

# Energy Saving Type 2 Port Solenoid Valve

## VXE Series

For Air, Water, Oil



RoHS

*Power  
consumption*

(SMC comparison)

# 1/3



VX2
VXK
VXD
VXZ
VXS
VXB
<b>VXE</b>
VXP
VXR
VXH
VXF
VX3
VXA

**New generation valve corresponding to energy-saving needs**

●IP65 ●RoHS compliance



# VXE Series

## VXE2, VXD2, VXE22

**2 port solenoid valve for various fluids**

**Energy saving type of the VX2, VXD2 and VXZ2 series**

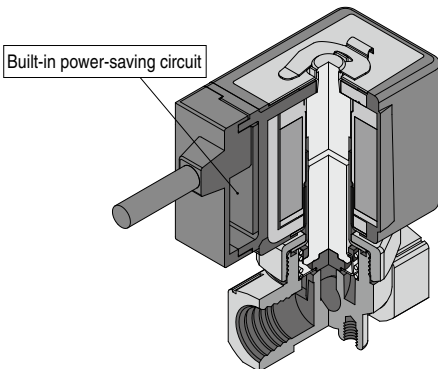
**VXE2** Direct Operated

**VXD2** Pilot Operated

**VXE22** 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	
<b>VXE□21</b> (VXD2130)	<b>1.5</b> <b>(1.8)</b>	0.19 (0.23)	0.38 (0.46)	25 (30)
<b>VXE□22</b>	<b>2.3</b>	0.29	0.58	25
<b>VXE□23</b>	<b>3</b>	0.44	0.88	30



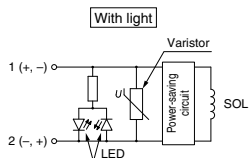
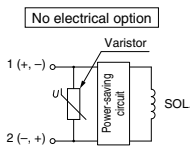
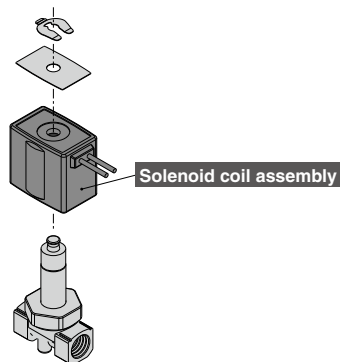
### ● Interchangeable

The mounting dimensions and its basic specifications are equivalent to those of current 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	Thread						Flange		
	Orifice diameter	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								●	
	50 mmØ									●
<b>VXEZ2</b> Zero Differential Pressure Type Pilot Operated 	10 mmØ		●	●						
	15 mmØ				●					
	20 mmØ					●				
	25 mmØ						●			

P.261

P.283

P.297

VX2

VXK

VXD

VXZ

VXS

VXB

**VXE**

VXP

VXR

VXH

VXF

VX3

VXA

## Energy Saving Type

### Direct Operated 2 Port Solenoid Valve

# VXE21/22/23 Series

For Air, Water, Oil



## Single Unit

### Valve

Normally closed (N.C.)

### Solenoid Coil

Coil: Class B

### Rated Voltage

24 VDC, 12 VDC

### Material

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

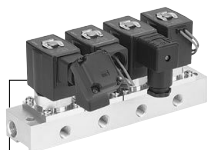
### Electrical Entry

- Grommet
- Conduit
- DIN terminal
- Conduit terminal



### Normally Closed (N.C.)

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



## Manifold

### Valve

Normally closed (N.C.)

### Base

Common SUP  
Individual SUP (Aluminum base only)

### Solenoid Coil

Coil: Class B

### Rated Voltage

24 VDC, 12 VDC

### Material

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

### Electrical Entry

- Grommet
- Conduit
- DIN terminal
- Conduit terminal



### Manifold

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

# VXE21/22/23 Series

## 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) <sup>Note 1)</sup>		Temperature increase (°C) <sup>Note 2)</sup>
		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 1) Energizing time should be 200 ms or longer.

Note 2) Value for ambient temperature at 20°C and when the rated voltage is applied.

### Contents

For Air /Single Unit .....	P.264
For Air /Manifold .....	P.266
For Water /Single Unit .....	P.268
For Water /Manifold .....	P.270
For Oil /Single Unit .....	P.272
For Oil /Manifold .....	P.274
Construction: Single Unit .....	P.276
Construction: Manifold .....	P.277
Dimensions: Single unit .....	P.278
Dimensions: Manifold .....	P.280
Replacement Parts .....	P.308

# Applicable Fluid Check List

## All Options (Single Unit)

Refer to page 264 and after for specifications and models.

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/Fluorine-free <small>Note 4)</small>	J	EPDM	Stainless steel
Other combination	B	PTFE	Brass (C37)
	C		Stainless steel
	K		



VX2

VXK

VXD

VXZ

VXS

VXB

**VXE**

VXP

VXR

VXH

VXF

VX3

VXA

## All Options (Manifold)

Refer to page 266 and after for specifications and models.

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 ( $10^{-6}$  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.



# VXE21/22/23 Series

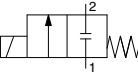
## For Air /Single Unit

(Non-leak/Medium vacuum)

### Model/Valve Specifications

N.C.

Symbol



### Normally Closed (N.C.)

Port size	Orifice dia (mm)	Model	Max. operating pressure differential (MPa)	Flow rate characteristics <sup>Note 1)</sup>			Max. system pressure (MPa)	Weight (g) <sup>Note 2)</sup>	
				C[dm <sup>3</sup> /(s·bar)]	b	Cv			
1/8 (6A)	2	VXE2110-01	1.5	0.59	0.48	0.18	3.0	300	
	3	VXE2120-01	0.6	1.2	0.45	0.33			
	4.5	VXE2130-01	0.2	2.3	0.46	0.61			
1/4 (8A)	2	VXE2110-02	1.5	0.59	0.48	0.18	3.0	300	
	3	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						
		8	VXE2250-02						0.08
	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								
3/8 (10A)	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							
	VXE2250-03	0.08				6.4	0.30	1.60	
	VXE2350-03	0.2							
	8	VXE2260-03	0.03	11	0.30				2.20
		VXE2360-03	0.07						
		10	VXE2260-04			0.03	11	0.30	
	VXE2360-04		0.07						
	1/2 (15A)	10	VXE2260-04	0.03	11	0.30	2.20	1.0	700
		VXE2360-04	0.07						

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

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

Note 2) Weight of grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for conduit terminal type respectively.

• Refer to "Glossary of Terms" on page 309 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>	
−10 <sup>Note</sup> to 60	−10 <sup>Note</sup> to 60	−20 to 60

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

### Valve Leakage Rate

#### 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.

**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.  
 Refer to page 308 for ordering coil only.

**Thread type**  

Nil	Rc
T	NPTF
F	G
N	NPT

**Electrical entry**  

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

 Connector

\* Refer to Table (3) for available combinations between electrical option (L) and 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 mm)	2 (3 mm)	3 (4.5 mm)	4 (6 mm)	5 (8 mm)	6 (10 mm)
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>2</sup> <sub>3</sub> 0	VX021N-12A
VXE22 <sup>3</sup> <sub>0</sub> 0	VX022N-12A
VXE23 <sup>3</sup> <sub>0</sub> 0	
VXE22 <sup>3</sup> <sub>0</sub> 0	VX023N-12A-L
VXE23 <sup>3</sup> <sub>0</sub> 0	

Dimensions → page 278 (Single unit)



# VXE21/22/23 Series

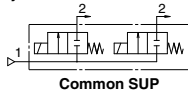
## For Air /Manifold

(Non-leak/Medium vacuum)

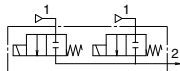
### Solenoid Valve for Manifold/Valve Specifications

N.C.

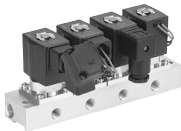
Symbol



Common SUP



Individual SUP



### Normally Closed (N.C.)

Orifice dia. (mm)	Model	Max. operating pressure differential (MPa)	Flow rate characteristics <sup>Note 1)</sup>			Max. system pressure (MPa)
			$C[dm^3/(s \cdot bar)]$	b	Cv	
2	VXE2111-00	1.5	0.59	0.48	0.18	3.0
	VXE2121-00	0.6				
3	VXE2221-00	1.5	1.2	0.45	0.33	
	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				

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

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

- Refer to "Glossary of Terms" on page 309 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		
Nil, R	V	
-10 <sup>Note</sup> to 60	-10 <sup>Note</sup> to 60	-20 to 60

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

### Valve Leakage Rate

#### Internal Leakage

Seal material	Leakage	
	Air	Non-leak/ Medium vacuum <small>(Note)</small>
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 <small>(Note)</small>
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)



**DC** **VXE** **21** **2** **1** **-00-5 G1**

VVX21  
VVX22 1 - 07 - 1  
VVX23

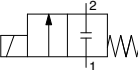
# VXE21/22/23 Series

## For Water /Single Unit

### Model/Valve Specifications

N.C.

Symbol



### Normally Closed (N.C.)

Port size	Orifice dia. (mm)	Model	Max. operating pressure differential (MPa)	Flow rate characteristics		Max. system pressure (MPa)	Note 2) Weight (g)	
				Kv	Cv converted			
1/8 (6A)	2	VXE2110-01	1.5	0.15	0.17		300	
	3	VXE2120-01	0.5	0.28	0.33			
	4.5	VXE2130-01	0.2	0.54	0.61			
1/4 (8A)	2	VXE2110-02	1.5	0.15	0.17	3.0		
	3	VXE2120-02	0.5	0.28	0.33			
		VXE2220-02	1.5					
		VXE2320-02	3.0					
	4.5	VXE2130-02	0.2	0.54	0.61			
		VXE2230-02	0.35					
		VXE2330-02	0.9					
	6	VXE2240-02	0.15	0.93	1.10		470	
		VXE2340-02	0.3					
	8	VXE2250-02	0.08	1.36	1.60		560	
		VXE2350-02	0.2					
3/8 (10A)	10	VXE2260-02	0.03	1.64	1.90		700	
		VXE2360-02	0.07					
	3	VXE2220-03	1.5	0.28	0.33		470	
		VXE2320-03	3.0					
	4.5	VXE2230-03	0.35	0.54	0.61		470	
		VXE2330-03	0.9					
	6	VXE2240-03	0.15	0.93	1.10		470	
		VXE2340-03	0.3					
	8	VXE2250-03	0.08	1.36	1.60		560	
		VXE2350-03	0.2					
	1/2 (15A)	10	VXE2260-03	0.03	1.89	2.20		700
			VXE2360-03	0.07				
		10	VXE2260-04	0.03	1.89	2.20		560
VXE2360-04			0.07					

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

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

Note 2) Weight of grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for conduit terminal type respectively.

• Refer to "Glossary of Terms" on page 309 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	
NBR, G, L	
1 to 60	-20 to 60

Note) With no freezing

### Valve Leakage Rate

#### 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.  
Refer to page 308 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</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 mm)	2 (3 mm)	3 (4.5 mm)	4 (6 mm)	5 (8 mm)	6 (10 mm)
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	—
L	FKM	Stainless steel	High corrosive/Oil-free

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

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

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

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

Dimensions → page 278 (Single unit)

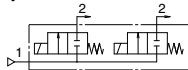
# VXE21/22/23 Series

## For Water /Manifold

### Solenoid Valve for Manifold/Valve Specifications

N.C.

Symbol



Common SUP



### Normally Closed (N.C.)

Orifice dia. (mm)	Model	Max. operating pressure differential (MPa)	Note 1) Flow rate characteristics		Max. system pressure (MPa)
			Kv	Cv converted	
2	VXE2111	1.5	0.15	0.17	3.0
3	VXE2121	0.5	0.28	0.33	
	VXE2221	1.5			
	VXE2321	3.0			
4.5	VXE2131	0.2	0.54	0.61	
	VXE2231	0.35			
	VXE2331	0.9			
6	VXE2241	0.15	0.93	1.10	
	VXE2341	0.3			

Note 1) The flow rate characteristics of this product have variations.  
When the highly precise flow control is required according to the system to be used, select an orifice diameter 1.3 times larger than that shown above and install a restrictor on the downstream side of the solenoid valve to make the adjustment.

- Refer to "Glossary of Terms" on page 309 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	
Nil, G, L	
1 to 60	-20 to 60

Note) With no freezing

### Valve Leakage Rate

#### 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.  
Refer to page 308 for ordering coil only.

### Electrical entry

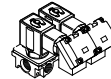
#### G-Grommet



#### C-Conduit



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



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



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

## How to Order Manifold Bases

**VVX21 VVX22 VVX23**

**1 C - 07 - 1**

**Number of manifolds**

02	2 stations
10	10 stations

**Thread type**

Nil	Rc
T	NPTF
F	G
N	NPT

**Port size (OUT port)**

1	Rc1/8
2	Rc1/4

\* IN port sizes are all Rc3/8.

**Manifold base**

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

### Blanking plate part no.

For VXE21: VVX21-3A

For VXE22: VVX22-3A

For VXE23: VVX23-3A

### Seal material

Nil	NBR
F	FKM
E	EPDM

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	NBR	—
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	—

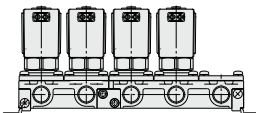
## How to Order Manifold Assemblies (Example)

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  
\* VVX21-3A ..... 1 set      for solenoid valves, etc. to be mounted.

①-----②-----③-----④-----⑤



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 → page 281 (Manifold)

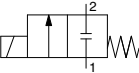
# VXE21/22/23 Series

## For Oil /Single Unit

### Model/Valve Specifications

N.C.

Symbol



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

Port size	Orifice dia. (mm)	Model	Max. operating pressure differential (MPa)	Note 1) Flow rate characteristics		Max. system pressure (MPa)	Note 2) Weight (g)		
				Kv	Cv converted				
1/8 (6A)	2	VXE2110-01	1.5	0.15	0.17	3.0	300		
	3	VXE2120-01	0.5	0.28	0.33				
	4.5	VXE2130-01	0.15	0.54	0.61				
1/4 (8A)	2	VXE2110-02	1.5	0.15	0.17	3.0	470		
	3	VXE2120-02	0.5	0.28	0.33				
		VXE2220-02	1.2						
		VXE2320-02	2.0						
	4.5	VXE2130-02	0.15	0.54	0.61				
		VXE2230-02	0.3						
		VXE2330-02	0.85						
	6	VXE2240-02	0.1	0.93	1.10	1.0	560		
		VXE2340-02	0.3						
		VXE2250-02	0.08						
	8	VXE2350-02	0.2	1.36	1.60			3.0	700
		VXE2260-02	0.03						
10	VXE2360-02	0.07	1.64	1.90	560				
3/8 (10A)	3	VXE2220-03	1.2	0.28	0.33	3.0	470		
	VXE2320-03	2.0							
	4.5	VXE2230-03	0.3	0.54	0.61				
		VXE2330-03	0.85						
		VXE2240-03	0.1						
	6	VXE2340-03	0.3	0.93	1.10			1.0	560
		VXE2250-03	0.08						
		VXE2350-03	0.2						
	8	VXE2260-03	0.03	1.89	2.20	3.0	700		
		VXE2360-03	0.07						
		VXE2260-04	0.03						
	1/2 (15A)	10	VXE2360-04	0.07	1.89			2.20	560
VXE2260-04			0.07	700					

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

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

Note 2) Weight of grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for conduit terminal type respectively.

• Refer to "Glossary of Terms" on page 309 for details on the max. operating pressure differential and the max. system pressure.

⚠ When the fluid is oil.

The dynamic viscosity of the fluid must not exceed 50 mm<sup>2</sup>/s.

### Fluid and Ambient Temperature

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

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

### Valve Leakage Rate

#### 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

**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.  
Refer to page 308 for ordering coil only.

**Thread type**  
Nil Rc  
T NPTF  
F G  
N NPT

**Electrical entry**  
G-Grommet  
C-Conduit  
T - With conduit terminal  
TL - With conduit terminal and light  
D - DIN terminal  
DL - DIN terminal with light  
DO - For DIN terminal (without connector, with gasket)  
Connector

\* Refer to Table (3) for available combinations between electrical option (L) and 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 mm)	2 (3 mm)	3 (4.5 mm)	4 (6 mm)	5 (8 mm)
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
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 3/0	VX021N-12A
VXE22 3/0	VX022N-12A
VXE23 3/0	
VXE22 3/0	VX023N-12A-L
VXE23 3/0	

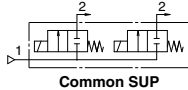


For Oil /Manifold

Solenoid Valve for Manifold/Valve Specifications

N.C.

Symbol



Normally Closed (N.C.)

Orifice dia. (mmø)	Model	Max. operating pressure differential (MPa)	Flow rate characteristics <sup>Note 1)</sup>		Max. system pressure (MPa)
			Kv	Cv converted	
2	VXE2111	1.5	0.15	0.17	3.0
3	VXE2121	0.5	0.28	0.33	
	VXE2221	1.2			
	VXE2321	2.0			
4.5	VXE2131	0.15	0.54	0.61	
	VXE2231	0.3			
	VXE2331	0.85			
6	VXE2241	0.1	0.93	1.10	
	VXE2341	0.3			

Note 1) The flow rate characteristics of this product have variations.  
When the highly precise flow control is required according to the system to be used, select an orifice diameter 1.3 times larger than that shown above and install a restrictor on the downstream side of the solenoid valve to make the adjustment.

- Refer to "Glossary of Terms" on page 309 for details on the max. operating pressure differential and the max. system pressure.

⚠ When the fluid is oil.

The dynamic viscosity of the fluid must not exceed 50 mm<sup>2</sup>/s.

Fluid and Ambient Temperature

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

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

Valve Leakage Rate

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**



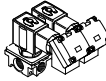

Nil	—
Z	Oil-free

**Rated voltage**

5	24 VDC
6	12 VDC

\* Refer to Table (3) shown below for availability.  
Refer to page 308 for ordering coil only.

### 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.

## 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 mm)	2 (3 mm)	3 (4.5 mm)	4 (6 mm)
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)

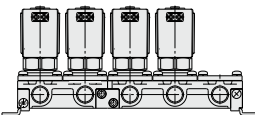
Enter the valve and blanking plate to be mounted under the manifold base part number.

Example

VVX211CF-05-1 ..... 1 set  
\* VXE211A-1G1 ..... 4 sets  
\* VVX21-3A-F ..... 1 set

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

— ① — ② — ③ — ④ — ⑤ — ⑥ — ⑦ — ⑧ — ⑨ — ⑩ —



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 → page 281 (Manifold)

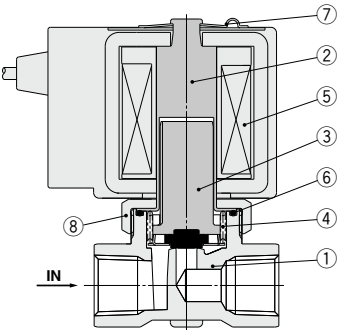
# VXE21/22/23 Series

For Air/Water/Oil

## Construction: Single Unit

Normally closed (N.C.)

Body material: Brass (C37), Stainless steel



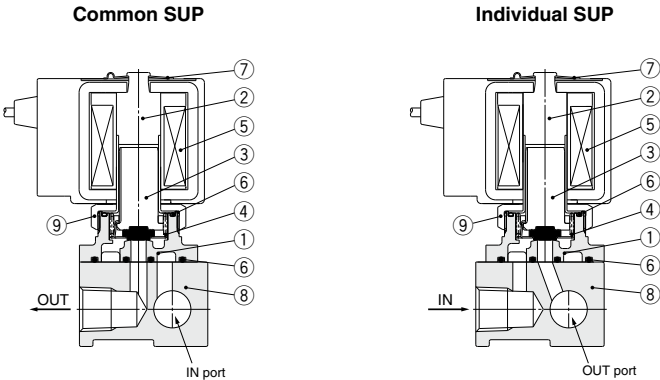
## Component Parts

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

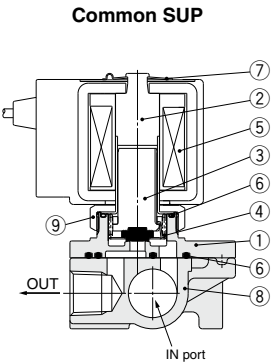
The materials in parentheses are seal materials.

**Construction: Manifold**

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



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



**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.

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

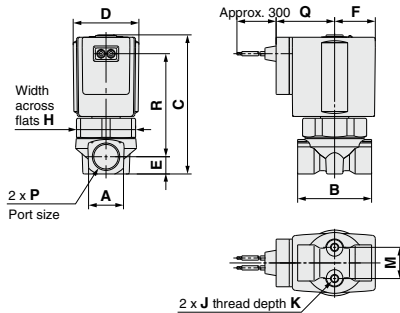
# VXE21/22/23 Series

For Air/Water/Oil

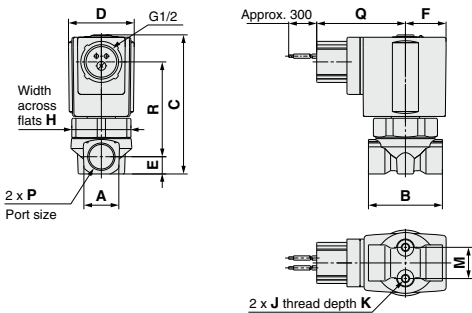
## Dimensions: Single Unit/Body Material: Brass (C37), Stainless Steel

VXE21□0/22□0/23□0

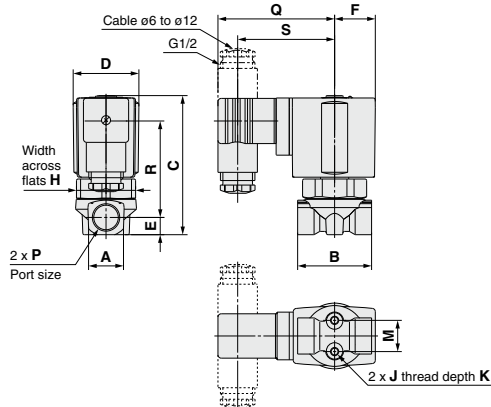
### Grommet: G



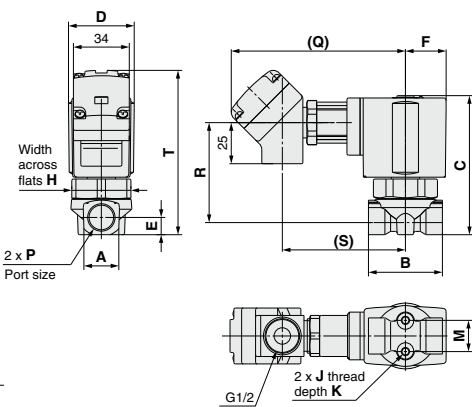
### Conduit: C



### DIN terminal: D



### Conduit terminal: T



Model	Orifice diameter	Port size P	A	B	C	D	E	F	H	Mounting dimension			(mm)											
													Electrical entry											
										Grommet		Conduit		DIN terminal				Conduit terminal						
N.C.	J	K	M	Q	R	Q	R	Q	R	S	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		10.5		35	M5	8	19	33	56	51.5	51	68.5	52	56.5	103.5	51	72.5	93.5	
VXE22□0	ø8, ø10	1/4, 3/8, 1/2	30	50	85		14	22.5	32	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		10.5		36	M5	8	19	36	62	54	57	71	58	59	106	57	75	99.5	
VXE23□0	ø8, ø10	1/4, 3/8, 1/2	30	50	92		14	25	36	M5	8	23	36	65	54	60	71	61	59	106	60	75	106	

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

**VXE21□0/22□0/23□0**

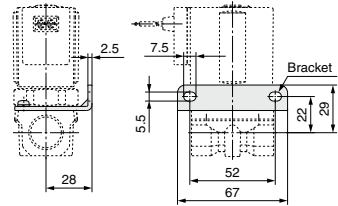
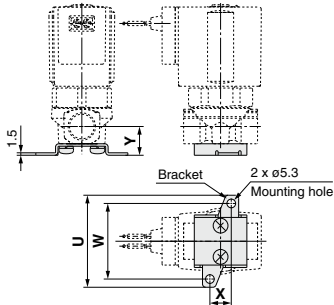
**Specifications with bracket**

**Orifice: ø2, ø3, ø4.5, ø6**

**(Packed in the same container)**

**Orifice: ø8, ø10**

**(Assembled at the shipment)**



(mm)

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

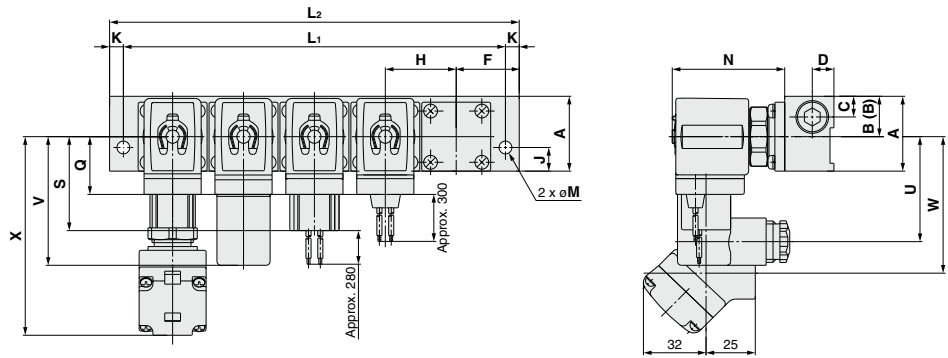
VX2  
VXK  
VXD  
VXZ  
VXS  
VXB  
VXE  
VXP  
VXR  
VXH  
VXF  
VX3  
VXA

# VXE21/22/23 Series

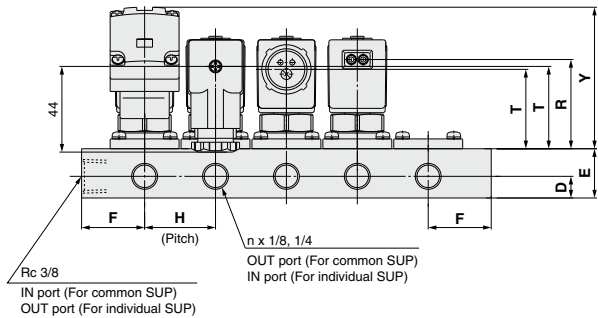
For Air

## Dimensions: Manifold/Base Material: Aluminum

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



D side    Stations    1    2    3    4    5    n    U side



		(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
	L <sub>2</sub>	126	172	218	264	310	356	402	448	494

Model	A	B	(B) Individual SUP	C	D	E	F	H	J	K	M	N	(mm)											
													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		

**VXE21/22/23**(mm)

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



## Energy Saving Type

### Pilot Operated 2 Port Solenoid Valve

# VXED21/22/23 Series

For Air, Water, Oil



#### ■ Valve

Normally closed (N.C.)

#### ■ Solenoid Coil

Coil: Class B

#### ■ Rated Voltage

24 VDC, 12 VDC

#### ■ Material

Body — Brass (C37)/CAC408,  
Stainless steel  
Seal — NBR, FKM, EPDM

#### ■ Electrical Entry

- Grommet
- Conduit
- DIN terminal
- Conduit terminal



Model	VXED2130	VXED2140	VXED2150	VXED2260
Orifice diameter	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 diameter	35 mmø	—	—
	40 mmø	—	●
	50 mmø	—	—
Port size (Flange)	32A	40A	50A

VX2

VXK

VXD

VXZ

VXS

VXB

VXE

VXP

VXR

VXH

VXF

VX3

VXA

## 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, CAC408
	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

⚠ Be sure to read “Specific Product Precautions.”

### Solenoid Coil Specifications

Normally Closed (N.C.)

DC Specification

Model	Power consumption (W) (Holding)	Inrush current (A) (Inrush time: 200 ms) <small>Note 1)</small>		Temperature increase (°C) <small>Note 2)</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 1) Energizing time should be 200 ms or longer.

Note 2) Value for ambient temperature at 20°C and when the rated voltage is applied.

### Contents

For Air .....	P.286
For Water .....	P.288
For Oil .....	P.290
Construction .....	P.292
Dimensions .....	P.293
Replacement Parts .....	P.308

# Applicable Fluid Check List

## Energy Saving Type / Pilot Operated 2 Port Solenoid Valve VXED21/22/23 Series

### All Options (8A to 25A)

Refer to page 286 and after for specifications and models.



VXED2 <sup>3</sup><sub>1 2 4 5 6</sub> 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 (Note 2)	A	FKM	Brass (C37)
	H		Stainless steel
High corrosive/Oil-free	L (Note 1)	FKM	Stainless steel
Copper-free/Fluorine-free (Note 3)	J	EPDM	Stainless steel
Other combination	B	EPDM	Brass (C37)

Note 1) The L option is oil-free treatment.

Note 2) The dynamic viscosity of the fluid must not exceed 50 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.

### All Options (32A to 50A)

Refer to page 286 and after for specifications and models.

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

• Option symbol

Fluid and application	Option symbol	Seal material	Body material
Air	Nil	NBR	CAC408
Water	Nil	NBR	
Oil (Note)	A	FKM	
Other combination	B	EPDM	

Note) 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.



VX2

VXK

VXD

VXZ

VXS

VXB

VXE

VXP

VXR

VXH

VXF

VX3

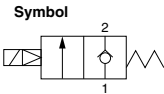
VXA

# VXED21/22/23 Series

For Air

## Model/Valve Specifications

N.C.



Port size		Orifice diameter (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)	Flow rate 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		2.4		
		15	VXED2140-04		1.0	20.0		5.5		
	3/4 (20A)	20	VXED2150-06			38.0	0.30	9.5		

Port size		Orifice diameter (mmo)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)	Flow rate characteristics	Max. system pressure (MPa)	Weight (g) <sup>(Note)</sup>
						Effective area (mm²)		
Thread (Nominal size)	1 (25A)	25	VXED2260-10	0.02	1.0	225	1.5	1650
	32A	35	VXED2270-32	415		5400		
Flange	40A	40	VXED2380-40	0.03		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 of Terms" on page 309 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	
NII, G	
-10 to 60	-10 to 60

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

## Valve Leakage Rate

### Internal Leakage

Seal material	Leakage (Air) <sup>Note 1)</sup>	
	1/4 to 1	32A to 50A
NBR	2 cm³/min or less	10 cm³/min or less

### External Leakage

Seal material	Leakage (Air) <sup>Note 1)</sup>	
	1/4 to 1	32A to 50A
NBR	1 cm³/min or less	1 cm³/min or less

Note 1) Leakage is the value at ambient temperature 20°C.



## 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.

**Bracket**  

Nil	None
B	With bracket

  
\* Removal of bracket is not possible.

**Rated voltage**  

5	24 VDC
6	12 VDC

  
\* Refer to Table (3) shown below for availability.  
Refer to page 308 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</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) 

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

**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 mm)	4 (15 mm)	5 (20 mm)	6 (25 mm)	7 (35 mm)	8 (40 mm)	9 (50 mm)	Body	Seal
Port symbol (Port size)	Thread	02 (1/4)	—	—	●	—	—	—	—	—	—	Brass (C37) Stainless steel	NBR
		03 (3/8)	—	—	●	—	—	—	—	—	—		
		04 (1/2)	—	—	●	—	—	—	—	—	—		
		06 (3/4)	—	—	—	●	—	—	—	—	—		
	Flange	—	10 (1)	—	—	—	—	●	—	—	—	CAC408	
		—	32 (32A)	—	—	—	—	—	●	—	—		
		—	—	40 (40A)	—	—	—	—	—	●	—		
		—	—	50 (50A)	—	—	—	—	—	—	●		
		—	—	—	—	—	—	—	—	—	—		
		—	—	—	—	—	—	—	—	—	—		

**Table (2) Solenoid Valve Option**

Option symbol	Seal material	Body material
Nil	NBR	Brass (C37), CAC408
G (Note)		Stainless steel

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

Note 2) Select nil because the L option is the oil-free treatment.

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

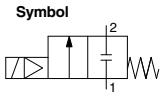
Rated voltage		L (With light)
Voltage symbol	Voltage	
5	24 VDC	●
6	12 VDC	—

# VXED21/22/23 Series

## For Water

### Model/Valve Specifications

N.C.



Port size		Orifice diameter (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)	Flow rate characteristics		Max. system pressure (MPa)	Weight (g) <sup>Note)</sup>
						Kv	Cv converted		
Thread (Nominal size)	1/4 (8A)	10	VXED2130-02	0.02	0.5	1.6	1.9	1.5	420
	3/8 (10A)	10	VXED2130-03			2.0	2.4		670
		15	VXED2140-03			3.9	4.5		500
	1/2 (15A)	10	VXED2130-04			2.0	2.4		670
		15	VXED2140-04		4.6	5.5	1150		
	3/4 (20A)	20	VXED2150-06		8.2	9.5	1650		
	1 (25A)	25	VXED2260-10		11.0	13	5400		
	Flange	32A	35		VXED2270-32	19.6	23		6800
40A		40	VXED2380-40	26.4	31	8400			
50A		50	VXED2390-50	42.8	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 of Terms" on page 309 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	
NII, G, L	
1 to 60	-10 to 60

Note) With no freezing

### Valve Leakage Rate

Internal Leakage		
Seal material	Leakage (Water) <sup>Note 1)</sup>	
	1/4 to 1	32A to 50A
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) <sup>Note 1)</sup>	
	1/4 to 1	32A to 50A
NBR, FKM	0.1 cm <sup>3</sup> /min or less	0.1 cm <sup>3</sup> /min or less

Note 1) Leakage is the value at ambient temperature 20°C.



## 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 308 for ordering coil only.

**Bracket**  
**Nil** None  
**B** With bracket  
\* Removal of bracket is not possible.

### Electrical entry

G-Grommet	C-Conduit
 <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 mm)	4 (15 mm)	5 (20 mm)	6 (25 mm)	7 (35 mm)	8 (40 mm)	9 (50 mm)	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)	—	—	—	—	●	—	—	—	CAC408	
		—	32 (32A)	—	—	—	—	—	●	—	—		
		—	—	40 (40A)	—	—	—	—	—	●	—		
		—	—	50 (50A)	—	—	—	—	—	—	●		

**Table (2) Solenoid Valve Option**

Option symbol	Seal material	Body material	Note
<b>Nil</b>	NBR	Brass (C37), CAC408	—
<b>G</b> (Note)	FKM	Stainless steel	—
<b>L</b> (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**

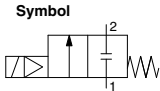
Rated voltage		L (With light)
Voltage symbol	Voltage	
<b>5</b>	24 VDC	●
<b>6</b>	12 VDC	—

# VXED21/22/23 Series

**For Oil**

## Model/Valve Specifications

N.C.



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



Port size		Orifice diameter (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)	Flow rate characteristics		Max. system pressure (MPa)	Weight (g) <sup>(Note)</sup>
						Kv	Cv converted		
Thread (Nominal size)	1/4 (8A)	10	VXED2130-02	0.02	0.4	1.6	1.9	1.5	420
	3/8 (10A)	10	VXED2130-03			2.0	2.4		670
		15	VXED2140-03			3.9	4.5		500
	1/2 (15A)	10	VXED2130-04		0.4	2.0	2.4		670
		15	VXED2140-04			4.6	5.5		1150
	3/4 (20A)	20	VXED2150-06		0.7	8.2	9.5		1650
		25	VXED2260-10			11.0	13		5400
Flange	32A	35	VXED2270-32	0.03		19.6	23	6800	
	40A	40	VXED2380-40			26.4	31	8400	
	50A	50	VXED2390-50			42.8	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 of Terms" on page 309 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 Rate

### Internal Leakage

Seal material	Leakage (Oil) <sup>Note 1)</sup>	
	1/4 to 1	32A to 50A
FKM	0.2 cm <sup>3</sup> /min or less	1 cm <sup>3</sup> /min or less

### External Leakage

Seal material	Leakage (Oil) <sup>Note 1)</sup>	
	1/4 to 1	32A to 50A
FKM	0.1 cm <sup>3</sup> /min or less	0.1 cm <sup>3</sup> /min or less

Note 1) Leakage is the value at ambient temperature 20°C.





## 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 308 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 mm)	4 (15 mm)	5 (20 mm)	6 (25 mm)	7 (35 mm)	8 (40 mm)	9 (50 mm)	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)	—	—	—	—	—	●	—		
		—	—	50 (50A)	—	—	—	—	—	—	●		

**Table (2) Solenoid Valve Option**

Option symbol	Seal material	Body material
<b>A</b>	FKM	Brass (C37), CAC408
<b>H</b> (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	
<b>5</b>	24 VDC	●
<b>6</b>	12 VDC	—

# VXED21/22/23 Series

For Air/Water/Oil

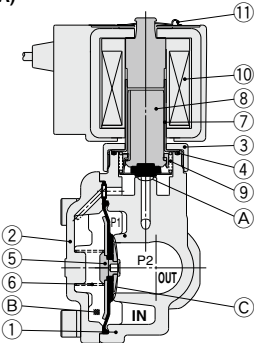
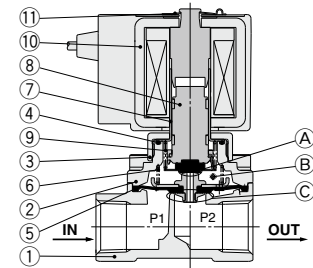
## Construction

Normally closed (N.C.)

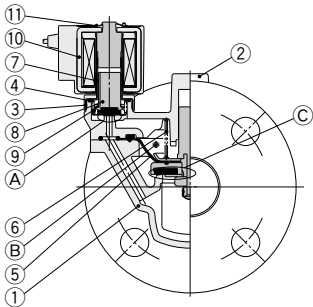
Body material: Brass (C37) (32A or more: CAC408), Stainless steel (32A or more: not available)

VXED2130 (8A/10A)

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



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



### Working principle

<Valve opened>

When the coil 10 is energized, the armature assembly 8 is attracted into the core of the tube assembly 7 and the pilot valve A opens. Then the pressure in the pressure action chamber B falls to open the main valve C.

<Valve closed>

When the coil 10 is not energized, the pilot valve A is closed and the pressure in the pressure action chamber B rises and the main valve C closes.

### Component Parts

No.	Description	Size	Material	
			Brass (C37) (CAC408) body specification	Stainless steel body specification
1	Body	8A to 25A	Brass (C37)	Stainless steel
		32A to 50A	CAC408	—
2	Bonnet	8A to 25A	Brass (C37)	Stainless steel
		32A to 50A	CAC408	—
3	Nut	8A to 50A	Brass (C37)	Brass (C37), Ni plated
4	O-ring	8A to 50A	(NBR, FKM, EPDM)	
5	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
6	Valve spring	8A to 50A	Stainless steel	
7	Tube assembly	8A to 50A	Stainless steel	
8	Armature assembly	8A to 50A	(NBR, FKM, EPDM) Stainless steel, PPS	
9	Return spring	8A to 50A	Stainless steel	
10	Solenoid coil	8A to 50A	—	
11	Clip	8A to 50A	SK	

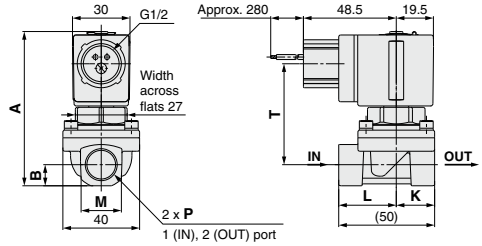
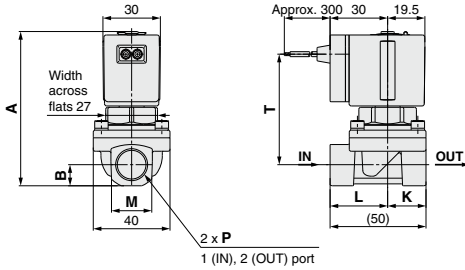
The materials in parentheses are seal materials.

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

**VXED2130**

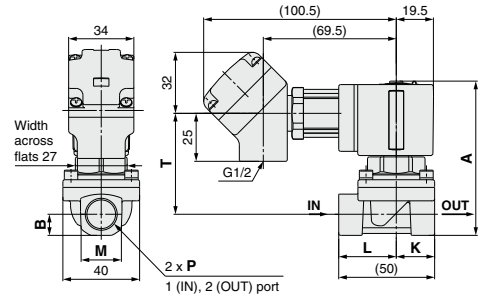
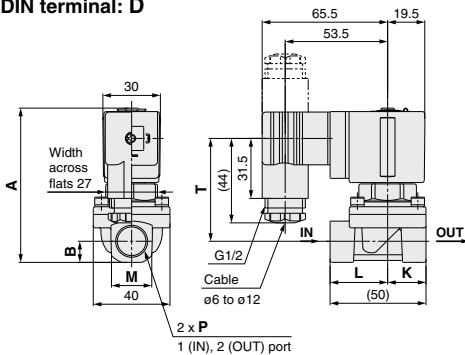
**Grommet: G**

**Conduit: C**

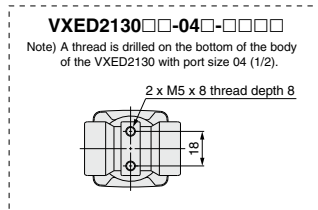
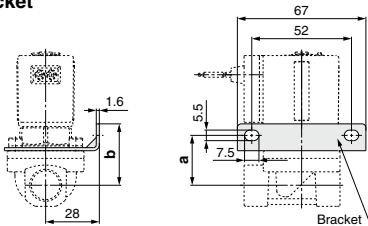


**DIN terminal: D**

**Conduit terminal: T**



**With bracket**



(mm)																		
Model	Port size P	A	B	K	L	M	Electrical entry										Bracket mounting dimension	
							Grommet		Conduit		DIN terminal				Conduit terminal			
							T	U	T	U	T	U	V	T	U	V	a	b
N.C.																		
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

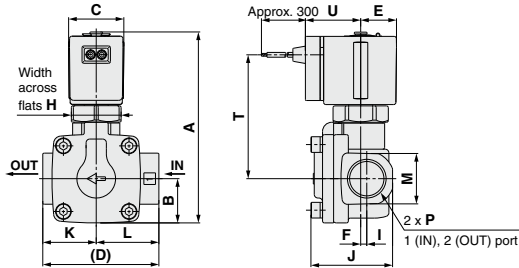
# VXED21/22/23 Series

For Air/Water/Oil

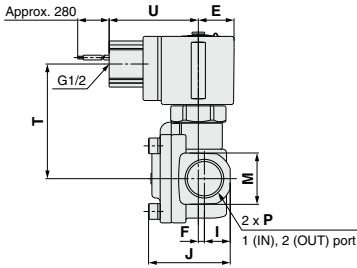
Dimensions: Body Material: Brass (C37), Stainless Steel

VXED2140/2150/2260

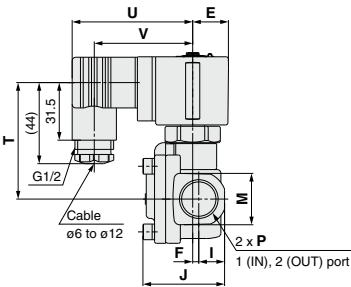
Grommet: G



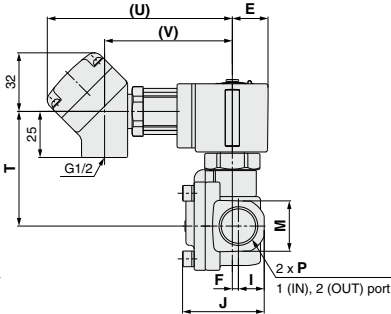
Conduit: C



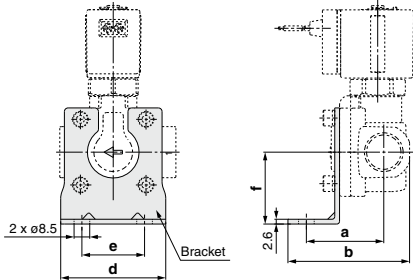
DIN terminal: D



Conduit terminal: T



With bracket

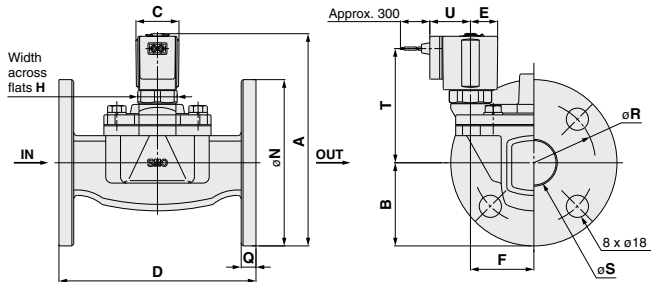


Model	Port size P	A	B	C	D	E	F	H	I	J	K	L	M	Electrical entry								Bracket mounting dimension						
														Grommet		Conduit		DIN terminal		Conduit terminal								
														T	U	T	U	T	U	T	U	a	b	d	e	f		
VXED2140	3/8, 1/2	103.5	24	30	63	19.5	3.5	27	14	44.5	29	34	28	67.5	30	62.5	48.5	63.5	65.5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

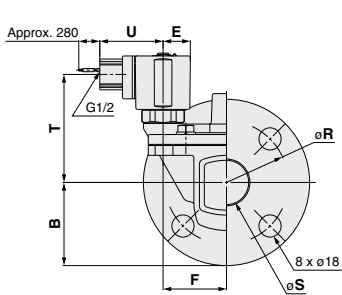
**Dimensions: Body Material: Brass (CAC408), Stainless Steel**

**VXED2270/2380/2390**

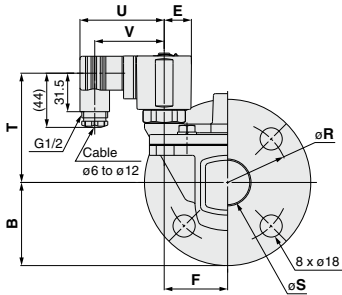
**Grommet: G**



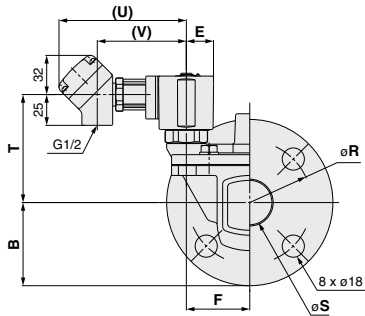
**Conduit: C**



**DIN terminal: D**



**Conduit terminal: T**



(mm)																								
Model	Applicable flange	A	B	C	D	E	F	H	N	Q	R	S	Electrical entry											
													Grommet			Conduit			DIN terminal			Conduit terminal		
													T	U	V	T	U	V	T	U	V	T	U	V
N.C.																								
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		

(mm)

## Energy Saving Type

Zero Differential Pressure Type Pilot Operated 2 Port Solenoid Valve

# VXEZ22/23 Series

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 diameter				
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)

VX2

VXK

VXD

VXZ

VXS

VXB

VXE

VXP

VXR

VXH

VXF

VX3

VXA

## VXEZ22/23 Series

# 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

⚠ Be sure to read “Specific Product Precautions.”

### Solenoid Coil Specifications

#### DC Specification (Class B coil only)

Model	Power consumption (W) (Holding)	Inrush current (A) (Inrush time: 200 ms) <sup>Note 1)</sup>		Temperature increase (°C) <sup>Note 2)</sup>
		24 VDC	12 VDC	
VXEZ22	2.3	0.29	0.58	25
VXEZ23	3	0.44	0.88	30

Note 1) Energizing time should be 200 ms or longer.

Note 2) Value for ambient temperature at 20°C and when the rated voltage is applied.

## Contents

For Air .....	P.300
For Water .....	P.302
For Oil .....	P.304
Construction .....	P.306
Dimensions .....	P.307
Replacement Parts .....	P.308

**VXEZ22/23 Series****Applicable Fluid Check List****All Options**

Refer to page 300 or later for specifications and models.

**VXEZ2**   **0**   -   -   **1** - 

● Option symbol

Fluid and application	Option symbol	Seal material	Body material
Air	<b>Nil</b>	NBR	Brass (C37)
	<b>G</b>		Stainless steel
Water	<b>Nil</b>	NBR	Brass (C37)
	<b>G</b>		Stainless steel
Oil <small>Note 2)</small>	<b>A</b>	FKM	Brass (C37)
	<b>H</b>		Stainless steel
High corrosive/Oil-free	<b>L</b> <small>Note 1)</small>	FKM	Stainless steel
Copper-free/Fluorine-free <small>Note 3)</small>	<b>J</b>	EPDM	Stainless steel
Other combination	<b>B</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.



VX2

VXK

VXD

VXZ

VXS

VXB

**VXE**

VXP

VXR

VXH

VXF

VX3

VXA



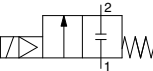
# VXEZ22/23 Series

For Air

## Model/Valve Specifications

N.C.

Symbol



### Normally Closed (N.C.)

Port size (Nominal size)	Orifice diameter (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)	Flow rate characteristics			Max. system pressure (MPa)	Weight (g)
					C	b	Cv		
1/4 (8A)	10	VXEZ2230-02	0	0.7	8.5	0.44	2.4	1.5	550
3/8 (10A)		VXEZ2230-03			11.0	0.42	2.8		
1/2 (15A)	15	VXEZ2240-04			23.0	0.34	6.0		
3/4 (20A)	20	VXEZ2350-06		1.0	38.0	0.20	9.5		1300

Port size (Nominal size)	Orifice diameter (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)	Flow rate characteristics	Max. system pressure (MPa)	Weight (g)
					Effective area (mm <sup>2</sup> )		
1 (25A)	25	VXEZ2360-10	0	1.0	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 of Terms" on page 309 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>N11, G</b>	
–10 to 60 <sup>Note)</sup>	–10 to 60

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

## Valve Leakage Rate

### Internal Leakage

Seal material	Leakage (Air) <sup>Note 1) 2)</sup>
NBR	1 cm <sup>3</sup> /min or less

### External Leakage

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

- Note 1) Leakage is the value at ambient temperature 20°C.  
Note 2) Leakage is the value when the pressure differential ranges from 0.02 MPa to the maximum operating pressure differential.



## 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.

**Rated voltage**

5	24 VDC
6	12 VDC

\* Refer to Table (3) shown below for availability.  
Refer to page 308 for ordering coil only.

**Thread type**

Nil	Rc
T	NPTF
F	G
N	NPT

**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)

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

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

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

**Table (2) Solenoid Valve Option**

Option symbol	Seal material	Body material	Note
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	—

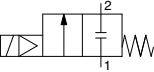
# VXEZ22/23 Series

## For Water

### Model/Valve Specifications

N.C.

Symbol



### Normally Closed (N.C.)

Port size (Nominal size)	Orifice diameter (mm)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)	Flow rate characteristics		Max. system pressure (MPa)	Weight (g)
					Kv	Cv converted		
1/4 (8A)	10	VXEZ2230-02	0	0.7	1.6	1.9	1.5	550
3/8 (10A)		VXEZ2230-03			2.0	2.4		
1/2 (15A)	15	VXEZ2240-04			4.6	5.3		
3/4 (20A)	20	VXEZ2350-06		1.0	7.8	9.2		1300
1 (25A)	25	VXEZ2360-10			10.3	12.0		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 of Terms" on page 309 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	
NII, G, L	
1 to 60	-10 to 60

\* With no freezing

### Valve Leakage Rate

#### Internal Leakage

Seal material	Leakage (Water) <sup>Note 1) 2)</sup>
NBR, FKM	0.1 cm <sup>3</sup> /min or less

#### External Leakage

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

- Note 1) Leakage is the value at ambient temperature 20°C.  
Note 2) Leakage is the value when the pressure differential ranges from 0.02 MPa to the maximum operating pressure differential.



How to Order

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

**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.

**Rated voltage**  

5	24 VDC
6	12 VDC

  
\* Refer to Table (3) shown below for availability.  
Refer to page 308 for ordering coil only.

**Thread type**  

Nil	Rc
T	NPTF
F	G
N	NPT

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

Table (2) Solenoid Valve Option

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

Table (3) Rated Voltage – Electrical Option

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

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

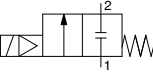
# VXEZ22/23 Series

**For Oil**

## Model/Valve Specifications

**N.C.**

Symbol



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

### Normally Closed (N.C.)

Port size (Nominal size)	Orifice diameter (mm)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa)	Flow rate characteristics		Max. system pressure (MPa)	Weight (g)
					Kv	Cv converted		
1/4 (8A)	10	VXEZ2230-02	0	0.7	1.6	1.9	1.5	550
3/8 (10A)		VXEZ2230-03			2.0	2.4		
1/2 (15A)	15	VXEZ2240-04			4.6	5.3		
3/4 (20A)		VXEZ2350-06			7.8	9.2		
1 (25A)	25	VXEZ2360-10			10.3	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 of Terms" on page 309 for details on the max. operating pressure differential and the max. system pressure.

## Fluid and Ambient Temperature

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

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

## Valve Leakage Rate

### Internal Leakage

Seal material	Leakage (Oil) <sup>Note 1) 2)</sup>
FKM	0.1 cm <sup>3</sup> /min or less

### External Leakage

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

Note 1) Leakage is the value at ambient temperature 20°C.  
Note 2) Leakage is the value when the pressure differential ranges from 0.02 MPa to the maximum operating pressure differential.

Zero Differential Pressure Type Pilot Operated  
2 Port Solenoid Valve

VXEZ22/23 Series

For Oil



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.

**Rated voltage**  
5 | 24 VDC  
6 | 12 VDC  
\* Refer to Table (3) shown below for availability.  
Refer to page 308 for ordering coil only.

**Thread type**  
Nil | Rc  
T | NPTF  
F | G  
N | NPT

**Bracket**  
Nil | None  
B | With bracket  
\* Removal of bracket is not possible.

**Electrical entry**  
G-Grommet  
C-Conduit  
T - With conduit terminal  
TL - With conduit terminal and light  
D - DIN terminal  
DL - DIN terminal with light  
DO - For DIN terminal (without connector, with gasket)  
Connector

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

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

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

Table (2) Solenoid Valve Option

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

Table (3) Rated Voltage – Electrical Option

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



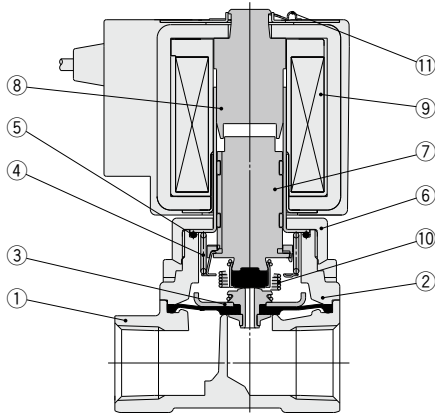
# VXEZ22/23 Series

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 (A) is opened.

When the pilot valve is opened and the pressure inside the pilot chamber (B) decreases, resulting in the pressure difference from the inlet pressure. Then the diaphragm assembly (3) is lifted and the main valve (C) 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 (C) 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 (A) is closed.

When the pilot valve is closed, the pressure inside the pilot chamber (B) increases, resulting that the pressure difference from the inlet pressure is lost and the main valve (C) is closed.

## Component Parts

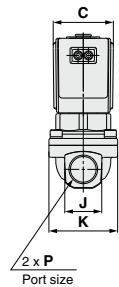
No.	Description	Material	
		Brass (C37) body specification	Stainless steel body specification
1	Body	Brass (C37)	Stainless steel
2	Bonnet	Brass (C37)	Stainless steel
3	Diaphragm assembly	(NBR, FKM, EPDM) Stainless steel	
4	Return spring	Stainless steel	
5	O-ring	(NBR, FKM, EPDM)	
6	Nut	Brass (C37)	Brass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

The materials in parentheses are seal materials.

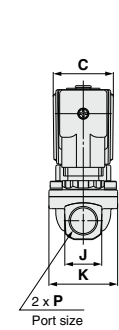
Dimensions: Body Material: Brass (C37), Stainless Steel

VXEZ22□0/23□0

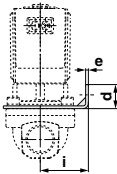
Grommet: G



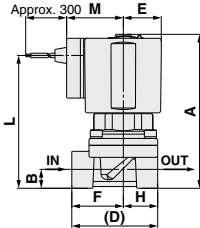
DIN terminal: D



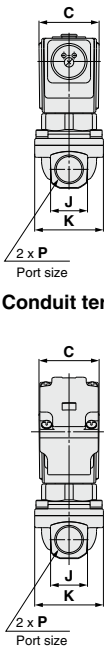
With bracket



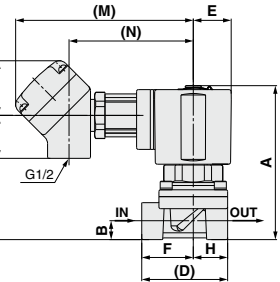
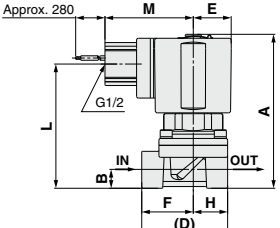
Conduit: C



Conduit terminal: T



Conduit: C



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

Model	Port size P	(mm)								
		A	B	C	D	E	F	H	J	K
N.C.										
VXEZ2230	1/4, 3/8	89	11	35	50	22.5	30	20	22	40
VXEZ2240	1/2	97	14	35	63	22.5	37	26	29.5	52
VXEZ2350	3/4	111	18	40	80	25	47.5	32.5	36	65
VXEZ2360	1/1	118.5	21	40	90	25	55	35	40.5	70

Model	Port size P	a	b	d	e	f	g	h	i	(mm)											
										Electrical entry											
										Grommet				Conduit				DIN terminal			
N.C.										L	M	L	M	L	M	N	L	M	N		
VXEZ2230	1/4, 3/8	52	67	14	1.6	26	5.5	7.5	28	77	33	72	51.5	73	68.5	56.5	72	103.5	72.5		
VXEZ2240	1/2	60	75	17	2.3	33	6.5	8.5	35	84.5	33	80	51.5	81	68.5	56.5	80	103.5	72.5		
VXEZ2350	3/4	68	87	22	2.6	40	6.5	9	43	99.5	36	94.5	54	95.5	71	59	94.5	106	75		
VXEZ2360	1/1	73	92	22	2.6	45.5	6.5	9	45	107	36	102	54	103	71	59	102	106	75		



# VXE□21/22/23 Series

For Air/Water/Oil

## Replacement Parts

### ● Solenoid coil assembly part no.

VXE02 **1** N-**1** GE-□

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.

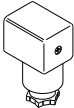
### ● DIN connector part no.

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**

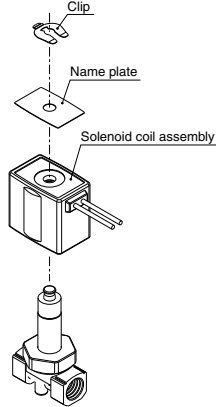


Table (1) Rated Voltage – Electrical Option

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** **Valve model**

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

# Glossary of Terms

## Pressure Terminology

### 1. Maximum operating pressure differential

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

### 2. Minimum operating pressure differential

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

### 3. Maximum system pressure

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

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

### 4. Proof pressure

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

## Electrical Terminology

### 1. Apparent power (VA)

Volt-ampere is the product of voltage (V) and current (A).

Power consumption (W): For AC,  $W = V \cdot A \cdot \cos\theta$ . For DC,  $W = V \cdot A$ .

Note)  $\cos\theta$  shows power factor.  $\cos\theta = 0.6$

### 2. Surge voltage

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

### 3. Enclosure

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

Verify the degree of protection for each product.



#### ● First Characteristics:

##### Degrees of protection against solid foreign objects

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

#### ● Second Characteristics:

##### Degrees of protection against water

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

Example) IP65: Dusttight, Low jetproof type

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

## Others

### 1. Material

NBR: Nitrile rubber

FKM: Fluororubber

EPDM: Ethylene propylene rubber

PTFE: Polytetrafluoroethylene resin

FFKM: Perfluoroelastomer

### 2. Oil-free treatment

The degreasing and washing of wetted parts.

### 3. Passage symbol

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

VX2

VXK

VXD

VXZ

VXS

VXB

VXE

VXP

VXR

VXH

VXF

VX3

VXA