

Normal Close High Vacuum Solenoid Valve



*1 Excluding grommet/AC

Minimum operating pressure

1×10^{-6} Pa(abs)^{*1}

*1 OUT side

Leakage

Internal

1.3×10^{-9} Pa·m³/s

External

1.3×10^{-11} Pa·m³/s



Power consumption

Max. 25% reduction

Size	XSA [W]	Previous model [W]
XSA1	4.5	6
XSA2	7	8
XSA3	10.5	11.5

Weight

Max. 18%^{*1} lighter

*1 XSA2- $\frac{3}{2}$

0.5 kg **→** **0.41 kg**^{New}

Reverse pressure potential

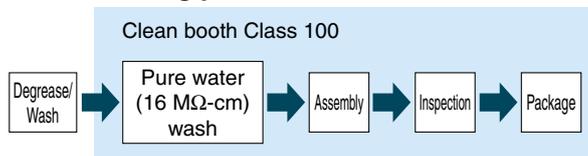
0.5 MPa(G)^{*1}

*1 XSA1-12 (Refer to the Specifications on page 3.)

Consistent clean room production

Washed, assembled and inspected in a Class 100 environment, and sealed in double bags

Manufacturing process

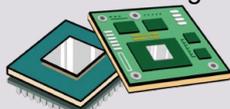


Applications

Photovoltaic cell manufacturing



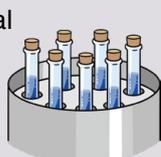
Semiconductor manufacturing



LCD manufacturing



Medical



Food



New

Female thread type (Rc, NPT) added



XSA Series



CAT.ES140-7B [Ⓐ]

Flame resistance
UL94V-0 compliant

Power consumption:

* DC/Class B

4.5 W (Size 1)

7 W (Size 2)

10.5 W (Size 3)

Electrical entry

	DC	AC
Grommet	●	—
DIN terminal	●	●
Terminal	●	●
Conduit	●	●
Flat terminal	●	—

Reduced particle generation

Moving the spring from the sliding part of the armature to the body reduces contact with the spring, thus reducing particle generation.

Improved sealing performance

The larger spring creates a firm seal!
Leakage (Internal): 1.3×10^{-9} Pa·m³/s

Fluid temperature

5 to 60°C

Rated voltage

AC	100 V, 200 V, 110 V, 220 V, 240 V, 48 V, 24 V, 230 V
DC	24 V, 12 V

2 types of fittings and female threads available



Face seal fitting

A fitting with high leak integrity for vacuum to positive pressure, that forms a seal through the placement of a metal gasket at the end of the sleeve and the tightening of the nut.



Compression fitting

A self-aligning tube fitting that uses ferrule rings to compress the tubing, creating a seal when the nut is tightened.



Female thread (Rc, NPT)

Variations

Face seal fitting	Model	Orifice diameter				Fitting/Port size (inch)		Minimum operating pressure Pa(abs)	Leakage Pa·m ³ /s	
		ø2	ø3	ø4.5	ø6	1/4	3/8		Internal	External
Compression fitting	XSA1	●	●	—	—	●	—	1 x 10 ⁻⁶	1.3 x 10 ⁻⁹	1.3 x 10 ⁻¹¹
	XSA2	—	●	●	●	●	●			
	XSA3	—	—	●	●	●	●			

Female thread (Rc, NPT)	Model	Orifice diameter				Female thread (Rc, NPT)			Minimum operating pressure Pa(abs)	Leakage Pa·m ³ /s	
		ø2	ø3	ø4.5	ø6	1/8	1/4	3/8		Internal	External
Female thread (Rc, NPT)	XSA1	●	●	—	—	●	—	—	1 x 10 ⁻⁶	1.3 x 10 ⁻⁹	1.3 x 10 ⁻¹¹
	XSA2	—	●	●	—	—	●	—			
	XSA3	—	—	●	●	—	—	●			



Face seal fitting

Compression fitting

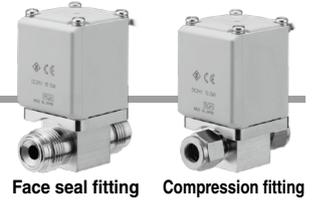
Female thread (Rc, NPT)

Normal Close High Vacuum Solenoid Valve XSA Series



*1 Excluding grommet/AC

How to Order



Face seal fitting Compression fitting



Female thread type

Face seal fitting
Compression fitting

XSA 1 - 1 2 S - 5 G 2 - []

Female thread type

XSA 1 - 1 1 P - 5 G 2

Valve size Orifice diameter Fitting size

Face seal fitting/Compression fitting

Valve size	Orifice diameter	Fitting size
1 Size 1	1 $\phi 2$	2 1/4
	2 $\phi 3$	
2 Size 2	2 $\phi 3$	2 1/4
	3 $\phi 4.5$	
	4 $\phi 6$	
3 Size 3	3 $\phi 4.5$	2 1/4
	4 $\phi 6$	

Female thread type

Valve size	Orifice diameter	Fitting size
1 Size 1	1 $\phi 2$	1 1/8
	2 $\phi 3$	
2 Size 2	2 $\phi 3$	2 1/4
	3 $\phi 4.5$	
3 Size 3	3 $\phi 4.5$	3 3/8
	4 $\phi 6$	

Fitting type

Face seal fitting/Compression fitting

V	Face seal fitting
S	Compression fitting

Female thread type

P	Rc female thread
N	NPT female thread

Voltage

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

Spacer

Nil	None
A	With spacer

* The spacer is used to raise the body when fastening it onto a flat area. Refer to the table below if spacers are required separately.

Electrical entry

		DC	AC
G	Grommet	●	—
GS	Grommet (With surge voltage suppressor)	●	● ^{*1}
D	DIN terminal (With surge voltage suppressor)	●	●
DL	DIN terminal with light (With surge voltage suppressor)	●	●
DO	DIN terminal without connector (With surge voltage suppressor)	●	●
T	Terminal (With surge voltage suppressor)	●	●
TL	Terminal with light (With surge voltage suppressor)	●	●
C	Conduit (With surge voltage suppressor)	●	●
F	Flat terminal	●	—

*1 Not CE-compliant

Table: Spacer Part No.
(Applicable to the face seal fitting/compression fitting)

Model	Part no.
XSA1	XSA1R-8-1
XSA2	XSA2R-8-1
XSA3	

For the special option below, refer to page 7.

Special electrical entry direction

XSA Series

Specifications

Model	XSA1-1 $\frac{1}{2}$	XSA1-2 $\frac{1}{2}$	XSA2-22	XSA2-32	XSA2-43* ³	XSA3-3 $\frac{2}{3}$	XSA3-43
Action	Normally closed						
Fluid	Air, Inert gas						
Orifice diameter mm \varnothing	2	3	4.5	6	4.5	6	
Withstand pressure MPa(G)	1.5						
Minimum operating pressure Pa(abs)/OUT side	1 x 10 ⁻⁶						
Maximum operating pressure MPa(G)/IN side	1.0						
Maximum operating pressure differential MPa* ¹	0.8	0.3	1.0	0.3	0.1	0.8	0.3
Reverse pressure potential MPa(G)* ²	0.5	0.25	0.4	0.2	0.05	0.2	0.15
Leakage Pa·m ³ /s* ⁴	Internal	1.3 x 10 ⁻⁹					
	External	1.3 x 10 ⁻¹¹					
Piping connection system	Face seal fitting/Compression fitting/(Rc, NPT) Female thread						
Connection size	Face seal fitting (inch)	1/4			3/8	1/4	3/8
	Compression fitting (inch)	1/4			—	3/8	—
(Rc, NPT) Female thread	1/8	1/4	—	3/8	—	—	
Ambient and fluid temperature °C	5 to 60						
Rated voltage* ⁵	100/110/200/220/230/240/24/48 VAC 12/24 VDC						
Power consumption W* ⁶	DC	4.5	7	10.5			
Apparent power VA* ⁶	AC	7	9.5	12			
Coil temperature rise °C* ⁷	DC	50	55	65			
	AC	60	70	70			
Allowable voltage fluctuation	±10% or less of the rated voltage						
Allowable leakage voltage	DC	2% or less of the rated voltage					
	AC	5% or less of the rated voltage					
Coil insulation type	Class B						
Weight kg* ⁸	Face seal fitting	0.28	0.41	0.42	0.53	0.62	
	Compression fitting	0.28	0.41	0.42	0.53	0.55	
	(Rc, NPT) Female thread	0.33	0.53	—	0.74	0.74	

*1 The operating pressure differential indicates the difference between Port 1 (high pressure side) and Port 2 (low pressure side).

Example) In the case of 0.3 MPa, Port 2 is a vacuum (1 Torr or less), while Port 1 can be pressurized to 0.2 MPa(G).

*2 The reverse pressure potential indicates the pressure which can be applied from Port 2 when Port 1 is at atmospheric pressure.

*3 Face seal fitting/compression fitting only

*4 Leakage when the ambient temperature is at 20°C and there is 0.1 MPa of differential pressure. Gas permeation is not included.

*5 AC type is equipped with full-wave rectifier.

*6 Power consumption/Apparent power: The value when there is an ambient temperature of 20°C and when the rated voltage is applied. (Variation: ±10%)

*7 The value when there is an ambient temperature of 20°C and when the rated voltage is applied. The value depends on the ambient environment. This is for reference.

*8 Indicates case of grommet type

Flow Rate Characteristics

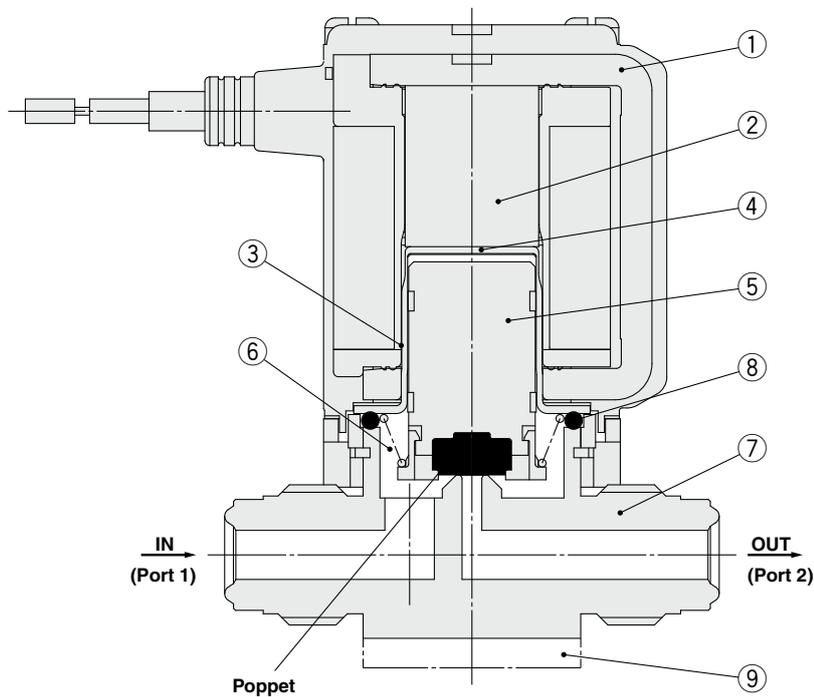
Face seal fitting/Compression fitting

		XSA1-12	XSA1-22	XSA2-22	XSA2-32	XSA2-43	XSA3-32	XSA3-43
Flow rate characteristics	C[dm ³ /(s·bar)]	0.55	1.07	1.07	1.51	2.78	1.54	2.89
	b	0.41	0.36	0.34	0.24	0.21	0.24	0.21

(Rc, NPT) Female thread

		XSA1-11	XSA1-21	XSA2-22	XSA2-32	XSA3-33	XSA3-43
Flow rate characteristics	C[dm ³ /(s·bar)]	0.54	1.14	1.14	2.23	2.37	3.50
	b	0.36	0.39	0.42	0.38	0.40	0.15

Construction/Operation



Component Parts

No.	Description	Material
1	Solenoid coil	Cu + Fe + Resin
2	Core	Fe
3	Tube	Stainless steel
4	Seat (PET seat to shut the residual magnetism)	PET
5	Armature assembly	FKM, Stainless steel, Resin (PPS)
6	Spring	Stainless steel
7	Body	Stainless steel
8	O-ring	FKM
9	Spacer	Al

■: Parts in contact with gas

<Option>

⑨ Spacer (Face seal fitting/compression fitting only): The spacer is used to raise the body when fastening it onto a flat area.

<Operating principle>

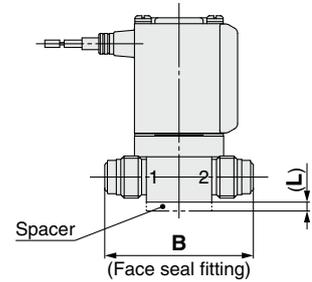
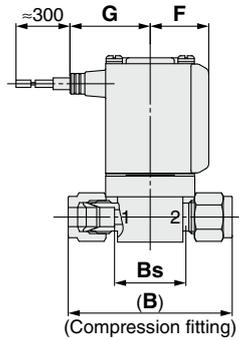
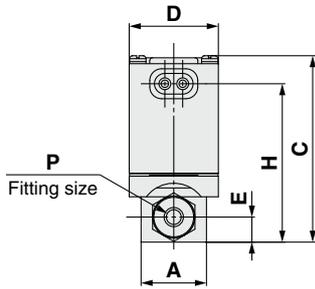
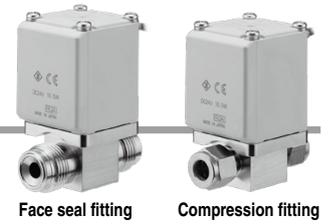
By energizing the solenoid coil ①, the armature assembly ⑤ overcomes the composite force, which consists of the force acting on the poppet due to differential pressure and the reactive force of the spring ⑥, and is adsorbed to the core ② side, thus opening the poppet.

When the energizing of the solenoid coil ① is canceled, the armature assembly ⑤ is separated from the core ② side by the reactive force of the spring ⑥, thus closing the poppet.

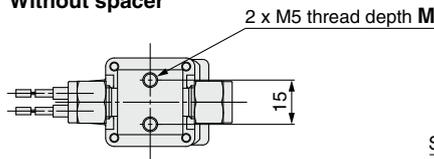
XSA Series

Dimensions: Face Seal Fitting, Compression Fitting

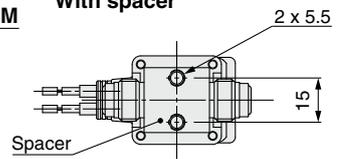
Grommet: G



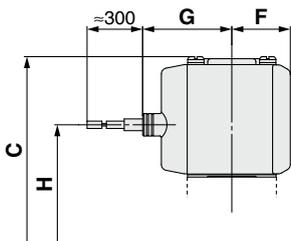
Without spacer



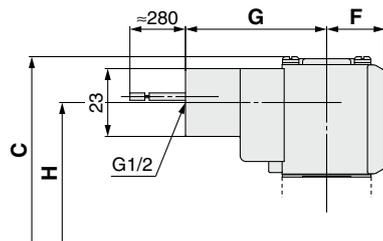
With spacer



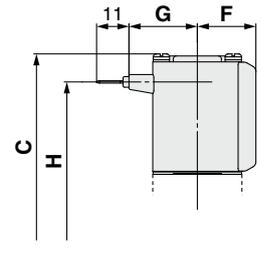
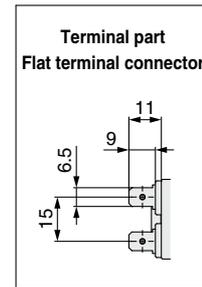
Grommet: GS



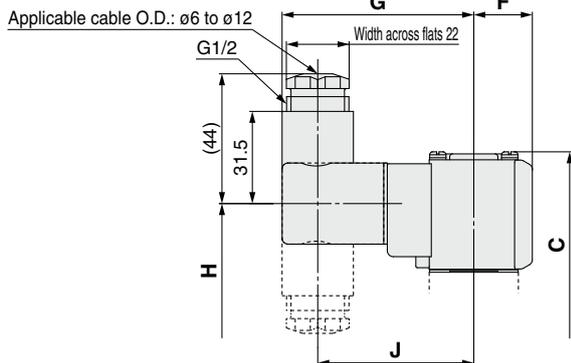
Conduit: C



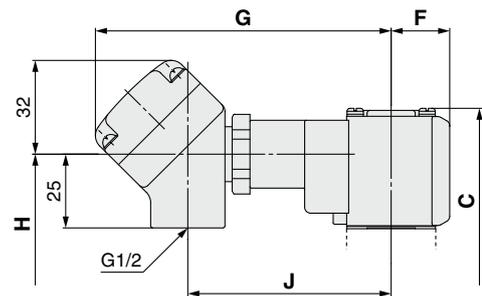
Flat terminal: F



DIN terminal: D



Terminal: T



Dimensions

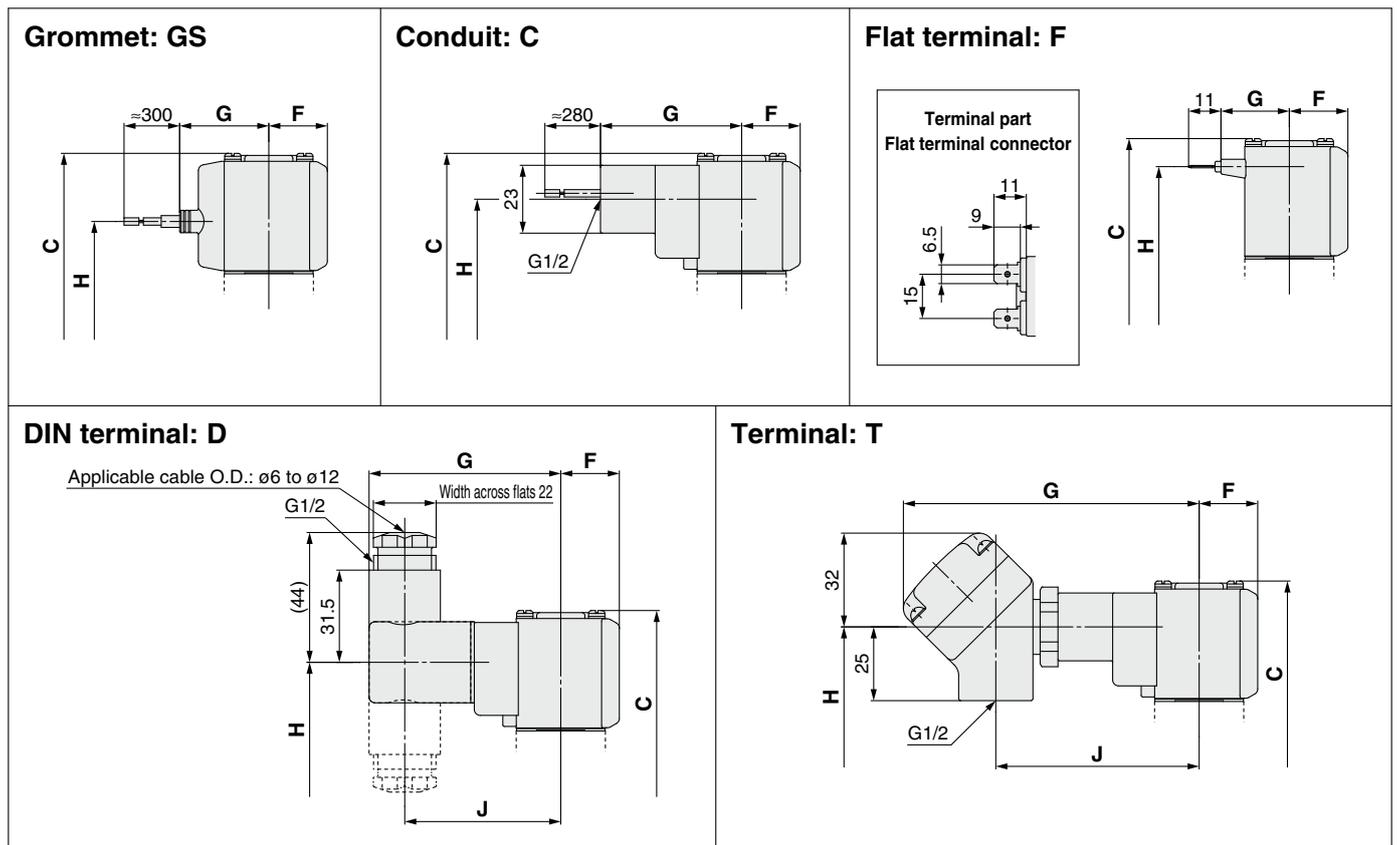
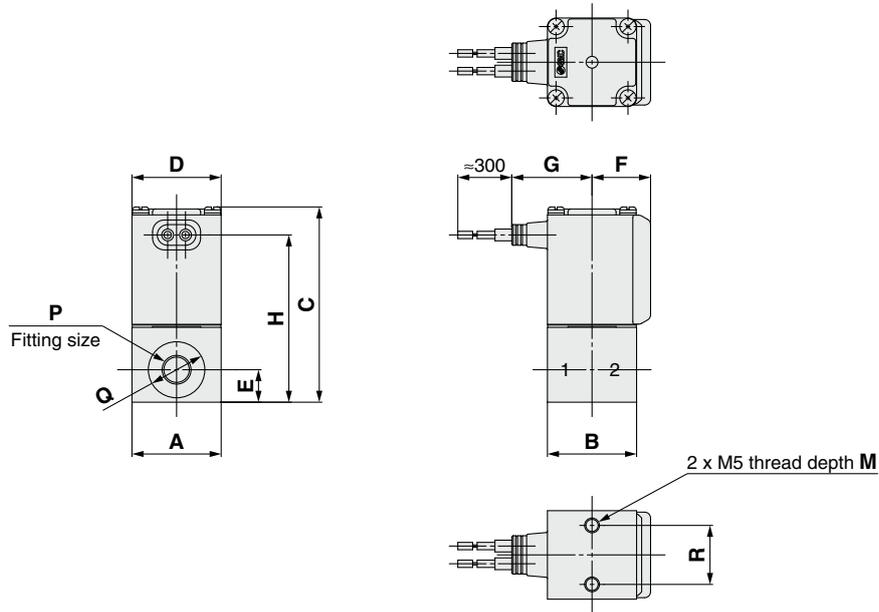
Model	A	B	Bs	C	D	E	F	L	M	P [inch]	Grommet: G		Grommet: GS		Conduit: C		Flat terminal: F		DIN terminal: D			Terminal: T		
											G	H	G	H	G	H	G	H	G	H	J	G	H	J
											XSA1-□2S	22	55	24	63	30	8.5	20	3	8	1/4	27	53.5	30
XSA1-□2V		50	—																					
XSA2-□2S		63	31.5							1/4														
XSA2-□2V		56	—	73.5	35		22			3/8	29.5	63	32.5	49.5	50	57	25.5	63	67	55	55	102	57	71
XSA2-43S		64.5	31							1/4														
XSA2-43V		67	—							3/8														
XSA3-32S	25	63	31.5			11.5		5	10	1/4	32	67.5	35	54		61.5		67.5		59.5			61.5	
XSA3-32V		56	—		40		24.5			3/8							28		69.5		57.5	104.5		73.5
XSA3-43S		64.5	31							1/4														
XSA3-43V		67	—	82.5						3/8		72		58.5		66		72		64				66



Female thread type

Dimensions: (Rc, NPT) Female Thread

Grommet: G



Dimensions

[mm]

Model	A	B	C	D	E	F	M	P	Q	R	Grommet: G		Grommet: GS		Conduit: C		Flat terminal: F		DIN terminal: D			Terminal: T		
											G	H	G	H	G	H	G	H	G	H	J	G	H	J
XSA1-□1P(N)	30	30	66	30	11	20	8	1/8	ø19	20	27	56.5	30	43	47.5	50.5	23	56.5	64.5	48.5	52.5	99.5	50.5	68.5
XSA2-□2P(N)	36	36	79	35	14	22	10	1/4	ø24	20	29.5	68.5	32.5	55	50	62.5	25.5	68.5	67	60.5	55	102	62.5	71
XSA3-□3P(N)	40	40	88	40	16.5	24.5		3/8	ø29	22	32	77.5	35	64	52.5	71.5	28	77.5	69.5	69.5	57.5	104.5	71.5	73.5

Special Option



Special Electrical Entry Direction

XSA 1-12S-5G2

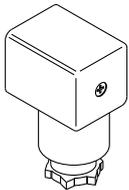
Enter standard product number.

Special electrical entry direction

Symbol	Electrical entry direction
A	
B	
C	

Replacement Parts

• DIN Connector Part No.



<For Class B Coil>

Electrical option	Rated voltage	Connector part no.
None	24 VDC	GDM2A-G
	12 VDC	
	100 VAC	
	110 VAC	
	200 VAC	
	220 VAC	
	230 VAC	
	240 VAC	
	24 VAC	
48 VAC		
With light	24 VDC	GDM2A-L5
	12 VDC	GDM2A-L6
	100 VAC	GDM2A-L1
	110 VAC	GDM2A-L1
	200 VAC	GDM2A-L2
	220 VAC	GDM2A-L2
	230 VAC	GDM2A-L2
	240 VAC	GDM2A-L2
	24 VAC	GDM2A-L5
48 VAC	GDM2A-L15	

* Select an appropriate DIN connector suitable for the coil insulation type.

• Gasket Part No. for DIN Connector

VCW20-1-29-1 (For Class B Coil)

• Lead Wire Assembly for Flat Terminal (Set of 2 pcs.)

VX021S-1-16FB