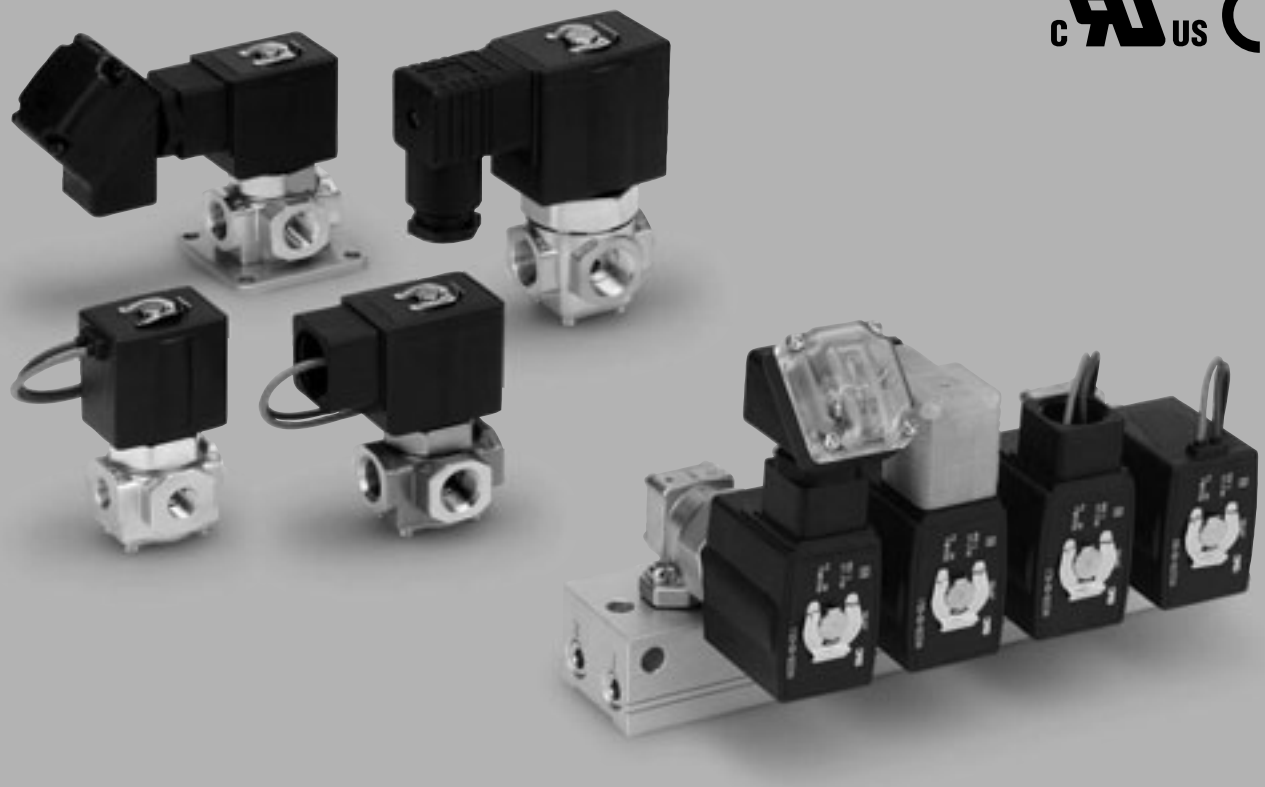
Direct Operated 3 Port Solenoid Valve

Series VX31/32/33

For Air, Water, Oil, Steam

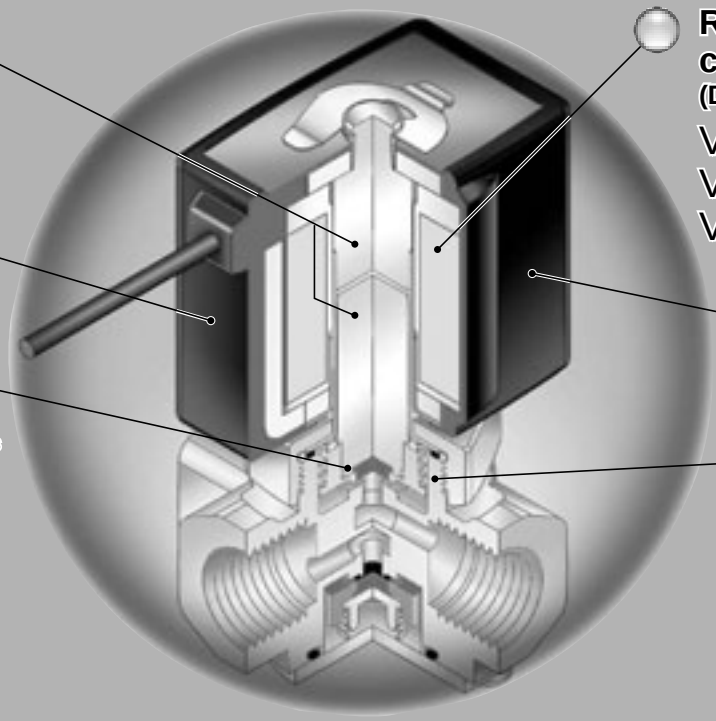


Solenoid valves for various fluids used in a wide variety of applications

Improved corrosion resistance
Special magnetic material adopted

Enclosure: Equivalent to IP65

Low-noise construction
Special construction enables to reduce the metal noise. (DC specification)



Reduced power consumption
(DC specification)
VX31: 6 w → **4.5** w
VX32: 8 w → **7** w
VX33: 11.5 w → **10.5** w

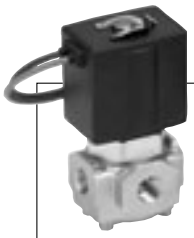
Flame resistance UL94V-0 conformed
Flame resistant mold coil material

Improved maintenance performance
Maintenance is performed easily due to the threaded assembly.

Direct Operated 3 Port Solenoid Valve

Series VX31/32/33

For Air, Water, Oil, Steam



Single Unit

■ Valve

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

■ Solenoid Coil

Coil: Class B, Class H

■ Rated Voltage

100 VAC, 200 VAC, 110 VAC,
220 VAC, 240 VAC, 230 VAC,
48 VAC, 24 VDC, 12 VDC

■ Material

Body — Brass (C37), Stainless steel
Seal — NBR, FKM, EPDM, PTFE, FFKM

■ Electrical Entry

- Grommet
- Conduit
- DIN terminal
- Conduit terminal

Normally Closed (N.C.) / Normally Open (N.O.) / Common (COM.)

Model		VX31	VX32	VX33
Orifice dia.	1.5 mmø	●	—	—
	2.2 mmø	●	●	●
	3 mmø	●	●	●
	4 mmø	—	●	●
Port size		1/8 1/4	1/4 3/8	1/4 3/8

Manifold

■ Valve

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

■ Base

Common SUP/EXH type

■ Solenoid Coil

Coil: Class B, Class H

■ Rated Voltage

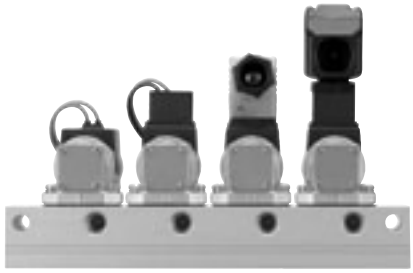
100 VAC, 200 VAC, 110 VAC,
220 VAC, 240 VAC, 230 VAC,
48 VAC, 24 VDC, 12 VDC

■ Material

Body — Brass (C37)
Base — Aluminum
Seal — NBR, FKM, EPDM

■ Electrical Entry

- Grommet
- Conduit
- DIN terminal
- Conduit terminal



Normally Closed (N.C.) / Normally Open (N.O.) / Common (COM.)

Model			VX31	VX32	VX33
Orifice dia.	1.5 mmø		●	—	—
	2.2 mmø		●	●	●
	3 mmø		●	●	●
	4 mmø		—	●	●
(Common SUP/EXH type) Port size		IN port	1/4		
		OUT port	1/8, 1/4		
		EXH port	1/4		

Common Specifications

Standard Specifications

Valve specifications	**Valve construction**		Direct operated poppet
	Withstand pressure (MPa)		3.0
	Body material		Brass (C37), Stainless steel
	Seal material		NBR, FKM, EPDM, PTFE, FFKM
	Enclosure		Dusttight, Low jetproof (equivalent to IP65)*
	Environment		Location without corrosive or explosive gases
Coil specifications	**Rated voltage**	**AC (Class B coil, Built-in full-wave rectifier type)**	100 VAC, 200 VAC, 110 VAC, 220 VAC, 230 VAC, 240 VAC, 48 VAC
		AC (Class H coil)	
		DC	24 VDC, 12 VDC
	Allowable voltage fluctuation		±10% of rated voltage
	Allowable leakage voltage	**AC (Class B coil, Built-in full-wave rectifier type)**	±5% or less of rated voltage
		AC (Class H coil)	±20% or less of rated voltage
		DC	±2% or less of rated voltage
	Coil insulation type		Class B, Class H

* Electrical entry, Grommet with surge voltage suppressor (GS) has a rating of IP40.

Solenoid Coil Specifications

DC Specification

Model	Power consumption (W)	Temperature rise (°C) Note)
VX31	4.5	45
VX32	7	45
VX33	10.5	60

Note) The values are for an ambient temperature of 20°C and at the rated voltage.

AC Specification (Class B coil, Built-in full-wave rectifier type)

Model	Apparent power (VA)*	Temperature rise (°C) Note)
VX31	7	55
VX32	9.5	60
VX33	12	65

* There is no difference in the frequency and the inrush and energized apparent power, since a rectifying circuit is used in the AC (Class B).
Note) The values are for an ambient temperature of 20°C and at the rated voltage.

AC Specification (Class H coil)

Model		Apparent power (VA)		Temperature rise (°C) Note)
	Frequency (Hz)	Inrush	Energized	
VX31	50	33	14	65
	60	28	12	60
VX32	50	65	33	100
	60	55	27	95
VX33	50	94	50	120
	60	79	41	115

Note) The values are for an ambient temperature of 20°C and at the rated voltage.

Contents

Applicable Fluid Check List

Direct Operated 3 Port Solenoid Valve Series VX31/32/33

All Options (Single Unit)

Refer to pages 184, 188, 190, 194, and 196 for specifications and models.

VX3□ 0 2 4 □□–□□–□□□1–□

Option symbol

Fluid and application	Option symbol	Seal material		Body material/ Shading coil material Note 6)	Guide pin material	Coil insulation type Note 4)	Note
		Main valve poppet	Fixed sealant				
Air	**Nil**	NBR	NBR	Brass (C37)	PPS	B	—
	G			Stainless steel			
Medium vacuum, Non-leak, Oil-free	**M** Note 1, 2)	FKM	FKM	Stainless steel	PPS	B	
	V Note 1, 2)			Brass (C37)			
Water	**Nil**	NBR	NBR	Brass (C37)	PPS	B	
	G			Stainless steel			
Heated water	**E**	EPDM	EPDM	Brass (C37)/Cu	Stainless steel	H	
	P			Stainless steel/Ag			
Oil Note 3)	**A**	FKM	FKM	Brass (C37)	PPS	B	
	H			Stainless steel			
	D			Brass (C37)/Cu	Stainless steel	H	
	N			Stainless steel/Ag			
Steam (Max.183°C)	**S**	FFKM	PTFE	Brass (C37)/Cu	Stainless steel	H	COM. only
	Q			Stainless steel/Ag			
Copper-free, Fluorine-free Note 5)	**J**	EPDM	EPDM	Stainless steel	PPS	B	—
	P			Stainless steel/Ag	Stainless steel	H	
Others	**B**	EPDM	EPDM	Brass (C37)	PPS	B	
	C	FFKM	PTFE		Stainless steel		COM. only
	K Note 1, 2)			Stainless steel			COM. only, Oil-free

∗ If using for other fluids, please consult with SMC.

All Options (Manifold)*

Refer to pages 186, 192, and 198 for specifications and models.

VX3□□ 1 3 5 □□–00–□□□1

Option symbol

Fluid and application	Option symbol	Seal material		Body material/ Shading coil material Note 6)	Guide pin material	Coil insulation type Note 4)
		Main valve poppet	Fixed sealant			
Air	**Nil**	NBR	NBR	Brass (C37)	PPS	B
Medium vacuum, Non-leak, Oil-free	**V** Note 1, 2)	FKM	FKM	Brass (C37)	PPS	B
Oil Note 3)	**A**	FKM	FKM	Brass (C37)	PPS	B
	D			Brass (C37)/Cu	Stainless steel	H
Others	**B**	EPDM	EPDM	Brass (C37)	PPS	B
	E			Brass (C37)/Cu	Stainless steel	H

∗ Aluminum is only available with the material for a manifold base.
∗∗ If using for other fluids, please consult with SMC.

Note 1) The leakage amount (10^{-6} Pa·m³/s) of "V", "M" options are values when differential pressure is 0.1 MPa.
Note 2) "V", "M" and "K" options are for oil-free treatment.
Note 3) The dynamic viscosity of the fluid must not exceed 50 mm²/s.
Note 4) Coil insulation type Class H: AC spec. only, Class B/AC spec.: built-in full-wave rectifier type only
Note 5) The nuts (non-welded parts) are nickel plated on the Brass (C37) material.
Note 6) There is no shading coil attached to DC spec. or Class B/AC spec.

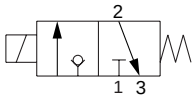
For Air /Single Unit

(Inert gas, Non-leak, Medium vacuum)

Model / Valve Specifications

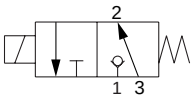
N.C.

Passage symbol



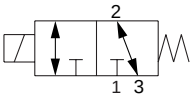
N.O.

Passage symbol



COM.

Passage symbol



Port size	Orifice diameter (mmø)	Model	Max. operating pressure differential (MPa)			Flow characteristics			Max. system pressure (MPa)	Mass (g) Note)
			N.C.	N.O.	COM.	C[dm³/(s·bar)]	b	Cv		
1/8 (6A)	1.5	**VX311□-01**	1	1	0.7	0.29	0.32	0.08	2.0	380
	2.2	**VX312□-01**	0.7	0.5	0.4	0.60	0.25	0.15		
	3	**VX313□-01**	0.3	0.3	0.2	0.82	0.20	0.20		
1/4 (8A)	1.5	**VX311□-02**	1	1	0.7	0.29	0.32	0.08		
	2.2	**VX312□-02**	0.7	0.5	0.4	0.60	0.25	0.15		
		VX322□-02	1.2	1	0.7	0.64	0.40	0.17		530
		VX332□-02	1.6	1.6	1					730
	3	**VX313□-02**	0.3	0.3	0.2	0.82	0.20	0.20		380
		VX323□-02	0.6	0.5	0.3	1.1	0.25	0.27		530
		VX333□-02	1	0.9	0.6					730
	4	**VX324□-02**	0.3	0.25	0.2	1.6	0.20	0.38		530
		VX334□-02	0.5	0.4	0.3					730
3/8 (10A)	2.2	**VX322□-03**	1.2	1	0.7	0.64	0.40	0.17		530
		VX332□-03	1.6	1.6	1					730
	3	**VX323□-03**	0.6	0.5	0.3	1.1	0.25	0.27		530
		VX333□-03	1	0.9	0.6					730
	4	**VX324□-03**	0.3	0.25	0.2	1.6	0.20	0.38		530
		VX334□-03	0.5	0.4	0.3					730

Note) Mass of grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for conduit terminal type respectively.
Also, add 60 g for VX31□□, 80 g for VX32□□ and VX33□□ respectively for bracket option.

• Refer to “Glossary of Terms” on page 26, for details on the max. operating pressure differential and the max. system pressure.

Fluid and Ambient Temperature

Power source	Fluid temperature (°C)		Ambient temperature (°C)
	Solenoid valve option (symbol)		
	Nil, G	**V, M**	
AC	–10 Note) to 60	–10 Note) to 40	–20 to 60
DC	–10 Note) to 60	–10 Note) to 40	–20 to 40

Note) Dew point temperature: –10°C or less

Valve Leakage Rate

Internal Leakage / External Leakage

Seal material	Max. operating pressure differential	Leakage rate	
		Air	Non-leak, Medium vacuum Note)
NBR, FKM	From 0 to less than 1 MPa	1 cm³/min or less	10^{-6} Pa·m³/sec or less
	1 MPa or more	2 cm³/min or less	

Note) The leakage amount (10^{-6} Pa·m³/sec) for the “V” and “M” option are values when the differential pressure is 0.1 MPa.

How to Order (Single Unit)

DC

AC/Class B coil (Built-in full-wave rectifier type)

VX 31 1 4 □ □ – 01 □ – 5 G 1 – □

VX 31 1 4 □ □ – 01 □ – 1 G R1 – □

Model
Refer to Table (1) shown below for availability.

Orifice diameter
Refer to Table (1) shown below for availability.

Valve / Body type

0	N.C. / Single unit
2	N.O. / Single unit
4	COM. / Single unit

Solenoid valve option
Refer to Table (2) shown below for availability.

Bracket

Nil	None
B	With bracket

∗ Bracket is neither mountable nor removable.

Built-in full-wave rectifier type

Port size
Refer to Table (1) shown below for availability.

Suffix

Nil	—
Z	Oil-free spec.

Thread type

Nil	Rc
T	NPTF
F	G
N	NPT

Rated voltage

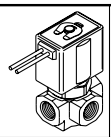
1	100 VAC 50/60 Hz	**6**	12 VDC
2	200 VAC 50/60 Hz	**7**	240 VAC 50/60 Hz
3	110 VAC 50/60 Hz	**8**	48 VAC 50/60 Hz
4	220 VAC 50/60 Hz	**J**	230 VAC 50/60 Hz
5	24 VDC		

∗ Refer to Table (3) shown below for availability.

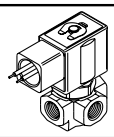
Refer to page 203 for ordering coil only.

Electrical entry

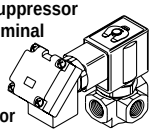
G - **Grommet**
GS - **With grommet surge voltage suppressor**



C - **Conduit**

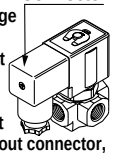


T - **With conduit terminal**
TS - **With conduit terminal and surge voltage suppressor**
TL - **With conduit terminal and light**
TZ - **With conduit terminal, surge voltage suppressor and light**



D - **DIN terminal**
DS - **DIN terminal with surge voltage suppressor**
DL - **DIN terminal with light**
DZ - **DIN terminal with surge voltage suppressor and light**
DO - **For DIN terminal (without connector, gasket is included.)**

Connector



∗ DIN type is available with class B only.

∗ Refer to Table (3) for available combinations between each electrical option (S, L, Z) and rated voltage.
∗ Surge voltage suppressor is integrated into the AC/Class B coil, as a standard.

Table (1) Model/Orifice Diameter/Port Size

Solenoid valve model				Orifice symbol (Diameter)			
Model	**VX31**	**VX32**	**VX33**	**1** (1.5 mmø)	**2** (2.2 mmø)	**3** (3 mmø)	**4** (4 mmø)
Port symbol (Port size)	**01** (1/8)	—	—	●	●	●	—
	02 (1/4)	—	—	●	●	●	—
	—	**02** (1/4)	**02** (1/4)	—	●	●	●
	—	**03** (3/8)	**03** (3/8)	—	●	●	●

Table (2) Solenoid Valve Option

Option symbol	Seal material		Body material/ Shading coil material	Guide pin material	Coil insulation type	Note Note)
	Main valve poppet	Fixed sealant				
Nil	NBR	NBR	Brass (C37)	PPS	B	—
G			Stainless steel			
M	FKM	FKM	Stainless steel			Non-leak (10^{-6} Pa·m³/sec), Medium vacuum (0.1 Pa.abs), Oil-free
V			Brass (C37)			

Note) The leakage amount (10^{-6} Pa·m³/sec) for the "V" and "M" option are values when the differential pressure is 0.1 MPa.

Table (3) Rated Voltage – Electrical Option

Rated voltage			Class B		
			S	**L**	**Z**
AC/ DC	Voltage symbol	Voltage	With surge voltage suppressor	With light	With light and surge voltage suppressor
AC	**1**	100 V	— Note)	●	— Note)
	2	200 V		●	
	3	110 V		●	
	4	220 V		●	
	7	240 V		—	
	8	48 V		—	
	J	230 V		—	
DC	**5**	24 V	●	●	●
	6	12 V	●	—	—

Note 1) Option S, Z are not available as surge voltage suppressor is integrated into the AC/Class B coil, as a standard.
∗ Class H coil is not available.

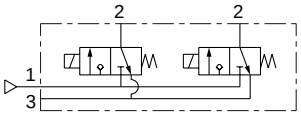
For Air /Manifold

(Inert gas, Non-leak, Medium vacuum)

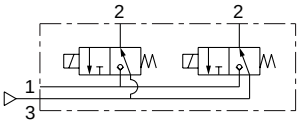
Solenoid Valve for Manifold / Valve Specifications

N.C. **N.O.** **COM.**

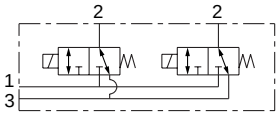
Passage symbol



Passage symbol



Passage symbol



Orifice diameter (mmø)	Model	Max. operating pressure differential (MPa)			Flow characteristics			Max. system pressure (MPa)
		N.C.	N.O.	COM.	C[dm³/(s·bar)]	b	Cv	
1.5	**VX311□-00**	1	1	0.7	0.29	0.32	0.08	2.0
2.2	**VX312□-00**	0.7	0.5	0.4	0.60	0.25	0.15	
	VX322□-00	1.2	1	0.7	0.64	0.40	0.17	
	VX332□-00	1.6	1.6	1				
3	**VX313□-00**	0.3	0.3	0.2	0.82	0.20	0.20	
	VX323□-00	0.6	0.5	0.3	1.1	0.25	0.27	
	VX333□-00	1	0.9	0.6				
4	**VX324□-00**	0.3	0.25	0.2	1.6	0.20	0.38	
	VX334□-00	0.5	0.4	0.3				

• Refer to “Glossary of Terms” on page 26 for details on the max. operating pressure differential and the max. system pressure.

Fluid and Ambient Temperature

Power source	Fluid temperature (°C)		Ambient temperature (°C)
	Solenoid valve option (symbol)		
	Nil	**V**	
AC	–10 Note) to 60	–10 Note) to 40	–20 to 60
DC	–10 Note) to 60	–10 Note) to 40	–20 to 40

Note) Dew point temperature: –10°C or less

Valve Leakage Rate

Internal Leakage / External Leakage

Seal material	Max. operating pressure differential	Leakage rate	
		Air	Non-leak, Medium vacuum Note)
NBR, FKM	From 0 to less than 1 MPa	1 cm³/min or less	10^{-6} Pa·m³/sec or less
	1 MPa or more	2 cm³/min or less	

Note) The leakage amount (10^{-6} Pa·m³/sec) for the “V” option are values when the differential pressure is 0.1 MPa.

How to Order (Solenoid Valve for Manifold)

DC

AC/Class B coil (Built-in full-wave rectifier type)

VX 31 1 1 □ □ –00– 5 G 1

VX 31 1 1 □ □ –00– 1 G R1

Model
Refer to Table (1) shown below for availability.

Orifice diameter
Refer to Table (1) shown below for availability.

Valve / Body type

1	N.C. / Manifold
3	N.O. / Manifold
5	COM. / Manifold

Solenoid valve option
Refer to Table (2) shown below for availability.

Suffix

Nil	—
Z	Oil-free spec.

Built-in full-wave rectifier type

Rated voltage

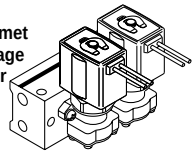
1	100 VAC 50/60 Hz	6	12 VDC
2	200 VAC 50/60 Hz	7	240 VAC 50/60 Hz
3	110 VAC 50/60 Hz	8	48 VAC 50/60 Hz
4	220 VAC 50/60 Hz	J	230 VAC 50/60 Hz
5	24 VDC		

∗ Refer to Table (3) shown below for availability.

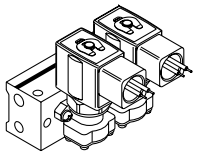
Refer to page 203 for ordering coil only.

Electrical entry

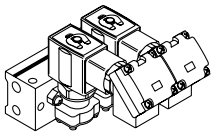
G - Grommet
GS - With grommet surge voltage suppressor



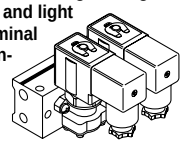
C - Conduit



T - With conduit terminal
TS - With conduit terminal and surge voltage suppressor
TL - With conduit terminal and light
TZ - With conduit terminal, surge voltage suppressor and light



D - DIN terminal
DS - DIN terminal with surge voltage suppressor
DL - DIN terminal with light
DZ - DIN terminal with surge voltage suppressor and light
DO - For DIN terminal (without connector, gasket is included.)



∗ DIN type is available with class B only.

∗ Refer to Table (3) for available combinations between each electrical option (S, L, Z) and rated voltage.
∗ Surge voltage suppressor is integrated into the AC/Class B coil, as a standard.

How to Order Manifold Bases

VVX31
VVX32 **1** □ – **07** – **1**
VVX33

Number of manifolds

02	2 stations
⋮	⋮
10	10 stations

Port size (Individual port)

1	Rc 1/8
2	Rc 1/4

∗ Common port sizes are all Rc 1/4.
∗∗ Indicating numbers shown below are for common ports.

Type	SUP port	EXH port
N.C.	1	3
N.O.	3	1

Suffix

Nil	—
Z	Oil-free spec.

Manifold base

● Blanking plate part no.

For VX31: VVX31-4A-□
For VX32/33: VVX32-4A-□

Seal material

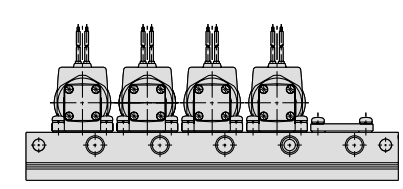
Nil	NBR
F	FKM

How to Order Manifold Assemblies (Example)

Enter the valve and blanking plate to be mounted under the manifold base part number.

Example
VVX311-05-1 ..... 1 set
∗ VX3111-00-1GR1 ... 4 sets
∗ VVX31-4A ..... 1 set

"∗" is the symbol for mounting.
Add an "∗" in front of the part numbers for solenoid valves, etc. to be mounted.



Enter the product's part number in order, counting the 1st station from the left in the manifold arrangement, when viewing the individual port in front.
The common port on the right side is plugged.

Table (1) Model/Orifice Diameter

Solenoid valve model	Orifice symbol (Diameter)			
	1 (1.5 mmø)	2 (2.2 mmø)	3 (3 mmø)	4 (4 mmø)
VX31	●	●	●	—
VX32	—	●	●	●
VX33	—	●	●	●

Table (2) Solenoid Valve Option

Option symbol	Seal material		Body material	Guide pin material	Coil insulation type	Note Note)
	Main valve poppet	Fixed sealant				
Nil	NBR	NBR	Brass (C37)	PPS	B	—
V	FKM	FKM				Non-leak (10^{-6} Pa·m³/sec), Medium vacuum (0.1 Pa.abs), Oil-free

∗ Aluminum is only available as a material for the manifold base.
Note) The leakage amount (10^{-6} Pa·m³/sec) for the "V"option are values when the differential pressure is 0.1 MPa.

Table (3) Rated Voltage – Electrical Option

Rated voltage			Class B		
			S	L	Z
AC/DC	Voltage symbol	Voltage	With surge voltage suppressor	With light	With light and surge voltage suppressor
AC	1	100 V	— Note)	●	— Note)
	2	200 V		●	
	3	110 V		●	
	4	220 V		●	
	7	240 V		—	
	8	48 V		—	
	J	230 V		—	
DC	5	24 V	●	●	●
	6	12 V	●	—	—

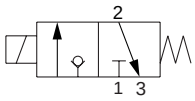
∗ Class H coil is not available.
Note) Option S, Z are not available as surge voltage suppressor is integrated into the AC/Class B coil, as a standard.

For Water /Single Unit

Model / Valve Specifications

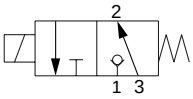
N.C.

Passage symbol



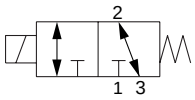
N.O.

Passage symbol



COM.

Passage symbol



Port size	Orifice diameter (mmø)	Model	Max. operating pressure differential (MPa)			Flow characteristics		Max. system pressure (MPa)	Mass (g) Note)
			N.C.	N.O.	COM.	Av x $10^{-6}m^2$	Cv converted		
1/8 (6A)	1.5	**VX311□-01**	1	1	0.7	1.9	0.08	2.0	380
	2.2	**VX312□-01**	0.7	0.5	0.4	3.8	0.16		
	3	**VX313□-01**	0.3	0.3	0.2	5.8	0.24		
1/4 (8A)	1.5	**VX311□-02**	1	1	0.7	1.9	0.08		
	2.2	**VX312□-02**	0.7	0.5	0.4	3.8	0.16		
		VX322□-02	1.2	1	0.7	4.6	0.19		530
		VX332□-02	1.6	1.6	1				730
	3	**VX313□-02**	0.3	0.3	0.2	5.8	0.24		380
		VX323□-02	0.6	0.5	0.3	7.9	0.33		530
		VX333□-02	1	0.9	0.6				730
	4	**VX324□-02**	0.3	0.25	0.2	12	0.50		530
		VX334□-02	0.5	0.4	0.3				730
3/8 (10A)	2.2	**VX322□-03**	1.2	1	0.7	4.6	0.19		530
		VX332□-03	1.6	1.6	1				730
	3	**VX323□-03**	0.6	0.5	0.3	7.9	0.33		530
		VX333□-03	1	0.9	0.6				730
	4	**VX324□-03**	0.3	0.25	0.2	12	0.50		530
		VX334□-03	0.5	0.4	0.3				730

Note) Mass of grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for conduit terminal type respectively.
Also, add 60 g for VX31□□, 80 g for VX32□□ and VX33□□ respectively for bracket option.

• Refer to “Glossary of Terms” on page 26, for details on the max. operating pressure differential and the max. system pressure.

Fluid and Ambient Temperature

Power source	Fluid temperature (°C) Solenoid valve option (Symbol)		Ambient temperature (°C)
	Nil, G, H	**E, P**	
AC	1 to 60	1 to 99	–20 to 60
DC	1 to 40	—	–20 to 40

Note) With no freezing

Valve Leakage Rate

Internal Leakage / External Leakage

Seal material	Max. operating pressure differential	Leakage rate (Water)
NBR, FKM, EPDM	From 0 to less than 1 MPa	0.1 cm^3/min or less
	1 MPa or more	0.2 cm^3/min or less

How to Order (Single Unit)

DC, AC/Class H coil VX 31 1 4 ☐ ☐ – 01 ☐ – 1 G 1 – ☐

AC/Class B coil (Built-in full-wave rectifier type) VX 31 1 4 ☐ ☐ – 01 ☐ – 1 G R1 – ☐

Model
Refer to Table (1) shown below for availability.

Orifice diameter
Refer to Table (1) shown below for availability.

Valve / Body type

0	N.C. / Single unit
2	N.O. / Single unit
4	COM. / Single unit

Solenoid valve option
Refer to Table (2) shown below for availability.

Port size
Refer to Table (1) shown below for availability.

Thread type

Nil	Rc
T	NPTF
F	G
N	NPT

Suffix

Nil	—
Z	Oil-free spec.

Bracket

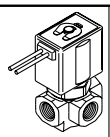
Nil	None
B	With bracket

∗ Bracket is neither mountable nor removable.

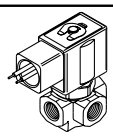
Built-in full-wave rectifier type

Electrical entry

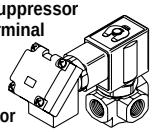
G - **Grommet**
GS - **With grommet surge voltage suppressor**



C - **Conduit**

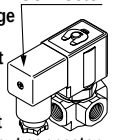


T - **With conduit terminal**
TS - **With conduit terminal and surge voltage suppressor**
TL - **With conduit terminal and light**
TZ - **With conduit terminal, surge voltage suppressor and light**



D - **DIN terminal**
DS - **DIN terminal with surge voltage suppressor**
DL - **DIN terminal with light**
DZ - **DIN terminal with surge voltage suppressor and light**
DO - **For DIN terminal (without connector, gasket is included.)**

Connector



∗ DIN type is available with class B only.

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	**J**	230 VAC 50/60 Hz
5	24 VDC		

∗ Refer to Table (3) shown below for availability.

Refer to page 203 for ordering coil only.

∗ Refer to Table (3) for available combinations between each electrical option (S, L, Z) and rated voltage.
∗ Surge voltage suppressor is integrated into the AC/Class B coil, as a standard.

Table (1) Model/Orifice Diameter/Port Size

Solenoid valve model				Orifice symbol (Diameter)			
Model	VX31	VX32	VX33	**1** (1.5 mmø)	**2** (2.2 mmø)	**3** (3 mmø)	**4** (4 mmø)
Port symbol (Port size)	**01** (1/8)	—	—	●	●	●	—
	02 (1/4)	—	—	●	●	●	—
	—	**02** (1/4)	**02** (1/4)	—	●	●	●
	—	**03** (3/8)	**03** (3/8)	—	●	●	●

Table (2) Solenoid Valve Option

Option symbol	Seal material		Body material/ Shading coil material	Guide pin material	Coil insulation type	Note
	Main valve poppet	Fixed sealant				
Nil	NBR	NBR	Brass (C37)	PPS	B	—
G			Stainless steel			
E	EPDM	EPDM	Brass (C37)/Cu	Stainless steel	H	Heated water
P			Stainless steel/Ag			
H	FKM	FKM	Stainless steel	PPS	B	—

Table (3) Rated Voltage – Electrical Option

Rated voltage			Class B		
			S	**L**	**Z**
AC/ DC	Voltage symbol	Voltage	With surge voltage suppressor	With light	With light and surge voltage suppressor
AC	**1**	100 V	— Note)	●	— Note)
	2	200 V		●	
	3	110 V		●	
	4	220 V		●	
	7	240 V		—	
	8	48 V		—	
	J	230 V		—	
DC	**5**	24 V	●	●	●
	6	12 V	●	—	—

Note) Option S, Z are not available as surge voltage suppressor is integrated into the AC/Class B coil, as a standard.

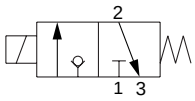
Rated voltage			Class H		
			S	**L**	**Z**
AC/ DC	Voltage symbol	Voltage	With surge voltage suppressor	With light	With light and surge voltage suppressor
AC	**1**	100 V	●	●	●
	2	200 V	●	●	●
	3	110 V	●	●	●
	4	220 V	●	●	●
	7	240 V	●	—	—
	8	48 V	●	—	—
	J	230 V	●	—	—
DC	**5**	24 V	DC specification is not available.		
	6	12 V			

For Oil /Single Unit

Model / Valve Specifications

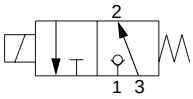
N.C.

Passage symbol



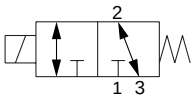
N.O.

Passage symbol



COM.

Passage symbol



Port size	Orifice diameter (mmø)	Model	Max. operating pressure differential (MPa)			Flow characteristics		Max. system pressure (MPa)	Mass Note) (g)
			N.C.	N.O.	COM.	Av x $10^{-6}m^2$	Cv converted		
1/8 (6A)	1.5	**VX311□-01**	1	1	0.7	1.9	0.08	2.0	380
	2.2	**VX312□-01**	0.7	0.5	0.4	3.8	0.16		
	3	**VX313□-01**	0.3	0.3	0.2	5.8	0.24		
1/4 (8A)	1.5	**VX311□-02**	1	1	0.7	1.9	0.08		
	2.2	**VX312□-02**	0.7	0.5	0.4	3.8	0.16		
		VX322□-02	1.2	1	0.7	4.6	0.19		530
		VX332□-02	1.6	1.6	1				730
	3	**VX313□-02**	0.3	0.3	0.2	5.8	0.24		380
		VX323□-02	0.6	0.5	0.3	7.9	0.33		530
		VX333□-02	1	0.9	0.6				730
	4	**VX324□-02**	0.3	0.25	0.2	12	0.50		530
		VX334□-02	0.5	0.4	0.3				730
3/8 (10A)	2.2	**VX322□-03**	1.2	1	0.7	4.6	0.19		530
		VX332□-03	1.6	1.6	1				730
	3	**VX323□-03**	0.6	0.5	0.3	7.9	0.33		530
		VX333□-03	1	0.9	0.6				730
	4	**VX324□-03**	0.3	0.25	0.2	12	0.50		530
		VX334□-03	0.5	0.4	0.3				730

Note) Mass of grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for conduit terminal type respectively.
Also, add 60 g for VX31□□, 80 g for VX32□□ and VX33□□ respectively for bracket option.

• Refer to “Glossary of Terms” on page 26, for details on the max. operating pressure differential and the max. system pressure.

Fluid and Ambient Temperature

Power source	Fluid temperature (°C) Solenoid valve option (Symbol)		Ambient temperature (°C)
	A, H	**D, N**	
AC	–5 Note) to 60	–5 Note) to 120	–20 to 60
DC	–5 Note) to 40	—	–20 to 40

Note) Dynamic viscosity: 50 mm^2/s or less

Valve Leakage Rate

Internal Leakage / External Leakage

Seal material	Max. operating pressure differential	Leakage rate (Oil)
FKM	From 0 to less than 1 MPa	0.1 cm^3/min or less
	1 MPa or more	0.2 cm^3/min or less

How to Order (Single Unit)

DC, AC/Class H coil VX 31 1 4 A □ – 01 □ – 1 G 1 – □

AC/Class B coil (Built-in full-wave rectifier type) VX 31 1 4 A □ – 01 □ – 1 G R1 – □

Model
Refer to Table (1) shown below for availability.

Orifice diameter
Refer to Table (1) shown below for availability.

Valve / Body type

0	N.C. / Single unit
2	N.O. / Single unit
4	COM. / Single unit

Solenoid valve option
Refer to Table (2) shown below for availability.

Port size
Refer to Table (1) shown below for availability.

Thread type

Nil	Rc
T	NPTF
F	G
N	NPT

Suffix

Nil	—
Z	Oil-free spec.

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	**J**	230 VAC 50/60 Hz
5	24 VDC		

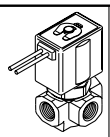
∗ Refer to Table (3) shown below for availability.

Refer to page 203 for ordering coil only.

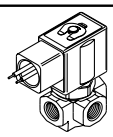
Built-in full-wave rectifier type

Electrical entry

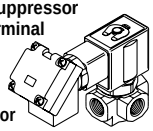
G - Grommet
GS - With grommet surge voltage suppressor



C - Conduit

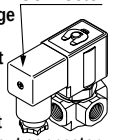


T - With conduit terminal
TS - With conduit terminal and surge voltage suppressor
TL - With conduit terminal and light
TZ - With conduit terminal, surge voltage suppressor and light



D - DIN terminal
DS - DIN terminal with surge voltage suppressor
DL - DIN terminal with light
DZ - DIN terminal with surge voltage suppressor and light
DO - For DIN terminal (without connector, gasket is included.)

Connector



∗ DIN type is available with class B only.

∗ Refer to Table (3) for available combinations between each electrical option (S, L, Z) and rated voltage.
∗ Surge voltage suppressor is integrated into the AC/Class B coil, as a standard.

Table (1) Model/Orifice Diameter/Port Size

Solenoid valve model				Orifice symbol (Diameter)			
Model	VX31	VX32	VX33	**1** (1.5 mmø)	**2** (2.2 mmø)	**3** (3 mmø)	**4** (4 mmø)
Port symbol (Port size)	**01** (1/8)	—	—	●	●	●	—
	02 (1/4)	—	—	●	●	●	—
	—	**02** (1/4)	**02** (1/4)	—	●	●	●
	—	**03** (3/8)	**03** (3/8)	—	●	●	●

Table (2) Solenoid Valve Option

Option symbol	Seal material		Body material/ Shading coil material	Guide pin material	Coil insulation type
	Main valve poppet	Fixed sealant			
A	FKM	FKM	Brass (C37)	PPS	B
H			Stainless steel		
D			Brass (C37)/Cu	Stainless steel	H
N			Stainless steel/Ag		

∗ The additives contained in oil are different depending on the type and manufacturers, so the durability of the seal materials will vary. For details, please consult with SMC.

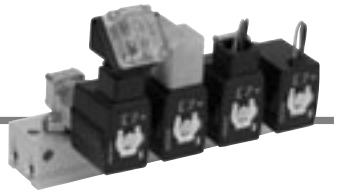
Table (3) Rated Voltage – Electrical Option

Rated voltage			Class B		
			S	**L**	**Z**
AC/ DC	Voltage symbol	Voltage	With surge voltage suppressor	With light	With light and surge voltage suppressor
AC	**1**	100 V	— Note)	●	— Note)
	2	200 V		●	
	3	110 V		●	
	4	220 V		●	
	7	240 V		—	
	8	48 V		—	
	J	230 V		—	
DC	**5**	24 V	●	●	●
	6	12 V	●	—	—

Note) Option S, Z are not available as surge voltage suppressor is integrated into the AC/Class B coil, as a standard.

Rated voltage			Class H		
			S	**L**	**Z**
AC/ DC	Voltage symbol	Voltage	With surge voltage suppressor	With light	With light and surge voltage suppressor
AC	**1**	100 V	●	●	●
	2	200 V	●	●	●
	3	110 V	●	●	●
	4	220 V	●	●	●
	7	240 V	●	—	—
	8	48 V	●	—	—
	J	230 V	●	—	—
DC	**5**	24 V	DC specification is not available.		
	6	12 V			

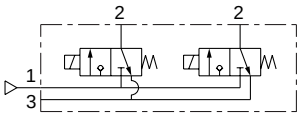
For Oil /Manifold



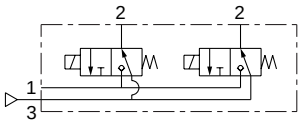
Solenoid Valve for Manifold / Valve Specifications

N.C. | **N.O.** | **COM.**

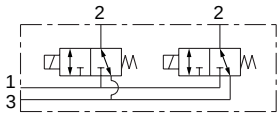
Passage symbol



Passage symbol



Passage symbol



Orifice diameter (mmø)	Model	Max. operating pressure differential (MPa)			Flow characteristics		Max. system pressure (MPa)
		N.C.	N.O.	COM.	Av x $10^{-6}m^2$	Cv converted	
1.5	**VX311□-00**	1	1	0.7	1.9	0.08	2.0
2.2	**VX312□-00**	0.7	0.5	0.4	3.8	0.16	
	VX322□-00	1.2	1	0.7	4.6	0.19	
	VX332□-00	1.6	1.6	1			
3	**VX313□-00**	0.3	0.3	0.2	5.8	0.24	
	VX323□-00	0.6	0.5	0.3	7.9	0.33	
	VX333□-00	1	0.9	0.6			
4	**VX324□-00**	0.3	0.25	0.2	12	0.50	
	VX334□-00	0.5	0.4	0.3			

• Refer to “Glossary of Terms” on page 26 for details on the max. operating pressure differential and the max. system pressure.

Fluid and Ambient Temperature

Power source	Fluid temperature (°C)		Ambient temperature (°C)
	Solenoid valve option (Symbol)		
	A	**D**	
AC	–5 Note) to 60	–5 Note) to 120	–20 to 60
DC	–5 Note) to 40	—	–20 to 40

Note) Dynamic viscosity: 50 mm^2/s or less

Valve Leakage Rate

Internal Leakage / External Leakage

Seal material	Max. operating pressure differential	Leakage rate (Oil)
FKM	From 0 to less than 1 MPa	0.1 cm^3/min or less
	1 MPa or more	0.2 cm^3/min or less

How to Order (Solenoid Valve for Manifold)

DC, AC/Class H coil **VX 31 1 1 A □ –00– 1 G 1**

AC/Class B coil (Built-in full-wave rectifier type) **VX 31 1 1 A □ –00– 1 G R1**

Built-in full-wave rectifier type

Model
Refer to Table (1) shown below for availability.

Orifice diameter
Refer to Table (1) shown below for availability.

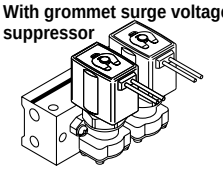
Valve / Body type

1	N.C. / Manifold
3	N.O. / Manifold
5	COM. / Manifold

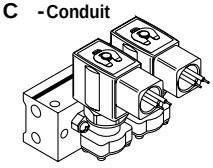
Solenoid valve option
Refer to Table (2) shown below for availability.

Electrical entry

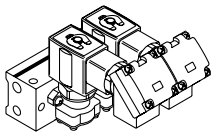
G - Grommet
GS - With grommet surface voltage suppressor



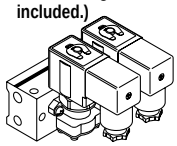
C - Conduit



T - With conduit terminal
TS - With conduit terminal and surge voltage suppressor
TL - With conduit terminal and light
TZ - With conduit terminal, surge voltage suppressor and light



D - DIN terminal
DS - DIN terminal with surge voltage suppressor
DL - DIN terminal with light
DZ - DIN terminal with surge voltage suppressor and light
DO - For DIN terminal (without connector, gasket is included.)



∗ DIN type is available with class B only.

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	J	230 VAC 50/60 Hz
5	24 VDC		

∗ Refer to Table (3) shown below for availability.

Suffix

Nil	—
Z	Oil-free spec.

Refer to page 203 for ordering coil only.

∗ Refer to Table (3) for available combinations between each electrical option (S, L, Z) and rated voltage.
∗ Surge voltage suppressor is integrated into the AC/Class B coil, as a standard.

How to Order Manifold Bases

VVX31
VVX32 **1 □ –07 –1**
VVX33

Manifold base

Suffix

Nil	—
Z	Oil-free spec.

Number of manifolds

02	2 stations
⋮	⋮
10	10 stations

Port size (Individual port)

1	Rc 1/8
2	Rc 1/4

∗ Common port sizes are all Rc 1/4.
∗∗ Indicating numbers shown below are for common ports.

Type	SUP port	EXH port
N.C.	1	3
N.O.	3	1

● Blanking plate part no.
For VX31: VVX31-4A-F
For VX32/33: VVX32-4A-F

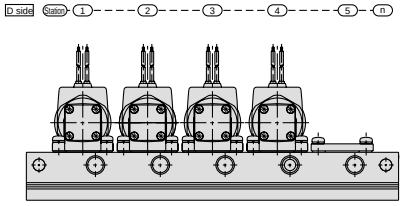
Seal material: FKM

How to Order Manifold Assemblies (Example)

Enter the valve and blanking plate to be mounted under the manifold base part number.

Example
VVX311-05-1 ..... 1 set
∗ VX3111A-00-1GR1.. 4 sets
∗ VVX31-4A-F..... 1 set

"∗" is the symbol for mounting.
Add an "∗" in front of the part numbers for solenoid valves, etc. to be mounted.



Enter the product's part number in order, counting the 1st station from the left in the manifold arrangement, when viewing the individual port in front.
The common port on the right side is plugged.

Table (1) Model/Orifice/Diameter

Solenoid valve model	Orifice symbol (Diameter)			
	1 (1.5 mmø)	2 (2.2 mmø)	3 (3 mmø)	4 (4 mmø)
VX31	●	●	●	—
VX32	—	●	●	●
VX33	—	●	●	●

Table (2) Solenoid Valve Option

Option symbol	Seal material		Body material/ Shading coil material	Guide pin material	Coil insulation type
	Main valve poppet	Fixed sealant			
A	FKM	FKM	Brass (C37)	PPS	B
D			Brass (C37)/Cu	Stainless steel	H

∗ Aluminum is only available as a material for the manifold base.
∗ The additives contained in oil are different depending on the type and manufacturers, so the durability of the seal materials will vary. For details, please consult with SMC.

Table (3) Rated Voltage – Electrical Entry – Electrical Option

Rated voltage			Class B			Class H		
			S	L	Z	S	L	Z
AC/DC	Voltage symbol	Voltage	With surge voltage suppressor	With light	With light and surge voltage suppressor	With surge voltage suppressor	With light	With light and surge voltage suppressor
AC	1	100 V	— Note)	●	— Note)	●	●	●
	2	200 V		●		●	●	●
	3	110 V		●		●	●	●
	4	220 V		●		●	●	●
	7	240 V		—		●	—	—
	8	48 V		—		●	—	—
	J	230 V		—		●	—	—
DC	5	24 V	●	●	●	DC specification is not available.		
	6	12 V	●	—	—			

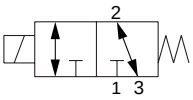
Note) Option S, Z are not available as surge voltage suppressor is integrated into the AC/Class B coil, as a standard.

For Steam /Single Unit

Model / Valve Specifications

COM.

Passage symbol



Port size	Orifice diameter (mmø)	Model	Max. operating pressure differential (MPa)	Flow characteristics		Max. system pressure (MPa)	Mass (g) Note)
			COM.	Av x $10^{-6}m^2$	Cv converted		
1/8 (6A)	1.5	**VX3114-01**	0.7	1.9	0.08	1.0	380
	2.2	**VX3124-01**	0.4	3.8	0.16		
	3	**VX3134-01**	0.2	5.8	0.24		
1/4 (8A)	1.5	**VX3114-02**	0.7	1.9	0.08		
	2.2	**VX3124-02**	0.4	3.8	0.16		
		VX3224-02	0.7	4.6	0.19		530
		VX3324-02	1				730
	3	**VX3134-02**	0.2	5.8	0.24		380
		VX3234-02	0.3	7.9	0.33		530
		VX3334-02	0.6				730
	4	**VX3244-02**	0.2	12	0.50		530
		VX3344-02	0.3				730
3/8 (10A)	2.2	**VX3224-03**	0.7	4.6	0.19		530
		VX3324-03	1				730
	3	**VX3234-03**	0.3	7.9	0.33		530
		VX3334-03	0.6				730
	4	**VX3244-03**	0.2	12	0.50		530
		VX3344-03	0.3				730

Note) Mass of grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for conduit terminal type respectively.
Also, add 60 g for VX31□□, 80 g for VX32□□ and VX33□□ respectively for bracket option.

• Refer to “Glossary of Terms” on page 26, for details on the max. operating pressure differential and the max. system pressure.

Fluid and Ambient Temperature

Power source	Fluid temperature (°C)	Ambient temperature (°C)
	Solenoid valve option (Symbol)	
	S, Q	
AC	183	–20 to 60

Valve Leakage Rate

Internal Leakage

Seal material	Leakage rate (Air)
FFKM	150 cm^3/min or less

External Leakage

Seal material	Leakage rate (Air)
PTFE	1 cm^3/min or less

How to Order (Single Unit)

VX 31 1 4 S □ – 01 □ – 1 G 1 – □

Model
Refer to Table (1) shown below for availability.

Orifice diameter
Refer to Table (1) shown below for availability.

Valve / Body type

4	COM. / Single unit

Solenoid valve option
Refer to Table (2) shown below for availability.

Port size
Refer to Table (1) shown below for availability.

Thread type

Nil	Rc
T	NPTF
F	G
N	NPT

Suffix

Nil	—
Z	Oil-free spec.

Rated voltage

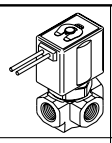
1	100 VAC 50/60 Hz	**7**	240 VAC 50/60 Hz
2	200 VAC 50/60 Hz	**8**	48 VAC 50/60 Hz
3	110 VAC 50/60 Hz	**J**	230 VAC 50/60 Hz
4	220 VAC 50/60 Hz		

∗ Refer to Table (3) shown below for availability.

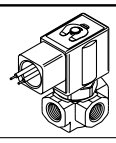
Refer to page 203 for ordering coil only.

Electrical entry

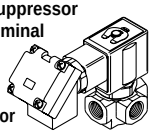
G - **Grommet**
GS - **With grommet surge voltage suppressor**



C - **Conduit**



T - **With conduit terminal**
TS - **With conduit terminal and surge voltage suppressor**
TL - **With conduit terminal and light**
TZ - **With conduit terminal, surge voltage suppressor and light**



∗ Refer to Table (3) for available combinations between each electrical option (S, L, Z) and rated voltage.

Bracket

Nil	None
B	With bracket

∗ Bracket is neither mountable nor removable.

Table (1) Model/Orifice Diameter/Port Size

Solenoid valve model				Orifice symbol (Diameter)			
Model	VX31	VX32	VX33	**1** (1.5 mmø)	**2** (2.2 mmø)	**3** (3 mmø)	**4** (4 mmø)
Port symbol (Port size)	**01** (1/8)	—	—	●	●	●	—
	02 (1/4)	—	—	●	●	●	—
	—	**02** (1/4)	**02** (1/4)	—	●	●	●
	—	**03** (3/8)	**03** (3/8)	—	●	●	●

Table (2) Solenoid Valve Option

Option symbol	Seal material		Body material/ Shading coil material	Guide pin material	Coil insulation type
	Main valve poppet	Fixed sealant			
S	FFKM	PTFE	Brass (C37)/Cu	Stainless steel	H
Q			Stainless steel/Ag		

Solenoid coil: AC/Class H only

Table (3) Rated Voltage – Electrical Option

Rated voltage			Class H		
			S	**L**	**Z**
AC/ DC	Voltage symbol	Voltage	With surge voltage suppressor	With light	With light and surge voltage suppressor
AC	**1**	100 V	●	●	●
	2	200 V	●	●	●
	3	110 V	●	●	●
	4	220 V	●	●	●
	7	240 V	●	—	—
	8	48 V	●	—	—
	J	230 V	●	—	—
DC	**5**	24 V	DC specification is not available.		
	6	12 V			

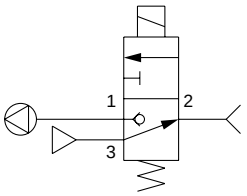
For Vacuum Pad / Single Unit
Series VXV31/32/33

- **Vacuum circuit side is suited for a large orifice. Supply pressure side is suited for high pressure and a vacuum pad.**
- **Construction and dimensions are the same as the VX3 series.**

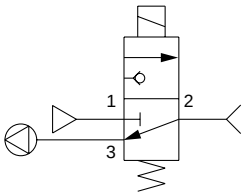
Model / Valve Specifications

N.C. **N.O.**

Passage symbol (example)



Passage symbol (example)



Port size	Orifice diameter (mmø)		Model	Operating pressure* (MPa)		Flow characteristics						Max. system pressure (MPa)	Mass Note) (g)
						Passage: 1⇔2			Passage: 2⇔3				
	Port 1 side	Port 3 side		Port 1 side	Port 3 side	C[dm³/(s·bar)]	b	Cv	C[dm³/(s·bar)]	b	Cv		
1/8 (6A)	3	1.5	**VXV3130-01**	Low vacuum	0 to 0.5	0.82	0.20	0.20	0.29	0.32	0.08	2.0	380
	1.5	3	**VXV3132-01**	0 to 0.5	Low vacuum	0.29	0.32	0.08	0.82	0.20	0.20		
1/4 (8A)	3	1.5	**VXV3130-02**	Low vacuum	0 to 0.5	0.82	0.20	0.20	0.29	0.32	0.08		
	1.5	3	**VXV3132-02**	0 to 0.5	Low vacuum	0.29	0.32	0.08	0.82	0.20	0.20		
	4	2.2	**VXV3240-02**	Low vacuum	0 to 0.5	1.6	0.20	0.38	0.64	0.40	0.17		530
			VXV3340-02		0 to 0.9								730
	2.2	4	**VXV3242-02**	0 to 0.5	Low vacuum	0.64	0.40	0.17	1.6	0.20	0.38		530
			VXV3342-02	0 to 0.9									730
3/8 (10A)	4	2.2	**VXV3240-03**	Low vacuum	0 to 0.5	1.6	0.20	0.38	0.64	0.40	0.17		530
			VXV3340-03		0 to 0.9								730
	2.2	4	**VXV3242-03**	0 to 0.5	Low vacuum	0.64	0.40	0.17	1.6	0.20	0.38		530
			VXV3342-03	0 to 0.9									730

Note) Mass of grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for conduit terminal type respectively.
Also, add 60 g for VX31□□, 80 g for VX32□□ and VX33□□ respectively for bracket option.

• Refer to "Glossary of Terms" on page 26, for details on the max. operating pressure differential and the max. system pressure.

* Low vacuum: Up to 1.3 x 10^2Pa

Fluid and Ambient Temperature

Power source	Fluid temperature (°C)	Ambient temperature (°C)
AC	–10 Note) to 60	–20 to 60
DC	–10 Note) to 60	–20 to 40

Note 1) Dew point temperature: –10°C or less

Valve Leakage Rate

Internal Leakage / External Leakage

Seal material	Leakage rate Note)
	Air
NBR, FKM	1 cm³/min or less

Note) Value when air pressure is applied.

How to Order (Single Unit)

DC

AC/Class B coil (Built-in full-wave rectifier type)

VXV 31 3 0 □ □ – 01 □ – 5 G 1 – □

VXV 31 3 0 □ □ – 01 □ – 1 G R1 – □

Model
Refer to Table (1) shown below for availability.

Orifice diameter
Refer to Table (1) shown below for availability.

Valve / Body type

0	N.C. / Single unit
2	N.O. / Single unit

Solenoid valve option
Refer to Table (2) shown below for availability.

Port size
Refer to Table (1) shown below for availability.

Bracket

Nil	None
B	With bracket

∗ Bracket is neither mountable nor removable.

Built-in full-wave rectifier type

Suffix

Nil	—
Z	Oil-free spec.

Thread type

Nil	Rc
T	NPTF
F	G
N	NPT

Rated voltage

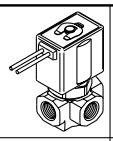
1	100 VAC 50/60 Hz	**6**	12 VDC
2	200 VAC 50/60 Hz	**7**	240 VAC 50/60 Hz
3	110 VAC 50/60 Hz	**8**	48 VAC 50/60 Hz
4	220 VAC 50/60 Hz	**J**	230 VAC 50/60 Hz
5	24 VDC		

∗ Refer to Table (3) shown below for availability.

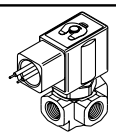
Refer to page 203 for ordering coil only.

Electrical entry

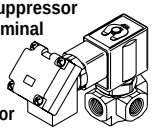
G - **Grommet**
GS - **With grommet surge voltage suppressor**



C - **Conduit**

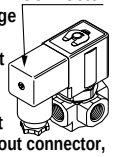


T - **With conduit terminal**
TS - **With conduit terminal and surge voltage suppressor**
TL - **With conduit terminal and light**
TZ - **With conduit terminal, surge voltage suppressor and light**



D - **DIN terminal**
DS - **DIN terminal with surge voltage suppressor**
DL - **DIN terminal with light**
DZ - **DIN terminal with surge voltage suppressor and light**
DO - **For DIN terminal (without connector, gasket is included.)**

Connector



∗ DIN type is available with class B only.

∗ Refer to Table (3) for available combinations between each electrical option (S, L, Z) and rated voltage.
∗ Surge voltage suppressor is integrated into the AC/Class B coil, as a standard.

Table (1) Model/Orifice Diameter/Port Size

Solenoid valve model				Orifice symbol (Diameter) Note)	
Model	**VXV31**	**VXV32**	**VXV33**	**3** (1.5/3 mmø)	**4** (2.2/4 mmø)
Port symbol (Port size)	**01** (1/8)	—	—	●	—
	02 (1/4)	—	—	●	—
	—	**02** (1/4)	**02** (1/4)	—	●
	—	**03** (3/8)	**03** (3/8)	—	●

Note) The orifice diameter shown above are for the supply pressure side/ vacuum side port.

Table (2) Solenoid Valve Option

Option symbol	Seal material		Body material	Guide pin material	Coil insulation type
	Main valve poppet	Fixed sealant			
Nil	NBR	NBR	Brass (C37)	PPS	B
A	FKM	FKM			
G	NBR	NBR	Stainless steel		
H	FKM	FKM			

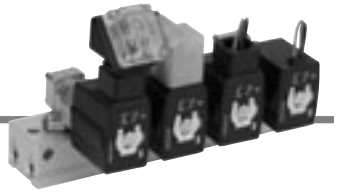
Table (3) Rated Voltage – Electrical Option

Rated voltage			Class B		
			S	**L**	**Z**
AC/ DC	Voltage symbol	Voltage	With surge voltage suppressor	With light	With light and surge voltage suppressor
AC	**1**	100 V	— Note)	●	— Note)
	2	200 V		●	
	3	110 V		●	
	4	220 V		●	
	7	240 V		—	
	8	48 V		—	
	J	230 V		—	
DC	**5**	24 V	●	●	●
	6	12 V	●	—	—

Note) Option S, Z are not available as surge voltage suppressor is integrated into the AC/Class B coil, as a standard.
∗ Class H coil is not available.

For Vacuum Pad / Manifold
Series VVXV31/32/33

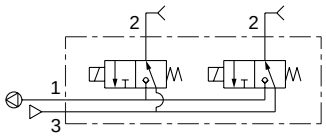
- **Construction and dimensions are the same as those of the VVX3 series.**



Model / Valve Specifications

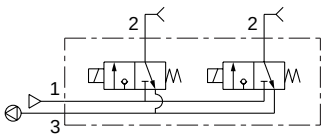
N.C.

Passage symbol (example)



N.O.

Passage symbol (example)



Orifice diameter (mmø)		Model	Operating pressure* (MPa)		Flow characteristics						Max. system pressure (MPa)
					Passage: 1⇔2			Passage: 2⇔3			
Port 1 side	Port 3 side		Port 1 side	Port 3 side	C[dm³/(s·bar)]	b	Cv	C[dm³/(s·bar)]	b	Cv	
3	1.5	**VXV3131-00**	Low vacuum	0 to 0.5	0.82	0.20	0.20	0.29	0.32	0.08	2.0
1.5	3	**VXV3133-00**	0 to 0.5	Low vacuum	0.29	0.32	0.08	0.82	0.20	0.20	
4	2.2	**VXV3241-00**	Low vacuum	0 to 0.5	1.6	0.20	0.38	0.64	0.40	0.17	
		VXV3341-00		0 to 0.9							
2.2	4	**VXV3243-00**	0 to 0.5	Low vacuum	0.64	0.40	0.17	1.6	0.20	0.38	
		VXV3343-00	0 to 0.9								

• Refer to "Glossary of Terms" on page 26 for details on the max. operating pressure differential and the max. system pressure.
∗ Low vacuum: Up to 1.3 x 10^2Pa

Fluid and Ambient Temperature

Power source	Fluid temperature (°C)	Ambient temperature (°C)
AC	–10 Note) to 60	–20 to 60
DC	–10 Note) to 60	–20 to 40

Note 1) Dew point temperature: –10°C or less

Valve Leakage Rate

Internal Leakage / External Leakage

Seal material	Leakage rate Note)
	Air
NBR, FKM	1 cm³/min or less

Note) Value when air pressure is applied.

How to Order (Solenoid Valve for Manifold)

DC

AC/Class B coil (Built-in full-wave rectifier type)

VXV 31 3 1 □ □ – 00 – 5 G 1

VXV 31 3 1 □ □ – 00 – 1 G R1

Model
Refer to Table (1) shown below for availability.

Orifice diameter
Refer to Table (1) shown below for availability.

Valve / Body type

1	N.C. / Manifold
3	N.O. / Manifold

Solenoid valve option
Refer to Table (2) shown below for availability.

Suffix

Nil	—
Z	Oil-free spec.

Built-in full-wave rectifier type

Electrical entry

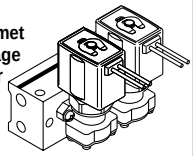
Rated voltage

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	J	230 VAC 50/60 Hz
5	24 VDC		

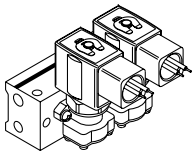
∗ Refer to Table (3) shown below for availability.

Refer to page 203 for ordering coil only.

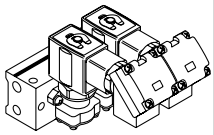
G - Grommet
GS - With grommet surge voltage suppressor



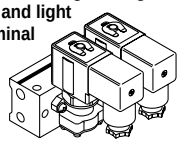
C - Conduit



T - With conduit terminal
TS - With conduit terminal and surge voltage suppressor
TL - With conduit terminal and light
TZ - With conduit terminal, surge voltage suppressor and light



D - DIN terminal
DS - DIN terminal with surge voltage suppressor
DL - DIN terminal with light
DZ - DIN terminal with surge voltage suppressor and light
DO - For DIN terminal (without connector, gasket is included.)



∗ DIN type is available with class B only.

∗ Refer to Table (3) for available combinations between each electrical option (S, L, Z) and rated voltage.
∗ Surge voltage suppressor is integrated into the AC/Class B coil, as a standard.

How to Order Manifold Bases

VVX31
VVX32 **1 □ – 07 – 1**
VVX33

Number of manifolds

02	2 stations
⋮	⋮
10	10 stations

Port size (Individual port)

1	Rc 1/8
2	Rc 1/4

∗ Common port sizes are all Rc 1/4.
∗∗ Indicating numbers shown below are for common ports.

Type	Vacuum side port	SUP side port
N.C.	1	3
N.O.	3	1

Suffix

Nil	—
Z	Oil-free spec.

Manifold base

● **Blanking plate part no.**

For VXV31: VVX31-4A-□
For VXV32/33: VVX32-4A-□

Seal material

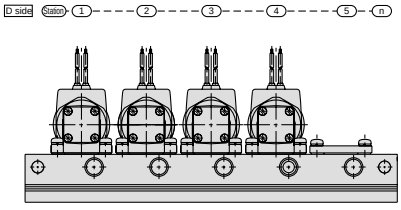
Nil	NBR
F	FKM

How to Order Manifold Assemblies (Example)

Enter the valve and blanking plate to be mounted under the manifold base part number.

Example
VVX311-05-1 ..... 1 set
∗ VXV3131-00-1GR1.. 4 sets
∗ VVX31-4A ..... 1 set

"∗" is the symbol for mounting.
Add an "∗" in front of the part numbers for solenoid valves, etc. to be mounted.



Enter the product's part number in order, counting the 1st station from the left in the manifold arrangement, when viewing the individual port in front.
The common port on the right side is plugged.

Table (1) Model/Orifice Diameter

Solenoid valve model	Orifice symbol (Diameter) Note)	
	3 (1.5/3 mmø)	4 (2.2/4 mmø)
VXV31	●	—
VXV32	—	●
VXV33	—	●

Note) The orifice diameter shows the supply pressure side/vacuum side.

Table (2) Solenoid Valve Option

Option symbol	Seal material		Body material	Guide pin material	Coil insulation type
	Main valve poppet	Fixed sealant			
Nil	NBR	NBR	Brass (C37)	PPS	B
A	FKM	FKM			

∗ Aluminum is only available as a material for the manifold base.

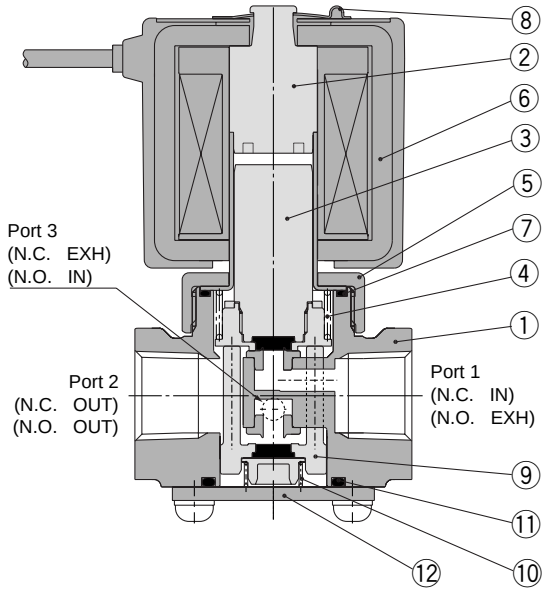
Table (3) Rated Voltage – Electrical Option

Rated voltage			Class B		
			S	L	Z
AC/DC	Voltage symbol	Voltage	With surge voltage suppressor	With light	With surge voltage suppressor
AC	1	100 V	— Note)	●	— Note)
	2	200 V		●	
	3	110 V		●	
	4	220 V		●	
	7	240 V		—	
	8	48 V		—	
	J	230 V		—	
DC	5	24 V	●	●	●
	6	12 V	●	—	—

∗ Class H coil is not available.
Note) Option S, Z are not available as surge voltage suppressor is integrated into the AC/Class B coil, as a standard.

Construction

Single unit
Body material: Brass (C37), Stainless steel

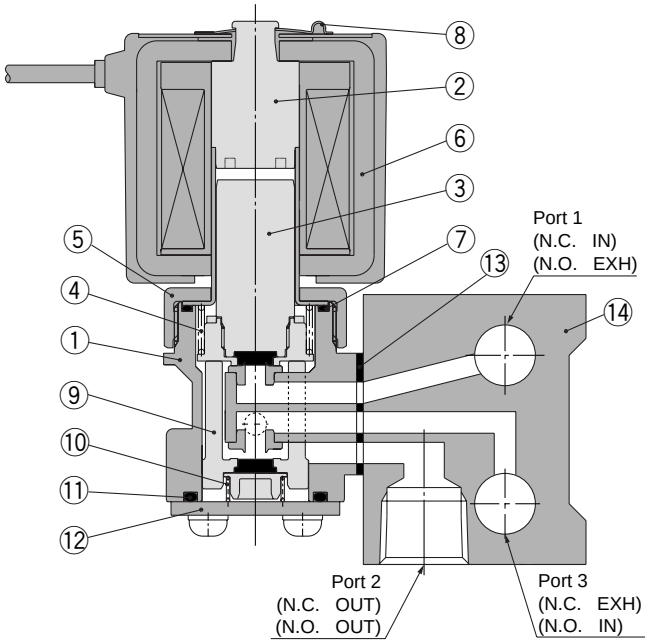


Component Parts

No.	Description	Material	
		Standard	Option
1	**Body**	Brass (C37)	Stainless steel
2	**Tube assembly** Note)	Stainless steel, Cu	Stainless steel, Ag
3	**Armature assembly**	Stainless steel, C36, PTFE (NBR)	Stainless steel, PTFE (FKM, EPDM, FFKM)
4	**Return spring**	Stainless steel	
5	**Nut**	Brass (C37)	Brass (C37)/Ni plated
6	**Solenoid coil**	Class B molded	Class H molded
7	**O-ring**	(NBR)	(FKM, EPDM, PTFE)
8	**Clip**	SK	
9	**Guide pin assembly**	PPS, C36 (NBR)	Stainless steel (FKM, EPDM, FFKM)
10	**Support spring**	Stainless steel	
11	**O-ring**	(NBR)	(FKM, EPDM, PTFE)
12	**Plate**	Stainless steel	

The materials in parentheses are the seal materials.
Note) Cu and Ag are not applicable to the DC spec and to the AC spec with built-in full-wave rectifier.

Manifold
Base material: Aluminum
Manifold body material: Brass (C37)



Component Parts

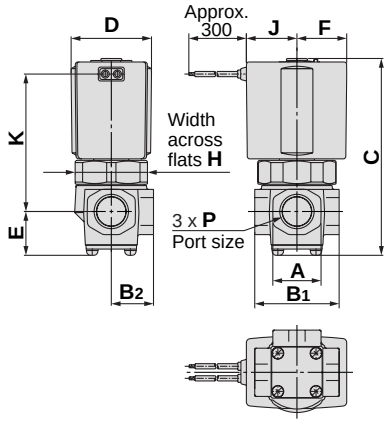
No.	Description	Material	
		Standard	Option
1	**Manifold body**	Brass (C37)	
2	**Tube assembly** Note)	Stainless steel, Cu	
3	**Armature assembly**	Stainless steel, C36, PTFE (NBR)	Stainless steel, PTFE (FKM, EPDM)
4	**Return spring**	Stainless steel	
5	**Nut**	Brass (C37)	Brass (C37)/Ni plated
6	**Solenoid coil**	Class B molded	Class H molded
7	**O-ring**	(NBR)	(FKM, EPDM)
8	**Clip**	SK	
9	**Guide pin assembly**	PPS, C36 (NBR)	Stainless steel (FKM, EPDM)
10	**Support spring**	Stainless steel	
11	**O-ring**	(NBR)	(FKM, EPDM)
12	**Plate**	Stainless steel	
13	**Gasket**	(NBR)	(FKM, EPDM)
14	**Base**	Aluminum	

The materials in parentheses are the seal materials.
Note) Cu is not applicable to the DC spec and to the AC spec with built-in full-wave rectifier.

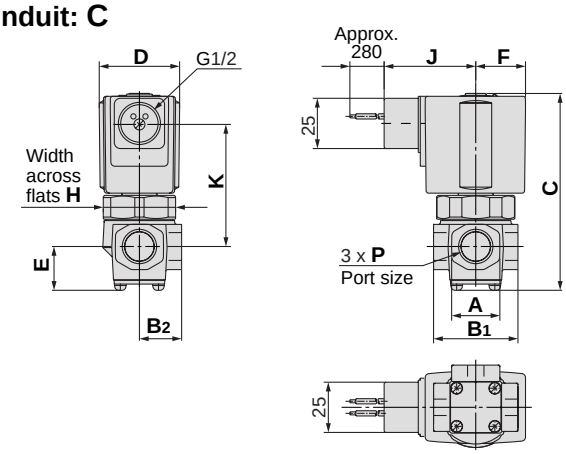
Dimensions: Single Unit / Body Material: Brass (C37), Stainless Steel

Normally closed (N.C.) : VX31□0/VX32□0/VX33□0
Normally open (N.O.) : VX31□2/VX32□2/VX33□2
Common (COM.) : VX31□4/VX32□4/VX33□4

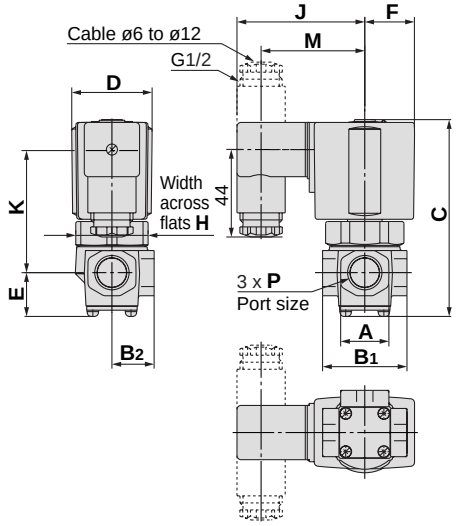
Grommet: G



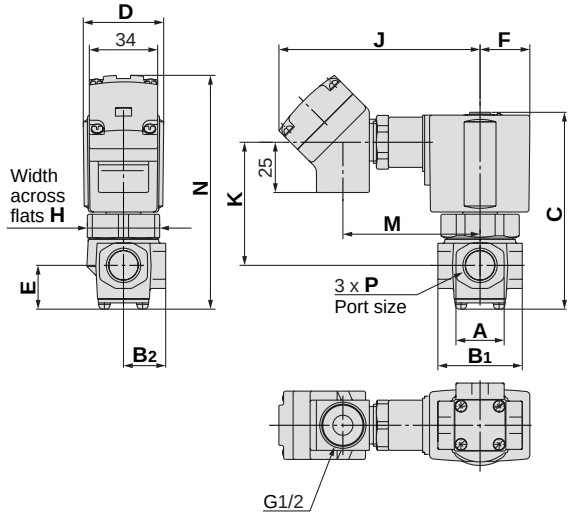
Conduit: C



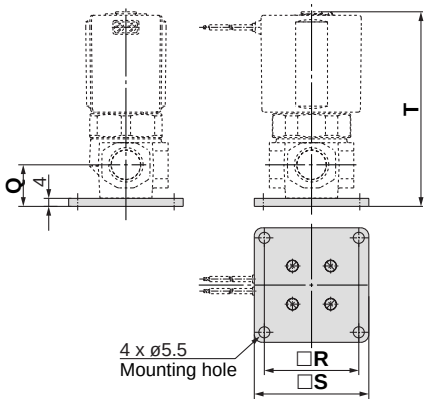
DIN terminal: D



Conduit terminal: T



With bracket



(mm)

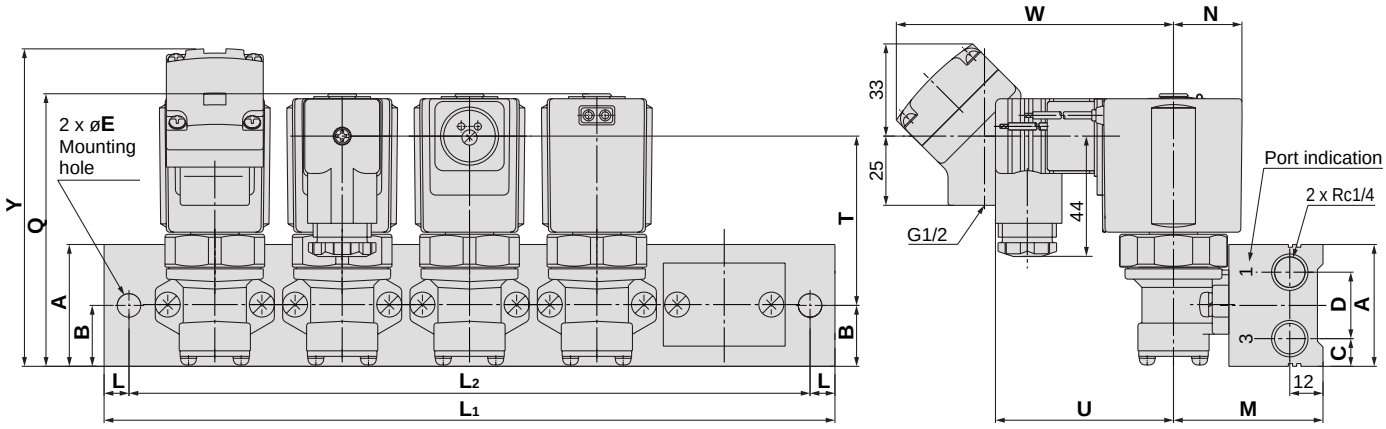
Model N.C., N.O., COM.	Orifice diameter	Port size P	Electrical entry (AC/Class B)										
			Grommet		Conduit		DIN terminal			Conduit terminal			
			J	K	J	K	J	K	M	J	K	M	N
VX31□□	ø1.5, ø2.2, ø3	1/8	30	46	48.5	41	65.5	42	53.5	100.5	41	69.5	91.5
VX31□□	ø1.5, ø2.2, ø3	1/4											
VX32□□	ø2.2, ø3, ø4	1/4, 3/8	33	56	51.5	51	68.5	52	56.5	103.5	51	72.5	105
VX33□□	ø2.2, ø3, ø4	1/4, 3/8	36	64.5	54	59.5	71	60.5	59	106	59.5	75	113

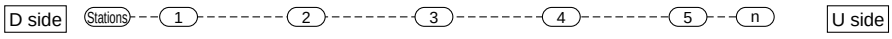
(mm)

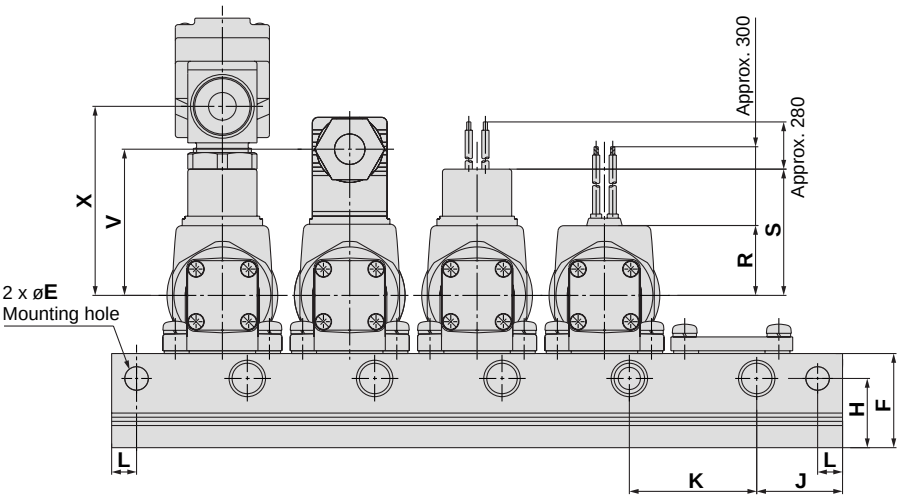
Model N.C., N.O., COM.	Orifice diameter	Port size P	A	B		C	D	E	F	H	Electrical entry (DC, AC/Class H)										Bracket mounting			
											Grommet		Conduit		DIN terminal			Conduit terminal						
				B1	B2						J	K	J	K	J	K	M	J	K	M	N	Q	R	S	T
VX31□□	ø1.5, ø2.2, ø3	1/8	22	36	18	76.5	30	19	19.5	27	19.5	50	40	42.5	58.5	42	46.5	92	42.5	61	93	17.5	40	50	75.5
VX31□□	ø1.5, ø2.2, ø3	1/4		41	20.5																			
VX32□□	ø2.2, ø3, ø4	1/4, 3/8	24	42	21	90	35	22	22.5	32	22.5	60	43	52.5	61.5	52	49.5	95	52.5	64	106.5	21	47	57	89
VX33□□	ø2.2, ø3, ø4	1/4, 3/8	24	42	21	98	40	22	25	36	25.5	68.5	46	61	64	60.5	52	98	61	66.5	114.5	21	47	57	97

Dimensions: Manifold / Base Material: Aluminum

Normally closed (N.C.) :
Normally open (N.O.) : VVX31/VVX32/VVX33
Common (COM.) :







(mm)

Model	Dimension	n (stations)								
		2	3	4	5	6	7	8	9	10
VVX31	L1	96	132	168	204	240	276	312	348	384
	L2	84	120	156	192	228	264	300	336	372
VVX32	L1	126	172	218	264	310	356	402	448	494
VVX33	L2	108	154	200	246	292	338	384	430	476

(mm)

Model	A	B	C	D	E	F	H	J	K	L	M	N	Q	Electrical entry (DC, AC/Class H)								
														Grommet	Conduit		DIN terminal			Conduit terminal		
														R	S	T	T	U	V	W	X	Y
VVX31	40	20	9	22	6.5	33	24	26	36	6	49	19.5	80.5	19.5	40	45.5	45	58.5	46.5	92	61	97
VVX32	44	22	10	24	8.5	34	25	31	46	9	55	22.5	91	22.5	43	54	53.5	61.5	49.5	95	64	107.5
VVX33	44	22	10	24	8.5	34	25	31	46	9	55	25	99.5	25.5	46	62	61.5	64	52	98	66.5	116

(mm)

Model	Electrical entry (AC/Class B)								
	Grommet	Conduit		DIN terminal			Conduit terminal		
	R	S	T	T	U	V	W	X	Y
VVX31	30	48.5	44	45	65.5	53.5	100.5	69.5	95.5
VVX32	33	51.5	52.5	53.5	68.5	56.5	103.5	72.5	106
VVX33	36	54	60.5	61.5	71	59	106	75	114.5

Replacement Parts

• Solenoid coil assembly part no.

DC

VX02 1 N − 5 G

Series

1	VX31□□
2	VX32□□
3	VX33□□

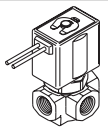
Rated voltage Note)

5	24 VDC
6	12 VDC

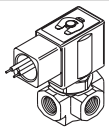
Note 1) Refer to Table (1) for available combinations.

Electrical entry

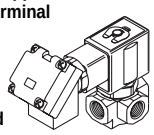
G - **Grommet**
GS - **With grommet surge voltage suppressor**



C - **Conduit**



T - **With conduit terminal**
TS - **With conduit terminal and surge voltage suppressor**
TL - **With conduit terminal and light**
TZ - **With conduit terminal, surge voltage suppressor and light**



D - **DIN terminal**
DS - **DIN terminal with surge voltage suppressor**
DL - **DIN terminal with light**
DZ - **DIN terminal with surge voltage suppressor and light**
DO - **For DIN terminal (without connector)**

Connector

∗ Refer to Table (1) for available combinations between each electrical option and rated voltage.

AC/Class H coil

VX02 1 N − 1 G − H − 2 − Z

Series

1	VX31□□
2	VX32□□
3	VX33□□

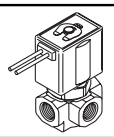
Rated voltage Note)

1	100 VAC 50/60 Hz
2	200 VAC 50/60 Hz
3	110 VAC 50/60 Hz
4	220 VAC 50/60 Hz
7	240 VAC 50/60 Hz
8	48 VAC 50/60 Hz
J	230 VAC 50/60 Hz

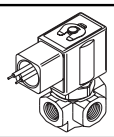
Note 1) Refer to Table (1) for available combinations.

Electrical entry

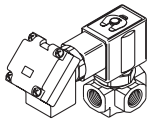
G - **Grommet**
GS - **With grommet surge voltage suppressor**



C - **Conduit**



T - **With conduit terminal**
TS - **With conduit terminal and surge voltage suppressor**
TL - **With conduit terminal and light**
TZ - **With conduit terminal, surge voltage suppressor and light**



∗ Refer to Table (1) for available combinations between each electrical option and rated voltage.

AC/Class B coil (Built-in full-wave rectifier type)

VX02 1 N − 1 G R

Series

1	VX31□□
2	VX32□□
3	VX33□□

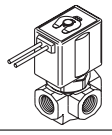
Rated voltage Note)

1	100 VAC 50/60 Hz
2	200 VAC 50/60 Hz
3	110 VAC 50/60 Hz
4	220 VAC 50/60 Hz
7	240 VAC 50/60 Hz
8	48 VAC 50/60 Hz
J	230 VAC 50/60 Hz

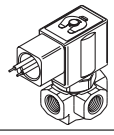
Note 1) Refer to Table (1) for available combinations.

Electrical entry

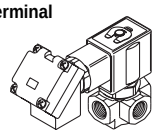
G - **Grommet**



C - **Conduit**

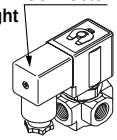


T - **With conduit terminal**
TL - **With conduit terminal and light**



D - **DIN terminal**
DL - **DIN terminal with light**
DO - **For DIN terminal (without connector)**

Connector



∗ Refer to Table (1) for available combinations between each electrical option and rated voltage.
∗ Surge voltage suppressor is integrated into the AC/Class B coil, as a standard.

Table (1) Rated Voltage – Electrical Option

Rated voltage			Class B			Class H		
			S	L	Z	S	L	Z
AC/DC	Voltage symbol	Voltage	With surge voltage suppressor	With light	With light and surge voltage suppressor	With surge voltage suppressor	With light	With light and surge voltage suppressor
AC	1	100 V	— Note)	●	— Note)	●	●	●
	2	200 V		●		●	●	●
	3	110 V		●		●	●	●
	4	220 V		●		●	●	●
	7	240 V		—		●	—	—
	8	48 V		—		●	—	—
	J	230 V		—		●	—	—
DC	5	24 V	●	●	●	DC specification is not available.		
	6	12 V	●	—	—			

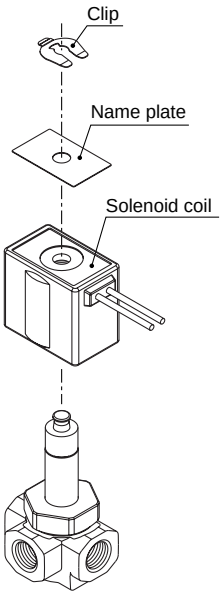
Note) Option S, Z are not available since a surge voltage suppressor is integrated into the AC/Class B coil, as a standard.
∗ When changing coils, AC/DC are not interchangeable with each other, and Class B and H coils are also not interchangeable with each other.

Replacement Parts

- **Name plate part no.**

AZ-T-VX **Valve model**

↑ Enter by referring to "How to Order".



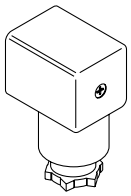
- **Clip part no.**

For VX31: VX021N-10
For VX32: VX022N-10
For VX33: VX023N-10

- **DIN connector part no.**

Without electrical option **GDM2A**

With electrical option **GDM2A −** □□



Electrical option

S	With surge voltage suppressor
L	With light
Z	With light and surge voltage suppressor

∗ Refer to Table (1) for available combinations between each electrical option (S, L, Z) and rated voltage.

Rated voltage

1	100 VAC, 110 VAC
2	200 VAC, 220 VAC, 230 VAC, 240 VAC
5	24 VDC
6	12 VDC
15	48 VAC

- **Gasket part no. for DIN connector**

VCW20-1-29-1