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

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

VXED21/22/23 Series
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) Note 1)		Temperature increase (°C) Note 2)
		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 1 2 3 4 5 6 **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 mm²/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 2 3 7 8 9 **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	

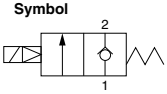
Note) The dynamic viscosity of the fluid must not exceed 50 mm²/s or less.

For Air

Model/Valve Specifications

N.C.

Symbol



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

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

Note 1) Weight of grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for conduit terminal type respectively.
Note 2) 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	
–10 to 60	–10 to 60

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

Valve Leakage Rate

Internal Leakage

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

External Leakage

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

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

Rated voltage

5	24 VDC
6	12 VDC

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

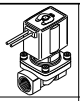
Bracket

Nil	None
B	With bracket

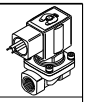
* Removal of bracket is not possible.

Electrical entry

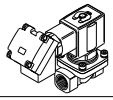
G - Grommet



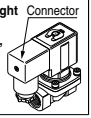
C - Conduit



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.

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 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
		03 (3/8)	—	—	●	●	—	—	—	—	—		
		04 (1/2)	—	—	●	●	—	—	—	—	—		
		06 (3/4)	—	—	—	—	●	—	—	—	—		
		—	**10** (1)	—	—	—	—	●	—	—	—		
	Flange	—	**32** (32A)	—	—	—	—	—	●	—	—		
		—	—	**40** (40A)	—	—	—	—	—	●	—	CAC408	
		—	—	**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

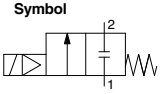
Rated voltage		**L** (With light)
Voltage symbol	Voltage	
5	24 VDC	●
6	12 VDC	—

For Water

Model/Valve Specifications

N.C.

Symbol



Port size		Orifice diameter (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa) Note 2)	Flow rate characteristics		Max. system pressure (MPa) Note 2)	Weight (g) Note 1)
						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		
		15	**VXED2140-03**		1.0	3.9	4.5		670
	1/2 (15A)	10	**VXED2130-04**		0.5	2.0	2.4		500
		15	**VXED2140-04**		1.0	4.6	5.5		670
	3/4 (20A)	20	**VXED2150-06**			8.2	9.5		1150
	1 (25A)	25	**VXED2260-10**			11.0	13		1650
Flange	32A	35	**VXED2270-32**	0.03		19.6	23		5400
	40A	40	**VXED2380-40**			26.4	31		6800
	50A	50	**VXED2390-50**			42.8	49		8400

Note 1) Weight of grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for conduit terminal type respectively.
Note 2) 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	–10 to 60

Note) With no freezing

Valve Leakage Rate

Internal Leakage

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

External Leakage

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

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

Rated voltage

5	24 VDC
6	12 VDC

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

Refer to page 308 for ordering coil only.

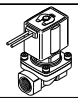
Bracket

Nil	None
B	With bracket

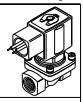
* Removal of bracket is not possible.

Electrical entry

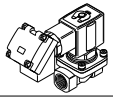
G - Grommet



C - Conduit

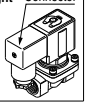


T - With conduit terminal
TL - With conduit terminal and light



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 diameter							Material	
Model		VXED21	VXED22	VXED23	3 (10 mmø)	4 (15 mmø)	5 (20 mmø)	6 (25 mmø)	7 (35 mmø)	8 (40 mmø)	9 (50 mmø)	Body	Seal
Port symbol (Port size)	Thread	**02** (1/4)	—	—	●	—	—	—	—	—	—	Brass (C37) Stainless steel	NBR FKM
		03 (3/8)	—	—	●	●	—	—	—	—	—		
		04 (1/2)	—	—	●	●	—	—	—	—	—		
		06 (3/4)	—	—	—	—	●	—	—	—	—		
		—	**10** (1)	—	—	—	—	●	—	—	—		
	Flange	—	**32** (32A)	—	—	—	—	—	●	—	—	CAC408	
		—	—	**40** (40A)	—	—	—	—	—	●	—		
		—	—	**50** (50A)	—	—	—	—	—	—	●		

Table (2) Solenoid Valve Option

Option symbol	Seal material	Body material	Note
Nil	NBR	Brass (C37), CAC408	—
G Note)		Stainless steel	
L Note)	FKM	Stainless steel	High corrosive/Oil-free

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

Table (3) Rated Voltage – Electrical Option

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

For Oil

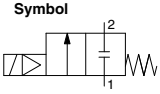
⚠ When the fluid is oil.

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

Model/Valve Specifications

N.C.

Symbol



Port size		Orifice diameter (mmø)	Model	Min. operating pressure differential (MPa)	Max. operating pressure differential (MPa) Note 2)	Flow rate characteristics		Max. system pressure (MPa) Note 2)	Weight (g) Note 1)
						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		
		15	**VXED2140-03**		0.7	3.9	4.5		670
	1/2 (15A)	10	**VXED2130-04**		0.4	2.0	2.4		500
		15	**VXED2140-04**		0.7	4.6	5.5		670
	3/4 (20A)	20	**VXED2150-06**			8.2	9.5		1150
	1 (25A)	25	**VXED2260-10**			11.0	13		1650
Flange	32A	35	**VXED2270-32**	0.03		19.6	23		5400
	40A	40	**VXED2380-40**			26.4	31		6800
	50A	50	**VXED2390-50**			42.8	49		8400

Note 1) Weight of grommet type. Add 10 g for conduit, 30 g for DIN terminal, and 60 g for conduit terminal type respectively.
Note 2) 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 mm²/s or less

Valve Leakage Rate

Internal Leakage

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

External Leakage

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

Thread type

Nil	Rc
T	NPTF
F	G*
N	NPT

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

Rated voltage

5	24 VDC
6	12 VDC

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

Refer to page 308 for ordering coil only.

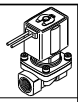
Bracket

Nil	None
B	With bracket

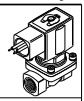
* Removal of bracket is not possible.

Electrical entry

G- Grommet



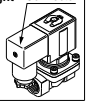
C- Conduit



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 diameter							Material	
Model		VXED21	VXED22	VXED23	3 (10 mmø)	4 (15 mmø)	5 (20 mmø)	6 (25 mmø)	7 (35 mmø)	8 (40 mmø)	9 (50 mmø)	Body	Seal
Port symbol (Port size)	Thread	**02** (1/4)	—	—	●	—	—	—	—	—	—	Brass (C37) Stainless steel	FKM
		03 (3/8)	—	—	●	●	—	—	—	—	—		
		04 (1/2)	—	—	●	●	—	—	—	—	—		
		06 (3/4)	—	—	—	—	●	—	—	—	—		
		—	**10** (1)	—	—	—	—	●	—	—	—		
	Flange	—	**32** (32A)	—	—	—	—	—	●	—	—	CAC408	
		—	—	**40** (40A)	—	—	—	—	—	●	—		
		—	—	**50** (50A)	—	—	—	—	—	—	●		

Table (2) Solenoid Valve Option

Option symbol	Seal material	Body material
A	FKM	Brass (C37), CAC408
H Note)		Stainless steel

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

Table (3) Rated Voltage – Electrical Option

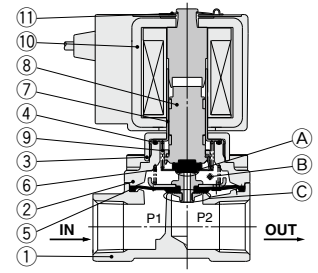
Rated voltage		**L** (With light)
Voltage symbol	Voltage	
5	24 VDC	●
6	12 VDC	—

Construction

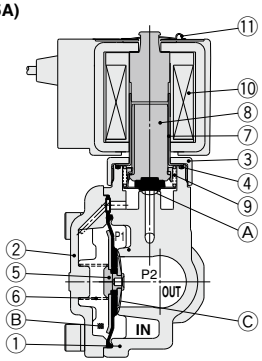
Normally closed (N.C.)

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

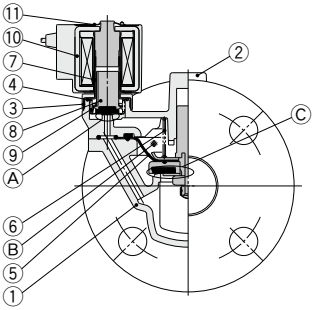
VXED2130 (8A/10A)



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

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

Component Parts

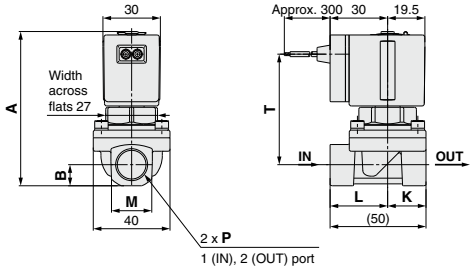
No.	Description	Size	Material	
			Brass (C37) (CAC408) body specification	Stainless steel body specification
1	**Body**	8A to 25A	Brass (C37)	Stainless steel
		32A to 50A	CAC408	—
2	**Bonnet**	8A to 25A	Brass (C37)	Stainless steel
		32A to 50A	CAC408	—
3	**Nut**	8A to 50A	Brass (C37)	Brass (C37), Ni 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.

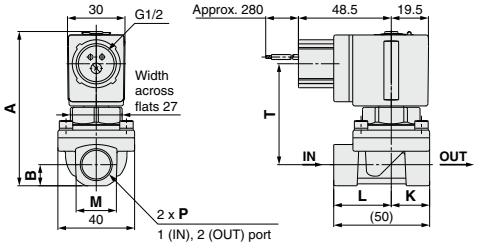
Dimensions: Body Material: Brass (C37), Stainless Steel

VXED2130

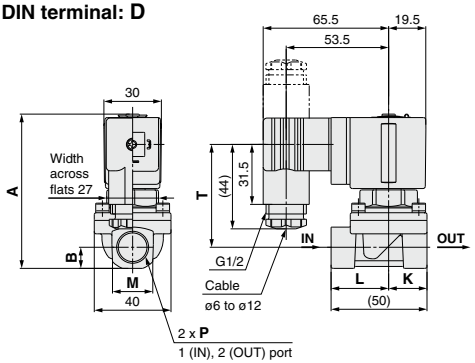
Grommet: G



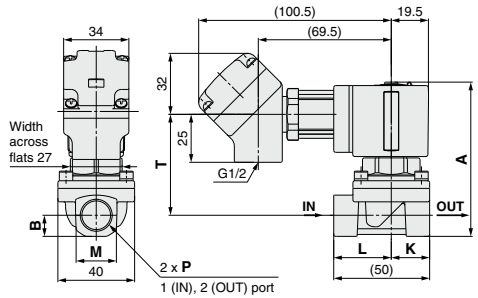
Conduit: C



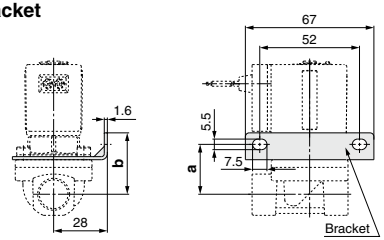
DIN terminal: D



Conduit terminal: T

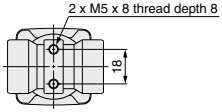


With bracket



VXED2130□□-04□-□□□□

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



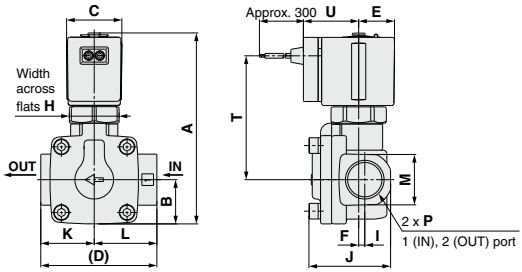
(mm)

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

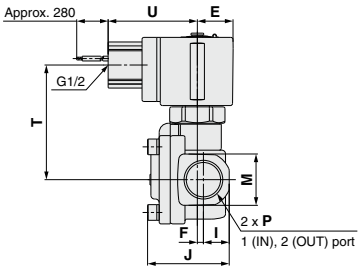
Dimensions: Body Material: Brass (C37), Stainless Steel

VXED2140/2150/2260

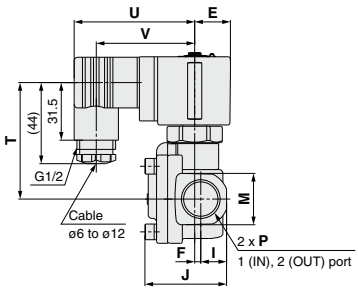
Grommet: G



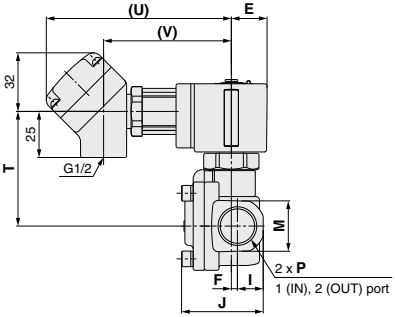
Conduit: C



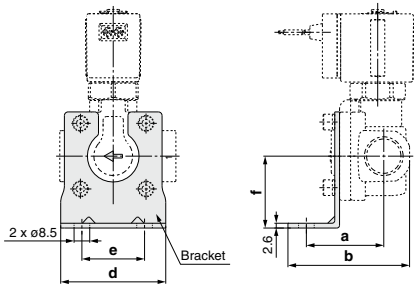
DIN terminal: D



Conduit terminal: T



With bracket



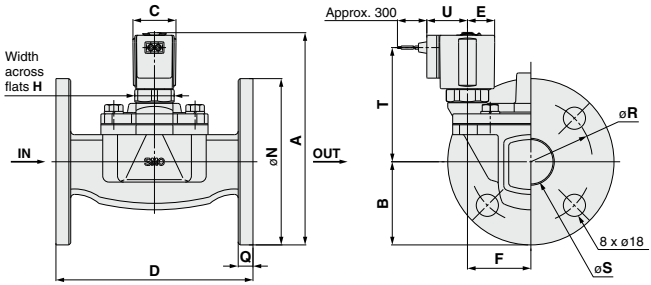
(mm)

Model	Port size	A	B	C	D	E	F	H	I	J	K	L	M	Electrical entry										Bracket mounting dimension				
														Grommet		Conduit		DIN terminal			Conduit terminal							
N.C.	P													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

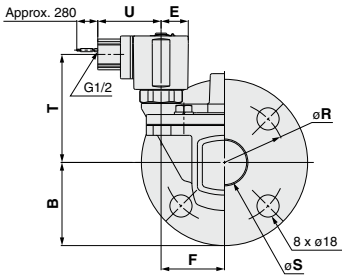
Dimensions: Body Material: Brass (CAC408), Stainless Steel

VXED2270/2380/2390

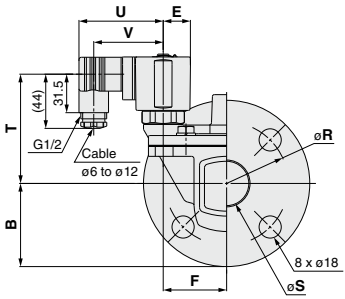
Grommet: G



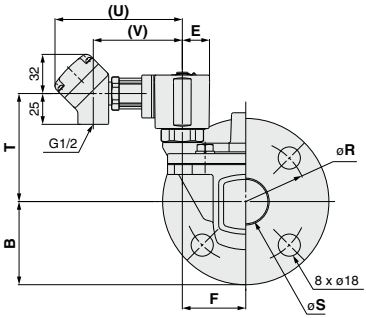
Conduit: C



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		
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