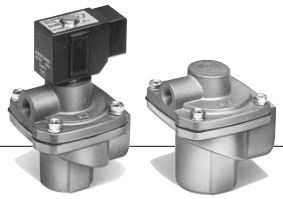
2 Port Solenoid Valve For Dust Collector

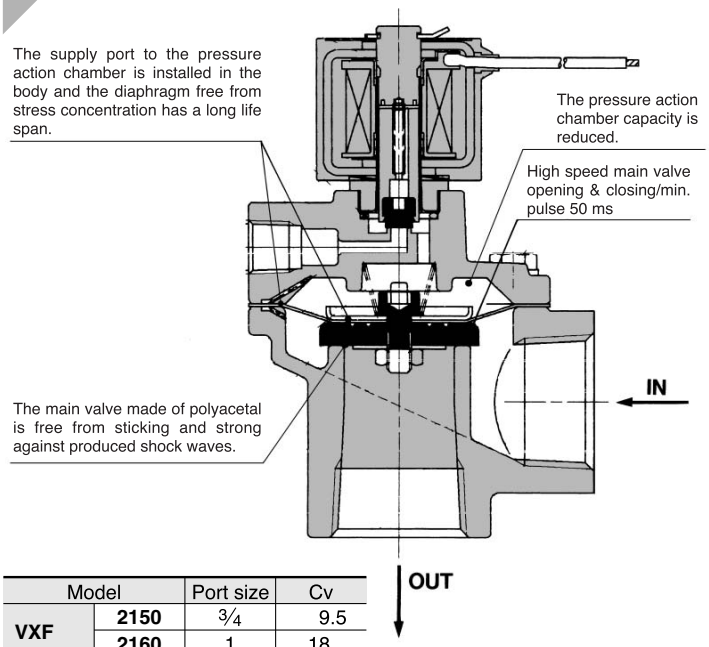
Series VXF

2 port solenoid valve for dust collector

Series VXF



In this L-shaped 2 port valve, the bag filter is cleaned by high speed air jet and shock wave to materialize high speed response and control of instantaneous large flow rate.

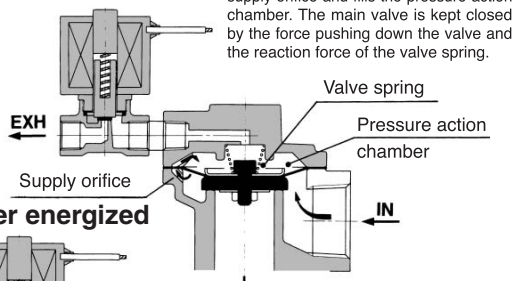


Model		Port size	Cv
VXF VXFA	2150	3/4	9.5
	2160	1	18
	2280	1 1/2	45

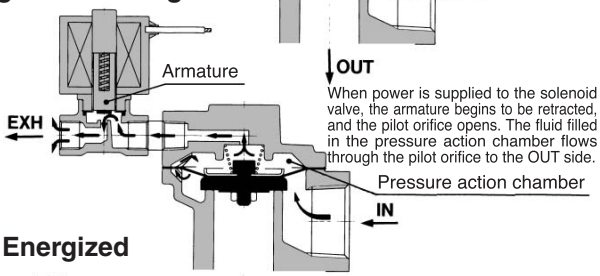
Working principle (*VXFA*)

De-energized

Fluid from the IN side goes through the supply orifice and fills the pressure action chamber. The main valve is kept closed by the force pushing down the valve and the reaction force of the valve spring.

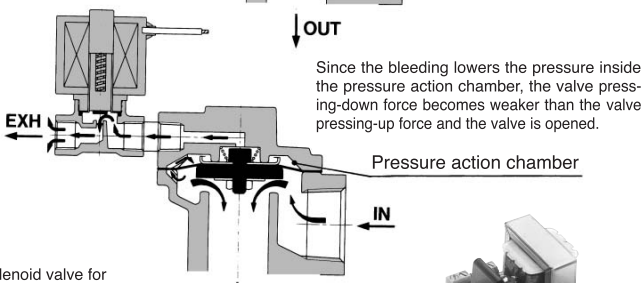


Right after energized



When power is supplied to the solenoid valve, the armature begins to be retracted, and the pilot orifice opens. The fluid filled in the pressure action chamber flows through the pilot orifice to the OUT side.

Energized

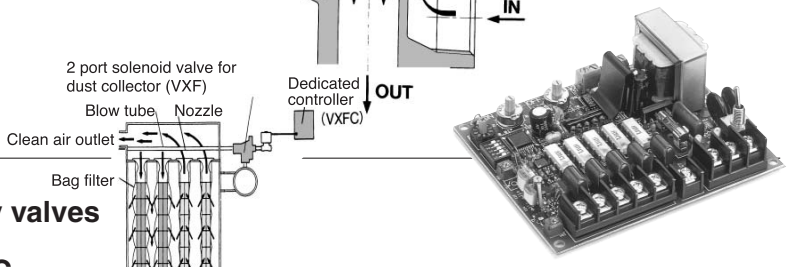


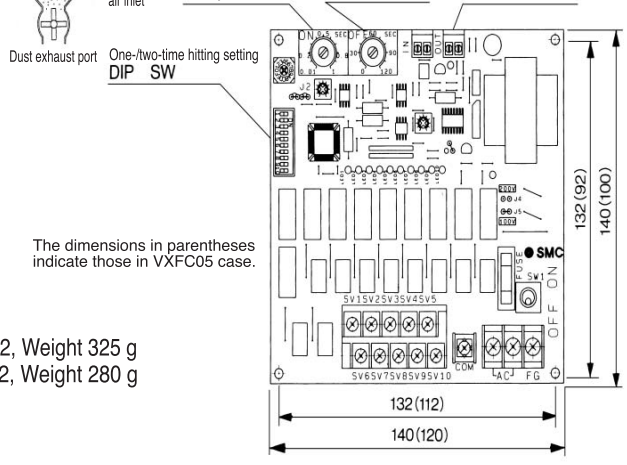
Since the bleeding lowers the pressure inside the pressure action chamber, the valve pressing-down force becomes weaker than the valve pressing-up force and the valve is opened.

Controller dedicated for operation

Series VXFC

The valve controller turns ON/OFF many valves for the dust controller.
Power voltage: 100 VAC, 200 VAC, 24 VDC
Output points: 5 points, 10 points





The dimensions in parentheses indicate those in VXFC05 case.

■ **Two-time hitting function**
Two-time hitting can be set to improve the sweeping effect by the bag filter. Two-time hitting is available by turning ON the DIP SW (one-time by turning OFF).

■ **Connection of multiple circuit boards is possible**
Number of output points can be increased (15/20/25/30 points) by connecting boards.

■ **Wide ranging time setting**
ON-time (output to the valve): 0.01 to 1 sec.
OFF-time (adjournment to next output): 1 to 120 sec.

■ **Small, lightweight, and compact**
VXFC10-1: Outside dimensions 140 x 140, Mounting dimensions 132 x 132, Weight 325 g
VXFC05-1: Outside dimensions 120 x 100, Mounting dimensions 112 x 92, Weight 280 g

The VX∗ series will be revised shortly.

How to Order

Solenoid type Normally closed

VXF **2150** — **06** — **1** **G** ☐ — ☐

Air operated type

VXFA **2150** — **06**

Option

Nil	Standard
S∗	With silencer

∗ Refer to the table (2) below for availability.

Table (2) Option/Silencer

Model	Noise reduction	Effective area
2504-002	19 dB or more	33.9 mm²

Electrical option

Nil	None
S	With surge voltage suppressor
L	With indicator light
Z	With light/ surge voltage suppressor

∗ Refer to the table (1) given below for availability.

Model — Port size

2150	06	Rc 3/4
2160	10	Rc 1
2280	14	Rc 1 1/2

Rated voltage

1	100 VAC 50/60 Hz
2	200 VAC 50/60 Hz
3	110 VAC 50/60 Hz
4	220 VAC 50/60 Hz
5	24 VDC
6	12 VDC
7	240 VAC 50/60 Hz
8	48 VAC 50/60 Hz
9	Other (Contact us for inquiry)

∗ Refer to the table (1) given below for availability.
∗∗ Refer to page 17-3-75 for ordering coil only.

Electrical entry

G	Grommet
C	Conduit
D	DIN terminal
T	Conduit terminal

∗ Refer to the table (1) given below for availability.

Table (1)
Rated Voltage-Electrical Entry-Electrical Option

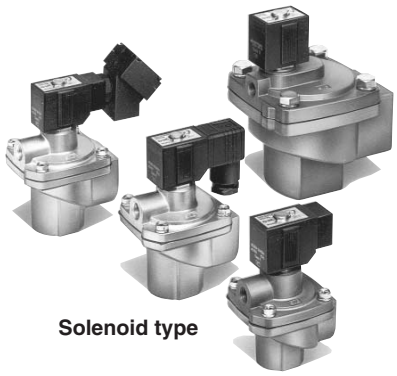
Insulation type		Class B			
Electrical entry		**G**	**C**	**D, T**	
Electrical option		**S** Note)	**—**	**S**	**L, Z**
AC	**1 (100 V)**	●	●	●	●
	2 (200 V)	●	●	●	●
	3 (110 V)	●	●	●	●
	4 (220 V)	●	●	●	●
	7 (240 V)	●	●	●	—
	8 (48 V)	●	●	●	—
DC	**5 (24 V)**	●	●	●	●
	6 (12 V)	●	●	●	—

Note) Surge voltage suppressor is attached in the middle of a lead wire.

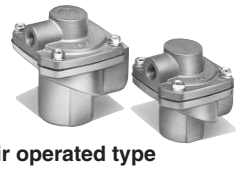
⚠ Caution

Selection

When selecting the air operated type VXFA, select 2 port solenoid valves (with orifice dia. of ø3 or more and effective area of 6 mm² or more) in order to maintain the pilot valve performance.



Solenoid type



Air operated type

Model/Valve Specifications

Port size	Orifice size (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)			Flow characteristics	Withstand pressure (MPa)	Fluid temperature (°C)(1)	Ambient temperature (°C)		Weight (g)	
				Solenoid valve		Air operated valve	Air						
							Effective area (mm²)						
3/4	20	**VXF2150** **VXFA2150**	0.03	AC	1.0	1.0	170	2.0	−10 to 60	AC	5 to 60	VXF 2150	530
				DC	0.7					DC	5 to 40	VXFA 2150	350
1	27	**VXF2160** **VXFA2160**	0.03	AC	1.0	1.0	330	2.0	−10 to 60	AC	5 to 60	VXF 2160	580
				DC	0.7					DC	5 to 40	VXFA 2160	400
1 1/2	40	**VXF2280** **VXFA2280**	0.03	AC	1.0	1.0	810	2.0	−10 to 60	AC	5 to 60	VXF 2280	1500
				DC	0.7					DC	5 to 40	VXFA 2280	1300

Note 1) Dew point shall be −10°C or less. No condensation allowed.

Solenoid Specifications

Model	Power source	Frequency (Hz)	Apparent power VA		Power consumptions W (Holding)	Temperature rise (°C) (Rated voltage)	Voltage fluctuation (%)	Pilot exhaust noise (dB)	
			Inrush	Holding				Without silencer	With silencer
VXF 2150	AC	50	20	11	4.5	45	Rated value ±10	104	83
		60				35			
	DC	—	—	—	6	55			
VXF 2160	AC	50	20	11	4.5	45	Rated value ±10	105	85
		60				35			
	DC	—	—	—	6	55			
VXF 2280	AC	50	40	18	7.5	60	Rated value ±10	108	85
		60				50			
	DC	—	—	—	8	60			

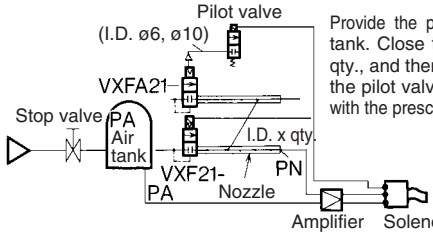
The VX∗ series will be revised shortly.

Model Selection (In the case of using as a bag filter)

Model selection

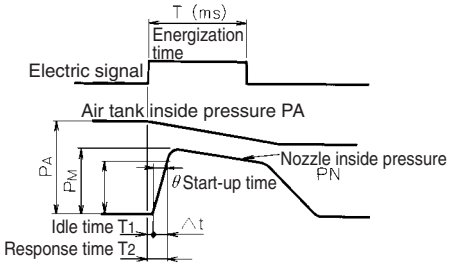
The deterrioration of VXF/VXFA properties due to the tube length from data Ⓑ (response time/idle time) and data Ⓒ (start-up speed), can be measured. Refer to this data to set energization time. Use data Ⓐ (flow rate characteristics) to calculate the flow rate for each loading time separately in relation to the nozzle dia./qty., pressure, and tube. The data does not correspond to the actual bag filter operation. (In the data: "Without tube" and Tube length ø =

How to calculate



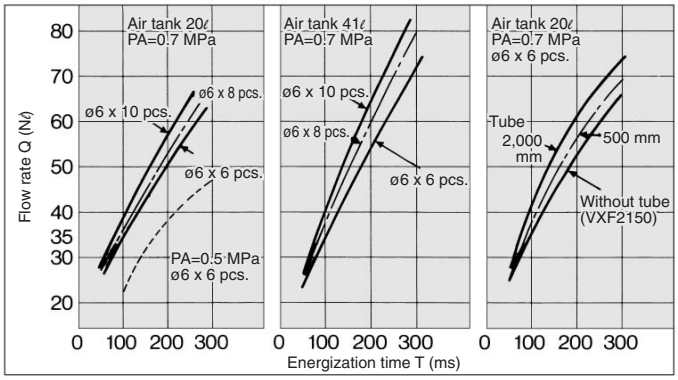
Provide the pressure from the air resource to the air tank. Close the stop valve, set the nozzle dia. and qty., and then energize the solenoid valve as well as the pilot valve of the air operation valve in accordance with the prescription. (Change the tube length.)

How to read the data

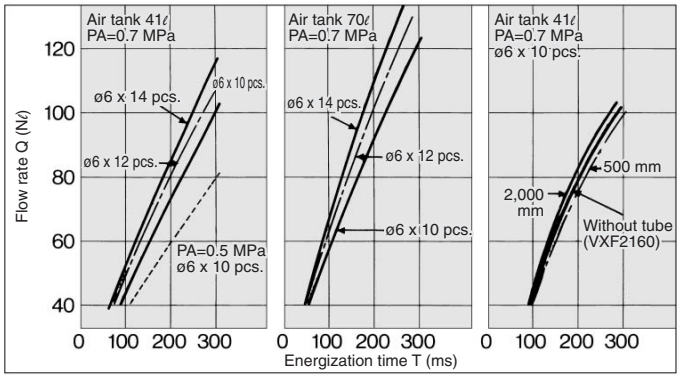


Data (A) Flow Characteristics

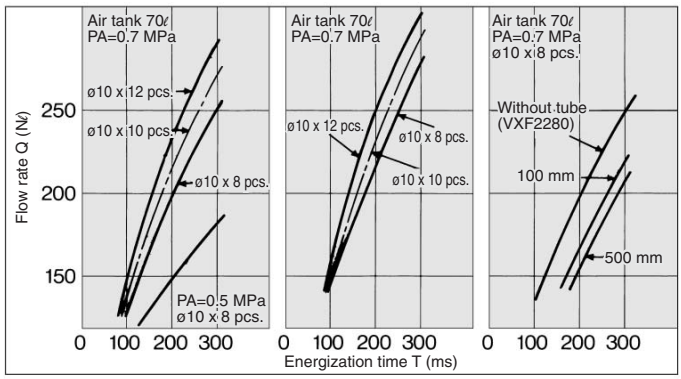
VXF2150/VXFA2150



VXF2160/VXFA2160



VXF2280/VXFA2280

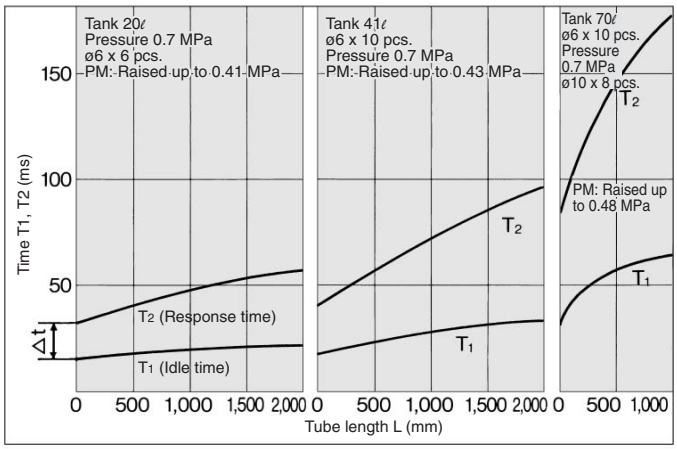


How to read the graph

Even if the energizing time is constant, a greater amount of air flows when the PA is at 0.7 MPa than at 0.5 MPa. Moreover, the greater the air tank capacity, the greater the amount of airflow. Furthermore, the greater the nozzle's total cross sectional area, the greater the amount of airflow. While the flow volume changes according to the length of the tube, be aware that a wasted flow volume is involved during a return.

Data (B) Response Time/Idle Time

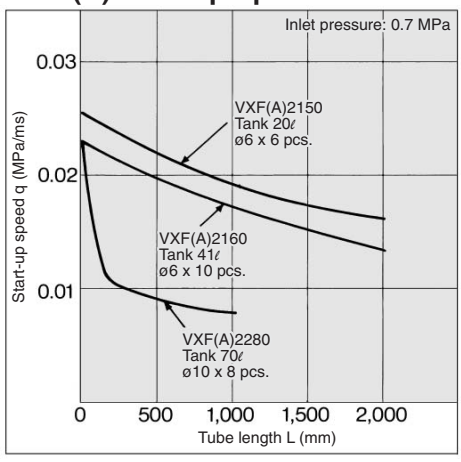
VXF2150 VXFA2150 | **VXF2160 VXFA2160** | **VXF2280 VXFA2280**



How to read the graph

The longer the tube length, the longer the response time and wasted time. If longer than the length in the diagram, the valve might not open due to the tube resistance.

Data (C) Start-up Speed



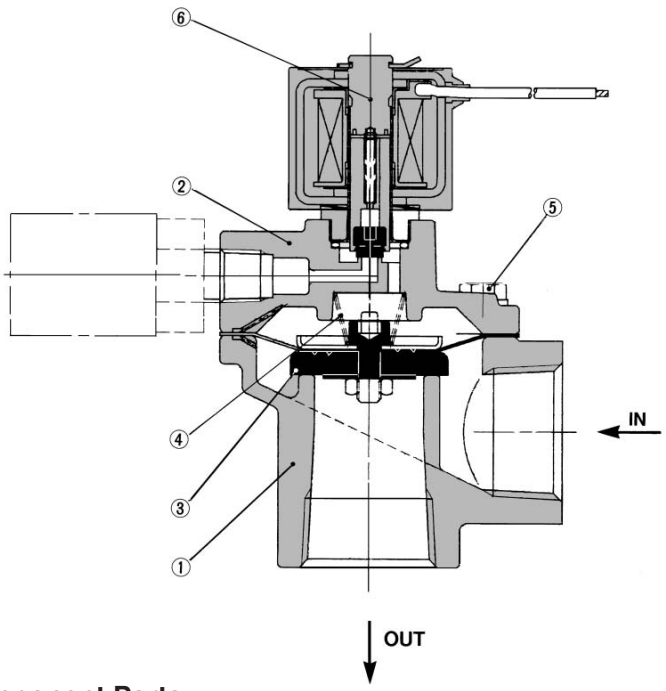
How to read the graph

The start-up speed stands for the degree of the nozzle inside pressure rise per the unit of time. The greater it is, the stronger the shock wave from the nozzle becomes. It also means that the closing speed increases and consumption of air can be used

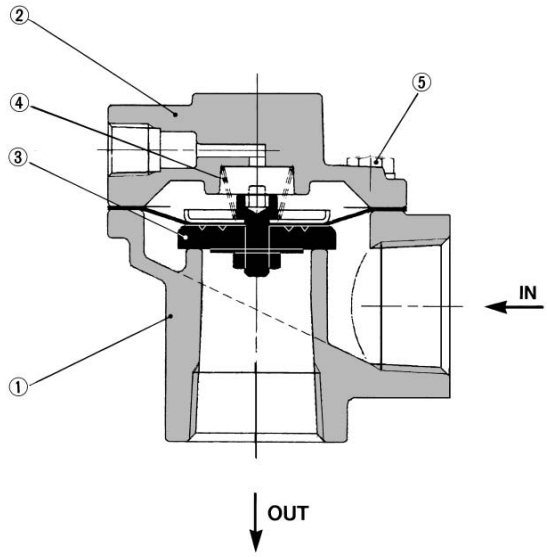
$$\text{Start-up speed } \theta = \frac{PM \times 0.9}{\Delta t} \text{ MPa/ms}$$

Construction

Solenoid type



Air operated type



Component Parts

No.	Description	Material
①	Body	Aluminum
②	Bonnet	Aluminum
③	Diaphragm assembly	NBR, POM
④	Spring	Stainless steel
⑤	Hexagonal bolt	Stainless steel
⑥	Solenoid assembly	— —

Solenoid Assembly Part No.

VXF 2150 — 00 — 1 G

Model — Port size

2150	Rc 3/4
2160	Rc 1
2280	Rc 1 1/2

Rated voltage

1	100 VAC (50/60 Hz)	**6**	12 VDC
2	200 VAC (50/60 Hz)	**7**	240 VAC (50/60 Hz)
3	110 VAC (50/60 Hz)	**8**	48 VAC (50/60 Hz)
4	220 VAC (50/60 Hz)	**9**	Other
5	24 VDC		

Electrical entry

G	Grommet (G, GS)
C	Conduit (C)
D	DIN terminal (D, DS, DL, DZ)
T	Conduit terminal (T, TS, TL, TZ)

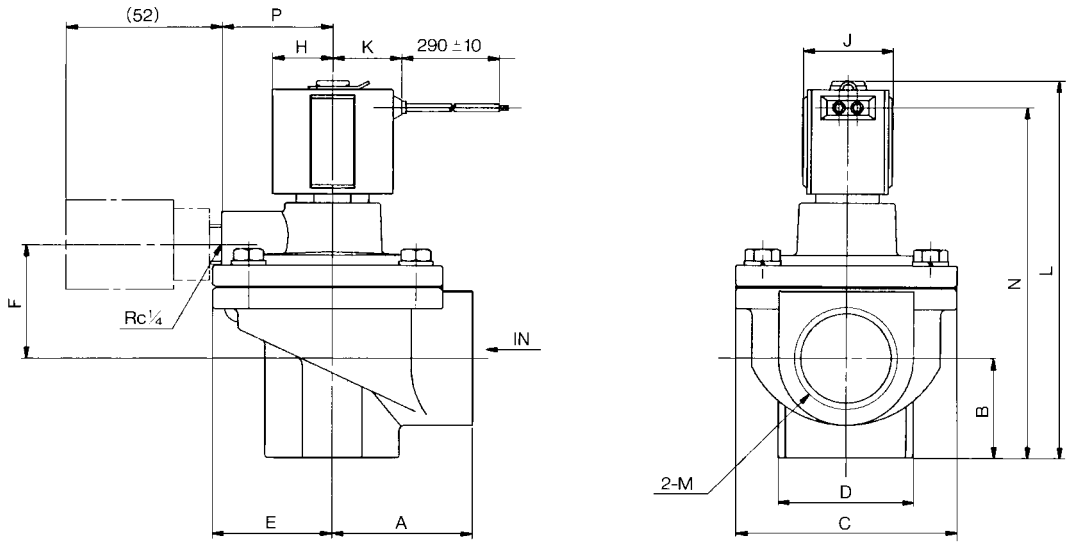
Electrical option

Nil	None
S	With surge voltage suppressor
L	With indicator light
Z	With light/surge voltage suppressor

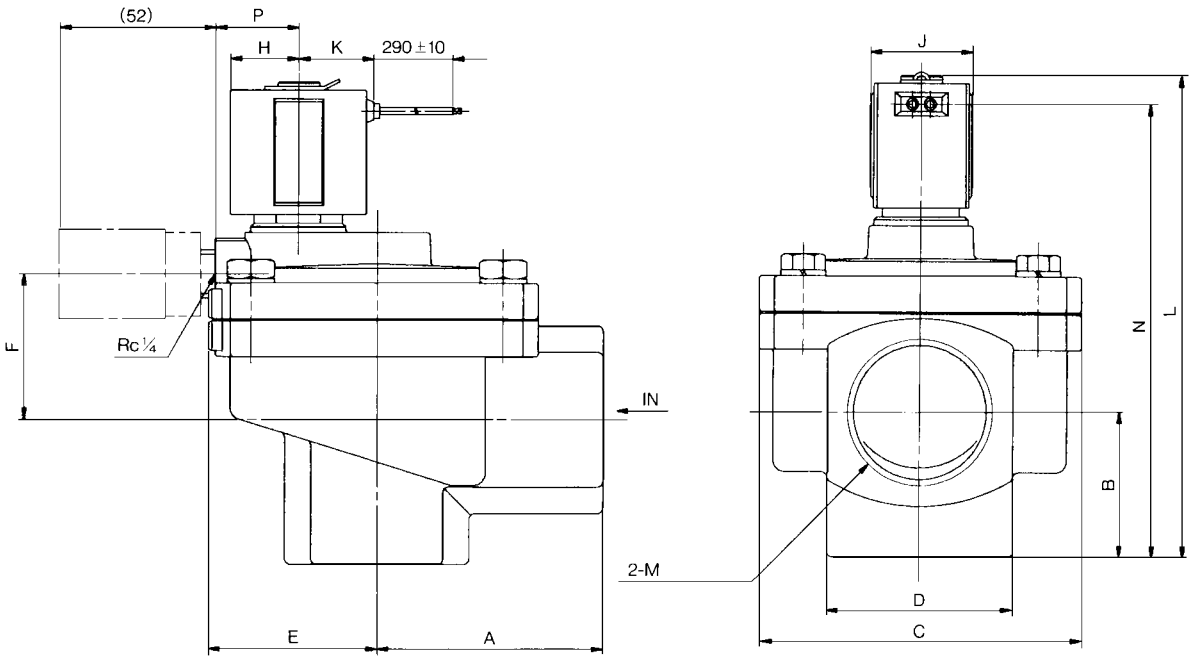
The VX∗ series will be revised shortly.

Dimensions

VXF21$^{6}_{5}$0: Solenoid type
Grommet: G



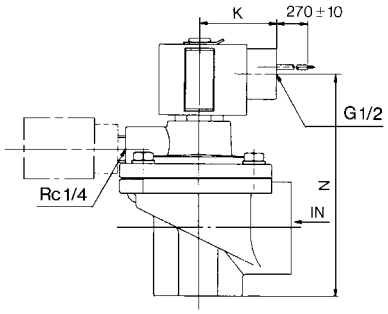
VXF2280: Solenoid type
Grommet: G



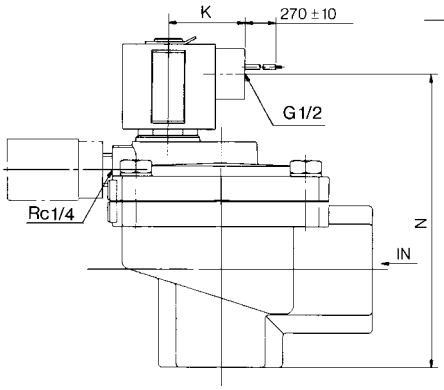
Model	M Port size Rc	A	B	C	D	E	F	H	J	K	L	N	P
VXF2150	3/4	40	25	66	36	35.5	32.5	20	30	23	113	103	33
VXF2160	1	48	33.5	74	45	40	38	20	30	23	127	118	37
VXF2280	1 1/2	77	48.5	110	63	57	49	23	35	25	162	152	28

Conduit: C

VXF2150/2160



VXF2280

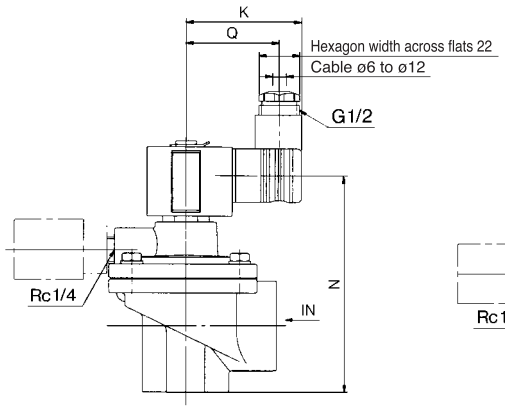


Conduit

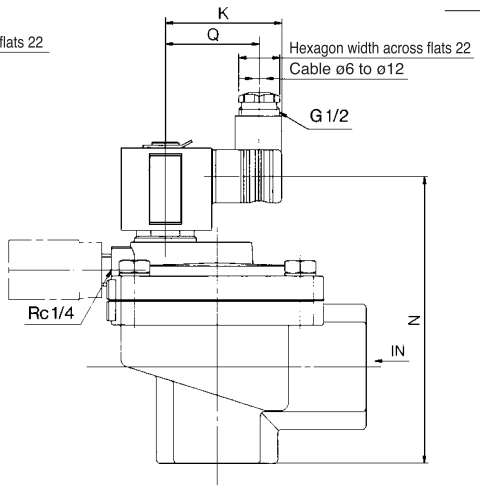
Model	K	N
VXF2150	39	96
VXF2160	39	110
VXF2280	41	144.5

DIN terminal: D

VXF2150/2160



VXF2280

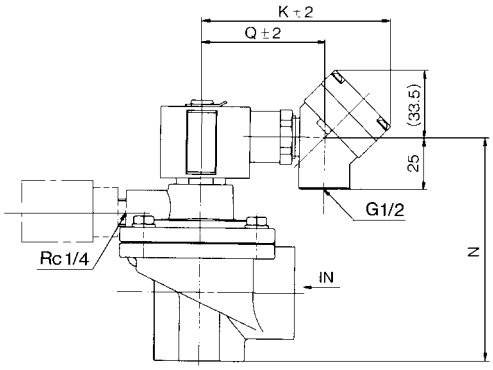


DIN Terminal

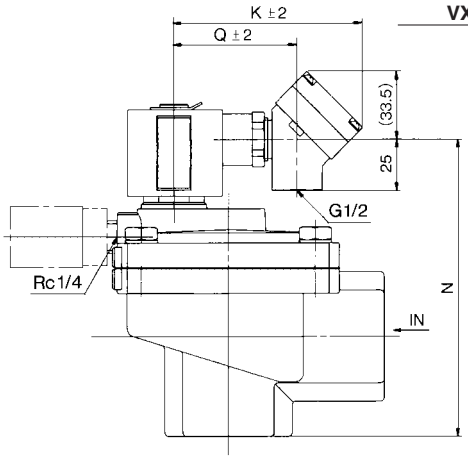
Model	K	N	Q
VXF2150	59	96	45
VXF2160	59	110	45
VXF2280	60	144.5	48

Conduit terminal: T

VXF2150/2160



VXF2280



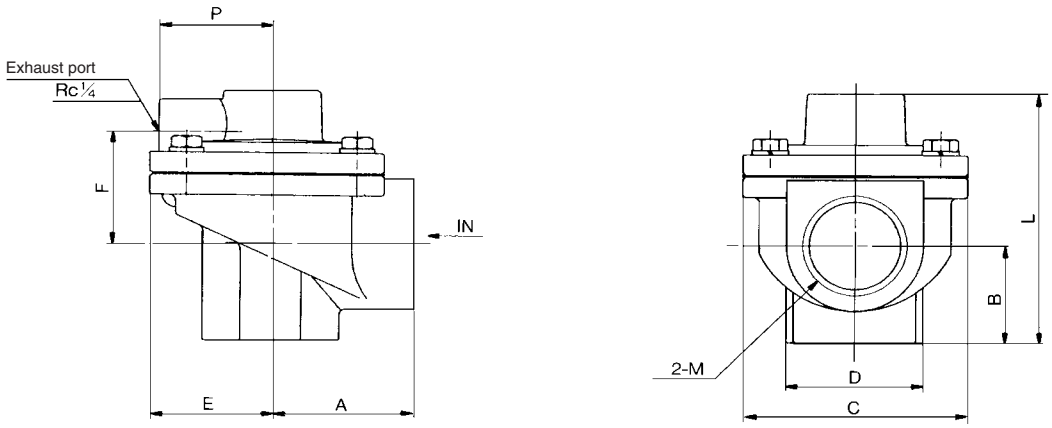
Conduit Terminal

Model	K	N	Q
VXF2150	92	96	59
VXF2160	92	110	59
VXF2280	95	144.5	62

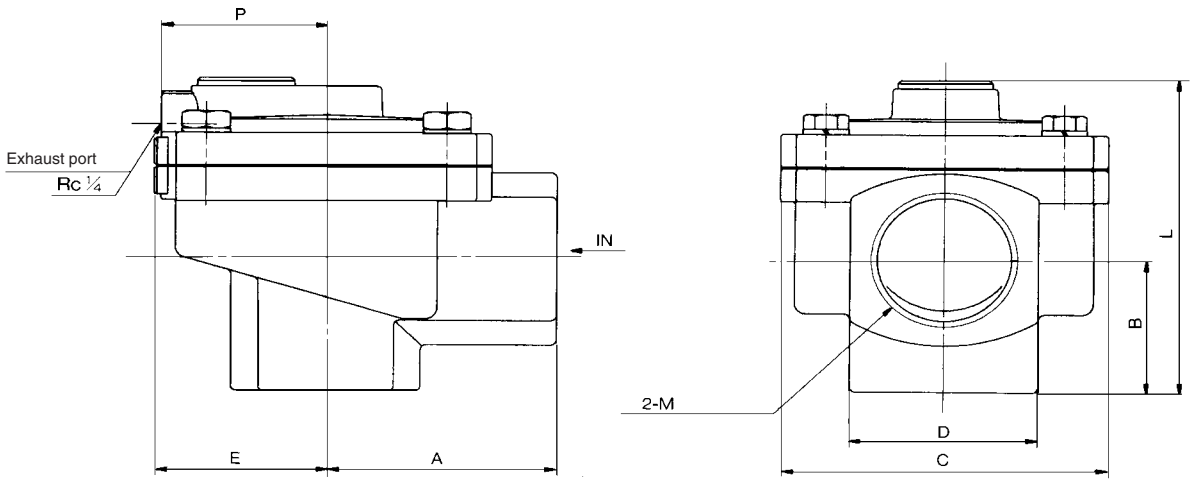
The VX∗ series will be revised shortly.

Dimensions

VXFA2150/2160: Air operated type

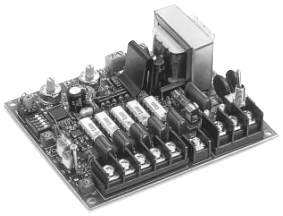


VXFA2280: Air operated type



Model	M Port size Rc	A	B	C	D	E	F	H	J	K	L	P
VXFA2150	3/4	40	25	66	36	35.5	32.5	20	30	23	72	33
VXFA2160	1	48	33.5	74	45	40	38	20	30	23	86	37
VXFA2280	1 1/2	77	48.5	110	63	57	49	23	35	25	114	55

Controller Specifications: Series VXFC



Specifications

Model		VXFC$^{05}_{10}$-1	VXFC$^{05}_{10}$-2	VXFC$^{05}_{10}$-5
Voltage Note)		100 VAC	200 VAC	24 VDC
Power supply fuse		3 A		1 A
Time setting	ON time	0.01 to 1 sec.		
	OFF time	0 to 120 sec.		
	Time repeatability	Max. ±20% of set time		
Number of output points		5 outputs, 10 outputs		
Operating ambient temperature		0 to 50 °C		
Operating ambient humidity		35 to 85% (No condensation allowed)		
Ouput current		Max. 1 A		Max. 0.5 A
Noise resistance		2000 V		

Note) The output and input voltages are the same.

How to Order Controller

VXFC **05** — **1**

Number of output points

05	5
10	10

Voltage

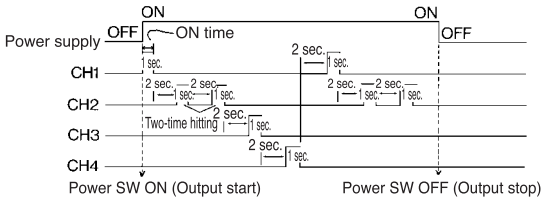
1	100 VAC
2	200 VAC
5	24 VDC

Two-time Hitting Function

A two-time hitting function is adopted to improve the bag filter dusting efficiency. Turn ON the dip switch for two-time hitting (OFF for one-time hitting).
(Effective up to the number of setting channels)

Operation sequence diagram

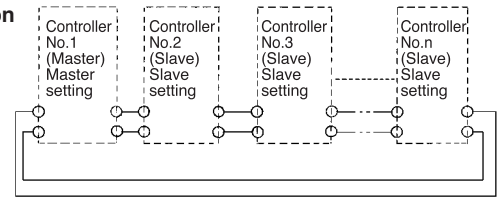
For
- 4 output points
- Two-time hitting only for CH2
- ON for 1 sec.
- OFF for 2 sec.



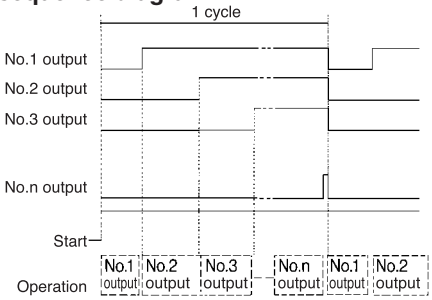
Cascade Connection (Multiple-board connection)

VXFC10-1: One board allows outputs at merely 10 output points max. But the points can be increased to 20 and 30 output points by connecting cascades.

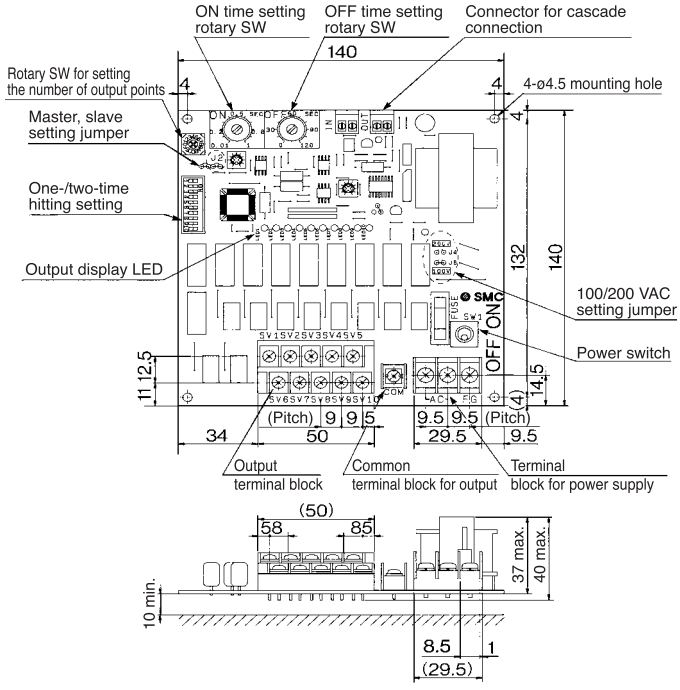
Connection



Operation sequence diagram



Dimensions



(VXFC10)

The VX∗ series will be revised shortly.

⚠ Precautions

Be sure to read before handling.
Refer to pages 17-6-1 to 17-6-10 for Safety Instructions and Solenoid Valve Precautions.

2 Port Solenoid Valve for Dust Collector: Series VXF

Silencer

⚠ Caution

1. The silencer's response properties do not change in the initial stage, but will change due to the blockage after long use. Replace it after using about 500,000 times. This number is subject to change based on fluid quality and energization time.
2. When using a silencer, make space for silencer replacement.

Selection

⚠ Caution

1. The response performance and start-up speed deterriorate in case of air operated type (VXFA) as compared with a solenoid type (VXF) case. Refer to the data for pilot piping.
2. Note that for DC units, idle time and return time increase if the voltage is lowered. If a surge voltage suppressor is installed, the return speed decreases.

Dedicated Controller for Operation: Series VXFC

Wiring

⚠ Warning

1. The controller starts its output the moment the power switch is turned ON. Be aware that even if the power switch is turned OFF, power is connected to the terminal board.

⚠ Caution

1. Make sure that the voltage of the power to be input matches the voltage in the controller's specifications. The voltage of the power that has been input becomes the voltage that is output to the solenoid valves.
2. Connect a ground that is rated Class 3 or greater to the power supply terminal board.
3. If the power source is DC, use caution to its polarity. If the polarity is incorrect, it may result in a malfunction or damage.
4. Operate at a voltage in the range of –10% to +10% of the rated voltage.

Environment

⚠ Caution

1. Operate under conditions that are free of vibration and impact.
2. Operate in an ambient temperature range between 0°C and 50°C.
3. Operate in an ambient humidity range between 35% to 85% (with no condensation). For further details, refer to the instruction manual in which it is explained separately.