input Base Unit
EX300-IE1-AB	Input Expander Unit

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



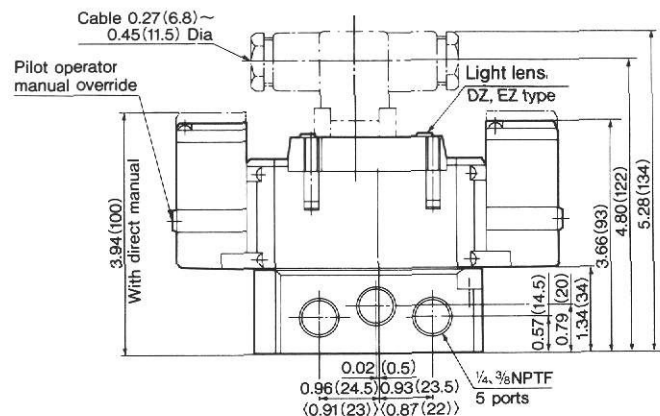
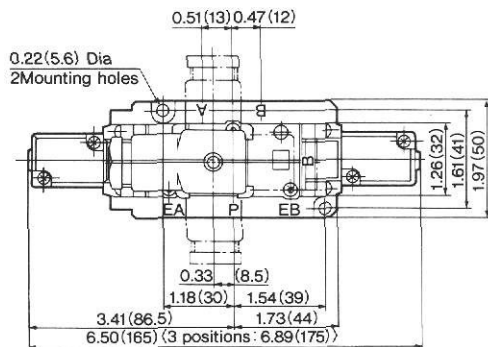
< >: 1/4 NPTF

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



< >: 1/4 NPTF

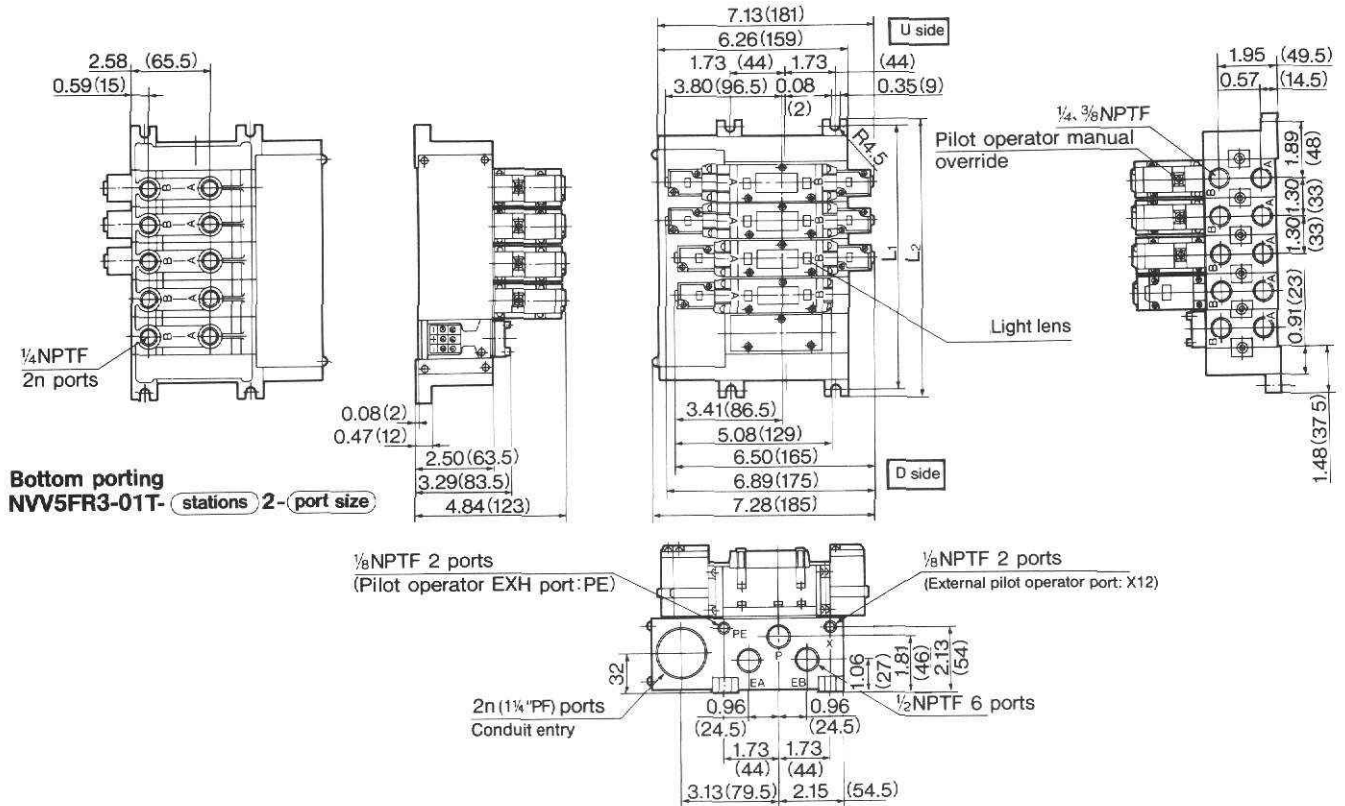
< >: 1/4 NPTF

Series NVFR3000:Base Mounted Type

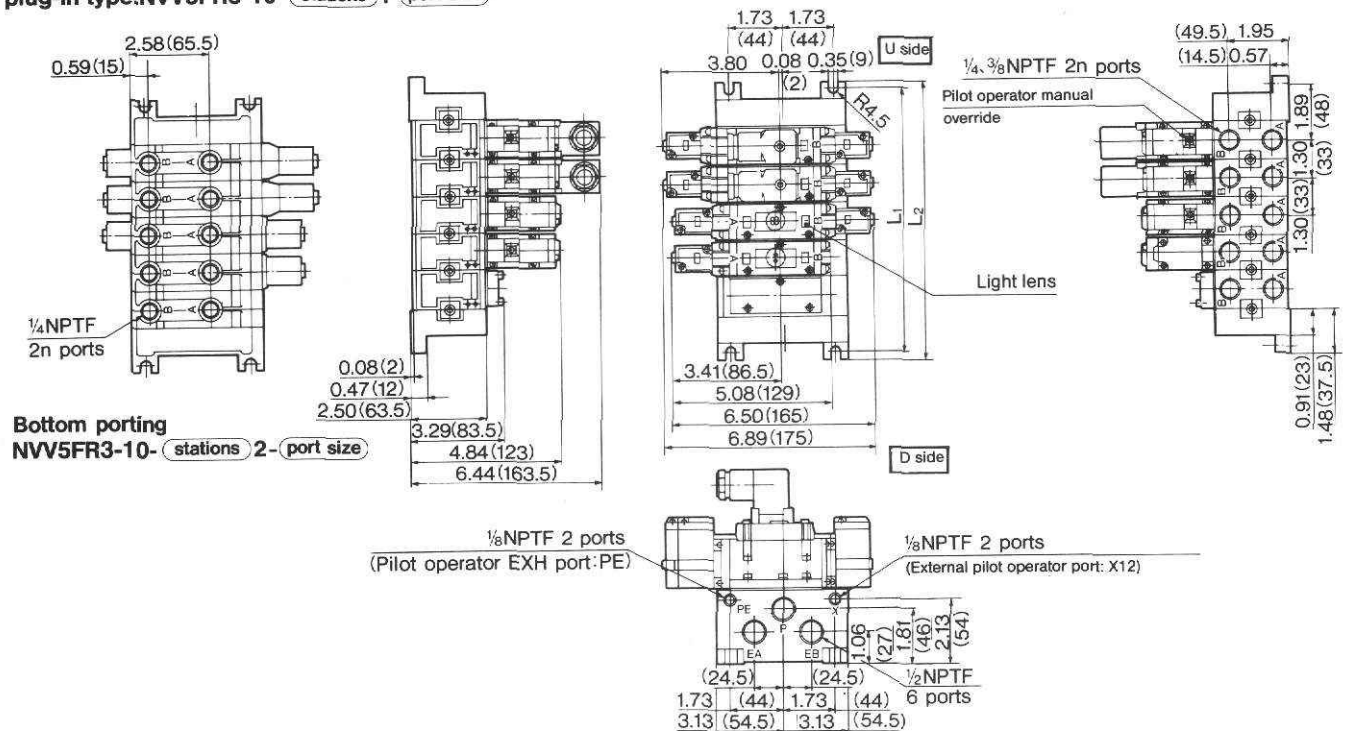
Manifold Plug-in Type / Non Plug-in Type / Dimensions

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

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×n+2.48 (L ₁ =33×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×n+2.95 (L ₂ =33×n+75)

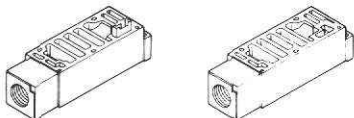
Series NVFR3000:Base Mounted Type

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.	NVFS3000-P-03T-1	NVFS3000-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	

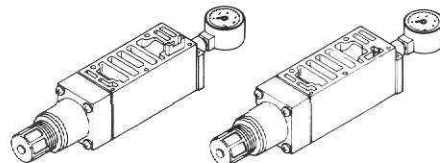


Interface regulator

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

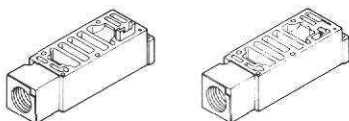
Note) For pressure center type valves, use p/n NARBF3000.



EXH Relocation spacer

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

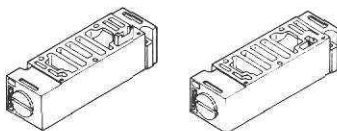
Body type	Plug-in type	Non plug-in type
Part No.	NVFS3000-R-03T-1	NVFS3000-R-03T-2



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.	VVFS3000-10 A	

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	

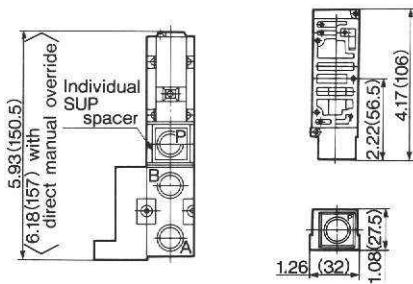
Manifold / Option Parts Plug-in Type / Non Plug-in Type / Dimensions

inch(mm)

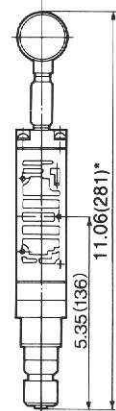
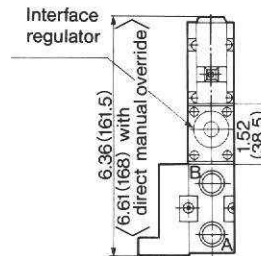
JP Relocation spacer

/VFS3000-P-03T-1 (Plug-in type)

/VFS3000-P-03T-2 (Non plug-in type)



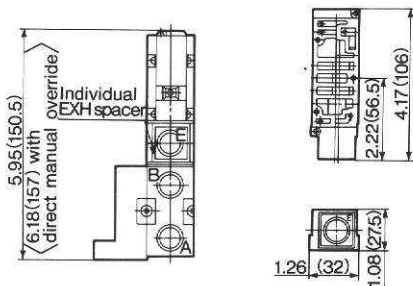
Interface regulator/regulation to P NARBF3050-N0-P-1 (Plug-in type) NARBF3050-N0-P-2 (Non plug-in type)



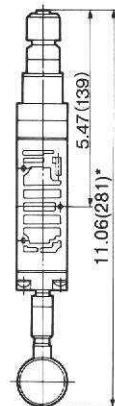
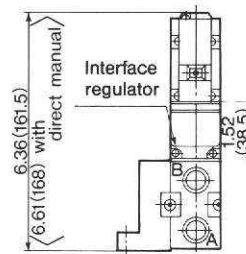
H Relocation spacer

/VFS3000-R-03T-1 (Plug-in type)

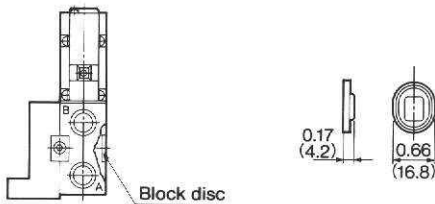
/VFS3000-R-03T-2 (Non plug-in type)



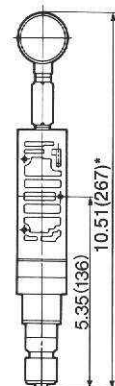
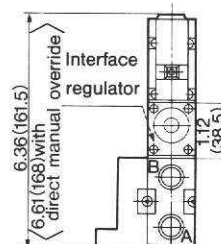
Interface regulator/regulation to A NARBF3050-N0-A-1 (Plug-in type) NARBF3050-N0-A-2 (Non plug-in type)



P/EXH gallery block disc: AZ703-59A



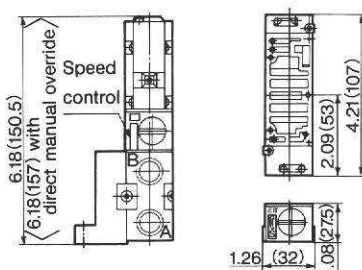
Interface regulator/regulation to B NARBF3050-N0-B-1 (Plug-in type) NARBF3050-N0-B-2 (Non plug-in type)



Surface speed control

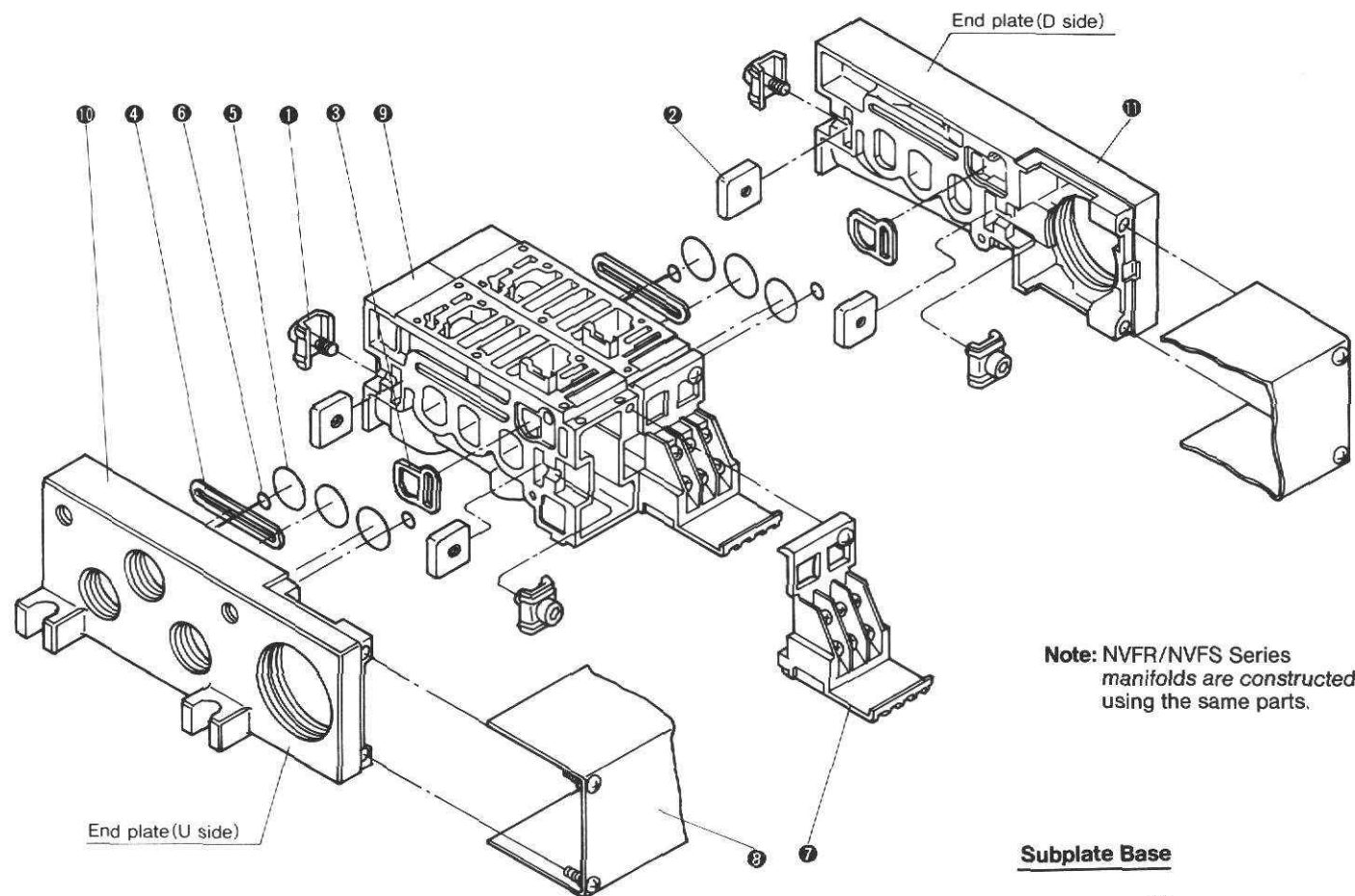
/FS3000-20A-1 (Plug-in type)

/FS3000-20A-2 (Non plug-in type)



Series NVFR3000:Base Mounted Type

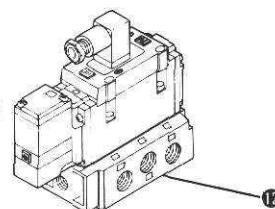
Manifold Base / Construction Plug-in Type / Non plug-in Type



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

Subplate Base

Cv: 2.3
(3/8 NPTF)



Note) Subplate shown: Non plug-in type.

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

Parts List

No.	Description	Material	Part No.
①	Metal clamp A	Steel plate	VVFS3000-5-2A
②	Metal joint B	Steel plate	
③	Gasket	NBR	VVFS3000-7
④	Gasket	NBR	VVFS3000-8
⑤	O-ring	NBR	19.8×16.6×1.6
⑥	O-ring	NBR	6×3×1.5
⑦	Terminal ass'y		VVFS3000-6A
⑧	Conduit cover ass'y		VVFS3000-4A- stations

Main Parts sub-ass'y

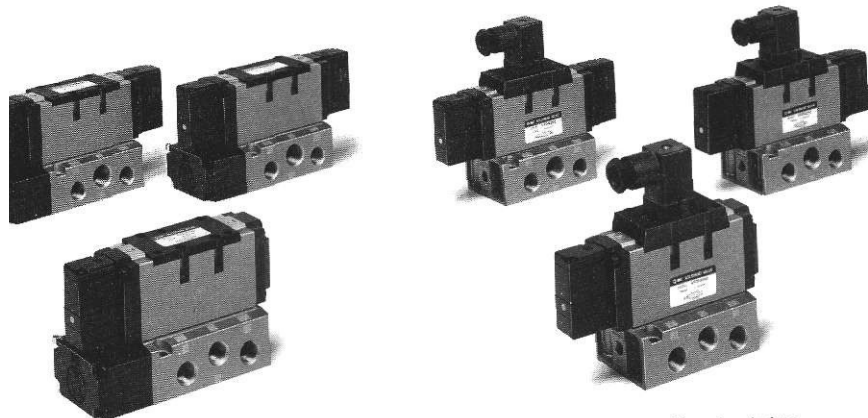
No.	Description	Part No. Note)	Component parts	Applicable valve
⑨	Manifold block ass'y	MBF3610-02-1	Manifold block ⑨, Terminal ⑦, Metal joint/clamp ①, ②	Plug-in type
		MBF3611-02-1	Gasket ③, ④, O-ring ⑤, ⑥, Receptacle ass'y ⑥	
		MBF371*-02-1	Manifold block ⑨, Joint/clamp ①, ②, Gasket ③, ④, O-ring ⑤, ⑥	Non plug-in type
⑩ ⑪	End plate (kit) ass'y	MEF363LR-04-1	End plates ⑩, Joint/clamp ①, ②, Gasket ③, ④, O-ring ⑤, ⑥	Plug-in type
		MEF373LR-04-1	End plates ⑩, Joint/clamp ①, ②, Gasket ③, ④, O-ring ⑤, ⑥	Non plug-in type
⑫	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 SPF027*-R-*

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).

NVFR
4000

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					
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			
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/cm ²)
	Min. operating pressure	2~3 position	30 PSIG (2.0kgf/cm ²)
		2 pos. dbl.	15 PSIG (1.0kgf/cm ²)
	Ambient and fluid temperature		Note 1) 32 ~ 120°F (0 ~ +50°C)
	Lubrication		Note 2) Not required
Electrical	Pilot operator manual override		Non-locking push type (Flush)
	Protection construction		Dust proof
	Rated voltage	AC	110V ^{5%} Hz, 220V ^{5%} Hz, 24V ^{5%} Hz
		DC	12V, 24V.
Electrical	Allowable voltage range		-15 ~ +10% rated voltage
	Coil insulation		Class B or equivalent
	Apparent power (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 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 ^{5%} Hz, 200V ^{5%} Hz
	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.

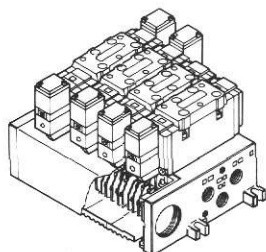
How to Order



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

• 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.

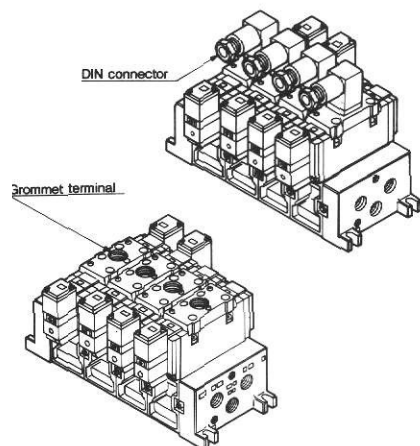
• Symbol

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

* Special Order

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

• Port size

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

Bottom 3/8NPTF only.

• Symbol

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

* Special Order

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

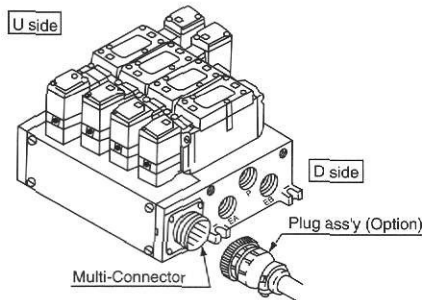
Manifold Specifications

Base mounted type	Wiring	Porting specifications	Port size		No. of Stations	Applicable solenoid valve
		A,B port	P,EA,EB	A,B		
Plug-in type NVV5FR4-01T	With terminal blocks	Side, Bottom	1/2 NPTF	3/8, 1/2 NPTF	2-10	NVFR4000-OF
Non Plug-in type NVV5FR4-10	DIN Connector Grommet terminal					NVFR4010-OD NVFR4010-OE

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	1/2 NPTF	3/8 NPTF
04T	1/2 NPTF	1/2 NPTF

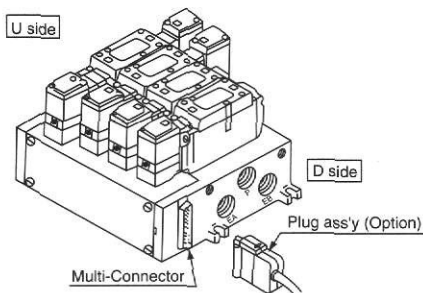
Symbol

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

* Bottom porting: 3/8 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	1/2 NPTF	3/8 NPTF
04T	1/2 NPTF	1/2 NPTF

Symbol

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

* Bottom porting: 3/8 only

Plug-in Type: Serial Interface Manifold

IVV5FR4 — 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

*SI option

— For standard **1 type modules

X200 For AB2 modules

*SI module must be ordered separately

Port size

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

Series IN313 Serial Interface Modules

IN313 — AB 1

Protocol

AB	Allen Bradley
DN	DeviceNet
MB	Mitsubishi
PR	Profibus
TA	Omron

Output/Inputs

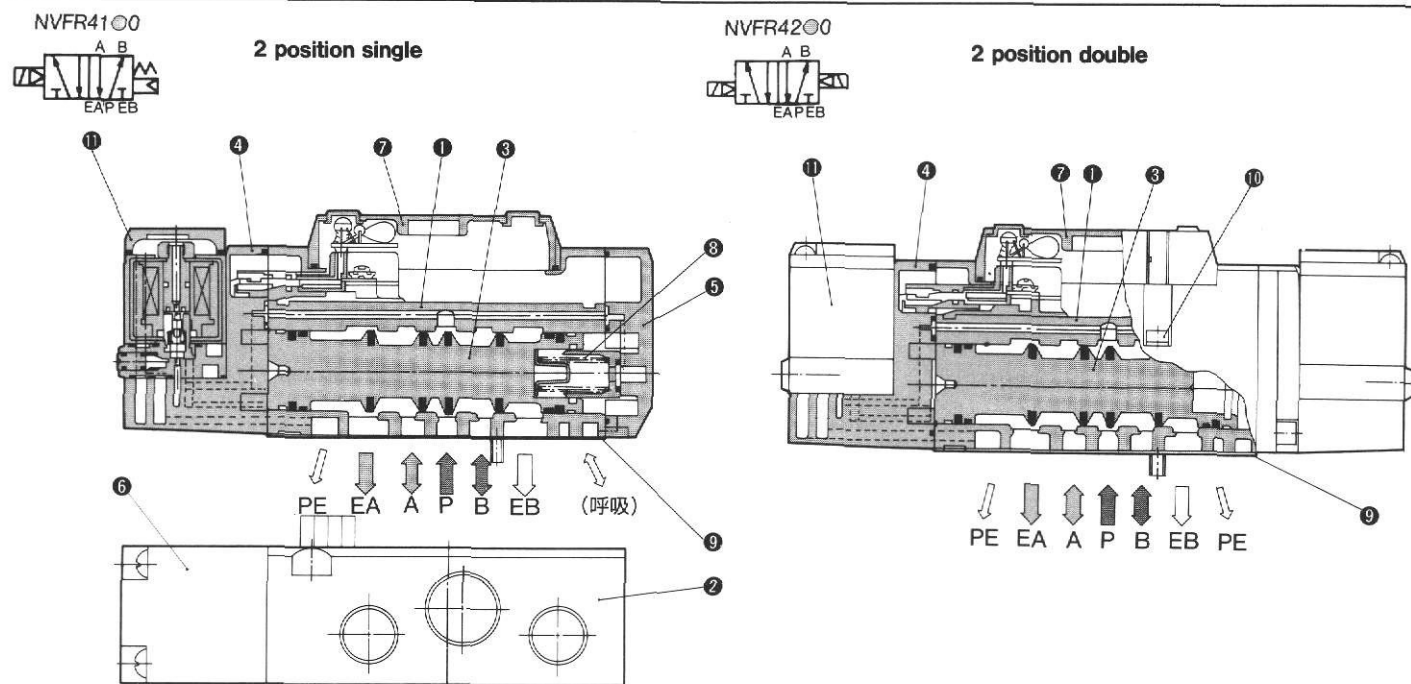
1	16 outputs
2	32 outputs/32 inputs (Available on Allen Bradley only)

B2 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

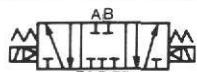
Series NVFR4000:Base Mounted Type

Construction/Parts List

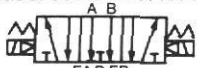


3 position Closed center/Exhaust center/Pressure center

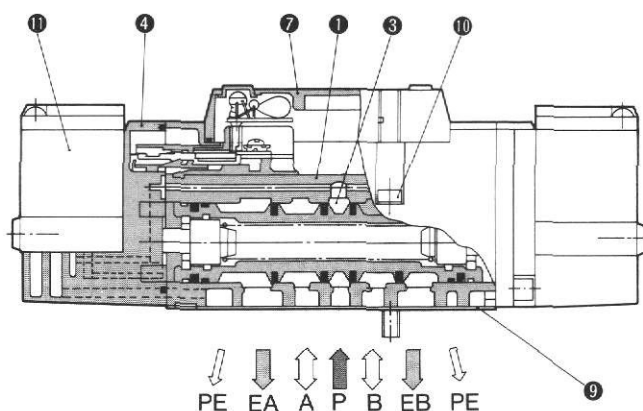
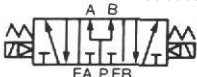
Closed center/NVFR4300



Exhaust center/NVFR4400



Pressure center/NVFR4500



Main Parts

No.	Description	Material	Note
①	Body	Aluminum diecast	Platinum silver
②	Subplate	Aluminum diecast	Platinum silver
③	Spool	Aluminum/NBR	
④	Adapter plate	Aluminum diecast	Black

No.	Description	Material	Note
⑤	End plate	Aluminum diecast	Black
⑥	Junction cover	Resin	
⑦	Lamp cover	Resin	
⑧	Return spring	SUS	

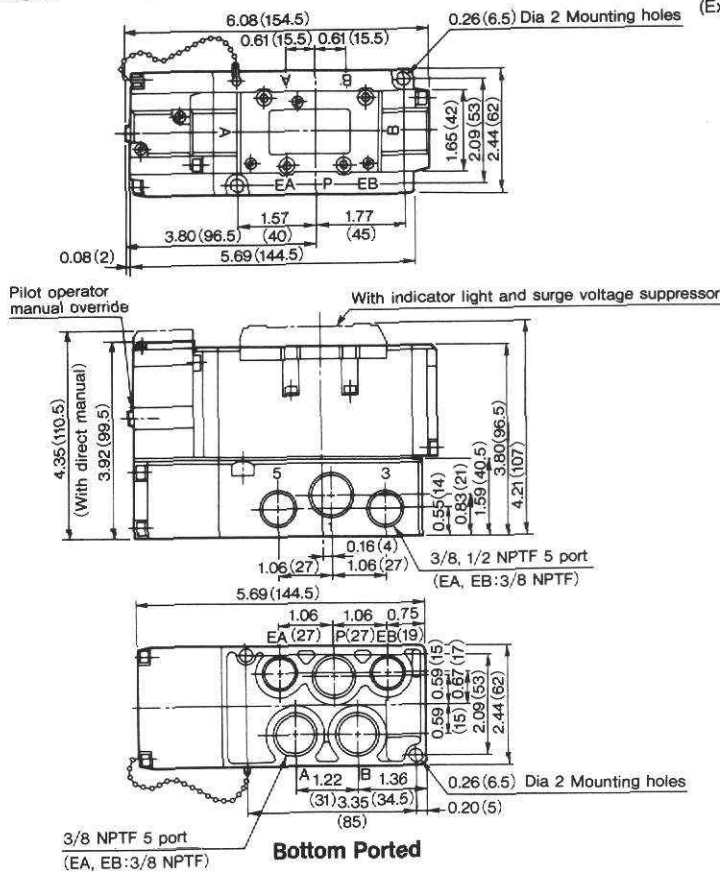
Spare Parts

No.	Description	Material	Part Nos.		
			NVFR4100	NVFR4200	NVFR4300, 4400, 4500
⑨	Gasket	NBR	VF4000-20	VF4000-20	VF4000-20
⑩	Valve mounting bolt	Steel	AXT335-1-11 (M4X40)	AXT335-1-11 (M4X40)	AXT335-1-11 (M4X40)
⑪	Pilot Ass'y	—	SF4-※F※-70		

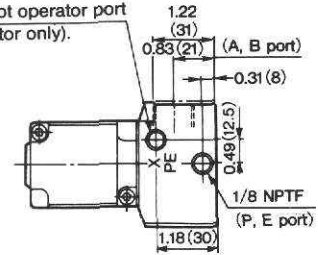
ug-in type 2 Position Single, Double, 3 Position/Dimensions

inch (mm)

osition single:NVFR4100-○F



1/8 NPTF: External pilot operator port
(External pilot operator only).

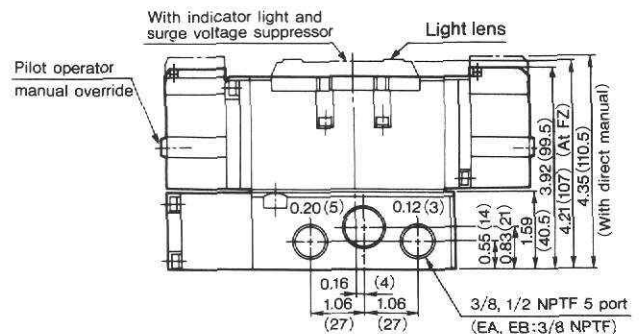
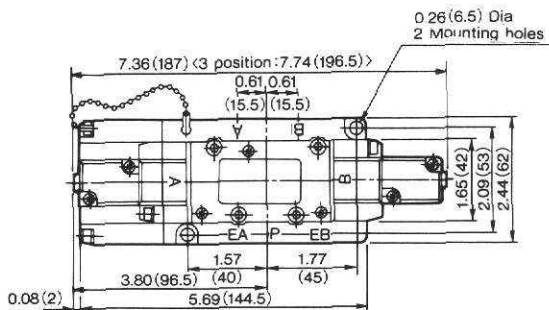


osition double:NVFR4200-○F

osition closed center:NVFR4300-○F

osition exhaust center:NVFR4400-○F

osition pressure center:NVFR4500-○F

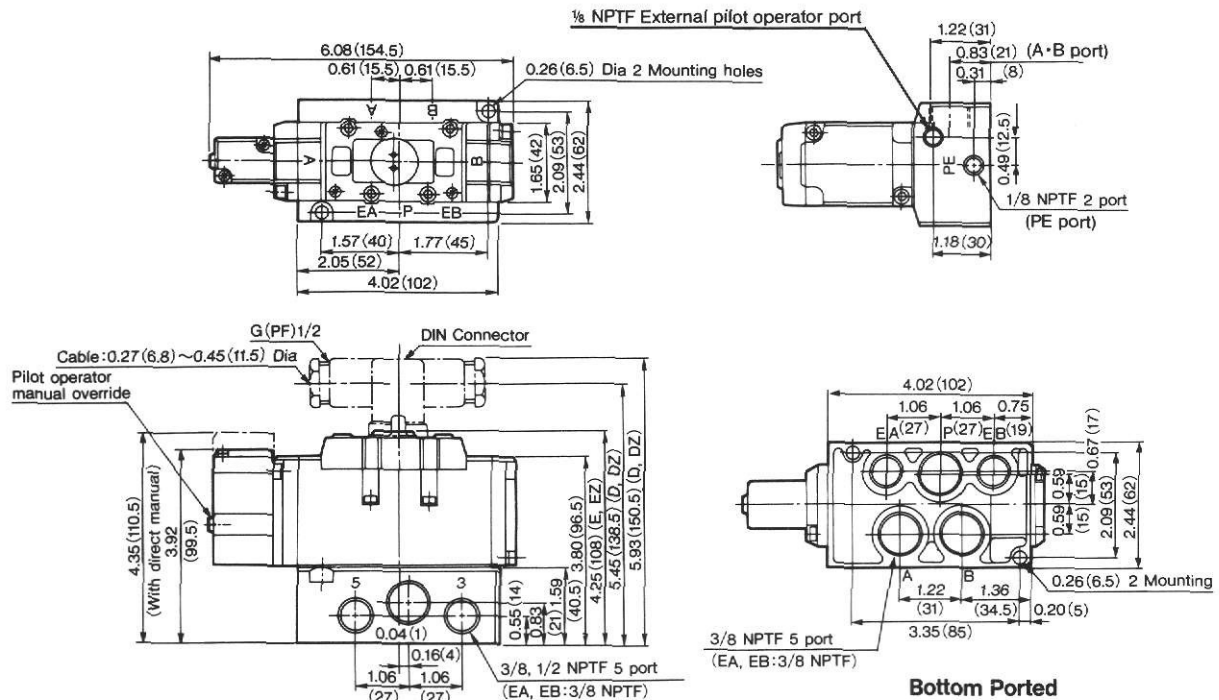


Series NVFR4000:Base Mounted Type

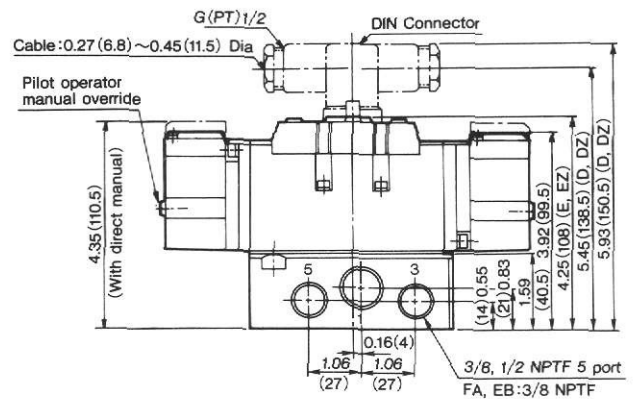
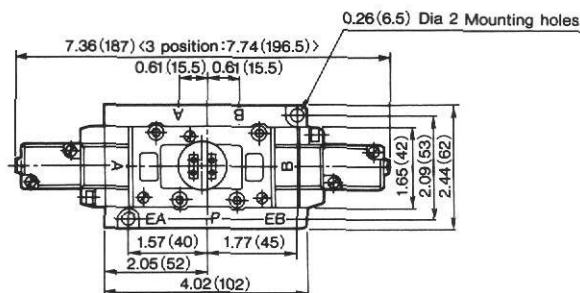
Non Plug-in type: 2 position Single, Double, 3 position/Dimensions

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

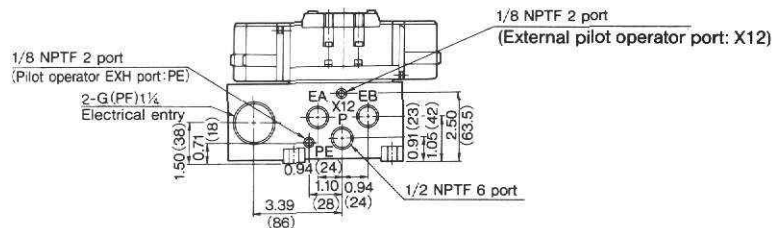
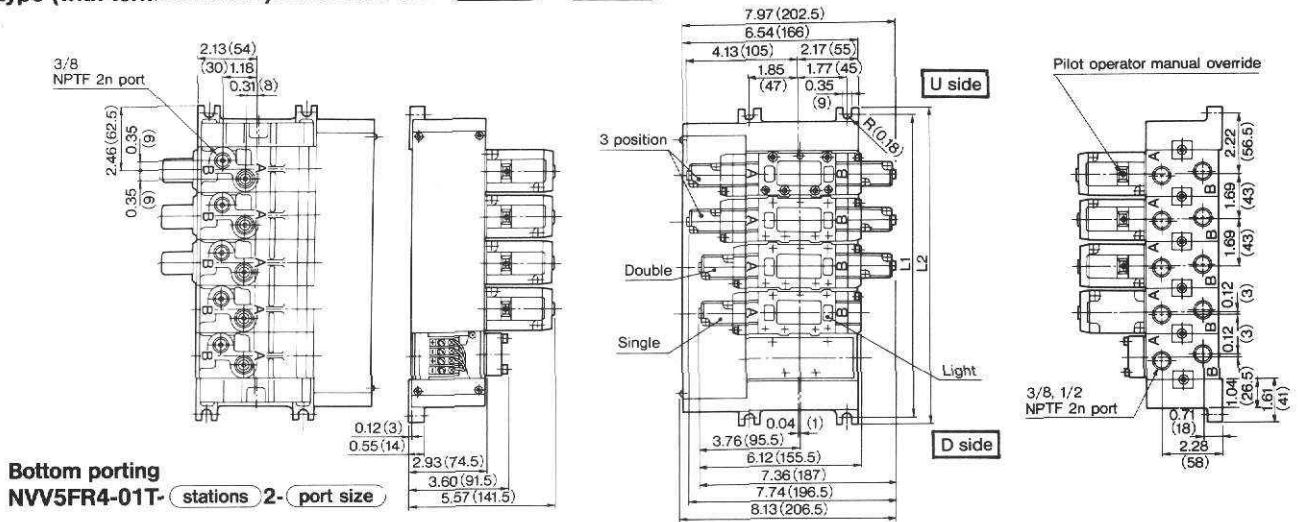


Series NVFR4000:Base Mounted Type

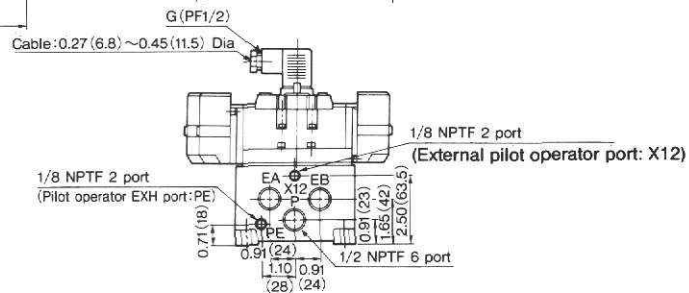
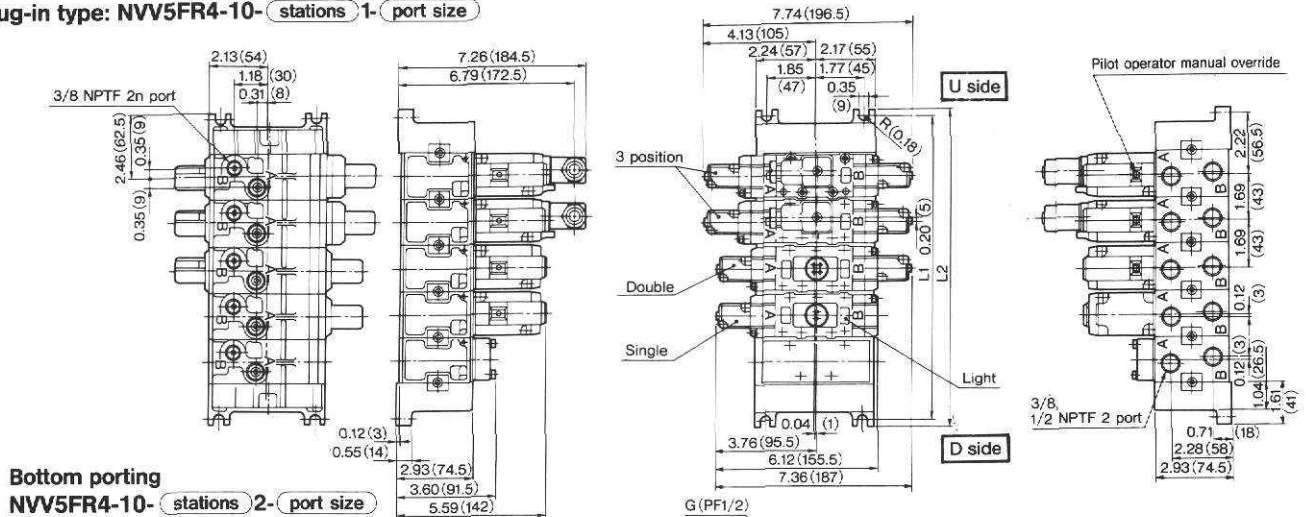
Manifold Plug-in Type/Non Plug-in Type/Dimensions

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

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×n+2.76 (L ₁ =43×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×n+3.23 (L ₂ =43×n+82)

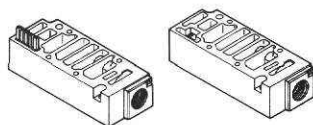
Series NVFR4000:Base Mounted Type

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	



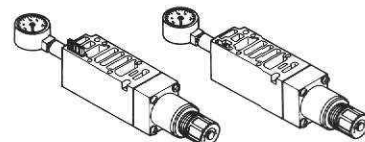
EXH block disc

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

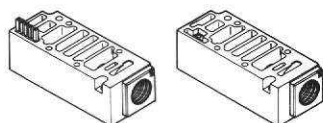
Note) For pressure center type valves, use p/n NARBF3000.



EXH Relocation spacer

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

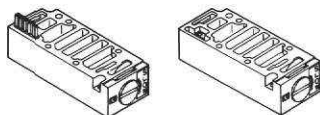
Body type	Plug-in type	Non plug-in type
Part No.	NVVFS4000-R-04T-1	NVVFS4000-R-04T-2



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

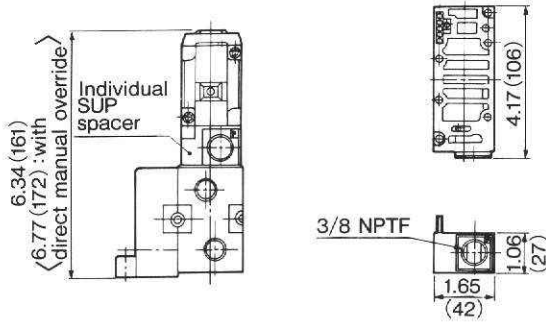
Manifold/Option Parts Plug-in Type/Non plug-in Type/Dimensions

inch (mm)

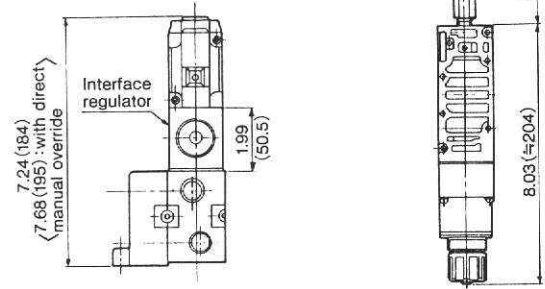
JP Relocation spacer

/VFS4000-P-03T-1(Plug-in type)

/VFS4000-P-03T-2(Non Plug-in type)



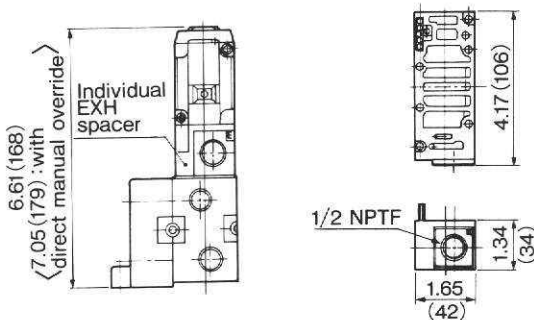
Interface regulator/regulation to P NARBF4050-N0-P-1 (Plug-in type) NARBF4050-N0-P-2 (Non plug-in type)



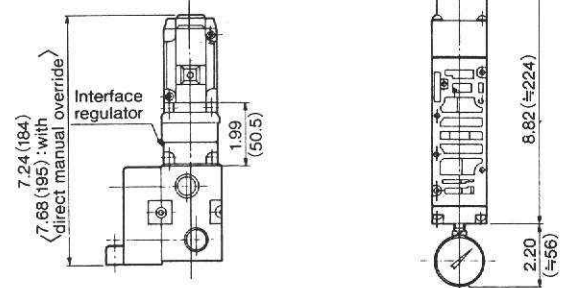
EH Relocation spacer

/VFS4000-R-04T-1(Plug-in type)

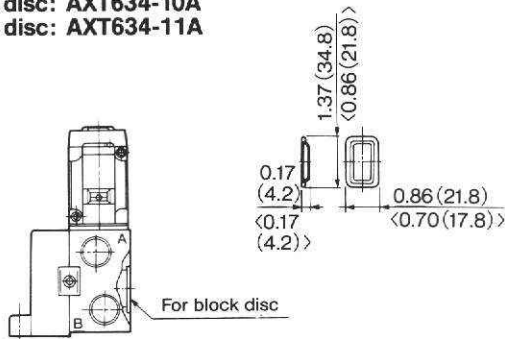
/VFS4000-R-04T-2(Non Plug-in type)



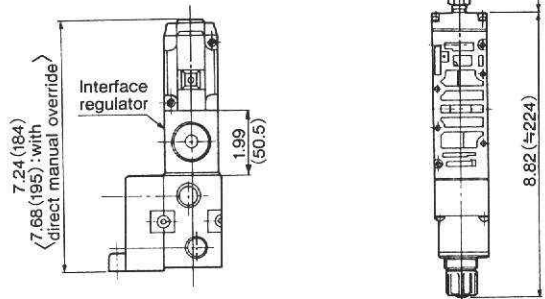
Interface regulator/regulation to A NARBF4050-N0-A-1 (Plug-in type) NARBF4050-N0-A-2 (Non plug-in type)



JP gallery block disc: AXT634-10A EH gallery block disc: AXT634-11A



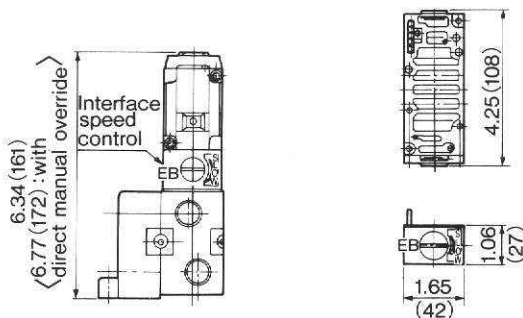
Interface regulator/regulation to B NARBF4050-N0-B-1 (Plug-in type) NARBF4050-N0-B-2 (Non plug-in type)



Interface speed control

/FS4000-20A-1(Plug-in type)

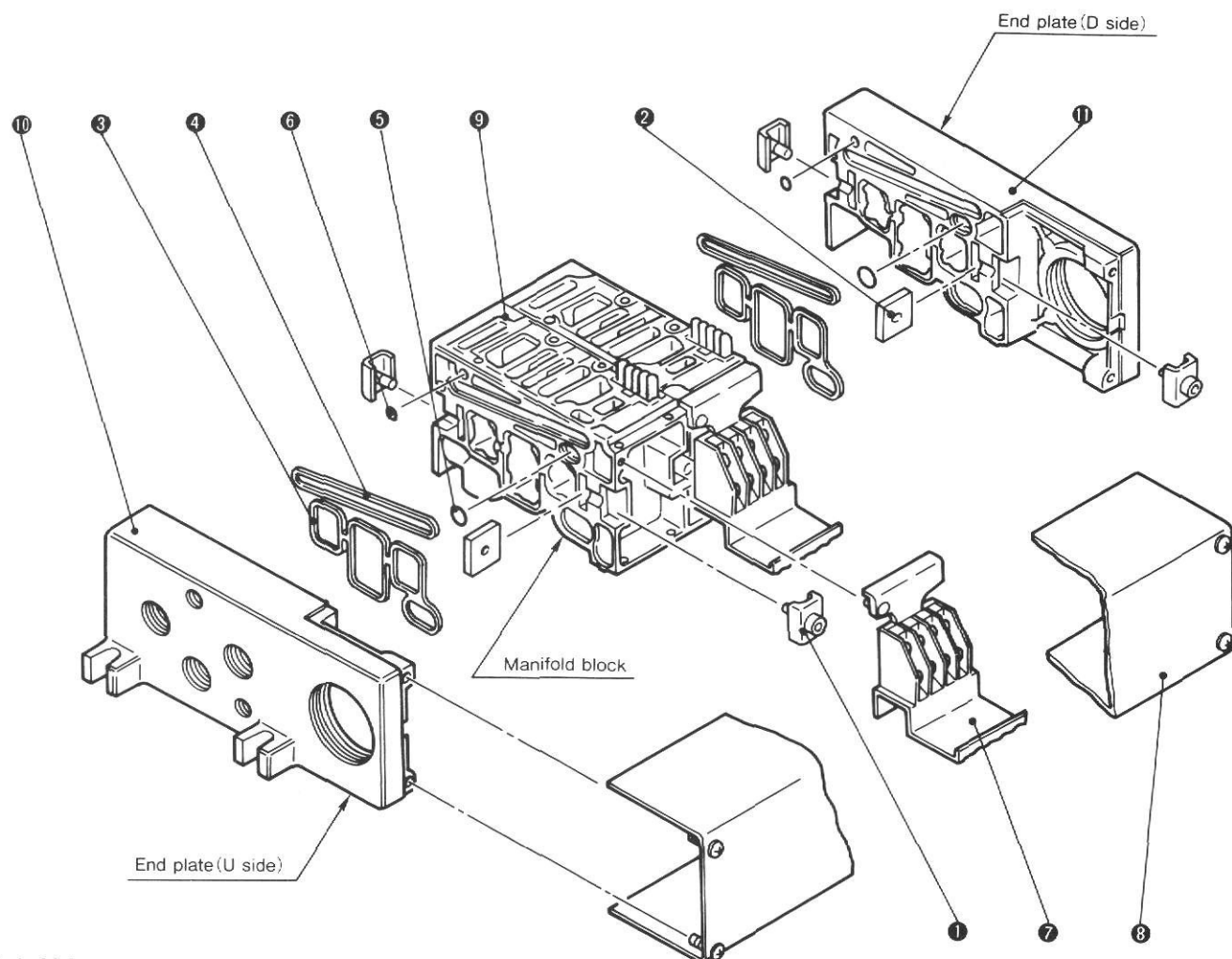
/FS4000-20A-2(Non plug-in type)



< > :EXH block disc

Series NVFR4000:Base Mounted Type

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



Parts List

No.	Description	Material	Parts No.
①	Metal clamp A	Steel plate	VVFS4000-5-2A
②	Metal joint B	Steel plate	
③	Gasket	NBR	VVF4000-7
④	Gasket	NBR	VVF4000-8
⑤	O-ring	NBR	AS568-001
⑥	O-ring	NBR	AS568-006
⑦	Terminal ass'y	—	VVF4000-6A
⑧	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
⑨	Manifold block ass'y	MBF4610-03-1		Manifold block ⑨, Terminal ⑦, Metal joint/clamp ①, ②. Gasket ③, ④, O-ring ⑤, ⑥, Receptacle ass'y	Plug-in type
		MBF4611-03-1			
		MBF471*-03-04-1		Manifold block ⑨, Metal joint ①, ②, Gasket ③, ④, O-ring ⑤, ⑥	Non plug-in type
⑩	End plate (kit) ass'y	MEF463LR-04-1		End plate (U) ⑩, End plate (D) ⑪, Metal joint/clamp ①, ②, Gasket ③, ④, O-ring ⑤, ⑥	Plug-in type
		MEF473LR-04-1		End plate (U) ⑩, End plate (D) ⑪, Metal joint/clamp ①, ②, Gasket ③, ④, O-ring ⑤, ⑥	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 SPF037⁷*R-**

Light/Surge Voltage Surge Suppressor/Electrical Entry

Base Mounted Type (NVFR2000 only)

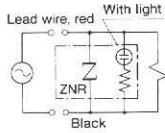
Light/Surge Voltage Suppressor

In the case of surge voltage suppressor, voltage absorption element ZNR is attached to AC power.

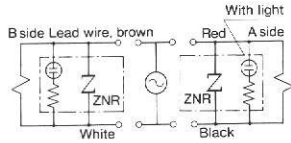
In the case of directional diode, a directional diode is attached for DC power. (24 VDC or less)

and 100VDC

Single

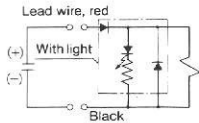


Double

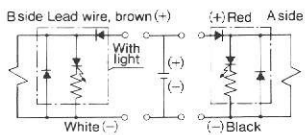


24VDC or less

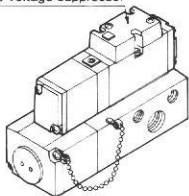
Single



Double

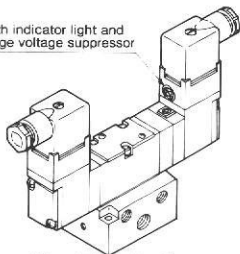


With indicator light and surge voltage suppressor



Plug-in Type

With indicator light and surge voltage suppressor

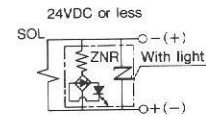
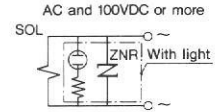
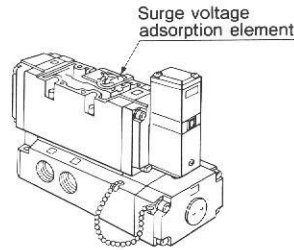


Non Plug-in Type

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.

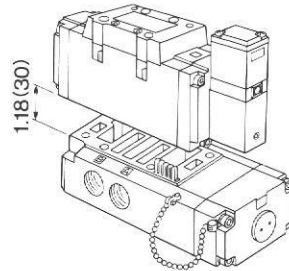


Note) No polarity

Valve Removal/Replacement

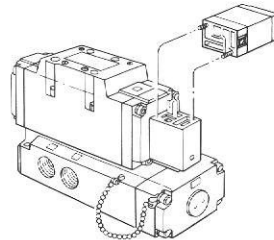
Solenoid valve

● 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.

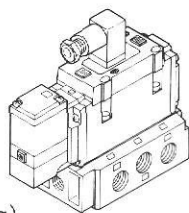


Operational Guide For Series NVFR

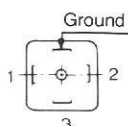
Electrical Entry

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.



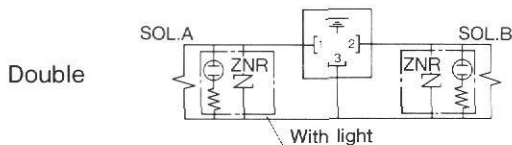
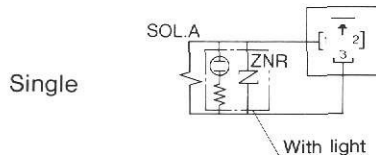
DIN connector (Wiring)



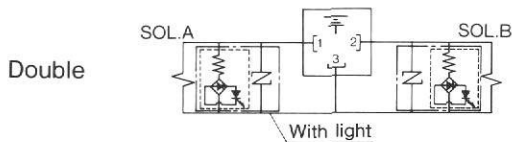
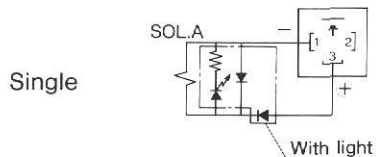
1	A side -
2	B side -
3	COM +
	Ground

- (+, -) indicate the direction of DC Solenoid valve with light, surge voltage suppressor. NVFS valves can be used negative (-) COM.

AC and 100VDC or more



24VDC or less



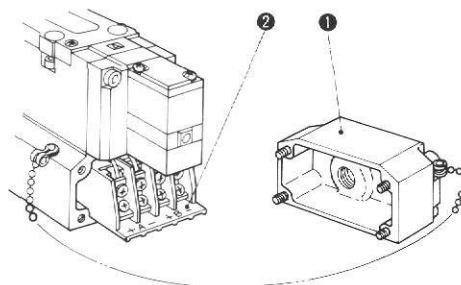
- Cable
Applicable cable O.D.: 0.27 (6.8) Dia ~ 0.45 (11.5) Dia
- Applicable terminal
Applicable terminal on block board: (3 kinds)
1.25Y-3L, 1.25-3.5S, 1.25-4M (1.25mm centers)
(spade or ring type, size 4, 22-16 AWG)
- Connector/Clamping torque
Set screw (5.2 in-lbs)
Terminal screw (7.8 in-lbs)
- Incorrect common (DIN connector terminal No. 3)
causes damage on power side circuit.

Plug-in type (with terminal)

- Remove the junction cover ① on the subplate to expose the plug-in valve terminal block ② 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	+ -	+ -

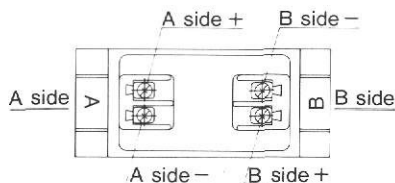
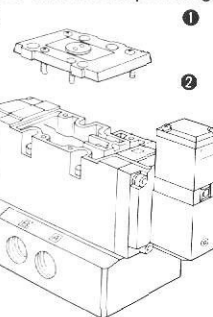
- (+, -) indicate the direction of DC solenoid valve with light or with surge voltage suppressor.
- However reverse direction wiring is also possible in some cases.



- 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 ① over terminal block ② 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

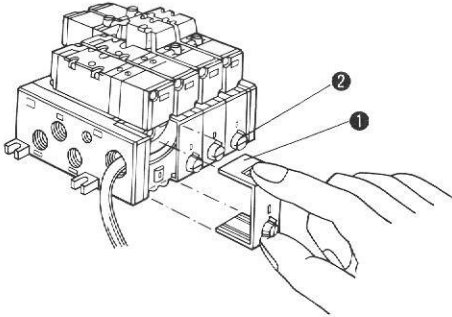
- (+, -) indicate the direction of DC solenoid valve with light or with surge voltage suppressor.

Lead Wire/ Wiring Manifold/ Plug-in Type

Type 01 Insert Plug Type Lead Wires

How to Remove Junction Cover (Type 01)

Turn the knob ② of Junction cover ① on the manifold block 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

When 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.

Power/Lead wire color identification

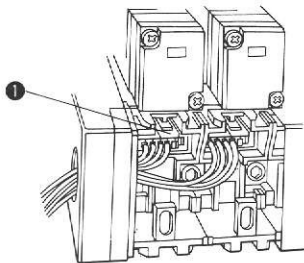
Solenoid	A side	B side
Lead wire color	Red, Black	Brown, White

Power/Lead wire color identification

Solenoid	A side		B side	
	+	-	+	-
Lead wire color	Red	Black	Brown	White

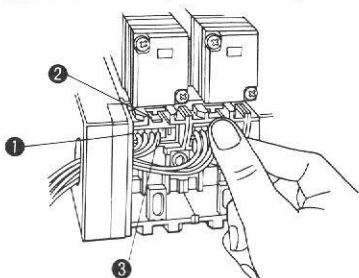
When ground wiring is required, use green wire.

+, - indicate the wiring polarity of solenoid valve with light, surge voltage suppressor.



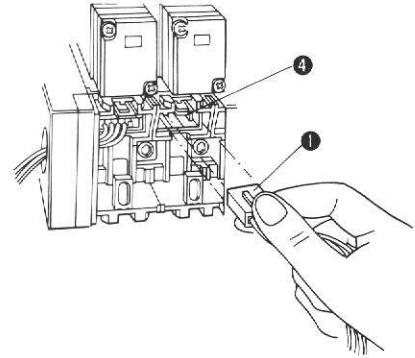
How to Use Connector Plug

When removing plug ① from manifold base, push the lever area ② of plug downward with thumb and pull it out together with the lead wires ③.



• When inserting the plug ① into the manifold base, push the lever area of plug with thumb and place in the receptacle housing ④ horizontally.

After plugging in, pull lead wires taut to ensure that connection is secure.



Type 01T With Terminal Block

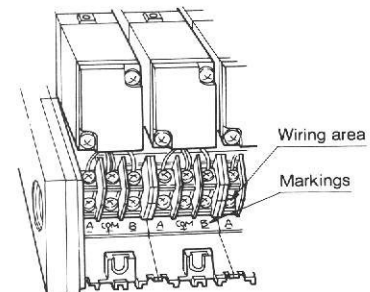
• Remove junction cover of manifold to expose terminal block attached to the manifold block. Lead wires from solenoid valve are connected with the terminals on the upper side of the terminal block.

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

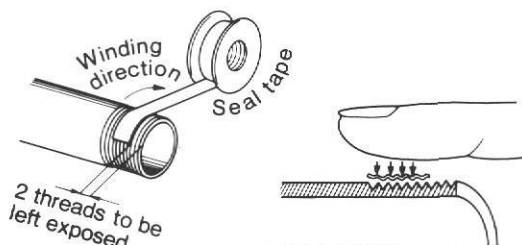
Operational Guide For Series NVFR

Precautions

Piping

- 1 Use appropriate I.D. piping.
- 2 Before 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).
- 3 In 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.
- 4 When 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/cm ²)
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

- 1 When 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.
- 2 When used in environmental conditions such as corrosive gas, chemicals or chemical solutions, steam, sea water, or temperatures higher than 140°F (60°C), etc.

Lubrication

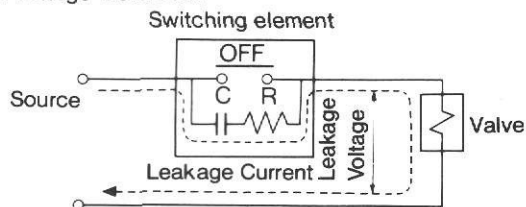
Valves are pre-lubricated. No further lubrication is necessary.

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

1 Excessive 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.

2 If 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.**

3 When disassembling and re-assembling, please ensure that all components are in their proper positions.

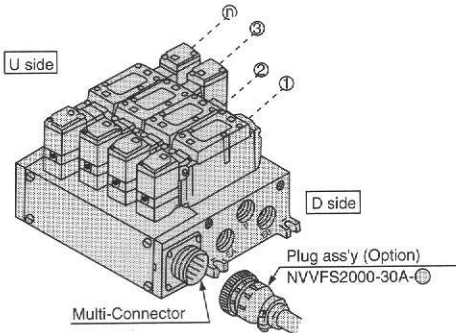
Prevent gaskets from slipping, and tighten bolts equally.

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.

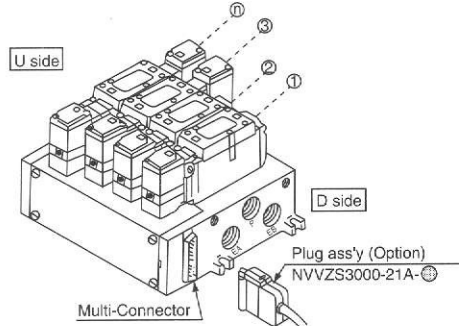


Manifold Interior Wiring

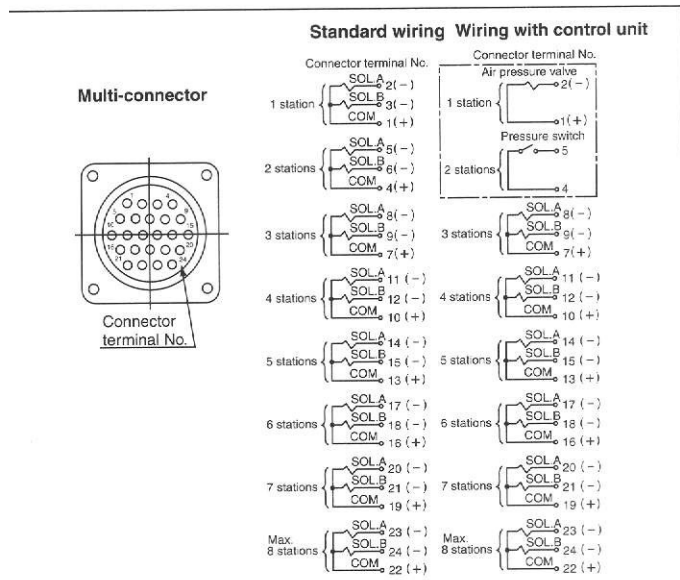
Type 01F With D Sub Connector

Series VFR2000, 3000, 4000, 5000

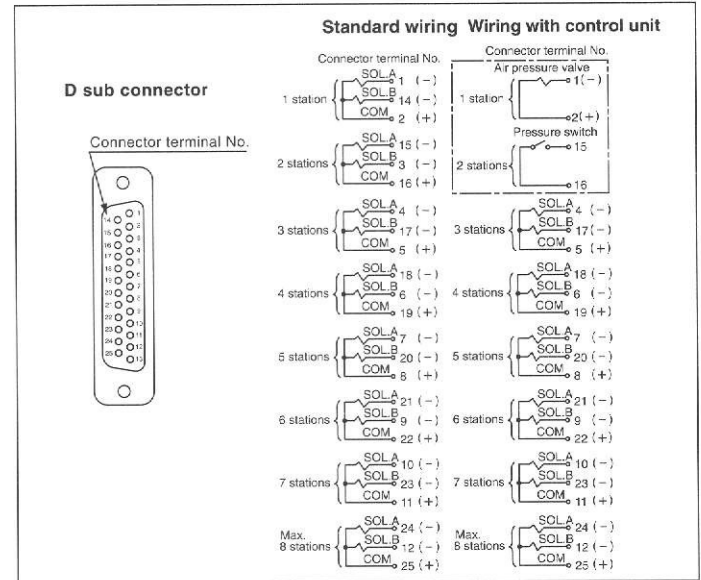
- The use with D sub connector when wiring enables the elimination of wiring labor.
- Also connectors with MIL Specification DIN type connector (terminal 25 pcs) provides them with a wide range of interchangeability.
- Manifold interior wiring is in accordance with +COM specifications and is connected 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



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
VVFR2000-30A-2	3m	Cable clamp 206128-1...1pc
VVFR2000-30A-3	5m	Socket 66105-2...24 pcs.
VVFR2000-30A-4	7m	Nippon AMP's cable
		VCTF 24 pcs x 0.75mm ²

Compatible Plug Ass'y (Option)

Ass'y No.	Cable length	Components
VVFR2000-21A-1	1.5m	Plug-206837-1...1 pc
VVFR2000-21A-2	3m	Cable clamp 206138-1...1 pc
VVFR2000-21A-3	5m	Socket 66105-2...24 pcs.
VVFR2000-21A-4	8m	Nippon AMP's cable
		VCTF 24 pcs x 0.75mm ²

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

Terminal No.	13	14	15	16	17	18	19	20	21	22	23	24
Lead wire color	Brown	Brown	White	White	Pink	Pink	Gray	Gray	Sky blue	Sky blue	Bright green	Bright green
Dot marking	—	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	Black	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	Violet	Gray	Orange	Red	Brown	Pink	Gray	Black	White
Dot marking	Red	Black	Black	White	—	—	Black	White	White	Red	Red	White	—

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)

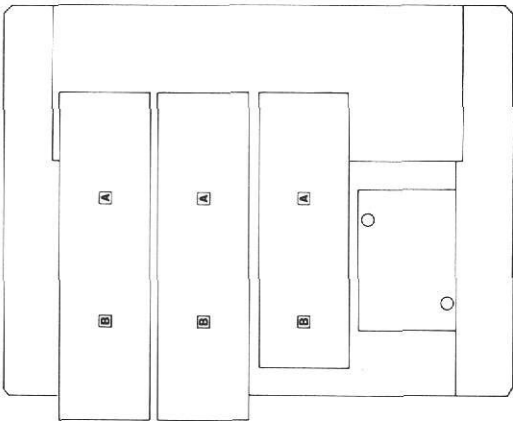
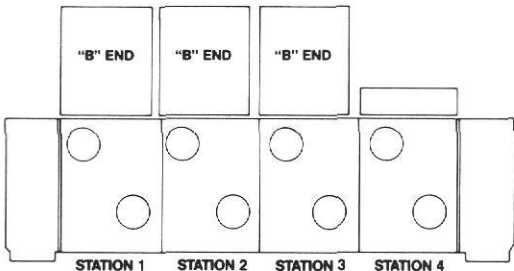
Mixed Configuration Manifold:

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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