


Pilot Operated 2 Port Solenoid Valve

Series VXD21/22/23

For Water, Oil, Air

Single Unit

<p>Valve</p> <p>Normally closed (N.C.) Normally open (N.O.)</p>	<p>Electrical Entry</p> <p>• Grommet • DIN terminal • Conduit • Conduit terminal</p>		<table border="1"> <thead> <tr> <th>Model</th> <th>VXD2130</th> <th>VXD214$\frac{0}{2}$</th> <th>VXD215$\frac{0}{2}$</th> <th>VXD226$\frac{0}{2}$</th> </tr> </thead> <tbody> <tr> <td rowspan="4">Body size</td> <td>10A</td> <td>●</td> <td>—</td> <td>—</td> </tr> <tr> <td>15A</td> <td>—</td> <td>●</td> <td>—</td> </tr> <tr> <td>20A</td> <td>—</td> <td>—</td> <td>●</td> </tr> <tr> <td>25A</td> <td>—</td> <td>—</td> <td>●</td> </tr> <tr> <td>Port size (Thread)</td> <td>1/4, 3/8, 1/2</td> <td>3/8, 1/2</td> <td>3/4</td> <td>1</td> </tr> </tbody> </table>	Model	VXD2130	VXD214 $\frac{0}{2}$	VXD215 $\frac{0}{2}$	VXD226 $\frac{0}{2}$	Body size	10A	●	—	—	15A	—	●	—	20A	—	—	●	25A	—	—	●	Port size (Thread)	1/4, 3/8, 1/2	3/8, 1/2	3/4	1
Model	VXD2130		VXD214 $\frac{0}{2}$	VXD215 $\frac{0}{2}$	VXD226 $\frac{0}{2}$																									
Body size	10A	●	—	—																										
	15A	—	●	—																										
	20A	—	—	●																										
	25A	—	—	●																										
Port size (Thread)	1/4, 3/8, 1/2	3/8, 1/2	3/4	1																										
<p>Solenoid Coil</p> <p>Coil: Class B, Class H</p>	<p>Rated Voltage</p> <p>100 VAC, 200 VAC, 110 VAC, 220 VAC, 240 VAC, 230 VAC, 48 VAC, 24 VDC, 12 VDC</p>	<table border="1"> <thead> <tr> <th>Model</th> <th>VXD227$\frac{0}{2}$</th> <th>VXD238$\frac{0}{2}$</th> <th>VXD239$\frac{0}{2}$</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Body size</td> <td>32A</td> <td>●</td> <td>—</td> </tr> <tr> <td>40A</td> <td>—</td> <td>●</td> </tr> <tr> <td>50A</td> <td>—</td> <td>●</td> </tr> <tr> <td>Port size (Flange)</td> <td>32A</td> <td>40A</td> <td>50A</td> </tr> </tbody> </table>	Model	VXD227 $\frac{0}{2}$	VXD238 $\frac{0}{2}$	VXD239 $\frac{0}{2}$	Body size	32A	●	—	40A	—	●	50A	—	●	Port size (Flange)	32A	40A	50A										
Model	VXD227 $\frac{0}{2}$	VXD238 $\frac{0}{2}$	VXD239 $\frac{0}{2}$																											
Body size	32A	●	—																											
	40A	—	●																											
	50A	—	●																											
Port size (Flange)	32A	40A	50A																											
<p>Material</p> <table border="1"> <tr> <td>Body</td> <td>Brass/Bronze, Stainless steel</td> </tr> <tr> <td>Seal</td> <td>NBR, FKM, EPDM</td> </tr> </table>	Body	Brass/Bronze, Stainless steel	Seal	NBR, FKM, EPDM																										
Body	Brass/Bronze, Stainless steel																													
Seal	NBR, FKM, EPDM																													

Standard Specifications

Valve specifications	Valve construction		Pilot operated 2 port diaphragm type
	Withstand pressure (MPa)		5.0
	Body material		Brass (C37), Stainless steel, Bronze (CAC407)
	Seal material		NBR, FKM, EPDM
	Enclosure		Dust-tight, Low jetproof (equivalent to IP65) ^{Note 1)}
Environment		Location without corrosive or explosive gases	
Coil specifications	Rated voltage	AC (Class B coil, with a full-wave rectifier)	100 VAC, 200 VAC, 110 VAC, 220 VAC, 230 VAC, 240 VAC, 48 VAC
		AC (Class B coil/H coil) ^{Note 2)}	
		DC (Class B coil only)	
	Allowable voltage fluctuation	24 VDC, 12 VDC	
	Allowable leakage voltage	AC (Class B coil, with a full-wave rectifier)	
AC (Class B coil/H coil) ^{Note 2)}		±10% or less of rated voltage	
DC (Class B coil only)		±20% or less of rated voltage	
Coil insulation type		±2% or less of rated voltage	
		Class B, Class H	

Note 1) Electrical entry, Grommet with surge voltage suppressor (GS) has a rating of IP40.

Note 2) The AC (Class B) coil for the VXD2130 comes with a full-wave rectifier.

Solenoid Coil Specifications

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

DC Specification

Model	Power consumption (W)	Temperature rise (C°) ^{Note)}
VXD2130	5.5	50
VXD214 $\frac{0}{2}$ /215 $\frac{0}{2}$	4.5	45
VXD226 $\frac{0}{2}$ /227 $\frac{0}{2}$	7	45
VXD238 $\frac{0}{2}$ /239 $\frac{0}{2}$	10.5	60

AC Specification (Class B coil, with a full-wave rectifier)

Model	Apparent power (VA)*	Temperature rise (C°) ^{Note)}
VXD21	7	55
VXD22	9.5	60
VXD23	12	65

* There is no difference in apparent power due to the inrush, energisation, or frequency of the power, since the AC coil uses a rectifying circuit.

AC Specification (Class B coil)

Model	Frequency (Hz)	Apparent power (VA)		Temperature rise (C°) ^{Note)}
		Inrush	Energised	
VXD21	50	19	9	45
	60	16	7	40
VXD22	50	43	19	55
	60	35	16	50
VXD23	50	62	30	65
	60	52	25	60

* The AC (Class B) coil for the VXD2130 comes with a full-wave rectifier.

AC Specification (Class H coil)

Model	Frequency (Hz)	Apparent power (VA)		Temperature rise (C°) ^{Note)}
		Inrush	Energised	
VXD21	50	19	9	45
	60	16	7	40
VXD22	50	43	19	55
	60	35	16	50
VXD23	50	62	30	65
	60	52	25	60

How to Order Solenoid Coil Assembly

Table (1) Model and Solenoid Coil Type

Select the coil type from A to C, and refer to "How to Order" below.

Voltage type	AC		AC (with a full-wave rectifier)	DC
	Class B	Class H	Class B	Class B
(Solenoid valve option)	(-, A, B, G, H, J, L)	(D, E, N, P)	(-, A, B, G, H, J, L)	(-, A, B, G, H, J, L)
Model	VXD2130	— Note)	A	B
	VXD21 ⁴ / ₅ □	A	A	C
	VXD22 ⁶ / ₇ □	A	A	C
	VXD23 ⁸ / ₉ □	A	A	C
	VXD23 ⁸ / ₉ □	A	A	C

DC, AC (Except VXD2130 AC/Class B) Note 1)

AVX02 1N-5G

Series

1	VXD21□□
2	VXD22□□
3	VXD23□□

Rated voltage Note 2)

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

Coil insulation type

-	Class B
H	Class H Note)

Note) DIN terminal and DC are not available.

Valve

Symbol	Valve
-	N.C.
2	N.O.

Note 1) The AC (Class B) coil for VXD2130 only comes with a full-wave rectifier.

Note 2) Refer to "Table (2)" for the 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	D - DIN DS - DIN with surge voltage suppressor
TL - With conduit terminal and light	DL - DIN with light DZ - DIN with surge voltage suppressor and light
TZ - With conduit terminal, surge voltage suppressor and light	DO - For DIN (without connector)

Connector

* Refer to "Table (2)" for the available combinations between each electrical option and rated voltage.

BVX021N-5G-Z

Rated voltage

5	24 VDC
6	12 VDC

Table (2) Rated Voltage – Electrical Option

AC/DC	Voltage symbol	Voltage	Class B			Class H		
			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	●	●	●	●	●	●
	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.		

* Option S, Z are not available as a surge voltage suppressor is integrated into the AC/Class B coil (with a full wave rectifier) as 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. AC/Class B (with a full-wave rectifier)/DC are interchangeable with each other.

AC/Class B (with a full-wave rectifier)

CVX02 1N-1GR

Series

1	VXD21□□
2	VXD22□□
3	VXD23□□

Rated voltage Note 1)

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

Valve

Symbol	Valve
-	N.C.
2	N.O.

Note 1) Refer to "Table (2)" for the available combinations.

Electrical entry

G - Grommet	C - Conduit
T - With conduit terminal TL - With conduit terminal and light	D - DIN DL - DIN with light DO - For DIN (without connector)

Connector

* Refer to "Table (2)" for the available combinations between each electrical option and rated voltage.

* A surge voltage suppressor is integrated into the AC/Class B coil (with a full wave rectifier) as standard.

• Name plate part no.

AZ-T-VX **Valve model**

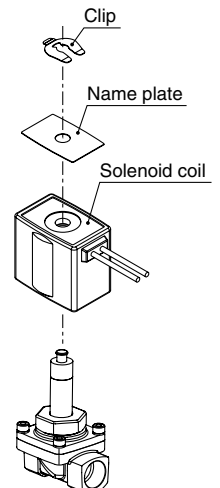
↑ Enter by referring to "How to Order".

• Clip part no. (For N.C.)

For VXD21: VX021N-10
For VXD22: VX022N-10
For VXD23: VX023N-10

• Clip part no. (For N.O.)

For VXD21: ETW-7
For VXD22: ETW-8
For VXD23: ETW-9

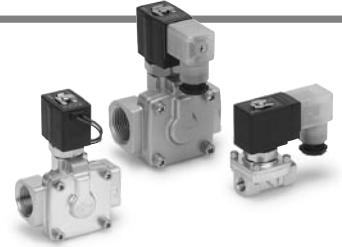
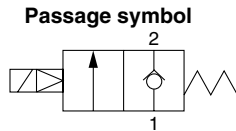


Series VXD21/22/23

For Water

Model/Valve Specifications

Normally closed (N.C.)



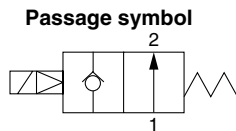
Port size	Orifice size (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)		Flow characteristics		Max. system pressure (MPa)	Weight (g) ^(Note)	
				AC	DC	Av x 10 ⁻⁶ m ²	Cv converted			
Thread	1/4 (8A)	10	VXD2130-02	0.02	0.7	0.5	46	1.9	1.5	420
	3/8 (10A)	10	VXD2130-03				58	2.4		
		15	VXD2140-03				110	4.5		
	1/2 (15A)	10	VXD2130-04		0.7	0.5	58	2.4		
		15	VXD2140-04		130	5.5				
	Flange	3/4 (20A)	20		VXD2150-06	1.0	1.0	230		9.5
1 (25A)		25	VXD2260-10	310	13			1650		
32A		35	VXD2270-32	550	23			5400		
Flange	40A	40	VXD2380-40	0.03			740	31	6800	
	50A	50	VXD2390-50				1200	49	8400	



(Note) Weight of grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for terminal type respectively.

• Refer to "Glossary of Terms" on front matter 10, for details on the max. operating pressure differential and the max. system pressure.

Normally open (N.O.)



Port size	Orifice size (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)		Flow characteristics		Max. system pressure (MPa)	Weight (g) ^(Note)	
				AC, DC		Av x 10 ⁻⁶ m ²	Cv converted			
Thread	3/8 (10A)	15	VXD2142-03	0.7			110	4.5	1.5	690
	1/2 (15A)	VXD2142-04	130				5.5			
	3/4 (20A)	20	VXD2152-06				230	9.5		
	1 (25A)	25	VXD2262-10				310	13		
Flange	32A	35	VXD2272-32	0.03			550	23	5400	
	40A	40	VXD2382-40				740	31	6800	
	50A	50	VXD2392-50				1200	49	8400	



(Note) Weight of grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for terminal type respectively.

• Refer to "Glossary of Terms" on front matter 10, for details on the max. operating pressure differential and the max. system pressure.

Operating Fluid and Ambient Temperature

Power source	Operating fluid temperature (°C)		Ambient temperature (°C)
	Solenoid valve option		
	Standard, G, H	E, P	
AC	1 to 60	1 to 99	-10 to 60
DC	1 to 60	—	-10 to 60

Note 1) Since the AC/Class B coil (with a full-wave rectifier) uses a rectifying circuit, the fluid and ambient temperature are the same as the DC specifications.

Note 2) With no freezing.

Tightness of Valve (Leakage Rate)

Seal material	Leakage rate (With water pressure)	
	1/4 to 1	32A to 50A
NBR, FKM, EPDM	0.2 cm ³ /min or less	1 cm ³ /min or less

How to Order

DC/AC (except VXD2130 AC/Class B)
AC/Class B coil (with a full-wave rectifier)

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

Valve/Body configuration • Refer to "Table (1)" shown below for availability.

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

Suffix • Refer to "Table (3)" shown below for availability.

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

Rated voltage • Refer to "Table (3)" shown below for availability.

Electrical entry • Refer to "Table (3)" for the available combinations between each electrical option (S, L, Z) and rated voltage.

Bracket • Refer to "Table (1)" shown below for availability.

With a full-wave rectifier, surge voltage suppressor

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

* DIN type is available with class B insulation only.

Bracket

-	None
B	With bracket

* Bracket is not removable.

Thread type

-	Rc
T	NPTF
F	G
N	NPT

Rated voltage

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

* Refer to "Table (3)" shown below for availability.

Refer to page 2 for ordering coil only.

Table (1) Port/Orifice Size

Normally closed (N.C.)

Solenoid valve (Port size)				Orifice symbol							Material	
Model	VXD21	VXD22	VXD23	3 (10 mmø)	4 (15 mmø)	5 (20 mmø)	6 (25 mmø)	7 (35 mmø)	8 (40 mmø)	9 (50 mmø)	Body	Seal
Port no. (Port size)	Thread	02 (1/4)	-	-	●	-	-	-	-	-	Brass (C37), Stainless steel	NBR FKM EPDM
		03 (3/8)	-	-	●	●	-	-	-	-		
		04 (1/2)	-	-	●	●	-	-	-	-		
	06 (3/4)	-	-	-	-	●	-	-	-			
	-	10 (1)	-	-	-	-	●	-	-	-		
	Flange	-	32 (32A)	-	-	-	-	-	●	-		
-	-	40 (40A)	-	-	-	-	-	●	-			
-	-	50 (50A)	-	-	-	-	-	-	●			

Normally open (N.O.)

Solenoid valve (Port size)				Orifice symbol						Material		
Model	VXD21	VXD22	VXD23	4 (15 mmø)	5 (20 mmø)	6 (25 mmø)	7 (35 mmø)	8 (40 mmø)	9 (50 mmø)	Body	Seal	
Port no. (Port size)	Thread	03 (3/8)	-	-	●	-	-	-	-	Brass (C37), Stainless steel	NBR FKM EPDM	
		04 (1/2)	-	-	●	-	-	-	-			
		06 (3/4)	-	-	-	●	-	-	-			
	-	10 (1)	-	-	-	●	-	-	-			
	Flange	-	32 (32A)	-	-	-	●	-	-			Bronze (CAC407)
	-	-	40 (40A)	-	-	-	●	-	-			
-	-	50 (50A)	-	-	-	-	●	-				

Table (2) Solenoid Valve Option

Option symbol	Seal material	Body material/ Shading coil material	Coil insulation type	Note
-	NBR	Brass (C37)/Copper	B	-
G		Stainless steel/Silver		
E	EPDM	Brass (C37)/Copper	H	Heated water (AC only)
P		Stainless steel/Silver		
L	FKM	Stainless steel/Silver	B	High corrosion resistance specification, Oil-free

Table (3) 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	●	-	-	●	-	-
DC	J	230 V	●	-	-	●	-	-
	5	24 V	●	●	●	DC specification is not available.		
	6	12 V	●	-	-			

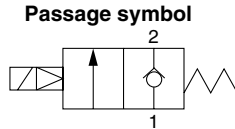
Note) Option S, Z are not available as a surge voltage suppressor is integrated into the AC/Class B coil (with a full-wave rectifier) as standard.

Series VXD21/22/23

For Oil

Model/Valve Specifications

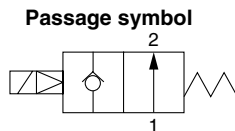
Normally closed (N.C.)



Port size	Orifice size (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)		Flow characteristics		Max. system pressure (MPa)	Weight (g) ^(Note)		
				AC	DC	Av x 10 ⁻⁶ m ²	Cv converted				
Thread	1/4 (8A)	10	VXD2130-02	0.02	0.5	0.4	46	1.9	1.5	420	
	3/8 (10A)	10	VXD2130-03				58	2.4			
		15	VXD2140-03				110	4.5			
	1/2 (15A)	10	VXD2130-04		0.5	0.4	58	2.4			
		15	VXD2140-04		130	5.5					
	Flange	3/4 (20A)	20		VXD2150-06	0.7	0.7	230			9.5
1 (25A)		25	VXD2260-10	310	13			670			
32A		35	VXD2270-32	550	23			1150			
Flange	40A	40	VXD2380-40	0.03					1650		
	50A	50	VXD2390-50						740	31	6800
									1200	49	8400

Note) Weight of grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for terminal type respectively.
 • Refer to "Glossary of Terms" on front matter 10, for details on the max. operating pressure differential and the max. system pressure.

Normally open (N.O.)



Port size	Orifice size (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)		Flow characteristics		Max. system pressure (MPa)	Weight (g) ^(Note)
				AC, DC		Av x 10 ⁻⁶ m ²	Cv converted		
Thread	3/8 (10A)	15	VXD2142-03	0.6		110	4.5	1.5	690
	1/2 (15A)	20	VXD2142-04			130	5.5		
	3/4 (20A)	25	VXD2152-06			230	9.5		
	1 (25A)	35	VXD2262-10			310	13		
Flange	32A	35	VXD2272-32	0.03		550	23		1690
	40A	40	VXD2382-40			740	31		5400
	50A	50	VXD2392-50			1200	49		6800

Note) Weight of grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for terminal type respectively.
 • Refer to "Glossary of Terms" on front matter 10, for details on the max. operating pressure differential and the max. system pressure.

Operating Fluid and Ambient Temperature

Power source	Operating fluid temperature (°C)		Ambient temperature (°C)
	Solenoid valve option		
	A, H	D, N	
AC	-5 to 60	-5 to 100	-10 to 60
DC	-5 to 60	—	-10 to 60

Note 1) Kinematic viscosity: 50 mm²/s or less.
 Note 2) Since the AC/Class B coil (with a full-wave rectifier) uses a rectifying circuit, the fluid and ambient temperature are the same as the DC specifications.

Tightness of Valve (Leakage Rate)

Seal material	Leakage rate (With oil pressure)	
	1/4 to 1	32A to 50A
FKM	0.2 cm ³ /min or less	1 cm ³ /min or less

How to Order

DC/AC (except VXD2130 AC/Class B)

AC/Class B coil (with a full-wave rectifier)

* The AC (Class B) coil for VXD2130 only comes with a full-wave rectifier.

Model

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

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

Valve/Body configuration

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

Solenoid valve option

Refer to "Table (2)" shown below for availability.

Suffix

-	-
Z	Oil-free

Thread type

-	Rc
T	NPTF
F	G
N	NPT

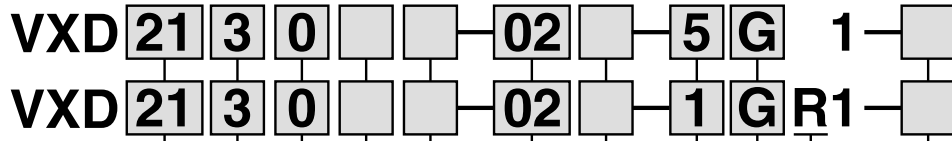
Rated voltage

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

* Refer to "Table (3)" shown below for availability.



Refer to page 2 for ordering coil only.



Bracket

-	None
B	With bracket

* Bracket is not removable.

With a full-wave rectifier, surge voltage suppressor

Electrical entry

<p>G - Grommet</p> <p>GS - With grommet surge voltage suppressor</p>	<p>C - Conduit</p>
<p>T - With conduit terminal</p> <p>TS - With conduit terminal and surge voltage suppressor</p> <p>TL - With conduit terminal and light</p> <p>TZ - With conduit terminal, surge voltage suppressor and light</p>	<p>D - DIN</p> <p>DS - DIN with surge voltage suppressor</p> <p>DL - DIN with light</p> <p>DZ - DIN with surge voltage suppressor and light</p> <p>DO - For DIN (without connector)</p> <p>* DIN type is available with class B insulation only.</p>

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

* Option S, Z are not available as a surge voltage suppressor is integrated into the AC/Class B coil (with a full-wave rectifier) as standard.

Table (1) Port/Orifice Size

Normally closed (N.C.)

Solenoid valve (Port size)				Orifice symbol							Material		
Model	VXD21	VXD22	VXD23	3 (10 mmø)	4 (15 mmø)	5 (20 mmø)	6 (25 mmø)	7 (35 mmø)	8 (40 mmø)	9 (50 mmø)	Body	Seal	
Port no. (Port size)	Thread	02 (1/4)	-	-	●	-	-	-	-	-	Brass (C37), Stainless steel	NBR FKM EPDM	
		03 (3/8)	-	-	●	●	-	-	-	-			
		04 (1/2)	-	-	●	●	-	-	-	-			
	06 (3/4)	-	-	-	-	●	-	-	-	-			
	Flange	-	10 (1)	-	-	-	-	●	-	-			-
		-	32 (32A)	-	-	-	-	-	●	-			-
-		-	40 (40A)	-	-	-	-	-	●	-			
			50 (50A)	-	-	-	-	-	-	●			
			-	-	-	-	-	-	-	-	Bronze (CAC407)		

Normally open (N.O.)

Solenoid valve (Port size)				Orifice symbol						Material		
Model	VXD21	VXD22	VXD23	4 (15 mmø)	5 (20 mmø)	6 (25 mmø)	7 (35 mmø)	8 (40 mmø)	9 (50 mmø)	Body	Seal	
Port no. (Port size)	Thread	03 (3/8)	-	-	●	-	-	-	-	Brass (C37), Stainless steel	NBR FKM EPDM	
		04 (1/2)	-	-	●	-	-	-	-			
		06 (3/4)	-	-	-	●	-	-	-			-
	Flange	-	10 (1)	-	-	-	●	-	-			-
		-	32 (32A)	-	-	-	-	●	-			-
		-	-	40 (40A)	-	-	-	-	●			-
			50 (50A)	-	-	-	-	-	●			
			-	-	-	-	-	-	-	Bronze (CAC407)		

Table (2) Solenoid Valve Option

Option symbol	Seal material	Body material/ Shading coil material	Coil insulation type
A	FKM	Brass (C37)/Copper	B
H		Stainless steel/Silver	
D		Brass (C37)/Copper	H
N		Stainless steel/Silver	

Table (3) Rated Voltage – Electrical Option

Rated voltage			Class B			Class H		
AC/DC	Voltage symbol	Voltage	S	L	Z	S	L	Z
AC	1	100 V	●	●	●	●	●	●
	2	200 V	●	●	●	●	●	●
	3	110 V	●	●	●	●	●	●
	4	220 V	●	●	●	●	●	●
	7	240 V	●	-	-	●	-	-
	8	48 V	●	-	-	●	-	-
DC	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 a surge voltage suppressor is integrated into the AC/Class B coil (with a full-wave rectifier) as standard.

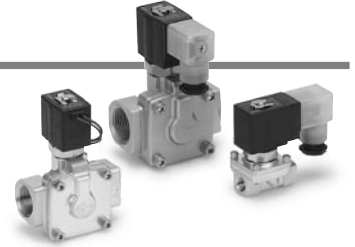
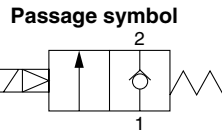
Series VXD21/22/23

For Air

(Inert gas)

Model/Valve Specifications

Normally closed (N.C.)



Port size		Orifice size (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)		Flow characteristics			Max. system pressure (MPa)	Weight (g) ^(Note)		
					AC	DC	C	b	Cv				
Thread	1/4 (8A)	10	VXD2130-02	0.02	0.9	0.7	8.5	0.35	2.0	1.5	420		
	3/8 (10A)	10	VXD2130-03				9.2		2.4				
		15	VXD2140-03				18.0		5.0				
	1/2 (15A)	10	VXD2130-04				0.9		0.7			9.2	2.4
		15	VXD2140-04				1.0		1.0			20.0	5.5
3/4 (20A)	20	VXD2150-06	1.0	1.0	38.0	0.30	9.5	1150					

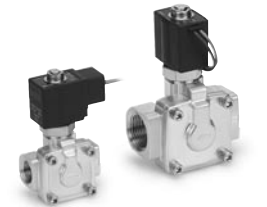
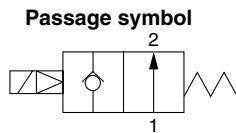
Port size		Orifice size (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)		Flow characteristics		Max. system pressure (MPa)	Weight (g) ^(Note)
					AC, DC	Effective area (mm ²)				
Thread	1 (25A)	25	VXD2260-10	0.02	1.0	1.0	225		1.5	1650
	32A	35	VXD2270-32				415			5400
Flange	40A	40	VXD2380-40	0.03	1.0	1.0	560		1.5	6800
	50A	50	VXD2390-50				880			8400



Note) Weight of grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for terminal type respectively.

• Refer to "Glossary of Terms" on front matter 10, for details on the max. operating pressure differential and the max. system pressure.

Normally open (N.O.)



Port size		Orifice size (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)		Flow characteristics			Max. system pressure (MPa)	Weight (g) ^(Note)
					AC, DC	Effective area (mm ²)					
Thread	3/8 (10A)	15	VXD2142-03	0.02	0.7	0.7	18.0	0.35	5.0	1.5	690
	1/2 (15A)		VXD2142-04				20.0		5.5		
	3/4 (20A)	20	VXD2152-06				38.0		0.30		

Port size		Orifice size (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)		Flow characteristics		Max. system pressure (MPa)	Weight (g) ^(Note)
					AC, DC	Effective area (mm ²)				
Thread	1 (25A)	25	VXD2262-10	0.02	0.7	0.7	225		1.5	1690
	32A	35	VXD2272-32				415			5400
Flange	40A	40	VXD2382-40	0.03	0.7	0.7	560		1.5	6800
	50A	50	VXD2392-50				880			8400



Note) Weight of grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for terminal type respectively.

• Refer to "Glossary of Terms" on front matter 10, for details on the max. operating pressure differential and the max. system pressure.

Operating Fluid and Ambient Temperature

Power source	Operating fluid temperature (°C)		Ambient temperature (°C)
	Solenoid valve option		
	Standard, G		
AC	-10 ^(Note) to 60		-10 to 60
DC	-10 ^(Note) to 60		-10 to 60

Note) Dew point temperature: -10°C or less.

Tightness of Valve (Leakage Rate)

Seal material	Leakage rate (Air)	
	1/4 to 1	32A to 50A
NBR, FKM	2 cm ³ /min or less	10 cm ³ /min or less

How to Order (Single Unit)

DC VXD 21 3 0 [] [] - 02 [] - 5 G 1 - []

AC/Class B coil (with a full-wave rectifier) VXD 21 3 0 [] [] - 02 [] - 1 G R1 - []

* The AC (Class B) coil for VXD2130 only comes with a full-wave rectifier.

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

Orifice size • Refer to "Table (1)" shown below for availability.

Valve/Body configuration •

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

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

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

-	Rc
T	NPTF
F	G
N	NPT

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

Suffix •

-	-
Z	Oil-free

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 2 for ordering coil only.

Bracket

-	None
B	With bracket

* Bracket is not removable.

With a full-wave rectifier, surge voltage suppressor

Electrical entry

G - Grommet	C - Conduit
GS - With grommet surge voltage suppressor	Connector
T - With conduit terminal	D - DIN
TS - With conduit terminal and surge voltage suppressor	DS - DIN with surge voltage suppressor
TL - With conduit terminal and light	DL - DIN with light
TZ - With conduit terminal, surge voltage suppressor and light	DZ - DIN with surge voltage suppressor and light
	DO - For DIN (without connector)

* DIN type is available with class B insulation only.

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

* Option S, Z are not available as a surge voltage suppressor is integrated into the AC/Class B coil (with a full-wave rectifier) as standard.

For Water
For Oil
For Air

Table (1) Port/Orifice Size

Normally closed (N.C.)

Solenoid valve (Port size)				Orifice symbol							Material	
Model	VXD21	VXD22	VXD23	3 (10 mmø)	4 (15 mmø)	5 (20 mmø)	6 (25 mmø)	7 (35 mmø)	8 (40 mmø)	9 (50 mmø)	Body	Seal
Port no. (Port size)	Thread	02 (1/4)	-	-	●	-	-	-	-	-	Brass (C37), Stainless steel	NBR
		03 (3/8)	-	-	●	●	-	-	-	-		
		04 (1/2)	-	-	●	●	-	-	-	-		
	06 (3/4)	-	-	-	-	●	-	-	-	-		
	-	10 (1)	-	-	-	-	●	-	-	-		
	-	32 (32A)	-	-	-	-	-	●	-	-		
Flange	-	-	40 (40A)	-	-	-	-	-	●	-	Bronze (CAC407)	
	-	-	50 (50A)	-	-	-	-	-	-	●		
	-	-	-	-	-	-	-	-	-	-		

Normally open (N.O.)

Solenoid valve (Port size)				Orifice symbol						Material	
Model	VXD21	VXD22	VXD23	4 (15 mmø)	5 (20 mmø)	6 (25 mmø)	7 (35 mmø)	8 (40 mmø)	9 (50 mmø)	Body	Seal
Port no. (Port size)	Thread	03 (3/8)	-	-	●	-	-	-	-	Brass (C37), Stainless steel	NBR
		04 (1/2)	-	-	●	-	-	-	-		
		06 (3/4)	-	-	-	●	-	-	-		
	-	10 (1)	-	-	-	●	-	-	-		
	-	32 (32A)	-	-	-	-	●	-	-		
	-	-	40 (40A)	-	-	-	-	●	-		
Flange	-	-	50 (50A)	-	-	-	-	-	●	Bronze (CAC407)	
	-	-	-	-	-	-	-	-	●		

Table (2) Solenoid Valve Option

Option symbol	Seal material	Body material/ Shading coil material	Coil insulation type	Note
-	NBR	Brass (C37)/Copper	B	-
G		Stainless steel/Silver		

Table (3) 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	●	-	-	●	-	-
DC	J	230 V	●	-	-	●	-	-
	5	24 V	●	●	●	DC specification is not available.		
	6	12 V	●	-	-			

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

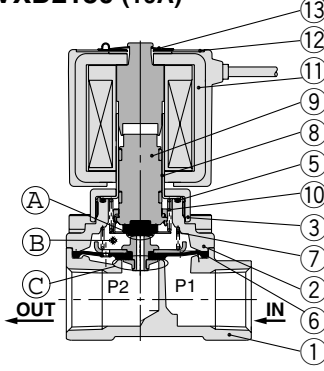
Series VXD21/22/23

Construction

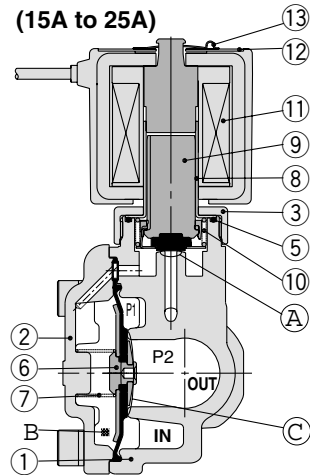
Normally closed (N.C.)

Body material: Brass (32A or more: Bronze), Stainless steel

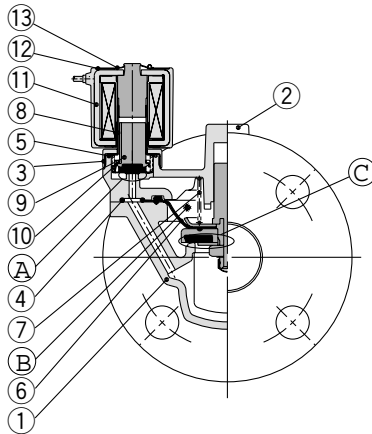
VXD2130 (10A)



VXD2140/2150/2260 (15A to 25A)



VXD2270/2380/2390 (32A to 50A)



Operation

<Valve opened> When the coil ⑪ is energised, the armature assembly ⑨ is attracted into the core of the tube assembly ⑧ and the pilot valve ① opens. Then the pressure in the pressure action chamber ② falls to open the main valve ③.
<Valve closed> When the coil ⑪ is not energised, the pilot valve ① is closed and the pressure in the pressure action chamber ② rises and the main valve ③ closes.

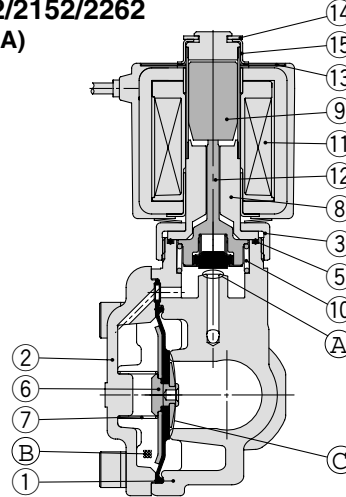
Component Parts

No.	Description	Size	Material	
			Standard	Option
1	Body	10A to 25A	Brass	Stainless steel
		32A to 50A	Bronze	
2	Bonnet	10A to 25A	Brass	Stainless steel
		32A to 50A	Bronze	
3	Nut	10A to 50A	Brass	Brass, Ni plated
4	O-ring	32A to 50A	(NBR)	(FKM, EPDM)
5	O-ring	10A to 50A	(NBR)	(FKM, EPDM)
6	Diaphragm assembly	10A to 25A	Stainless steel, (NBR)	Stainless steel, (FKM) / Stainless steel, (EPDM)
		32A to 50A	Stainless steel, Brass (NBR)	Stainless steel, (FKM, EPDM)
7	Valve spring	10A to 50A	Stainless steel	
8	Tube assembly	10A to 25A	Stainless steel, Copper	Stainless steel, Silver
		32A to 50A	—	
9	Armature assembly	10A	Stainless steel, PPS, (NBR)	Stainless steel, PPS, (FKM) / Stainless steel, (EPDM)
		15A to 50A	—	
10	Reurn spring	10A to 50A	Stainless steel	
11	Solenoid coil	10A to 50A	Class B molded	Class H molded
12	Name plate	10A to 50A	Aluminum	
13	Clip	10A to 50A	SK	

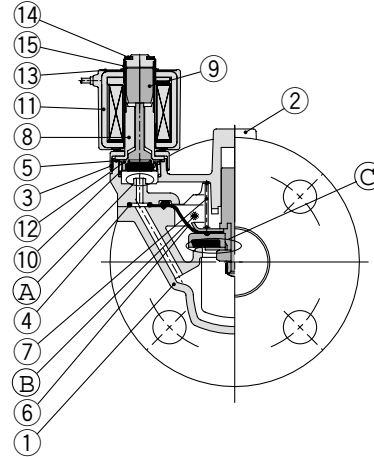
Normally open (N.O.)

Body material: Brass (32A or more: Bronze), Stainless steel

VXD2142/2152/2262 (15A to 25A)



VXD2272/2382/2392 (32A to 50A)



Operation

<Valve opened> When the coil ⑪ is energised, the opened pilot ① closes, the pressure in pressure action chamber ② rises and the main valve ③ closes.
<Valve closed> When the coil ⑪ is not energised, the closed pilot valve ① opens, the pressure in pressure action chamber ② drops and the main valve ③ opens.

Component Parts

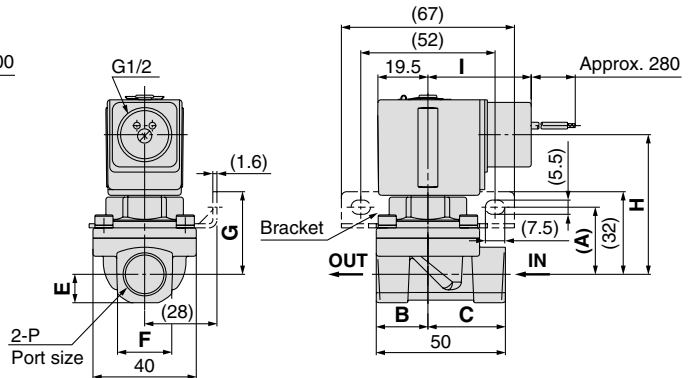
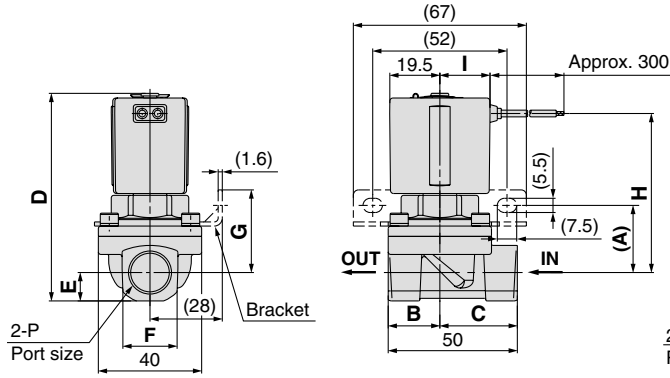
No.	Description	Size	Material	
			Standard	Option
1	Body	15A to 25A	Brass	Stainless steel
		32A to 50A	Bronze	
2	Bonnet	15A to 25A	Brass	Stainless steel
		32A to 50A	Bronze	
3	Nut	15A to 25A	Brass	Brass, Ni plated
4	O-ring	32A to 50A	(NBR)	(FKM, EPDM)
5	O-ring	15A to 50A	(NBR)	(FKM, EPDM)
6	Diaphragm assembly	15A to 25A	Stainless steel, (NBR)	Stainless steel, (FKM) / Stainless steel, (EPDM)
		32A to 50A	Stainless steel, (NBR)	Stainless steel, (FKM, EPDM)
7	Valve spring	15A to 25A	Stainless steel	
8	Tube assembly	15A to 25A	Stainless steel, Copper	Stainless steel, Silver
		32A to 50A	—	
9	Armature assembly	10A to 50A	Stainless steel	
10	Reurn spring	15A to 50A	Stainless steel	
11	Solenoid coil	15A to 50A	Class B molded	Class H molded
12	Push rod assembly	15A to 50A	(NBR), PPS, Stainless steel	(FKM, (EPDM), Stainless steel)
13	Name plate	15A to 50A	Aluminum	
14	Clip	15A to 50A	SK	
15	Cover	15A to 50A	Stainless steel	

Dimensions

Normally closed (N.C.): VXD2130

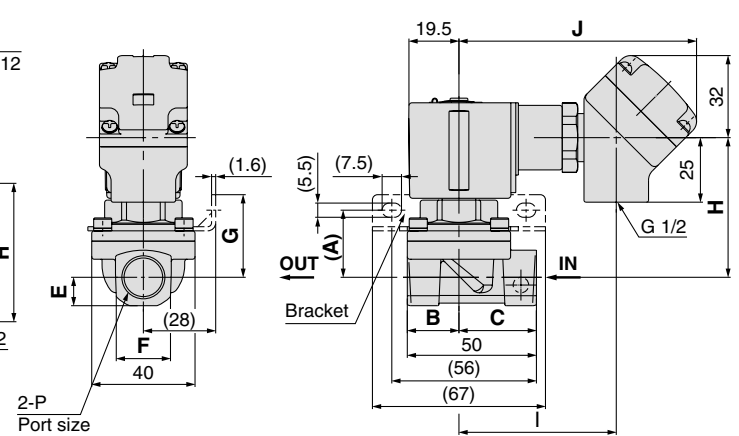
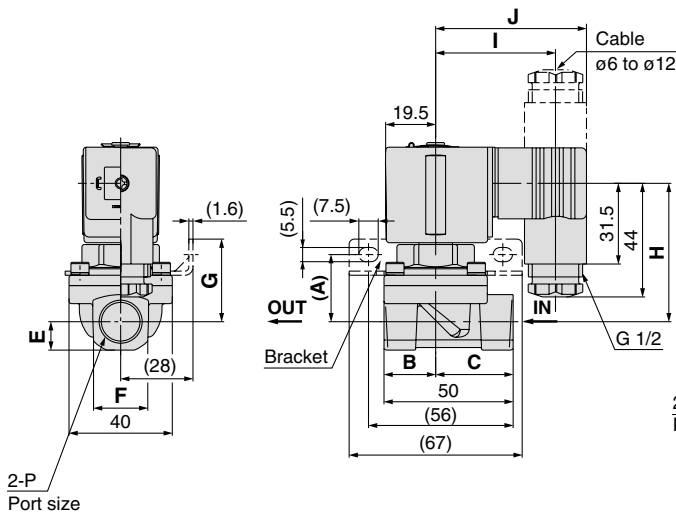
Grommet: G

Conduit: C

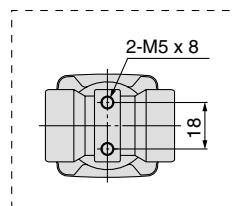


DIN terminal: D

Conduit terminal: T



VXD2130-04



Model	Port size P	A	B	C	D	E	F	G	Electrical entry (DC, AC/Class H coil)									
									Grommet		Conduit		DIN terminal		Conduit terminal			
									H	I	H	I	H	I	J	H	I	J
Normally closed VXD2130	1/4, 3/8	26	20	30	80.5	11	21	32	62	19.5	54.5	40	54	46.5	58.5	54.5	61	92
	1/2	28	24	26	86	14.5	28	34	64	19.5	56.5	40	56	46.5	58.5	56.5	61	92

Model	Electrical entry (AC/Class B coil)*									
	Grommet		Conduit		DIN terminal			Conduit terminal		
	H	I	H	I	H	I	J	H	I	J
Normally closed VXD2130	58	30	53	48.5	54	53.5	65.5	53	69.5	100.5
	60	30	55	48.5	56	53.5	65.5	55	69.5	100.5

* Coil with a full-wave rectifier (electrical option "R")

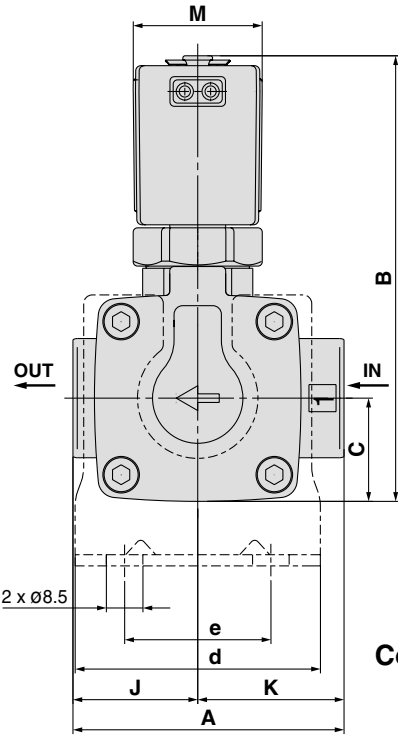
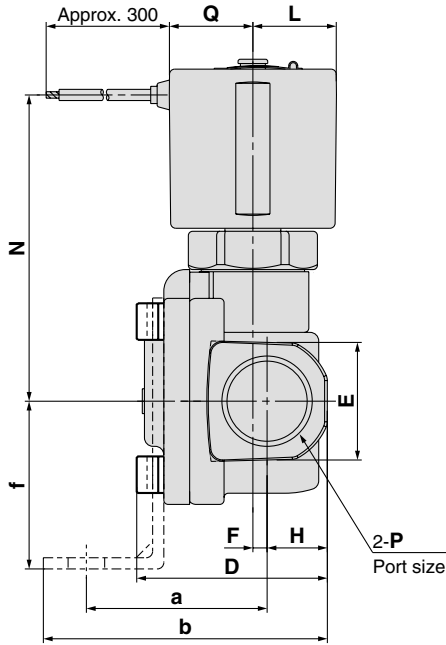
Series VXD21/22/23

Dimensions

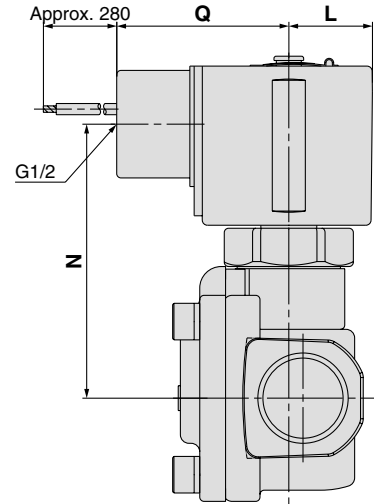
Normally closed (N.C.): VXD2140/2150/2260

Normally open (N.O.): VXD2142/2152/2262

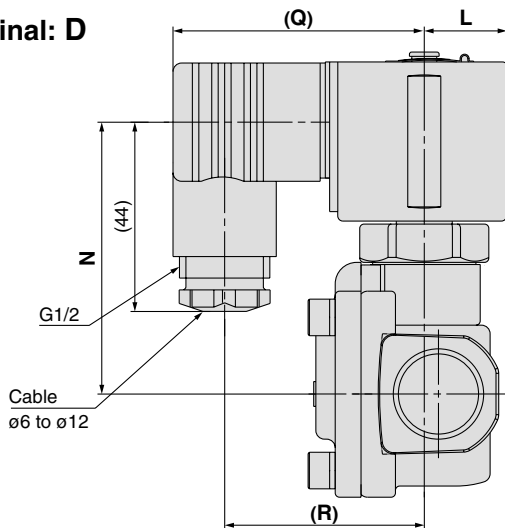
Grommet: G



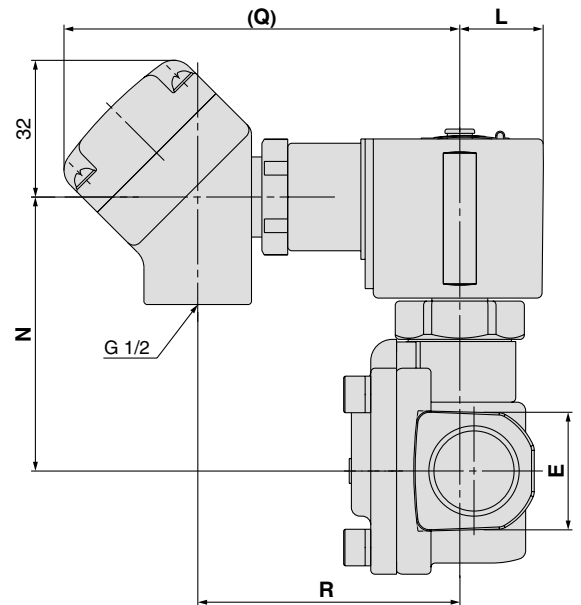
Conduit: C



DIN terminal: D



Conduit terminal: T



Model		Port size P	A	B	C	D	E	F	H	J	K	L	M	Electrical entry (DC, AC)											
Normally closed	Normally open													Grommet			Conduit			DIN terminal			Conduit terminal		
														N	Q	R	N	Q	R	N	Q	R	N	Q	R
VXD2140	VXD2142	3/8, 1/2	63	104 (110.5)	24	44.5	28	3.5	14	29	34	19.5	30	71.5	19.5	64	40	63.5	58.5	46.5	64	92	61		
VXD2150	VXD2152	3/4	80	115.5 (122)	29	51.5	35	4.5	17	37	43	19.5	30	78	19.5	70.5	40	70	58.5	46.5	70.5	92	61		
VXD2260	VXD2262	1	90	133 (140.5)	33	60	42	4.5	20	43	47	22.5	35	92	22.5	84.5	43	84	61.5	49.5	84.5	95	64		

() denotes the value for N.O.

Model		Port size P	Bracket mounting				
Normally closed	Normally open		a	b	d	e	f
VXD2140	VXD2142	3/8, 1/2	42	66	57	34	39
VXD2150	VXD2152	3/4	46	73	74	51	45.5
VXD2260	VXD2262	1	56	86	81	58	49.5

Model		Electrical entry (AC/Class B coil)*											
Normally closed	Normally open	Grommet			Conduit			DIN terminal			Conduit terminal		
		N	Q	R	N	Q	R	N	Q	R	N	Q	R
VXD2140	VXD2142	67.5	37	62.5	48.5	63.5	65.5	53.5	62.5	100.5	69.5		
VXD2150	VXD2152	74	37	69	48.5	70	65.5	53.5	69	100.5	69.5		
VXD2260	VXD2262	88	40	83	51.5	84	68.5	56.5	83	103.5	72.5		

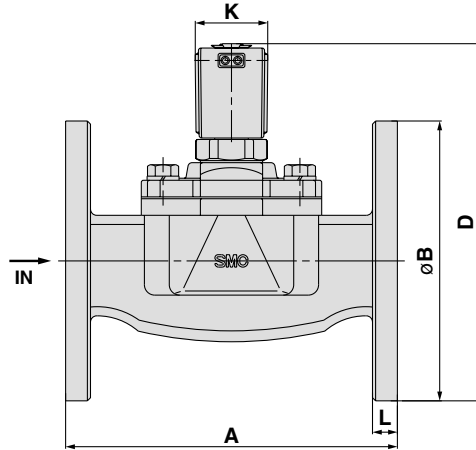
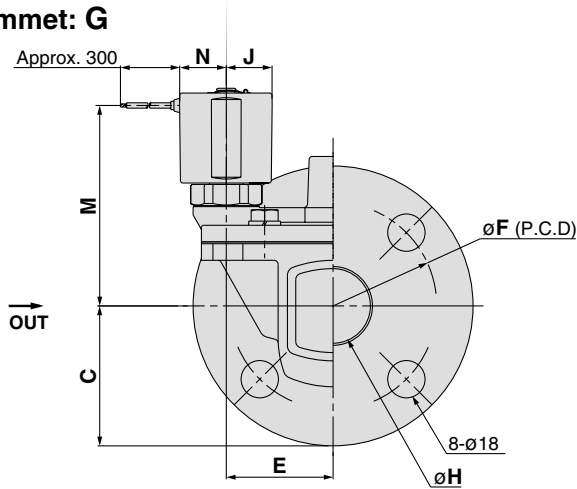
* Coil with a full-wave rectifier (electrical option "R")

Dimensions

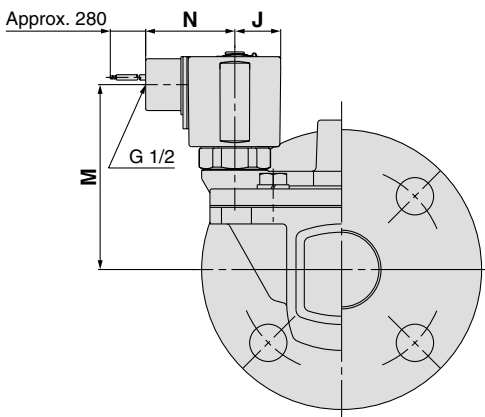
Normally closed (N.C.): VXD2270/2380/2390

Normally open (N.O.): VXD2272/2382/2392

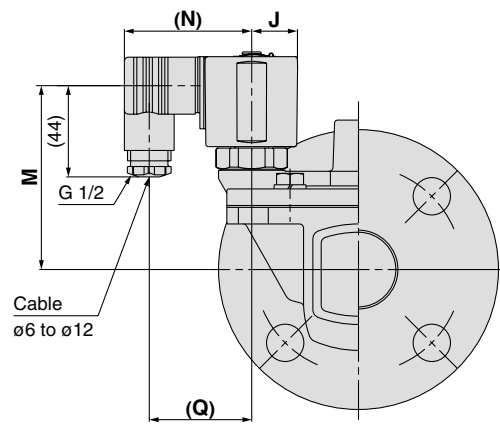
Grommet: G



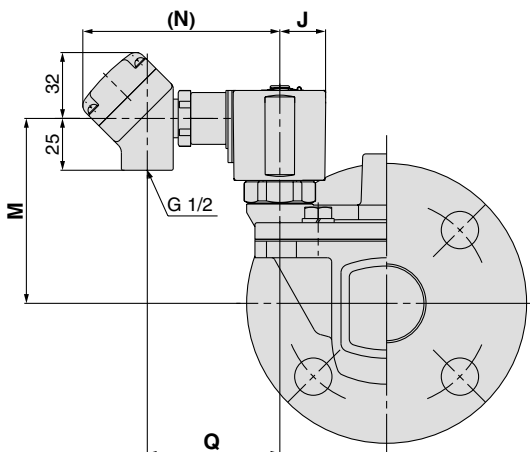
Conduit: C



DIN terminal: D



Conduit terminal: T



(mm)

Model		Electrical entry (AC/Class B coil)*									
		Grommet		Conduit		DIN terminal		Conduit terminal			
Normally closed	Normally open	M	N	M	N	M	N	Q	M	N	Q
VXD2270	VXD2272	93	33	88	51.5	89	68.5	56.5	88	103.5	72.5
VXD2380	VXD2382	103	36	98	54	99	71	59	98	106	75
VXD2390	VXD2392	108.5	36	103.5	54	104.5	71	59	103.5	106	75

* Coil with a full-wave rectifier (electrical option "R")

(mm)

Model		Applicable flange	A	B	C	D	E	F	H	J	K	L	Electrical entry (DC, AC)									
													Grommet		Conduit		DIN terminal		Conduit terminal			
Normally closed	Normally open												M	N	M	N	M	N	Q	M	N	Q
VXD2270	VXD2272	32A	160	135	67.5	172.5 (180)	51.5	100	36	22.5	35	12	97	22.5	89.5	43	89	61.5	49.5	89.5	95	64
VXD2380	VXD2382	40A	170	140	70	185 (192.5)	54.5	105	42	25	40	14	106.5	25.5	99	46	98.5	64	52	99	98	66.5
VXD2390	VXD2392	50A	180	155	77.5	198.5 (205.5)	59	120	52	25	40	14	112.5	25.5	105	46	104.5	64	52	105	98	66.5

() denotes the value for N.O.



Series VXD21/22/23

Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by labels of "Caution", "Warning" or "Danger". To ensure safety, be sure to observe ISO 4414 ^{Note 1)}, JIS B 8370 ^{Note 2)} and other safety practices.

⚠ Caution : Operator error could result in injury or equipment damage.

⚠ Warning : Operator error could result in serious injury or loss of life.

⚠ Danger : In extreme conditions, there is a possible result of serious injury or loss of life.

Note 1) ISO 4414: Pneumatic fluid power--General rules relating to systems.

Note 2) JIS B 8370: General Rules for Pneumatic Equipment

⚠ Warning

1. The compatibility of the pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.

Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or post analysis and/or tests to meet your specific requirements. The expected performance and safety assurance are the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified, referring to the latest catalogue information with a view to giving due consideration to any possibility of equipment failure when configuring a system.

2. Only trained personnel should operate pneumatically operated machinery and equipment.

Compressed air can be dangerous if handled incorrectly. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.

1. Inspection and maintenance of machinery/equipment should only be performed once measures to prevent falling or runaway of the driven objects have been confirmed.
2. When equipment is removed, confirm that safety process as mentioned above. Turn off the supply pressure for this equipment and exhaust all residual compressed air in the system.
3. Before machinery/equipment is restarted, take measures to prevent quick extension of a cylinder piston rod, etc.

4. Contact SMC if the product will be used in any of the following conditions:

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuits in press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.



2 Port Solenoid Valve for Fluid Control/Precautions 1

Be sure to read this before handling.

For detailed precautions on each series, refer to the main text.

Caution on Design

Warning

1. Cannot be used as an emergency shutoff valve, etc.

The valves presented in this catalogue are not designed for safety applications such as an emergency shutoff valve. If the valves are used in this type of system, other reliable safety assurance measures should also be adopted.

2. Extended periods of continuous energisation

The solenoid coil will generate heat when continuously energised. Avoid using in a tightly shut container. Install it in a well-ventilated area. Furthermore, do not touch it while it is being energised or right after it is energised.

3. This solenoid valve cannot be used for explosion proof applications.

4. Maintenance space

The installation should allow sufficient space for maintenance activities (removal of valve, etc.).

5. Liquid rings

In cases with a flowing liquid, provide a bypass valve in the system to prevent the liquid from entering the liquid seal circuit.

6. Actuator drive

When an actuator, such as a cylinder, is to be driven using a valve, take appropriate measures to prevent potential danger caused by actuator operation.

7. Pressure (including vacuum) holding

It is not usable for an application such as holding the pressure (including vacuum) inside of a pressure vessel because air leakage is entailed in a valve.

8. When the conduit type is used as equivalent to an IP65 enclosure, install a wiring conduit, etc.

9. When an impact, such as water hammer, etc., caused by the rapid pressure fluctuation is applied, the solenoid valve may be damaged. Please pay attention to this.

Selection

Warning

1. Confirm the specifications.

Give careful consideration to the operating conditions such as the application, fluid and environment, and use within the operating ranges specified in this catalogue.

2. Fluid

1) Type of fluid

Before using a fluid, confirm whether it is compatible with the materials from each model by referring to the fluids listed in this catalogue. Use a fluid with a kinematic viscosity of 50 mm²/s or less. If there is something you do not know, please contact SMC.

2) Inflammable oil, Gas

Confirm the specification for leakage in the interior and/or exterior area.

Selection

Warning

3) Corrosive gas

Cannot be used since it will lead to cracks by stress corrosion or result in other incidents.

4) Use an oil-free specification when oily particles must not enter the fluid passage.

5) Applicable fluid on the list may not be used depending on the operating condition. Just because the compatibility list shows the general case, still give adequate confirmation when selecting a model.

3. Fluid quality

The use of a fluid which contains foreign matter can cause problems such as malfunction and seal failure by promoting wear of the valve seat and armature, and by sticking to the sliding parts of the armature, etc. Install a suitable filter (strainer) immediately upstream from the valve. As a general rule, use 80 to 100 mesh. When used to supply water to boilers, substances such as calcium and magnesium which generate hard scale and sludge are included. Since this scale and sludge can cause the valve to malfunction, install water softening equipment, and a filter (strainer) directly upstream from the valve to remove these substances.

4. Air quality

1) Use clean air.

Do not use compressed air which includes chemicals, synthetic oils containing organic solvents, salt or corrosive gases, etc., as it can cause damage or malfunction.

2) Install air filters.

Install air filters close to the valves on their upstream side. A filtration degree of 5µm or less should be selected.

3) Install an air dryer or after cooler, etc.

Compressed air that includes excessive drainage may cause malfunction of valves and other pneumatic equipment. To prevent this, install an air dryer or after cooler, etc.

4) If excessive carbon powder is generated, eliminate it by installing mist separators on the upstream side of the valves.

If excessive carbon powder is generated by the compressor, it may adhere to the inside of the valves and cause a malfunction.

Refer to SMC's Best Pneumatics catalogue for further details on compressed air quality.

5. Ambient environment

Use within the operable ambient temperature range. Confirm the compatibility between the product's composition materials and the ambient atmosphere. Be sure that the fluid used does not touch the external surface of the product.

6. Countermeasures against static electricity

Take measures to prevent static electricity since some fluids can cause static electricity.

7. For the low particle generation specification, please contact SMC.



2 Port Solenoid Valve for Fluid Control/Precautions 2

Be sure to read this before handling.

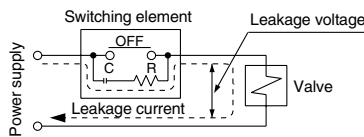
For detailed precautions on each series, refer to the main text.

Selection

⚠ Caution

1. Leakage voltage

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 coil with a full-wave rectifier: 10% or less of rated voltage
- AC/Class B, H coil: 20% or less of rated voltage
- DC coil: 2% or less of rated voltage

2. Low temperature operation

1. The valve can be used in an ambient temperature of between -10 to -20°C , however take measures to prevent freezing or solidification of impurities, etc.
2. When using valves for water application in cold climates, take appropriate countermeasures to prevent the water from freezing in tubing after cutting the water supply from the pump, by draining the water, etc. When heating by steam, be careful not to expose the coil portion to steam. Installation of a dryer or, heat retaining of the body is recommended to prevent a freezing condition in which the dew point temperature is high and the ambient temperature is low, and the high flow runs.

Mounting

⚠ Warning

1. If air leakage increases or equipment does not operate properly, stop operation.

After mounting is completed, confirm that it has been done correctly by performing a suitable function test.

2. Do not apply external force to the coil section.

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

3. Be sure not to position the coil downwards.

When mounting a valve with its coil positioned downwards, foreign objects in the fluid will adhere to the iron core leading to a malfunction.

4. Do not warm the coil assembly with a heat insulator, etc.

Use tape, heaters, etc., for freeze prevention on the piping and body only. They can cause the coil to burn out.

5. Secure with brackets, except in the case of steel piping and copper fittings.

6. Avoid sources of vibration, or adjust the arm from the body to the minimum length so that resonance will not occur.

7. Painting and coating

Warnings or specifications printed or labelled on the product should not be erased, removed or covered up.

Piping

⚠ Caution

1. Preparation before piping

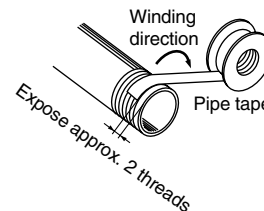
Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

Avoid pulling, compressing, or bending the valve body when piping.

2. Wrapping of pipe tape

When connecting pipes, fittings, etc., be sure that chips from the pipe threads and sealing material do not enter the valve.

Furthermore, when pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.



3. Avoid connecting ground lines to piping, as this may cause electric corrosion of the system.

4. Always tighten threads with the proper tightening torque.

When attaching fittings to valves, tighten with the proper tightening torque shown below.

Tightening Torque for Piping

Connection threads	Proper tightening torque N·m
Rc 1/8	7 to 9
Rc 1/4	12 to 14
Rc 3/8	22 to 24
Rc 1/2	28 to 30
Rc 3/4	
Rc 1	36 to 38

5. Connection of piping to products

When connecting piping to a product, refer to its instruction manual to avoid mistakes regarding the supply port, etc.

6. Steam generated in a boiler contains a large amount of drainage.

Be sure to operate it with a drain trap installed.

7. In applications such as vacuum and non-leak specifications, use caution specifically against the contamination of foreign matters or airtightness of the fittings.



2 Port Solenoid Valve for Fluid Control/Precautions 3

Be sure to read this before handling.

For detailed precautions on each series, refer to the main text.

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 absorber, etc., in parallel with the solenoid. Or, adopt the option that comes with the surge voltage protection circuit. (However, a surge voltage occurs even if the surge voltage protection circuit is used. For details, please contact SMC).

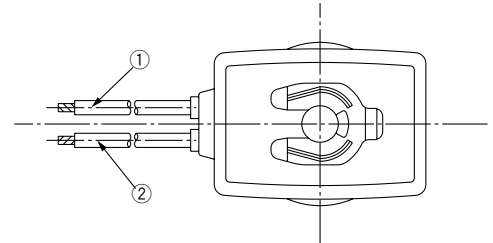
Electrical Connection

⚠ Caution

Grommet

Class H coil: AWG18 Insulator O.D. 2.2 mm

Class B coil: AWG20 Insulator O.D. 2.5 mm

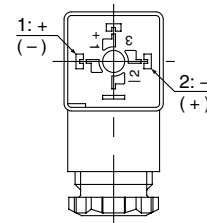


Rated voltage	Lead wire colour	
	①	②
DC (Class B only)	Black	Red
100 VAC	Blue	Blue
200 VAC	Red	Red
Other AC	Gray	Gray

* There is no polarity.

DIN connector (Class B only)

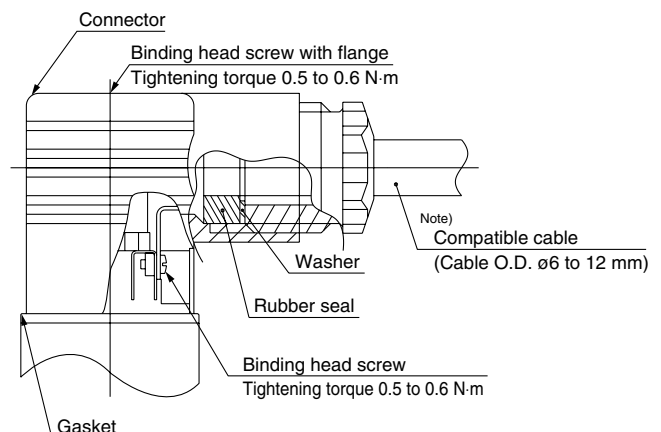
Since internal connections are as shown below for the DIN connector, make connections to the power supply accordingly.



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

* There is no polarity.

- Use compatible heavy duty cords with cable O.D. of $\phi 6$ to 12.
- Use the tightening torques below for each section.



Note) For an outside cable diameter of $\phi 9$ to 12 mm, remove the internal parts of the rubber seal before using.



2 Port Solenoid Valve for Fluid Control/Precautions 4

Be sure to read this before handling.

For detailed precautions on each series, refer to the main text.

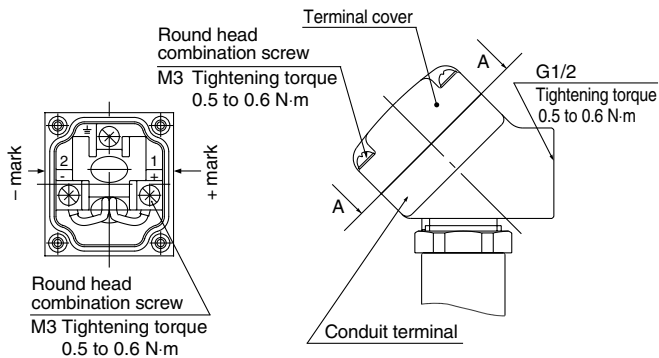
Electrical Connection

Caution

Conduit terminal

In the case of the 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.



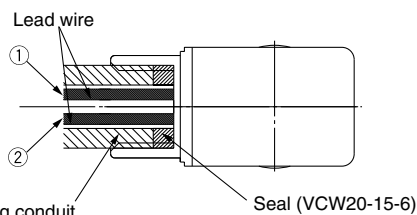
View A-A

(Internal connection diagram)

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



Bore size G1/2 Tightening torque 0.5 to 0.6 N·m

Rated voltage	Lead wire colour	
	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

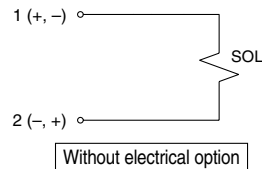
Note) Please order separately.

Electrical Circuit

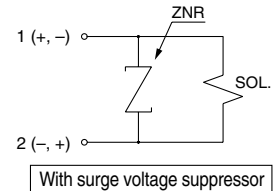
Caution

DC circuit

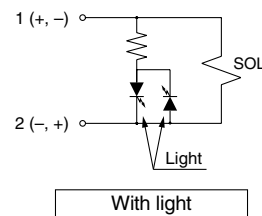
Grommet, Conduit, Conduit terminal, DIN connector



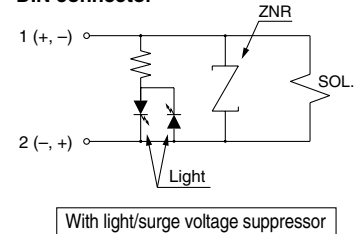
Grommet, Conduit terminal, DIN connector



Conduit terminal, DIN connector



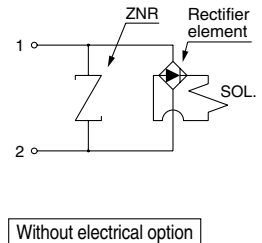
Conduit terminal, DIN connector



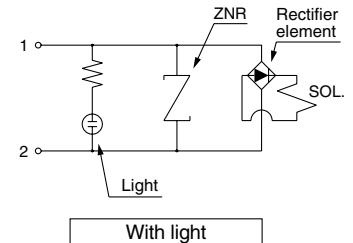
AC/Class B (with a full-wave rectifier) coil circuit

* Surge voltage suppressor is attached to the AC/Class B coil (with a full-wave rectifier) as standard.

Grommet, Conduit, Conduit terminal, DIN connector

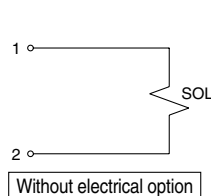


Conduit terminal, DIN connector

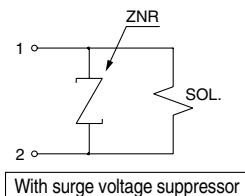


AC/Class B, H coil circuit

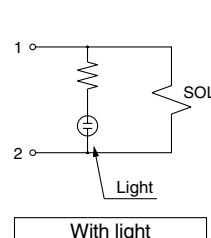
Grommet, Conduit, Conduit terminal



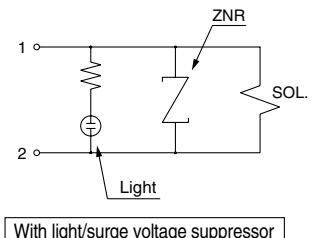
Grommet, Conduit terminal



Conduit terminal



Conduit terminal





2 Port Solenoid Valve for Fluid Control/Precautions 5

Be sure to read this before handling.

For detailed precautions on each series, refer to the main text.

Operating Environment

Warning

1. Do not use the valves in an atmosphere having corrosive gases, chemicals, salt water, water, steam, or where there is direct contact with any of these.
2. Do not use in explosive atmospheres.
3. Do not use in locations subject to vibration or impact.
4. Do not use in locations where radiated heat will be received from nearby heat sources.
5. Employ suitable protective measures in locations where there is contact with water droplets, oil or welding spatter, etc.

Lubrication

Caution

1. This solenoid valve can be operated without lubrication.

If a lubricant is used in the system, use turbine oil Class 1, ISO VG32 (with no additive). But do not lubricate a valve with EPDM seal.

Refer to the table of brand name of lubricants compliant with Class 1 turbine oil (with no additive), ISO VG32.

Class 1 Turbine Oil (with no additive), ISO VG32

Classification of viscosity (cst) (40°C)	Viscosity according to ISO Grade	32
Idemitsu Kosan Co.,Ltd.		Turbine oil P-32
Nippon Oil Corp.		Turbine oil 32
Cosmo Oil Co.,Ltd.		Cosmo turbine 32
Japan Energy Corp.		Kyodo turbine 32
Kygnus Oil Co.		Turbine oil 32
Kyushu Oil Co.		Stork turbine 32
Nippon Oil Corp.		Mitsubishi turbine 32
Showa Shell Sekiyu K.K.		Turbine 32
Tonen General Sekiyu K.K.		General R turbine 32
Fuji Kosan Co.,Ltd.		Fucoal turbine 32

Please contact SMC regarding Class 2 turbine oil (with additives), ISO VG32.

Maintenance

Warning

1 Removing the product

The valve will reach a high temperature when used with high temperature fluids. Confirm that the valve temperature has dropped sufficiently before performing work. If touched inadvertently, there is a danger of being burned.

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

2. Low frequency operation

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

Caution

1. Filters and strainers

1. Be careful regarding clogging of filters and strainers.
2. Replace filter elements after one year of use, or earlier if the pressure drop reaches 0.1 MPa.
3. Clean strainers when the pressure drop reaches 0.1 MPa.

2. Lubrication

When using after lubricating, never forget to lubricate continuously.

3. Storage

In case of long term storage after use with heated water, thoroughly remove all moisture to prevent rust and deterioration of rubber materials, etc.

4. Exhaust the drain from an air filter periodically.

Operating Precautions

Warning

1. Valves will reach high temperatures when used with high temperature fluids. Use caution, as there is a danger of being burned if the valve is directly touched.