Energy Saving Type
2 Port Solenoid Valve

For Air/Water/Oil

Power consumption 1/3
(SMC comparison)

Reduction of running costs

Reduction of CO_2

Reduction of power supply capacity for facilities

Reduction of temperature increase

New generation valve corresponding to energy-saving needs

- **IP65**
- **RoHS** compliance

Series VXE

SMC

CAT.EUS70-36A-UK

Series VXE

VXE2, VXED2, VXEZ2

2 port solenoid valve for various fluids
Energy saving type of the VX2, VXD2 and VXZ2 series

VXE2	**Direct Operated**
VXED2	**Pilot Operated**
VXEZ2	**Zero Differential Pressure Type Pilot Operated**

○ The power consumption (when holding) is substantially reduced (approx. 1/3).

○ Coil heat reduction

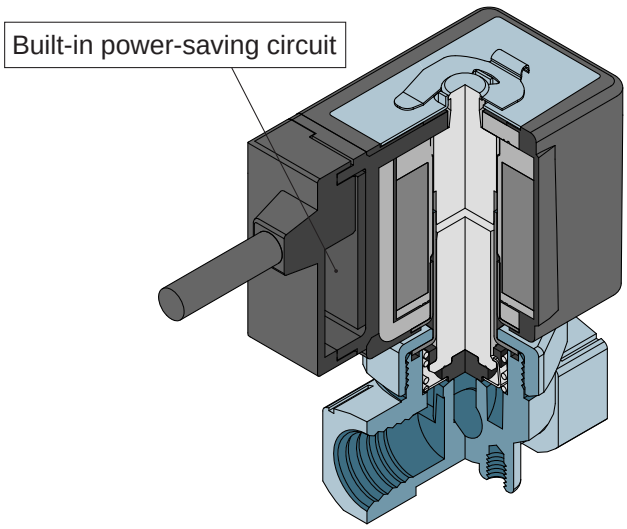
Model	Power consumption (W) (Holding)	Inrush current (A) (Inrush time: 200 ms)		Temperature increase (°C)
		24 VDC	12 VDC	
VXE□21 (VXED2130)	1.5 (1.8)	0.19 (0.23)	0.38 (0.46)	25 (30)
VXE□22	2.3	0.29	0.58	25
VXE□23	3	0.44	0.88	30

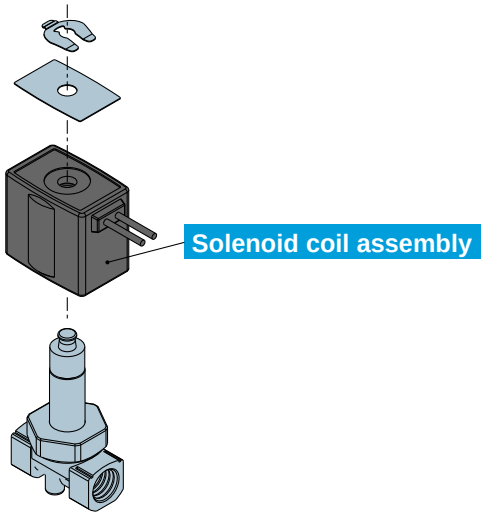
● Interchangeable

The mounting dimensions and its basic specifications are equivalent to those of conventional models.

● Replaceable coil

Possible to change the solenoid coil assembly for the VX2, VXD and VXZ with the power-saving coil type.
(Restricted for the rated voltage 12, 24 VDC)





Body Size Variations between 1/8" to 2"

Series	Port size / Orifice diameter	Thread 1/8	Thread 1/4	Thread 3/8	Thread 1/2	Thread 3/4	Thread 1	Flange 32A	Flange 40A	Flange 50A
VXE2 Direct Operated 	2 mmø	●	●							
	3 mmø	●	●	●						
	4.5 mmø	●	●	●						
	6 mmø		●	●						
	8 mmø		●	●						
	10 mmø		●	●	●					
VXED2 Pilot Operated 	10 mmø		●	●	●					
	15 mmø			●	●					
	20 mmø					●				
	25 mmø						●			
	35 mmø							●		
	40 mmø								●	
	50 mmø									●
VXEZ2 Zero Differential Pressure Type Pilot Operated 	10 mmø		●	●						
	15 mmø				●					
	20 mmø					●				
	25 mmø						●			

P.1
P.21
P.33

Energy Saving Type

Direct Operated 2 Port Solenoid Valve

Series VXE21/22/23

For Air/Water/Oil

Single Unit

■ **Valve**

Normally closed (N.C.)

■ **Solenoid Coil**

Coil: Class B

■ **Rated Voltage**

24 VDC, 12 VDC

■ **Material**

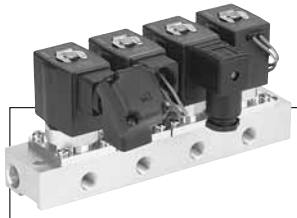
Body — Brass (C37), Stainless steel
Seal — NBR, FKM, EPDM, PTFE

■ **Electrical Entry**

- Grommet
- Conduit
- DIN terminal
- Conduit terminal

Normally Closed (N.C.)

Model		VXE21	VXE22		VXE23	
Orifice diameter	2mmø	●	—	—	—	—
	3 mmø	●	●	—	●	—
	4.5 mmø	●	●	—	●	—
	6 mmø	—	●	—	●	—
	8 mmø	—	●	—	●	—
	10 mmø	—	●	●	●	●
Port size		1/8 1/4	1/4 3/8	1/2	1/4 3/8	1/2



Manifold

■ **Valve**

Normally closed (N.C.)

■ **Base**

Common SUP
Individual SUP (Aluminum base only)

■ **Solenoid Coil**

Coil: Class B

■ **Rated Voltage**

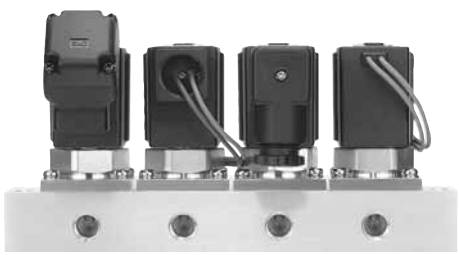
24 VDC, 12 VDC

■ **Material**

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

■ **Electrical Entry**

- Grommet
- Conduit
- DIN terminal
- Conduit terminal



Manifold

Model		VXE21	VXE22	VXE23
Orifice dia.	2 mmø	●	—	—
	3 mmø	●	●	●
	4.5 mmø	●	●	●
	6 mmø	—	●	●
(Common SUP) Port size	IN port	3/8		
	OUT port	1/8, 1/4		

Series VXE21/22/23
Common Specifications

Standard Specifications

Valve specifications	**Valve construction**	Direct operated poppet
	Valve type	N.C.
	Withstand pressure	5.0 MPa
	Body material	Brass (C37), Stainless steel
	Seal material	NBR, FKM, EPDM, PTFE
	Enclosure	Dust tight, Low jetproof (IP65)
	Environment	Location without corrosive or explosive gases
Coil specifications	**Rated voltage**	24 VDC, 12 VDC
	Allowable voltage fluctuation	±10% of rated voltage
	Allowable leakage voltage	2% or less of rated voltage
	Coil insulation type	Class B
	Surge voltage suppressor	Built-in surge voltage suppressor

Solenoid Coil Specifications

Normally Closed (N.C.)

DC Specification

Model	Power consumption (W) (Holding)	Inrush current (A) (Inrush time: 200 ms)		Temperature increase (C°) Note)
		24 VDC	12 VDC	
VXE21	1.5	0.19	0.38	25
VXE22	2.3	0.29	0.58	25
VXE23	3	0.44	0.88	30

Note) Value for ambient temperature at 20°C and when the rated voltage is applied.

Applicable Fluid Check List / All Options (Single Unit)

VXE2□□0□□–□□–□□□1–□

Option symbol

Fluid and application	Option symbol	Seal material	Body material
Air	—	NBR	Brass (C37)
	G		Stainless steel
Medium vacuum/Non-leak/ Oil-free Note 1)	**V** Note 2)	FKM	Brass (C37)
	M Note 2)		Stainless steel
Water	—	NBR	Brass (C37)
	G		Stainless steel
Oil Note 3)	**A**	FKM	Brass (C37)
	H		Stainless steel
High corrosive/Oil-free	**L** Note 2)	FKM	Stainless steel
Copper-free/Fluoro-free Note 4)	**J**	EPDM	Stainless steel
Other combination	**B**	EPDM	Brass (C37)
	C	PTFE	
	K		Stainless steel

Applicable Fluid Check List / All Options (Manifold)

VXE2□□1□□–□□–□□□1

Base symbol

Option symbol

Fluid and application	Option symbol	Base symbol	Seal material	Body material
Air	—	**00**	NBR	Aluminum
Medium vacuum/Non-leak/Oil-free Note 1)	**V** Note 2)	**00**	FKM	Aluminum
Water	—	—	NBR	Brass (C37)
	G			Stainless steel
Oil Note 3)	**A**	—	FKM	Brass (C37)
	H			Stainless steel
High corrosive/Oil-free	**L** Note 2)	—	FKM	Stainless steel
Non-leak/Copper-free/Oil-free Note 4)	**R**	**00**	FKM	Aluminum

Note 1) The leakage amount (10^{-6} Pa·m³/s) for V and M options is the value when the differential pressure is 0.1 MPa.
Note 2) The V, M and L options are oil-free treatment.
Note 3) The dynamic viscosity of the fluid must not exceed 50 mm²/s.
Note 4) The nuts (non-wetted parts) are nickel plated on the brass (C37) material.

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

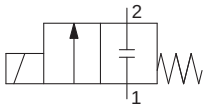
For Air /Single Unit

(Inert gas/Non-leak/Medium vacuum)

Model/Valve Specifications

N.C.

Passage symbol



Normally Closed (N.C.)

Port size	Orifice dia. (mmø)	Model	Max. operating pressure differential (MPa)	Flow characteristics			Max. system pressure (MPa)	Note) Weight (g)
				C[dm³/(s·bar)]	b	Cv		
1/8 (6A)	2	**VXE2110-01**	1.5	0.59	0.48	0.18	3.0	300
	3	**VXE2120-01**	0.6	1.2	0.45	0.33		
	4.5	**VXE2130-01**	0.2	2.3	0.46	0.61		
1/4 (8A)	2	**VXE2110-02**	1.5	0.59	0.48	0.18		
	3	**VXE2120-02**	0.6	1.2	0.45	0.33		
		VXE2220-02	1.5					470
		VXE2320-02	3.0					620
	4.5	**VXE2130-02**	0.2	2.3	0.46	0.61		300
		VXE2230-02	0.35					470
		VXE2330-02	0.9					620
	6	**VXE2240-02**	0.15	4.1	0.30	1.10		470
		VXE2340-02	0.35					620
	8	**VXE2250-02**	0.08	6.4	0.30	1.60	1.0	560
		VXE2350-02	0.2					700
	10	**VXE2260-02**	0.03	8.8	0.30	2.00		560
		VXE2360-02	0.07					700
3/8 (10A)	3	**VXE2220-03**	1.5	1.2	0.45	0.33	3.0	470
		VXE2320-03	3.0					620
	4.5	**VXE2230-03**	0.35	2.3	0.46	0.61		470
		VXE2330-03	0.9					620
	6	**VXE2240-03**	0.15	4.1	0.30	1.10		470
		VXE2340-03	0.35					620
	8	**VXE2250-03**	0.08	6.4	0.30	1.60	1.0	560
		VXE2350-03	0.2					700
	10	**VXE2260-03**	0.03	11	0.30	2.20		560
		VXE2360-03	0.07					700
1/2 (15A)	10	**VXE2260-04**	0.03	11	0.30	2.20		560
		VXE2360-04	0.07					700

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

- Refer to “Glossary” on page 44 for details on the max. operating pressure differential and the max. system pressure.

Fluid and Ambient Temperature

Fluid temperature (C)		Ambient temperature (°C)
Solenoid valve option symbol		
—, G	**V, M**	
–10 Note) to 60	–10 Note) to 60	–20 to 60

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

Valve Leakage

Internal Leakage

Seal material	Leakage	
	Air	Non-leak/ Medium vacuum Note)
NBR, FKM	1 cm³/min or less	10^{-6} Pa·m³/sec or less

External Leakage

Seal material	Leakage	
	Air	Non-leak/ Medium vacuum Note)
NBR, FKM	1 cm³/min or less	10^{-6} Pa·m³/sec or less

Note) Value for V and M options (Non-leak/Medium vacuum)

How to Order (Single Unit)

DC **VXE** **21** **2** **0** □ □ **–** **01** □ **–** **5** **G** **1–** □

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

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

Valve/Body configuration

0	N.C. / Single unit

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

Suffix

–I	—
Z	Oil-free

Select "–" because the solenoid valve V, M options are oil-free treatment.

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

Thread type

–	Rc
T	NPTF
F	G
N	NPT

Rated voltage

5	24 VDC
6	12 VDC

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

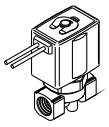
Refer to page 43 for ordering the coil only.

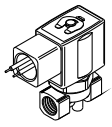
Bracket

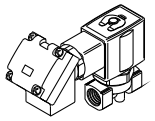
–	None
B	With bracket

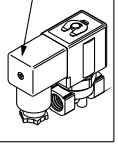
∗ VX021N-12A and VX022N-12A are packed in the same container as the main body.
∗ Refer to Table (4) if a bracket is ordered separately.

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, with gasket)
Connector 

∗ Refer to Table (3) for available combinations between electrical option (L) and the rated voltage.

Table (1) Model/Orifice Diameter/Port Size
Normally Closed (N.C.)

Solenoid valve model (Port size)				Orifice symbol (diameter)					
Model	**VXE21**	**VXE22**	**VXE23**	**1** (2 mmø)	**2** (3 mmø)	**3** (4.5 mmø)	**4** (6 mmø)	**5** (8 mmø)	**6** (10 mmø)
Port symbol (Port size)	**01** (1/8)	—	—	●	●	●	—	—	—
	02 (1/4)	—	—	●	●	●	—	—	—
	—	**02** (1/4)	**02** (1/4)	—	●	●	●	●	●
	—	**03** (3/8)	**03** (3/8)	—	●	●	●	●	●
	—	**04** (1/2)	**04** (1/2)	—	—	—	—	—	●

Table (2) Solenoid Valve Option

Option symbol	Seal material	Body material	Note
–	NBR	Brass (C37)	—
G		Stainless steel	
V	FKM	Brass (C37)	Non-leak (10^{-6} Pa·m³/sec)/Oil-free/ Medium vacuum (0.1 Pa.abs)
M		Stainless steel	

Table (3) Rated Voltage – Electrical Option

Rated voltage		**L** (With light)
Voltage symbol	Voltage	
5	24 VDC	●
6	12 VDC	—

Table (4) Bracket Part No.

Model	Part no.
VXE21 $^{1}_{2}$ **0** $_{3}$	VX021N-12A
VXE22 $^{2}_{3}$ **0** $_{4}$ **VXE23** $^{2}_{3}$ **0** $_{4}$	VX022N-12A
VXE22 $^{5}_{6}$ **0** **VXE23** $^{5}_{6}$ **0**	VX023N-12A-L

Dimensions → P. 17 (Single unit)

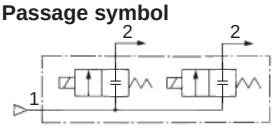
For Air /Manifold

(Inert gas/Non-leak/Medium vacuum)

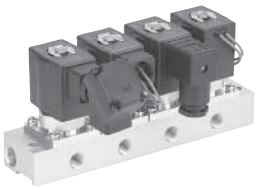
Solenoid Valve for Manifold/Valve Specifications

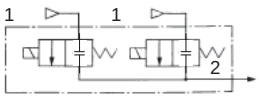
N.C.

Passage symbol



Common SUP





Individual SUP

Normally Closed (N.C.)

Orifice dia. (mmø)	Model	Max. operating pressure differential (MPa)	Flow characteristics			Max. system pressure (MPa)
			C[dm³/(s·bar)]	b	Cv	
2	**VXE2111-00**	1.5	0.59	0.48	0.18	3.0
3	**VXE2121-00**	0.6	1.2	0.45	0.33	
	VXE2221-00	1.5				
	VXE2321-00	3.0				
4.5	**VXE2131-00**	0.2	2.3	0.46	0.61	
	VXE2231-00	0.35				
	VXE2331-00	0.9				
6	**VXE2241-00**	0.15	4.1	0.30	1.10	
	VXE2341-00	0.35				

• Refer to “Glossary” on page 44 for details on the max. operating pressure differential and the max. system pressure.

Fluid and Ambient Temperature

Fluid temperature (°C)		Ambient temperature (°C)
Solenoid valve option symbol		
—, R	**V**	
–10 Note) to 60	–10 Note) to 60	–20 to 60

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

Valve Leakage

Internal Leakage

Seal material	Leakage	
	Air	Non-leak/ Medium vacuum Note)
NBR, FKM	1 cm³/min or less	10^{-6} Pa·m³/sec or less

External Leakage

Seal material	Leakage	
	Air	Non-leak/ Medium vacuum Note)
NBR, FKM	1 cm³/min or less	10^{-6} Pa·m³/sec or less

Note) Value for V and M options (Non-leak/Medium vacuum)

How to Order (Solenoid Valve for Manifold)

DC **VXE** **21** **2** **1** □ □ **–** **00** **–** **5** **G** **1**

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

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

Valve/Body configuration

1	N.C. (for Manifold)

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

Suffix

–	—
Z	Oil-free

Select "–" because the solenoid valve V and R options are oil-free treatment.

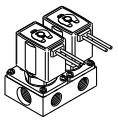
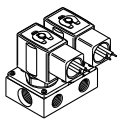
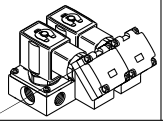
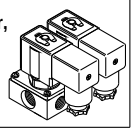
Rated voltage

5	24 VDC
6	12 VDC

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

Refer to page 43 for ordering the coil only.

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, with gasket) 

∗ Refer to Table (3) for available combinations between the electrical option (L) and the rated voltage.

How to Order Manifold Bases

VVX21
VVX22 **1** □ □ □ **–** **07** **–** **1**
VVX23

Number of manifolds

02	2 stations
⋮	⋮
10	10 stations

Port size (Individual port)

1	Rc1/8
2	Rc1/4

∗ Common port sizes are all Rc3/8.

Thread type

–	Rc
T	NPTF
F	G
N	NPT

Suffix

–	—
Z	Oil-free

Base type

—	Common SUP
V	Individual SUP

Manifold base

Blanking plate part no.

For VXE21: VX011-001 □
For VXE22/23: VX011-006 □

Seal material

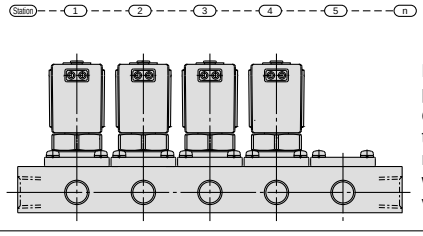
–	NBR
F	FKM

How to Order Manifold Assemblies (Example)

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

Example
VVX211-05-1 ..... 1 set
∗ VXE2111-00-1G1 ... 4 sets
∗ VX011-001..... 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.

Table (1) Model/Orifice Diameter

Solenoid valve model	Orifice symbol (diameter)			
	1 (2 mmø)	**2** (3 mmø)	**3** (4.5 mmø)	**4** (6 mmø)
VXE21	●	●	●	—
VXE22	—	●	●	●
VXE23	—	●	●	●

Table (2) Solenoid Valve Option

Option symbol	Body/Base material	Seal material	Note
–	Aluminum	NBR	—
V		FKM	Non-leak/Medium vacuum/Oil-free
R			Non-leak/Copper-free/Oil-free Note)

Note) The nuts (non-wetted parts) are nickel plated on the Brass (C37) material.

Table (3) Rated Voltage – Electrical Option

Rated voltage		**L** (With light)
Voltage symbol	Voltage	
5	24 VDC	●
6	12 VDC	—

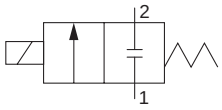
Dimensions → P. 19 (Manifold)

For Water /Single Unit

Model/Valve Specifications

N.C.

Passage symbol



Normally Closed (N.C.)

Port size	Orifice dia. (mmø)	Model	Max. operating pressure differential (MPa)	Flow characteristics		Max. system pressure (MPa)	Note) Weight (g)
				Av x $10^{-6}m^2$	Cv converted		
1/8 (6A)	2	**VXE2110-01**	1.5	4.1	0.17	3.0	300
	3	**VXE2120-01**	0.5	7.9	0.33		
	4.5	**VXE2130-01**	0.2	15.0	0.61		
1/4 (8A)	2	**VXE2110-02**	1.5	4.1	0.17		
	3	**VXE2120-02**	0.5	7.9	0.33		
		VXE2220-02	1.5				470
		VXE2320-02	3.0				620
	4.5	**VXE2130-02**	0.2	15.0	0.61		300
		VXE2230-02	0.35				470
		VXE2330-02	0.9				620
	6	**VXE2240-02**	0.15	26.0	1.10		470
		VXE2340-02	0.3				620
	8	**VXE2250-02**	0.08	38.0	1.60	1.0	560
		VXE2350-02	0.2				700
	10	**VXE2260-02**	0.03	46.0	1.90		560
		VXE2360-02	0.07				700
3/8 (10A)	3	**VXE2220-03**	1.5	7.9	0.33	3.0	470
		VXE2320-03	3.0				620
	4.5	**VXE2230-03**	0.35	15.0	0.61		470
		VXE2330-03	0.9				620
	6	**VXE2240-03**	0.15	26.0	1.10		470
		VXE2340-03	0.3				620
	8	**VXE2250-03**	0.08	38.0	1.60	1.0	560
		VXE2350-03	0.2				700
	10	**VXE2260-03**	0.03	53.0	2.20		560
		VXE2360-03	0.07				700
1/2 (15A)	10	**VXE2260-04**	0.03	53.0	2.20		560
		VXE2360-04	0.07				700

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

- Refer to “Glossary” on page 44 for details on the max. operating pressure differential and the max. system pressure.

Fluid and Ambient Temperature

Fluid temperature (°C) / Solenoid valve option symbol	Ambient temperature (°C)
—, G, L	
1 to 60	–20 to 60

Note) With no freezing

Valve Leakage

Internal Leakage

Seal material	Leakage (Water)
NBR, FKM	0.1 cm^3/min or less

External Leakage

Seal material	Leakage (Water)
NBR, FKM	0.1 cm^3/min or less

How to Order (Single Unit)

DC **VXE** **21** **2** **0** □ □ **–** **01** □ **–** **5** **G** **1–** □

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

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

Valve/Body configuration

0	N.C. / Single unit

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

Suffix

–	—
Z	Oil-free

Select "–" because the solenoid valve L option is oil-free treatment.

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

Thread type

–	Rc
T	NPTF
F	G
N	NPT

Rated voltage

5	24 VDC
6	12 VDC

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

Refer to page 43 for ordering the coil only.

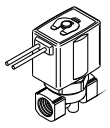
Bracket

–	None
B	With bracket

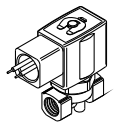
∗ VX021N-12A and VX022N-12A are packed in the same container as the main body.
∗ Refer to Table (4) if a bracket is ordered separately.

Electrical entry

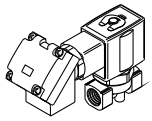
G - **Grommet**



C - **Conduit**

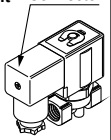


T - **With conduit terminal**
TL - **With conduit terminal and light**



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

Connector



∗ Refer to Table (3) for available combinations between the electrical option (L) and the rated voltage.

Table (1) Model/Orifice Diameter/Port Size
Normally Closed (N.C.)

Solenoid valve model (Port size)				Orifice symbol (diameter)					
Model	**VXE21**	**VXE22**	**VXE23**	**1** (2 mmø)	**2** (3 mmø)	**3** (4.5 mmø)	**4** (6 mmø)	**5** (8 mmø)	**6** (10 mmø)
Port symbol (Port size)	**01** (1/8)	—	—	●	●	●	—	—	—
	02 (1/4)	—	—	●	●	●	—	—	—
	—	**02** (1/4)	**02** (1/4)	—	●	●	●	●	●
	—	**03** (3/8)	**03** (3/8)	—	●	●	●	●	●
	—	**04** (1/2)	**04** (1/2)	—	—	—	—	—	●

Table (2) Solenoid Valve Option

Option symbol	Seal material	Body material	Note
–	NBR	Brass (C37)	—
G		Stainless steel	
L	FKM	Stainless steel	High corrosive/Oil-free

Table (3) Rated Voltage – Electrical Option

Rated voltage		**L** (With light)
Voltage symbol	Voltage	
5	24 VDC	●
6	12 VDC	—

Table (4) Bracket Part No.

Model	Part no.
VXE21 $^{1}_{3}$**0**	VX021N-12A
VXE22 $^{2}_{4}$**0** **VXE23** $^{2}_{4}$**0**	VX022N-12A
VXE22 $^{5}_{6}$**0** **VXE23** $^{5}_{6}$**0**	VX023N-12A-L

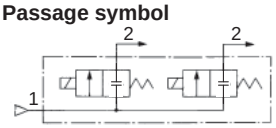
Dimensions → P. 17 (Single unit)

For Oil /Manifold

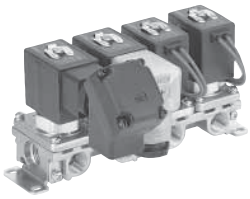
Solenoid Valve for Manifold/Valve Specifications

N.C.

Passage symbol



Common SUP



Normally Closed (N.C.)

Orifice dia. (mmø)	Model	Max. operating pressure differential (MPa)	Flow characteristics		Max. system pressure (MPa)
			Av x $10^{-6}m^2$	Cv converted	
2	**VXE2111**	1.5	4.1	0.17	3.0
3	**VXE2121**	0.5	7.9	0.33	
	VXE2221	1.5			
	VXE2321	3.0			
4.5	**VXE2131**	0.2	15	0.61	
	VXE2231	0.35			
	VXE2331	0.9			
6	**VXE2241**	0.15	26	1.10	
	VXE2341	0.3			

• Refer to “Glossary” on page 44 for details on the max. operating pressure differential and the max. system pressure.

Fluid and Ambient Temperature

Fluid temperature (C) / Solenoid valve option symbol	Ambient temperature (C)
—, G, L	
1 to 60	–20 to 60

Note) With no freezing

Valve Leakage

Internal Leakage

Seal material	Leakage (Water)
NBR, FKM	0.1 cm^3/min or less

External Leakage

Seal material	Leakage (Water)
NBR, FKM	0.1 cm^3/min or less

How to Order (Solenoid Valve for Manifold)

DC **VXE** **21** **2** **1** □ □ – **5** **G** **1**

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

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

Valve/Body configuration

1	N.C. (for Manifold)

Solenoid valve option
Refer to Table (2)-(1) shown below for availability.

Suffix

–	—
Z	Oil-free

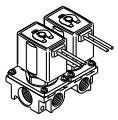
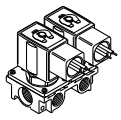
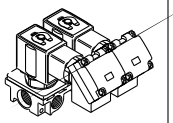
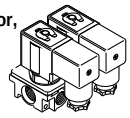
Select "–" because the solenoid valve L option is oil-free treatment.

Rated voltage

5	24 VDC
6	12 VDC

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

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, with gasket) 

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

Refer to page 43 for ordering the coil only.

How to Order Manifold Bases

VVX21
VVX22 **1** □ **C** □ – **07** – **1**
VVX23

Port size (OUT port)

1	Rc1/8
2	Rc1/4

∗ IN port sizes are all Rc3/8.

Thread type

–	Rc
T	NPTF
F	G
N	NPT

Number of manifolds

02	2 stations
⋮	⋮
10	10 stations

Suffix

–	—
Z	Oil-free

Manifold base

Base/Seal material
∗ Refer to Table (2)-(2) shown below for availability.

● **Blanking plate part no.**
For VXE21: VVX21-3A— □
For VXE22: VVX22-3A— □
For VXE23: VVX23-3A— □

Seal material

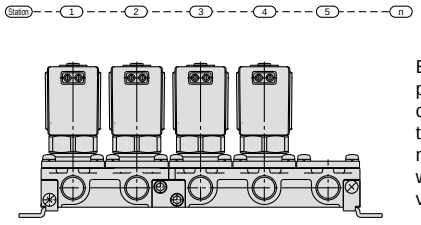
–	NBR
F	FKM
E	EPDM

How to Order Manifold Assemblies (Example)

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

Example
VVX211C-05-1 ..... 1 set
∗ VXE2111-1G1 ..... 4 sets
∗ VVX21-3A ..... 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.

Table (1) Model/Orifice Diameter

Solenoid valve model	Orifice symbol (diameter)			
	1 (2 mmø)	**2** (3 mmø)	**3** (4.5 mmø)	**4** (6 mmø)
VXE21	●	●	●	—
VXE22	—	●	●	●
VXE23	—	●	●	●

Table (2) Solenoid Valve Option

Solenoid valve option symbol (1)	Base/Seal material symbol (2)	Body/Base material	Seal material	Note
–	**C**	Brass (C37)	NBR	—
G	**S**	Stainless steel		
L	**SF**	Stainless steel	FKM	High corrosive/ Oil-free

Table (3) Rated Voltage – Electrical Option

Rated voltage		**L** (With light)
Voltage symbol	Voltage	
5	24 VDC	●
6	12 VDC	—

Dimensions → P. 19 (Manifold)

For Oil /Single Unit

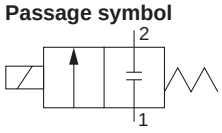
⚠ When the fluid is oil.

The dynamic viscosity of the fluid must not exceed 50 mm²/s.

Model/Valve Specifications

N.C.

Passage symbol



Normally Closed (N.C.)

Port size	Orifice dia. (mmø)	Model	Max. operating pressure differential (MPa)	Flow characteristics		Max. system pressure (MPa)	Note) Weight (g)
				Av x 10^{-6}m²	Cv converted		
1/8 (6A)	2	**VXE2110-01**	1.5	4.1	0.17	3.0	300
	3	**VXE2120-01**	0.5	7.9	0.33		
	4.5	**VXE2130-01**	0.15	15	0.61		
1/4 (8A)	2	**VXE2110-02**	1.5	4.1	0.17		
	3	**VXE2120-02**	0.5	7.9	0.33		
		VXE2220-02	1.2				470
		VXE2320-02	2.0				620
	4.5	**VXE2130-02**	0.15	15	0.61		300
		VXE2230-02	0.3				470
		VXE2330-02	0.85				620
	6	**VXE2240-02**	0.1	26	1.10		470
		VXE2340-02	0.3				620
	8	**VXE2250-02**	0.08	38	1.60	1.0	560
		VXE2350-02	0.2				700
	10	**VXE2260-02**	0.03	46	1.90		560
		VXE2360-02	0.07				700
3/8 (10A)	3	**VXE2220-03**	1.2	7.9	0.33	3.0	470
		VXE2320-03	2.0				620
	4.5	**VXE2230-03**	0.3	15	0.61		470
		VXE2330-03	0.85				620
	6	**VXE2240-03**	0.1	26	1.10		470
		VXE2340-03	0.3				620
	8	**VXE2250-03**	0.08	38	1.60	1.0	560
		VXE2350-03	0.2				700
	10	**VXE2260-03**	0.03	53	2.20		560
		VXE2360-03	0.07				700
1/2 (15A)	10	**VXE2260-04**	0.03	53	2.20		560
		VXE2360-04	0.07				700

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

- Refer to “Glossary” on page 44 for details on the max. operating pressure differential and the max. system pressure.

Fluid and Ambient Temperature

Fluid temperature (°C) / Solenoid valve option symbol	Ambient temperature (°C)
A, H	
–5 Note) to 60	–20 to 60

Note) Dynamic viscosity: 50 mm²/s or less

Valve Leakage

Internal Leakage

Seal material	Leakage (Oil)
FKM	0.1 cm³/min or less

External Leakage

Seal material	Leakage (Oil)
FKM	0.1 cm³/min or less

How to Order (Single Unit)

DC **VXE** [21] [2] [0] [A] [ ] – [01] [ ] – [5] [G] 1 – [ ]

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

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

Valve/Body configuration

0	N.C. / Single unit

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

Suffix

–	—
Z	Oil-free

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

Thread type

–	Rc
T	NPTF
F	G
N	NPT

Rated voltage

5	24 VDC
6	12 VDC

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

Refer to page 43 for ordering the coil only.

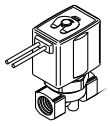
Bracket

–	None
B	With bracket

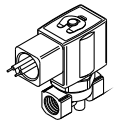
∗ VX021N-12A and VX022N-12A are packed in the same container as the main body.
∗ Refer to Table (4) if a bracket is ordered separately.

Electrical entry

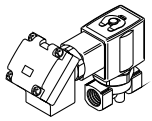
G- Grommet



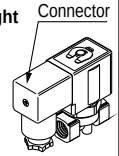
C- Conduit



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



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



∗ Refer to Table (3) for available combinations between the electrical option (L) and the rated voltage.

Table (1) Model/Orifice Diameter/Port Size

Normally Closed (N.C.)

Solenoid valve model (Port size)				Orifice symbol (diameter)					
Model	**VXE21**	**VXE22**	**VXE23**	**1** (2 mmø)	**2** (3 mmø)	**3** (4.5 mmø)	**4** (6 mmø)	**5** (8 mmø)	**6** (10 mmø)
Port symbol (Port size)	**01** (1/8)	—	—	●	●	●	—	—	—
	02 (1/4)	—	—	●	●	●	—	—	—
	—	**02** (1/4)	**02** (1/4)	—	●	●	●	●	●
	—	**03** (3/8)	**03** (3/8)	—	●	●	●	●	●
	—	**04** (1/2)	**04** (1/2)	—	—	—	—	—	●

Normally Open (N.O.)

Solenoid valve model (Port size)				Orifice symbol (diameter)			
Model	**VXE21**	**VXE22**	**VXE23**	**1** (2 mmø)	**2** (3 mmø)	**3** (4.5 mmø)	**4** (6 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
A	FKM	Brass (C37)
H		Stainless steel

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

Table (3) Rated Voltage – Electrical Option

Rated voltage		**L** (With light)
Voltage symbol	Voltage	
5	24 VDC	●
6	12 VDC	—

Table (4) Bracket Part No.

Model	Part no.
VXE21$^{1}_{3}$**0**	VX021N-12A
VXE22$^{2}_{4}$**0** **VXE23**$^{2}_{4}$**0**	VX022N-12A
VXE22$^{5}_{6}$**0** **VXE23**$^{5}_{6}$**0**	VX023N-12A-L

Dimensions → P. 17 (Single unit)

For Oil /Manifold

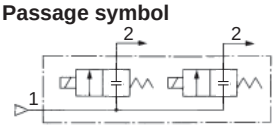
⚠ When the fluid is oil.

The dynamic viscosity of the fluid must not exceed 50 mm²/s.

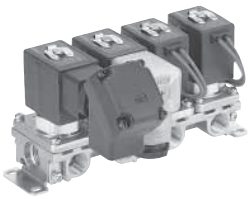
Solenoid Valve for Manifold/Valve Specifications

N.C.

Passage symbol



Common SUP



Normally Closed (N.C.)

Orifice dia. (mmø)	Model	Max. operating pressure differential (MPa)	Flow characteristics		Max. system pressure (MPa)
			Av x 10^{-6}m²	Cv converted	
2	**VXE2111**	1.5	4.1	0.17	3.0
3	**VXE2121**	0.5	7.9	0.33	
	VXE2221	1.2			
	VXE2321	2.0			
4.5	**VXE2131**	0.15	15	0.61	
	VXE2231	0.3			
	VXE2331	0.85			
6	**VXE2241**	0.1	26	1.10	
	VXE2341	0.3			

• Refer to “Glossary” on page 44 for details on the max. operating pressure differential and the max. system pressure.

Fluid and Ambient Temperature

Fluid temperature (C) / Solenoid valve option symbol	Ambient temperature (C)
A, H	
–5 Note) to 60	–20 to 60

Note) Dynamic viscosity: 50 mm²/s or less

Valve Leakage

Internal Leakage

Seal material	Leakage (Oil)
FKM	0.1 cm³/min or less

External Leakage

Seal material	Leakage (Oil)
FKM	0.1 cm³/min or less

How to Order (Solenoid Valve for Manifold)

DC **VXE** **21** **2** **1** **A** **□** **–** **5** **G** **1**

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

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

Valve/Body configuration

1	N.C. (for Manifold)

Solenoid valve option
Refer to Table (2)-(1) shown below for availability.

Suffix

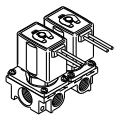
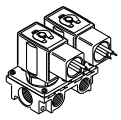
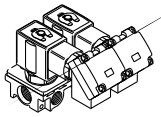
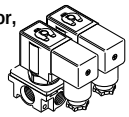
–	—
Z	Oil-free

Rated voltage

5	24 VDC
6	12 VDC

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

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, with gasket) 

∗ Refer to Table (3) for available combinations between the electrical option (L) and the rated voltage.

Refer to page 43 for ordering the coil only.

How to Order Manifold Bases

VVX21
VVX22 **1** **□** **CF** **□** **–** **07** **–** **1**
VVX23

Port size (OUT port)

1	Rc1/8
2	Rc1/4

∗ IN port sizes are all Rc3/8.

Manifold base

Thread type

–	Rc
T	NPTF
F	G
N	NPT

Base/Seal material
∗ Refer to Table (2)-(2) shown below for availability.

Number of manifolds

02	2 stations
⋮	⋮
10	10 stations

Suffix

–	—
Z	Oil-free

● **Blanking plate part no.**
For VXE21: VVX21-3A-F
For VXE22: VVX22-3A-F
For VXE23: VVX23-3A-F

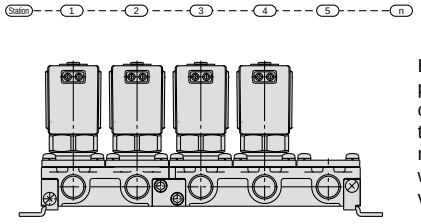
Seal material: FKM

How to Order Manifold Assemblies (Example)

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

Example
VVX211CF-05-1..... 1 set
∗ VXE2111A-1G1 ..... 4 sets
∗ VVX21-3A-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.

Table (1) Model/Orifice Diameter

Solenoid valve model	Orifice symbol (diameter)			
	1 (2 mmø)	**2** (3 mmø)	**3** (4.5 mmø)	**4** (6 mmø)
VXE21	●	●	●	—
VXE22	—	●	●	●
VXE23	—	●	●	●

Table (2) Solenoid Valve Option

Solenoid valve option symbol (1)	Base/Seal material symbol (2)	Body/Base material	Seal material
A	**CF**	Brass (C37)	FKM
H	**SF**	Stainless steel	

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

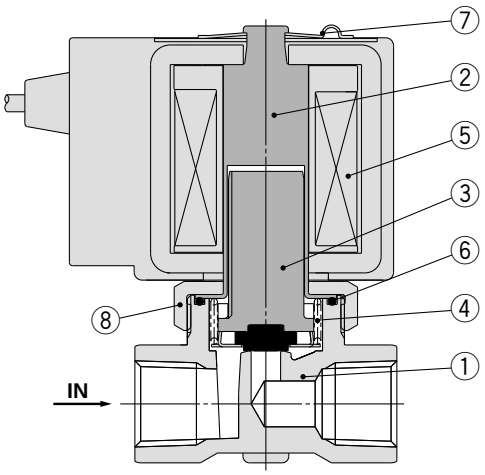
Table (3) Rated Voltage – Electrical Option

Rated voltage		**L** (With light)
Voltage symbol	Voltage	
5	24 VDC	●
6	12 VDC	—

Dimensions → P. 19 (Manifold)

Construction: Single Unit

Normally closed (N.C.)
Body material: Brass (C37), Stainless steel



Component Parts

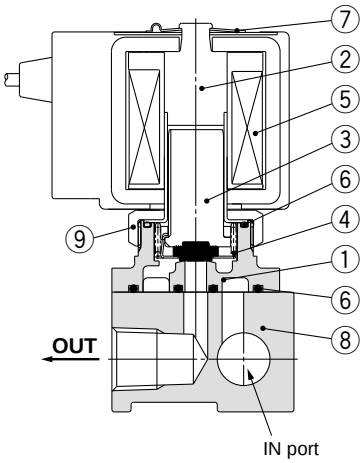
No.	Description	Material	
		Brass (C37) body specification	Stainless steel body specification
1	**Body**	Brass (C37)	Stainless steel
2	**Tube assembly**	Stainless steel	
3	**Armature assembly**	(NBR, FKM, EPDM, PTFE) Stainless steel, PPS	
4	**Return spring**	Stainless steel	
5	**Solenoid coil**	—	
6	**O-ring**	(NBR, FKM, EPDM, PTFE)	
7	**Clip**	SK	
8	**Nut**	Brass (C37)	Brass (C37), Ni plated

The materials in parentheses are (No. 6) seal materials.

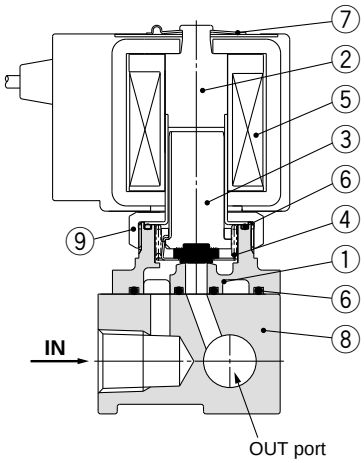
Construction: Manifold

Normally closed (N.C.)
Base material: Aluminum
Fluid: Air

Common SUP

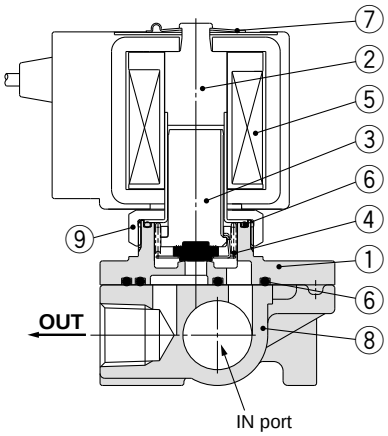


Individual SUP



Base material: Brass (C37), Stainless steel
Fluid: Water/Oil

Common SUP



Component Parts

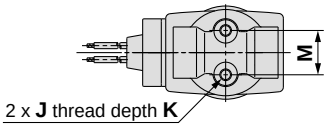
No.	Description	Material		
		Aluminum base specification	Brass (C37) base specification	Stainless steel base specification
1	**Body**	Aluminum	Brass (C37)	Stainless steel
2	**Tube assembly**	Stainless steel		
3	**Armature assembly**	(NBR, FKM, EPDM, PTFE) Stainless steel, PPS		
4	**Return spring**	Stainless steel		
5	**Solenoid coil**	—		
6	**O-ring**	(NBR, FKM, EPDM, PTFE)		
7	**Clip**	SK		
8	**Base**	Aluminum	Brass (C37)	Stainless steel
9	**Nut**	Brass (C37), (Ni plated)	Brass (C37)	Brass (C37), Ni plated

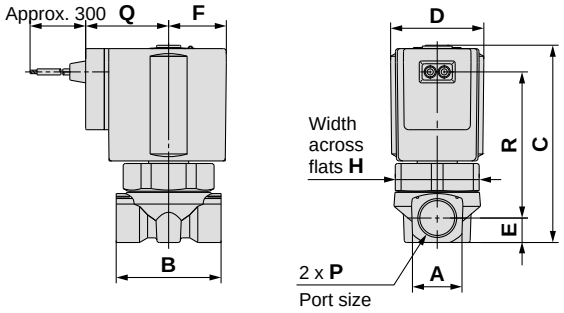
The materials in parentheses are (No. 6) seal materials.

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

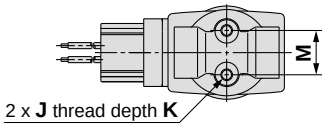
VXE21□0/22□0/23□0

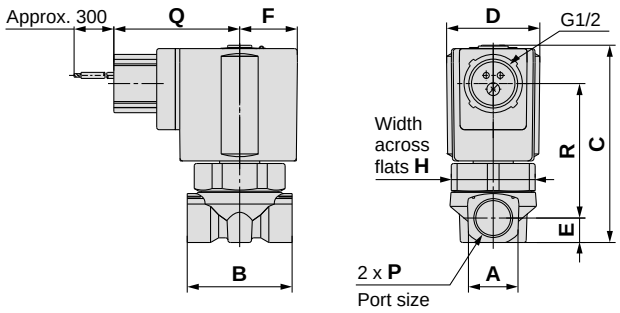
Grommet: G



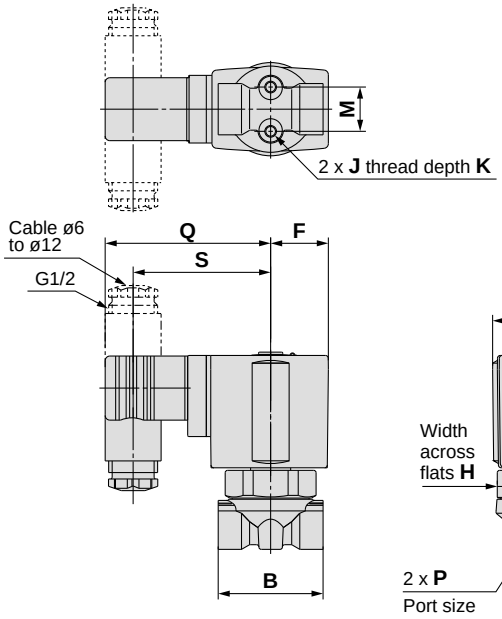


Conduit: C

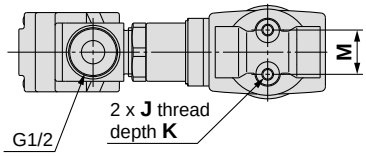


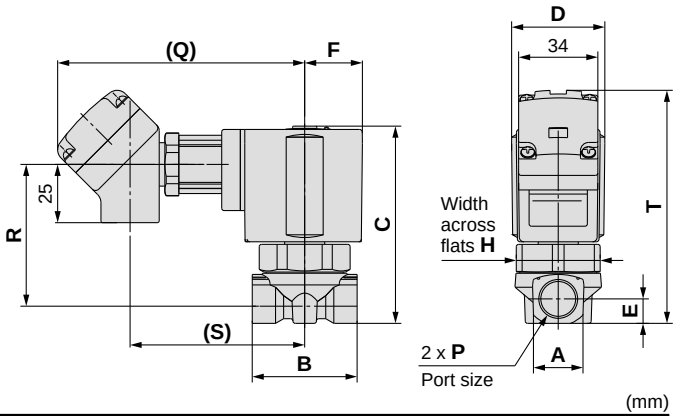


DIN terminal: D



Conduit terminal: T





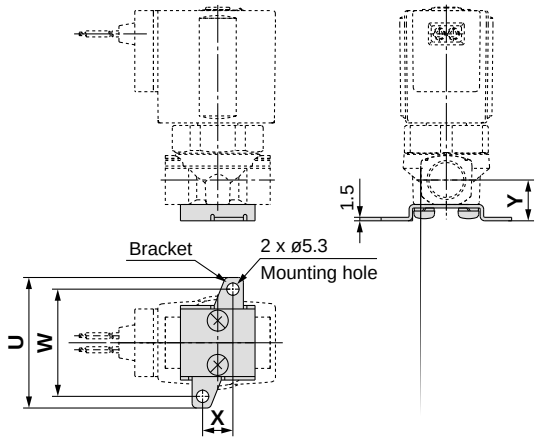
(mm)

Model	Orifice diameter	Port size P	A	B	C	D	E	F	H	Mounting dimension			Electrical entry									
													Grommet		Conduit		DIN terminal			Conduit terminal			
N.C.										J	K	M	Q	R	Q	R	Q	R	S	Q	R	S	T
VXE21□0	ø2, ø3, ø4.5	1/8, 1/4	18	40	68	30	9	19.5	27	M4	6	12.8	30	46	48.5	41	65.5	42	53.5	100.5	41	69.5	82
VXE22□0	ø3, ø4.5, ø6	1/4, 3/8	22	45	78	35	10.5	22.5	32	M5	8	19	33	56	51.5	51	68.5	52	56.5	103.5	51	72.5	93.5
VXE22□0	ø8, ø10	1/4, 3/8, 1/2	30	50	85		14			M5	8	23	33	59	51.5	54	68.5	55	56.5	103.5	54	72.5	100
VXE23□0	ø3, ø4.5, ø6	1/4, 3/8	22	45	85.5	40	10.5	25	36	M5	8	19	36	62	54	57	71	58	59	106	57	75	99.5
VXE23□0	ø8, ø10	1/4, 3/8, 1/2	30	50	92		14			M5	8	23	36	65	54	60	71	61	59	106	60	75	106

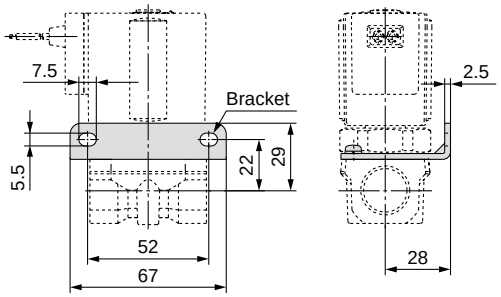
Dimensions: Single Unit/Body Material: Brass (C37), Stainless Steel

VXE21□0/22□0/23□0

Specifications with bracket
Orifice: ø2, ø3, ø4.5, ø6
(Packed in the same container)



Orifice: ø8, ø10
(Assembled at the shipment)

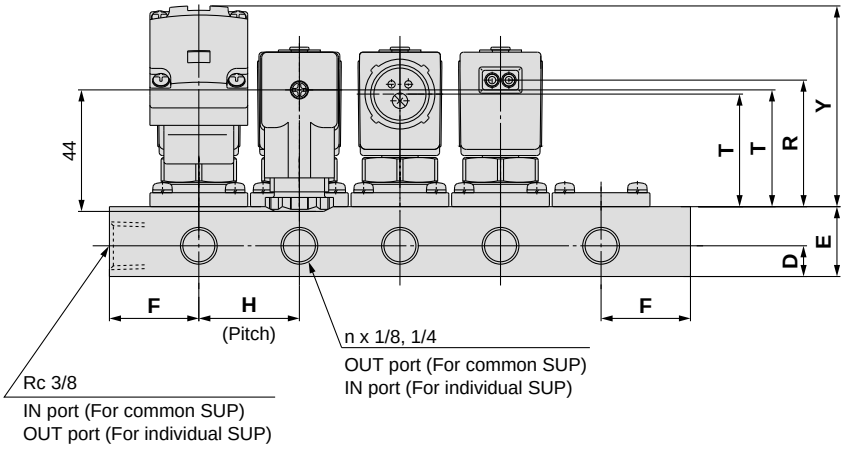


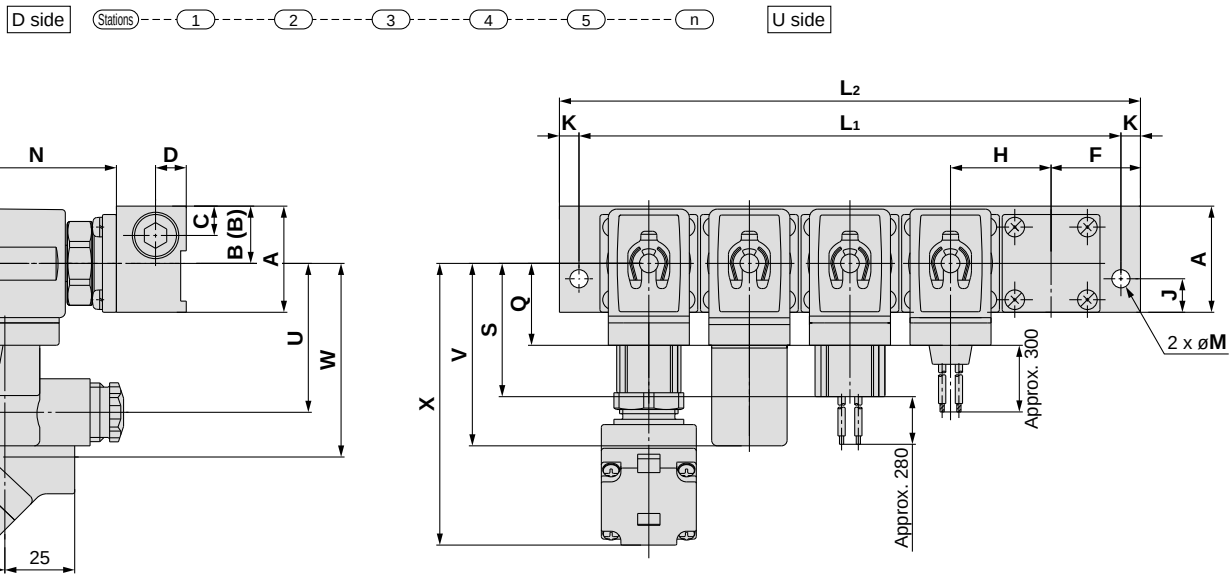
(mm)

Model	Orifice diameter	Port size P	Bracket mounting dimension			
N.C.			U	W	X	Y
VXE21□0	ø2, ø3, ø4.5	1/8, 1/4	46	36	11	15
VXE22□0	ø3, ø4.5, ø6	1/4, 3/8	56	46	13	17.5
VXE22□0	ø8, ø10	1/4, 3/8, 1/2	—	—	—	—
VXE23□0	ø3, ø4.5, ø6	1/4, 3/8	56	46	13	17.5
VXE23□0	ø8, ø10	1/4, 3/8, 1/2	—	—	—	—

Dimensions: Manifold/Base Material: Aluminum

Normally closed (N.C.): VXE21/22/23





(mm)

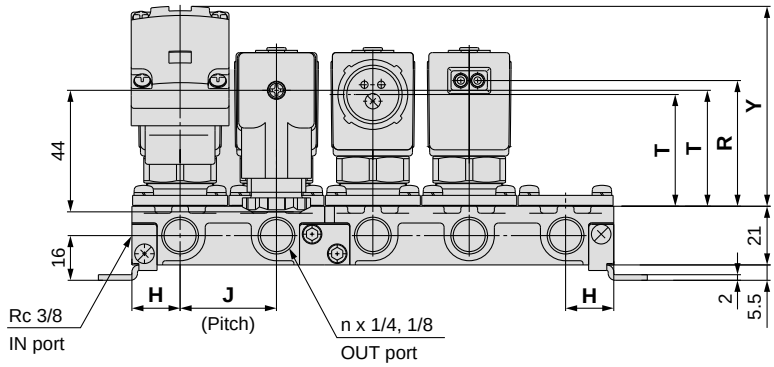
Model	Dimension	n (stations)								
		2	3	4	5	6	7	8	9	10
VVXE21	L_1	86	122	158	194	230	266	302	338	374
	L_2	100	136	172	208	244	280	316	352	388
VVXE22	L_1	108	154	200	246	292	338	384	430	476
VVXE23	L_2	126	172	218	264	310	356	402	448	494

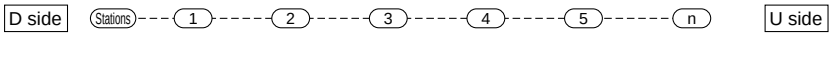
(mm)

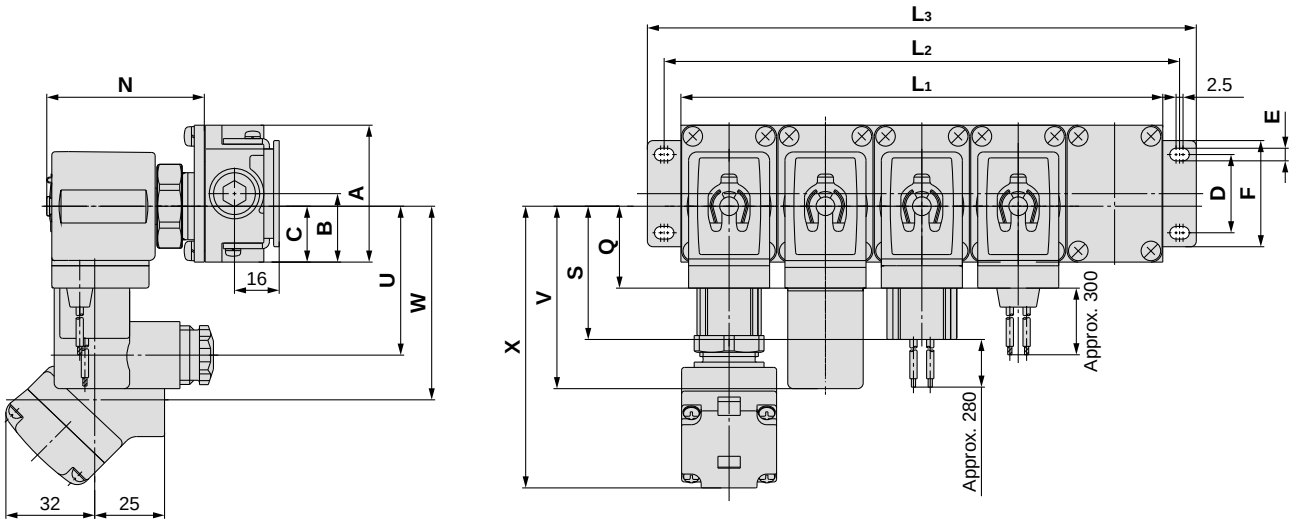
Model	A	B	(B) Individual SUP	C	D	E	F	H	J	K	M	N	Electrical entry									
													Grommet		Conduit		DIN terminal			Conduit terminal		
													Q	R	S	T	U	V	T	W	X	Y
VVXE21	38	20.5	17.5	10.5	11	25	32	36	12	7	6.5	57.5	30	44.5	48.5	40	53.5	65.5	41	69.5	100.5	72
VVXE22	49	26.5	22.5	13	13	30	40	46	15	9	8.5	66.5	33	54.5	51.5	50	56.5	68.5	51	72.5	103.5	82
VVXE23	49	26.5	22.5	13	13	30	40	46	15	9	8.5	71.5	36	59	54	54	59	71	55	75	106	86

Dimensions: Manifold/Base Material: Brass (C37), Stainless Steel

VXE21/22/23







(mm)

Model	Dimension	n (stations)								
		2	3	4	5	6	7	8	9	10
VXE21	L_1	69	103.5	138	172.5	207	241.5	276	310.5	345
	L_2	81	115.5	150	184.5	219	253.5	288	322.5	357
	L_3	93	127.5	162	196.5	231	265.5	300	334.5	369
VXE22	L_1	77	115.5	154	192.5	231	269.5	308	346.5	385
	L_2	89	127.5	166	204.5	243	281.5	320	358.5	397
	L_3	101	139.5	178	216.5	255	293.5	332	370.5	409
VXE23	L_1	83	124.5	166	207.5	249	290.5	332	373.5	415
	L_2	95	136.5	178	219.5	261	302.5	344	385.5	427
	L_3	107	148.5	190	231.5	273	314.5	356	397.5	439
Manifold construction		2 stations x 1	3 stations x 1	2 stations x 2	2 stations + 3 stations	3 stations x 2	2 stations x 2 + 3 stations	2 stations + 3 stations x 2	3 stations x 3	2 stations x 2 + 3 stations x 2

(mm)

Model	A	B	C	D	E	F	H	J	N	Electrical entry									
										Grommet		Conduit		DIN terminal			Conduit terminal		
										Q	R	S	T	U	V	T	W	X	Y
VXE21	49	24.5	20	28	4.5	38	17.3	34.5	56	30	43	48.5	38	53.5	65.5	39	69.5	100.5	70
VXE22	57	28.5	25.5	30	5.5	42	19.3	38.5	64.5	33	52.5	51.5	47.5	56.5	68.5	48.5	72.5	103.5	80
VXE23	57	28.5	25.5	30	5.5	42	20.8	41.5	72.5	36	60	54	55	59	71	56	75	106	87

Energy Saving Type

Pilot Operated 2 Port Solenoid Valve

Series VXED21/22/23

For Air/Water/Oil

■ Valve

Normally closed (N.C.)

■ Solenoid Coil

Coil: Class B

■ Rated Voltage

24 VDC, 12 VDC

■ Material

Body —— Brass (C37)/Bronze (CAC407), Stainless steel
Seal —— NBR, FKM, EPDM

■ Electrical Entry

- Grommet
- Conduit
- DIN terminal
- Conduit terminal

Model		VXED2130	VXED2140	VXED2150	VXED2260
Orifice dia.	10 mmø	●	—	—	—
	15 mmø	—	●	—	—
	20 mmø	—	—	●	—
	25 mmø	—	—	—	●
Port size (Thread)		1/4 3/8 1/2	3/8 1/2	3/4	1

Model		VXED2270	VXED2380	VXED2390
Orifice dia.	35 mmø	●	—	—
	40 mmø	—	●	—
	50 mmø	—	—	●
Port size (Flange)		32A	40A	50A

Series VXED21/22/23
Common Specifications

Standard Specifications

Valve specifications	**Valve construction**	Pilot operated 2 port diaphragm type
	Valve type	N.C.
	Withstand pressure	8A to 25A: 5.0 MPa, 32A to 50A: 2.0 MPa
	Body material	Brass (C37), Stainless steel, Bronze (CAC407)
	Seal material	NBR, FKM, EPDM
	Enclosure	Dust tight, Low jetproof (IP65)
	Environment	Location without corrosive or explosive gases
Coil specifications	**Rated voltage**	24 VDC, 12 VDC
	Allowable voltage fluctuation	±10% of rated voltage
	Allowable leakage voltage	2% or less of rated voltage
	Coil insulation type	Class B
	Surge voltage suppressor	Built-in surge voltage suppressor

Solenoid Coil Specifications

Normally Closed (N.C.)

DC Specification

Model	Power consumption (W) (Holding)	Inrush current (A) (Inrush time: 200 ms)		Temperature increase (C°) Note)
		24 VDC	12 VDC	
VXED2130	1.8	0.23	0.46	30
VXED2140/2150	1.5	0.19	0.38	25
VXED2260/2270	2.3	0.29	0.58	25
VXED2380/2390	3	0.44	0.88	30

Note) Value for ambient temperature at 20°C and when the rated voltage is applied.

Applicable Fluid Check List / All Options (8A to 25A)

VXED2 (1/2/3/4/5/6) 0 □□ – □□ – □□□ 1 – □

Option symbol

Fluid and application	Option symbol	Seal material	Body material
Air	**—**	NBR	Brass (C37)
	G		Stainless steel
Water	**—**	NBR	Brass (C37)
	G		Stainless steel
Oil Note 2)	**A**	FKM	Brass (C37)
	H		Stainless steel
High corrosive/Oil-free	**L** Note 1)	FKM	Stainless steel
Copper-free/Fluoro-free Note 3)	**J**	EPDM	Stainless steel
Other combination	**B**	EPDM	Brass (C37)

Note 1) The L option is oil-free treatment.
Note 2) The dynamic viscosity of the fluid must not exceed 50 mm²/s.
Note 3) The nuts (non-wetted parts) are nickel plated on the Brass (C37) material.

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

Applicable Fluid Check List / All Options (32A to 50A)

VXED2 (2/3/7/8/9) 0 □□ – □□ – □□□ 1 – □

Option symbol

Fluid and application	Option symbol	Seal material	Body material
Air	**—**	NBR	Bronze (CAC407)
Water	**—**	NBR	
Oil Note 2)	**A**	FKM	
Other combination	**B**	EPDM	

Note 1) The L option is oil-free treatment.
Note 2) The dynamic viscosity of the fluid must not exceed 50 mm²/s or less.

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

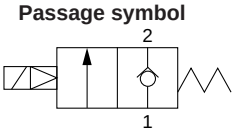
For Air

(Inert gas)

Model/Valve Specifications

N.C.

Passage symbol



Port size		Orifice dia. (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)	Flow characteristics			Max. system pressure (MPa)	Note) Weight (g)
						C	b	Cv		
Thread (Nominal size)	1/4 (8A)	10	**VXED2130-02**	0.02	0.7	8.5	0.35	2.0	1.5	420
	3/8 (10A)	10	**VXED2130-03**			9.2		2.4		
		15	**VXED2140-03**		1.0	18.0		5.0		670
	1/2 (15A)	10	**VXED2130-04**		0.7	9.2		2.4		500
		15	**VXED2140-04**		1.0	20.0		5.5		670
	3/4 (20A)	20	**VXED2150-06**			38.0	0.30	9.5		1150

Port size		Orifice dia. (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)	Flow characteristics	Max. system pressure (MPa)	Note) Weight (g)
						Effective area (mm^2)		
Thread (Nominal size)	1 (25A)	25	**VXED2260-10**	0.02	1.0	225	1.5	1650
Flange	32A	35	**VXED2270-32**	0.03		415		5400
	40A	40	**VXED2380-40**			560		6800
	50A	50	**VXED2390-50**			880		8400

Note) Weight for the grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for conduit terminal type respectively.
• Refer to “Glossary” on page 44 for details on the max. operating pressure differential and the max. system pressure.

Fluid and Ambient Temperature

Fluid temperature (°C)	Ambient temperature (°C)
Solenoid valve option symbol	
—, G	
–10 to 60	–10 to 60

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

Valve Leakage

Internal Leakage

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

External Leakage

Seal material	Leakage (Air)	
	1/4 to 1	32A to 50A
NBR	1 cm^3/min or less	1 cm^3/min or less

How to Order

DC **VXED** **21** **3** **0** □ □ – **02** □ – **5** **G** **1** – □

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

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

Valve/Body configuration

0	N.C. / Single unit

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

Suffix

–	—
Z	Oil-free

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

Thread type

–	Rc
T	NPTF
F	G
N	NPT

Rated voltage

5	24 VDC
6	12 VDC

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

Refer to page 43 for ordering the coil only.

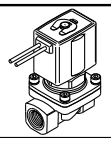
Bracket

–	None
B	With bracket

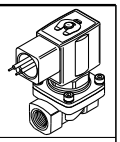
∗ Removal of the bracket is not possible.

Electrical entry

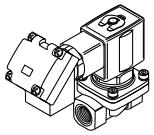
G - **Grommet**



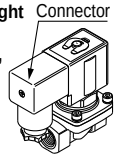
C - **Conduit**



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



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



∗ Refer to Table (3) for available combinations between the electrical option (L) and the rated voltage.

Table (1) Model/Orifice Diameter/Port Size

Normally Closed (N.C.)

Solenoid valve model (Port size)					Orifice diameter							Material	
Model		VXED21	VXED22	VXED23	**3** (10 mmø)	**4** (15 mmø)	**5** (20 mmø)	**6** (25 mmø)	**7** (35 mmø)	**8** (40 mmø)	**9** (50 mmø)	Body	Seal
Port symbol (Port size)	Thread	**02** (1/4)	—	—	●	—	—	—	—	—	—	Brass (C37)	NBR
		03 (3/8)	—	—	●	●	—	—	—	—	—		
		04 (1/2)	—	—	●	●	—	—	—	—	—		
		06 (3/4)	—	—	—	—	●	—	—	—	—		
		—	**10** (1)	—	—	—	—	●	—	—	—		
	Flange	—	**32** (32A)	—	—	—	—	—	●	—	—	Stainless steel	
		—	—	**40** (40A)	—	—	—	—	—	●	—		
		—	—	**50** (50A)	—	—	—	—	—	—	●		

Table (2) Solenoid Valve Option

Option symbol	Seal material	Body material
—	NBR	Brass (C37), Bronze (CAC407)
G Note)		Stainless steel

Note) The G option (stainless steel specification) is for port size 1/4 to 1 only.

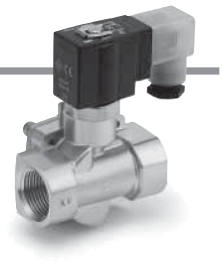
Table (3) Rated Voltage – Electrical Option

Rated voltage		**L** (With light)
Voltage symbol	Voltage	
5	24 VDC	●
6	12 VDC	—

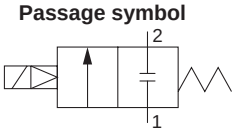
For Water

Model/Valve Specifications

N.C.



Passage symbol



Port size		Orifice dia. (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)	Flow characteristics		Max. system pressure (MPa)	Weight Note) (g)
						Av x $10^{-6}m^2$	Cv converted		
Thread (Nominal size)	1/4 (8A)	10	**VXED2130-02**	0.02	0.5	46	1.9	1.5	420
	3/8 (10A)	10	**VXED2130-03**			58	2.4		
		15	**VXED2140-03**		1.0	110	4.5		670
	1/2 (15A)	10	**VXED2130-04**		0.5	58	2.4		500
		15	**VXED2140-04**		1.0	130	5.5		670
	3/4 (20A)	20	**VXED2150-06**			230	9.5		1150
	1 (25A)	25	**VXED2260-10**			310	13		1650
Flange	32A	35	**VXED2270-32**	0.03		550	23		5400
	40A	40	**VXED2380-40**			740	31		6800
	50A	50	**VXED2390-50**			1200	49		8400

Note) Weight for the grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for conduit terminal type respectively.
• Refer to “Glossary” on page 44 for details on the max. operating pressure differential and the max. system pressure.

Fluid and Ambient Temperature

Fluid temperature (°C)	Ambient temperature (°C)
Solenoid valve option symbol	
—, G, L	
1 to 60	–10 to 60

Note) With no freezing

Valve Leakage

Internal Leakage

Seal material	Leakage (Water)	
	1/4 to 1	32A to 50A
NBR, FKM	0.2 cm^3/min or less	1 cm^3/min or less

External Leakage

Seal material	Leakage (Water)	
	1/4 to 1	32A to 50A
NBR, FKM	0.1 cm^3/min or less	0.1 cm^3/min or less

How to Order

DC **VXED** **21** **3** **0** □ □ – **02** □ – **5** **G** **1** – □

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

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

Valve/Body configuration

0	N.C. / Single unit

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

Suffix

–	—
Z	Oil-free

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

Thread type

–	Rc
T	NPTF
F	G
N	NPT

Rated voltage

5	24 VDC
6	12 VDC

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

Refer to page 43 for ordering the coil only.

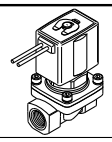
Bracket

–	None
B	With bracket

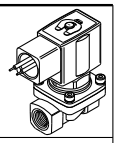
∗ Removal of the bracket is not possible.

Electrical entry

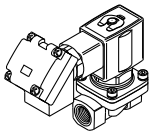
G - **Grommet**



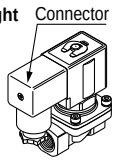
C - **Conduit**



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



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



∗ Refer to Table (3) for available combinations between the electrical option (L) and the rated voltage.

Table (1) Model/Orifice Diameter/Port Size

Normally Closed (N.C.)

Solenoid valve model (Port size)					Orifice diameter							Material	
Model		VXED21	VXED22	VXED23	3 (10 mmø)	4 (15 mmø)	5 (20 mmø)	6 (25 mmø)	7 (35 mmø)	8 (40 mmø)	9 (50 mmø)	Body	Seal
Port symbol (Port size)	Thread	**02** (1/4)	—	—	●	—	—	—	—	—	—	Brass (C37) Stainless steel	NBR FKM
		03 (3/8)	—	—	●	●	—	—	—	—	—		
		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	Note
—	NBR	Brass (C37), Bronze (CAC407)	—
G Note)		Stainless steel	
L Note)	FKM	Stainless steel	High corrosive/Oil-free

Note) The G and L options (stainless steel specification) are for port size 1/4 to 1 only.

Table (3) Rated Voltage – Electrical Option

Rated voltage		**L** (With light)
Voltage symbol	Voltage	
5	24 VDC	●
6	12 VDC	—

For Oil

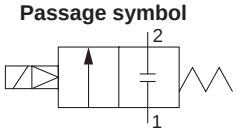
⚠ When the fluid is oil.

The dynamic viscosity of the fluid must not exceed 50 mm²/s.

Model/Valve Specifications

N.C.

Passage symbol



Port size		Orifice dia. (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)	Flow characteristics		Max. system pressure (MPa)	Weight Note) (g)
						Av x 10^{-6}m²	Cv converted		
Thread (Nominal size)	1/4 (8A)	10	**VXED2130-02**	0.02	0.4	46	1.9	1.5	420
	3/8 (10A)	10	**VXED2130-03**			58	2.4		
		15	**VXED2140-03**		0.7	110	4.5		670
	1/2 (15A)	10	**VXED2130-04**		0.4	58	2.4		500
		15	**VXED2140-04**		0.7	130	5.5		670
	3/4 (20A)	20	**VXED2150-06**			230	9.5		1150
	1 (25A)	25	**VXED2260-10**			310	13		1650
Flange	32A	35	**VXED2270-32**	0.03		550	23		5400
	40A	40	**VXED2380-40**			740	31		6800
	50A	50	**VXED2390-50**			1200	49		8400

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

• Refer to “Glossary” on page 44 for details on the max. operating pressure differential and the max. system pressure.

Fluid and Ambient Temperature

Fluid temperature (°C)	Ambient temperature (°C)
Solenoid valve option symbol	
A, H	
–5 to 60	–10 to 60

Note) Dynamic viscosity: 50 mm²/s or less

Valve Leakage

Internal Leakage

Seal material	Leakage (Oil)	
	1/4 to 1	32A to 50A
FKM	0.2 cm³/min or less	1 cm³/min or less

External Leakage

Seal material	Leakage (Oil)	
	1/4 to 1	32A to 50A
FKM	0.1 cm³/min or less	0.1 cm³/min or less

How to Order

DC **VXED** **21** **3** **0** □ □ – **02** □ – **5** **G** **1** – □

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

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

Valve/Body configuration

0	N.C. / Single unit

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

Suffix

–	—
Z	Oil-free

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

Thread type

–	Rc
T	NPTF
F	G
N	NPT

Rated voltage

5	24 VDC
6	12 VDC

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

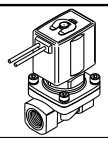
Refer to page 43 for ordering the coil only.

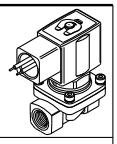
Bracket

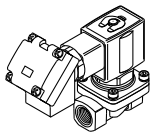
–	None
B	With bracket

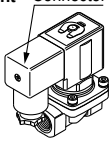
∗ Removal of bracket is not possible.

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, with gasket)
Connector 

∗ Refer to Table (3) for available combinations between the electrical option (L) and the rated voltage.

Table (1) Model/Orifice Diameter/Port Size

Normally Closed (N.C.)

Solenoid valve model (Port size)					Orifice diameter							Material	
Model		VXED21	VXED22	VXED23	3 (10 mmø)	4 (15 mmø)	5 (20 mmø)	6 (25 mmø)	7 (35 mmø)	8 (40 mmø)	9 (50 mmø)	Body	Seal
Port symbol (Port size)	Thread	**02** (1/4)	—	—	●	—	—	—	—	—	—	Brass (C37) Stainless steel	FKM
		03 (3/8)	—	—	●	●	—	—	—	—	—		
		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
A	FKM	Brass (C37), Bronze (CAC407)
H Note)		Stainless steel

Note) The H option (stainless steel specification) is for port size 1/4 to 1 only.

Table (3) Rated Voltage – Electrical Option

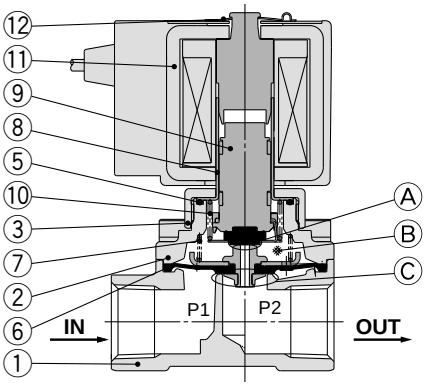
Rated voltage		**L** (With light)
Voltage symbol	Voltage	
5	24 VDC	●
6	12 VDC	—

Construction

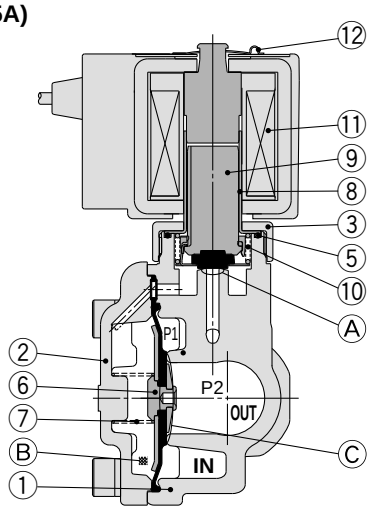
Normally closed (N.C.)

Body material: Brass (C37) (32A or more: Bronze (CAC407), Stainless steel (32A or more: not available)

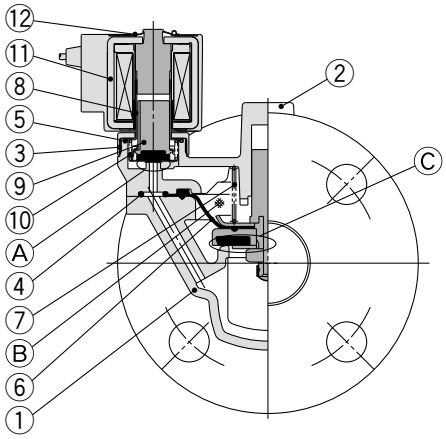
VXED2130 (8A/10A)



VXED2140/2150/2260
(10A to 25A)



VXED2270/2380/2390 (32A to 50A)



Working principle

<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 Ⓐ opens. Then the pressure in the pressure action chamber Ⓑ falls to open the main valve Ⓒ.

<Valve closed>
When the coil ⑪ is not energised, the pilot valve Ⓐ is closed and the pressure in the pressure action chamber Ⓑ rises and the main valve Ⓒ closes.

Component Parts

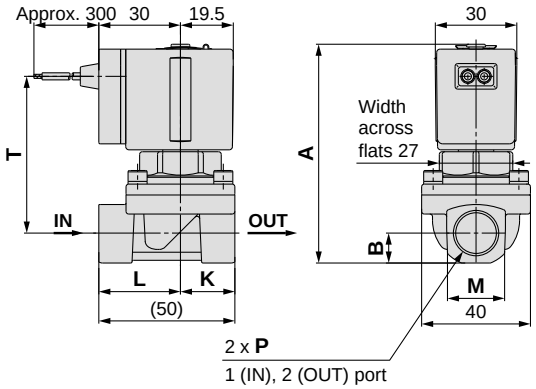
No.	Description	Size	Material	
			Brass (C37), Bronze (CAC407) body specification	Stainless steel body specification
1	**Body**	8A to 25A	Brass (C37)	Stainless steel
		32A to 50A	Bronze (CAC407)	—
2	**Bonnet**	8A to 25A	Brass (C37)	Stainless steel
		32A to 50A	Bronze (CAC407)	—
3	**Nut**	8A to 50A	Brass (C37)	Brass (C37), Ni plated
4	**O-ring**	32A to 50A	(NBR, FKM, EPDM)	
5	**O-ring**	8A to 50A	(NBR, FKM, EPDM)	
6	**Diaphragm assembly**	8A to 25A	(NBR, FKM, EPDM) Stainless steel	
		32A to 50A	(NBR, FKM, EPDM) Stainless steel, Brass (C37)	(NBR, FKM, EPDM) Stainless steel
7	**Valve spring**	8A to 50A	Stainless steel	
8	**Tube assembly**	8A to 50A	Stainless steel	
9	**Armature assembly**	8A to 50A	(NBR, FKM, EPDM) Stainless steel, PPS	
10	**Return spring**	8A to 50A	Stainless steel	
11	**Solenoid coil**	8A to 50A	—	
12	**Clip**	8A to 50A	SK	

The materials in parentheses are seal materials.

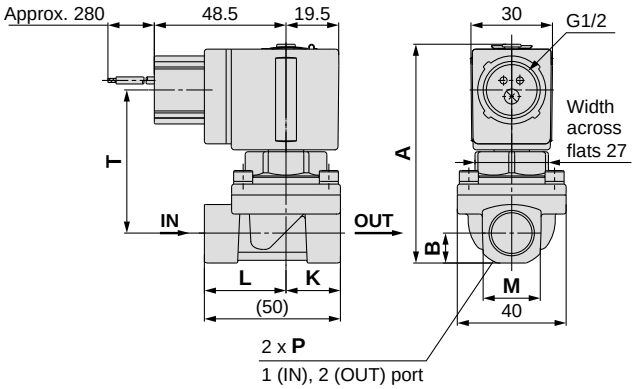
Dimensions: Single Unit/Body Material: Brass (C37), Stainless Steel

VXED2130

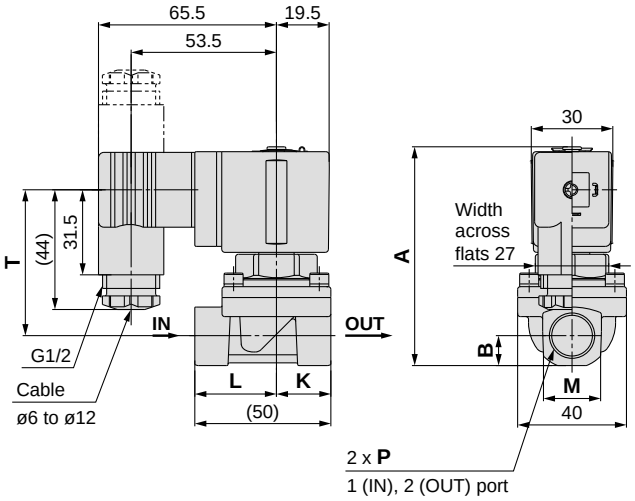
Grommet: G



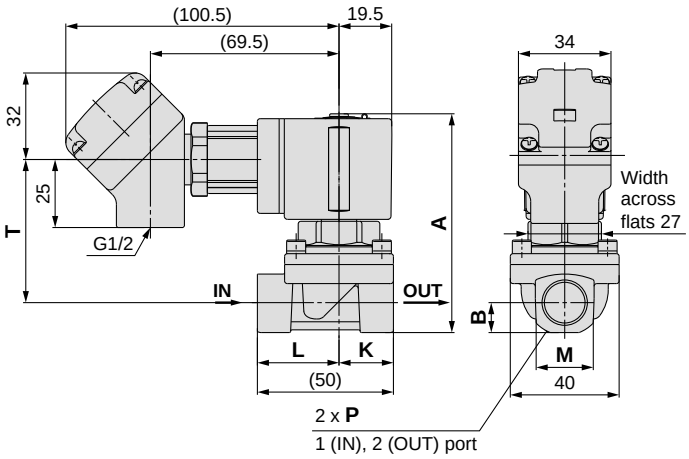
Conduit: C



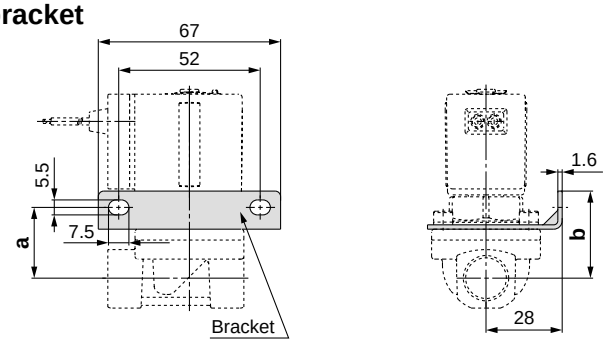
DIN terminal: D



Conduit terminal: T

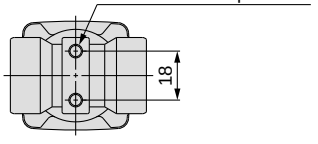


With bracket



VXED2130□□-04□-□□□□

Note) A thread is drilled on the bottom of the body of the VXED2130 with port size 04 (1/2).



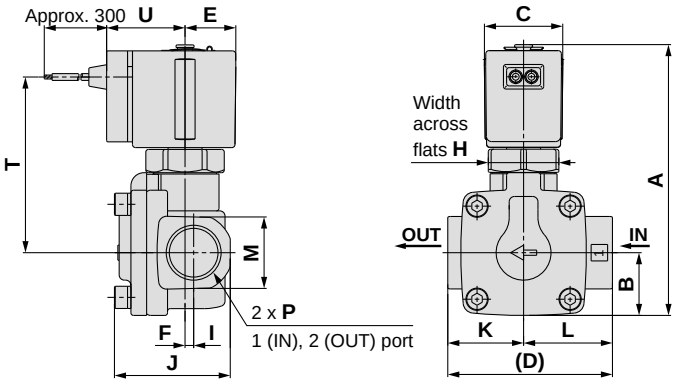
(mm)

Model	Port size P	A	B	K	L	M	Electrical entry										Bracket mounting dimension	
							Grommet		Conduit		DIN terminal			Conduit terminal				
N.C.							T	U	T	U	T	U	V	T	U	V	a	b
VXED2130	1/4, 3/8	80.5	11	20	30	22	58	30	53	48.5	54	65.5	53.5	53	100.5	69.5	26	32
	1/2	86	14.5	24	26	28	60	30	55	48.5	56	65.5	53.5	55	100.5	69.5	28	34

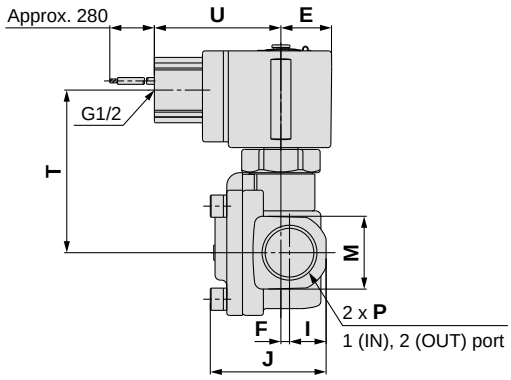
Dimensions: Single Unit/Body Material: Brass (C37), Stainless Steel

VXED2140/2150/2260

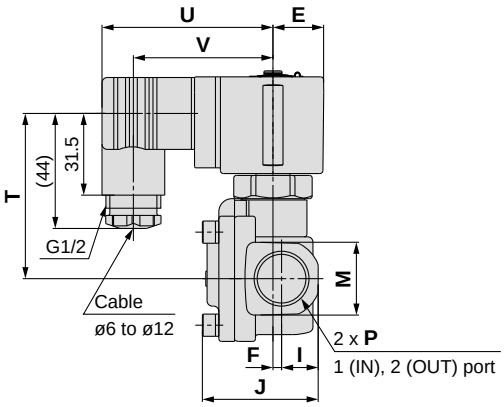
Grommet: G



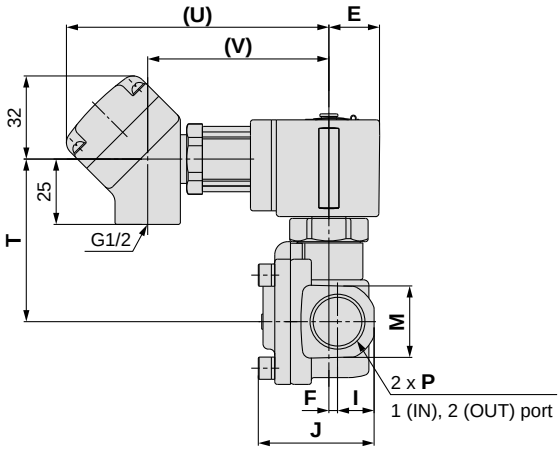
Conduit: C



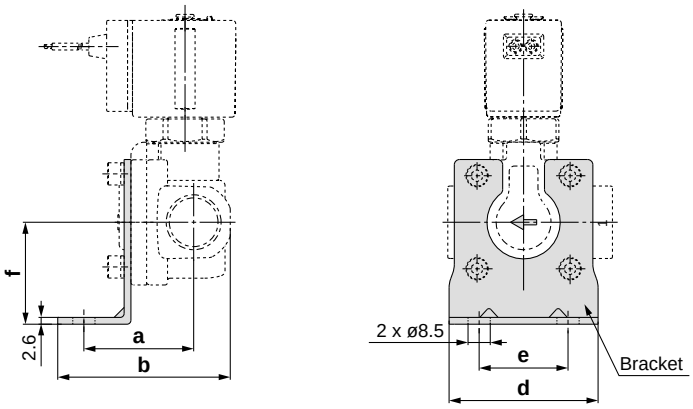
DIN terminal: D



Conduit terminal: T



With bracket



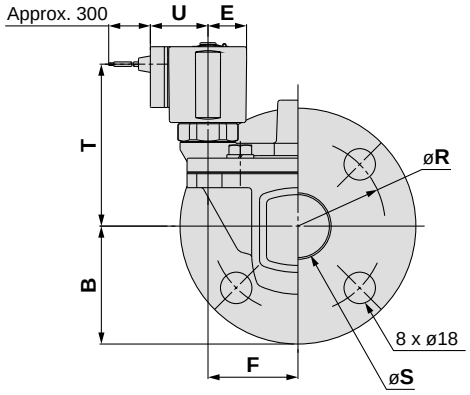
(mm)

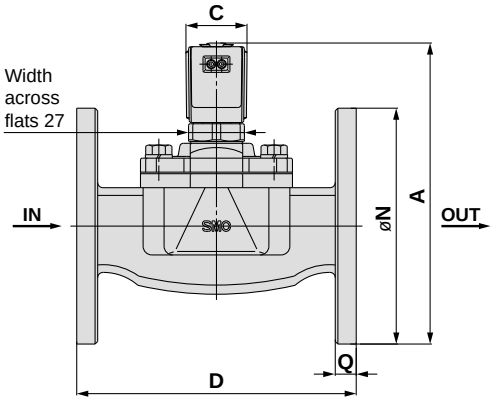
Model	Port size P	A	B	C	D	E	F	H	I	J	K	L	M	Electrical entry										Bracket mounting dimension				
														Grommet		Conduit		DIN terminal			Conduit terminal							
N.C.														T	U	T	U	T	U	V	T	U	V	a	b	d	e	f
VXED2140	3/8, 1/2	103.5	24	30	63	19.5	3.5	27	14	44.5	29	34	28	67.5	30	62.5	48.5	63.5	65.5	53.5	62.5	100.5	69.5	42	66	57	34	39
VXED2150	3/4	115	29	30	80	19.5	4.5	27	17	51.5	37	43	35	74	30	69	48.5	70	65.5	53.5	69	100.5	69.5	51	78	74	51	45.5
VXED2260	1	133	33	35	90	22.5	4.5	32	20	60	43	47	42	88	33	83	51.5	84	68.5	56.5	83	103.5	72.5	56	86	81	58	49.5

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

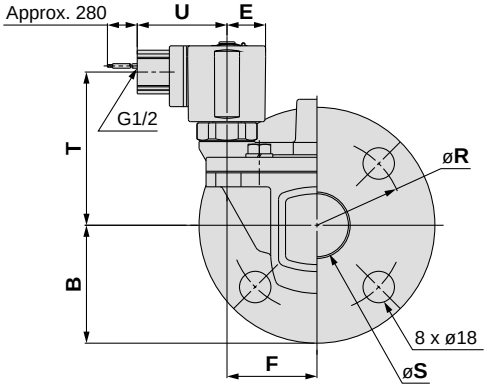
VXED2270/2380/2390

Grommet: G

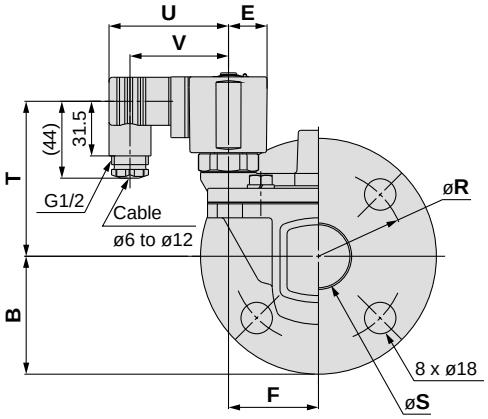




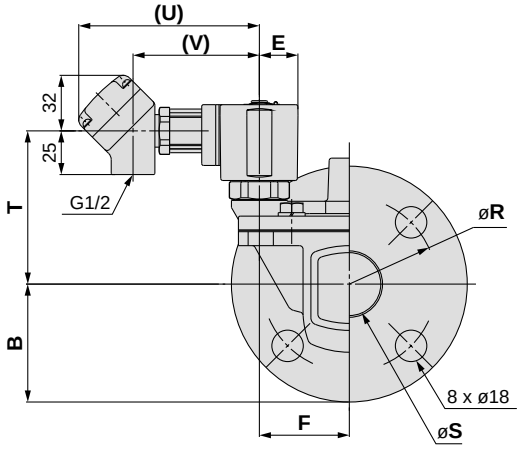
Conduit: C



DIN terminal: D



Conduit terminal: T



(mm)

Model	Applicable flange	A	B	C	D	E	F	H	N	Q	R	S	Electrical entry									
													Grommet		Conduit		DIN terminal			Conduit terminal		
N.C.													T	U	T	U	T	U	V	T	U	V
VXED2270	32A	172.5	67.5	35	160	22.5	51.5	32	135	12	100	36	93	33	88	51.5	89	68.5	56.5	88	103.5	72.5
VXED2380	40A	185	70	40	170	25	54.5	36	140	14	105	42	103	36	98	54	99	71	59	98	106	75
VXED2390	50A	198	77.5	40	180	25	59	36	155	14	120	52	108.5	36	103.5	54	104.5	71	59	103.5	106	75

Energy Saving Type

Zero Differential Pressure Type Pilot Operated 2 Port Solenoid Valve

Series VXEZ22/23

For Air/Water/Oil

■ **Valve**

Normally closed (N.C.)

■ **Solenoid Coil**

Coil: Class B

■ **Rated Voltage**

24 VDC, 12 VDC

■ **Material**

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

■ **Electrical Entry**

- Grommet
- Conduit
- DIN terminal
- Conduit terminal

Model		VXEZ2230	VXEZ2240	VXEZ2350	VXEZ2360
Orifice dia.	10 mmø	●	—	—	—
	15 mmø	—	●	—	—
	20 mmø	—	—	●	—
	25 mmø	—	—	—	●
Port size (Nominal size)		1/4 (8A) 3/8 (10A)	1/2 (15A)	3/4 (20A)	1 (25A)

Common Specifications

Standard Specifications

Valve specifications	**Valve construction**	Zero differential pressure type pilot operated 2 port diaphragm type
	Valve type	N.C.
	Withstand pressure	5.0 MPa
	Body material	Brass (C37), Stainless steel
	Seal material	NBR, FKM, EPDM
	Enclosure	Dust tight, Low jetproof (IP65)*
	Environment	Location without corrosive or explosive gases
Coil specifications	**Rated voltage**	24 VDC, 12 VDC
	Allowable voltage fluctuation	±10% of rated voltage
	Allowable leakage voltage	2% or less of rated voltage
	Coil insulation type	Class B
	Surge voltage suppressor	Built-in surge voltage suppressor

Solenoid Coil Specifications

DC Specification (Class B coil only)

Model	Power consumption (W) (Holding)	Inrush current (A) (Inrush time: 200 ms)		Temperature increase (C°) Note)
		24 VDC	12 VDC	
VXEZ22	2.3	0.29	0.58	25
VXEZ23	3	0.44	0.88	30

Note) Value for ambient temperature at 20°C and when the rated voltage is applied.

Applicable Fluid Check List / All Options

VXEZ2□□0□□–□□–□□□1–□

Option symbol

Fluid and application	Option symbol	Seal material	Body material
Air	**—**	NBR	Brass (C37)
	G		Stainless steel
Water	**—**	NBR	Brass (C37)
	G		Stainless steel
Oil Note 2)	**A**	FKM	Brass (C37)
	H		Stainless steel
High corrosive/Oil-free	**L** Note 1)	FKM	Stainless steel
Copper-free/Fluoro-free Note 3)	**J**	EPDM	Stainless steel
Other combination	**B**	EPDM	Brass (C37)

Note 1) The L option is oil-free treatment.
Note 2) The dynamic viscosity of the fluid must not exceed 50 mm²/s or less.
Note 3) The nuts (non-wetted parts) are nickel plated on the brass (C37) material.

* If used for other fluids, please consult with SMC.

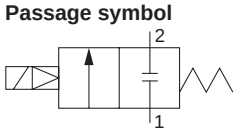
For Air

(Inert gas)

Model/Valve Specifications

N.C.

Passage symbol



Normally Closed (N.C.)

Port size (Nominal size)	Orifice dia. (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)	Flow characteristics			Max. system pressure (MPa)	Weight (g)
					C	b	Cv		
1/4 (8A)	10	**VXEZ2230-02**	0	0.7	8.5	0.44	2.4	1.5	550
3/8 (10A)		**VXEZ2230-03**			11.0	0.42	2.8		
1/2 (15A)	15	**VXEZ2240-04**			23.0	0.34	6.0		760
3/4 (20A)	20	**VXEZ2350-06**			38.0	0.20	9.5		1300

Port size (Nominal size)	Orifice dia. (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)	Flow characteristics	Max. system pressure (MPa)	Weight (g)
					Effective area (mm^2)		
1 (25A)	25	**VXEZ2360-10**	0	0.7	215	1.5	1480

∗ Weight for the grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for conduit terminal type respectively.

• Refer to “Glossary” on page 44 for details on the max. operating pressure differential and the max. system pressure.

Fluid and Ambient Temperature

Fluid temperature (°C)	Ambient temperature (°C)
Solenoid valve option symbol	
—, G	
–10 to 60 Note)	–10 to 60

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

Valve Leakage

Internal Leakage

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

External Leakage

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

How to Order

DC **VXEZ** **22** **3** **0** □ □ – **02** □ – **5** **G** **1** – □

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

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

Valve/Body configuration

0	N.C. / Single unit

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

Suffix

–	—
Z	Oil-free

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

Thread type

–	Rc
T	NPTF
F	G
N	NPT

Rated voltage

5	24 VDC
6	12 VDC

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

Refer to page 43 for ordering coil only.

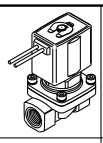
Bracket

–	None
B	With bracket

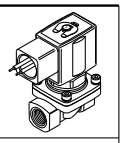
∗ Removal of bracket is not possible.

Electrical entry

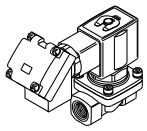
G - **Grommet**



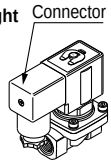
C - **Conduit**



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



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



∗ Refer to Table (3) for available combinations between thr electrical option (L) and the rated voltage.

Table (1) Model/Orifice Diameter/Port Size
Normally Closed (N.C.) / Normally Open (N.O.)

Solenoid valve model (Port size)			Orifice symbol (diameter)			
Model	**VXEZ22**	**VXEZ23**	3 (10 mmø)	4 (15 mmø)	5 (20 mmø)	6 (25 mmø)
Port symbol (Port size)	**02** (1/4)	—	●	—	—	—
	03 (3/8)	—	●	—	—	—
	04 (1/2)	—	—	●	—	—
	—	**06** (3/4)	—	—	●	—
	—	**10** (1)	—	—	—	●

Table (2) Solenoid Valve Option

Option symbol	Seal material	Body material	Note
—	NBR	Brass (C37)	—
G		Stainless steel	

Table (3) Rated Voltage – Electrical Option

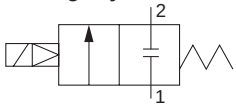
Rated voltage		**L** (With light)
Voltage symbol	Voltage	
5	24 VDC	●
6	12 VDC	—

For Water

Model/Valve Specifications

N.C.

Passage symbol



Normally Closed (N.C.)

Port size (Nominal size)	Orifice dia. (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)	Flow characteristics		Max. system pressure (MPa)	Weight (g)
					Av x $10^{-6}m^2$	Cv converted		
1/4 (8A)	10	**VXEZ2230-02**	0	0.7	46	1.9	1.5	550
3/8 (10A)		**VXEZ2230-03**			58	2.4		
1/2 (15A)	15	**VXEZ2240-04**			130	5.3		760
3/4 (20A)	20	**VXEZ2350-06**		1.0	220	9.2		1300
1 (25A)	25	**VXEZ2360-10**			290	12.0		1480

∗ Weight for the grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for conduit terminal type respectively.

• Refer to “Glossary” on page 44 for details on the max. operating pressure differential and the max. system pressure.

Fluid and Ambient Temperature

Fluid temperature (C)	Ambient temperature (C)
Solenoid valve option symbol	
—, G, L	
1 to 60	–10 to 60

∗ With no freezing

Valve Leakage

Internal Leakage

Seal material	Leakage (Water)
NBR, FKM	0.1 cm^3/min or less

External Leakage

Seal material	Leakage (Water)
NBR, FKM	0.1 cm^3/min or less

How to Order

DC **VXEZ** **22** **3** **0** □ □ – **02** □ – **5** **G** **1** – □

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

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

Valve/Body configuration

0	N.O. / Single unit

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

Suffix

–	—
Z	Oil-free

Select "–" because the solenoid valve L option is oil-free treatment.

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

Thread type

–	Rc
T	NPTF
F	G
N	NPT

Rated voltage

5	24 VDC
6	12 VDC

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

Refer to page 43 for ordering the coil only.

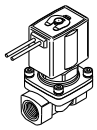
Bracket

–	None
B	With bracket

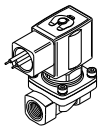
∗ Removal of the bracket is not possible.

Electrical entry

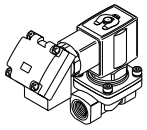
G - **Grommet**



C - **Conduit**

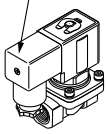


T - **With conduit terminal**
TL - **With conduit terminal and light**



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

Connector



∗ Refer to Table (3) for available combinations between the electrical option (L) and the rated voltage.

Table (1) Model/Orifice Diameter/Port Size
Normally Closed (N.C.) / Normally Open (N.O.)

Solenoid valve model (Port size)			Orifice symbol (diameter)			
Model	**VXEZ22**	**VXEZ23**	3 (10 mmø)	4 (15 mmø)	5 (20 mmø)	6 (25 mmø)
Port symbol (Port size)	**02** (1/4)	—	●	—	—	—
	03 (3/8)	—	●	—	—	—
	04 (1/2)	—	—	●	—	—
	—	**06** (3/4)	—	—	●	—
	—	**10** (1)	—	—	—	●

Table (2) Solenoid Valve Option

Option symbol	Seal material	Body material	Note
—	NBR	Brass (C37)	—
G		Stainless steel	
L	FKM	Stainless steel	High corrosive/Oil-free

Table (3) Rated Voltage – Electrical Option

Rated voltage		**L** (With light)
Voltage symbol	Voltage	
5	24 VDC	●
6	12 VDC	—

For Oil

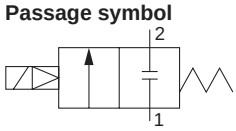
⚠ When the fluid is oil.

The dynamic viscosity of the fluid must not exceed 50 mm²/s.

Model/Valve Specifications

N.C.

Passage symbol



Normally Closed (N.C.)

Port size (Nominal size)	Orifice dia. (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)	Flow characteristics		Max. system pressure (MPa)	Weight (g)
					Av x 10^{-6}m²	Cv converted		
1/4 (8A)	10	**VXEZ2230-02**	0	0.7	46	1.9	1.5	550
3/8 (10A)		**VXEZ2230-03**			58	2.4		
1/2 (15A)	15	**VXEZ2240-04**			130	5.3		760
3/4 (20A)	20	**VXEZ2350-06**			220	9.2		1300
1 (25A)	25	**VXEZ2360-10**			290	12.0		1480

∗ Weight for the grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for conduit terminal type respectively.

• Refer to “Glossary” on page 44 for details on the max. operating pressure differential and the max. system pressure.

Fluid and Ambient Temperature

Fluid temperature (°C)	Ambient temperature (°C)
Solenoid valve option symbol	
A, H	
–5 to 60	–10 to 60

Note) Dynamic viscosity: 50 mm²/s or less

Valve Leakage

Internal Leakage

Seal material	Leakage (Oil)
FKM	0.1 cm³/min or less

External Leakage

Seal material	Leakage (Oil)
FKM	0.1 cm³/min or less

How to Order

DC **VXEZ** **22** **3** **0** □ □ – **02** □ – **5** **G** **1** – □

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

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

Valve/Body configuration

0	N.C. / Single unit

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

Suffix

–	—
Z	Oil-free

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

Thread type

–	Rc
T	NPTF
F	G
N	NPT

Rated voltage

5	24 VDC
6	12 VDC

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

Refer to page 43 for ordering the coil only.

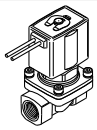
Bracket

–	None
B	With bracket

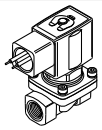
∗ Removal of the bracket is not possible.

Electrical entry

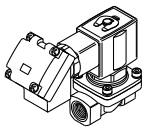
G- Grommet



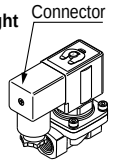
C- Conduit



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



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



∗ Refer to Table (3) for available combinations between the electrical option (L) and the rated voltage.

Table (1) Model/Orifice Diameter/Port Size
Normally Closed (N.C.) / Normally Open (N.O.)

Solenoid valve model (Port size)			Orifice symbol (diameter)			
Model	**VXEZ22**	**VXEZ23**	3 (10 mmø)	4 (15 mmø)	5 (20 mmø)	6 (25 mmø)
Port symbol (Port size)	**02** (1/4)	—	●	—	—	—
	03 (3/8)	—	●	—	—	—
	04 (1/2)	—	—	●	—	—
	—	**06** (3/4)	—	—	●	—
	—	**10** (1)	—	—	—	●

Table (2) Solenoid Valve Option

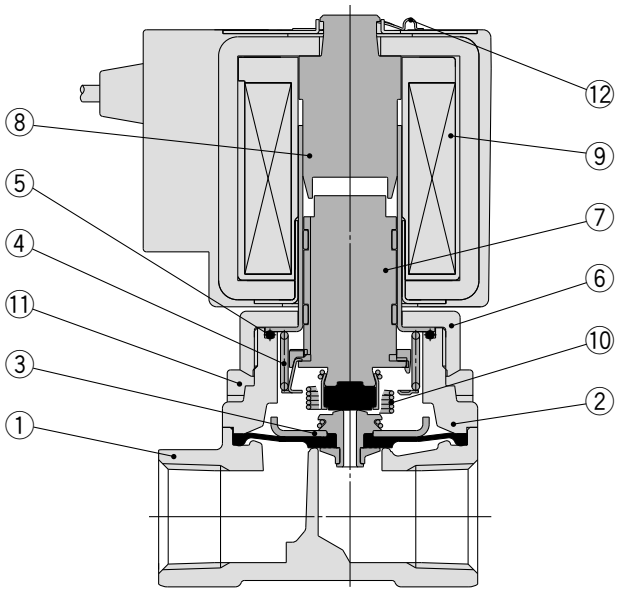
Option symbol	Seal material	Body material
A	FKM	Brass (C37)
H		Stainless steel

Table (3) Rated Voltage – Electrical Option

Rated voltage		**L** (With light)
Voltage symbol	Voltage	
5	24 VDC	●
6	12 VDC	—

Construction

Normally closed (N.C.)
Body material: Brass (C37), Stainless steel



Working principle

<Valve opened – when there is pressure>
When the coil ⑨ is energised, the armature assembly ⑦ is attracted into the core of the tube assembly ⑧ and the pilot valve Ⓐ is opened.
When the pilot valve is opened, the pressure inside the pilot chamber Ⓑ decreases, resulting in the pressure difference from the inlet pressure. Then the diaphragm assembly ③ is lifted and the main valve Ⓒ is opened.
<Valve opened – when there is no pressure or under low minute pressure>
The armature assembly ⑦ and the diaphragm assembly ③ are connected to each other with the lift spring ⑩. When the armature assembly is attracted, the diaphragm assembly is pulled up and the main valve Ⓒ is opened.
<Valve closed>
When the coil ⑨ is de-energised, the armature assembly ⑦ returns by the reacting force of the return spring ④ and the pilot valve Ⓐ is closed.
When the pilot valve is closed, the pressure inside the pilot chamber Ⓑ increases, resulting in the loss of pressure difference from the inlet and the main valve Ⓒ is closed.

Component Parts

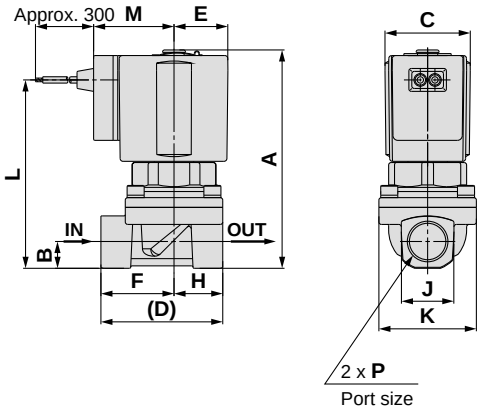
No.	Description	Material	
		Brass (C37) body specification	Stainless steel body specification
1	**Body**	Brass (C37)	Stainless steel
2	**Bonnet**	Brass (C37)	Stainless steel
3	**Diaphragm assembly**	(NBR, FKM, EPDM) Stainless steel	
4	**Return spring**	Stainless steel	
5	**O-ring**	(NBR, FKM, EPDM)	
6	**Nut**	Brass (C37)	Brass (C37), Ni plated
7	**Armature assembly**	(NBR, FKM, EPDM) Stainless steel, PPS	
8	**Tube assembly**	Stainless steel	
9	**Solenoid coil**	—	
10	**Lift spring**	Stainless steel	
11	**Hexagon socket bolt**	Stainless steel	
12	**Clip**	SK	

The materials in parentheses are seal materials.

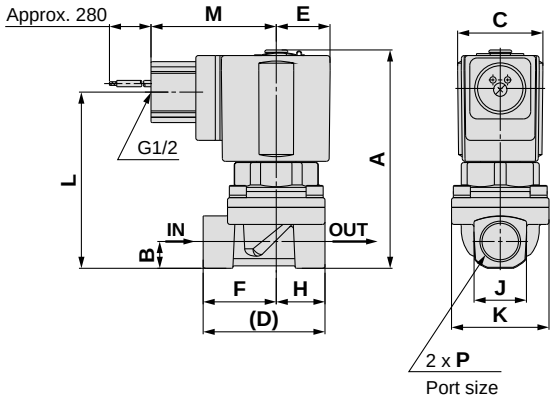
Dimensions: Body Material: Brass (C37), Stainless Steel

VXEZ22□0/23□0

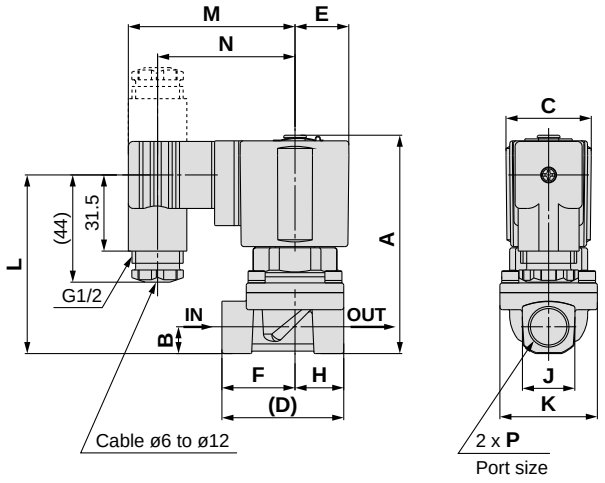
Grommet: G



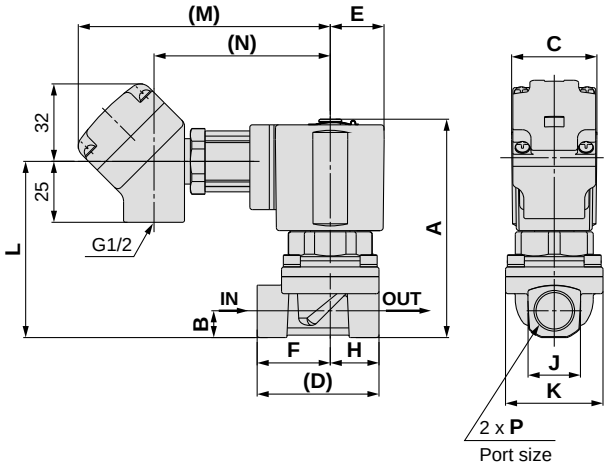
Conduit: C



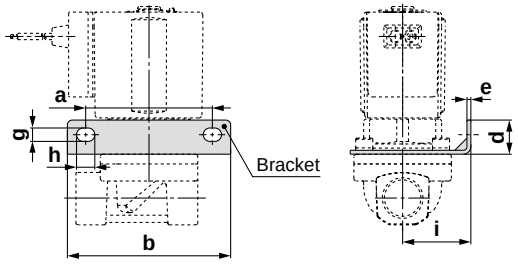
DIN terminal: D



Conduit terminal: T



With bracket



(mm)

Model N.C.	Port size P	A	B	C	D	E	F	H	J	K
VXEZ2230	1/4, 3/8	90	11	35	50	22.5	30	20	22	40
VXEZ2240	1/2	98	14	35	63	22.5	37	26	29.5	52
VXEZ2350	3/4	110	18	40	80	25	47.5	32.5	36	65
VXEZ2360	1/1	116.5	21	40	90	25	55	35	40.5	70

(mm)

Model N.C.	Port size P	a	b	d	e	f	g	h	i	Electrical entry: Grommet L	Grommet M	Conduit L	Conduit M	DIN terminal L	DIN terminal M	DIN terminal N	Conduit terminal L	Conduit terminal M	Conduit terminal N
VXEZ2230	1/4, 3/8	52	67	14	1.6	26	5.5	7.5	28	77.5	33	72.5	51.5	73.5	68.5	56.5	72.5	103.5	72.5
VXEZ2240	1/2	60	75	17	2.3	33	6.5	8.5	35	85.5	33	80.5	51.5	81.5	68.5	56.5	80.5	103.5	72.5
VXEZ2350	3/4	68	87	22	2.6	40	6.5	9	43	97.5	36	92.5	54	93.5	71	59	92.5	106	75
VXEZ2360	1/1	73	92	22	2.6	45.5	6.5	9	45	104	36	99	54	100	71	59	99	106	75

Replacement Parts

● Solenoid coil assembly part no.

VXE02 1 N − 1 G E − □

Series

1	VXE□21
2	VXE□22□□
3	VXE□23□□

Valve

Symbol	Model
Z	VXED2130
—	Others

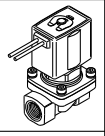
Rated voltage Note)

5	24 VDC
6	12 VDC

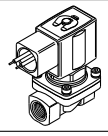
Note) Refer to Table (1) for available combinations.

Electrical entry

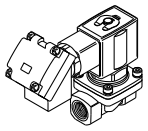
G - **Grommet**



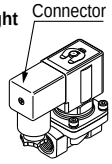
C - **Conduit**



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



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



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

● Clip part no.

For VXE□21: VX021N-10
For VXE□22: VX022N-10
For VXE□23: VX023N-10

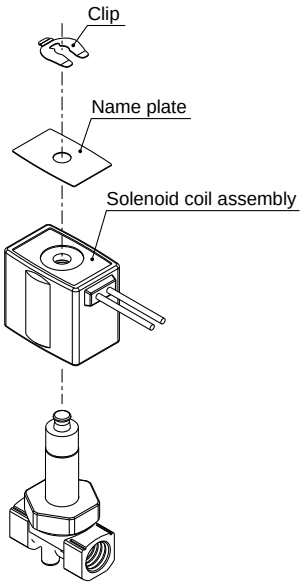


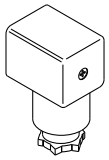
Table (1) Rated Voltage – Electrical Option

Rated voltage		**L** (With light)
Voltage symbol	Voltage	
5	24 VDC	●
6	12 VDC	—

● DIN connector part no.

Without electrical option **GDM2A**

With electrical option **GDM2A − □□**



Electrical option

L	With light

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

Rated voltage

5	24 VDC
6	12 VDC

● Gasket part no. for DIN connector

VCW20-1-29-1

● Name plate part no.

AZ-T-VX **Valve model**

↑ Enter by referring to "How to Order" (Single Unit).

AZ-T-VXE□□□□□□□-□□-□□□1-□

Valve model

Glossary

Pressure Terminology

1. Maximum operating pressure differential

The maximum pressure differential (the difference between the inlet and outlet pressure) which is allowed for operation, with the valve closed or open. 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 at which the valve must be withstood without a drop in performance after holding for one minute under the prescribed pressure and returning to the operating pressure range. (value under the prescribed conditions)

Electrical Terminology

1. Surge voltage

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

2. 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”.

IP65: Dust tight, 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.

Others

1. Material

NBR: Nitrile rubber
FKM: Fluoro rubber – Trade name: Viton®, Dai-el®, etc.
EPDM: Ethylene propylene rubber
PTFE: Polytetrafluoroethylene resin – Trade name: Teflon®, Polyflon®, etc.

2. Oil-free treatment

The degreasing and washing of wetted parts.

3. Passage symbol

In the JIS symbol () IN and OUT are in a blocked condition (), but actually in the case of reverse pressure (OUT> IN), there is a limit to the blocking.
() is used to indicate that blocking of reverse pressure is not possible.

Series VXE
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.

■ Explanation of the Labels

Labels	Explanation of the labels
⚠ **Danger**	In extreme conditions, there is a possible result of serious injury or loss of life.
⚠ **Warning**	Operator error could result in serious injury or loss of life.
⚠ **Caution**	Operator error could result in injury Note 3) or equipment damage. Note 4)

Note 1) ISO 4414: Pneumatic fluid power – General rules relating to systems
Note 2) JIS B 8370: General Rules for Pneumatic Equipment
Note 3) Injury indicates light wounds, burns and electrical shocks that do not require hospitalisation or hospital visits for long-term medical treatment.
Note 4) Equipment damage refers to extensive damage to the equipment and surrounding devices.

■ Selection/Handling/Applications

1. The compatibility of equipment is the responsibility of the person who designs the system or decides its specifications.
Since the products specified here are used in various operating conditions, their compatibility with a specific system must be based on specifications, post analysis and/or tests to meet a specific requirement. The expected performance and safety assurance will be 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 catalog information and taking into consideration the possibility of equipment failure when configuring a system. Be particularly careful in determining the compatibility with the fluid to be used.

2. Only trained personnel should operate machinery and equipment.
Fluids can be dangerous if handled incorrectly. Assembly, handling or maintenance of the system should be performed by trained and experienced operators.

3. Do not service machinery/equipment or attempt to remove components until the safety is confirmed.
1. Inspection and maintenance of machinery/equipment should only be performed once measures to prevent falling or runaway of the driven object have been confirmed. Measures to prevent danger from a fluid should also be confirmed.
2. When equipment is to be removed, confirm the safety processes mentioned above, release the fluid pressure and be certain there is no danger from fluid leakage or fluid remaining in the system.
3. Carefully restart the machinery, confirming that safety measures are being implemented.

4. If the equipment will be used in the following conditions or environment, please contact SMC first and be sure to take all necessary safety precautions.
1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. With fluids whose application causes concern due to the type of fluid or additives, etc.
3. An application which has the possibility of having a negative effect on people and/or property, and therefore requires special safety analysis.

■ Exemption from Liability

1. SMC, its officers and employees shall be exempted from liability for any loss or damage arising out of earthquakes or fire, action by a third person, accidents, customer error with or without intention, product misuse, and any other damages caused by abnormal operating conditions.

2. SMC, its officers and employees shall be exempted from liability for any direct or indirect loss or damage, including consequential loss or damage, loss of profits or loss of chance, claims, demands, proceedings, costs, expenses, awards, judgments and any other liability whatsoever including legal costs and expenses which may be suffered or incurred, whether in tort (including negligence), contract, breach of statutory duty, equity or otherwise.

3. SMC is exempted from liability for any damages caused by operations not contained in the catalogues and/or instruction manuals, and operations outside of the specification range.

4. SMC is exempted from liability for any loss or damage whatsoever caused by malfunctions of its products when combined with other devices or software.

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.

Design

⚠ Warning

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

The valves presented in this catalog 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.

5. Liquid rings

In case of with a flowing liquid, provide a by-pass 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 applications 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. Give attention to it.

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 dynamic viscosity of 50 mm^2/s or less. If there is something you do not know, please contact us.

2. Flammable 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 any oily particle must not enter the passage.

5. Applicable fluid on the list may not be used depending on the operating condition.

Give adequate confirmation, and then determine a model, just because the compatibility list shows the general case.

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 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 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 valves at their upstream side. A filtration degree of 5 μm 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 at 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, confirm us separately.

2 Port Solenoid Valve for Fluid Control Precautions 2

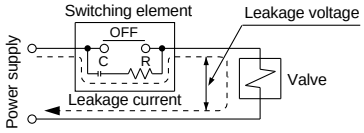
Be sure to read this before handling.
For detailed precautions on each series, refer to the main text.

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 the leakage current will flow through the resistor, C-R element, etc., creating a possible danger that the valve may not turn off.



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 applications in cold climates, take appropriate countermeasures to prevent the water from freezing in the tubing after cutting the water supply from the pump, by draining the water, etc.

When warming by a heater, etc., be careful not to expose the coil portion to the heater. Installation of a dryer, heat retaining of the body are 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 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 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 labeled on the product should not be erased, removed or covered up.

Piping

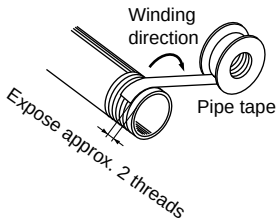
⚠ Caution

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.
Install piping so that it does not apply pulling, pressing, bending or other forces on the valve body.

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 to the proper tightening torque shown below.

Tightening Torque for Piping

Connection threads	Proper tightening torque N·m
Rc1/8	7 to 9
Rc1/4	12 to 14
Rc3/8	22 to 24
Rc1/2	28 to 30
Rc3/4	28 to 30
Rc1	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.

SMC

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

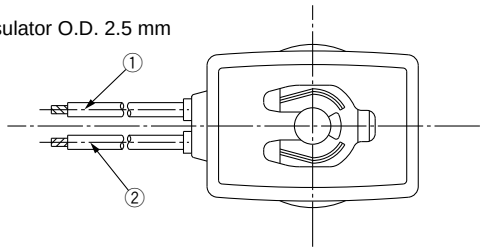
1. **As a rule, use electrical wire with a cross sectional area of 0.5 to 1.25 mm^2 for wiring. Furthermore, do not allow excessive force to be applied to the lines.**
2. **Use electrical circuits which do not generate chattering in their contacts.**
3. **Use voltage which is within ±10% of the rated voltage. In cases with a DC power supply where importance is placed on responsiveness, stay within ±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 an 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 consult with SMC.)

Electrical Connections

⚠ Caution

Grommet

AWG20 Insulator O.D. 2.5 mm

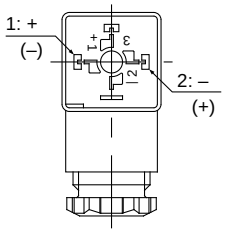


Lead wire color	
①	②
Black	Red

∗ There is no polarity.

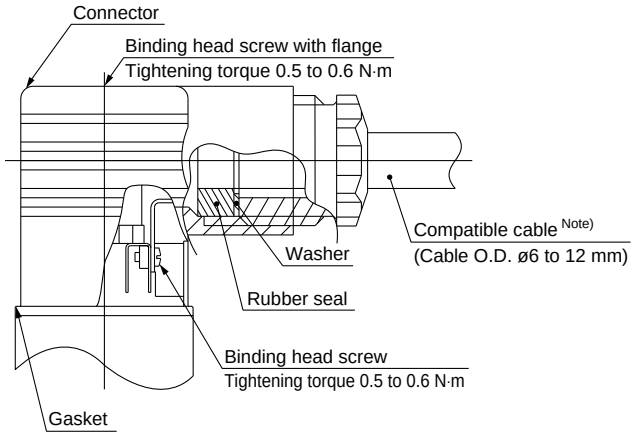
DIN terminal (Class B only)

Since internal connections are as shown below for the DIN terminal, 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 ø6 to 12 mm.
- Use the tightening torques below for each section.



Note) For an outside cable diameter of ø9 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.

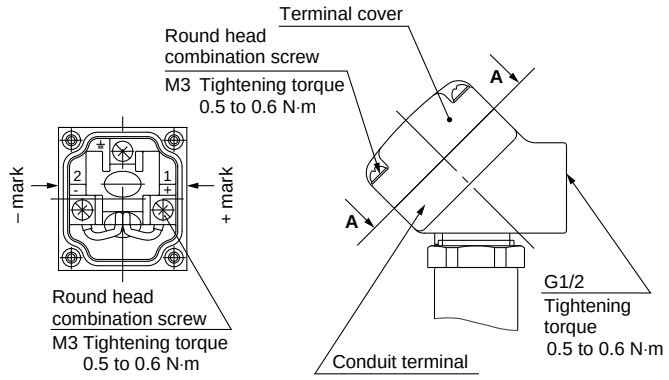
Electrical Connections

⚠ Caution

Conduit terminal

In 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.



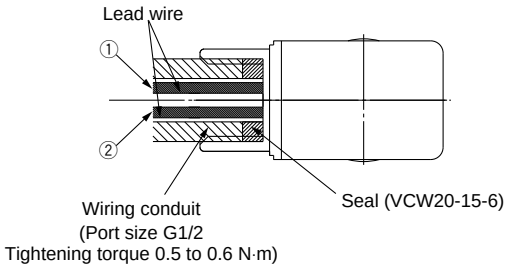
View A-A

(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.

AWG20 Insulator O.D. 2.5 mm



Lead wire color	
①	②
Black	Red

∗ There is no polarity for DC.

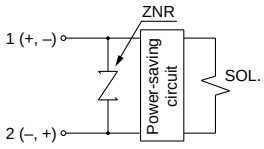
Description	Part no.
Seal	VCW20-15-6

Note) Please order separately.

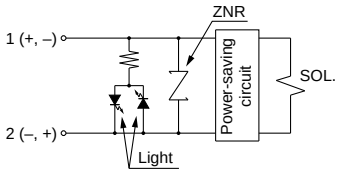
Electrical Circuits

⚠ Caution

Without electrical option



With light



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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 atmospheres having corrosive gases, chemicals, salt water, 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 is 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 seals.

   Refer to the table of brand name of lubricants compliant to 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**

   Valves reach high temperatures 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 burnt.

   1. **Shut off the fluid supply and release the fluid pressure in the system.**
   2. **Shut off the power supply.**
   3. **Dismount 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 energy 6 months.

Maintenance

⚠ 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 reach high temperatures from high temperature fluids. Use caution, as there is a danger of being burnt if a valve is touched directly.**

⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

⚠ Caution: **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

⚠ Warning: **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

⚠ Danger : **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots - Safety.
etc.

⚠ Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.
Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.
The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.
1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.
1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalogue.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⚠ Caution

1. The product is provided for use in manufacturing industries.
The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, wichever is first.*2) Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.

*2) **Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

⚠ Caution

SMC products are not intended for use as instruments for legal metrology.
Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

⚠ Safety Instructions | Be sure to read "Handling Precautions for SMC Products" (M-E03-3) before using.

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