2/3 Port Valve for Various Fluids Control

■ 2/3 Port Solenoid/Air Operaed Valve for Various Fluids Control
(For Water/Air/Oil/Gas/Vacuum/Steam)

The models VX21/22/23 have been revised. For details, please refer to catalog no. ES70-23A.
The models VX31/32/33 have been revised. For details, please refer to catalog no. ES70-26A.
Similar updating for other VX∗ series are scheduled to follow shortly.

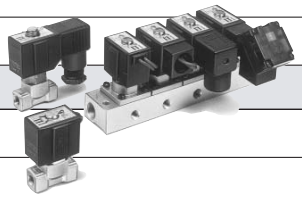
For Fluid Control
2/3 Port Valve
Solenoid Valve/Air Operated Valve
For Water, Air, Oil, Gas, Vacuum and Steam

2 Port, Direct Operated

Series VX21/22/23

N.C., N.O./ Single unit, Manifold

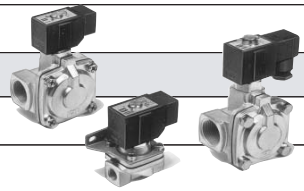
Refer to our catalog “ES70-23A”.

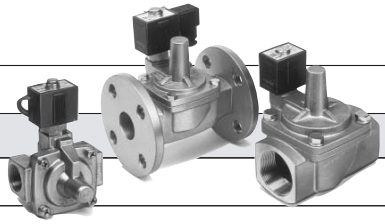


2 Port, Pilot Operated (Diaphragm type)

Series VXD21/22/23

N.C., N.O.





2 Port, Pilot Operated (Disk type)

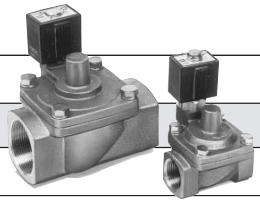
Series VXP21/22/23

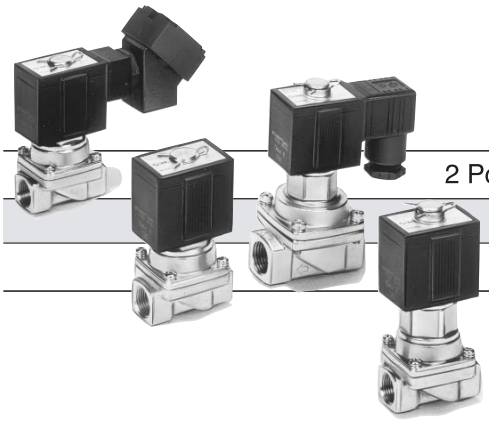
N.C., N.O.

2 Port, Pilot Operated

Series VXR21/22/23

< Water hammer relief > N.C., N.O.





2 Port, Pilot Operated (Diaphragm type, zero pressure differential operation)

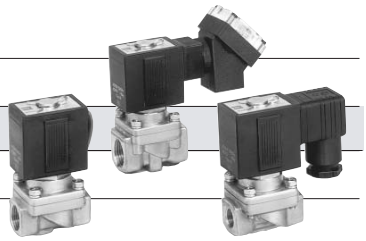
Series VXZ22/23

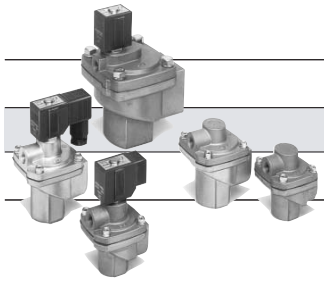
N.C., N.O./ Single unit

2 Port, Pilot Operated

Series *VXH22*

For high pressure control N.C./Single unit

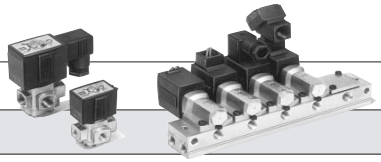




2 Port, Pilot Operated

Series *VXF21/22*

Quick response, Control of instantaneous large flow N.C./Single unit

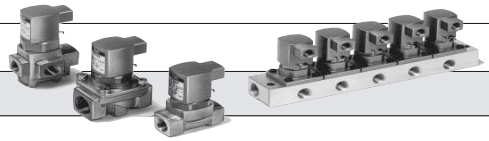


3 Port, Direct Operated

Series *VX31/32/33*

C.O./Single unit, Manifold

Refer to our catalog “ES70-26A”.



Air Operated Valve

2/3 Port, Direct Operated

Series *VXA21/22*

Series *VXA31/32*

Selection Procedure for 2/3 Port Valve for Fluid Control

1. Selection of the series

Select series by referring to the number of ports, valve type (N.C., N.O., C.O.), port size and applied fluid.

2. Check by the applicable fluids check list

Use the tables on pages 17-3-6 to -14 to check the compatibility of the applicable fluid with the solenoid valve.

3. Confirmation of the working pressure differential

There are two types of pressure differentials. The high pressure differential is the highest pressure difference allowable between the inlet side and the outlet side in an open and closed state. The minimum pressure differential is the lowest pressure required to hold the main valve fully open. Refer to the following pages for each series as the pressure differential varies with the orifice size, power supply, pressure and fluid.

4. Reference to the flow characteristic table

To obtain the flow rate of fluid, refer to the flow characteristic table.

5. Choice of the power supply voltage and electrical entry

Select the AC/DC power source and choose the electrical entry.

The models VX21/22/23 have been revised. For details, please refer to catalog no. ES70-23A.
The models VX31/32/33 have been revised. For details, please refer to catalog no. ES70-26A.
Similar updating for other VX∗ series are scheduled to follow shortly.

Solenoid Valves List

Number of ports			2 port										
Action			Direct operated				Pilot operated Diaphragm type		Pilot operated Disk type		Pilot operated <Water hammer relief>		
Series			VX21/22/23				VXD21/22/23		VXP21/22/23		VXR21/22/23		
Body type			Single unit		Manifold		Single unit		Single unit		Single unit		
Valve type			N.C.	N.O.	N.C.	N.O.	N.C.	N.O.	N.C.	N.O.	N.C.	N.O.	
Applicable fluids	Standard	Water	●		–		●		●		●		
		Air	●		●		●		●		–		
		Oil	●		●		●		●		●		
		Low vacuum (1 Torr)	●		●		–		–		–		
	Option	Steam	●		–		–		●		–		
		Medium vacuum (10^{-3} Torr) Non-leak (10^{-5}atm cc/sec)	●		●		–		–		–		
		High temperature water, High temperature oil	●		–		●		●		●		
Port size	Rc	1/8 (6A)	●	●	–		–	–	–	–	–	–	
		1/4 (8A)	●	●			●	–	●	–	–	–	
		3/8 (10A)	●	●			●	–	●	–	–	–	
		1/2 (15A)	●	–			●	●	●	●	●	●	
		3/4 (20A)	–	–			●	●	●	●	●	●	
		1 (25A)	–	–			●	●	●	●	●	●	
	Flange Rc	11/4 (32A)	–	–			● Flange	● Flange	● Flange Rc	● Flange Rc	● Rc	● Rc	
		11/2 (40A)	–	–			● Flange	● Flange	● Flange Rc	● Flange Rc	● Rc	● Rc	
		2 (50A)	–	–			● Flange	● Flange	● Flange Rc	● Flange Rc	● Rc	● Rc	
Page			Catalog ES70-23A				17-3-17		17-3-27		17-3-37		

∗ An option is available that sets the orifice in the vacuum side to the maximum bore for exclusive use when used in a vacuum pad application. Refer to page 17-3-86 for details.

Air Operated Valves List

Number of ports			2 port				3 port	
Action			Direct operated				Direct operated	
Series			VXA21/22				VXA31/32	
Body type			Single unit		Manifold		Single unit	Manifold
Valve type			N.C.	N.O.	N.C.	N.O.	C.O.	C.O.
Applicable fluids	Standard	Water	●		–		●	–
		Air	●		●		●	●
		Oil	●		●		●	●
		Low vacuum (1 Torr)	●		●		●	●
	Option	Medium vacuum (10^{-3} Torr) Non-leak (10^{-5}atm cc/sec)	●		●		●	●
Port size	Rc	1/8 (6A)	●	●	–		●	–
		1/4 (8A)	●	●			●	
		3/8 (10A)	●	●			●	
		1/2 (15A)	●	●			–	
Page			17-3-45		17-3-49		17-3-53	17-3-57

	2 port				3 port	
	Pilot operated <Zero pressure differential operation>		Pilot operated <High pressure control>	Pilot operated <Quick response, Instantaneous large flow>	Direct operated	
	VXZ22/23		**VXH22**	**VXF21/22**	**VX31/32/33**	
	Single unit		Single unit	Single unit	Single unit	Manifold
	N.C.	N.O.	N.C.	N.C.	N.C. /N.O. /C.O.	N.C. /N.O. /C.O.
	●		●	–	●	–
	●		●	●	●	●
	●		●	–	●	●
	●		–	–	● *	●
	–		–	–	●	–
	–		–	–	●	●
	●		–	–	●	–
	–	–	–	–	●	–
	●	●	●	–	●	
	●	●	●	–	●	
	●	●	●	–	–	
	●	●	–	●	–	
	●	●	–	●	–	
	–	–	–	–	–	
	–	–	–	● Rc	–	
	–	–	–	–	–	
	17-3-61		17-3-69	17-3-71	Catalog ES70-26A	

Applicable fluids check list 17-3-6 to 17-3-14

Glossary 17-3-15

How to order Solenoid coil assembly 17-3-16

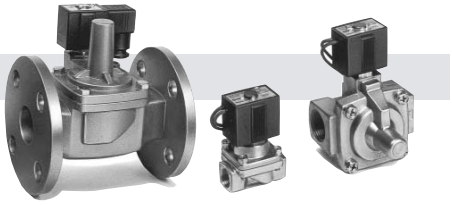
⚠ Caution

Be sure to read before handling. Refer to pages 17-6-3 to 17-6-10 for Safety Instructions and Solenoid Valve Precautions.

Applicable Fluids Check List

Pilot Operated 2 Port Solenoid Valve Series VXP21/22/23

Normally Closed (N.C.)



Refer to pages 17-3-28 and 17-3-29 for specifications and models.

Option Symbol and Composition

Option symbol	Seal material	Coil insulation type	Body, Shading coil material
Standard	NBR	B	Brass or BC6, Copper
A	FKM		
B	EPDM		
C	PTFE		
D Note 2)	FKM	H	
E	EPDM		
F Note 1)	FKM	B	
G	NBR		Stainless steel, Silver (10 to 25 A) Not available for 32 A to 50 A
H	FKM		
J	EPDM		
K Note 2)	PTFE		
L Note 1)	FKM		
N	FKM	H	
P	EPDM		
Q Note 2)	PTFE(FKM)		
S Note 2)	PTFE(FKM)		Brass or BC6, Copper
T Note 1)	NBR	B	

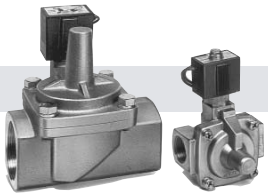
Note 1) Non-lube type. For other options, "-X21" at the end of product number represents the non-lube option.
Note 2) Available option for VXP2130.

Fluid Name and Option

Fluid (Application)	Option symbol and body material	
	Brass or BC6	Stainless steel
Applicable valve	10A to 50A Note 1)	10A to 25A
Ethyl alcohol	F, B	L, J
Ethylene glycol	B	J
Caustic soda (25% ≥)	—	J
Gas oil	A	H
Silicon oil	A	H
Fuel oil (up to 60°C)	A	H
Fuel oil (up to 100°C)	D	N
Steam system (Steam)	S	Q
Steam system (Boiler water)	—	G, J
Steam system (Condensate)	E	P
Insulation oil	A	H
Naphtha	A	H
Parachloroetylene	A	H
Brake oil	B	J
Water (up to 99°C)	D, E	N, P

∗ If using for other fluids, please contact SMC.
Note 1) 10A to 25A are brass and 32A to 50A are BC6.

Normally Open (N.C.)



Refer to pages 17-3-30 and 17-3-31 for specifications and models.

Option Symbol and Composition

Option symbol	Seal material	Coil insulation type	Body, Shading coil material	Holder material (in core assebmly)
Standard Note 2)	NBR	B	Brass or BC6, Copper	Polyacetal
A	FKM			
B	EPDM			
C	PTFE			Stainless steel
D Note 2)	FKM	H		
E	EPDM			
F Note 1)	FKM	B		Polyacetal
G	NBR		Stainless steel, Silver (15 to 25 A) Not available for 32 A to 50 A	
H	FKM			
J	EPDM			
K	PTFE			
L Note 1)	FKM			
N	FKM	H		Stainless steel
P	EPDM			
Q	PTFE(FKM)			
S	PTFE(FKM)		Brass or BC6, Copper	
T Note 1)	NBR	B		Polyacetal
X Note 1)	FKM	H		Stainless steel

Note 1) Non-lube type. For other options, "-X21" at the end of product number represents the non-lube option.
Note 2) Grease has been applied to the core part.

Fluid Name and Option

Fluid (Application)	Option symbol and body material	
	Brass or BC6	Stainless steel
Applicable valve	15A to 50A Note 1)	15A to 25A
Caustic soda (25%≥)	—	J
Gas oil	A	H
Silicon oil	A	H
Fuel oil (up to 60°C)	A	H
Fuel oil (up to 100°C)	D	N
Steam system (Steam)	S	Q
Steam system (Boiler water)	—	G, J
Steam system (Condensate)	E	P
Insulation oil	A	H
Parachloroetylene	A	H
Brake oil	B	J
Water (up to 99°C)	E	N, P

∗ If using for other fluids, please contact SMC.
Note 1) 15A to 25A are brass and 32A to 50A are BC6.

Glossary

Pressure

1. Max. operating pressure differential
This pressure difference is the highest pressure difference allowable to operate (a difference between the pressures in the inlet slide and the outlet side) in an open state and the closed state of valve. A case of 0 kgf/cm^2 in the outlet side results in the highest operating pressure.

2. Min. operating pressure differential
This pressure difference is the lowest pressure difference (a difference between the pressures in the inlet slide and the outlet side) required to hold the main valve fully open.

3. Max. system presure
This pressure is the limit of pressure that can be applied to pipe line. (Line pressure)
[The pressure difference in a solenoid valve must be maintained less than the highest operating pressure difference.]

4. Proof pressure
This is the pressure that can be withstood without deterioration of the performance when valve returns within the range of the operating pressure. (A value under a specified condition.)

Electricity

1. Apparent power (VA)
Volt-ampere is the product of voltage (V) and current (A). Power dissipation (W): For AC , W = V/A cosθ. For DC, W = V/A (Note) cosθ shows power factor.

2. Surge voltage
The surge voltage is a high voltage generated momentarily when cutting the power supply.

3. Hum sound
The hum sound is a noise generated through repeated adsorption and releasing on an armature adsorption surface.
For an AC solenoid, no shading coil releases the spring reaction because of the existance of a 0 point (twice per frequency) of the suction force.

Others

1. Material
NBR: Nitrile rubber
FKM: Fluoro rubber—Trade names: Vitron®, Dai-el®, etc.
EPDM: Ethylene propylene rubber
PTFE: Polytetrafluoroethylene resin—Trade names: Teflon®, Polyflon®, etc.
Polyacetal (POM)—Trade names: Duracon®, Derlin®, etc.

2. Oil preserve treatment
After assembly, valve is put through a parts washer to remove any oil used during assembly.

3. Symbol
The JIS symbol is ( ): this designates the valve to be normally closed.
However, in situations where the secondary pressure exceeds the primary side pressure, the resulting back pressure will cause back flow through the valve.

⚠ Caution

Refer to page 17-6-3 for Safety Instructions and Solenoid Valve Precautions.

The models VX21/22/23 have been revised. For details, please refer to catalog no. ES70-23A.
The models VX31/32/33 have been revised. For details, please refer to catalog no. ES70-26A.
Similar updating for other VX∗ series are scheduled to follow shortly.

Solenoid Coil Assembly

How to Order

VX021 — 001 C B [ ] [ ] — 01

VX solenoid coil assembly

Application

Size part no.		Applicable series
001	No.1 Solenoid	Series VX□21
002	No.2 Solenoid	Series VX□22
003	No.3 Solenoid	Series VX□23

Electrical entry

G	Grommet
C	Conduit
D	DIN terminal

Coil insulation type

B	Class B insulation
H ∗	Class H insulation

∗ DIN terminal or DC not available.

Terminal box

Nil	None
T	With terminal box

Electrical option

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

Rated voltage (1)

01	100 VAC 50/60 Hz
02	200 VAC 50/60 Hz
03	110 VAC 50/60 Hz
04	220 VAC 50/60 Hz
05	24 VDC
06	12 VDC
07	240 VAC 50/60 Hz
08	48 VAC 50/60 Hz
13	24 VAC 50/60 Hz
23	440 VAC 50/60 Hz
51	6 VDC
53	48 VDC
55	100 VDC
56	110 VDC

Note 1) The voltage codes of 01 to 08 when the suffix "0" is removed, are the same as the solenoid valve model codes.

Ordering example

Ex.) Series VX21, 100 VAC, Class B insulation, Grommet
Part no.: "**VX021-001GB-01**"
Ex.) Series VX22, 220 VAC, Class B insulation, DIN terminal with terminal box
Part no.: "**VX021-002DBT-04**"
Ex.) Series VX23, 24 VDC, Conduit terminal, with light/surge voltage surpressor
Part no.: "**VX021-003BTZ-05**"

Coil Combination

("Electrical Entry"-"Coil Insulation"-"Electrical Option")

Electrical entry	Without electrical option	With electrical option		
		With surge voltage suppressor	With indicator light	With light/ surge voltage suppressor
Grommet	GB	GBS	–	–
	GH	—	–	–
Conduit	CB	—	–	–
	CH	—	–	–
	CBT	CBTS	CBTL	CBTZ
	CHT	CHTS	CHTL	CHTZ
DIN terminal	DB	–	–	–
	DBT	DBTS	DBTL	DBTZ

∗ Applicable voltages with light/surge voltage suppressor are as follows; 100 VAC, 200 VAC, 110 VAC, 220 VAC and 24 VDC.
∗ Applicable voltages for "CHTL" and "CHTZ" are as follows; 100 VAC, 200 VAC, 110 VAC, 220 VAC.

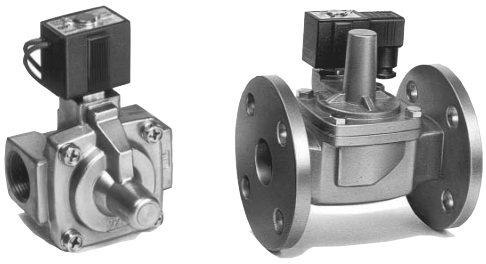
Made to Order Specifications

Splashproof Specifications (Based on JIS C 0920 / Based on IEC529IP-X4)

Suffix "-X36" to the end of solenoid coil part number.

Pilot Operated 2 Port Solenoid Valve For Air, Gas, Steam, Water and Oil

Series VXP21/22/23



N.C.

N.O.

■ Wide variations of combination

Able to control a wide variety of fluids.

Valve can be matched to particular application through selection of body materials (Brass/BC6 or Stainles steel), seal material (NBR, PTFE, EPDM or FKM) and solenoid coil (Class B or H).

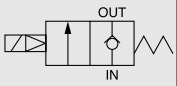
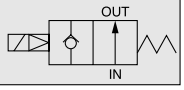
■ Easy to disassemble and reassemble in a short time.

■ Flange for threaded ports available.

(32A to 50A)

Variations

Valve

Normally closed (N.C.)	
Normally open (N.O.)	

Solenoid coil

Coil: Class B, Class H

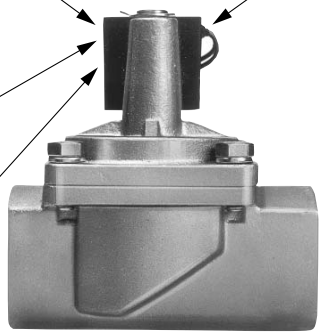
Rated voltage

□AC
Standard —— 100 V, 200 V
Option —— 48 V, 110 V, 220 V, 240 V

□DC
Standard —— 24 V
Option —— 12 V

Material

Body —— Brass/BC6, Stainless steel
Seal —— NBR, FKM, EPDM, PTFE



Electrical entry

- Grommet
- Conduit
- DIN terminal
- Conduit terminal

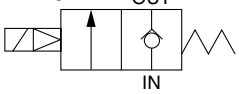
Model

Model	Port size	Orifice size (mmø)
Threaded type		
VXP2130	Rc 1/4, 3/8, 1/2	10
VXP214□	Rc 3/8, 1/2	15
VXP215□	Rc 3/4	20
VXP226□	Rc 1	25
VXP227□	Rc 1 1/4	35
VXP238□	Rc 1 1/2	40
VXP239□	Rc 2	50
Flange type		
VXP227□	32A	35
VXP238□	40A	40
VXP239□	50A	50

The VX∗ series will be revised shortly.

Normally Closed (N.C.)

JIS Symbol



Fluid

Standard specifications	Option (1)	Made to Order (2)
Water (Standard) Turbine oil	Steam ····· (S) High temperature water ····· (D, E) High temperature oil ····· (D, N)	Air ····· X44

Note 1) Refer to page 17-3-10 "Applicable Fluids Check List" for details of special fluids outside of the standard options and specifications.
Note 2) Please contact SMC for details.

Model/Valve Specifications

Connection Thread	Orifice size (mmø)	Model	Min. operating pressure differential (MPa)	Maximum operating pressure differential (MPa) Water AC	Water DC	Air AC	Air DC	Oil AC	Oil DC	Steam AC	Flow characteristics Water, Oil, Steam Av x $10^{-6}m^2$	Water, Oil, Steam Cv converted	Air C [$dm^3/(s \cdot bar)$]	Air b	Air Cv	Max. system pressure (MPa)	Weight (g)
1/4	10	**VXP2130-02**	0.04	0.7	0.5	0.9	0.7	0.5	0.4	0.9	46	1.9	8.5	0.35	2.0	Water, Air, Oil 1.5 Steam 1.0	420
3/8	10	**VXP2130-03**	0.04	0.7	0.5	0.9	0.7	0.5	0.4	0.9	58	2.4	9.2	0.35	2.4		420
	15	**VXP2140-03**	0.04	1.0	1.0	1.0	1.0	0.7	0.7	1.0	100	4.2	18	0.35	5.0		740
1/2	10	**VXP2130-04**	0.04	0.7	0.5	0.9	0.7	0.5	0.4	0.9	58	2.4	9.2	0.35	2.4		500
	15	**VXP2140-04**	0.04	1.0	1.0	1.0	1.0	0.7	0.7	1.0	130	5.3	20	0.35	5.5		740
3/4	20	**VXP2150-06**	0.04	1.0	1.0	1.0	1.0	0.7	0.7	1.0	220	9.2	38	0.30	9.2		1300

Connection Thread	Connection Flange	Orifice size (mmø)	Model	Min. operating pressure differential (MPa)	Maximum operating pressure differential (MPa) Water AC	Water DC	Air AC	Air DC	Oil AC	Oil DC	Steam AC	Flow characteristics Water, Oil, Steam Av x $10^{-6}m^2$	Water, Oil, Steam Cv converted	Air Effective area (mm^2)	Max. system pressure (MPa)	Weight (g)
1	—	25	**VXP2260-10**	0.04	1.0	1.0	1.0	1.0	0.7	0.7	1.0	290	12	215	Water Air Oil 1.5 Steam 1.0	1810
1 1/4	—	35	**VXP2270-12**	0.03	1.0	1.0	1.0	1.0	0.7	0.7	1.0	550	23	415		3300
1 1/2	—	40	**VXP2380-14**	0.03	1.0	1.0	1.0	1.0	0.7	0.7	1.0	740	31	560		4200
2	—	50	**VXP2390-20**	0.03	1.0	1.0	1.0	1.0	0.7	0.7	1.0	1200	49	880		5400
—	32A	35	**VXP2270-32**	0.03	1.0	1.0	1.0	1.0	0.7	0.7	1.0	550	23	415		5900
—	40A	40	**VXP2380-40**	0.03	1.0	1.0	1.0	1.0	0.7	0.7	1.0	740	31	560		7300
—	50A	50	**VXP2390-50**	0.03	1.0	1.0	1.0	1.0	0.7	0.7	1.0	1200	49	880		9200

Note) Weight of grommet type. Add 10 g for conduit type, 30 g for DIN terminal type, 60 g for conduit terminal type respectively.
- Refer to "Glossary" on page 17-3-15 for detail of max. operating pressure differential and max. system pressure.
- VXP2130: Option "C", "K", "Q", "S" only.

Solenoid Specifications

Model	Power source	Frequency (Hz)	Apparent power (VA) Inrush	Apparent power (VA) Holding	Power consumption (W) (Holding)	Temperature rise (°C) (Rated voltage)
VXP21	AC	50	20 (32)	11	4.5	45
		60	17 (28)	7	3.2	35
	DC	—	—	—	6	55
VXP22	AC	50	40	18	7.5	60
		60	35	12	6	50
	DC	—	—	—	8	60
VXP23	AC	50	50	21	11	65
		60	45	17	9.5	60
	DC	—	—	—	11.5	65

Note)
- The return voltage is 20% or more of the rated voltage for AC and 2% or more for DC.
- The allowable voltage fluctuation rate is ±10% of the rated voltage value for both AC and DC.
- When the ambient temperature is 20°C ± 5°C and rated voltage is applied.
- Changing coils from AC to DC and vice versa is impossible, because of different core shapes. VXP21$^{5}_{4}$0, 22$^{7}_{6}$0, 23$^{9}_{8}$0 are possible to exchange coil from AC to DC, but impossible from DC to AC.
  (Hum sound may generate because of no shading coil for DC.)
- ( ): VXP2130

Operating Fluid and Ambient Temperature

Temperature conditions	Power source	Operating fluid temperature (°C) Water (Standard)	Air (Standard)	Oil (Standard)	High temperature water (3) (D, E)	High temperature oil (3) (D)	Steam (3) (S)	Ambient temperature (°C)
Maximum	AC	60	80	60	99	100	183	60
	DC	40	60	40	—	—	—	40
Minimum	AC DC	1	–10 (1)	–5 (2)	—	—	—	–10

Note 1) Dew point: –10°C or less Note 2) 50 cSt or less
Note 3) "D", "E" etc. in parentheses are option symbols.
Note 4) VXP2130: Option "C", "K", "Q", "S" only.

The VX∗ series will be revised shortly.

How to Order (Normally Closed)

VXP21
VXP22
VXP23

Model

Valve/Body
0 — Normally closed/Single unit

Body size
3 — 10A
4 — 15A
5 — 20A
6 — 25A
7 — 32A
8 — 40A
9 — 50A

Solenoid valve option
Nil — Standard

Select an option mark in page 17-3-10 by "Applicable Fluids Check List" for special fluids outside of the standard.

VXP2130: Option "C", "K", "Q", "S" only.

Connection

Thread
02 — 1/4
03 — 3/8
04 — 1/2
06 — 3/4
10 — 1
12 — 1 1/4
14 — 1 1/2
20 — 2

Flange
32 — For 32A
40 — For 40A
50 — For 50A

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

Thread type
Nil — Rc
T — NPTF
F — G
N — NPT

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 (Please contact SMC separately.)

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

Refer to page 17-3-16 for ordering coil only.

Electrical entry
G — Grommet
C — Conduit
D — DIN terminal
T — Conduit terminal

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

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

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

Bracket
Nil — None
B — With bracket

Thread connection sizes are available from 02 to 10.

Table(1) Connection Size and Applicable Model

Connection	Size	Applicable model
Thread	1/4	VXP2130-02
	3/8	VXP2130-03,VXP2140-03
	1/2	VXP2130-04,VXP2140-04
	3/4	VXP2150-06
	1	VXP2260-10
	1 1/4	VXP2270-12
	1 1/2	VXP2380-14
	2	VXP2390-20
Flange	32A	VXP2270-32
	40A	VXP2380-40
	50A	VXP2390-50

Table(2) Rated Voltage-Electrical Entry-Electrical Option

Insulation type		Class B				Class H		
Electrical entry		G	C	D, T		G, C	T	
Electrical option		S(Note)	—	S	L, Z	—	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 lead wire.

Ordering example

(Example) Series VXP22, Rc 1 1/4, 100 VAC
Grommet
(Part no.) **VXP2270-12-1G**

Made to Order Specifications

Splashproof Specifications (Based on JIS C 0920 / Based on IEC529IP-X4)

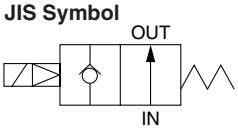
VXP Model — Port size — Electrical entry **- X36**

DIN terminal or class H coil not available.

The VX∗ series will be revised shortly.

Normally Open (N.O.)

JIS Symbol



Fluid

Standard specifications	Option [1]	Made to Order [2]
Water (Standard) Turbine oil	Steam ····· (S) High temperature water ·····(D, E) High temperature oil ····· (D)	Air ····· X44

Note 1) Refer to page 17-3-10 "Applicable Fluids Check List" for details of special fluids outside of the standard options and specifications.
Note 2) Please contact SMC for details.

Model/Valve Specifications

Connection		Orifice size (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)			Flow characteristics					Max. system pressure (MPa)	Weight (g)
Thread	Flange				Water, Air	Oil	Steam	Water, Oil, Steam		Air				
					AC/DC	AC/DC	AC	Av x $10^{-6}m^2$	Cv converted	C [$dm^3/(s\cdot bar)$]	b	Cv		
3/8	—	15	**VXP2142-03**	0.04	0.7	0.6	0.7	100	4.2	18	0.35	5.0	Water, Air, Oil 1.5 Steam 1.0	760
1/2	—	15	**VXP2142-04**	0.04	0.7	0.6	0.7	130	5.3	20	0.35	5.5		760
3/4	—	20	**VXP2152-06**	0.04	0.7	0.6	0.7	220	9.2	38	0.30	9.2		1320

Connection		Orifice size (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)			Flow characteristics			Max. system pressure (MPa)	Weight (g)
Thread	Flange				Water, Air	Oil	Steam	Water, Oil, Steam		Air		
					AC/DC	AC/DC	AC	Av x $10^{-6}m^2$	Cv converted	C [$dm^3/(s\cdot bar)$]		
1	—	25	**VXP2262-10**	0.04	0.7	0.6	0.7	290	12	215	Water, Air, Oil 1.5 Steam 1.0	1850
1 1/4	—	35	**VXP2272-12**	0.03	0.7	0.6	0.7	550	23	415		3300
1 1/2	—	40	**VXP2382-14**	0.03	0.7	0.6	0.7	740	31	560		4200
2	—	50	**VXP2392-20**	0.03	0.7	0.6	0.7	1200	49	880		5400
—	32A	35	**VXP2272-32**	0.03	0.7	0.6	0.7	550	23	415		5900
—	40A	40	**VXP2382-40**	0.03	0.7	0.6	0.7	740	31	560		7300
—	50A	50	**VXP2392-50**	0.03	0.7	0.6	0.7	1200	49	880		9200

Note) Weight of grommet type. Add 10 g for conduit type, 30 g for DIN terminal type, 60 g for conduit terminal type respectively.
• Refer to "Glossary" on page 17-3-15 for details of max. operating pressure differential and max. system pressure.

Solenoid Specifications

Model	Power source	Frequency (Hz)	Apparent power (VA)		Power consumption (W) (Holding)	Temperature rise (°C) (Rated voltage)
			Inrush	Holding		
VXP21	AC	50	25	12	5	50
		60	20	8	3.5	35
	DC	—	—	—	6	50
VXP22	AC	50	45	20	8	55
		60	40	15	6.5	45
	DC	—	—	—	8	50
VXP23	AC	50	60	25	10.5	60
		60	50	20	9.5	50
	DC	—	—	—	11.5	55

Note) • They are values in an ambient temperature of 20°C ±5°C and application of rated voltage.
• Changing coils from AC to DC and vice versa is impossible, because of different core shapes.
• Return voltage is 20% or more of the rated value at AC power and 5% or more at the DC power.
• The allowable voltage fluctuation rate is ±10% of the rated voltage value for both AC and DC.

Operating Fluid and Ambient Temperature

Temperature conditions	Power source	Operating fluid temperature (°C)						Ambient temperature (°C)
		Water (Standard)	Air (Standard)	Oil (Standard)	High temperature water [3] (D, E)	High temperature oil [3] (D)	Steam [3] (S)	
Maximum	AC	60	80	60	99	100	183	60
	DC	40	60	40	—	—	—	40
Minimum	AC DC	1	–10 [1]	–5 [2]	—	—	—	–10

Note 1) Dew point: –10°C or less Note 2) 50 cSt or less
Note 3) "D", "E" etc. in parentheses are option symbols.

The VX∗ series will be revised shortly.

How to Order (Normally open)

VXP21
VXP22
VXP23
2

Model

Body size
4 — 15A
5 — 20A
6 — 25A
7 — 32A
8 — 40A
9 — 50A

Valve/Body
2 — Normally open/Single unit

Solenoid valve option
Nil — Standard

Select an option mark in page 17-3-10 by "Applicable Fluids Check List" for special fluids outside of the standard.

Connection
Thread
03 — 3/8
04 — 1/2
06 — 3/4
10 — 1
12 — 1 1/4
14 — 1 1/2
20 — 2
Flange
32 — For 32A
40 — For 40A
50 — For 50A

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

Thread type
Nil — Rc
T — NPTF
F — G
N — NPT

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 (Please contact SMC separately.)

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

Refer to page 17-3-16 for ordering coil only.

Electrical entry
G — Grommet
C — Conduit
D — DIN terminal
T — Conduit terminal

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

Electrical option
Nil - None
S – With surge voltage suppressor
L – With indicator light
Z – With light/surge voltage suppressor

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

Bracket
Nil — None
B — With bracket

Thread connection sizes are available from 03 to 10.

Table (1)
Connection Size and Applicable Model

Connection	Size	Applicable model
Thread	3/8	VXP2142-03
	1/2	VXP2142-04
	3/4	VXP2152-06
	1	VXP2262-10
	1 1/4	VXP2272-12
	1 1/2	VXP2382-14
	2	VXP2392-20
Flange	32A	VXP2272-32
	40A	VXP2382-40
	50A	VXP2392-50

Table (2)
Rated Voltage-Electrical Entry-Electrical Option

Insulation type		Class B				Class H		
Electrical entry		G	C	D, T		G, C	T	
Electrical option		S	—	S	L, Z	—	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 lead wire.

Ordering example

(Example) Series VXP22, 32A Flange, 200 VAC, DIN terminal
(Part no.) **VXP2272-32-2D**

Made to Order Specifications

Splashproof Specifications (Based on JIS C 0920 / Based on IEC529IP-X4)

VXP Model — Port size — Electrical entry - X36

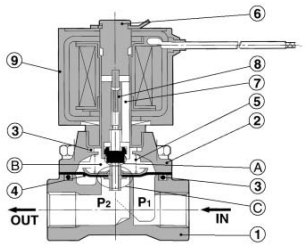
DIN terminal or class H coil not available.

The VX∗ series will be revised shortly.

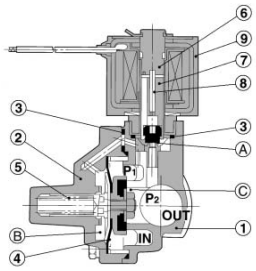
Construction/Principle Parts Material

Normally Closed (N.C.)

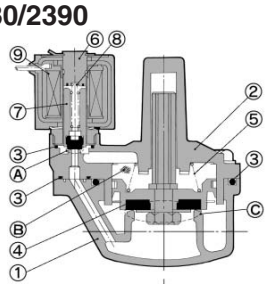
VXP2130



VXP2140/2150/2260



VXP2270/2380/2390



Operation

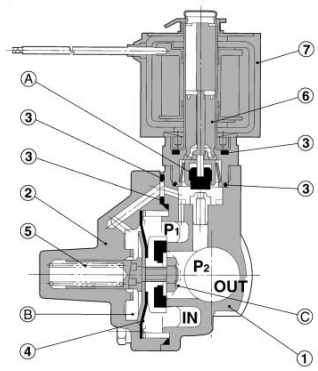
<Valve opened> When the coil ⑨ is energized, the armature assembly ⑦ is attracted into the core of the core assembly ⑥ and the pilot valve Ⓐ opens. Then the pressure in the pressure action chamber Ⓑ falls to open the main valve Ⓒ.

<Valve closed> When the coil ⑨ is not energized, the pilot valve Ⓐ is closed and the pressure in the pressure action chamber Ⓑ rises and the main valve Ⓒ closes.

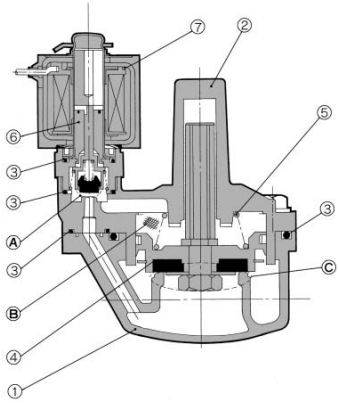
No.	Description	Size	Material	
			Standard	Option
①	Body	10A to 25A	Brass	Stainless steel
		32A to 50A	BC6	—
②	Bonnet	10A to 25A	Brass	Stainless steel
		32A to 50A	BC6	—
③	O-ring	—	NBR	FKM/EPDM
④	Disk assembly	10A to 25A	Stainless steel, Brass, NBR	Stainless steel, FKM Stainless steel, EPDM
		32A to 50A		Stainless steel, Brass FKM/EPDM
⑤	Valve spring	—	Stainless steel	—
⑥	Core assembly	10A to 25A	Stainless steel, Copper	Stainless steel, Silver
		32A to 50A		—
⑦	Armature assembly	—	Stainless steel, NBR	Stainless steel, FKM Stainless steel, EPDM
⑧	Return spring	—	Stainless steel	—
⑨	Coil assembly	—	Class B molded	Class H molded

Normally Open (N.O.)

VXP2142/2152/2262



VXP2272/2382/2392



Operation

<Valve opened> When the coil ⑦ is energized, the opened pilot Ⓐ closes, the pressure in pressure action chamber Ⓑ rises and the main valve Ⓒ closes.

<Valve closed> When coil ⑦ is not energized, the closed pilot valve Ⓐ opens, the pressure in pressure action chamber Ⓑ drops and the main valve Ⓒ opens.

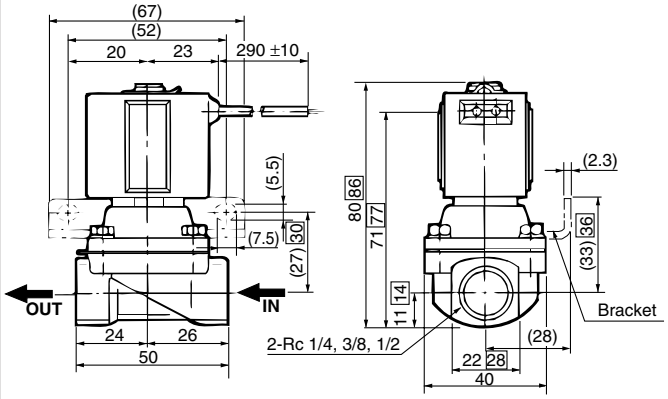
No.	Description	Size	Material	
			Standard	Option
①	Body	15A to 25A	Brass	Stainless steel
		32A to 50A	BC6	—
②	Bonnet	15A to 25A	Brass	Stainless steel
		32A to 50A	BC6	—
③	O-ring	—	NBR	FKM/EPDM
④	Disk assembly	15A to 25A	Stainless steel, Brass, NBR	Stainless steel, FKM Stainless steel, EPDM
		32A to 50A		Stainless steel, Brass FKM/EPDM
⑤	Valve spring	—	Stainless steel	—
⑥	Core assembly	15A to 25A	Stainless steel, Copper, NBR Polyacetal PTFE	Stainless steel, Silver FKM/EPDM, PTFE
		32A to 50A		Stainless steel, Copper, FKM/EPDM, PTFE
⑦	Coil assembly	—	Class B molded	Class H molded

The VX∗ series will be revised shortly.

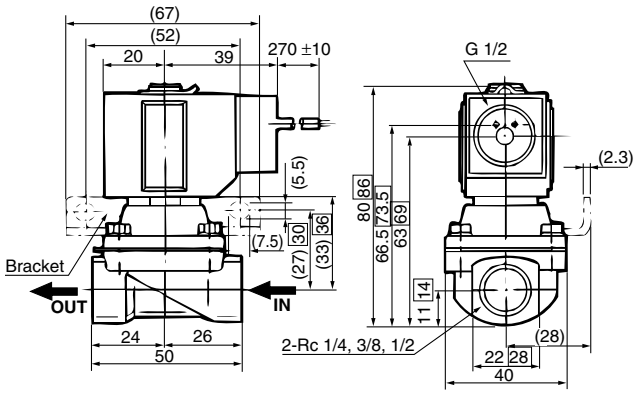
Dimensions (Orifice Size: 10 mmø)

Normally Closed: VXP2130

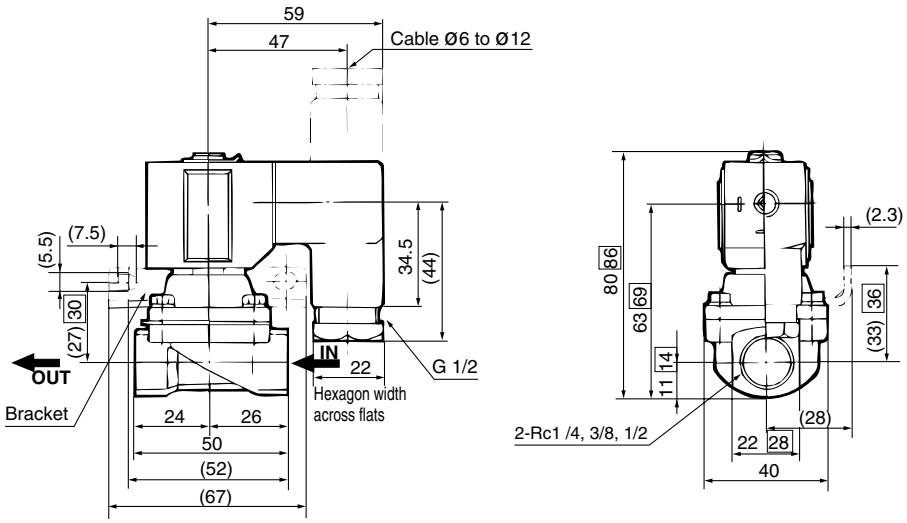
Grommet: G



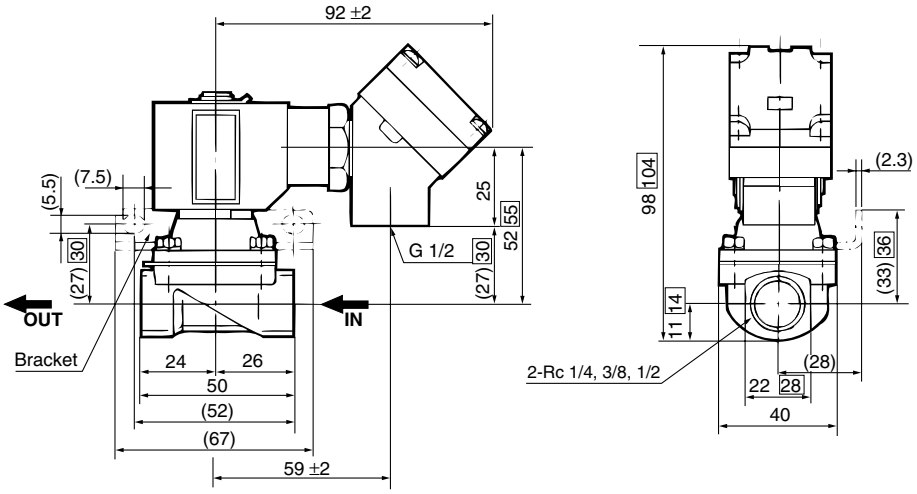
Conduit: C



DIN terminal: D



Conduit terminal: T



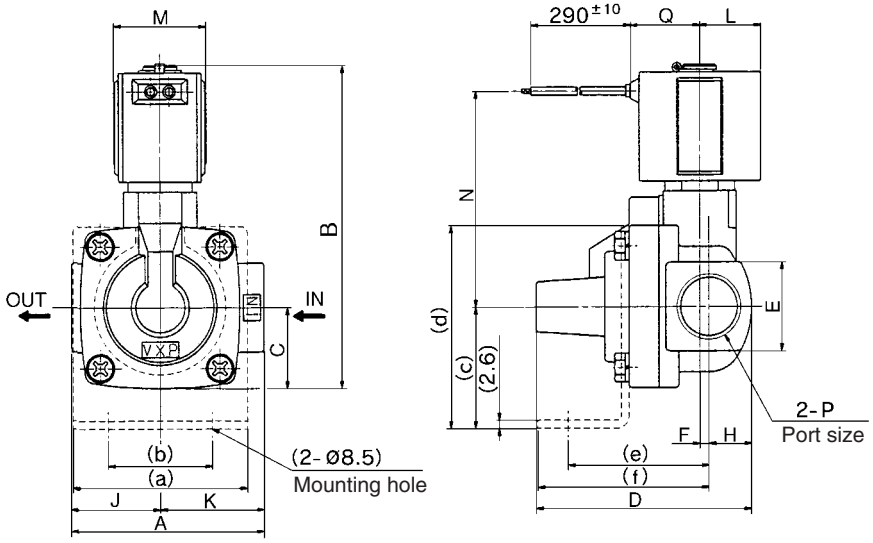
□: Port size Rc 1/2

The VX∗ series will be revised shortly.

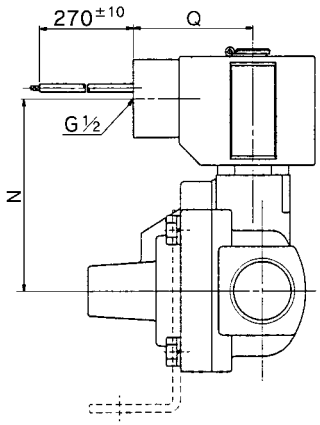
Dimensions (Orifice Size: 15 mmø, 20 mmø, 25 mmø)

Normally Closed:VXP2140/2150/2260 Normally Open:VXP2142/2152/2262

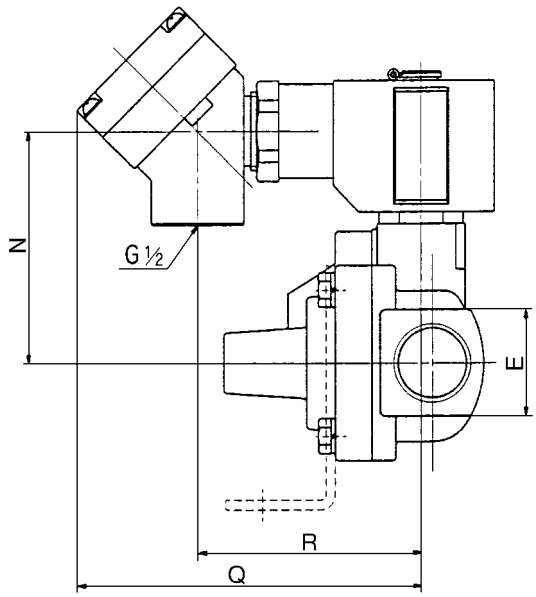
Grommet: G



Conduit: C



Conduit terminal: T



Model		P Port size Rc	A	B	C	D	E	F	H	J	K	L	M	Electrical entry							Bracket					
														Grommet		Conduit		Conduit terminal								
Normally closed	Normally open													N	Q	N	Q	N	Q	R	a	b	c	d	e	f
VXP2140	**VXP2142**	3/8, 1/2	63	104 (116)	26	71	28	3	14	29	34	20	30	69 (76)	23	61	39	61 (68)	92	59	57	34	39	65	47	57
VXP2150	**VXP2152**	3/4	80	118 (136)	32.5	87	35	8	17.5	37	43	20	30	77 (84)	23	69	39	69 (76)	92	59	74	51	45.5	78	52	62
VXP2260	**VXP2262**	1	90	133 (150)	36.5	97	40	8	20	43	47	23	35	87 (97)	25.5	79	41.5	79 (89)	95	62	81	58	49.5	86	57	67

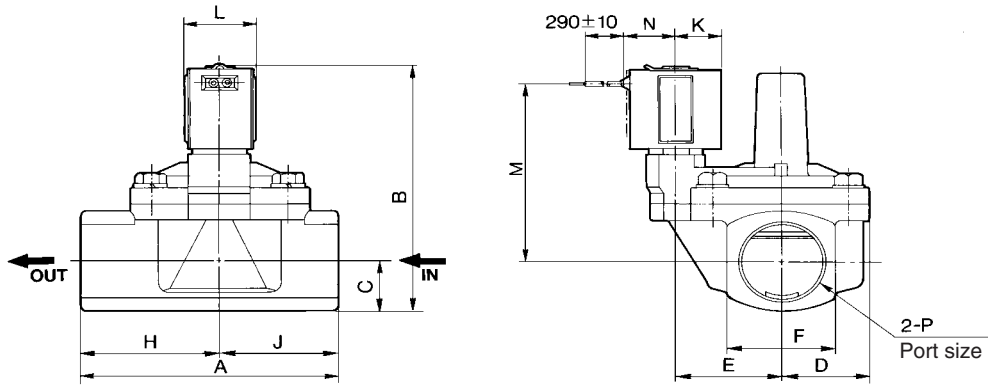
( ): N.O.

The VX∗ series will be revised shortly.

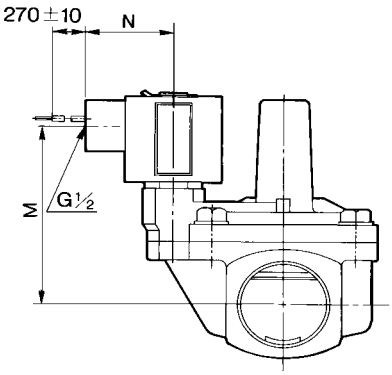
Dimensions

Normally Closed: VXP2270/2380/2390 Normally Open: VXP2272/2382/2392

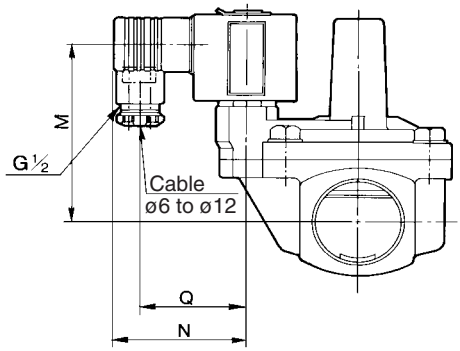
Grommet: G



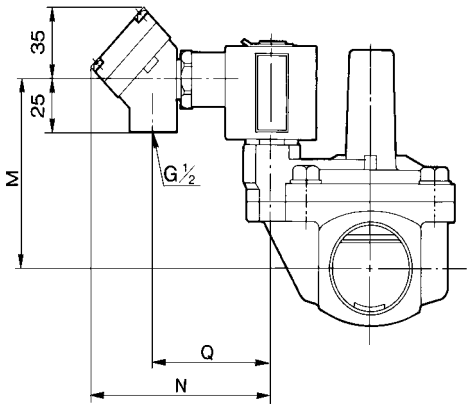
Conduit: C



DIN terminal: D



Conduit terminal: T



Model		P Applicable thread Pc	A	B	C	D	E	F	H	J	K	L	Electrical entry									
													Grommet		Conduit		DIN terminal			Conduit terminal		
Normally closed	Normally open												M	N	M	N	M	N	Q	M	N	Q
VXP2270	**VXP2272**	1	125	128 (145)	26.5	43.5	51.5	53	67.5	57.5	23	35	92 (102)	25.5	84 (94)	41.5	84 (94)	60	48	84 (94)	95	62
VXP2380	**VXP2382**	1 ½	132	144 (159)	30	46.5	54.5	60	72	60	25.5	40	103 (113)	28	95 (105)	44.5	95(105)	62	50	95(105)	97	64
VXP2390	**VXP2392**	2	150	160 (175)	35.5	52	59	71	81	69	25.5	40	114 (124)	28	106 (117)	44.5	106(117)	62	50	106(117)	97	64

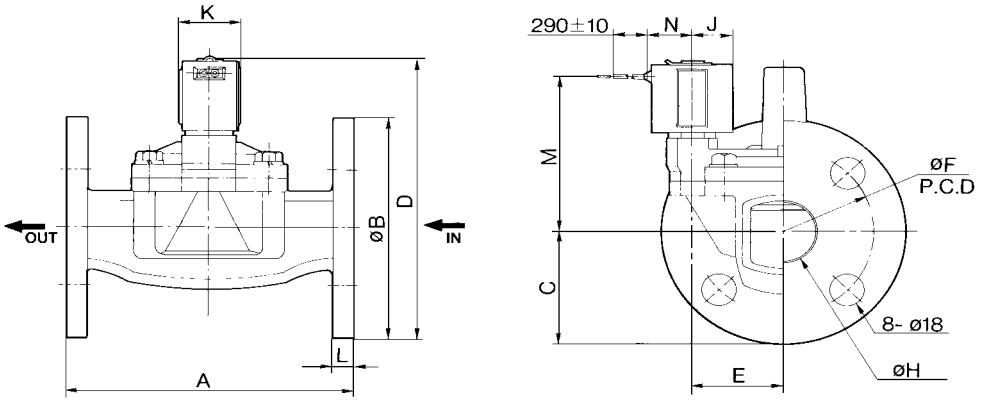
( ): N.O.

The VX∗ series will be revised shortly.

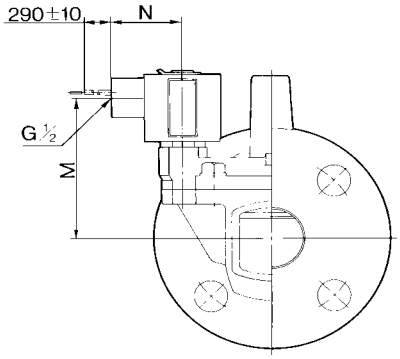
Dimensions

Normally Closed: VXP2270/2380/2390 Normally Open: VXP2272/2382/2392

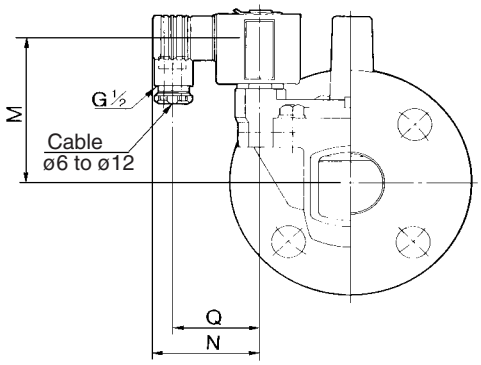
Grommet: G



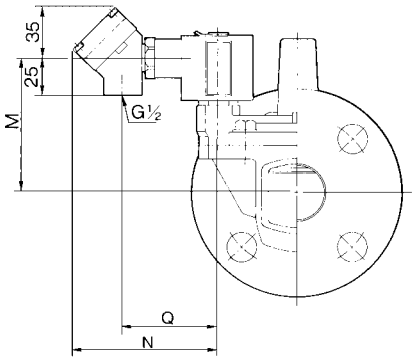
Conduit: C



DIN terminal: D



Conduit terminal: T



Model		Applicable flange	A	B	C	D	E	F	H	J	K	L	Electrical entry									
													Grommet		Conduit		DIN terminal			Conduit terminal		
Normally closed	Normally open												M	N	M	N	M	N	Q	M	N	Q
VXP2270	**VXP2272**	32A	160	135	67.5	169 (186.5)	51.5	100	36	23	35	12	92 (102)	25.5	84 (94)	41.5	84 (94)	60	48	84 (94)	95	62
VXP2380	**VXP2382**	40A	170	140	70	184 (199)	54.5	105	42	25.5	40	14	103 (113)	28	95(105)	44.5	95(105)	62	50	95(105)	97	64
VXP2390	**VXP2392**	50A	180	155	77.5	202.5(217.5)	59	120	52	25.5	40	14	114 (124)	28	106(117)	44.5	106(117)	62	50	106(117)	97	64

( ): N.O.