

# Energy Saving Type 2 Port Solenoid Valve

For Air/Water/Oil



*Power  
consumption*

(SMC comparison)

**1/3**



New generation valve corresponding to energy-saving needs

• IP65 • RoHS compliance

**Series VXE**

  
CAT.ES70-36A

# 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)	<b>1.5</b> <b>(1.8)</b>	0.19 (0.23)	0.38 (0.46)	25 (30)
VXE□22	<b>2.3</b>	0.29	0.58	25
VXE□23	<b>3</b>	0.44	0.88	30

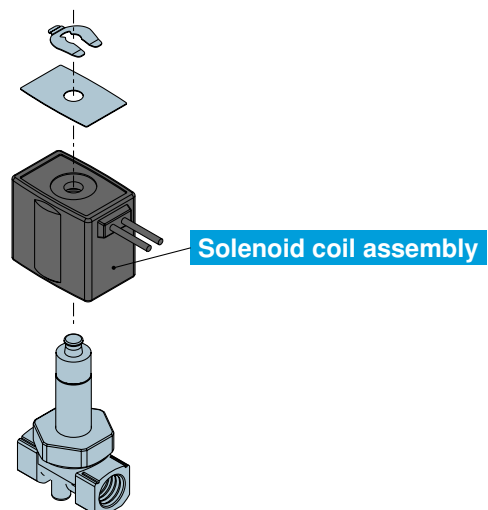
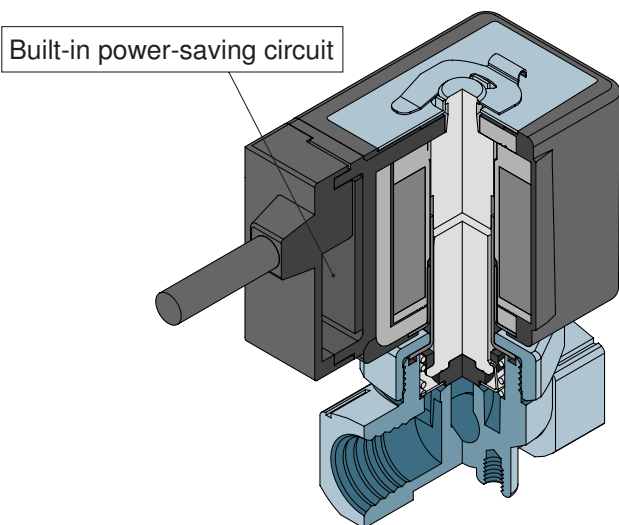
### ● Interchangeable

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						Flange		
		1/8	1/4	3/8	1/2	3/4	1	32A	40A	50A
<b>VXE2</b> Direct Operated 	2 mmø	●	●							
	3 mmø	●	●	●						
	4.5 mmø	●	●	●						
	6 mmø		●	●						
	8 mmø		●	●						
	10 mmø		●	●	●					
<b>VXED2</b> Pilot Operated 	10 mmø		●	●	●					
	15 mmø			●	●					
	20 mmø					●				
	25 mmø						●			
	35 mmø							●		
	40 mmø								●	
<b>VXEZ2</b> Zero Differential Pressure Type Pilot Operated 	10 mmø		●	●						
	15 mmø				●					
	20 mmø					●				
	25 mmø						●			



Model

VXE2

VXED2

VXEZ2

P.1

P.21

P.33

Specifications

Applications

For Air

For Water

For Oil

Dimensions

Construction

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

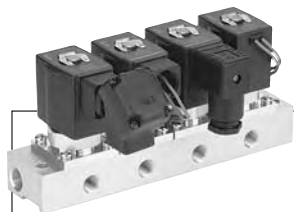
### Electrical Entry

- Grommet
- Conduit
- DIN terminal
- Conduit terminal



### Normally Closed (N.C.)

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



## 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	IN 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	Dusttight, 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°) <small>Note</small>
		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	Nil	NBR	Brass (C37)
	G		Stainless steel
Medium vacuum/Non-leak/ Oil-free <small>Note 1</small>	V <small>Note 2</small>	FKM	Brass (C37)
	M <small>Note 2</small>		Stainless steel
Water	Nil	NBR	Brass (C37)
	G		Stainless steel
Oil <small>Note 3</small>	A	FKM	Brass (C37)
	H		Stainless steel
High corrosive/Oil-free	L <small>Note 2</small>	FKM	Stainless steel
Copper-free/Fluoro-free <small>Note 4</small>	J	EPDM	Stainless steel
Other combination	B	PTFE	Brass (C37)
	C		Stainless steel
	K		Stainless steel

## Applicable Fluid Check List / All Options (Manifold)

VXE2   1   -   -    1

● Option symbol      ● Base symbol

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

Note 1) The leakage amount (10<sup>-6</sup> Pa·m<sup>3</sup>/s) of V and M options is value when 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 mm<sup>2</sup>/s or less.

Note 4) The nuts (non-wetted parts) are nickel plated on the C37 material.

\* If using for other fluids, please consult with SMC.

# Series VXE21/22/23

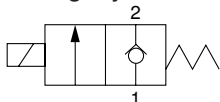
## For Air /Single Unit

(Inert gas/Non-leak/Medium vacuum)

### Model/Valve Specifications

N.C.

Passage symbol



#### Normally Closed (N.C.)

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

Note) Weight of 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		
<b>Nil, G</b>	<b>V, M</b>	-20 to 60
-10 <sup>Note)</sup> to 60	-10 <sup>Note)</sup> to 60	

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

### Valve Leakage

#### Internal Leakage

Seal material	Leakage	
	Air	Non-leak/ Medium vacuum <sup>Note)</sup>
NBR, FKM	1 cm <sup>3</sup> /min or less	10 <sup>-6</sup> Pa·m <sup>3</sup> /sec or less

#### External Leakage

Seal material	Leakage	
	Air	Non-leak/ Medium vacuum <sup>Note)</sup>
NBR, FKM	1 cm <sup>3</sup> /min or less	10 <sup>-6</sup> Pa·m <sup>3</sup> /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**  

Nil	—
Z	Oil-free

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

**Bracket**  

Nil	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.

**Rated voltage**  

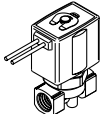
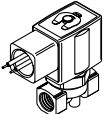
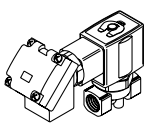
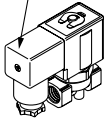
5	24 VDC
6	12 VDC

 \* Refer to Table (3) shown below for availability.  
Refer to page 43 for ordering coil only.

**Thread type**  

Nil	Rc
T	NPTF
F	G
N	NPT

**Electrical entry**

<b>G-Grommet</b> 	<b>C-Conduit</b> 
<b>T - With conduit terminal</b> <b>TL - With conduit terminal and light</b> 	<b>D - DIN terminal</b> <b>DL - DIN terminal with light</b> <b>DO - For DIN terminal (without connector, with gasket)</b> Connector 

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

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

Model	Solenoid valve model (Port size)			Orifice symbol (diameter)					
	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
Nil	NBR	Brass (C37)	—
G		Stainless steel	
V	FKM	Brass (C37)	Non-leak (10 <sup>-6</sup> Pa·m <sup>3</sup> /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 <sup>1</sup> / <sub>3</sub> 20	VX021N-12A
VXE22 <sup>2</sup> / <sub>4</sub> 30	VX022N-12A
VXE23 <sup>3</sup> / <sub>4</sub> 30	
VXE22 <sup>5</sup> / <sub>6</sub> 0	VX023N-12A-L
VXE23 <sup>5</sup> / <sub>6</sub> 0	

Dimensions → P. 17 (Single unit)

Model  
VXE2  
VXED2  
VXEZ2  
Specifications  
Applications  
For Air  
For Water  
For Oil  
Construction  
Dimensions

# Series VXE21/22/23

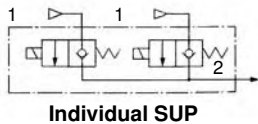
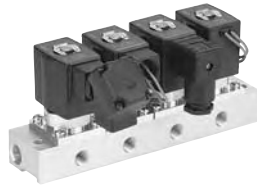
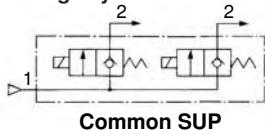
## For Air /Manifold

(Inert gas/Non-leak/Medium vacuum)

### Solenoid Valve for Manifold/Valve Specifications

N.C.

Passage symbol



#### Normally Closed (N.C.)

Orifice dia. (mmø)	Model	Max. operating pressure differential (MPa)	Flow characteristics			Max. system pressure (MPa)
			C[dm <sup>3</sup> /(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		
<b>Nil, R</b>	<b>V</b>	-20 to 60
-10 <sup>Note)</sup> to 60	-10 <sup>Note)</sup> to 60	



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

### Valve Leakage

#### Internal Leakage

Seal material	Leakage	
	Air	Non-leak/ Medium vacuum <sup>Note)</sup>
NBR, FKM	1 cm <sup>3</sup> /min or less	10 <sup>-6</sup> Pa·m <sup>3</sup> /sec or less

#### External Leakage

Seal material	Leakage	
	Air	Non-leak/ Medium vacuum <sup>Note)</sup>
NBR, FKM	1 cm <sup>3</sup> /min or less	10 <sup>-6</sup> Pa·m <sup>3</sup> /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**

Nil	—
Z	Oil-free

Select Nil because the solenoid valve V, 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 coil only.

**Electrical entry**

<b>G-Grommet</b> 	<b>C-Conduit</b> 
<b>T</b> -With conduit terminal <b>TL</b> -With conduit terminal and light	<b>D</b> -DIN terminal <b>DL</b> -DIN terminal with light <b>DO</b> -For DIN terminal (without connector, with gasket) 

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

### How to Order Manifold Bases

**VVX21**  
**VVX22** 1 - 07 - 1  
**VVX23**

**Port size (Individual port)**

1	Rc1/8
2	Rc1/4

\* Common port sizes are all Rc3/8.

**Thread type**

Nil	Rc
T	NPTF
F	G
N	NPT

**Number of manifolds**

02	2 stations
...	...
10	10 stations

**Suffix**

Nil	—
Z	Oil-free

**Base type**

Nil	Common SUP
V	Individual SUP

• Blanking plate part no.

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

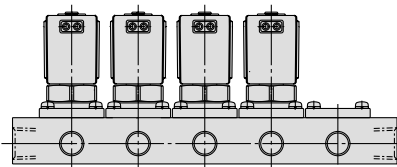
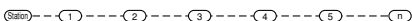
**Seal material**

Nil	NBR
F	FKM

### How to Order Manifold Assemblies (Example)

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

Example  
 VVX211-05-1 ..... 1 set    "\*" is the symbol for mounting.  
 \* VXE2111-00-1G1 ... 4 sets    Add an "\*" in front of the part numbers  
 \* VX011-001 ..... 1 set    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
Nil	Aluminum	NBR	—
V		FKM	Non-leak/Medium vacuum/Oil-free
R		FKM	Non-leak/Copper-free/Oil-free <sup>Note)</sup>

Note) The nuts (non-wetted parts) are nickel plated on the 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)

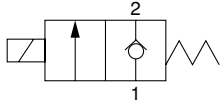
# Series VXE21/22/23

## 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 <sup>-6</sup> m <sup>2</sup>	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	3.0	470	
		VXE2120-02	0.5	7.9	0.33			
		VXE2220-02	1.5					
	3	VXE2320-02	3.0	15.0	0.61			620
		VXE2130-02	0.2					300
		VXE2230-02	0.35					470
	4.5	VXE2330-02	0.9	26.0	1.10			620
		VXE2240-02	0.15					470
		VXE2340-02	0.3					620
	6	VXE2250-02	0.08	38.0	1.60			560
		VXE2350-02	0.2					700
		VXE2260-02	0.03					46.0
8	VXE2360-02	0.07	700					
	VXE2250-03	0.08	53.0	2.20	560			
10	VXE2350-03	0.2			700			
	VXE2260-03	0.03			53.0	2.20	560	
3/8 (10A)	VXE2360-03	0.07	700					
	VXE2260-04	0.03	53.0	2.20			560	
1/2 (15A)	VXE2360-04	0.07			700			

Note) Weight of 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	
<b>Nil, G, L</b>	-20 to 60
1 to 60	

Note) With no freezing

### Valve Leakage

#### Internal Leakage

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

#### External Leakage

Seal material	Leakage (Water)
NBR, FKM	0.1 cm <sup>3</sup> /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**  

Nil	—
Z	Oil-free

Select Nil because the solenoid valve L option is oil-free treatment.
- Port size**  
Refer to Table (1) shown below for availability.
- Bracket**  

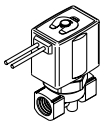
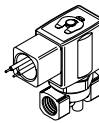
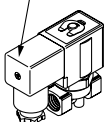
Nil	None
B	With bracket

\* 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.
- Rated voltage**  

5	24 VDC
6	12 VDC

\* Refer to Table (3) shown below for availability.
- Thread type**  

Nil	Rc
T	NPTF
F	G
N	NPT
- Electrical entry**  

<b>G-Grommet</b> 	<b>C-Conduit</b> 
<b>T</b> -With conduit terminal <b>TL</b> -With conduit terminal and light	<b>D</b> -DIN terminal <b>DL</b> -DIN terminal with light <b>DO</b> -For DIN terminal (without connector, with gasket) 

\* Refer to Table (3) for available combinations between electrical option (L) and 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 (3) Rated Voltage – Electrical Option**

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

**Table (2) Solenoid Valve Option**

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

**Table (4) Bracket Part No.**

Model	Part no.
VXE21 <sup>1</sup> / <sub>8</sub> 0	VX021N-12A
VXE22 <sup>2</sup> / <sub>4</sub> 0	VX022N-12A
VXE23 <sup>3</sup> / <sub>4</sub> 0	
VXE22 <sup>5</sup> / <sub>8</sub> 0	VX023N-12A-L
VXE23 <sup>5</sup> / <sub>8</sub> 0	

Dimensions → P. 17 (Single unit)

Model  
VXE2  
VXED2  
VXE22  
Specifications  
Applications  
For Air  
For Water  
For Oil  
Construction  
Dimensions

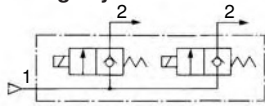
# Series VXE21/22/23

## For Oil /Manifold

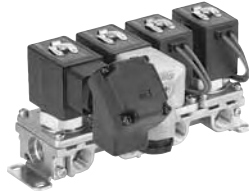
### Solenoid Valve for Manifold/Valve Specifications

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 <sup>-6</sup> m <sup>2</sup>	Cv converted	
2	VXE2111	1.5	4.1	0.17	3.0
3	VXE2121	0.5	7.9	0.33	
	VXE2221	1.5			
4.5	VXE2321	3.0	15	0.61	
	VXE2131	0.2			
	VXE2231	0.35			
6	VXE2331	0.9	26	1.10	
	VXE2241	0.15			
	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)	Ambient temperature (°C)
Solenoid valve option symbol	
<b>Nil, G, L</b>	-20 to 60
1 to 60	



Note) With no freezing

### Valve Leakage

#### Internal Leakage

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

#### External Leakage

Seal material	Leakage (Water)
NBR, FKM	0.1 cm <sup>3</sup> /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** •

Nil	—
Z	Oil-free

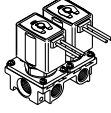
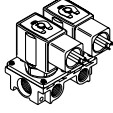
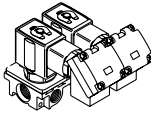
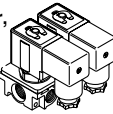
Select Nil because the solenoid valve L option is oil-free treatment.

**Rated voltage** •


5	24 VDC
6	12 VDC

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

**Electrical entry**

<b>G-Grommet</b> 	<b>C-Conduit</b> 
<b>T</b> -With conduit terminal <b>TL</b> -With conduit terminal and light 	<b>D</b> -DIN terminal <b>DL</b> -DIN terminal with light <b>DO</b> -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 coil only.

### How to Order Manifold Bases

**VVX21 VVX22 VVX23**

**1 C - 07 - 1**

**Port size (OUT port)**

1	Rc1/8
2	Rc1/4

\* IN port sizes are all Rc3/8.

**Manifold base**

**Thread type**

Nil	Rc
T	NPTF
F	G
N	NPT

**Number of manifolds**

02	2 stations
:	:
10	10 stations




**Suffix**

Nil	—
Z	Oil-free

**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 — 

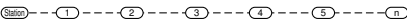
**Seal material**

Nil	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    "\*" is the symbol for mounting.  
\* VXE2111-1G1 ..... 4 sets    Add an "\*" in front of the part numbers for solenoid valves, etc. to be mounted.  
\* VVX21-3A ..... 1 set



Enter the product's part number in order, counting the 1st station from the left in the manifold arrangement, when viewing the individual port in front.

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
Nil	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)

Model  
VXE2  
VXED2  
VXE22  
Specifications  
Applications  
For Air  
For Water  
For Oil  
Construction  
Dimensions

# Series VXE21/22/23

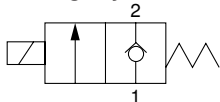
## For Oil /Single Unit

**⚠ When the fluid is oil.**  
The dynamic viscosity of the fluid must not exceed 50 mm<sup>2</sup>/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 <sup>-6</sup> m <sup>2</sup>	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	3.0	470	
	3	VXE2120-02	0.5	7.9	0.33			620
		VXE2220-02	1.2					300
		VXE2320-02	2.0			470		
	4.5	VXE2130-02	0.15	15	0.61	620		
		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	560		
		VXE2350-02	0.2			700		
		VXE2260-02	0.03			1.0	560	
10	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	560		
		VXE2350-03	0.2			700		
	10	VXE2260-03	0.03	53	2.20	1.0	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 of 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 <b>A, H</b>	
-5 Note) to 60	-20 to 60

Note) Dynamic viscosity: 50 mm<sup>2</sup>/s or less

### Valve Leakage

#### Internal Leakage

Seal material	Leakage (Oil)
FKM	0.1 cm <sup>3</sup> /min or less

#### External Leakage

Seal material	Leakage (Oil)
FKM	0.1 cm <sup>3</sup> /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**  

Nil	—
Z	Oil-free

**Bracket**  

Nil	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.

**Rated voltage**  

5	24 VDC
6	12 VDC

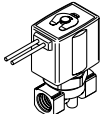
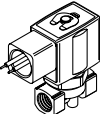
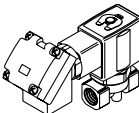
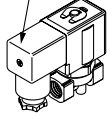
\* Refer to Table (3) shown below for availability.  
Refer to page 43 for ordering coil only.

**Thread type**  

Nil	Rc
T	NPTF
F	G
N	NPT

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

**Electrical entry**

<b>G-Grommet</b> 	<b>C-Conduit</b> 
<b>T -With conduit terminal</b> <b>TL -With conduit terminal and light</b> 	<b>D -DIN terminal</b> <b>DL -DIN terminal with light</b> <b>DO -For DIN terminal (without connector, with gasket)</b> 

\* Refer to Table (3) for available combinations between electrical option (L) and 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 (3) Rated Voltage – Electrical Option

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

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 seal materials will vary. For details, please consult with SMC.

Table (4) Bracket Part No.

Model	Part no.
VXE21 <sup>1</sup> / <sub>8</sub> 0	VX021N-12A
VXE22 <sup>2</sup> / <sub>4</sub> 0	VX022N-12A
VXE23 <sup>2</sup> / <sub>4</sub> 0	
VXE22 <sup>5</sup> / <sub>8</sub> 0	VX023N-12A-L
VXE23 <sup>5</sup> / <sub>8</sub> 0	

Dimensions → P. 17 (Single unit)

Model  
VXE2  
VXED2  
VXEZ2  
Specifications  
Applications  
For Air  
For Water  
For Oil  
Dimensions  
Construction

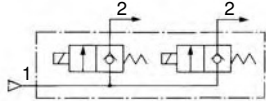
## For Oil /Manifold

**⚠ When the fluid is oil.**  
The dynamic viscosity of the fluid must not exceed 50 mm<sup>2</sup>/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 <sup>-6</sup> m <sup>2</sup>	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)	Ambient temperature (°C)
Solenoid valve option symbol	
<b>A, H</b>	
-5 <sup>Note)</sup> to 60	-20 to 60



Note) Dynamic viscosity: 50 mm<sup>2</sup>/s or less

### Valve Leakage

#### Internal Leakage

Seal material	Leakage (Oil)
FKM	0.1 cm <sup>3</sup> /min or less

#### External Leakage

Seal material	Leakage (Oil)
FKM	0.1 cm <sup>3</sup> /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**  

Nil	—
Z	Oil-free
- Rated voltage**  

5	24 VDC
6	12 VDC

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

Refer to page 43 for ordering coil only.

**Electrical entry**

<b>G-Grommet</b> 	<b>C-Conduit</b> 
<b>T</b> -With conduit terminal <b>TL</b> -With conduit terminal and light	<b>D</b> -DIN terminal <b>DL</b> -DIN terminal with light <b>DO</b> -For DIN terminal (without connector, with gasket) 

### How to Order Manifold Bases

**VVX21 VVX22 VVX23 1 - CF - 07 - 1**

- Port size (OUT port)**  

1	Rc1/8
2	Rc1/4

\* IN port sizes are all Rc3/8.
- Thread type**  

Nil	Rc
T	NPTF
F	G
N	NPT
- Number of manifolds**  

02	2 stations
⋮	⋮
10	10 stations
- Suffix**  

Nil	—
Z	Oil-free
- Base/Seal material**  
\* Refer to Table (2)-(2) shown below for availability.
- Manifold base**
- Blanking plate part no.**  
For VXE21: VVX21-3A-F  
For VXE22: VVX22-3A-F  
For VXE23: VVX23-3A-F
- Seal material: FKM**

**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 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	—

### 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    “\*” is the symbol for mounting.  
 \* VXE2111A-1G1 ..... 4 sets    Add an “\*” in front of the part numbers for solenoid valves, etc. to be mounted.  
 \* VVX21-3A-F ..... 1 set

Enter the product's part number in order, counting the 1st station from the left in the manifold arrangement, when viewing the individual port in front.

Dimensions → P. 19 (Manifold)

Model VXE2 VXE22 VXE23  
 Specifications  
 Applications For Air For Water For Oil  
 Dimensions Construction

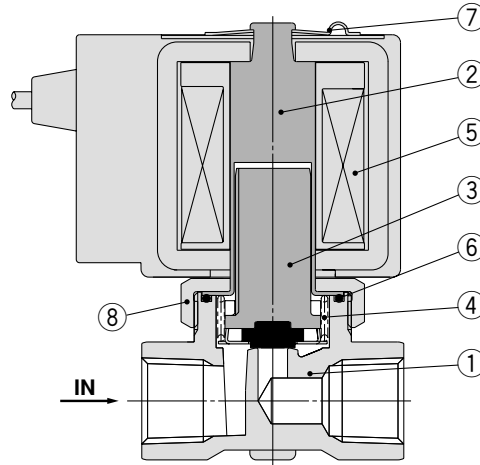
# Series VXE21/22/23

For Air/Water/Oil

## Construction: Single Unit

Normally closed (N.C.)

Body material: Brass (C37), Stainless steel



## Component Parts

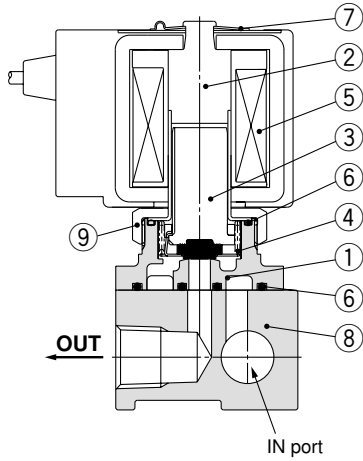
No.	Description	Material	
		Brass (C37) body specification	Stainless steel body specification
1	<b>Body</b>	Brass (C37)	Stainless steel
2	<b>Tube assembly</b>	Stainless steel	
3	<b>Armature assembly</b>	(NBR, FKM, EPDM, PTFE) Stainless steel, PPS	
4	<b>Return spring</b>	Stainless steel	
5	<b>Solenoid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

The materials in parentheses are seal materials.

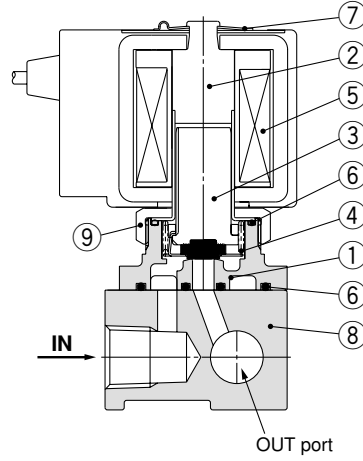
**Construction: Manifold**

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

**Common SUP**

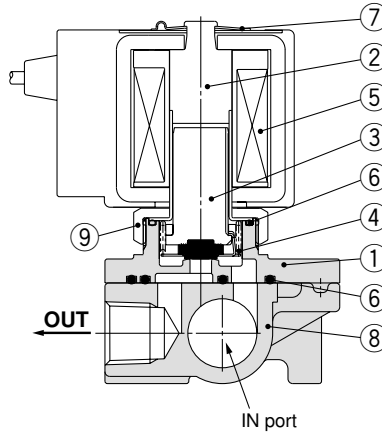


**Individual SUP**



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 seal materials.

Model

VXE2

VXED2

VXEZ2

Specifications

Applica-  
tions

For Air

For Water

For Oil

Construction

Dimensions

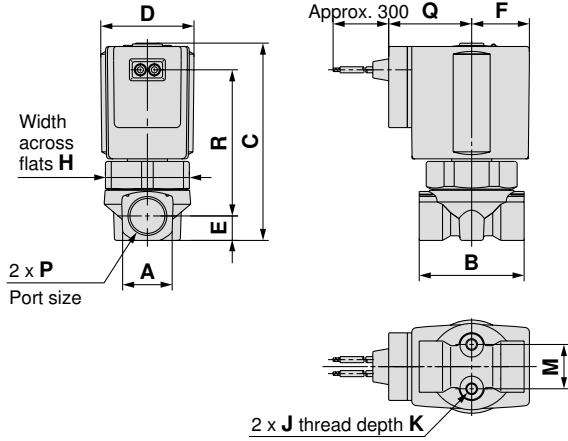
# Series VXE21/22/23

For Air/Water/Oil

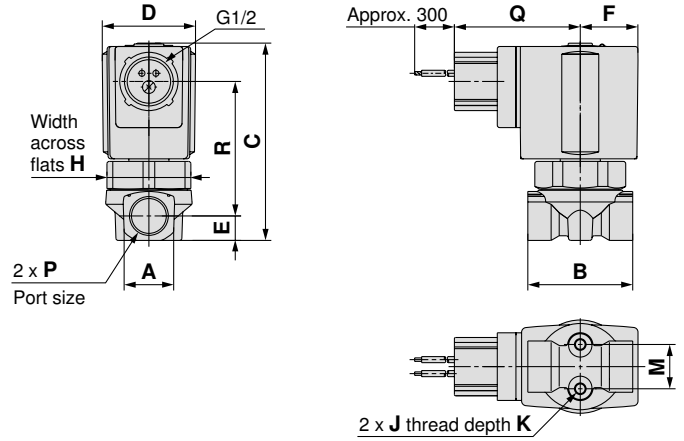
## Dimensions: Single Unit/Body Material: Brass (C37), Stainless Steel

VXE21□0/22□0/23□0

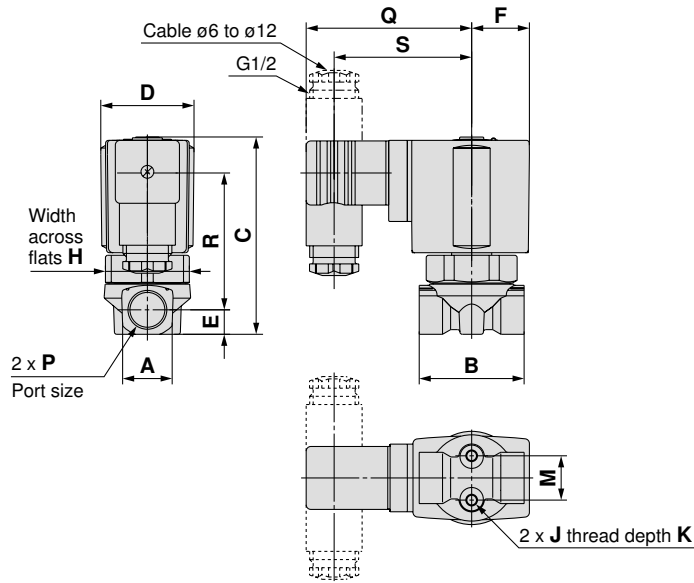
### Grommet: G



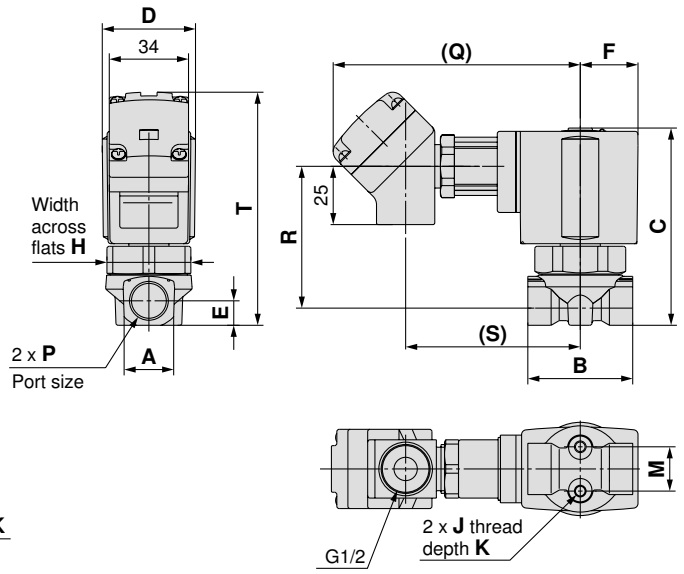
### Conduit: C



### DIN terminal: D



### Conduit terminal: T



Model	Orifice diameter	Port size P	A	B	C	D	E	F	H	Electrical entry (mm)													
										Mounting dimension			Grommet		Conduit		DIN terminal			Conduit terminal			
										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					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					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

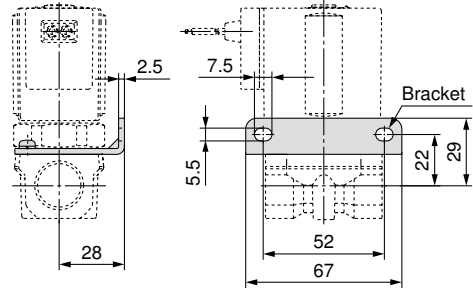
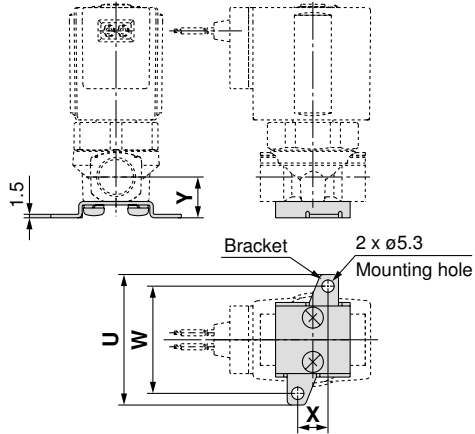
Specifications with bracket

Orifice:  $\phi 2$ ,  $\phi 3$ ,  $\phi 4.5$ ,  $\phi 6$

(Packed in the same container)

Orifice:  $\phi 8$ ,  $\phi 10$

(Assembled at the shipment)



(mm)

Model N.C.	Orifice diameter	Port size P	Bracket mounting dimension			
			U	W	X	Y
VXE21□0	$\phi 2$ , $\phi 3$ , $\phi 4.5$	1/8, 1/4	46	36	11	15
VXE22□0	$\phi 3$ , $\phi 4.5$ , $\phi 6$	1/4, 3/8	56	46	13	17.5
VXE22□0	$\phi 8$ , $\phi 10$	1/4, 3/8, 1/2	—	—	—	—
VXE23□0	$\phi 3$ , $\phi 4.5$ , $\phi 6$	1/4, 3/8	56	46	13	17.5
VXE23□0	$\phi 8$ , $\phi 10$	1/4, 3/8, 1/2	—	—	—	—

Model

VXE2

VXED2

VXEZ2

Specifications

Applications

For Air

For Water

For Oil

Construction

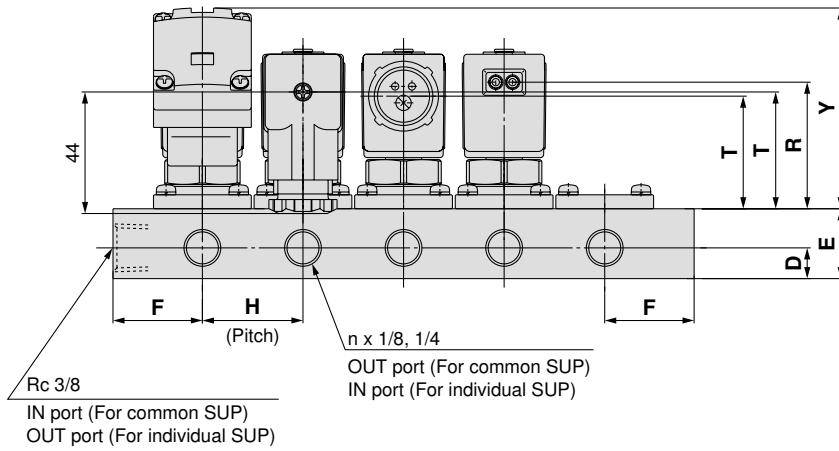
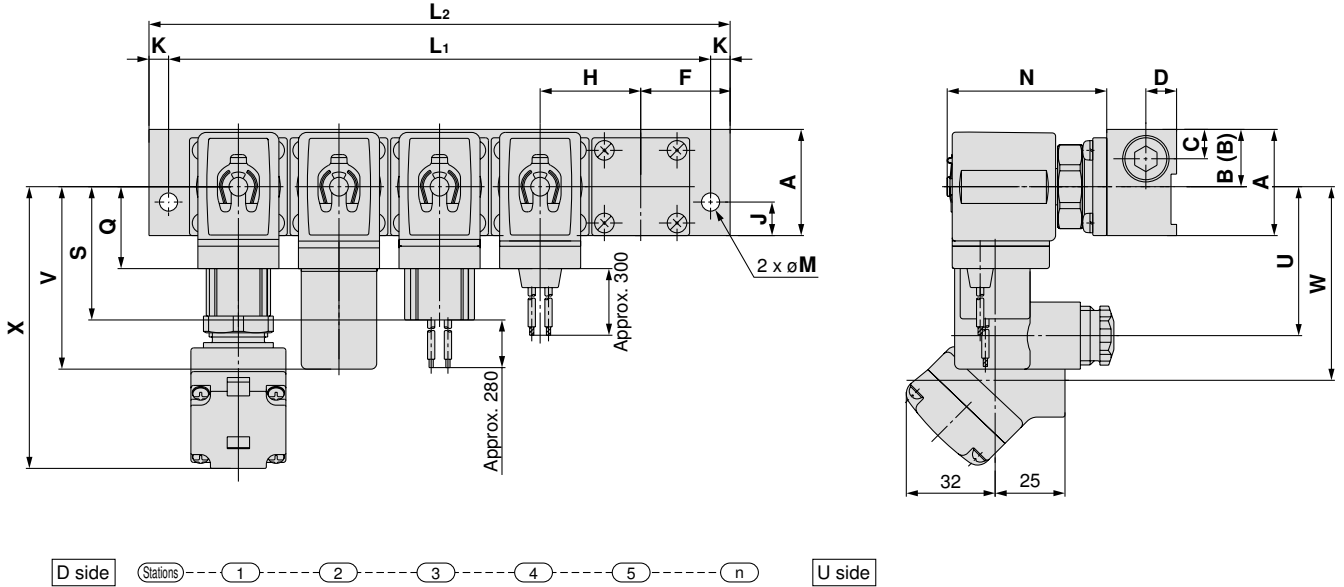
Dimensions

# Series VXE21/22/23

For Air

## 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 <sub>1</sub>	86	122	158	194	230	266	302	338	374
	L <sub>2</sub>	100	136	172	208	244	280	316	352	388
VVXE22	L <sub>1</sub>	108	154	200	246	292	338	384	430	476
VVXE23	L <sub>2</sub>	126	172	218	264	310	356	402	448	494

(mm)

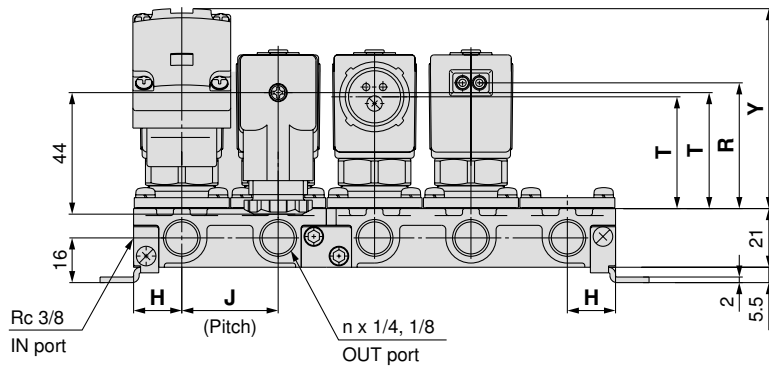
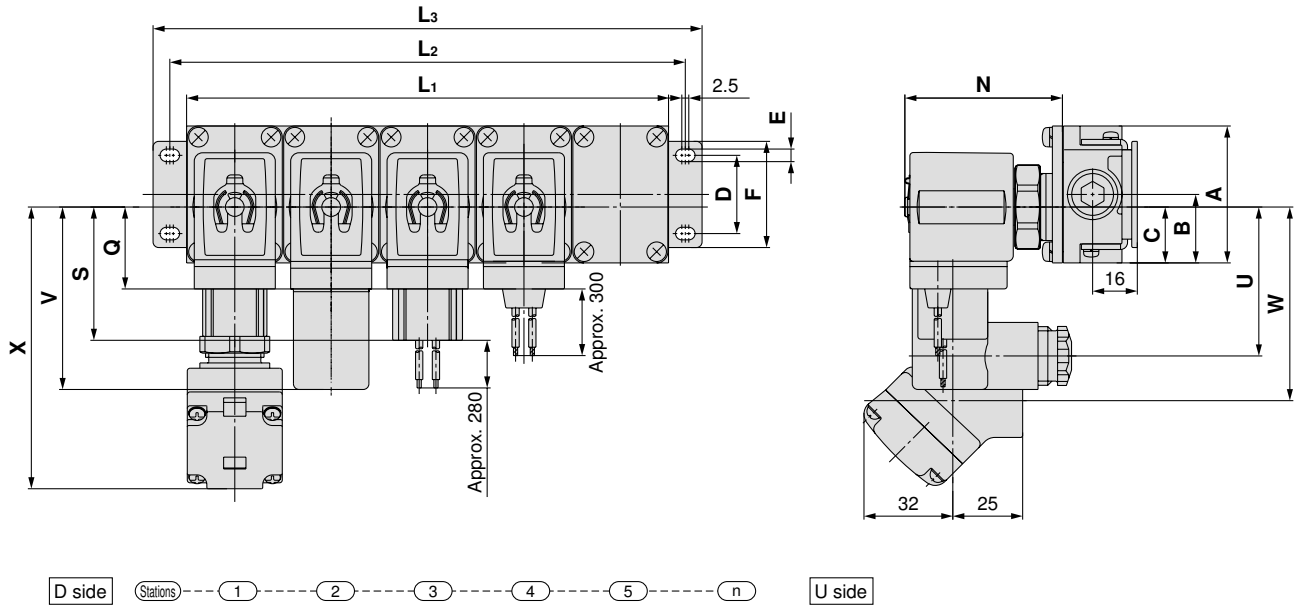
Model	A	B	(B) Individual SUP	C	D	E	F	H	J	K	M	N	Electrical entry									
													Grommet		Conduit		DIN terminal			Conduit terminal		
													Q	R	S	T	U	V	T	W	X	Y
VVXE21	38	20.5	17.5	10.5	11	25	32	36	12	7	6.5	57.5	30	44.5	48.5	40	53.5	65.5	41	69.5	100.5	72
VVXE22	49	26.5	22.5	13	13	30	40	46	15	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

# Direct Operated 2 Port Solenoid Valve *Series VXE21/22/23*

For Water/Oil

## 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 <sub>1</sub>	69	103.5	138	172.5	207	241.5	276	310.5	345
	L <sub>2</sub>	81	115.5	150	184.5	219	253.5	288	322.5	357
	L <sub>3</sub>	93	127.5	162	196.5	231	265.5	300	334.5	369
VXE22	L <sub>1</sub>	77	115.5	154	192.5	231	269.5	308	346.5	385
	L <sub>2</sub>	89	127.5	166	204.5	243	281.5	320	358.5	397
	L <sub>3</sub>	101	139.5	178	216.5	255	293.5	332	370.5	409
VXE23	L <sub>1</sub>	83	124.5	166	207.5	249	290.5	332	373.5	415
	L <sub>2</sub>	95	136.5	178	219.5	261	302.5	344	385.5	427
	L <sub>3</sub>	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

Model

VXE2

VXED2

VXE22

Specifications

Applications

For Air

For Water

For Oil

Construction

Dimensions

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)/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	3/4	1
	3/8	1/2		
	1/2			

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, CAC407
	Seal material	NBR, FKM, EPDM
	Enclosure	Dusttight, 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°) <small>Note)</small>
		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 <sup>3</sup><sub>2</sub> <sup>1</sup><sub>4</sub> <sup>5</sup><sub>0</sub>   -   -     1 -

Option symbol

Fluid and application	Option symbol	Seal material	Body material
Air	Nil	NBR	Brass (C37)
	G		Stainless steel
Water	Nil	NBR	Brass (C37)
	G		Stainless steel
Oil <small>Note 2)</small>	A	FKM	Brass (C37)
	H		Stainless steel
High corrosive/Oil-free	L <small>Note 1)</small>	FKM	Stainless steel
Copper-free/Fluoro-free <small>Note 3)</small>	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 mm<sup>2</sup>/s or less.

Note 3) The nuts (non-wetted parts) are nickel plated on the C37 material.

\* If using for other fluids, please consult with SMC.

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

VXED2 <sup>2</sup><sub>3</sub> <sup>7</sup><sub>8</sub> <sup>9</sup><sub>0</sub>   -   -     1 -

Option symbol

Fluid and application	Option symbol	Seal material	Body material
Air	Nil	NBR	CAC407
Water	Nil	NBR	
Oil <small>Note 2)</small>	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 mm<sup>2</sup>/s or less.

\* If using for other fluids, please consult with SMC.

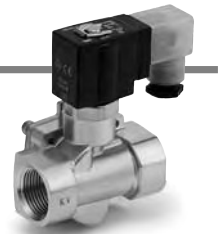
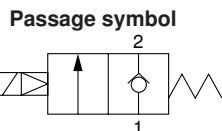
# Series VXED21/22/23

## For Air

(Inert gas)

### Model/Valve Specifications

N.C.



Port size		Orifice dia. (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)	Flow characteristics			Max. system pressure (MPa)	Weight (g) <sup>(Note)</sup>
						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		
	1/2 (15A)	10	VXED2130-04			0.7		9.2		
		15	VXED2140-04		1.0	20.0		5.5		
	3/4 (20A)	20	VXED2150-06			38.0		0.30		

Port size		Orifice dia. (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)	Flow characteristics	Max. system pressure (MPa)	Weight (g) <sup>(Note)</sup>
						Effective area (mm <sup>2</sup> )		
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 of 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	
<b>Nil, G</b>	

-10 to 60      -10 to 60

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

### Valve Leakage

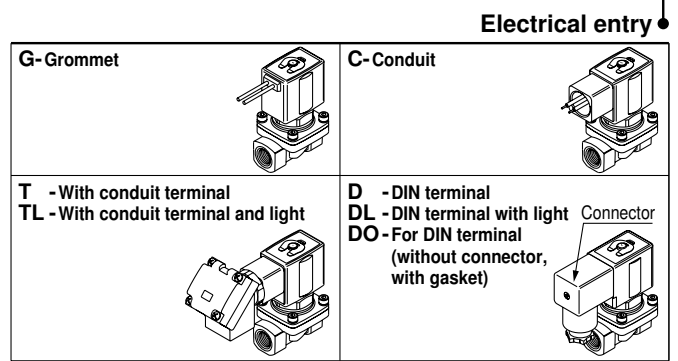
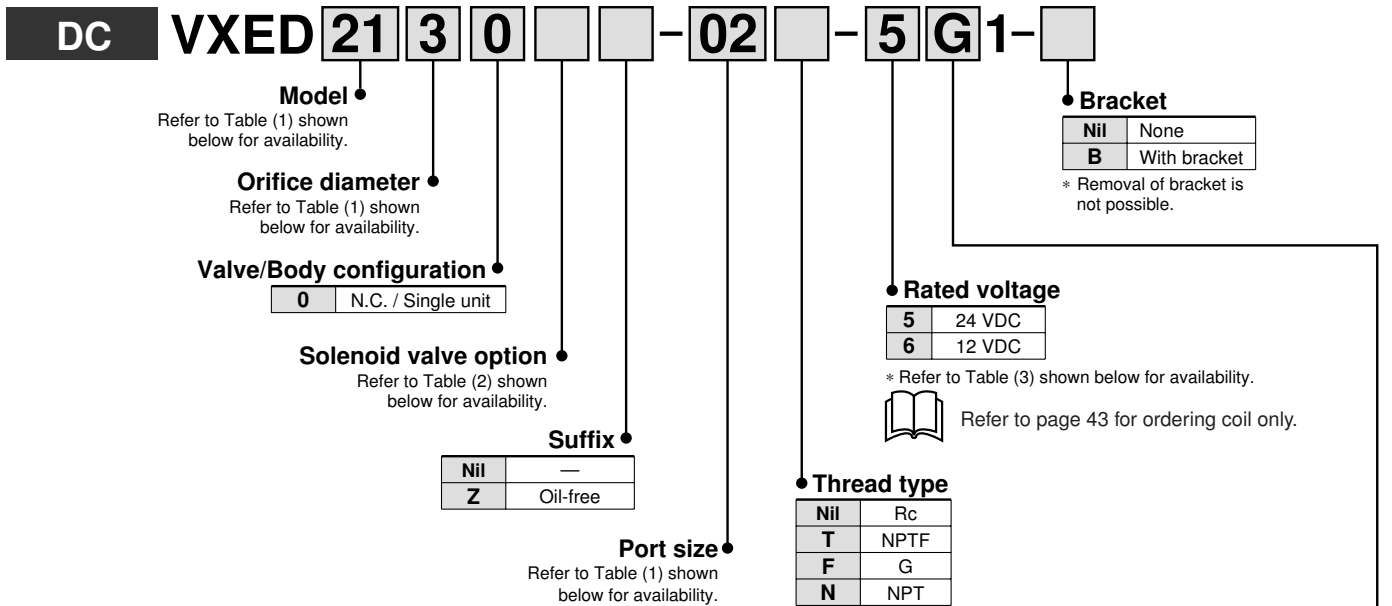
#### Internal Leakage

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

#### External Leakage

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

## How to Order



**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)	—	—	—	—	●	—	—	—		
	Flange	—	10 (1)	—	—	—	—	●	—	—	Stainless steel	NBR
		—	32 (32A)	—	—	—	—	●	—	—		
		—	—	40 (40A)	—	—	—	—	●	—		
		—	—	50 (50A)	—	—	—	—	—	●		

**Table (2) Solenoid Valve Option**

Option symbol	Seal material	Body material
Nil	NBR	Brass (C37), CAC407
G <small>Note</small>		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	—

Model

VXE2

VXED2

VXEZ2

Specifications

Applications

For Air

For Water

For Oil

Construction

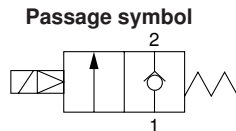
Dimensions

# Series VXED21/22/23

## For Water

### Model/Valve Specifications

N.C.



Port size		Orifice dia. (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)	Flow characteristics		Max. system pressure (MPa)	Weight (g) <sup>Note)</sup>
						Av x 10 <sup>-6</sup> m <sup>2</sup>	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		670
		15	VXED2140-03		110	4.5	500		
	1/2 (15A)	10	VXED2130-04		0.5	58	2.4		670
		15	VXED2140-04			130	5.5		1150
	3/4 (20A)	20	VXED2150-06		1.0	230	9.5		1650
1 (25A)	25	VXED2260-10	310	13		5400			
	Flange	32A	VXED2270-32	550		23	6800		
		40A	VXED2380-40	740		31	8400		
50A	VXED2390-50	1200	49						

Note) Weight of 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	
<b>Nii, G, L</b>	
1 to 60	-10 to 60

Note) With no freezing

### Valve Leakage

#### Internal Leakage

Seal material	Leakage (Water)	
		1/4 to 1
NBR, FKM	0.2 cm <sup>3</sup> /min or less	1 cm <sup>3</sup> /min or less

#### External Leakage

Seal material	Leakage (Water)	
		1/4 to 1
NBR, FKM	0.1 cm <sup>3</sup> /min or less	0.1 cm <sup>3</sup> /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**

Nil	—
Z	Oil-free

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

**Thread type**

Nil	Rc
T	NPTF
F	G
N	NPT

**Rated voltage**

5	24 VDC
6	12 VDC

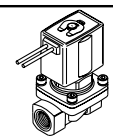
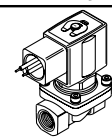

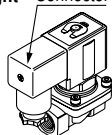
\* Refer to Table (3) shown below for availability.  
Refer to page 43 for ordering coil only.

**Bracket**

Nil	None
B	With bracket

\* Removal of bracket is not possible.

**Electrical entry**

<b>G- Grommet</b> 	<b>C- Conduit</b> 
<b>T</b> -With conduit terminal <b>TL</b> -With conduit terminal and light 	<b>D</b> -DIN terminal <b>DL</b> -DIN terminal with light <b>DO</b> -For DIN terminal (without connector, with gasket) 

\* Refer to Table (3) for available combinations between electrical option (L) and 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)	—	—	—	—	●	—	—	—		
	Flange	—	10 (1)	—	—	—	—	●	—	—	CAC407	
		—	32 (32A)	—	—	—	—	—	●	—		
		—	—	40 (40A)	—	—	—	—	—	●		
		—	—	50 (50A)	—	—	—	—	—	●		

**Table (2) Solenoid Valve Option**

Option symbol	Seal material	Body material	Note
Nil	NBR	Brass (C37), 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	—

Model

VXE2

VXED2

VXEZ2

Specifications

Applications

For Air

For Water

For Oil

Construction

Dimensions

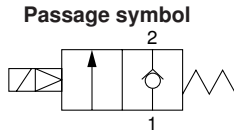
# Series VXED21/22/23

## For Oil

**⚠ When the fluid is oil.**  
The dynamic viscosity of the fluid must not exceed 50 mm<sup>2</sup>/s.

### Model/Valve Specifications

N.C.



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

Note) Weight of 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	
<b>A, H</b>	
-5 to 60	-10 to 60

Note) Dynamic viscosity: 50 mm<sup>2</sup>/s or less

### Valve Leakage

#### Internal Leakage

Seal material	Leakage (Oil)	
	FKM	1/4 to 1
	0.2 cm <sup>3</sup> /min or less	1 cm <sup>3</sup> /min or less

#### External Leakage

Seal material	Leakage (Oil)	
	FKM	1/4 to 1
	0.1 cm <sup>3</sup> /min or less	0.1 cm <sup>3</sup> /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**

Nil	—
Z	Oil-free

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

**Thread type**

Nil	Rc
T	NPTF
F	G
N	NPT

**Rated voltage**

5	24 VDC
6	12 VDC

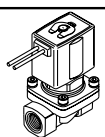
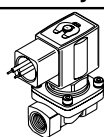
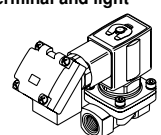
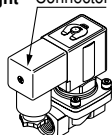
\* Refer to Table (3) shown below for availability.  
Refer to page 43 for ordering coil only.

**Bracket**

Nil	None
B	With bracket

\* Removal of bracket is not possible.

**Electrical entry**

<b>G-Grommet</b> 	<b>C-Conduit</b> 
<b>T - With conduit terminal</b> <b>TL - With conduit terminal and light</b> 	<b>D - DIN terminal</b> <b>DL - DIN terminal with light</b> <b>DO - For DIN terminal (without connector, with gasket)</b> 

\* Refer to Table (3) for available combinations between electrical option (L) and 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)	—	—	—	—	●	—	—	—		
	Flange	—	10 (1)	—	—	—	—	●	—	—		
		—	32 (32A)	—	—	—	—	—	●	—		
—	—	40 (40A)	—	—	—	—	—	●	—	CAC407		
—	—	50 (50A)	—	—	—	—	—	—	●			

**Table (2) Solenoid Valve Option**

Option symbol	Seal material	Body material
A	FKM	Brass (C37), 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	—

Model

VXE2

VXED2

VXEZ2

Specifications

Applications

For Air

For Water

For Oil

Construction

Dimensions

# Series VXED21/22/23

For Air/Water/Oil

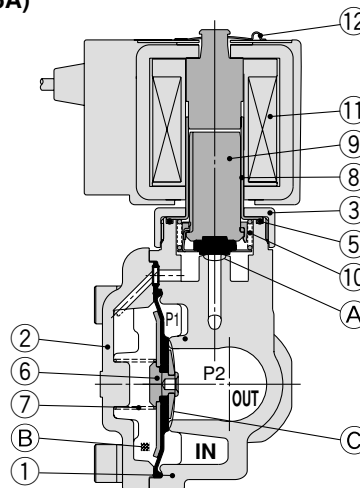
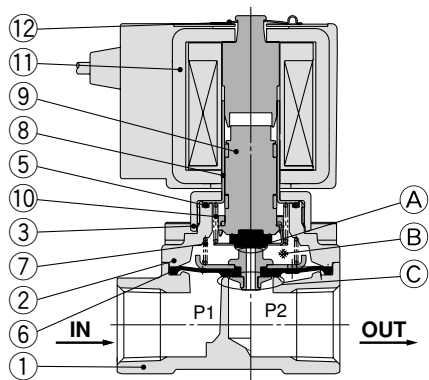
## Construction

Normally closed (N.C.)

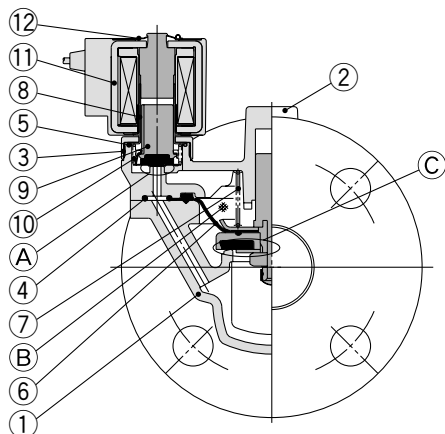
Body material: Brass (C37) (32A or more: CAC407), Stainless steel (32A or more: not available)

VXED2130 (8A/10A)

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



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



### Working principle

<Valve opened>

When the coil ⑪ is energized, the armature assembly ⑨ is attracted into the core of the tube assembly ⑧ and the pilot valve ① opens. Then the pressure in the pressure action chamber ② falls to open the main valve ③.

<Valve closed>

When the coil ⑪ is not energized, the pilot valve ① is closed and the pressure in the pressure action chamber ② rises and the main valve ③ closes.

### Component Parts

No.	Description	Size	Material	
			Brass (C37) (CAC407) body specification	Stainless steel body specification
1	Body	8A to 25A	Brass (C37)	Stainless steel
		32A to 50A	CAC407	—
2	Bonnet	8A to 25A	Brass (C37)	Stainless steel
		32A to 50A	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	

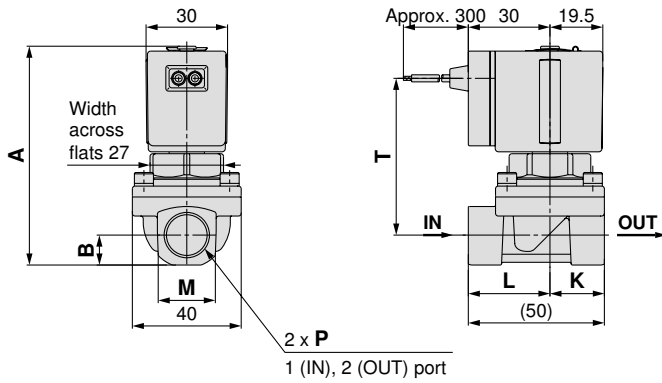
The materials in parentheses are seal materials.



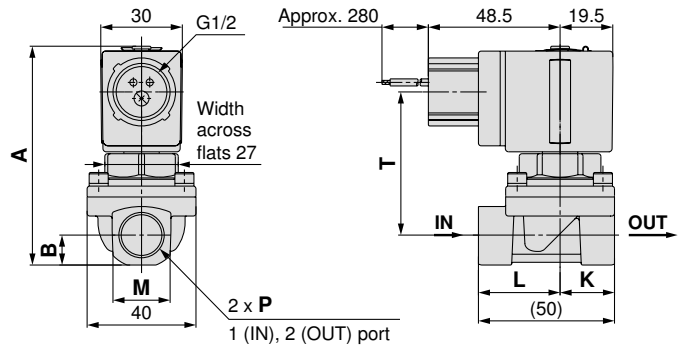
## Dimensions: Single Unit/Body Material: Brass (C37), Stainless Steel

### VXED2130

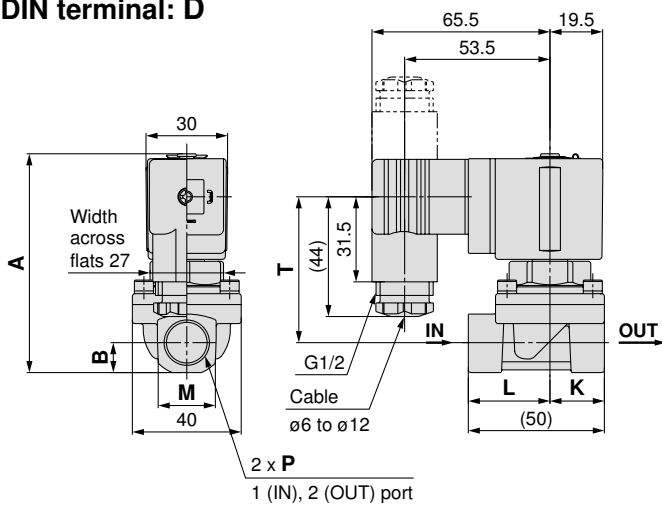
Grommet: G



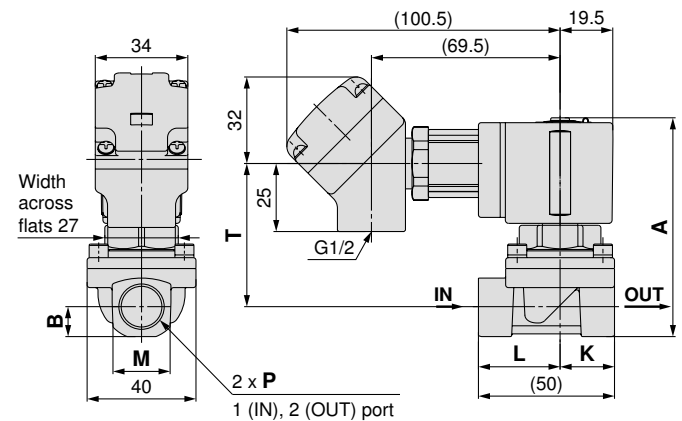
Conduit: C



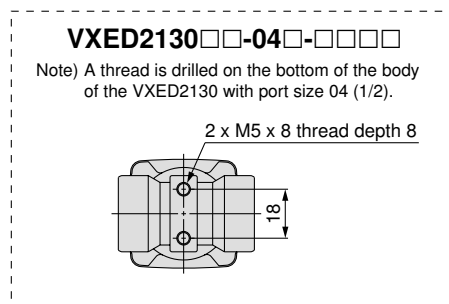
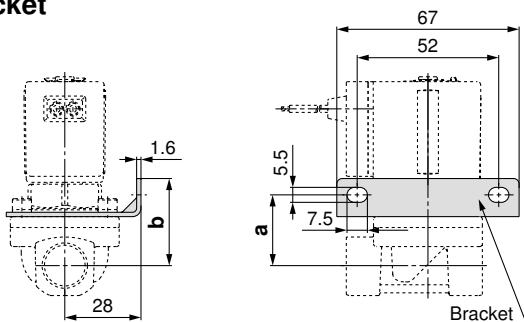
DIN terminal: D



Conduit terminal: T



With bracket



Model	Port size P	A	B	K	L	M	Electrical entry									Bracket mounting dimension		
							Grommet		Conduit		DIN terminal			Conduit terminal			a	b
							T	U	T	U	T	U	V	T	U	V		
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

Model

VXE2

VXED2

VXE22

Specifications

Applications

For Air

For Water

For Oil

Dimensions

Construction

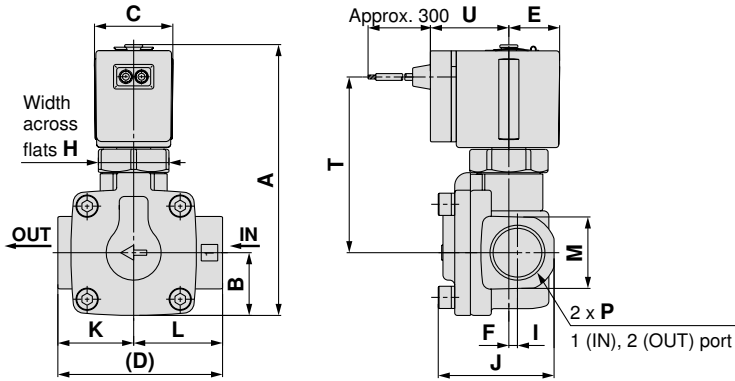
# Series VXED21/22/23

For Air/Water/Oil

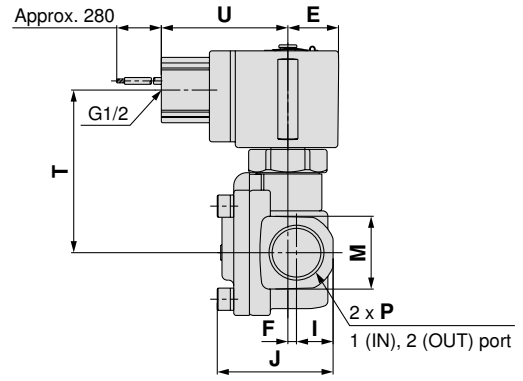
Dimensions: Single Unit/Body Material: Brass (C37), Stainless Steel

VXED2140/2150/2260

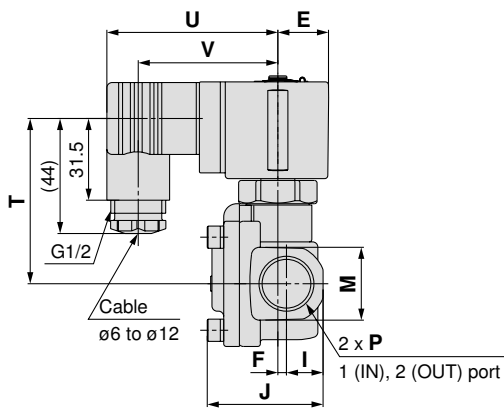
Grommet: G



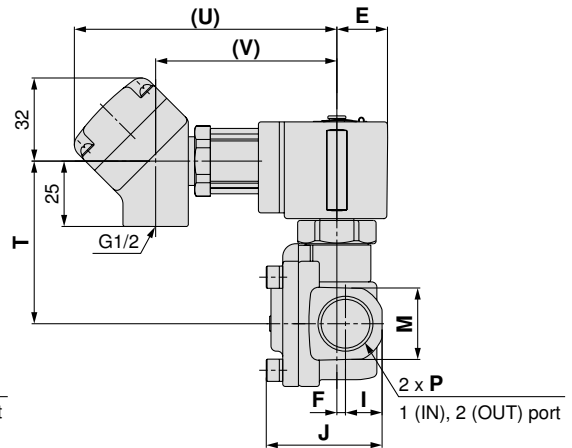
Conduit: C



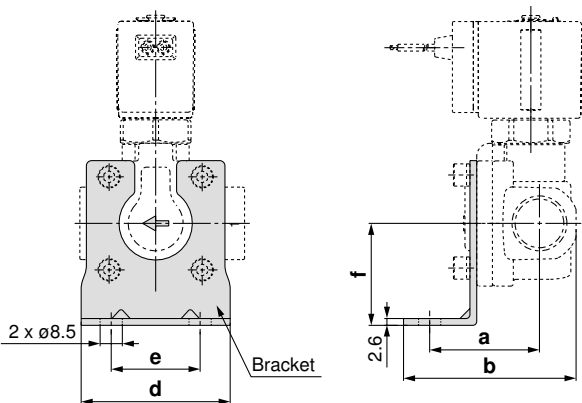
DIN terminal: D



Conduit terminal: T



With bracket

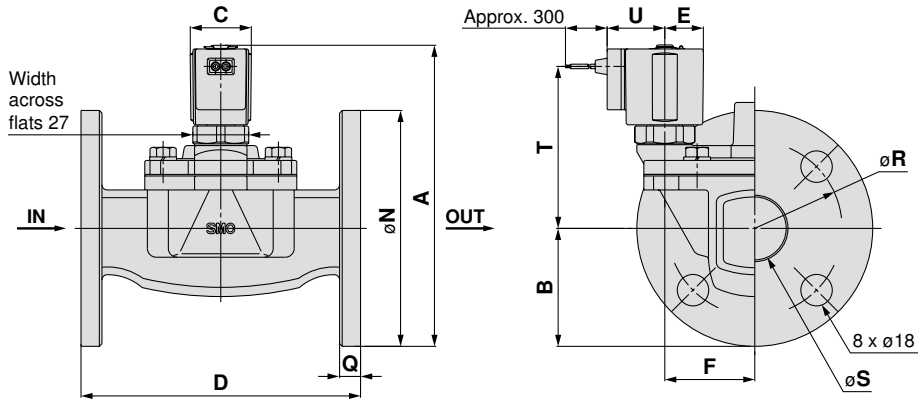


Model	Port size P	A	B	C	D	E	F	H	I	J	K	L	M	Electrical entry														
														Grommet		Conduit		DIN terminal		Conduit terminal		Bracket mounting dimension						
														T	U	T	U	T	U	V	T	U	V	a	b	d	e	f
VXED2140	3/8, 1/2	103.5	24	30	63	19.5	3.5	27	14	44.5	29	34	28	67.5	30	62.5	48.5	63.5	65.5	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

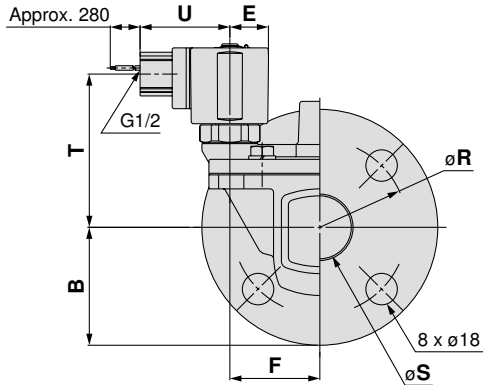
**Dimensions: Single Unit/Body Material: Brass (C37), Stainless Steel**

**VXED2270/2380/2390**

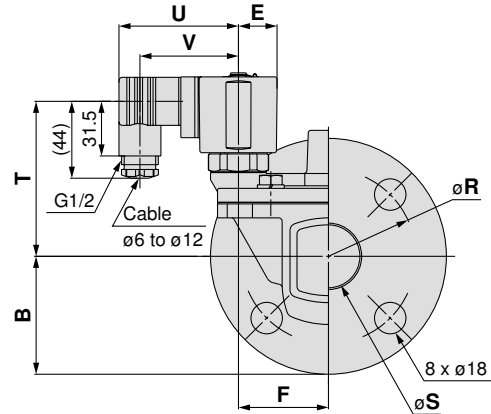
**Grommet: G**



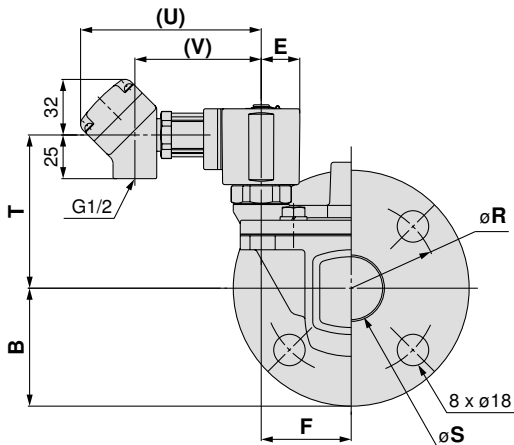
**Conduit: C**



**DIN terminal: D**



**Conduit terminal: T**



Model	Applicable flange	(mm)																				
		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

Model

VXE2

VXED2

VXE2

Specifications

Applications

For Air

For Water

For Oil

Construction

Dimensions

**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**

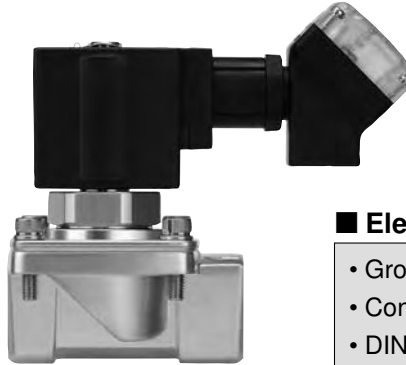
Coil: Class B

**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)

# Series VXEZ22/23

## 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	Dusttight, 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°) <small>Note</small>
		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	Nil	NBR	Brass (C37)
	G		Stainless steel
Water	Nil	NBR	Brass (C37)
	G		Stainless steel
Oil <small>Note 2</small>	A	FKM	Brass (C37)
	H		Stainless steel
High corrosive/Oil-free	L <small>Note 1</small>	FKM	Stainless steel
Copper-free/Fluoro-free <small>Note 3</small>	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 mm<sup>2</sup>/s or less.

Note 3) The nuts (non-wetted parts) are nickel plated on the C37 material.

\* If using for other fluids, please consult with SMC.

# Series VXEZ22/23

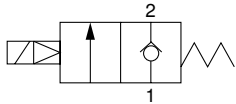
## For Air

(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)	VXEZ2240-04	23.0			0.34	6.0	760		
3/4 (20A)	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 <sup>2</sup> )		
1 (25A)	25	VXEZ2360-10	0	0.7	215	1.5	1480

- \* Weight of 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	
<b>Nil, G</b>	-10 to 60
-10 to 60 <sup>Note)</sup>	

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

### Valve Leakage

#### Internal Leakage

Seal material	Leakage (Air)
NBR	1 cm <sup>3</sup> /min or less

#### External Leakage

Seal material	Leakage (Air)
NBR	1 cm <sup>3</sup> /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**

Nil	—
Z	Oil-free

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

**Thread type**

Nil	Rc
T	NPTF
F	G
N	NPT

**Rated voltage**

5	24 VDC
6	12 VDC

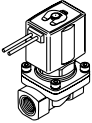
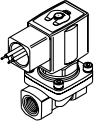
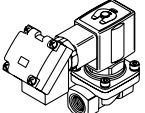
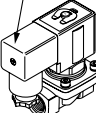
\* Refer to Table (3) shown below for availability.  
Refer to page 43 for ordering coil only.

**Bracket**

Nil	None
B	With bracket

\* Removal of bracket is not possible.

**Electrical entry**

<b>G-Grommet</b> 	<b>C-Conduit</b> 
<b>T - With conduit terminal</b> <b>TL - With conduit terminal and light</b> 	<b>D - DIN terminal</b> <b>DL - DIN terminal with light</b> <b>DO - For DIN terminal (without connector, with gasket)</b> 

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

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

Model	Solenoid valve model (Port size)		Orifice symbol (diameter)			
	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
Nil	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	—

Model

VXE2

VXED2

VXEZ2

Specifications

Applications

For Air

For Water

For Oil

Construction

Dimensions

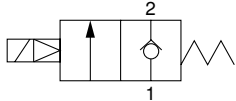
# Series VXEZ22/23

## 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)
					$Av \times 10^{-6}m^2$	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)	VXEZ2240-04	130			5.3			
3/4 (20A)	VXEZ2350-06	220			9.2			
1 (25A)	VXEZ2360-10	290		12.0				

\* Weight of 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	
<b>Nil, G, L</b>	
1 to 60	-10 to 60



\* With no freezing

### Valve Leakage

#### Internal Leakage

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

#### External Leakage

Seal material	Leakage (Water)
NBR, FKM	0.1 cm <sup>3</sup> /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**

Nil	—
Z	Oil-free

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

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

**Thread type**

Nil	Rc
T	NPTF
F	G
N	NPT

**Rated voltage**

5	24 VDC
6	12 VDC

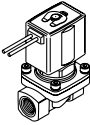
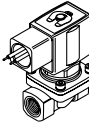
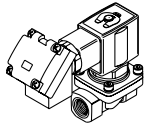
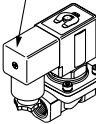
\* Refer to Table (3) shown below for availability.

**Bracket**

Nil	None
B	With bracket

\* Removal of bracket is not possible.

**Electrical entry**

<b>G-Grommet</b> 	<b>C-Conduit</b> 
<b>T - With conduit terminal</b> <b>TL - With conduit terminal and light</b> 	<b>D - DIN terminal</b> <b>DL - DIN terminal with light</b> <b>DO - For DIN terminal (without connector, with gasket)</b> 

\* Refer to page 43 for ordering coil only.

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

Model	Solenoid valve model (Port size)		Orifice symbol (diameter)			
	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
Nil	NBR	Brass (C37)	—
G		Stainless steel	
L	FKM	Stainless steel	High corrosive/Oil-free

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

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

Model

VXE2

VXED2

VXEZ2

Specifications

Applications

For Air

For Water

For Oil

Construction

Dimensions

# Series VXEZ22/23

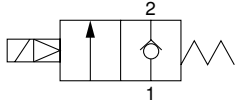
## For Oil

**⚠ When the fluid is oil.**  
The dynamic viscosity of the fluid must not exceed 50 mm<sup>2</sup>/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 <sup>-6</sup> m <sup>2</sup>	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)	VXEZ2240-04	130			5.3			
3/4 (20A)	VXEZ2350-06	220			9.2			
1 (25A)	VXEZ2360-10	290			12.0			

\* Weight of 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 <b>A, H</b>	
-5 to 60	-10 to 60



Note) Dynamic viscosity: 50 mm<sup>2</sup>/s or less

### Valve Leakage

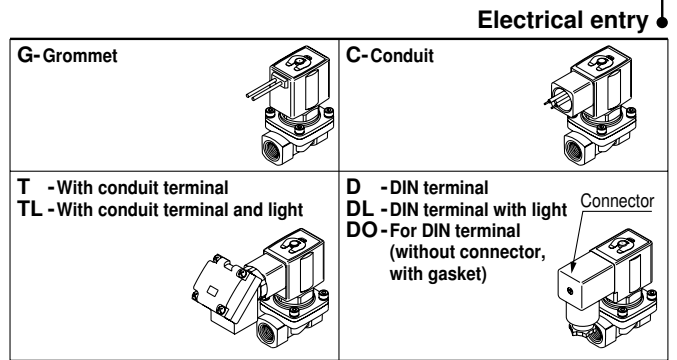
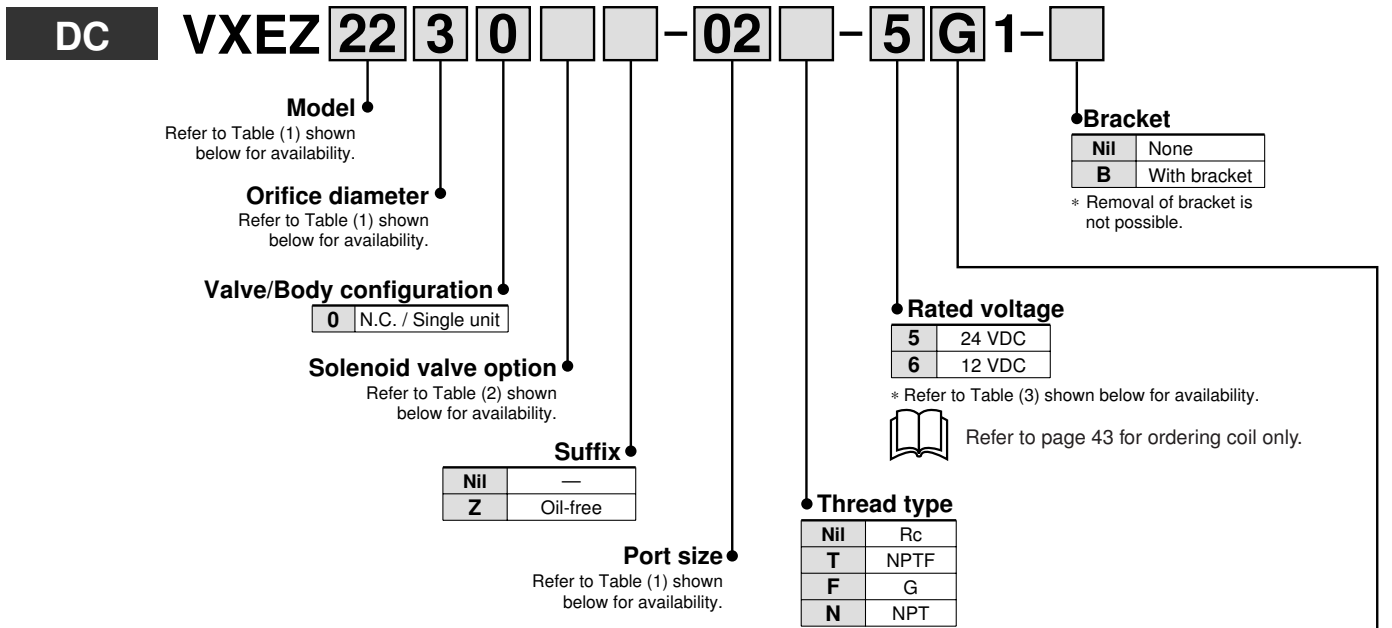
#### Internal Leakage

Seal material	Leakage (Oil)
FKM	0.1 cm <sup>3</sup> /min or less

#### External Leakage

Seal material	Leakage (Oil)
FKM	0.1 cm <sup>3</sup> /min or less

How to Order



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

Model	Solenoid valve model (Port size)		Orifice symbol (diameter)			
	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	—

Model

VXE2

VXED2

VXEZ2

Specifications

Applications

For Air

For Water

For Oil

Construction

Dimensions

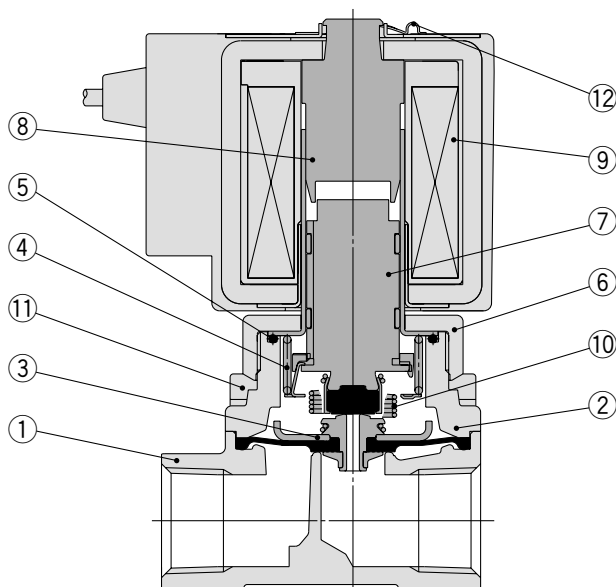
# Series VXEZ22/23

For Air/Water/Oil

## Construction

Normally closed (N.C.)

Body material: Brass (C37), Stainless steel



### Working principle

<Valve opened – when there is pressure>

When the coil ⑨ is energized, the armature assembly ⑦ is attracted into the core of the tube assembly ⑧ and the pilot valve ① is opened.

When the pilot valve is opened and the pressure inside the pilot chamber ② decreases, resulting in the pressure difference from the inlet pressure. Then the diaphragm assembly ③ is lifted and the main valve ④ 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 with each other with the lift spring ⑩. When the armature assembly is attracted, the diaphragm assembly is pulled up and the main valve ④ is opened.

<Valve closed>

When the coil ⑨ is de-energized, the armature assembly ⑦ returns by the reacting force of the return spring ④ and the pilot valve ① is closed.

When the pilot valve is closed, the pressure inside the pilot chamber ② increases, resulting that the pressure difference from the inlet pressure is lost and the main valve ④ is closed.

### Component Parts

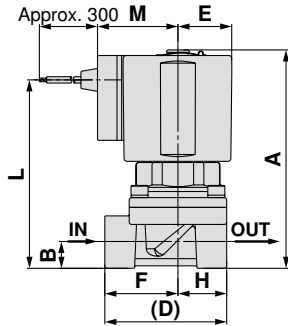
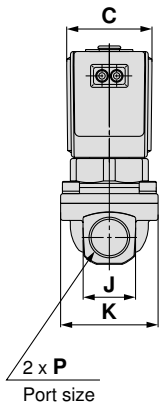
No.	Description	Material	
		Brass (C37) body specification	Stainless steel body specification
1	<b>Body</b>	Brass (C37)	Stainless steel
2	<b>Bonnet</b>	Brass (C37)	Stainless steel
3	<b>Diaphragm assembly</b>	(NBR, FKM, EPDM) Stainless steel	
4	<b>Return spring</b>	Stainless steel	
5	<b>O-ring</b>	(NBR,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

The materials in parentheses are seal materials.

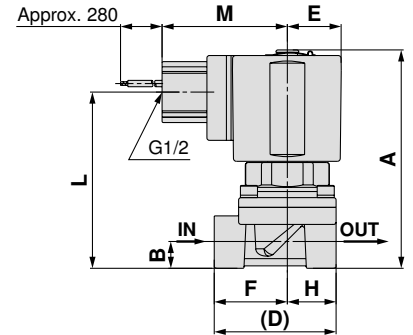
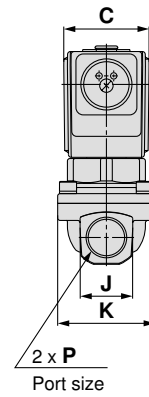
Dimensions: Body Material: Brass (C37), Stainless Steel

VXEZ22□0/23□0

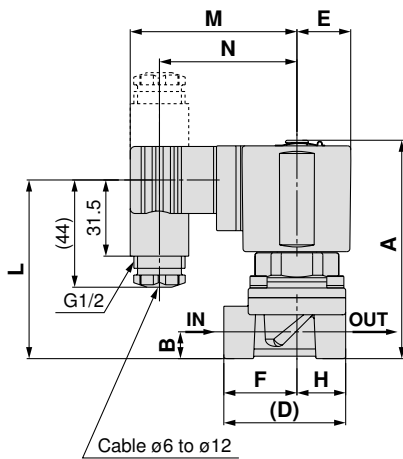
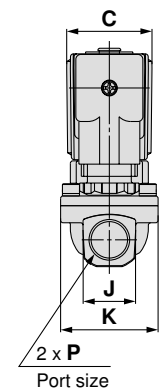
Grommet: G



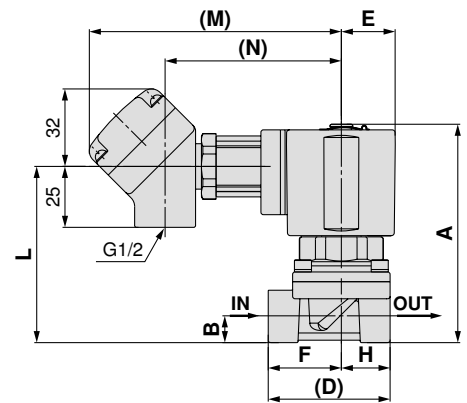
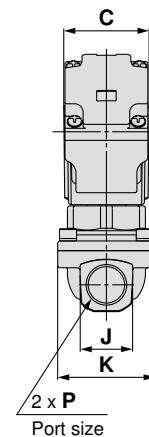
Conduit: C



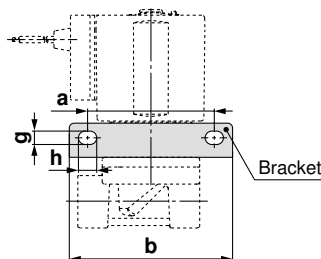
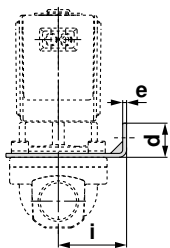
DIN terminal: D



Conduit terminal: T



With bracket



(mm)

Model	Port size P	A	B	C	D	E	F	H	J	K
N.C.										
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	Port size P	a	b	d	e	f	g	h	i	Electrical entry									
										Grommet		Conduit		DIN terminal		Conduit terminal			
N.C.										L	M	L	M	L	M	L	M	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

# Series VXE□21/22/23

For Air/Water/Oil

## Replacement Parts

### ● Solenoid coil assembly part no.

VXE02 **1** N-**1** G E-□

Series

1	VXE□21
2	VXE□22□□
3	VXE□23□□

Valve

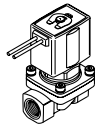
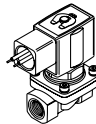
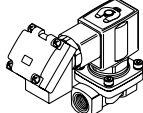
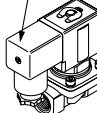
Symbol	Model
Z	VXED2130
Nil	Others

Rated voltage Note)

5	24 VDC
6	12 VDC

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

Electrical entry

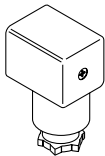
<b>G-Grommet</b> 	<b>C-Conduit</b> 
<b>T</b> -With conduit terminal <b>TL</b> -With conduit terminal and light 	<b>D</b> -DIN terminal <b>DL</b> -DIN terminal with light <b>DO</b> -For DIN terminal (without connector, with gasket) 

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

### ● 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

### ● Clip part no.

For VXE□21: **VX021N-10**

For VXE□22: **VX022N-10**

For VXE□23: **VX023N-10**

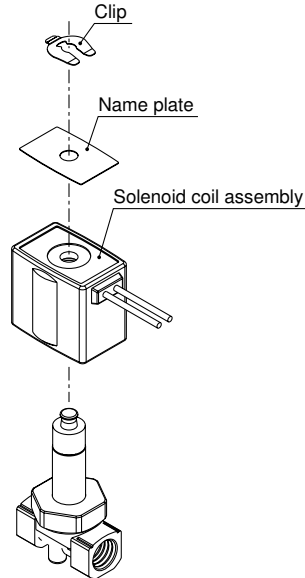


Table (1) Rated Voltage – Electrical Option

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

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

## Electrical Terminology

### 1. 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: Dusttight, Low jetproof type

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

## 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 (☒☒☒☒<sup>☒</sup>) 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 <sup>Note 1)</sup>, JIS B 8370 <sup>Note 2)</sup> and other safety practices.

### ■ Explanation of the Labels

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

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 hospitalization 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.

The fluid 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, 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 catalogs 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 energization

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

#### 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 cases 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 an application such as holding the pressure (including vacuum) inside of a pressure vessel because air leakage is entailed in a valve.

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

#### 9. When an impact, such as water hammer, etc., caused by the rapid pressure fluctuation is applied, the solenoid valve may be damaged. Give an 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 catalog.

#### 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 catalog. Use a fluid with a dynamic viscosity of 50 mm<sup>2</sup>/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 from the valve. As a general rule, use 80 to 100 mesh. When used to supply water to boilers, substances such as calcium and magnesium which generate hard scale and sludge are included. Since this scale and sludge can cause the valve to malfunction, install water softening equipment, and a filter (strainer) directly upstream from the valve to remove these substances.

#### 4. Air quality

##### 1. Use clean air.

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

##### 2. Install air filters.

Install air filters close to 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 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 2004 Vol. 14 catalog 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.

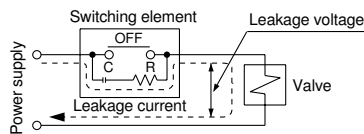
For detailed precautions on each series, refer to the main text.

## 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 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  $-20^{\circ}\text{C}$ . However, take measures to prevent freezing or solidification of impurities, etc.

2. When using valves for water application in cold climates, take appropriate countermeasures to prevent the water from freezing in tubing after cutting the water supply from the pump, by draining the water, etc.

When warming by a heater, etc., be careful not to expose the coil portion to a heater. Installation of a dryer, heat retaining of the body is recommended to prevent a freezing condition in which the dew point temperature is high and the ambient temperature is low, and the high flow runs.

## Mounting

### ⚠ Warning

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

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

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

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

3. Be sure not to position the coil downwards.

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

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

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

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

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

7. Painting and coating

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

## Piping

### ⚠ Caution

#### 1. Preparation before piping

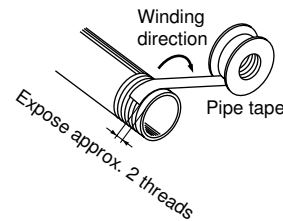
Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

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 with 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.



# 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

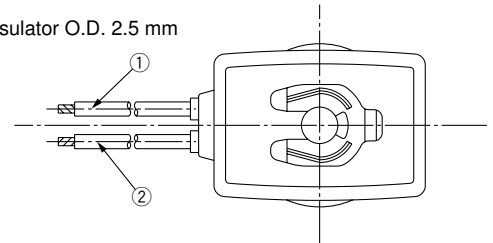
1. As a rule, use electrical wire with a cross sectional area of 0.5 to 1.25 mm<sup>2</sup> for wiring. Furthermore, do not allow excessive force to be applied to the lines.
2. Use electrical circuits which do not generate chattering in their contacts.
3. Use voltage which is within  $\pm 10\%$  of the rated voltage. In cases with a DC power supply where importance is placed on responsiveness, stay within  $\pm 5\%$  of the rated value. The voltage drop is the value in the lead wire section connecting the coil.
4. When a surge from the solenoid affects the electrical circuitry, install a surge absorber, etc., in parallel with the solenoid. Or, adopt 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

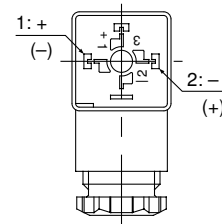


Lead wire color	
①	②
Black	Red

\* There is no polarity.

##### DIN terminal (Class B only)

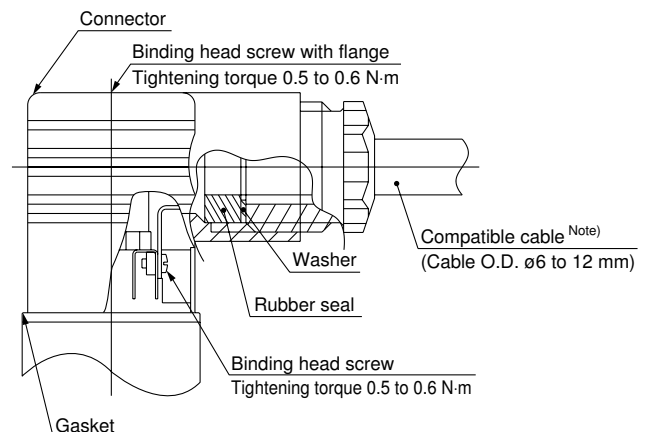
Since internal connections are as shown below for the DIN terminal, make connections to the power supply accordingly.



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

\* There is no polarity.

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



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



# 2 Port Solenoid Valve for Fluid Control Precautions 4

Be sure to read this before handling.

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

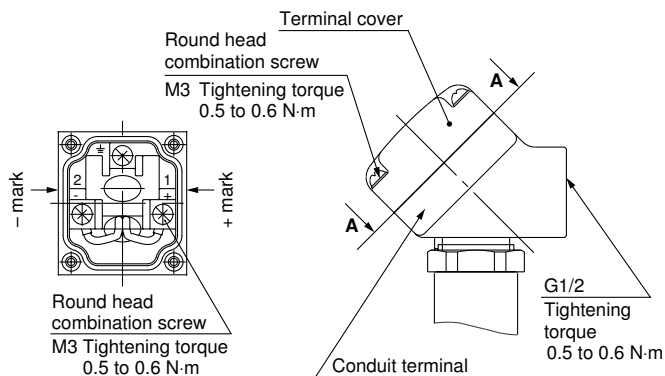
## Electrical Connections

### ⚠ Caution

#### Conduit terminal

In the case of the conduit terminal, make connections according to the marks shown below.

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



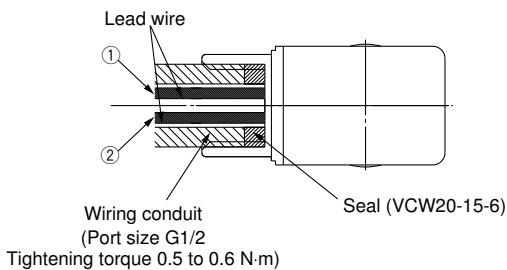
#### View A-A

(Internal connection diagram)

#### Conduit

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

AWG20 Insulator O.D. 2.5 mm



Lead wire color	
①	②
Black	Red

\* There is no polarity for DC.

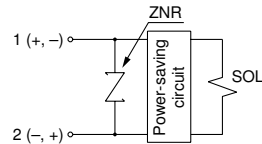
Description	Part no.
Seal	VCW20-15-6

Note) Please order separately.

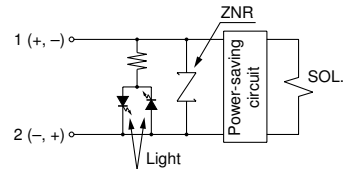
## Electrical Circuits

### ⚠ Caution

Without electrical option



With light





# 2 Port Solenoid Valve for Fluid Control Precautions 5

Be sure to read this before handling.

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

## Operating Environment

### ⚠ Warning

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

## Lubrication

### ⚠ Caution

1. This solenoid valve can be operated without lubrication.

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

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

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

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

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

## Maintenance

### ⚠ Warning

1. Removing the product

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

1. Shut off the fluid supply and release the fluid pressure in the system.
2. Shut off the power supply.
3. 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 once a half year.

## 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.

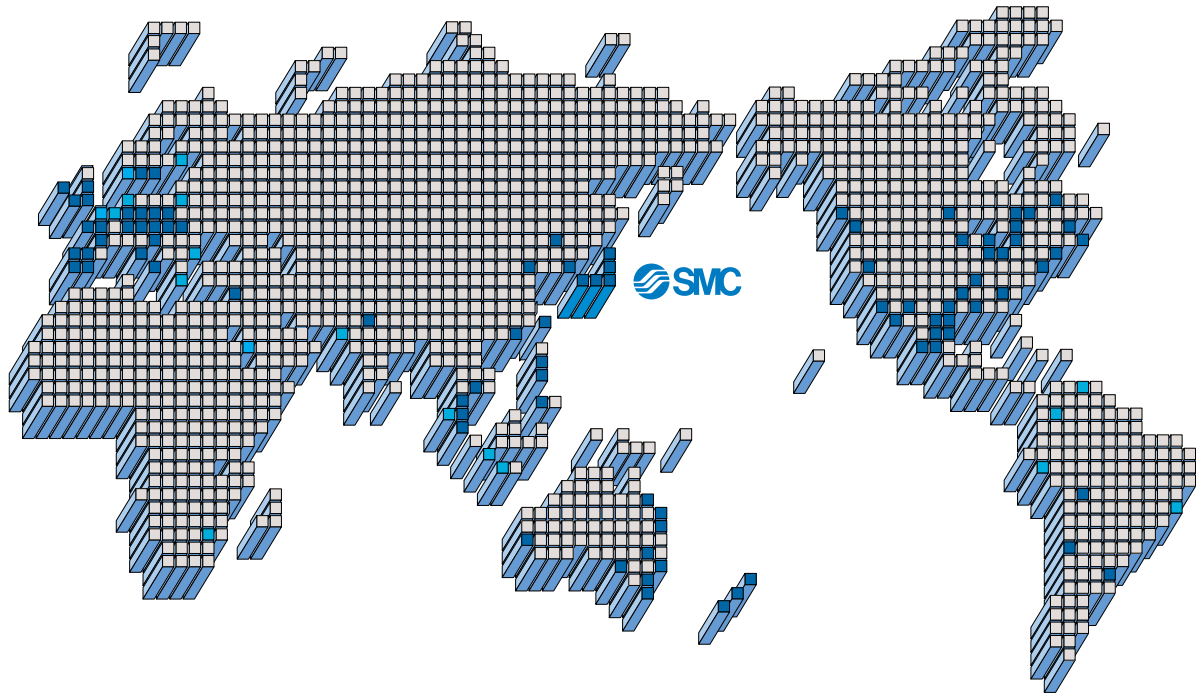
## Operating Precautions

### ⚠ Warning

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



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## SMC Corporation

Akihabara UDX 15F,  
4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, JAPAN

Phone: 03-5207-8249 FAX: 03-5298-5362

URL <http://www.smcworld.com>

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