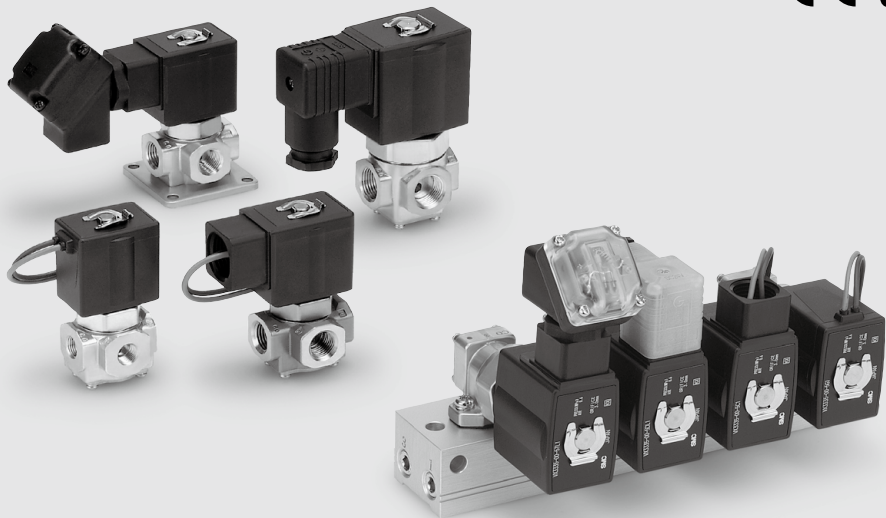


Direct Operated 3 Port Solenoid Valve

VX31/32/33 Series

For Air, Water, Oil, Steam



| |
|------------|
| VX2 |
| VXK |
| VXD |
| VXZ |
| VXS |
| VXB |
| VXE |
| VXP |
| VXR |
| VXH |
| VXF |
| VX3 |
| VXA |

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

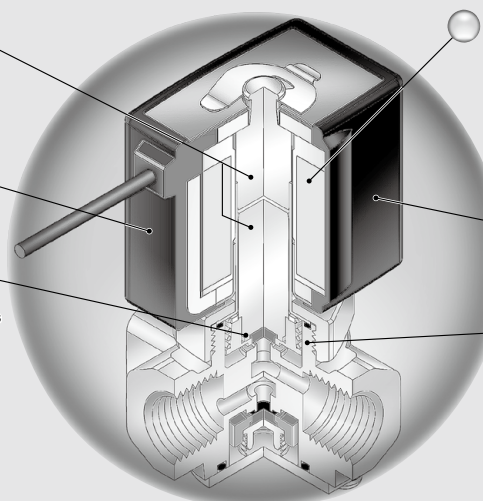
Improved corrosion resistance

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

VX31/32/33 Series

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

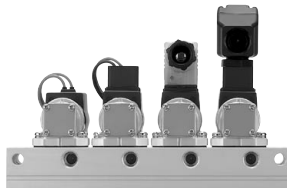
100 VAC, 200 VAC, 110 VAC,
220 VAC, 240 VAC, 230 VAC,
48 VAC, 24 VDC, 12 VDC

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 | 1/4 | | |
| | EXH port | 1/8, 1/4 | |
| | OUT port | 1/4 | |
| IN port | | | |

VX31/32/33 Series

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.
For enclosure, refer to "Glossary of Terms" on page 403.

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 | Frequency (Hz) | Apparent power (VA) | | Temperature rise (°C) ^{Note)} |
|-------|----------------|---------------------|-----------|--|
| | | 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

| | | | |
|------------------------------|-------|-----------------------------------|-------|
| For Air /Single Unit | P.382 | For Vacuum Pad /Single Unit | P.394 |
| For Air /Manifold | P.384 | For Vacuum Pad /Manifold | P.396 |
| For Water /Single Unit | P.386 | Construction | P.398 |
| For Oil /Single Unit | P.388 | Dimensions /Single Unit | P.399 |
| For Oil /Manifold | P.390 | Dimensions /Manifold | P.400 |
| For Steam /Single Unit | P.392 | Replacement Parts | P.401 |

Direct Operated 3 Port Solenoid Valve

VX31/32/33 Series

Applicable Fluid Check List



All Options (Single Unit)

Refer to page 382 and after for specifications and models.

VX3 - - 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 | | | |
| Others | B | EPDM | EPDM | Brass (C37) | PPS | B | COM. only |
| | C | | | Stainless steel | | | |
| | K ^{Note 1, 2)} | FFKM | PTFE | Stainless steel | Stainless steel | B | COM. only, Oil-free |

VX2
VXK
VXD
VXZ
VXS
VXB
VXE
VXP
VXR
VXH
VXF
VX3
VXA

All Options (Manifold)*

Refer to page 384 and after for specifications and models.

VX3 - 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.

Note 1) The leakage amount (10⁻³ 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.

VX31/32/33 Series

For Air /Single Unit

(Non-leak, Medium vacuum)

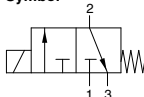
Model / Valve Specifications

N.C.

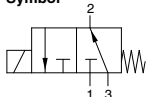
N.O.

COM.

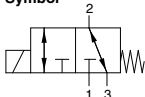
Symbol



Symbol



Symbol



Note) Symbols for N.C. and N.O. types

The symbols show that the N.C. type; port 3 and N.O. type; port 1 are in a blocked state (T). However, use each port pressure in the state shown below.

N.C. type: Pressure at port 1 ≥ Pressure at port 2 ≥ Pressure at port 3

N.O. type: Pressure at port 3 ≥ Pressure at port 2 ≥ Pressure at port 1

| Port size | Orifice diameter (mm) | Model | Max. operating pressure differential ^{Note 3)} (MPa) | | | Flow rate characteristics ^{Note 1)} | | | Max. system pressure ^{Note 3)} (MPa) | Weight ^{Note 2)} (g) | |
|-----------|-----------------------|-----------|---|------|------|--|------|------|---|-------------------------------|------|
| | | | N.C. | N.O. | COM. | C(dm ³ /(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 | | | |
| | | 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 | | | |
| | VX332□-02 | 1.6 | 1.6 | 1 | | | | | | | |
| | 2.2 | VX313□-02 | 0.3 | 0.3 | 0.2 | 0.82 | 0.20 | 0.20 | | | |
| | | VX323□-02 | 0.6 | 0.5 | 0.3 | 1.1 | 0.25 | 0.27 | | | |
| | | VX333□-02 | 1 | 0.9 | 0.6 | | | | | | |
| | VX324□-02 | 0.3 | 0.25 | 0.2 | | | | | | | |
| | 3 | VX334□-02 | 0.5 | 0.4 | 0.3 | 1.6 | 0.20 | 0.38 | | | |
| 4 | | VX322□-03 | 1.2 | 1 | 0.7 | | | | 0.64 | 0.40 | 0.17 |
| | | VX332□-03 | 1.6 | 1.6 | 1 | | | | | | |
| | VX323□-03 | 0.6 | 0.5 | 0.3 | | | | | | | |
| 3/8 (10A) | 2.2 | VX333□-03 | 1 | 0.9 | 0.6 | 1.1 | 0.25 | 0.27 | | | |
| | | VX324□-03 | 0.3 | 0.25 | 0.2 | | | | | | |
| | | VX334□-03 | 0.5 | 0.4 | 0.3 | | | | | | |
| | 3 | VX322□-03 | 1.2 | 1 | 0.7 | 1.6 | 0.20 | 0.38 | | | |
| | | VX332□-03 | 1.6 | 1.6 | 1 | | | | | | |
| | | VX323□-03 | 0.6 | 0.5 | 0.3 | | | | | | |
| 4 | VX333□-03 | 1 | 0.9 | 0.6 | 1.1 | 0.25 | 0.27 | | | | |
| | VX324□-03 | 0.3 | 0.25 | 0.2 | | | | | | | |
| | VX334□-03 | 0.5 | 0.4 | 0.3 | | | | | | | |

Note 1) The flow rate characteristics of this product have variations.

When the highly precise flow control is required according to the system to be used, select an orifice diameter 1.3 times larger than that shown above and install a restrictor on the downstream side of the solenoid valve to make the adjustment.

Note 2) Weight 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.

Note 3) Refer to "Glossary of Terms" on page 403, 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) | | |
| | NII, 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 cm ³ /min or less | 10 ⁻⁶ Pa·m ³ /sec or less |
| | 1 MPa or more | 2 cm ³ /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)

Model
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 |

Suffix

| | |
|-----|----------------|
| Nil | — |
| Z | Oil-free spec. |

VX31 1 4 [] [] - 01 [] - 5 G 1 - []

VX31 1 4 [] [] - 01 [] - 1 GR1 - []

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

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

Thread type
Refer to Table (1) shown below for availability.

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

Electrical entry

| | |
|---|---|
| G - Grommet | C - Conduit |
| GS - With grommet surge voltage suppressor | |
| T - With conduit terminal | D - DIN terminal |
| TS - With conduit terminal and surge voltage suppressor | DS - DIN terminal with surge voltage suppressor |
| TL - With conduit terminal and light | DL - DIN terminal with light |
| TZ - With conduit terminal, surge voltage suppressor and light | DZ - DIN terminal with surge voltage suppressor and light |
| | DD - For DIN terminal (without connector, gasket is included.) |

* DIN type is available with class B only.

Bracket

| | |
|-----|--------------|
| Nil | None |
| B | With bracket |

* Bracket is neither mountable nor removable.

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 401 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

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

Table (2) Solenoid Valve Option

| Option symbol | Seal material Main valve poppet | Fixed sealant | Body material/ Shading coil material | Guide pin material | Coil insulation type | Note ^(Note) |
|---------------|---------------------------------------|---------------|--|-----------------------|----------------------------|---|
| Nil | NBR | NBR | Brass (C37) | PPS | B | — |
| G | | | Stainless steel | | | |
| M | FKM | FKM | Stainless steel | PPS | B | Non-leak (10 ⁻⁶ Pa·m ³ /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 | Voltage symbol | With surge voltage suppressor | With light | With light and surge voltage suppressor |
| | 1 | 100 V | ● | — (Note) |
| | 2 | 200 V | ● | — (Note) |
| | 3 | 110 V | ● | — (Note) |
| | 4 | 220 V | ● | — (Note) |
| | 7 | 240 V | — | — (Note) |
| | 8 | 48 V | — | — (Note) |
| DC | J | 230 V | — | — (Note) |
| | 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.

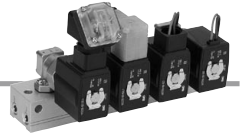
- VX2
- VXK
- VXD
- VXZ
- VXS
- VXB
- VXE
- VXP
- VXR
- VXH
- VXF
- VX3
- VXA

VVX31/32/33 Series

For Air /Manifold

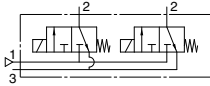
(Non-leak, Medium vacuum)

Solenoid Valve for Manifold / Valve Specifications

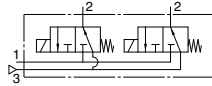


| | | |
|-------------|-------------|-------------|
| N.C. | N.O. | COM. |
|-------------|-------------|-------------|

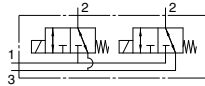
Symbol



Symbol



Symbol



Note) Symbols for N.C. and N.O. types

The symbols show that the N.C. type: port 3 and N.O. type: port 1 are in a blocked state (T).

However, use each port pressure in the state shown below.

N.C. type: Pressure at port 1 \geq Pressure at port 2 \geq Pressure at port 3

N.O. type: Pressure at port 3 \geq Pressure at port 2 \geq Pressure at port 1

| Orifice diameter (mm) | Model | Max. operating pressure differential ^{Note 2)} (MPa) | | | Flow rate characteristics ^{Note 1)} | | | Max. system pressure ^{Note 2)} (MPa) |
|-----------------------|-----------|---|------|------|--|------|------|---|
| | | N.C. | N.O. | COM. | Cj[dm ³ /(s·bar)] | b | Cv | |
| 1.5 | VX311□-00 | 1 | 1 | 0.7 | 0.29 | 0.32 | 0.08 | 2.0 |
| | VX312□-00 | 0.7 | 0.5 | 0.4 | 0.60 | 0.25 | 0.15 | |
| 2.2 | 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 | 1.1 | 0.25 | 0.27 | |
| | VX323□-00 | 0.6 | 0.5 | 0.3 | | | | |
| | 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 | | | | |

Note 1) The flow rate characteristics of this product have variations.

When the highly precise flow control is required according to the system to be used, select an orifice diameter 1.3 times larger than that shown above and install a restrictor on the downstream side of the solenoid valve to make the adjustment.

Note 2) Refer to "Glossary of Terms" on page 403 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 MPa or more | 1 cm ³ /min or less 2 cm ³ /min or less | 10 ⁻⁶ Pa·m ³ /sec 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)

VX31 1 1 -00-5 G 1
VX31 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.

Suffix

Built-in full-wave rectifier type

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.

| | |
|-----|----------------|
| 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 401 for ordering coil only.

Electrical entry

| | |
|---|--|
| <p>G - Grommet GS - With grommet surge voltage suppressor</p> | <p>C - Conduit</p> |
| <p>T - With conduit terminal TS - With conduit terminal and surge voltage suppressor</p> <p>TL - With conduit terminal and light TZ - With conduit terminal, surge voltage suppressor and light</p> | <p>D - DIN terminal DS - DIN terminal with surge voltage suppressor</p> <p>DL - DIN terminal with light DZ - DIN terminal with surge voltage suppressor and light</p> <p>DO - For DIN terminal (without connector, gasket is included.)</p> |

* 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

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 |

Manifold base

Blanking plate part no.

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

Seal material

| | |
|-----|-----|
| Nil | NBR |
| F | FKM |

Number of manifolds

| | |
|----|-------------|
| 02 | 2 stations |
| : | : |
| 10 | 10 stations |

Suffix

| | |
|-----|----------------|
| Nil | — |
| Z | Oil-free spec. |

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 Main valve poppet | Fixed sealant | Body material | Guide pin material | Coil insulation type | Note (Note) |
|---------------|------------------------------------|---------------|---------------|--------------------|----------------------|--|
| Nil | NBR | NBR | Brass (C37) | PPS | B | Non-leak (10 ⁻⁶ Pa·m ³ /sec), Medium vacuum (0.1 Pa.abs), Oil-free |
| V | FKM | FKM | | | | |

* 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

| AC/DC | Rated voltage | | Class B | | |
|-------|----------------|---------|------------------------------------|-----------------|--|
| | Voltage symbol | Voltage | S With surge voltage suppressor | L With light | Z 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 | | — | |
| DC | J | 230 V | ● | ● | ● |
| | 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.

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
* VVX311-00-1GR1 ... 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.

VX31/32/33 Series

For Water /Single Unit

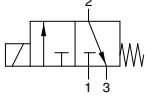
Model / Valve Specifications

N.C.

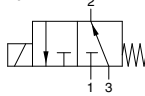
N.O.

COM.

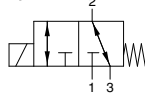
Symbol



Symbol



Symbol



Note) Symbols for N.C. and N.O. types

The symbols show that the N.C. type; port 3 and N.O. type; port 1 are in a blocked state (T).
However, use each port pressure in the state shown below.

N.C. type: Pressure at port 1 ≥ Pressure at port 2 ≥ Pressure at port 3
N.O. type: Pressure at port 3 ≥ Pressure at port 2 ≥ Pressure at port 1

| Port size | Orifice diameter (mm) | Model | Max. operating pressure differential ^{Note 3)} (MPa) | | | Flow rate characteristics ^{Note 1)} | | Max. system pressure ^{Note 3)} (MPa) | Weight ^{Note 2)} (g) | | | |
|--------------|-----------------------|-----------|---|------|------|--|--------------|---|-------------------------------|-----|------|------|
| | | | N.C. | N.O. | COM. | Kv | Cv converted | | | | | |
| 1/8 (6A) | 1.5 | VX311□-01 | 1 | 1 | 0.7 | 0.07 | 0.08 | 2.0 | 380 | | | |
| | 2.2 | VX312□-01 | 0.7 | 0.5 | 0.4 | 0.14 | 0.16 | | | | | |
| | 3 | VX313□-01 | 0.3 | 0.3 | 0.2 | 0.21 | 0.24 | | | | | |
| 1/4 (8A) | 1.5 | VX311□-02 | 1 | 1 | 0.7 | 0.07 | 0.08 | | 2.0 | 530 | | |
| | | VX312□-02 | 0.7 | 0.5 | 0.4 | 0.14 | 0.16 | | | | | |
| | | VX322□-02 | 1.2 | 1 | 0.7 | 0.16 | 0.19 | | | | | |
| | VX332□-02 | 1.6 | 1.6 | 1 | | | | | | | | |
| | 3 | VX313□-02 | 0.3 | 0.3 | 0.2 | 0.21 | 0.24 | | | | 2.0 | 380 |
| | | VX323□-02 | 0.6 | 0.5 | 0.3 | 0.28 | 0.33 | | | | | |
| | | VX333□-02 | 1 | 0.9 | 0.6 | | | | | | | |
| | 4 | VX324□-02 | 0.3 | 0.25 | 0.2 | | | | | | 0.43 | 0.50 |
| | | VX334□-02 | 0.5 | 0.4 | 0.3 | | | | | | | |
| VX322□-03 | | 1.2 | 1 | 0.7 | | | | | | | | |
| 3/8 (10A) | 2.2 | VX332□-03 | 1.6 | 1.6 | 1 | 0.16 | 0.19 | 2.0 | 730 | | | |
| | | VX323□-03 | 0.6 | 0.5 | 0.3 | | | | | | | |
| | | VX333□-03 | 1 | 0.9 | 0.6 | | | | | | | |
| | 3 | VX324□-03 | 0.3 | 0.25 | 0.2 | 0.28 | 0.33 | | | 2.0 | 530 | |
| | | VX334□-03 | 0.5 | 0.4 | 0.3 | | | | | | | |
| | | VX322□-03 | 1.2 | 1 | 0.7 | | | | | | | |
| 4 | VX332□-03 | 1.6 | 1.6 | 1 | 0.16 | 0.19 | 2.0 | 730 | | | | |
| | VX323□-03 | 0.6 | 0.5 | 0.3 | | | | | | | | |
| | VX333□-03 | 1 | 0.9 | 0.6 | | | | | | | | |
| 4 | VX324□-03 | 0.3 | 0.25 | 0.2 | 0.43 | 0.50 | 2.0 | 530 | | | | |
| | VX334□-03 | 0.5 | 0.4 | 0.3 | | | | | | | | |
| | VX322□-03 | 1.2 | 1 | 0.7 | | | | | | | | |

Note 1) The flow rate characteristics of this product have variations.

When the highly precise flow control is required according to the system to be used, select an orifice diameter 1.3 times larger than that shown above and install a restrictor on the downstream side of the solenoid valve to make the adjustment.

Note 2) Weight 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.

Note 3) Refer to "Glossary of Terms" on page 403, 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) | | |
| | NII, 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 1 MPa or more | 0.1 cm ³ /min or less 0.2 cm ³ /min or less |



How to Order (Single Unit)

DC, AC/Class H coil

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

Model
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 |

Suffix

| | |
|-----|----------------|
| Nil | — |
| Z | Oil-free spec. |

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

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 |

* For connection, prepare a fitting compliant with ISO 15030 and JIS B 8674.

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 401 for ordering coil only.

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 with surge voltage suppressor 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.) |

* 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.

- VX2
- VXK
- VXD
- VXZ
- VXS
- VXB
- VXE
- VXP
- VXR
- VXH
- VXF
- VX3
- VXA

Table (1) Model/Orifice Diameter/Port Size

| Model | Solenoid valve model | | | Orifice symbol (Diameter) | | | |
|-------------------------|----------------------|----------|----------|---------------------------|-------------|-----------|-----------|
| | 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 | | | Brass (C37) | | | — |
| G | NBR | NBR | Stainless steel | PPS | B | — |
| E | | | Brass (C37)/Cu | Stainless steel | H | Heated water |
| P | EPDM | EPDM | 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 | With surge voltage suppressor | With light | With light and surge voltage suppressor |
| AC | 1 100 V | ● | — (Note) |
| | 2 200 V | ● | — |
| | 3 110 V | ● | — |
| | 4 220 V | ● | — (Note) |
| | 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 | 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 | — | — |
| | 6 12 V | — | — |

DC specification is not available.

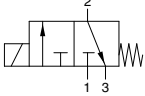
VX31/32/33 Series

For Oil /Single Unit

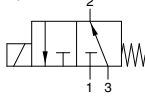
Model / Valve Specifications

| | | |
|------|------|------|
| N.C. | N.O. | COM. |
|------|------|------|

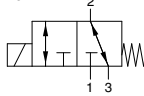
Symbol



Symbol



Symbol



Note) Symbols for N.C. and N.O. types

The symbols show that the N.C. type: port 3 and N.O. type: port 1 are in a blocked state (T).
However, use each port pressure in the state shown below.

N.C. type: Pressure at port 1 ≥ Pressure at port 2 ≥ Pressure at port 3

N.O. type: Pressure at port 3 ≥ Pressure at port 2 ≥ Pressure at port 1

| Port size | Orifice diameter (mm) | Model | Max. operating pressure differential ^{Note 3)} (MPa) | | | Flow rate characteristics ^{Note 1)} | | Max. system pressure ^{Note 3)} (MPa) | Weight ^{Note 2)} (g) |
|--------------|-----------------------|-----------|---|------|------|--|--------------|---|-------------------------------|
| | | | N.C. | N.O. | COM. | Kv | Cv converted | | |
| 1/8 (6A) | 1.5 | VX311□-01 | 1 | 1 | 0.7 | 0.07 | 0.08 | 2.0 | 380 |
| | 2.2 | VX312□-01 | 0.7 | 0.5 | 0.4 | 0.14 | 0.16 | | |
| | 3 | VX313□-01 | 0.3 | 0.3 | 0.2 | 0.21 | 0.24 | | |
| 1/4 (8A) | 1.5 | VX311□-02 | 1 | 1 | 0.7 | 0.07 | 0.08 | | |
| | | VX312□-02 | 0.7 | 0.5 | 0.4 | 0.14 | 0.16 | | |
| | 2.2 | VX322□-02 | 1.2 | 1 | 0.7 | 0.16 | 0.19 | | |
| | | VX332□-02 | 1.6 | 1.6 | 1 | | | | |
| | | VX313□-02 | 0.3 | 0.3 | 0.2 | 0.21 | 0.24 | | |
| | 3 | VX323□-02 | 0.6 | 0.5 | 0.3 | 0.28 | 0.33 | | |
| | | VX333□-02 | 1 | 0.9 | 0.6 | | | | |
| | | VX324□-02 | 0.3 | 0.25 | 0.2 | | | | |
| | | VX334□-02 | 0.5 | 0.4 | 0.3 | | | | |
| | 4 | VX322□-03 | 1.2 | 1 | 0.7 | 0.16 | 0.19 | | |
| VX332□-03 | | 1.6 | 1.6 | 1 | | | | | |
| 3/8 (10A) | 2.2 | VX323□-03 | 0.6 | 0.5 | 0.3 | 0.28 | 0.33 | | |
| | | VX333□-03 | 1 | 0.9 | 0.6 | | | | |
| | 3 | VX324□-03 | 0.3 | 0.25 | 0.2 | 0.43 | 0.50 | | |
| | | VX334□-03 | 0.5 | 0.4 | 0.3 | | | | |

Note 1) The flow rate characteristics of this product have variations.

When the highly precise flow control is required according to the system to be used, select an orifice diameter 1.3 times larger than that shown above and install a restrictor on the downstream side of the solenoid valve to make the adjustment.

Note 2) Weight 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.

Note 3) Refer to "Glossary of Terms" on page 403, 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, 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 mm²/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 1 MPa or more | 0.1 cm ³ /min or less 0.2 cm ³ /min or less |

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

For Oil / Single Unit



How to Order (Single Unit)

DC, AC/Class H coil

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

Model
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 |

Suffix

| | |
|-----|----------------|
| Nil | — |
| Z | Oil-free spec. |

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

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 |

* For connection, prepare a fitting compliant with ISO 16030 and JIS B 8674.

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 401 for ordering coil only.

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.) <p style="font-size: x-small;">* DIN type is available with class B only.</p> |

* 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.

- VX2
- VXK
- VXD
- VXZ
- VXS
- VXB
- VXE
- VXP
- VXR
- VXH
- VXF
- VX3
- VXA

Table (1) Model/Orifice Diameter/Port Size

| Model | Solenoid valve model | | | Orifice symbol (Diameter) | | | |
|-------------------------|----------------------|----------|----------|---------------------------|---------------|-------------|-------------|
| | VX31 | VX32 | VX33 | 1 (1.5 mm) | 2 (2.2 mm) | 3 (3 mm) | 4 (4 mm) |
| 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 | | |

Table (3) Rated Voltage – Electrical Option

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

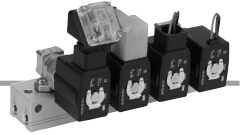
(Note) Option S, Z are not available as surge voltage suppressor is integrated into the AC/Class B coil, as a standard.

| AC/DC | Rated voltage | | Class H | | |
|-------|----------------|---------|------------------------------------|-----------------|--|
| | Voltage symbol | Voltage | S With surge voltage suppressor | L With light | Z 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 | DC specification is not available. | | |

VVX31/32/33 Series

For Oil / Manifold

Solenoid Valve for Manifold / Valve Specifications

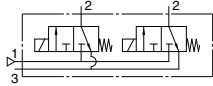


N.C.

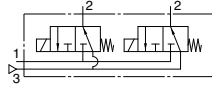
N.O.

COM.

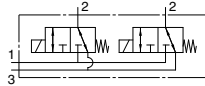
Symbol



Symbol



Symbol



Note) Symbols for N.C. and N.O. types

The symbols show that the N.C. type: port 3 and N.O. type: port 1 are in a blocked state (T).
However, use each port pressure in the state shown below.

N.C. type: Pressure at port 1 ≥ Pressure at port 2 ≥ Pressure at port 3
N.O. type: Pressure at port 3 ≥ Pressure at port 2 ≥ Pressure at port 1

| Orifice diameter (mm) | Model | Max. operating pressure differential ^{Note 2)} (MPa) | | | Flow rate characteristics ^{Note 1)} | | Max. system pressure ^{Note 2)} (MPa) |
|-----------------------|-----------|---|------|------|--|--------------|---|
| | | N.C. | N.O. | COM. | Kv | Cv converted | |
| 1.5 | VX311□-00 | 1 | 1 | 0.7 | 0.07 | 0.08 | 2.0 |
| | VX312□-00 | 0.7 | 0.5 | 0.4 | 0.14 | 0.16 | |
| 2.2 | VX322□-00 | 1.2 | 1 | 0.7 | 0.16 | 0.19 | |
| | VX332□-00 | 1.6 | 1.6 | 1 | | | |
| 3 | VX313□-00 | 0.3 | 0.3 | 0.2 | 0.21 | 0.24 | |
| | VX323□-00 | 0.6 | 0.5 | 0.3 | 0.28 | 0.33 | |
| | VX333□-00 | 1 | 0.9 | 0.6 | | | |
| 4 | VX324□-00 | 0.3 | 0.25 | 0.2 | 0.43 | 0.50 | |
| | VX334□-00 | 0.5 | 0.4 | 0.3 | | | |

Note 1) The flow rate characteristics of this product have variations.

When the highly precise flow control is required according to the system to be used, select an orifice diameter 1.3 times larger than that shown above and install a restrictor on the downstream side of the solenoid valve to make the adjustment.

Note 2) Refer to "Glossary of Terms" on page 403 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 mm²/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** **00-5 G 1**

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

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.

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 | | |

Suffix

| | |
|-----|----------------|
| Nil | — |
| Z | Oil-free spec. |

* Refer to Table (3) shown below for availability.
Refer to page 401 for ordering coil only.

Electrical entry

G - Grommet
GS - With grommet surge voltage suppressor

C - Conduit

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

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

* DIN type is available with class B only.

- VX2
- VXK
- VXD
- VXZ
- VXS
- VXB
- VXE
- VXP
- VXR
- VXH
- VXF
- VX3
- VXA

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 mm) | 2 (2.2 mm) | 3 (3 mm) | 4 (4 mm) |
| VX31 | ● | ● | ● | — |
| VX32 | — | ● | ● | ● |
| VX33 | — | ● | ● | ● |

Table (2) Solenoid Valve Option

| Option symbol | Main valve poppet | Fixed sealant | Body material/ Shading coil material | Guide pin material | Coil insulation type |
|---------------|-------------------|---------------|--------------------------------------|--------------------|----------------------|
| 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.

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

| Rated voltage | | Class B | | | Class H | | | |
|---------------|----------------|---------|-------------------------------|------------|---|------------------------------------|------------|---|
| 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 | ● | ● | ● | ● | ● | ● |
| | 2 | 200 V | ● | ● | ● | ● | ● | |
| | 3 | 110 V | ● | ● | ● | ● | ● | |
| | 4 | 220 V | — (Note) | ● | — (Note) | ● | ● | ● |
| | 7 | 240 V | — | — | — | ● | — | — |
| | 8 | 48 V | — | — | — | ● | — | — |
| DC | J | 230 V | — | — | — | — | — | — |
| | 5 | 24 V | ● | ● | ● | DC specification is not available. | | |
| | 6 | 12 V | — | — | — | DC specification 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.

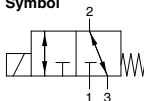
VX31/32/33 Series

For Steam /Single Unit

Model / Valve Specifications

COM.

Symbol



| Port size | Orifice diameter (mmø) | Model | Max. operating pressure differential ^{Note 3)} (MPa) | | Flow rate characteristics ^{Note 1)} | | Max. system pressure ^{Note 3)} (MPa) | Weight ^{Note 2)} (g) |
|--------------|------------------------|-----------|---|------|--|--------------|---|-------------------------------|
| | | | COM. | | Kv | Cv converted | | |
| 1/8 (6A) | 1.5 | VX3114-01 | 0.7 | | 0.07 | 0.08 | 1.0 | 380 |
| | 2.2 | VX3124-01 | 0.4 | | 0.14 | 0.16 | | |
| | 3 | VX3134-01 | 0.2 | | 0.21 | 0.24 | | |
| 1/4 (8A) | 1.5 | VX3114-02 | 0.7 | | 0.07 | 0.08 | | |
| | | VX3124-02 | 0.4 | | 0.14 | 0.16 | | |
| | | VX3224-02 | 0.7 | | 0.16 | 0.19 | | |
| | VX3324-02 | 1 | | | | | | |
| | 3 | VX3134-02 | 0.2 | 0.21 | 0.24 | | | |
| | | VX3234-02 | 0.3 | | | | | |
| VX3334-02 | | 0.6 | 0.28 | 0.33 | | | | |
| 4 | 4 | VX3244-02 | 0.2 | | 0.43 | 0.50 | | 530 |
| | | VX3344-02 | 0.3 | | | | | 730 |
| | | VX3244-03 | 0.7 | | | | 530 | |
| 3/8 (10A) | 2.2 | VX3324-03 | 1 | | 0.16 | 0.19 | 730 | |
| | | VX3234-03 | 0.3 | | 0.28 | 0.33 | 530 | |
| | | VX3334-03 | 0.6 | | | | 730 | |
| | VX3244-03 | 0.2 | | 530 | | | | |
| | 3 | 3 | VX3344-03 | 0.2 | | 0.43 | 0.50 | 730 |
| | | | VX3244-03 | 0.2 | | | | 530 |
| | | | VX3344-03 | 0.3 | | | | 730 |

Note 1) The flow rate characteristics of this product have variations.

When the highly precise flow control is required according to the system to be used, select an orifice diameter 1.3 times larger than that shown above and install a restrictor on the downstream side of the solenoid valve to make the adjustment.

Note 2) Weight 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.

Note 3) Refer to "Glossary of Terms" on page 403, 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) | | |
| AC | S, Q | | -20 to 60 |
| | 183 | | |

Valve Leakage Rate

Internal Leakage

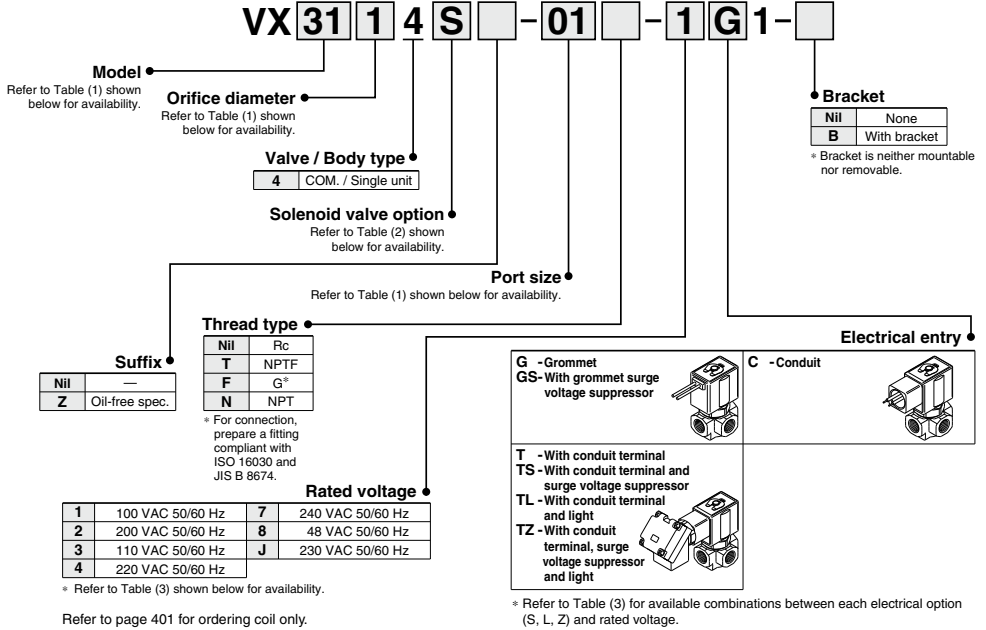
| Seal material | Leakage rate (Air) |
|---------------|----------------------------------|
| FFKM | 150 cm ³ /min or less |

External Leakage

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



How to Order (Single Unit)



- VX2
- VXK
- VXD
- VXZ
- VXS
- VXB
- VXE
- VXP
- VXR
- VXH
- VXF
- VX3
- VXA

Table (1) Model/Orifice Diameter/Port Size

| Model | Solenoid valve model | | | Orifice symbol (Diameter) | | | |
|----------------------------|----------------------|----------|----------|---------------------------|---------------|-------------|-------------|
| | VX31 | VX32 | VX33 | 1 (1.5 mm) | 2 (2.2 mm) | 3 (3 mm) | 4 (4 mm) |
| 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 | | |
|---------------|----------------|---------|------------------------------------|------------|---|
| AC/DC | Voltage symbol | Voltage | S | L | Z |
| | | | 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 | ● | — | — |
| DC | J | 230 V | ● | — | — |
| | 5 | 24 V | DC specification is not available. | | |
| | 6 | 12 V | DC specification is not available. | | |

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

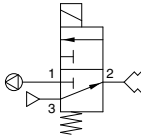
- Vacuum circuit side is suited for a large orifice. Supply pressure side is suited for high pressure and a vacuum pad.
- Construction and dimensions are the same as the VX3 series.

Model / Valve Specifications

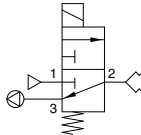
N.C.

N.O.

Symbol (example)



Symbol (example)



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

Note 1) The flow rate characteristics of this product have variations.

When the highly precise flow control is required according to the system to be used, select an orifice diameter 1.3 times larger than that shown above and install a restrictor on the downstream side of the solenoid valve to make the adjustment.

Note 2) Weight 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.

Note 3) Refer to "Glossary of Terms" on page 403, for details on the max. system pressure.

* Low vacuum: Up to 1.3 x 10²Pa-abs

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 cm ³ /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)

Model: **VXV 31 3 0 - 01 - 5 G 1 -**

Refer to Table (1) shown below for availability.

Orifice diameter: **3**

Refer to Table (1) shown below for availability.

Valve / Body type: **0** N.C. / Single unit
2 N.O. / Single unit

Solenoid valve option: **01**

Refer to Table (2) shown below for availability.

Port size: **5**

Refer to Table (1) shown below for availability.

Electrical entry: **G**

Built-in full-wave rectifier type: **1**

Bracket: **B** With bracket

Suffix: **Nil** —
Z Oil-free spec.

Thread type: **Nil** Rc
T NPTF
F G^{*}
N NPT

* For connection, prepare a fitting compliant with ISO 16030 and JIS B 8674.

Rated voltage: **6** 12 VDC

| | | | |
|----------|------------------|----------|------------------|
| 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.

Electrical entry options:

- 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 page 401 for ordering coil only.

Table (1) Model/Orifice Diameter/Port Size

| Model | Solenoid valve model | | | Orifice symbol (Diameter) ^{Note} | |
|----------------------------|----------------------|-----------------|-----------------|---|-----------------|
| | VXV31 | VXV32 | VXV33 | 3 (1.5/3 mm) | 4 (2.2/4 mm) |
| 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 | PPS | B |
| H | FKM | FKM | | | |

Table (3) Rated Voltage – Electrical Option

| AC/DC | Rated voltage | | Class B | | |
|-------|----------------|---------|------------------------------------|-----------------|--|
| | Voltage symbol | Voltage | S With surge voltage suppressor | L With light | Z With light and surge voltage suppressor |
| AC | 1 | 100 V | ● | ● | — |
| | 2 | 200 V | ● | ● | — |
| | 3 | 110 V | — | ● | — |
| | 4 | 220 V | — ^{Note} | ● | — ^{Note} |
| | 7 | 240 V | — | — | — |
| | 8 | 48 V | — | — | — |
| DC | J | 230 V | — | — | — |
| | 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.

- VX2
- VXK
- VXD
- VXZ
- VXS
- VXB
- VXE
- VXP
- VXR
- VXH
- VXF
- VX3
- VXA

For Vacuum Pad / Manifold

VVXV31/32/33 Series

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

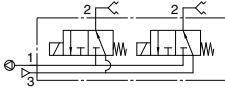


Model / Valve Specifications

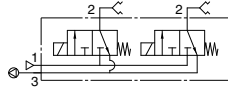
N.C.

N.O.

Symbol (example)



Symbol (example)



| Orifice diameter (mmø) | | Model | Operating pressure* (MPa) | | Flow rate characteristics | | | | | | (Note) Max. system pressure (MPa) |
|------------------------|-------------|-------------|---------------------------|-------------|-----------------------------|------|------|-----------------------------|------|------|--------------------------------------|
| Port 1 side | Port 3 side | | Port 1 side | Port 3 side | Passage: 1↔2 | | | Passage: 2↔3 | | | |
| | | | | | C[dm ³ /(s·bar)] | b | Cv | C[dm ³ /(s·bar)] | b | Cv | |
| 3 | 1.5 | VVXV3131-00 | Low vacuum | 0 to 0.5 | 0.82 | 0.20 | 0.20 | 0.29 | 0.32 | 0.08 | 2.0 |
| 1.5 | 3 | VVXV3133-00 | 0 to 0.5 | Low vacuum | 0.29 | 0.32 | 0.08 | 0.82 | 0.20 | 0.20 | |
| 4 | 2.2 | VVXV3241-00 | Low vacuum | 0 to 0.5 | 1.6 | 0.20 | 0.38 | 0.64 | 0.40 | 0.17 | |
| | | VVXV3341-00 | | 0 to 0.9 | | | | | | | |
| 2.2 | 4 | VVXV3243-00 | 0 to 0.5 | Low vacuum | 0.64 | 0.40 | 0.17 | 1.6 | 0.20 | 0.38 | |
| | | VVXV3343-00 | | | | | | | | | |

(Note) Refer to "Glossary of Terms" on page 403 for details on the max. system pressure.

* Low vacuum: Up to 1.3 x 10²Pa-abs

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 cm ³ /min or less |

(Note) Value when air pressure is applied.



How to Order (Solenoid Valve for Manifold)

DC
VXV 31 3 1 - 00 - 5 G 1
AC/Class B coil (Built-in full-wave rectifier type)
VXV 31 3 1 - 00 - 1 G R 1

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.

| | |
|-----|----------------|
| 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 | | |

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) shown below for availability.

Refer to page 401 for ordering coil only.

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. |

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 |

Manifold base

Blanking plate part no.

For VVX31: VVX31-4A-
 For VVX32/33: VVX32-4A-

Seal material

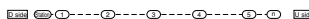
| | |
|-----|-----|
| Nil | NBR |
| F | FKM |

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 "*" is the symbol for mounting.
- * VVX3131-00-1GR1.. 4 sets Add an "*" in front of the part numbers for solenoid valves, etc. to be mounted.
- * VVX31-4A 1 set



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.

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.

Table (1) Model/Orifice Diameter

| Solenoid valve model | Orifice symbol (Diameter) ^(Note) | |
|----------------------|---|---------------|
| | 3 (1.5/3 mmø) | 4 (2.2/4 mmø) |
| VVXV31 | ● | — |
| VVXV32 | — | ● |
| VVXV33 | — | ● |

(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 | | |
|---------------|----------------|---------|-------------------------------|------------|-------------------------------|
| AC/DC | Voltage symbol | Voltage | S | L | Z |
| | | | With surge voltage suppressor | With light | With surge voltage suppressor |
| AC | 1 | 100 V | ● | — | — |
| | 2 | 200 V | ● | — | — |
| | 3 | 110 V | ● | — | — |
| | 4 | 220 V | ● | — | — |
| | 7 | 240 V | — | — | — |
| | 8 | 48 V | — | — | — |
| DC | J | 230 V | — | — | — |
| | 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.

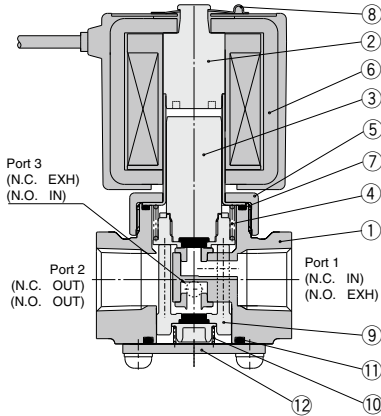
VX31/32/33 Series

For Air, Water, Oil, Steam

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 | |

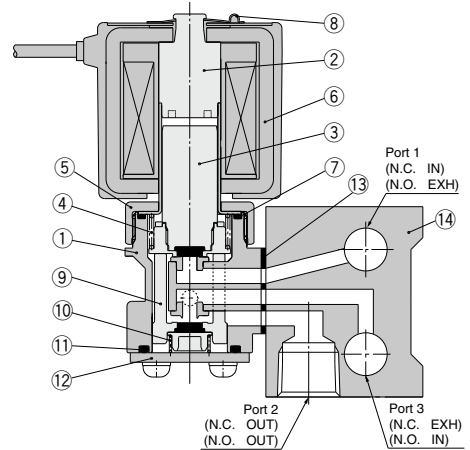
The materials in parentheses are the seal materials.

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.

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

For Air, Water, Oil, Steam / Single Unit

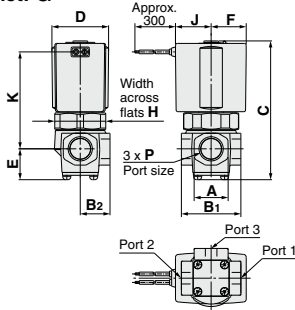
Dimensions: Single Unit / Body Material: Brass (C37), Stainless Steel

Normally closed (N.C.) : VX31□0/VX32□0/VX33□0

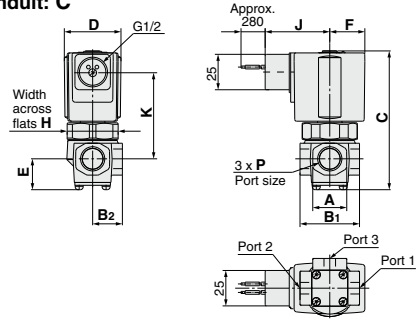
Normally open (N.O.) : VX31□2/VX32□2/VX33□2

Common (COM.) : VX31□4/VX32□4/VX33□4

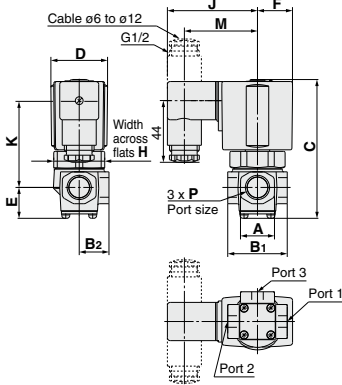
Grommet: G



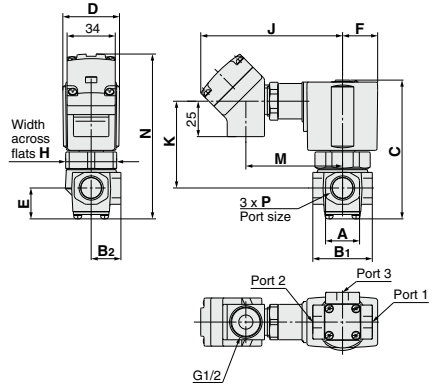
Conduit: C



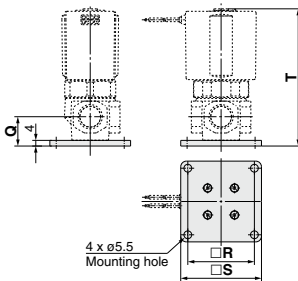
DIN terminal: D



Conduit terminal: T



With bracket



- VX2
- VXK
- VXD
- VXZ
- VXS
- VXB
- VXE
- VXP
- VXR
- VXH
- VXF
- VX3
- VXA

| Model | 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 | | | | | | | |
| N.C., N.O., COM. | | | | | | | | | | | | | | | | | | | | |
| 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 | 33 | 56 | 51.5 | 51 | 68.5 | 52 | 56.5 | 103.5 | 51 | 72.5 | 105 | | | | | | | |
| VX32□□ | ø2.2, ø3, ø4 | 1/4, 3/8 | 36 | 64.5 | 54 | 59.5 | 71 | 60.5 | 59 | 106 | 59.5 | 75 | 113 | | | | | | | |
| VX33□□ | ø2.2, ø3, ø4 | 1/4, 3/8 | 36 | 64.5 | 54 | 59.5 | 71 | 60.5 | 59 | 106 | 59.5 | 75 | 113 | | | | | | | |

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

VVX31/32/33 Series

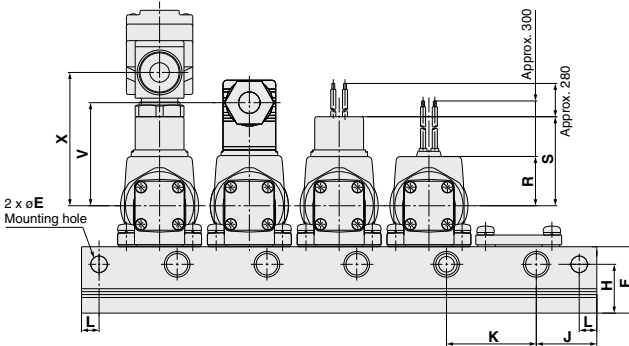
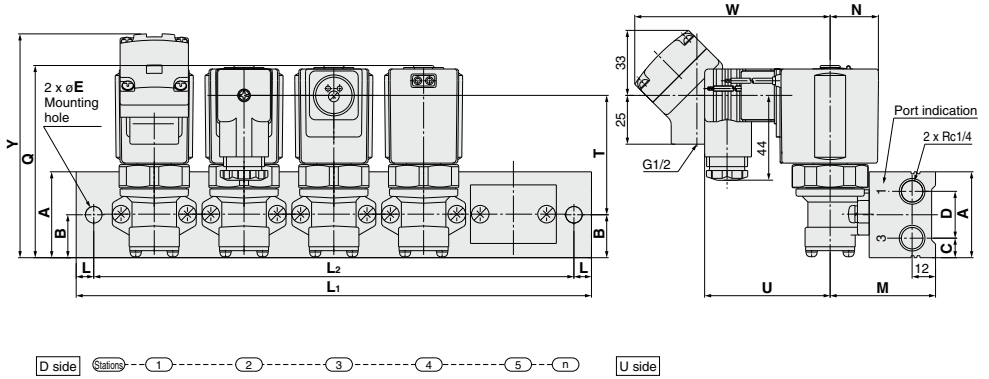
For Air, Oil / Manifold

Dimensions: Manifold / Base Material: Aluminum

Normally closed (N.C.) :

Normally open (N.O.) : VVX31/VVX32/VVX33

Common (COM.) :



| 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 |
| | L2 | 108 | 154 | 200 | 246 | 292 | 338 | 384 | 430 | 476 |

| 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 |

| Model | Electrical entry (AC/Class B) | | | | | |
|-------|-------------------------------|------|---------|------|--------------|------|
| | Grommet | | Conduit | | DIN terminal | |
| | R | S | T | T | U | V |
| VVX31 | 30 | 48.5 | 44 | 45 | 65.5 | 53.5 |
| VVX32 | 33 | 51.5 | 52.5 | 53.5 | 68.5 | 56.5 |
| VVX33 | 36 | 54 | 60.5 | 61.5 | 71 | 59 |

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) |

* 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 GR

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) |

* 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.

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.

Table (1) Rated Voltage - Electrical Option

| Rated voltage | | Class B | | | Class H | | | |
|---------------|----------------|---------|------------------------------------|-----------------|--|------------------------------------|-----------------|--|
| AC/DC | Voltage symbol | Voltage | S With surge voltage suppressor | L With light | Z With light and surge voltage suppressor | S With surge voltage suppressor | L With light | Z 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 | ● | — | — | DC specification is not available. | | |

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.

- VX2
- VXK
- VXD
- VXZ
- VXS
- VXB
- VXE
- VXP
- VXR
- VXH
- VXF
- VX3
- VXA

VX31/32/33 Series

For Air, Water, Oil, Steam

Replacement Parts

- Name plate part no.

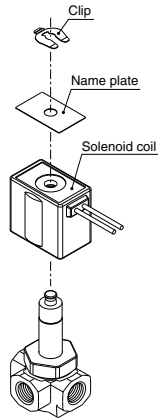
AZ-T-VX Valve model
 ↑ Enter by referring to "How to Order".

- Clip part no.

For VX31: **VX021N-10**

For VX32: **VX022N-10**

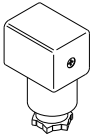
For VX33: **VX023N-10**



- DIN connector part no.

Without electrical option **3G-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

Glossary of Terms

Pressure Terminology

1. Maximum operating pressure differential

The maximum pressure differential (the difference between the inlet and outlet pressure) which is allowed for operation. When the outlet pressure is 0 MPa, this becomes the maximum operating pressure.

2. Minimum operating pressure differential

The minimum pressure differential (the difference between the inlet pressure and outlet pressure) required to keep the main valve fully opened.

3. Maximum system pressure

The maximum pressure that can be applied inside the pipelines (line pressure).

(The pressure differential of the solenoid valve portion must be less than the maximum operating pressure differential.)

4. Proof pressure

The pressure in which the valve must be withstood without a drop in performance after holding for one minute under prescribed pressure and returning to the operating pressure range. (value under the prescribed conditions)

Electrical Terminology

1. Apparent power (VA)

Volt-ampere is the product of voltage (V) and current (A). Power consumption (W); For AC, $W = V \cdot A \cdot \cos\theta$. For DC, $W = V \cdot A$. Note) $\cos\theta$ shows power factor. $\cos\theta = 0.6$

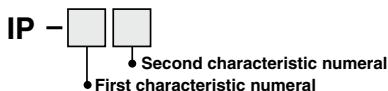
2. Surge voltage

A high voltage which is momentarily generated by shutting off the power in the shut-off area.

3. Enclosure

A degree of protection defined in the "JIS C 0920: Waterproof test of electric machinery/appliance and the degree of protection against the intrusion of solid foreign objects".

Verify the degree of protection for each product.



● First Characteristics:

Degrees of protection against solid foreign objects

| | |
|---|--|
| 0 | Non-protected |
| 1 | Protected against solid foreign objects of 50 mm ϕ and greater |
| 2 | Protected against solid foreign objects of 12 mm ϕ and greater |
| 3 | Protected against solid foreign objects of 2.5 mm ϕ and greater |
| 4 | Protected against solid foreign objects of 1.0 mm ϕ and greater |
| 5 | Dust-protected |
| 6 | Dusttight |

● Second Characteristics:

Degrees of protection against water

| | | |
|---|--|----------------------|
| 0 | Non-protected | — |
| 1 | Protected against vertically falling water drops | Dripproof type 1 |
| 2 | Protected against vertically falling water drops when enclosure tilted up to 15° | Dripproof type 2 |
| 3 | Protected against rainfall when enclosure tilted up to 60° | Rainproof type |
| 4 | Protected against splashing water | Splashproof type |
| 5 | Protected against water jets | Low jetproof type |
| 6 | Protected against powerful water jets | Strong jetproof type |
| 7 | Protected against the effects of temporary immersion in water | Immersible type |
| 8 | Protected against the effects of continuous immersion in water | Submersible type |

Example) IP65: Dusttight, Low jetproof type

"Low jetproof type" means that no water intrudes inside an equipment that could hinder from operating normally by means of applying water for 3 minutes in the prescribed manner. Take appropriate protection measures, since a device is not usable in an environment where a droplet of water is splashed constantly.

Others

1. Material

NBR: Nitrile rubber
FKM: Fluororubber
EPDM: Ethylene propylene rubber
PTFE: Polytetrafluoroethylene resin
FFKM: Perfluoroelastomer

2. Oil-free treatment

The degreasing and washing of wetted parts.

3. Passage symbol

In the symbol ($\frac{\text{IN}}{\text{OUT}}$) Port 1 (IN) and Port 2 (OUT) are shown in a blocked condition ($\frac{\text{---}}{\text{---}}$), but it is not possible to use the valve in cases of reverse pressure, where the Port 2 pressure is higher than the Port 1 pressure.

VX2

VXK

VXD

VXZ

VXS

VXB

VXE

VXP

VXR

VXH

VXF

VX3

VXA



VX3 Series

2/3 Port Solenoid Valves for Fluid Control Specific Product Precautions 1

Be sure to read this before handling the products. For detailed precautions on each series, refer to the main text.

Selection

⚠ Warning

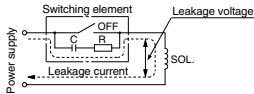
1. Minimum operating pressure differential (VXED, VXP, VXR)

Select an appropriate valve size while referring to the solenoid valve flow rate characteristics.

⚠ Caution

1. Leakage voltage

When the solenoid valve is operated using the controller, etc., the leakage voltage should be the product allowable leakage voltage or less. Particularly when using a resistor in parallel with a switching element and using a C-R element (surge voltage suppressor) to protect the switching element, take note that leakage current will flow through the resistor, C-R element, etc., creating a possible danger that the valve may not turn off.



AC/Class B built-in full-wave rectifier coil: 10% or less of rated voltage (VX3: 5% or less)

AC/Class B/H coil: 20% or less of rated voltage

DC coil: 2% or less of rated voltage

2. Selecting options

The fluid handled will differ depending on the valve options. Select optimal options for the fluid.

3. When the fluid is oil.

Generally, FKM is used as seal material, as it is resistant to oil. The resistance of the seal material may deteriorate depending on the type of oil, manufacturer or additives. Check the resistance before using. The kinematic viscosity must not exceed 50 mm²/s. The special construction of the armature adopted in the built-in full-wave rectifier type gives an improvement in OFF response by providing clearance on the absorbed surface when it is switched ON. Select the DC spec. or AC spec. built-in full-wave rectifier type when the dynamic viscosity is higher than water or when the OFF response is prioritized.

Piping

⚠ Caution

1. If a regulator and valve are connected directly, they may vibrate together and cause chattering. Do not connect directly.
2. If the cross-sectional area of piping for the fluid supply side is restricted, operation will become unstable due to inadequate pressure differential during valve operation. Use piping size for the fluid supply side that is suited to the port size.
3. The behavior of the diaphragm valve becomes unstable under the conditions that the circuit flow rate is restricted to 40% or less of the maximum flow rate on the solenoid valve flow rate characteristics. This may cause unstable valve activation. So, select a solenoid valve with an appropriate flow rate size while carefully checking the circuit flow rate.

Wiring

⚠ Caution

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

Operating Precautions

⚠ Warning

1. Make sure when using pilot type 2-port solenoid valves that the flow direction is from 1 (IN) to 2 (OUT). The valve is designed based on a flow direction of 1 (IN) to 2 (OUT) and harnesses the fluid pressure of port 1 (IN) when the valve opens or closes. If reverse pressure (2 (OUT) to 1 (IN)) is applied, it may lead to a reduced service life or cause damage to parts early on due to chattering or pulses from the main valve (diaphragm, piston, etc.). If there is a possibility that reverse pressure will be applied, take countermeasures by installing the check valve, etc. at the downstream side. When installing the check valve, allow ample space between the valve and the check valve. If it is placed near the valve, it may cause chattering and pulses in the main valve.



VX3 Series

2/3 Port Solenoid Valves for Fluid Control Specific Product Precautions 2

Be sure to read this before handling the products. For detailed precautions on each series, refer to the main text.

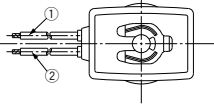
Electrical Connections

⚠ Caution

Grommet Class H coil: AWG18 Insulator O.D. 2.2 mm
Class B coil: AWG20 Insulator O.D. 2.5 mm

| Rated voltage | Lead wire color | |
|-------------------|-----------------|------|
| | (1) | (2) |
| DC (Class B only) | Black | Red |
| 100 VAC | Blue | Blue |
| 200 VAC | Red | Red |
| Other AC | Gray | Gray |

* There is no polarity.

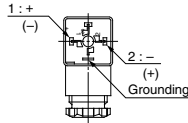


DIN terminal

Internal connections are as shown below. Make connections to the power supply accordingly.

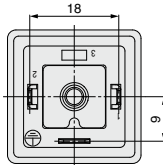
| Terminal no. | 1 | 2 |
|--------------|-------|-------|
| DIN terminal | + (-) | - (+) |

* There is no polarity.



DIN (EN175301-803) Terminal

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



Disassembly

- After loosening the binding head screw with flange, then if the housing is pulled in the direction of the arrow, the connector will be removed from the solenoid valve.
- Pull out the binding head screw with flange from the housing.
- There is a cutout on the bottom of the terminal block. Insert a small flat head screwdriver, etc. into this cutout, and remove the terminal block from the housing. (See figure below.)
- Remove the ground nut, and pull out the washer and the rubber seal.

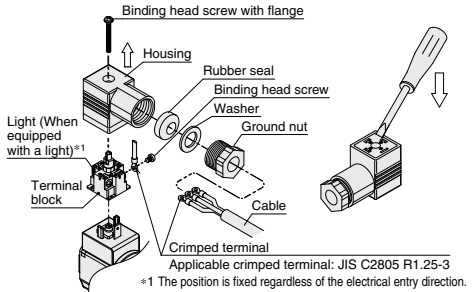
Wiring

- Pass the cable through the ground nut, washer and rubber seal in this order, and insert these parts into the housing.
- Loosen the binding head screw of the terminal block, then insert the core wire or the crimped terminal of the lead wire into the terminal, and securely fix it with the binding head screw. The binding head screw of the terminal block is M3.
Note 1) Tighten the screw to a torque of between 0.5 and 0.6 N·m.
Note 2) Cable O.D.: $\phi 6$ to $\phi 12$ mm
Note 3) For an outside cable diameter of $\phi 9$ to 12 mm, remove the internal parts of the rubber seal before using.

⚠ Caution

Assembly

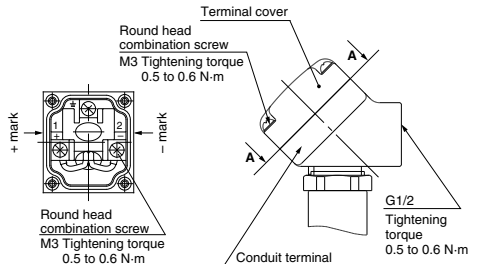
- Pass the cable through the ground nut, washer, rubber seal and the housing in this order, and connect to the terminal block. Then, set the terminal block inside the housing. (Push in the terminal block until it snaps into position.)
- Insert the rubber seal and the washer in this order into the cable entry of the housing, and then tighten the ground nut securely.
- Insert the gasket between the bottom part of the terminal block and the plug attached to the equipment, and then insert the binding head screw with flange from the top of the housing, and tighten it.
Note 1) Tighten the screw to a torque of between 0.5 and 0.6 N·m.
Note 2) The orientation of the connector can be changed in steps of 90° by changing the method of assembling the housing and the terminal block.



Conduit terminal

Make connections according to the marks shown below.

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



View A-A

(Internal connection diagram)

Disassembly

- Loosen the mounting screw, and remove the terminal cover from the conduit terminal.

Wiring

- Insert the cable into the conduit terminal.
- Loosen the screw with UP terminal of the conduit terminal, then insert the core wire or the crimped terminal of the lead wire into the terminal, and securely fix it with the screw with UP terminal.
Note 1) Tighten the screw to a torque of between 0.5 and 0.6 N·m.

VX2

VXK

VXD

VXZ

VXS

VXB

VXE

VXP

VXR

VXH

VXF

VX3

VXA



VX3 Series

2/3 Port Solenoid Valves for Fluid Control Specific Product Precautions 3

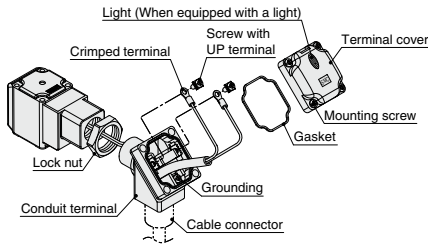
Be sure to read this before handling the products. For detailed precautions on each series, refer to the main text.

Electrical Connections

⚠ Caution

Assembly

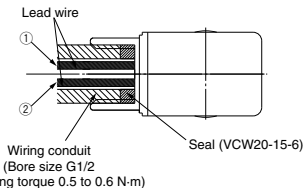
1. Insert the gasket into the conduit terminal, and then clamp the terminal cover with the mounting screw.
 Note 1) Tighten the screw to a torque of between 0.5 and 0.6 N·m.
 Note 2) When changing the orientation of the conduit terminal, carry out the following procedure.
 1. Apply a tool (monkey wrench, spanner, etc.) to the width across flats of the conduit terminal, and turn the terminal in the counterclockwise direction.
 2. Loosen the lock nut.
 3. Turn the conduit terminal in the clamping direction (clockwise direction) to about 15° ahead of the desired position.
 4. Turn the lock nut by hand to the coil side until it is lightly tightened.
 5. Apply a tool to the width across flats of the conduit terminal, and turn it to the desired position (through an angle of about 15°) so as to clamp the conduit terminal.
- Note: When changing the orientation by applying additional tightening force to the conduit terminal from the factory-set position, turn no more than one half a turn.



Conduit

When used as an IP65 equivalent, use seal (part no. VCW20-15-6) to install the wiring conduit. Also, use the tightening torque below for the conduit.

Class H coil: AWG18 Insulator O.D. 2.2 mm
 Class B coil: AWG20 Insulator O.D. 2.5 mm



Tightening torque 0.5 to 0.6 N·m)

| Rated voltage | Lead wire color | |
|---------------|-----------------|------|
| | ① | ② |
| DC | Black | Red |
| 100 VAC | Blue | Blue |
| 200 VAC | Red | Red |
| Other AC | Gray | Gray |

* There is no polarity for DC.

| Description | Part no. |
|-------------|------------|
| Seal | VCW20-15-6 |

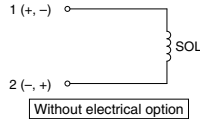
Note) Please order separately.

Electrical Circuits

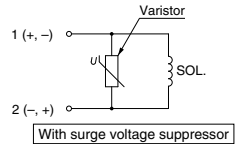
⚠ Caution

[DC circuit]

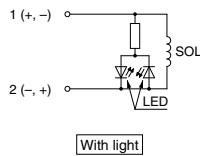
Grommet, Conduit, Conduit terminal, DIN type



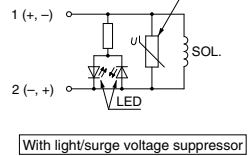
Grommet, Conduit terminal, DIN type



Conduit terminal, DIN type



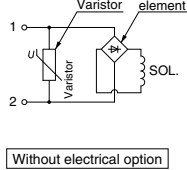
Conduit terminal, DIN type



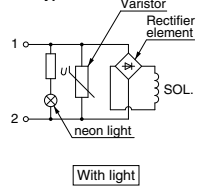
[AC, Class B (Built-in full wave rectifier type) Circuit]

* For AC/Class B, the standard product is equipped with surge voltage suppressor.

Grommet, Conduit, Conduit terminal, DIN type

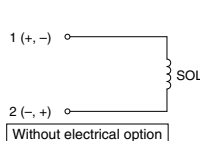


Conduit terminal, DIN type

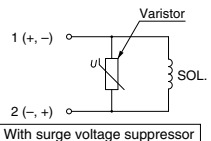


[AC, Class B/H Circuit]

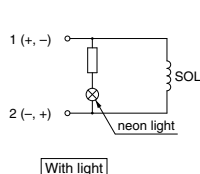
Grommet, Conduit, Conduit terminal



Grommet, Conduit terminal



Conduit terminal



Conduit terminal

