

NAMUR Solenoid Valves



Directional Control Valves

NAMUR Interface 3 Port Solenoid Valve/VFN200N Page 01

NAMUR Interface 5 Port Solenoid Valve/VFN2000N Page 04

NAMUR Interface 3/5 Port Solenoid Valve/

IP67 Compliant, Hygienic Design Type/

VFN2120N-X23/-X36 Page 11



NAMUR Interface 3 Port Solenoid Valve

Series VFN200N



The interface surface complies with NAMUR.

- Can be directly installed on the industrial valve actuator that complies with NAMUR.



How to Order

VFN212 N - 5 D Z [] - 02 F - [] - Q

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

For other rated voltages, please contact SMC.

Electrical entry	
G	Grommet
E	Grommet terminal
T	Conduit terminal
D	DIN terminal
DO	DIN terminal (Without connector)
Y ^{Note)}	DIN terminal
YO ^{Note)}	DIN terminal (Without connector)

Note) Conforming to DIN 43650, Form B

Thread type	
—	Rc (PT)
F	G (PF)
N	NPT

Solenoid	
—	Single solenoid
D	Double solenoid

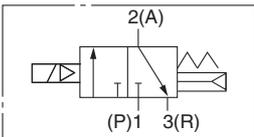
Manual override	
—	Non-locking push type (Flush)
A	Non-locking push type (Extended)
B	Locking type (Tool required)

Light/Surge voltage suppressor	
—	None
Z	With light/surge voltage suppressor
S ^{Note)}	With surge voltage suppressor

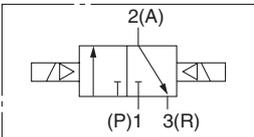
Note) Available for grommet type only.

Specifications

Symbol
Single solenoid



Double solenoid



Valve specifications	Fluid	Air, Inert gas		
	Valve type	Normally closed		
	Max. operating pressure	0.9 MPa (130 psi)		
	Min. operating pressure	0.15 MPa (22 psi)		
	Ambient and fluid temperature	-10 to +60 °C ^{Note 1)}		
	Lubrication	Not required ^{Note 2)}		
	Pilot valve manual override	Non-locking push type (Flush)		
	Enclosure	Dustproof		
	Port size	1/4		
	Cv factor (Effective area)	Refer to "Flow-rate Characteristics" table below.		
	Weight	Refer to "Weight" table below.		
	Other	Cylinder ports should be NAMUR hole pattern.		
	Electrical specifications	Coil rated voltage	12, 24 V DC, 100, 110 to 120, 200, 220, 240 V AC (50/60 Hz)	
Allowable voltage fluctuation		-15 to +10 % of rated voltage		
Coil insulation type		Class B or equivalent		
Apparent power AC (Power consumption)		Inrush	5.0 VA/60 Hz, 5.6 VA/50 Hz	
		Holding	2.3 VA (1.5 W)/60 Hz, 3.4 VA (2.1 W) 9/50 Hz	
Power consumption DC	1.8 W			
Electrical entry	Grommet, Grommet terminal, Conduit terminal, DIN terminal			

Note 1) Use dry-air at low temperature.

Note 2) Use turbine oil No.1 (ISO VG32), if lubricated.

Flow-rate Characteristics

		Flow-rate characteristics							
		1→4/2 (P→A/B)				4/2→5/3 (A/B→EA/EB)			
		C [dm ³ / (s·bar)]	b	Cv	Q ^{Note)} [l/min (ANR)]	C [dm ³ / (s·bar)]	b	Cv	Q ^{Note)} [l/min (ANR)]
2-position	Single solenoid	2.68	0.40	0.72	729	5.41	0.31	1.38	1384
	Double solenoid	2.68	0.40	0.72	729	5.41	0.31	1.38	1384

Note) These values have been calculated according to ISO 6358 and indicate the flow rate under standard conditions with an inlet pressure of 0.6 MPa (relative pressure) and a pressure drop of 0.1 MPa.

Weight

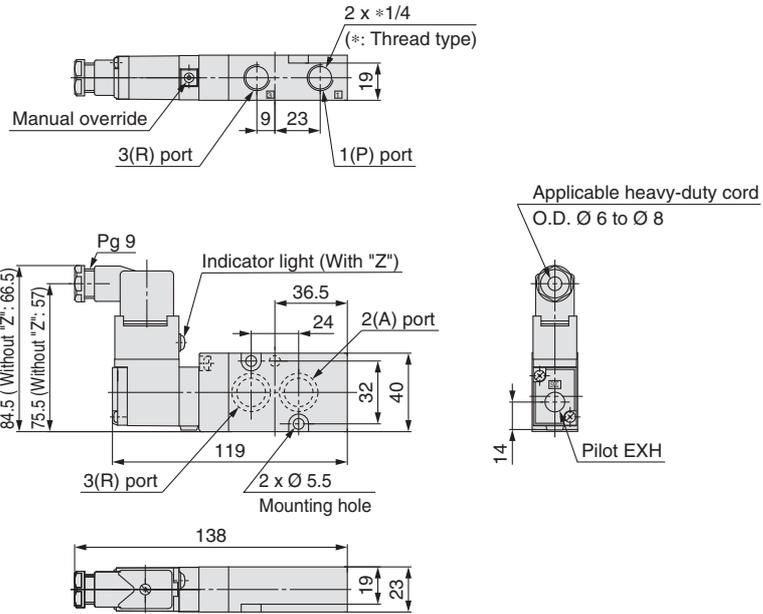
Model	Weight [g]
VFN212N-5D-02F	240
VFN212N-5D-02F-D	380

NAMUR Interface 3 Port Solenoid Valve *Series VFN200N*

Dimensions

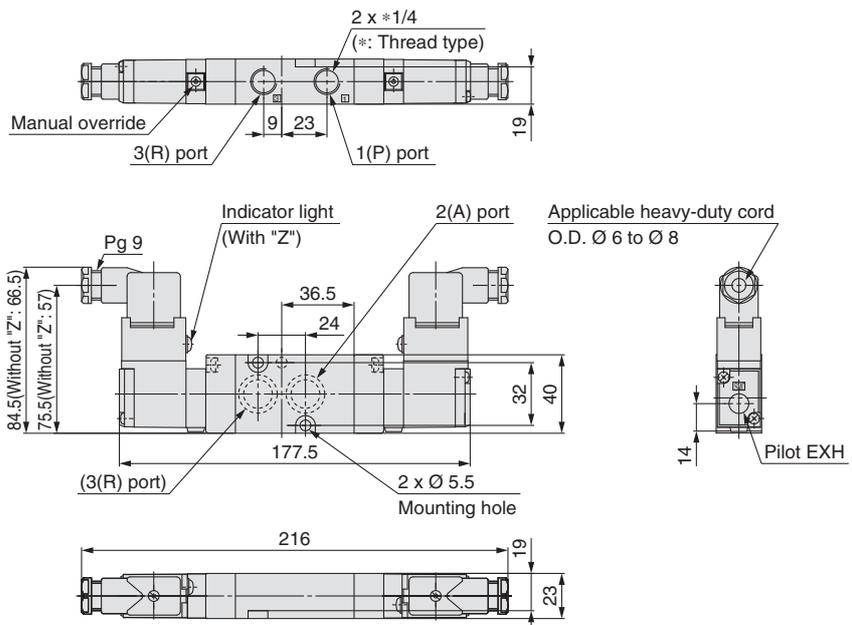
DIN terminal

VFN212N-□^D(Y)□□-02□-□-□-Q



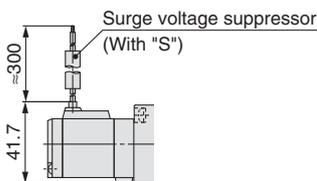
DIN terminal

VFN212N-□^D(Y)□□-02□-D-□-Q



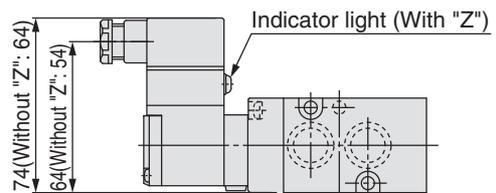
Grommet

VFN212N-□G□□-02□-□-□-Q



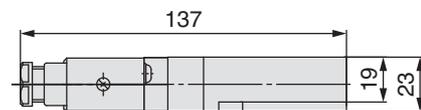
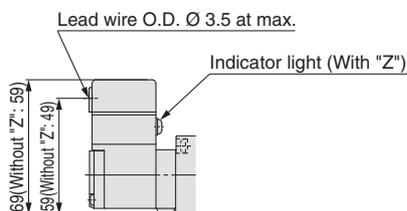
Conduit terminal

VFN212N-□T□□-02□-□-□-Q



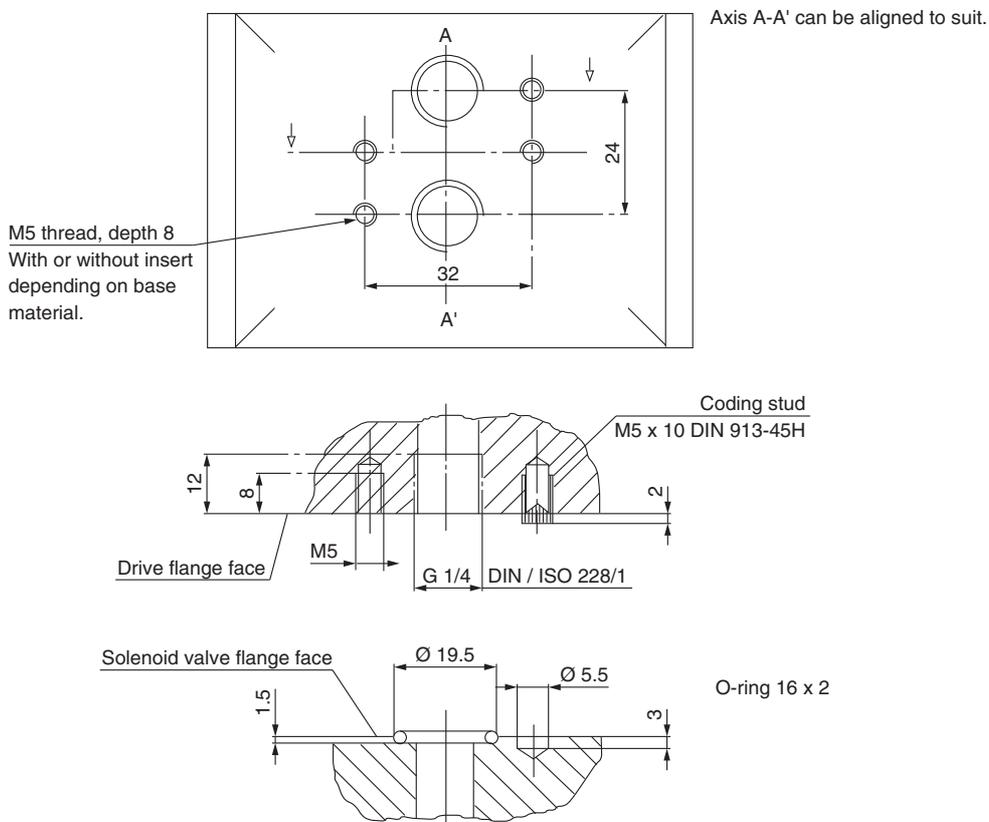
Grommet terminal

VFN212N-□E□□-02□-□-□-Q



Series VFN200N

NAMUR Mounting Pattern



The solenoid valve can be attached with 2 mounting bolts.
The positioning of the coding stud hole is left up to the manufacturer and thus also determines the location of the coding stud.

NAMUR Interface 5 Port Solenoid Valve Series *VFN2000N*



RoHS

The interface surface complies with NAMUR.

- Can be directly installed on the industrial valve actuator that complies with NAMUR.

How to Order

VFN2 **1** 20 N - **5** **D** **Z** - **02** **F** - **Q**

Solenoid	1 Single solenoid	2 Double solenoid
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NAMUR Interface

Voltage	1 100 V AC, 50/60 Hz	2 200 V AC, 50/60 Hz	3 110 to 120 V AC, 50/60 Hz	4 220 V AC, 50/60 Hz	5 24 V DC	6 12 V DC	7 240 V AC, 50/60 Hz
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For other rated voltages, please contact SMC.

Electrical entry	G Grommet	E Grommet terminal	T Conduit terminal	D DIN terminal	DO DIN terminal (Without connector)	Y ^{Note)} DIN terminal	YO ^{Note)} DIN terminal (Without connector)
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Note) Conforming to DIN 43650, Form B

Thread type	- Rc (PT)	F G (PF)	N NPT
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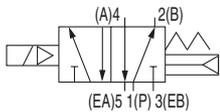
Manual override	- Non-locking push type (Flush)	A Non-locking push type (Extended)	B Locking type (Tool required)
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Light/Surge voltage suppressor	- None	Z With light/surge voltage suppressor	S ^{Note)} With surge voltage suppressor
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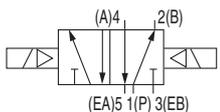
Note) Available for grommet type only.

Symbol

Single solenoid



Double solenoid



Specifications

Valve specifications	Fluid	Air, Inert gas		
	Max. operating pressure	0.9 MPa (130 psi)		
	Min. operating pressure	0.15 MPa (22 psi)		
	Ambient and fluid temperature	-10 to +60 °C ^{Note 1)}		
	Lubrication	Not required ^{Note 2)}		
	Pilot valve manual override	Non-locking push type (Flush)		
	Enclosure	Dustproof		
	Port size	1/4		
	Cv factor (Effective area)	Refer to "Flow-rate Characteristics" table below.		
	Weight	Refer to "Weight" table below.		
Other	Cylinder ports should be NAMUR hole pattern.			
Electrical specifications	Coil rated voltage	12, 24 V DC, 100, 110 to 120, 200, 220, 240 V AC (50/60 Hz)		
	Allowable voltage fluctuation	-15 to +10 % of rated voltage		
	Coil insulation type	Class B or equivalent		
	Apparent power AC (Power consumption)	Inrush	5.0 VA/60 Hz, 5.6 VA/50 Hz	
		Holding	2.3 VA (1.5 W)/60 Hz, 3.4 VA (2.1 W) 9/50 Hz	
	Power consumption DC	1.8 W		
Electrical entry	Grommet, Grommet terminal, Conduit terminal, DIN terminal			

Note 1) Use dry-air at low temperature.

Note 2) Use turbine oil No.1 (ISO VG32), if lubricated.

Flow-rate Characteristics

		Flow-rate characteristics							
		1→4/2 (P→A/B)				4/2→5/3 (A/B→EA/EB)			
		C [dm ³ / (s·bar)]	b	Cv	Q ^{Note)} [l/min (ANR)]	C [dm ³ / (s·bar)]	b	Cv	Q ^{Note)} [l/min (ANR)]
2-position	Single solenoid	3.48	0.25	0.85	858	4.57	0.17	1.06	1077
	Double solenoid	3.48	0.25	0.85	858	4.57	0.17	1.06	1077

Note) These values have been calculated according to ISO 6358 and indicate the flow rate under standard conditions with an inlet pressure of 0.6 MPa (relative pressure) and a pressure drop of 0.1 MPa.

Weight

Model	Weight [g]
VFN2120N-5D-02F	260
VFN2120N-5D-02F-D	400

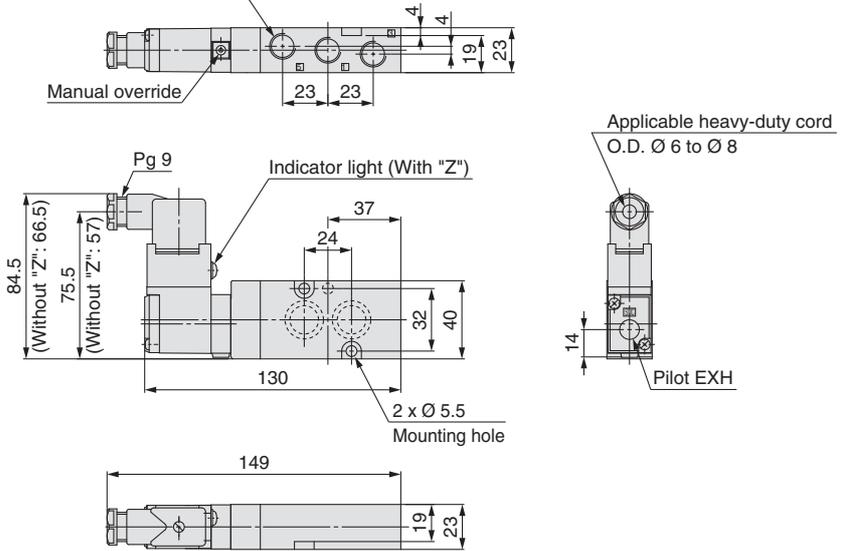
Series VFN2000N

Dimensions

DIN terminal

VFN2120N-□^D_(Y)□□-02□-□-Q

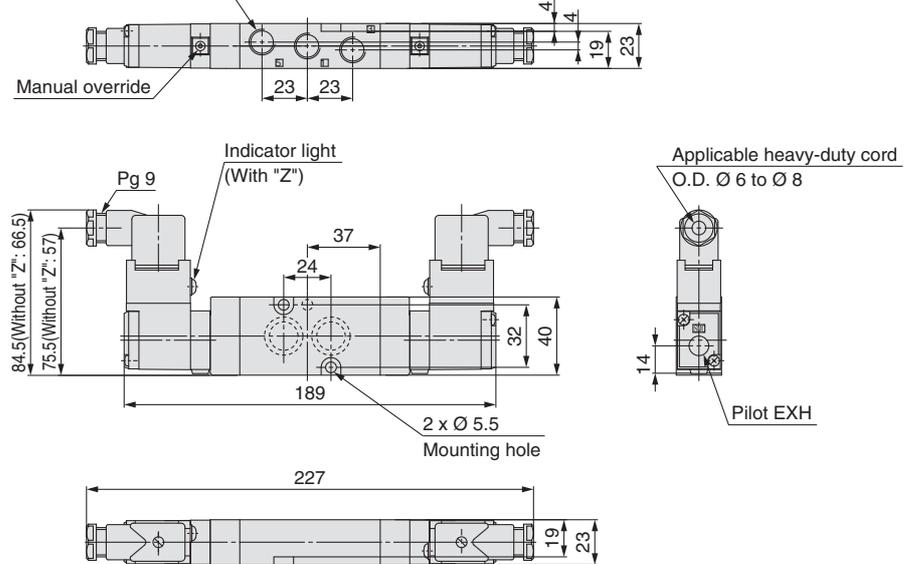
3 x Rc, G, NPT 1/4
<1(P), 5(R1), 2(R2) port>



DIN terminal

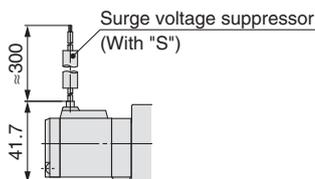
VFN2220N-□^D_(Y)□□-02□-□-Q

3 x Rc, G, NPT1/4
<1(P), 5(R1), 2(R2) port>



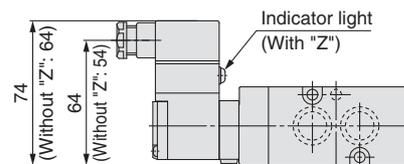
Grommet

VFN2120N-□G□□-02□-□-Q



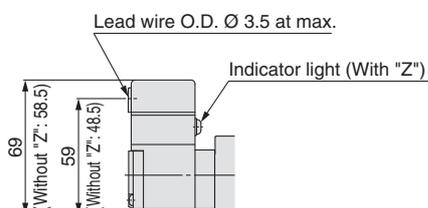
Conduit terminal

VFN2120N-□T□□-02□-□-Q

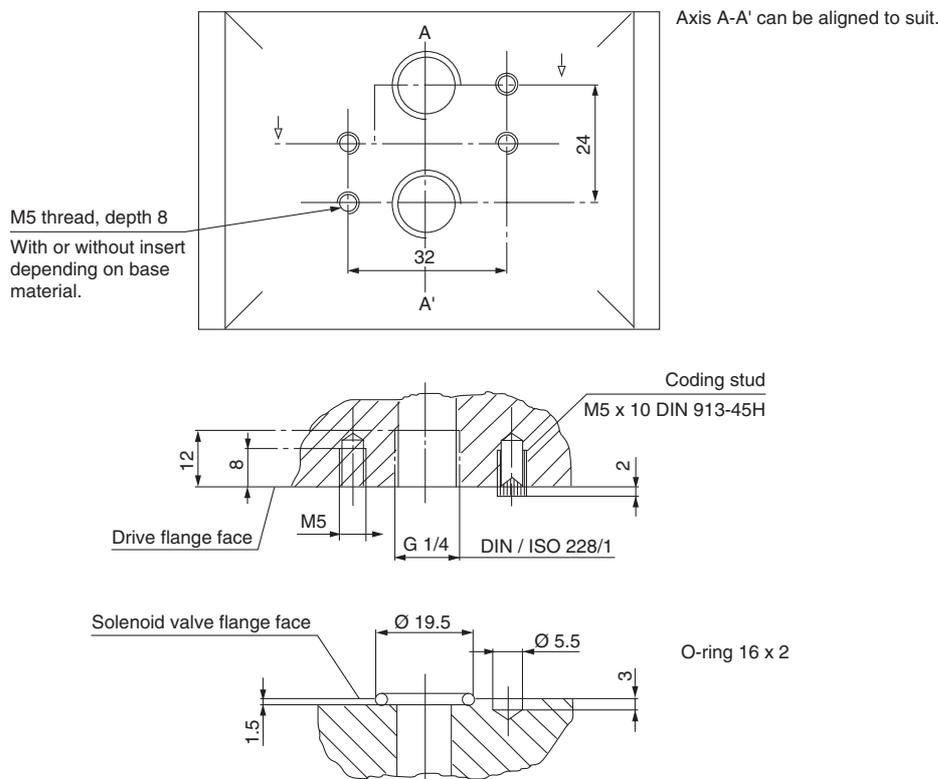


Grommet terminal

VFN2120N-□E□□-02□-□-Q



NAMUR Mounting Pattern



The solenoid valve can be attached with 2 mounting bolts.
The positioning of the coding stud hole is left up to the manufacturer and thus also determines the location of the coding stud.

How to Order Pilot Valve

SF4 - 5 D Z - 12 - X99 **CE**

Coil rated voltage

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

For other rated voltages, please contact SMC.

Electrical entry

G	Grommet
E	Grommet terminal
T	Conduit terminal
D	DIN terminal
DO	DIN terminal (Without connector)
Y ^{Note)}	DIN terminal
Y0 ^{Note)}	DIN terminal (Without connector)

Note) Conforming to DIN 43650, Form B

Pilot valve assembly for VFN200N/VFN2000N

Manual override

-	Non-locking push type (Flush)
A	Non-locking push type (Extended)
B	Locking type (Tool required)

Light/Surge voltage suppressor

-	None
Z	With light/surge voltage suppressor
S ^{Note)}	With surge voltage suppressor

Note) Available for grommet type only. Grommet type is available only with surge voltage suppressor, not with indicator light.



NAMUR Interface Solenoid Valves Specific Product Precautions 1

Be sure to read this before handling.

Design

⚠ Warning

1. Actuator drive

When an actuator, such as a cylinder, is to be driven using a valve, take appropriate measures to prevent potential danger caused by actuator operation.

2. Holding pressure (including vacuum)

Since the valves are subject to air leakage, they cannot be used for applications such as holding pressure (including vacuum) in a pressure vessel.

3. Not suitable for use as an emergency shutoff valve, etc.

The valves are not designed for safety applications such as an emergency shutoff valve. If the valves are used for the mentioned applications, additional safety measures should be adopted.

4. Ensure sufficient space for maintenance activities.

When installing the products, allow access for maintenance.

5. Release of residual pressure

For maintenance purposes install a system for releasing residual pressure.

Selection

⚠ Warning

1. Confirm the specifications.

Products are designed only for use in compressed air systems (including vacuum). Do not operate at pressures or temperatures, etc., beyond the range of specifications, as this can cause damage or malfunction. (Refer to the specifications.) Please contact SMC when using a fluid other than compressed air (including vacuum).

2. Extended periods of continuous energization

Please contact SMC when a valve is continuously energised for an extended period of time or when the energised period is longer than the de-energised period.

⚠ Caution

1. Momentary energisation (Double solenoid valve)

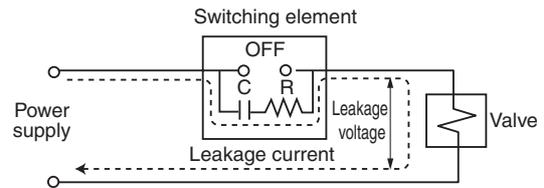
If a double solenoid valve is operated with momentary energization, it should be energised for at least 0.1 second. However, depending on the condition of the secondary load, it should be energised until the cylinder reaches the stroke end position, since there is a possibility of malfunction.

Selection

⚠ Caution

2. Leakage voltage

Take note that the leakage voltage will increase when a C-R circuit (surge voltage suppressor) is used for protecting a switching device because of the passing leakage voltage through the C-R circuit.



The suppressor residual leakage voltage should be as follows.
DC coil: 3 % or less of rated voltage
AC coil: 20 % or less of rated voltage

3. Solenoid valve drive with SSR

If the minimum load current of the SSR is larger than that of the solenoid valve, this may cause a malfunction.

When selecting the SSR, refer to the element catalogue specifications.

4. Surge voltage suppressor

If a surge protection circuit contains nonstandard diodes, such as Zener diodes or ZNR, a residual voltage that is in proportion to the protective circuit and the rated voltage will remain. Therefore, take into consideration the surge voltage protection of the controller.

In the case of diodes, the residual voltage is approximately 1 V.

5. Operation in a low temperature condition

It is possible to operate a valve in extreme temperature, as low as -10 °C. Take appropriate measures to avoid freezing of drainage, moisture etc. in low temperature.

6. Mounting orientation

Mounting orientation of a single solenoid valve is universal. When installing a double solenoid valve, mount the valve so that spool valve is horizontal.

Mounting

⚠ Warning

1. If air leakage increases or equipment does not operate properly, stop operation.

Check mounting conditions when air and power supplies are connected. Initial function and leakage tests should be performed after installation.

2. Operation manual

Install the products and operate them only after reading the operation manual carefully and understanding its contents. Also, keep the manual where it can be referred to as necessary.

3. Painting and coating

Warnings or specifications printed or affixed to the product should not be erased, removed or covered up. Also, applying paint to resinous parts may have an adverse effect due to the solvent in the paint.



NAMUR Interface Solenoid Valves

Specific Product Precautions 2

Be sure to read this before handling.

Piping

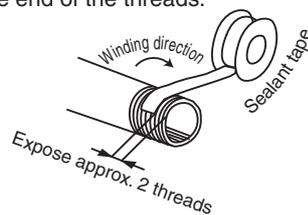
⚠ Caution

1. Preparation before piping

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

2. Wrapping of sealant tape

When screwing piping or fittings into ports, ensure that chips from the pipe threads or sealing material do not enter the piping. Also, if sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.



3. Connection of fittings

When attaching fittings to valves, tighten with the tightening torque shown below.

Connection thread size	Proper tightening torque N·m(kgf·cm)
1/4	12 to 14 (120 to 140)

4. Piping to products

When piping to a product, refer to the operation manual to avoid mistakes regarding the supply port, etc.

Wiring

⚠ Caution

1. Applied voltage

When electric power is connected to a solenoid valve, be careful to apply the proper voltage. Improper voltage may cause malfunction or coil damage.

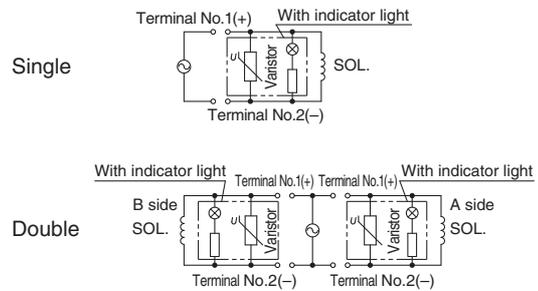
2. Check the connections.

Check if the connections are correct after completing all wiring.

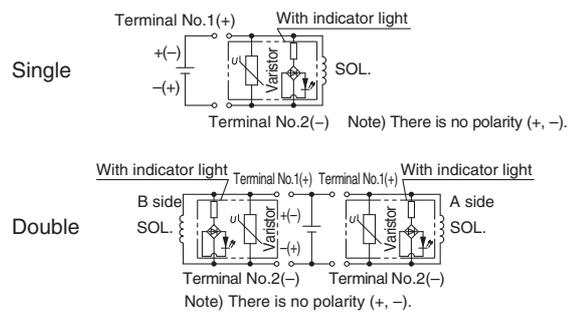
Light/Surge Voltage Suppressor

⚠ Caution

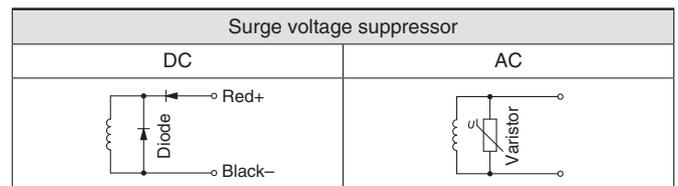
AC and 100 V DC



24 V DC or less



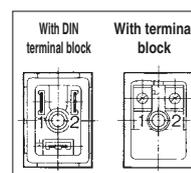
•Type G: Use lead wire from solenoid to connect with power side. Grommet with DC voltage surge voltage suppressor has polarity. Connect red lead wire to + (positive) side and black to - (negative) side.



Wiring

⚠ Caution

In the case of DIN terminal and terminal block (with indicator light/surge voltage suppressor), the interior wiring is shown below.



Applicable terminal: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S, but in the case of with DIN terminal block, is not a terminal structure.

Note) There is no polarity (+, -).



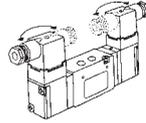
NAMUR Interface Solenoid Valves Specific Product Precautions 3

Be sure to read this before handling.

Changing Direction of DIN Terminal/Cable Entry

⚠ Caution

To change direction of DIN terminal retaining screw, pull off outer cover, rotate connector board through 180°. Replace cover and tighten screw.



Lubrication

⚠ Caution

1. Lubrication

- 1) The valve has been lubricated for life at the factory, and does not require any further lubrication.
- 2) If a lubricant is used in the system, use class 1 turbine oil (no additive), ISO VG32. Once a lubricant is used in the system, lubrication must be continued because the original lubricant applied during manufacturing will be washed away. Refer to each manufacturer's brand name of class 1 turbine oil (no additive), ISO VG32 as shown below.

Class 1 Turbine Oil (No additive), ISO VG32

Classification of viscosity cst (40C)	Viscosity according to ISO Grade	32
Idemitsu Kosan Co., Ltd.	Turbine oil P-32	
Nippon Oil Corporation	Turbine oil 32	
COSMO OIL CO., LTD.	Cosmo turbine 32	
Japan Energy Corporation	Kyodo turbine 32	
Kygnus Sekiyu K.K.	Turbine oil 32	
Kyushu Oil Co., Ltd.	Stork turbine 32	
Mitsubishi Oil Co., Ltd.	Mitsubishi turbine 32	
SHOWA SHELL SEKIYU K.K.	Turbine 32	
Tonen General Sekiyu K.K.	General R turbine 32	
FUJI KOSAN CO., LTD.	Fukkol turbine 32	

Please contact SMC for details about class 2 turbine oil (with additives), ISO VG32.

Air Supply

⚠ Warning

1. Use clean air.

Do not use compressed air that contains chemicals, synthetic oils including organic solvents, salt or corrosive gases, etc., as it can cause damage or malfunction.

⚠ Caution

1. Install an air filter.

Install an air filter upstream near the valve. Select an air filter with a filtration size of 5 µm or smaller.

Air Supply

⚠ Caution

2. Take measures to ensure air quality, such as by installing an aftercooler, air dryer, or water separator.

Compressed air that contains a large amount of drainage can cause malfunction of pneumatic equipment such as valves. Therefore, take appropriate measures to ensure air quality, such as by providing an aftercooler, air dryer, or water separator.

3. If excessive carbon powder is seen, install a mist separator on the upstream side of the valve.

If excessive carbon dust is generated by the compressor, it may adhere to the inside of a valve and cause it to malfunction.

For compressed air quality, refer to SMC Best Pneumatics catalogue.

Operating Environment

⚠ Warning

1. Do not use in an atmosphere having corrosive gases, chemicals, sea water, water, water steam, or where there is direct contact with any of these.

2. Do not use in explosive atmospheres.

3. Do not use in a place subject to heavy vibration and/or impact.

Confirm the specifications in the main section of the catalogue.

4. The valve should not be exposed to prolonged sunlight. Use a protective cover.

5. Remove any sources of excessive heat.

6. In locations where there is contact with spatter from water, oil, solder, etc., take suitable protective measures.

7. When the solenoid valve is mounted in a control panel or its energised for a long time, make sure ambient temperature is within the specification of the valve.



NAMUR Interface Solenoid Valves

Specific Product Precautions 4

Be sure to read this before handling.

Maintenance

Warning

1. Perform maintenance inspection according to the procedures indicated in the operation manual.

If handled improperly, malfunction and damage of machinery or equipment may occur.

2. Removal of equipment, and supply/exhaust of compressed air

When components are removed, first confirm that measures are in place to prevent workpieces from dropping, run-away equipment, etc. Then, cut off the supply pressure and electric power, and exhaust all compressed air from the system using the residual pressure release function. For 3-position closed centre type, exhaust the residual pressure between the valve and the cylinder.

When the equipment is operated after remounting or replacement, first confirm that measures are in place to prevent lurching of actuators, etc. Then, confirm that the equipment is operating normally.

3. Low frequency operation

Valves should be operated at least once every 30 days to prevent malfunction. (Use caution regarding the air supply.)

4. Manual override

When the manual override is operated, connected equipment will be actuated. Operate after safety is confirmed.

Caution

1. Drain flushing

Remove drainage from the air filters regularly.

2. Lubrication

Once lubrication has been started, it must be continued. Use class 1 turbine oil (with no additive), VG32. If other lubricant oil is used, it may cause malfunction. Please contact SMC for suggested class 2 turbine oil (with additive), VG32.

NAMUR Interface 3/5 Port Solenoid Valve

IP67 Compliant, Hygienic Design Type



VFN2120N-X23/-X36

- Hygienic design is adopted
Resin body with less concaves. Direct cleaning of valve is possible (IP67)
- 3 port/5 port available
Function plate realised 3/5 port selectable
- Low power consumption
Power consumption: 0.5 W
- Port threads: NPT 1/4, G 1/4 available

How to Order



VFN2120N-5 [] - 02 N - [] [] - X23 A - Q

Voltage

5	24 V DC
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Manual

		X23	X36
—	Push type	○	—
B	Locking type (Tool required)	○	—
C	Locking type (Manual type)	—	○

○: Available

1/3/5 port thread size

02	1/4"
----	------

1/3/5 port thread type

N	NPT
F	G

Mounting thread type

—	UNF10-32 thread
M	M5 x 0.8 thread
N	No mounting thread

Valve specifications

A	3 port (Coil side: A port)
B	5 port (Coil side: B port)
C	3 port (Coil side: B port)
D	5 port (Coil side: A port)

Electrical entry

X23	Vertical entry to piping port
X36	Horizontal entry to piping port

Check valve

—	Available
0	Not available

NAMUR Interface 3/5 Port Solenoid Valve **VFN2120N-X23/-X36**

Standard Specifications

Fluid	Air
Operating pressure range	0.15 to 0.9 MPa
Ambient and fluid temperature	-10 to +60 °C
Lubrication	Not required
Manual override	Push type/Locking type (tool required)/ Locking type (manual type)
Enclosure	Equivalent to IP67
Thread port size	1/4"
Flow-rate characteristics (Cv/Effective area)	0.8/11 mm ²
Rated voltage	24 V DC
Allowable voltage fluctuation	-15 to +10 % of rated voltage
Type of coil insulation	Class B
Power consumption	0.5 W

Replacement Parts

① Mounting screw

Model	Type	Contents
AXT842-30-19A-2	UNF10-32	With washer/A set of 10 screws
AXT842-30-19A-3	M5 x 0.8	



Mounting screw

② Check valve

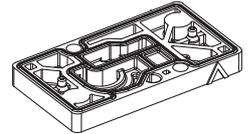
Model	Contents
AXT842-30-17A	A set of 10 pcs.



Check valve

③ Function plate assembly*

Model	Valve specifications
AXT842-30-10-A	3 port (Coil side: A port)
AXT842-30-10-B	5 port (Coil side: B port)
AXT842-30-10-C	3 port (Coil side: B port)
AXT842-30-10-D	5 port (Coil side: A port)



Function plate assembly

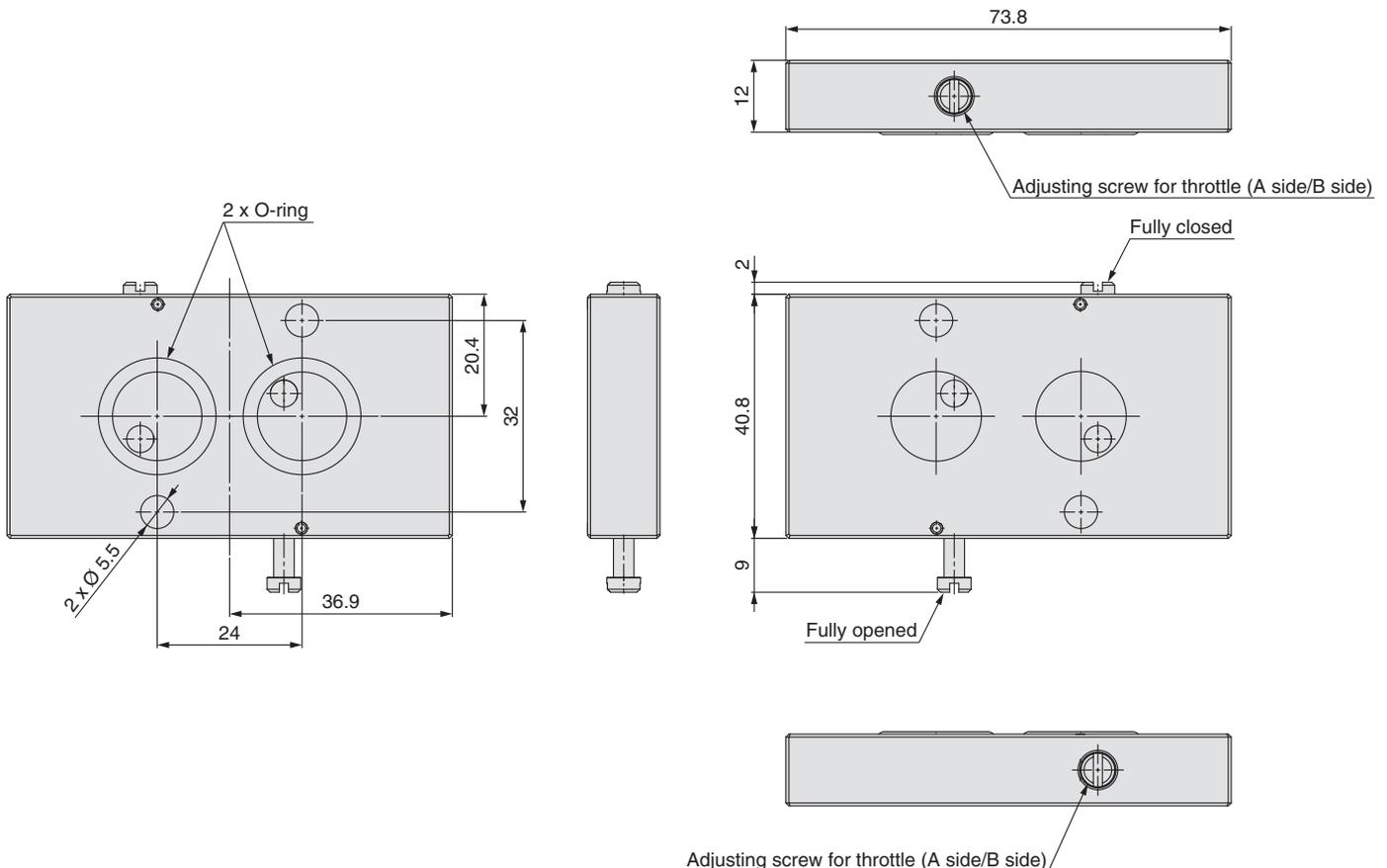
* Valve specifications can be freely changed by changing the function plate.

Options

Throttle valve spacer

Part no.	Mounting screw type	Body material	Accessories
AXT842-30-22A-1	UNF10-32	Stainless steel	O-ring for interface (2 pcs.) Mounting screw for spacer (2 pcs.)
AXT842-30-22A-2	M5 x 0.8		
AXT842-30-24A-1	UNF10-32	Aluminium (Black anodised)	
AXT842-30-24A-2	M5 x 0.8		

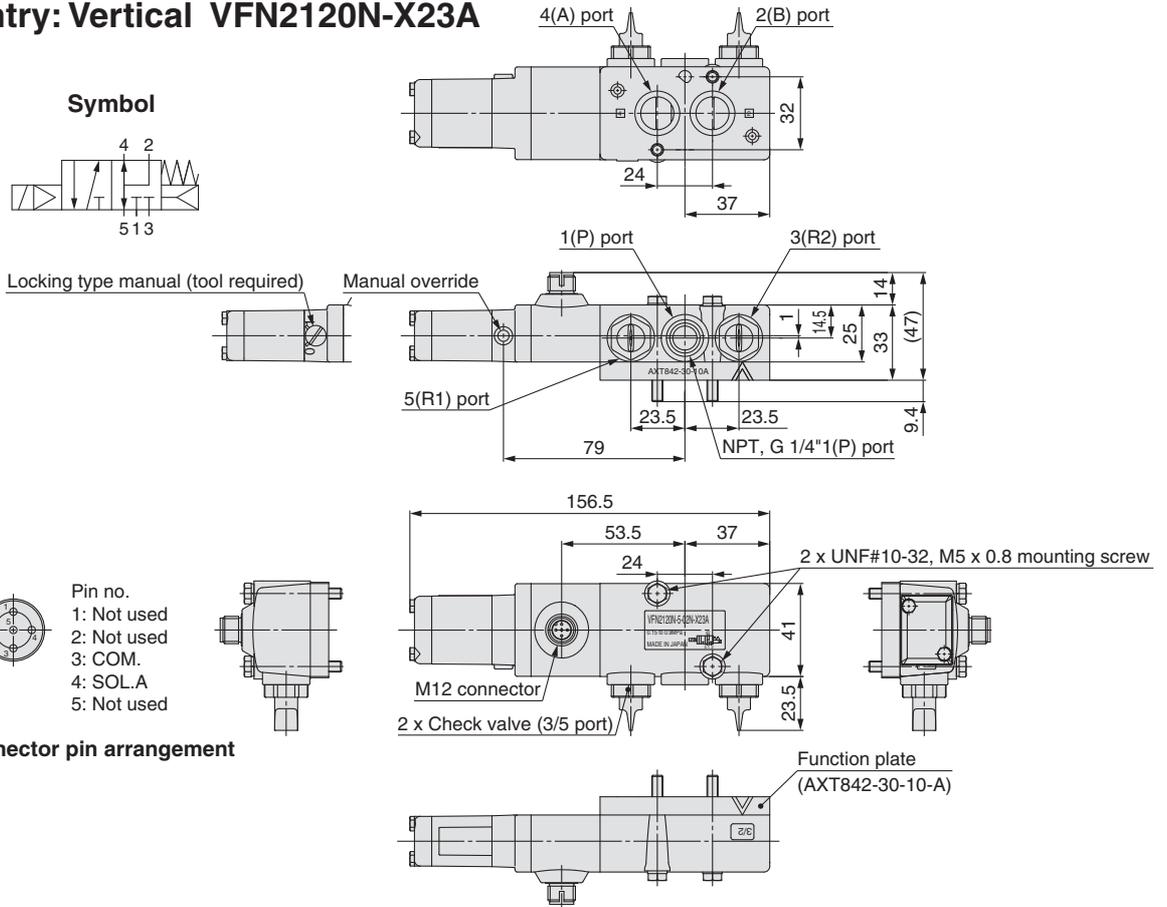
Dimensions



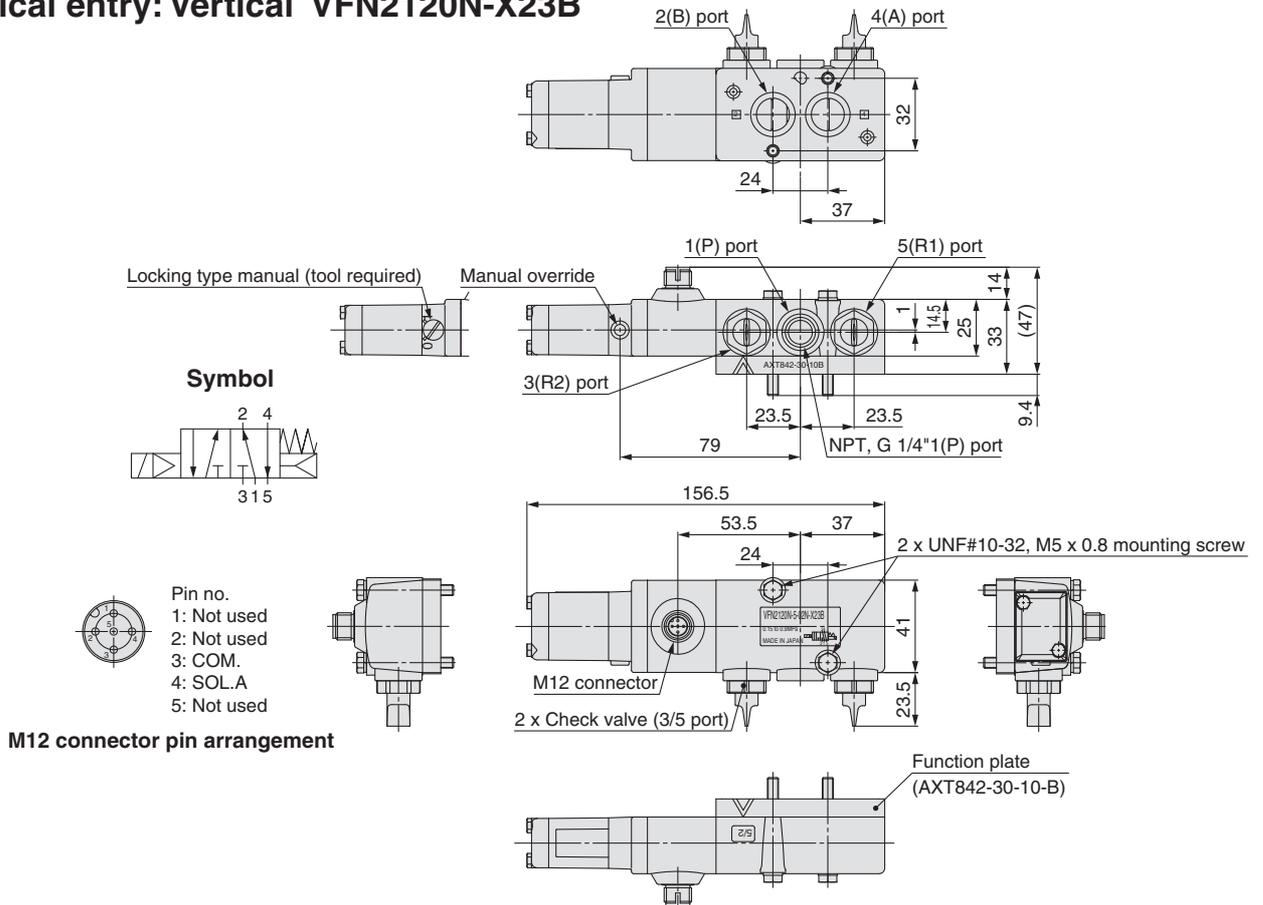
VFN2120N-X23/-X36

Dimensions

Electrical entry: Vertical VFN2120N-X23A



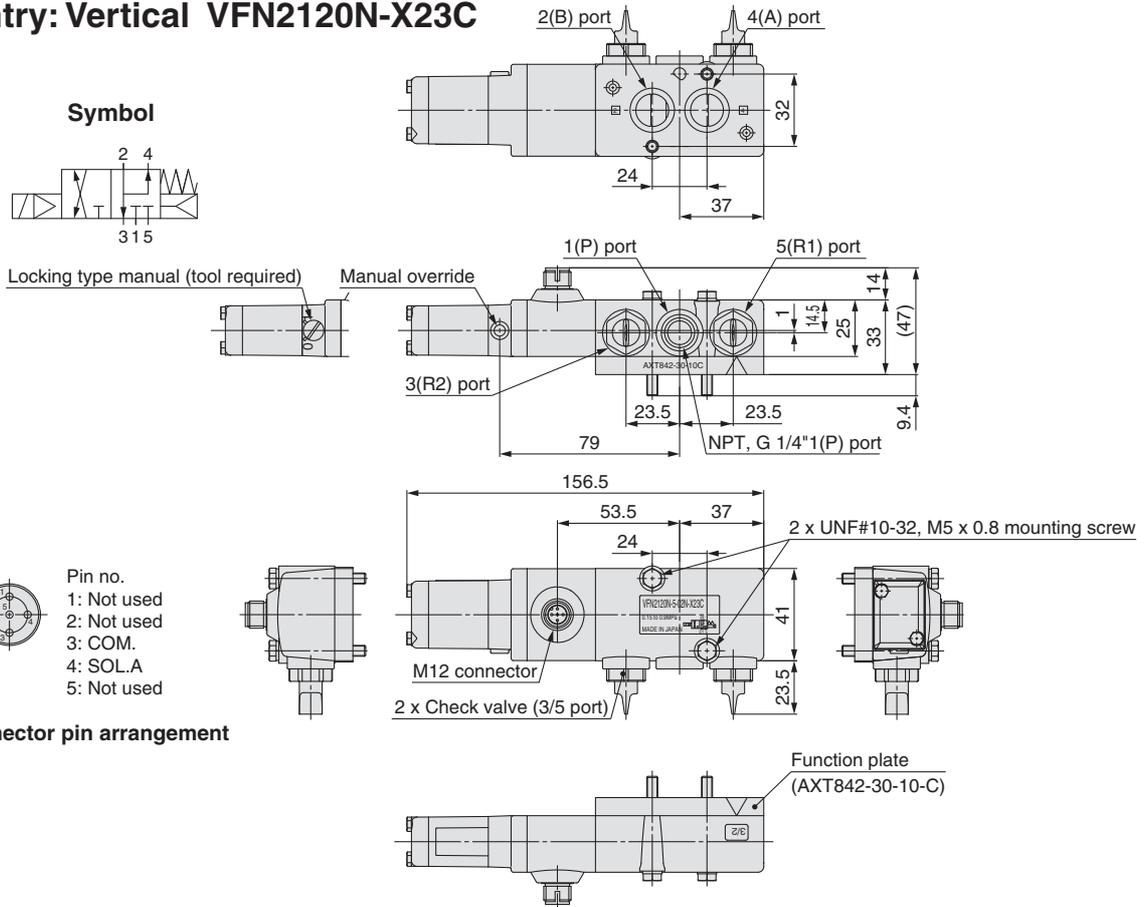
Electrical entry: Vertical VFN2120N-X23B



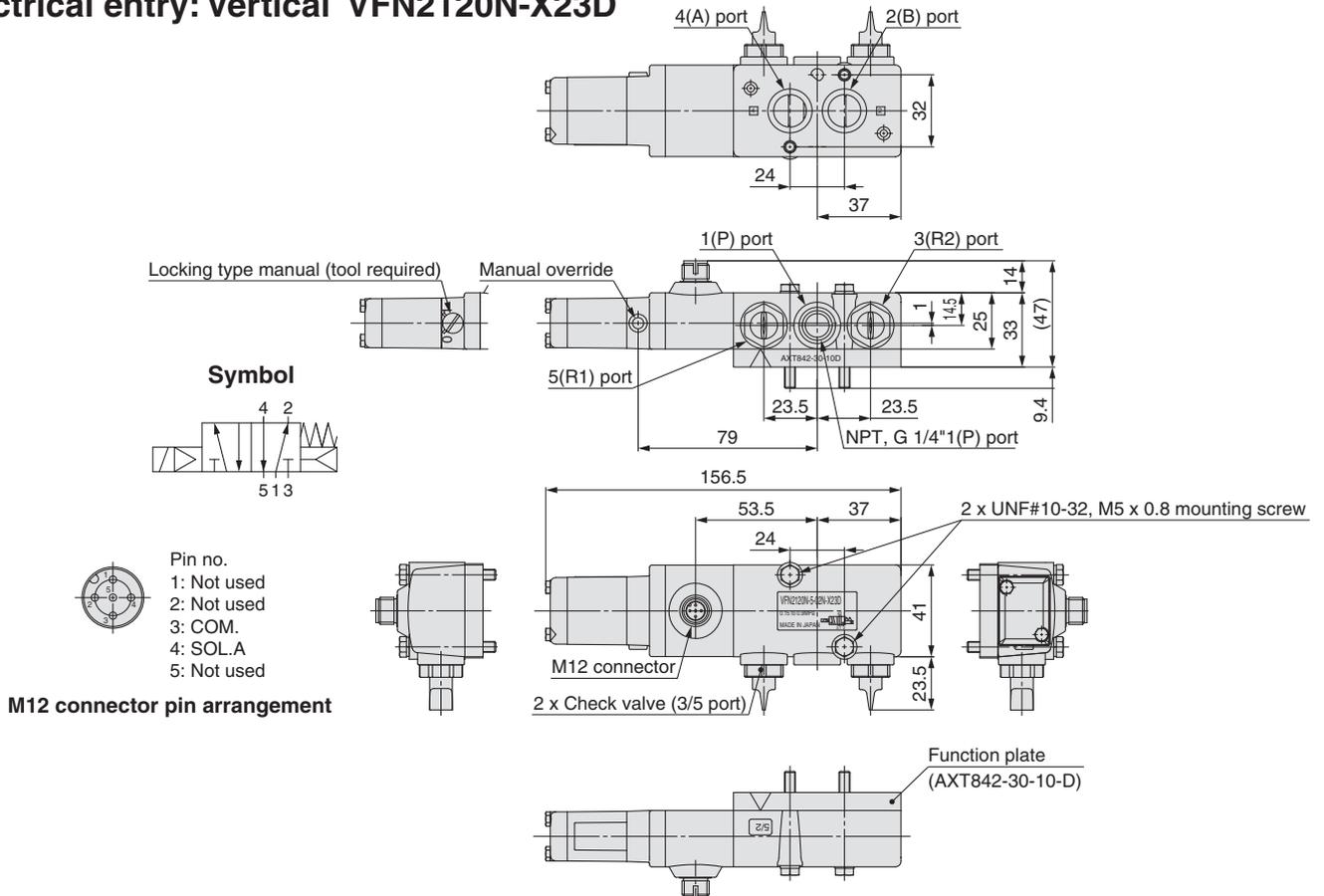
NAMUR Interface 3/5 Port Solenoid Valve IP67 Compliant, Hygienic Design Type **VFN2120N-X23/-X36**

Dimensions

Electrical entry: Vertical VFN2120N-X23C



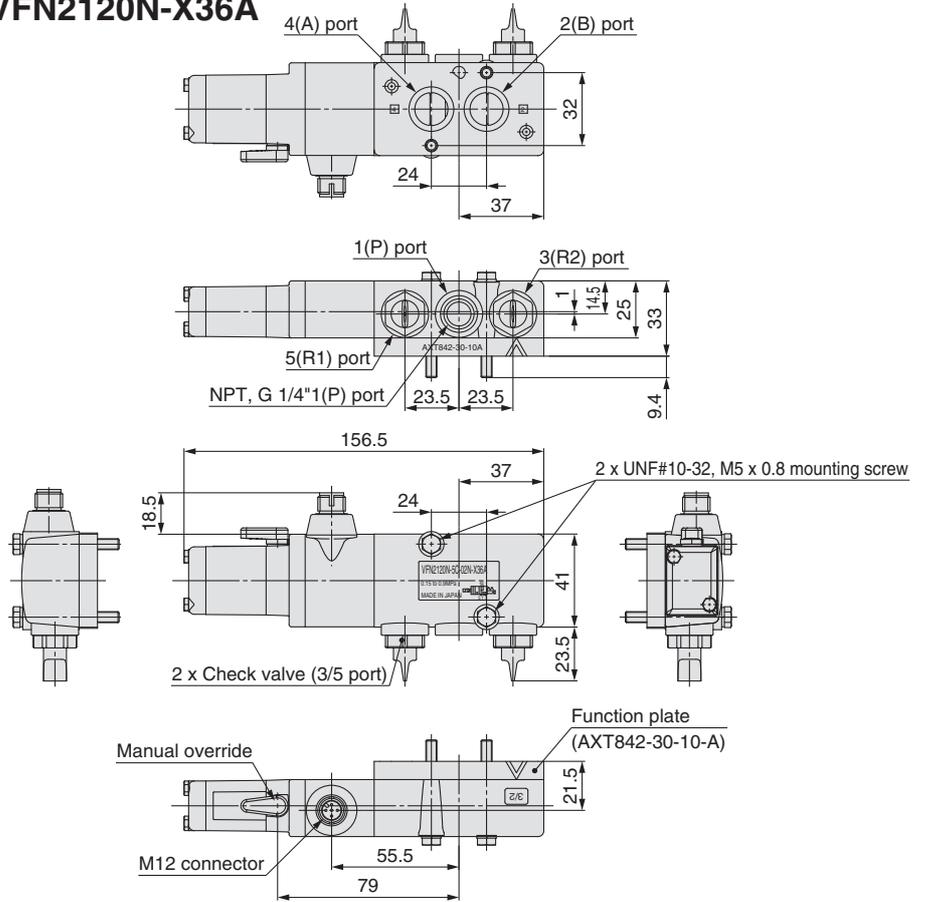
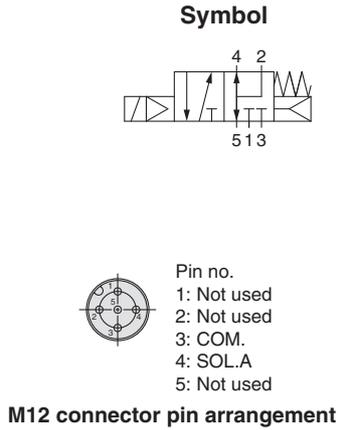
Electrical entry: Vertical VFN2120N-X23D



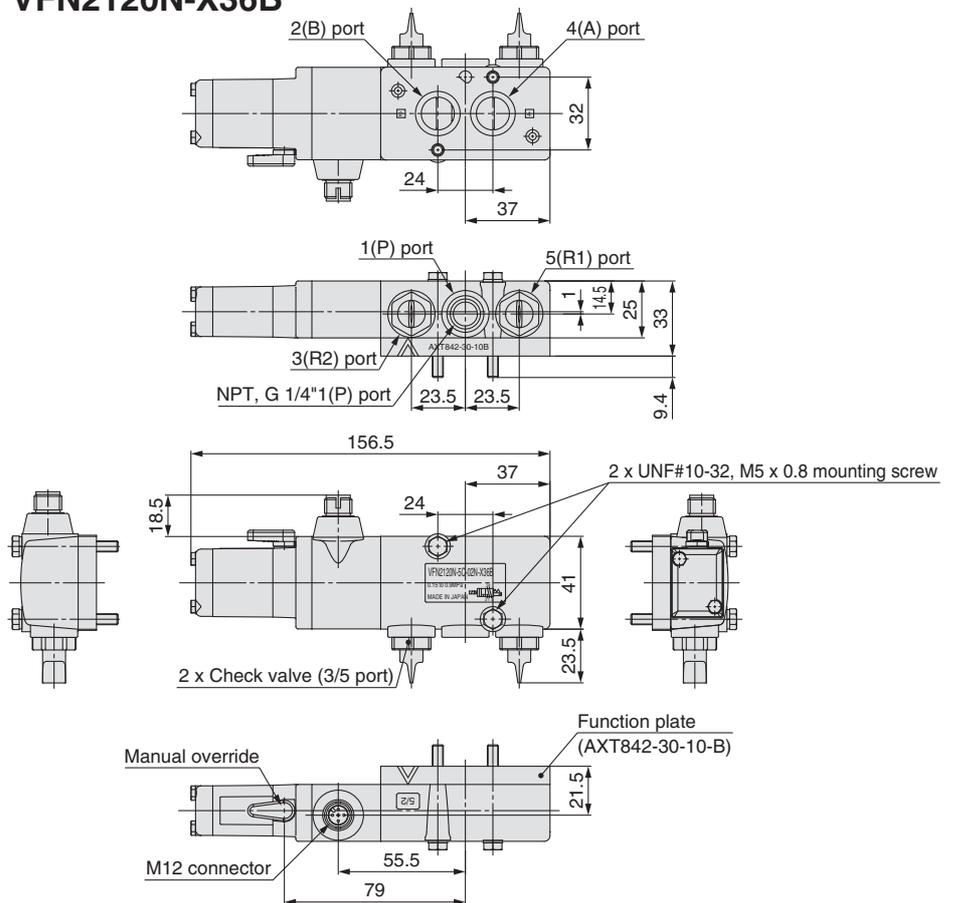
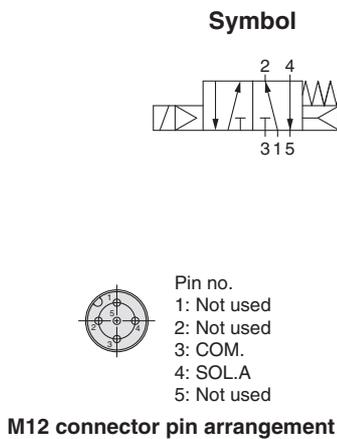
VFN2120N-X23/-X36

Dimensions

Electrical entry: Horizontal VFN2120N-X36A

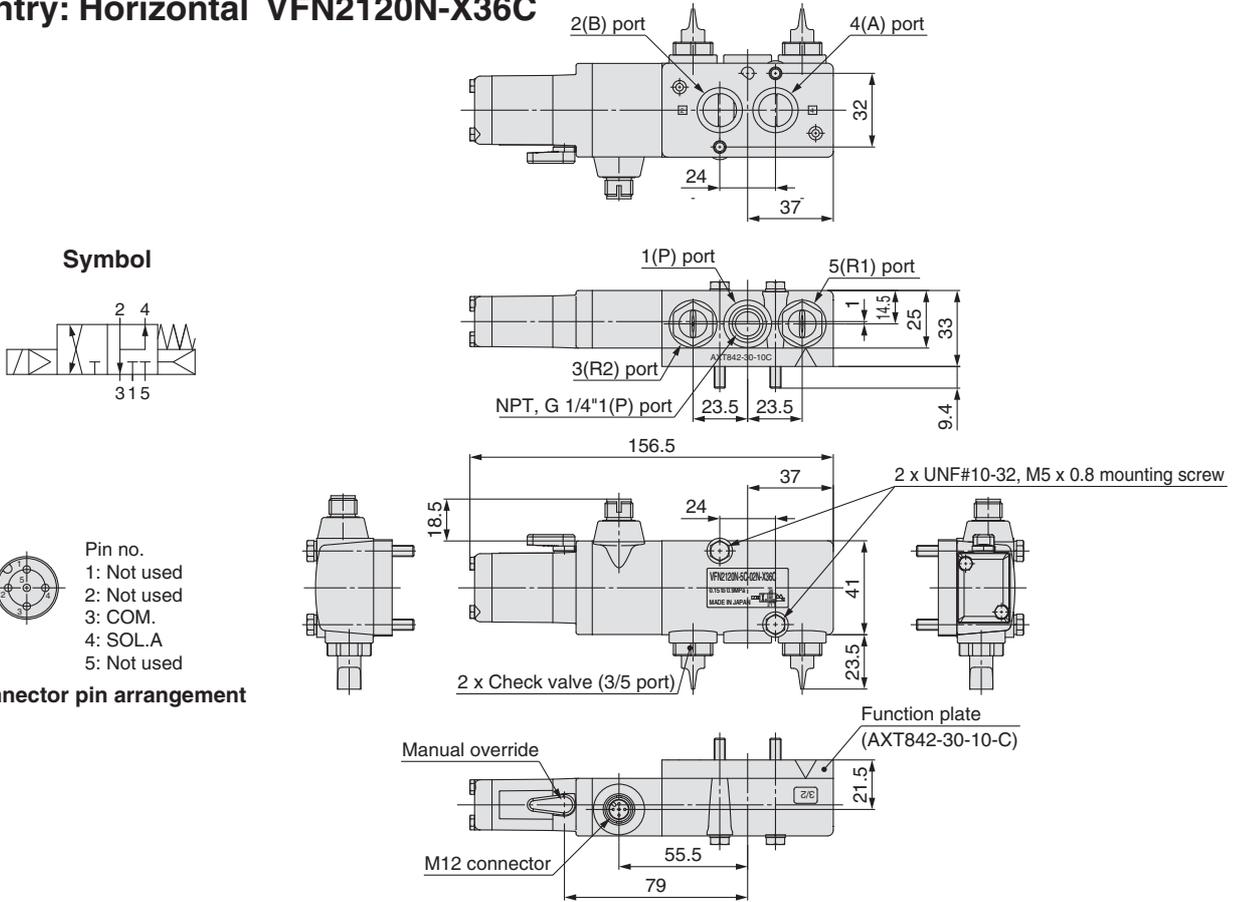


Electrical entry: Horizontal VFN2120N-X36B

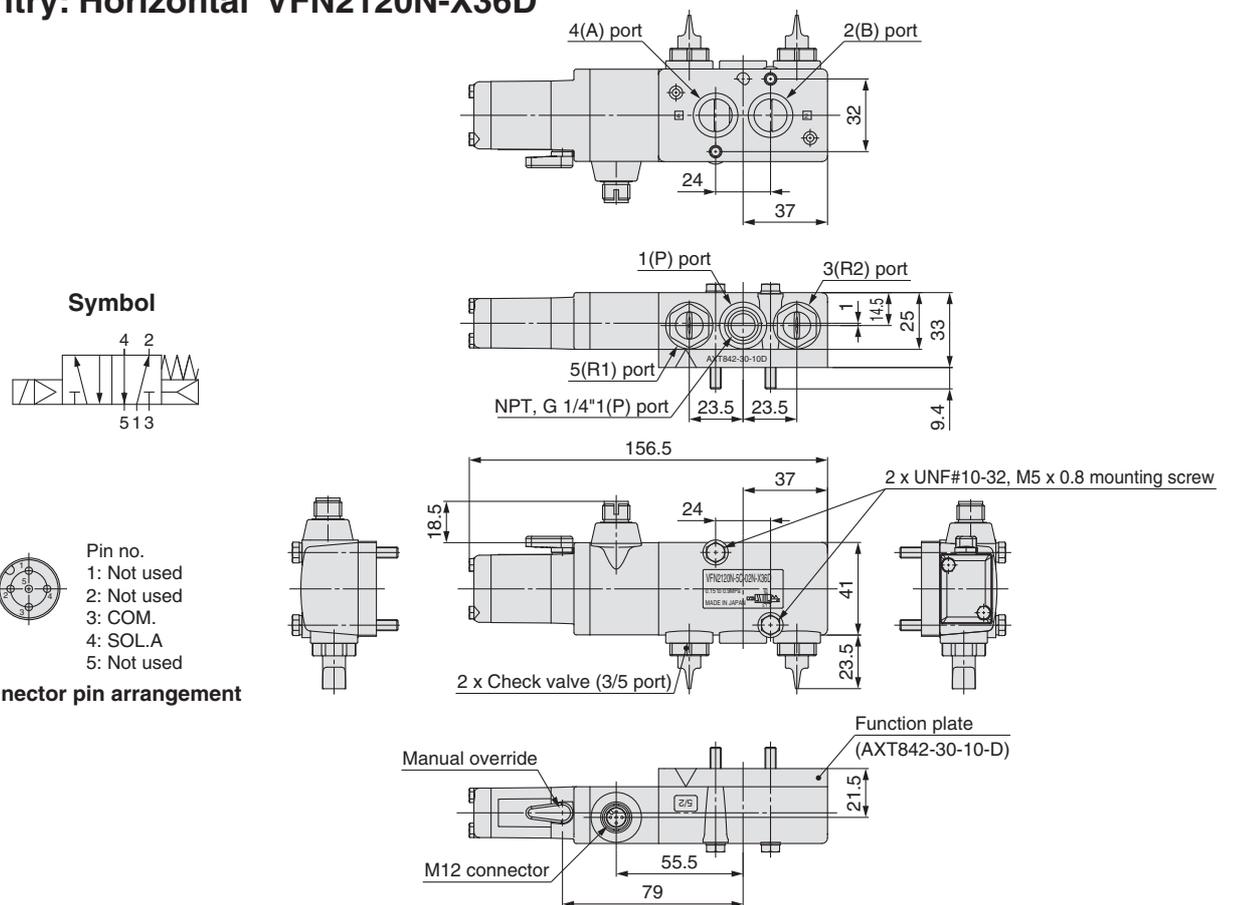


Dimensions

Electrical entry: Horizontal VFN2120N-X36C



Electrical entry: Horizontal VFN2120N-X36D



Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

-  **Caution:** Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
-  **Warning:** Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
-  **Danger:** Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

- *1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
- ISO 4413: Hydraulic fluid power – General rules relating to systems.
- IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
- ISO 10218-1: Manipulating industrial robots - Safety. etc.

Warning

- 1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**
Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
- 2. Only personnel with appropriate training should operate machinery and equipment.**
The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.
- 3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**
 1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
 2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
 3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
- 4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**
 1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
 2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalogue.
 3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
 4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.

*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Caution

- 1. The product is provided for use in manufacturing industries.**
The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Caution

- SMC products are not intended for use as instruments for legal metrology.**
Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

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