

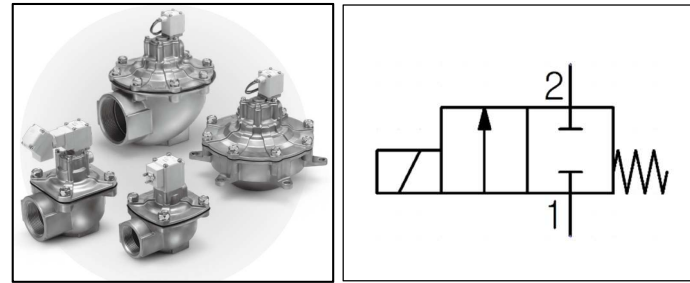


ORIGINAL INSTRUCTIONS

Instruction Manual

2 Port Solenoid Valve for Dust Collectors

VXF Series



The intended use of the valve is to control a large pulse of air for use in dust collectors.

1 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/IEC¹⁾, and other safety regulations.

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.

- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

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.

Warning

- Always ensure compliance with relevant safety laws and standards.
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

2 Specifications

2.1 General Specifications (Size 1-4)

Model	VXF21	VXF22	VXF23	VXF24
Orifice size [mm]	22	28	44	53
Fluid	Air			
Min. Operating Pressure	0.03			0.1
Max. Operating Pressure	0.7			
Fluid Temperature	-10 (no freezing) to 60°C (Standard) -10 (no freezing) to 100°C (High Temperature)			
Ambient Temperature	5 to 60°C			
Operating Environment	Indoor			
Weight - VXF / [VXFA] (Piping type)	0.43 / [0.25]	0.54 / [0.36]	1.16 / [0.94]	1.53 / [1.34]

Table 1

2 Specification - continued

2.2 General Specifications (Size 5-8)

Model	VXF25	VXF26	VXF27	VXF28
Orifice size [mm]	70	80	90	100
Fluid	Air			
Min. Operating Pressure	0.1			
Max. Operating Pressure	0.7			
Fluid Temperature	-10 (no freezing) to 60°C (Standard) -10 (no freezing) to 100°C (High Temperature)			
Ambient Temperature	5 to 60°C			
Operating Environment	Indoor			
Weight: VXF / [VXFA] (Note) (Piping type) Kg	2.71 / [2.55]	3.63 / [3.45]	-	-
Weight: VXF / [VXFA] (Note) (Flange type) Kg	1.30 / [1.09]	1.72 / [1.54]	1.81 / [1.61]	1.82 / [1.63]
Weight: VXF / [VXFA] (Note) (Flange body I type) Kg	-	3.30 / [3.06]	-	-
Weight: VXF / [VXFA] (Note) (Flange body II type) Kg	-	3.39 / [3.17]	-	-

Table 2

Note

Weights are for Grommet, for Conduit: +10g, for DIN: +30g, for Conduit Terminal: +60g

2.3 Solenoid Coil Specifications

Coil insulation type		Class B / Class H (Note 1)
Enclosure		IP65 (Note 2)
Rated voltage	DC	12, 24
	AC	24, 48, 100, 110, 200, 220, 230, 240
Voltage fluctuation		± 10% of rated voltage

Table 3

Note 1) Class B is standard temperature specification. Class H is high temperature specification

Note 2) When using the product in a place which requires water resistance, please contact SMC.

AC Specification

Size	Apparent Power Class B / Class H (VA) (Note 3) (Note 4)
VXF21, 22, 24, 25, 26, 27, 28	7/9
VXF23	10/12

Table 4

Note 3) Apparent power: The value at ambient temperature of 20°C and when the rated voltage is applied. (Variation: ±10%).

Note 4) There is no difference in the frequency and the inrush and energized apparent power because a rectifying circuit is used in the AC (Built-in full-wave rectifier type).

DC Specification

Size	Power Consumption (W) (Note 5)
VXF21, 22, 24, 25, 26, 27, 28	7
VXF23	8

Table 5

Note 5) Power consumption: The value at ambient temperature of 20°C and when the rated voltage is applied. (Variation: ±10%)

2.4 Leakage Specifications

	Leakage rate (Note 6)
Internal Leakage	1000 cm ³ /min or less
External Leakage	100 cm ³ /min or less

Table 6

Note 6) Leakage value at an ambient temperature of 20°C with 0.5 MPa of pressure applied. The amount of valve leakage may be greater if operated at a pressure lower than 0.3 MPa

Warning

Special products might have specifications different from those shown in this section. Contact SMC for specific drawings.

3 Installation

3.1 Installation

Warning

- Do not install the product unless the safety instructions have been read and understood.
- The installation should allow sufficient space for maintenance activities.
- If a regulator or restrictor is installed immediately before or after IN port, valve may oscillate (chatter). Install away from valve.
- The header tank capacity should be sufficient. This is a valve for large flow rates, so if capacity is small, the main valve may oscillate due to pressure drop or insufficient air supply.

3.2 Environment

Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact in excess of the product's specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product's specifications.
- Employ suitable protective measures in locations where there is contact with water droplets, oil or welding splatter, etc.
- Products compliant with IP65 enclosures (Based on IEC60529) are protected against dust and water, however, these products cannot be used in water.
- Products compliant with IP65 and IP67 enclosures satisfy the specifications by mounting each product properly. Be sure to read the Specific Product Precautions for each product.

3.3 Mounting

Warning

- If air leakage increases or equipment does not operate properly, stop operation. After mounting is completed, confirm that it has been done correctly by performing a suitable function test.
- Do not apply external force to the coil section. When tightening is

performed, apply a wrench or other tool to the outside of the piping connection parts.

- Mount a valve with its coil position upward, not downward. When mounting a valve with its coil position downward, foreign objects in the fluid will adhere to the iron core leading to a malfunction. Especially for strict leakage control, such as with vacuum applications and non-leak specifications, the coil must be positioned upward.
- Do not warm the coil assembly with a heat insulator etc. Use tape, heaters, etc., for freeze prevention on the piping and body only. They can cause the coil to burn out.
- Avoid sources of vibration, or adjust the arm from the body to the minimum length so that resonance will not occur.
- Painting and coating Warnings or specifications printed or labelled on the product should not be erased, removed or covered up.

Caution

- Machine the mounting surface shape so that there are no gaps between the mounting surface and the product.

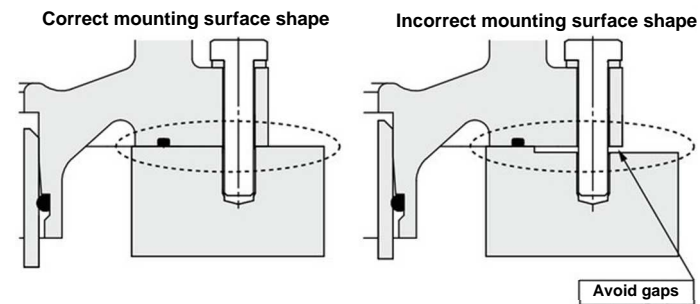


Figure 1

3 Installation - continued

Product Number	Proper Tightening Torque N.m	
VXF25B	(A,B)	12.5 ~ 15.0
	(C,D)	15.0 ~ 17.5
VXF26B	(A,B)	24.5 ~ 29.4
	(C,D)	29.4 ~ 34.3
VXF27B	(A,B)	24.5 ~ 29.4
	(C,D)	29.4 ~ 34.3
VXF28B	(A,B)	24.5 ~ 29.4
	(C,D)	29.4 ~ 34.3

Table 7

3.4 Piping

Caution

- Before connecting piping make sure to clean up chips, cutting oil, dust etc.
- Thoroughly blow through piping before connecting to valve.
- Install piping so that it does not apply pulling, pressing, bending or other forces on the valve body.
- During use, deterioration of the tube or damage to the fittings could cause tubes to come loose from their fittings and thrash about. Securely fasten tubes in place to prevent uncontrolled movement.
- Tighten fittings to specified tightening torque as specified in Table 7.

Connection Thread	Proper Tightening Torque N.m
Rc 1/4	12 to 14
Rc 3/8	22 to 24
Rc 1/2	28 to 30
Rc 3/4	28 to 30
Rc 1	36 to 38
Rc 1 1/2	40 to 42
Rc 2	48 to 50
Rc 2 1/2	48 to 50
Rc 3	48 to 50

Table 8

3.5 Wiring

Warning

- The solenoid valve is an electrical product. For safety, install an appropriate fuse and circuit breaker before use.
- When using multiple solenoid valves, it is not sufficient to merely install one fuse on the inlet side. In order to ensure the safety of the devices, select and install a fuse for each circuit

Caution

- As a rule, use electrical wire with a cross sectional area of 0.5 to 1.25 mm² for wiring. Furthermore, do not allow excessive force to be applied to the lines.
- Use electrical circuits which do not generate chattering in their contacts.
- Use voltage which is within ±10% of the rated voltage. In cases with a DC power supply where importance is placed on responsiveness, stay within ±5% of the rated value. The voltage drop is the value in the lead wire section connecting the coil.
- When a surge from the solenoid affects the electrical circuitry, install a surge voltage suppressor etc. in parallel with the solenoid. Or, adopt an option that comes with the surge voltage protection circuit. (However, a surge voltage occurs even if the surge voltage protection circuit is used. For details, please consult with SMC.)

3.6 Electrical Connections

Caution

3.6.1 Grommet

Class B coil: AWG20 Outside insulator diameter of 2.5 mm There is no polarity.

Rated Voltage	Lead wire colour (See Figure 2)	
	1	2
DC	Black	Red
100 VAC	Blue	Blue
200 VAC	Red	Red
Other AC	Grey	Grey

Table 9

3 Installation - continued

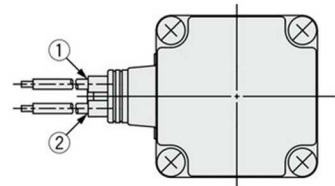


Figure 2

3.6.2 DIN Terminal

Caution

Internal connections are as shown below. Make connections to the power supply accordingly. There is no polarity.

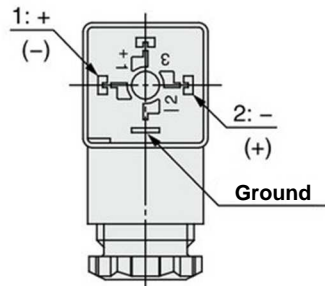


Figure 3

Terminal no.	1	2
DIN TERMINAL	+ (-)	- (+)

Table 10

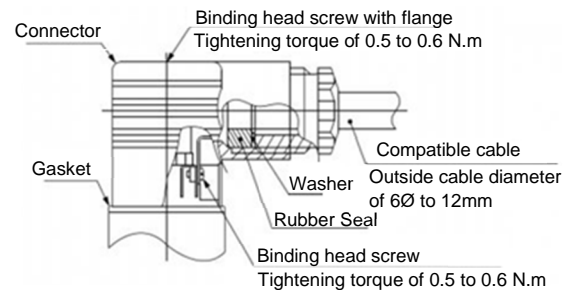


Figure 4

DIN (EN175301-803) Terminal

This DIN terminal corresponds to the Form A DIN connector with an 18 mm terminal pitch, which complies with EN175301-803B.

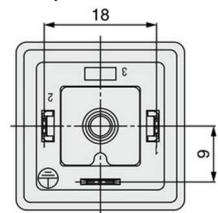


Figure 5

Warning

The ground terminal is linked to the coil assembly only and does not provide protective earth for the valve body

3.6.3 Conduit Terminal

Make connections according to the marks shown below.

- Use the tightening torques below for each section.
- Properly seal the terminal connection (G1/2) with the special wiring conduit etc.

3 Installation - continued

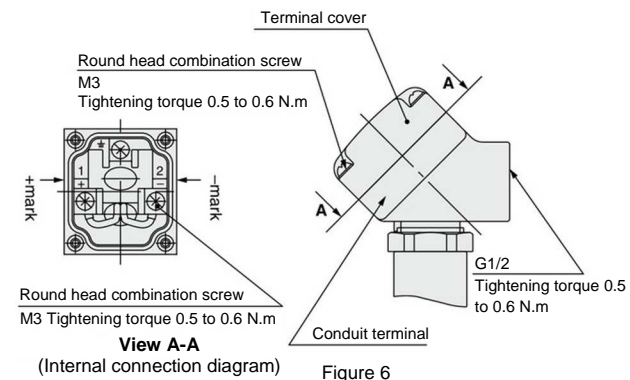


Figure 6

3.6.4 Conduit

When used as an IP65 equivalent, use seal to install the wiring conduit. Also, use the tightening torque below for the conduit. There is no polarity.

Class B coil: AWG20 Outside insulator diameter of 2.5 mm

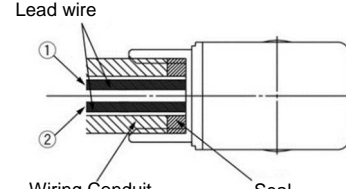


Figure 7

Rated Voltage	Lead wire colour	
	1	2
DC	Black	Red
100 VAC	Blue	Blue
200 VAC	Red	Red
Other AC	Grey	Grey

Table 11

Warning

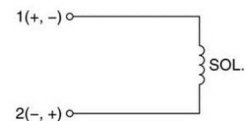
The ground terminal is linked to the coil assembly only and does not provide protective earth for the valve body

3.7 Electrical Circuits

Caution

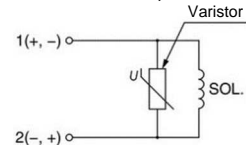
DC Circuits

Grommet, Flat terminal



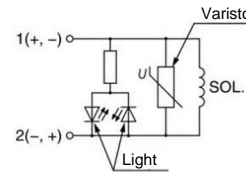
Without electrical option

Grommet, DIN terminal, Conduit terminal, Conduit



With surge voltage suppressor

DIN terminal, Conduit terminal



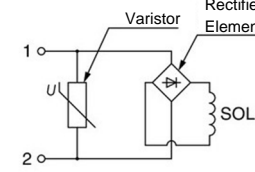
With light and surge voltage suppressor

Figure 8

3 Installation - continued

AC Circuits

Grommet, DIN terminal, Conduit terminal,



Without electrical option

DIN terminal, Conduit terminal

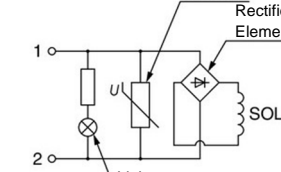


Figure 9

4 How to Order

Refer to product catalogue or SMC website (URL <https://www.smcworld.com>) to obtain more detail information for 'How to Order'

5 Outline Dimensions (mm)

Refer to product catalogue or SMC website (URL <https://www.smcworld.com>) to obtain more detail information for 'How to Order'

6 Maintenance

6.1 General Maintenance

Warning

- Removing the product
The valve can become hot depending on the fluid temperature. Confirm the valve temperature has dropped sufficiently before performing work. If touched inadvertently, there is a danger of being burned.

1. Shut off the fluid supply and release the fluid pressure in the system.
2. Shut off the power supply
3. Remove the product.

- Low frequency operation
Switch valves at least once every 30 days to prevent malfunction. Also, in order to use it under the optimum state, conduct a regular inspection once a half year.

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous.
- Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.
- Take care to ensure filters do not get clogged. Replace elements after 1 year of use or if pressure drop reaches 0.1 MPa.
- In case of long term storage after use, thoroughly remove all moisture to prevent rust and deterioration of rubber materials etc.
- Exhaust the drainage from air filters periodically

6 Maintenance - continued

6.2 Silencer

Caution

- Use of a silencer will not affect response time at the time of installation. However the silencer will become clogged over time and this can affect the response time of the valve. To avoid this, replace silencer after using about 500,000 times. This number is subject to change based on fluid quality and energizing time.
- When using a silencer, make space for silencer replacement.

7 Limitations of Use

8.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

Warning

• Air Quality

- 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.
- Install an air filter. Install an air filter close to the valve on the upstream side. A filtration degree of 5 μm or less should be selected.
- Install an aftercooler or air dryer, etc. Compressed air that contains excessive drainage may cause malfunction of valves and other pneumatic equipment. To prevent this, install an aftercooler or air dryer, etc.
- If excessive carbon powder is generated, eliminate it by installing a mist separator on the upstream side of valves. If excessive carbon powder is generated by the compressor, it may adhere to the inside of the valves and cause a malfunction.

• Ambient environment

Use within allowable ambient temperature range. Check the compatibility between the products composition materials and the ambient atmosphere. Be certain that the fluid used does not touch the external surface of the product.

- Countermeasures against static electricity
Take measures to prevent static electricity since some fluids can cause static electricity

• Low temperature operation

- The valve can be used in fluid temperatures down to -10°C. However, take measures to prevent freezing or solidification of impurities, etc.
- When using the valve in cold climates, take appropriate countermeasures to prevent freezing in tubing by draining the water etc. When warming by a heater etc., be careful not to expose the coil portion to a heater. Installation of a dryer and heat retaining of the body is recommended to prevent a freezing condition in which the dew point temperature is high and the ambient temperature is low, and there is high flow.

8 Product disposal

This product should not be disposed of as municipal waste. Check your local regulations and guidelines to dispose this product correctly, in order to reduce the impact on human health and the environment.

9 Contacts

Refer to www.smcworld.com or www.smc.eu for contacts.

SMC Corporation

URL : <http://www.smcworld.com> (Global) <http://www.smc.eu> (Europe)
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