



**Series VC**  
**Direct Operated**  
**2 Port Solenoid Valve for Water**  
***Series* VCW**



# Multipurpose Valve for Water

## Direct Operated 2 Port Solenoid Valve for Water

# Series VCW

### Improved durability

**(SMC comparison: Twice the life of previous series)**

The internal wear of moving parts has been reduced through the use of a unique magnetic material. Service life, durability and corrosion resistance have been increased.

**Large flow rate:  
Cv factor 0.16 to 2.1**

**Smaller size: Single valve –15% reduction in volume (Class 2)**

**Manifold length – Reduced by 18%  
(Class 3 : 7 stations) (SMC comparison)**

**Internal surge voltage suppressor**

#### Internal rectifier circuit (AC)

- AC/DC switchover is possible by simply changing the coil
- Reduced noise

#### Miniaturized coil

#### Size and weight reduced

New compact coil reduces the overall size & weight of the valve

Volume –15% } SMC comparison  
Weight –20% } (Class 2)

#### Improved corrosion resistance

Special materials introduced

**Clip type**

#### Quick change coils

Clip design makes coil replacement easy

#### Incombustibility UL94

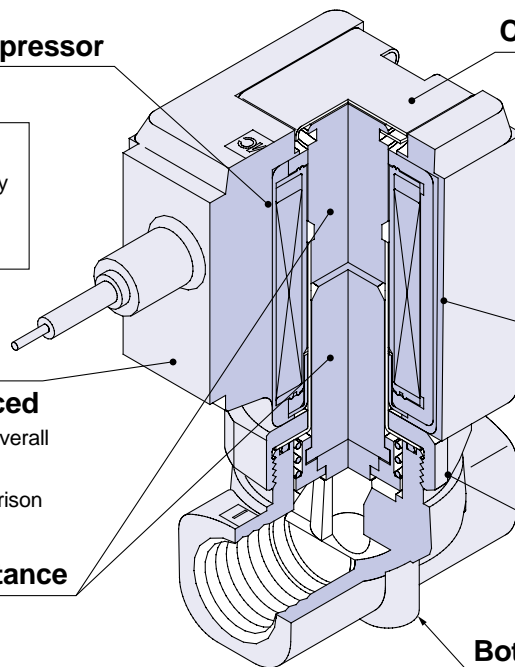
Conforms to V-0

#### Threaded assembly

Simplifies maintenance

#### Bottom mounting threads

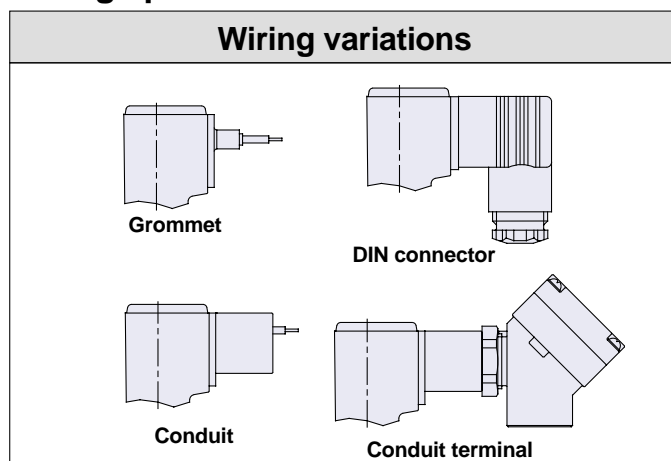
Mounting bracket also available



### A variety of wiring options

Grommet, DIN connector, Conduit, Conduit terminal

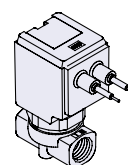
### Wiring specifications



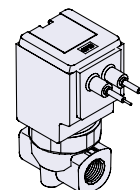
### Enclosure:

**Splash-proof (equivalent to IP65)**

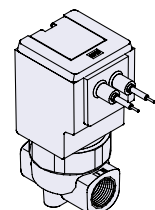
### 3 sizes available



VCW2  
Class 2



VCW3  
Class 3



VCW4  
Class 4

Series VC

# Direct Operated 2 Port Solenoid Valve for Water Series VCW

## How to Order Valves (Single Type)

VCW 2 1 1 G 2 02

**For water**

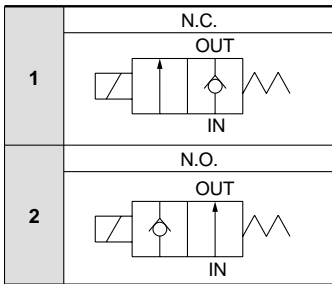
When no symbol is shown for material and insulation type

- Body material: Brass
- Seal material: NBR
- Coil insulation: Class B

**Series**

2	Class 2
3	Class 3
4	Class 4

**Valve type**



**Voltage**

1	100VAC
2	200VAC
3	110VAC
4	220VAC
5	24VDC
6	12VDC

\* Contact SMC regarding other voltages.

**Electrical entry**

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

\* All are equipped with surge voltage suppressor.

**Option. Foot bracket**

Valve model	Port size	Bracket part no.
VCW2□	1/8, 1/4	VCW20-12-01
VCW3□	1/4, 3/8	VCW30-12-02
	1/2	VCW30-12-04
VCW4□	1/4, 3/8	VCW40-12-02
	1/2	VCW30-12-04
	3/4	VCW40-12-06

\* Bracket material: Stainless steel

**Material and insulation type**

Symbol	Body material	Seal material	Coil insulation	Note
Nil	Brass	NBR	B	
A		FKM		
B		EPDM		
C		PTFE		
G	Stainless steel	NBR		
H		FKM		
J		EPDM		
K		PTFE		
L	FKM		For pure water <sup>Note)</sup>	

Note) A high corrosion resistant specification is used for the core material.

**Thread type**

Nil	Rc
F	G
N	NPT
T	NPTF

**Port size**

Symbol	Port size	Class 2	Class 3	Class 4
01	1/8 (6A)	○	—	—
02	1/4 (8A)	○	○	○
03	3/8 (10A)	—	○	○
04	1/2 (15A)	—	○	○
06	3/4 (20A)	—	—	○

**Orifice size**

Symbol	Orifice diameter	Class 2	Class 3	Class 4
2	ø2mm	○	—	—
3	ø3mm	○	○	○
4	ø4mm	○	○	○
5	ø5mm	○	○	○
7	ø7mm	—	○	○
10	ø10mm <sup>Note)</sup>	—	○	○

Note) ø10 is N.C. (normally closed) only.

\* Refer to model selection on page 9 for orifice and port size combinations.

## Standard Specifications



Valve specifications	<b>Valve construction</b>		Direct operated poppet
	<b>Fluid</b> <sup>Note 1)</sup>		Water, Pure water (except waste water or agricultural water)
	<b>Withstand pressure MPa</b>		5.0
	<b>Body material</b>		Brass, Stainless steel
	<b>Seal material</b>		NBR, FKM, EPDM, PTFE
	<b>Ambient temperature °C</b>		-20 to 60
	<b>Fluid temperature °C</b>		1 to 60 (with no freezing)
	<b>Enclosure</b>		Splash-proof (equivalent to IP65)
	<b>Atmosphere</b>		Location without corrosive or explosive gases
	<b>Valve leakage cm<sup>3</sup>/min</b>		0 (with water pressure)
<b>Mounting position</b>		Unrestricted	
Coil specifications	<b>Rated voltage</b>		24V, 12VDC, 100V, 110V, 200V, 220VAC (50/60Hz)
	<b>Allowable voltage fluctuation</b>		±10% of rated voltage
	<b>Coil insulation type</b>		Class B
	<b>Power consumption</b>	<b>DC</b>	VCW2: 6W, VCW3: 8W, VCW4: 11.5W
<b>AC 50/60Hz</b> <sup>Note 2)</sup>		VCW2: 8.5VA, VCW3: 10VA, VCW4: 13VA	

Note 1) When using pure water, select "L" for the type of material (stainless steel, FKM).

Note 2) Since a rectifier circuit is used for AC, there is no difference in power consumption for starting or holding.

## Characteristic Specifications

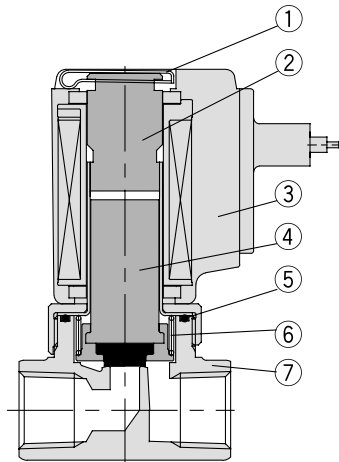
Model	Class	<sup>Note 1)</sup> Port size	<sup>Note 1)</sup> Orifice diameter	N.C. Max. operating pressure difference MPa	N.O. Max. operating pressure difference MPa	Effective area mm <sup>2</sup> (Cv factor)	Max. system pressure MPa	<sup>Note 2)</sup> Weight kg
VCW2	2	1/8 (6A) 1/4 (8A)	ø2	2.0	0.9	2.8 (0.16)	3.0	1/8: 0.21 1/4: 0.24
			ø3	0.8	0.45	5.9 (0.33)		
			ø4	0.5	0.25	9.2 (0.51)		
			ø5	0.3	0.15	11.7 (0.65)		
VCW3	3	1/4 (8A) 3/8 (10A) 1/2 (15A)	ø3	2.0	0.8	6.3 (0.35)	3.0	1/4: 0.42 3/8: 0.40 1/2: 0.49
			ø4	0.8	0.42	9.7 (0.54)		
			ø5	0.5	0.23	14.4 (0.80)		
			ø7	0.2	0.13	24.8 (1.38)		
			ø10	0.1	–	37.8 (2.10)		
VCW4	4	1/4 (8A) 3/8 (10A) 1/2 (15A) 3/4 (20A)	ø3	3.0	1.2	6.3 (0.35)	3.0	1/4: 0.58 3/8: 0.55 1/2: 0.62 3/4: 0.78
			ø4	1.3	0.73	10.8 (0.60)		
			ø5	0.7	0.47	15.3 (0.85)		
			ø7	0.3	0.22	24.8 (1.38)		
			ø10	0.12	–	37.8 (2.10)		

Note 1) Refer to model selection on page 9 regarding port size and orifice size combinations.

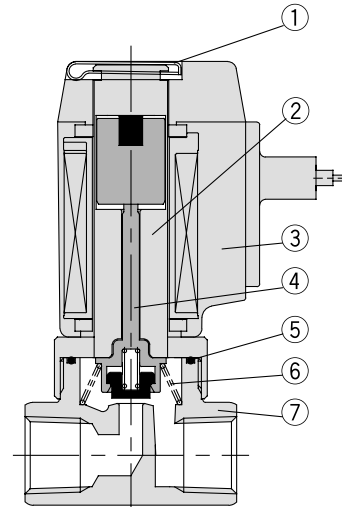
Note 2) The weight is the value for the grommet type.

## Construction

### N.C.



### N.O.



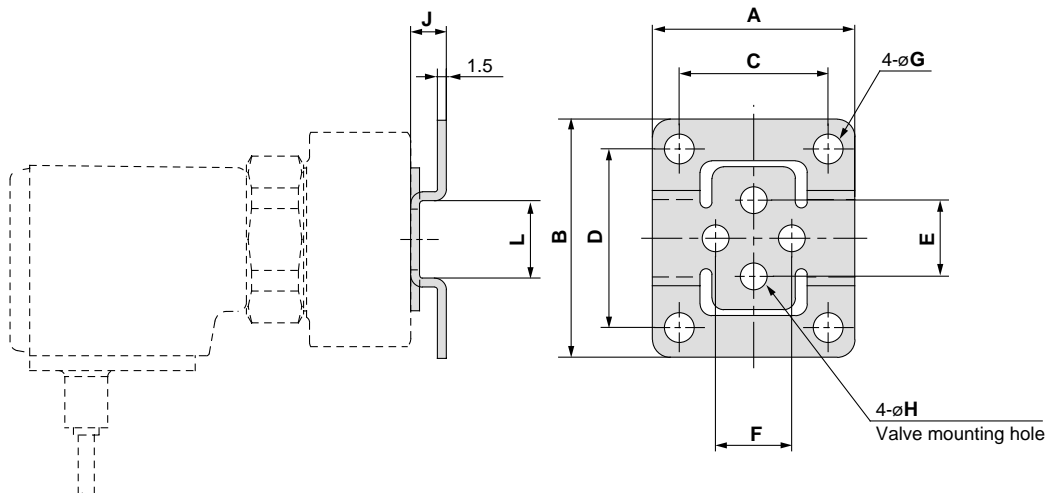
### Parts list

No.	Description	Material	
		Standard	Optional
1	Clip	Stainless steel	–
2	Tube assembly	Stainless steel	–
3	Coil assembly	Class B	–
4	Armature assembly	Class 2 Stainless steel, PPS, NBR Class 3/4 Stainless steel, NBR	Stainless steel, NBR/Stainless steel, FKM/Stainless steel, EPDM/Stainless steel, PTFE
5	O-ring	NBR	FKM, EPDM, PTFE
6	Return spring	Stainless steel	–
7	Body	Brass	Stainless steel

### Parts list

No.	Description	Material	
		Standard	Optional
1	Clip	Stainless steel	–
2	Tube assembly	Stainless steel, PTFE	–
3	Coil assembly	Class B	–
4	Push rod assembly	PPS, NBR	Stainless steel, NBR/Stainless steel, FKM, Stainless steel, EPDM/Stainless steel, PTFE
5	O-ring	NBR	FKM, EPDM, PTFE
6	Return spring	Stainless steel	–
7	Body	Brass	Stainless steel

## Bracket Dimensions



### Bracket mounting dimensions

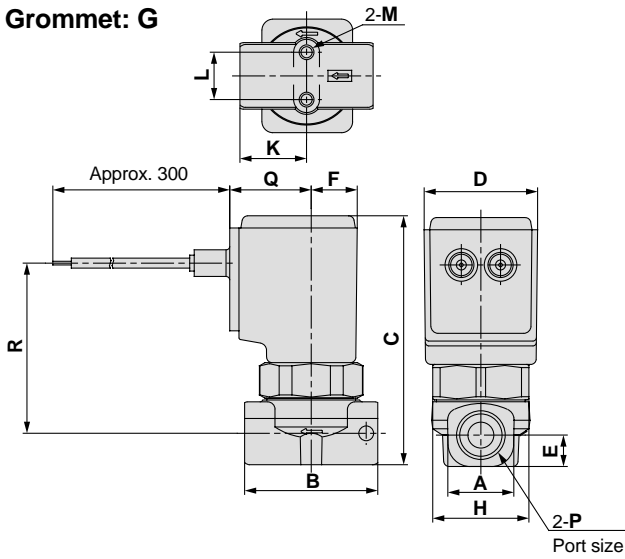
Valve model	Port size	Bracket part no.	A	B	C	D	E	F	G	H	J	L
VCW2□	1/8, 1/4	VCW20-12-01	34	40	25	30	12.8	12.8	5	4.5	6	13
VCW3□	1/4, 3/8	VCW30-12-02	42	52	30	40	19	19	6	5.5	7	19
	1/2	VCW30-12-04	48	56	36	44	23	23	6	5.5	7	23
VCW4□	1/4, 3/8	VCW40-12-02	42	52	30	40	23	23	6	5.5	7	19
	1/2	VCW30-12-04	48	56	36	44	23	23	6	5.5	7	23
	3/4	VCW40-12-06	56	65	44	53	28.2	28.2	6	5.5	7	26

\* Bracket material: Stainless steel

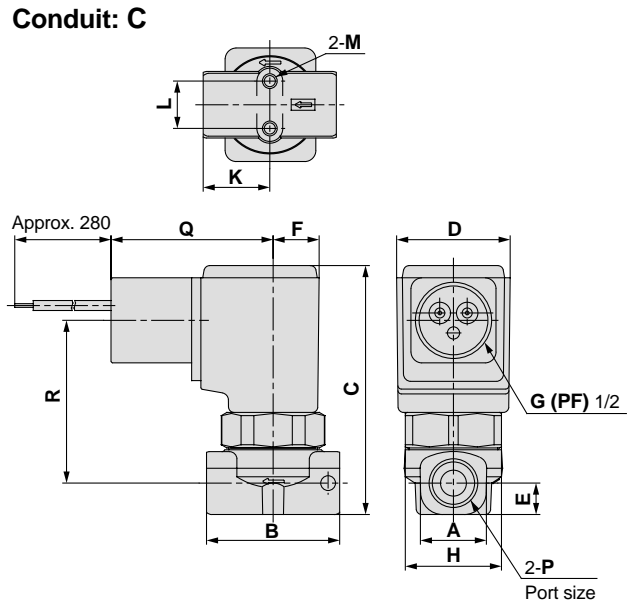
# Series VCW

## Dimensions (N.C.)

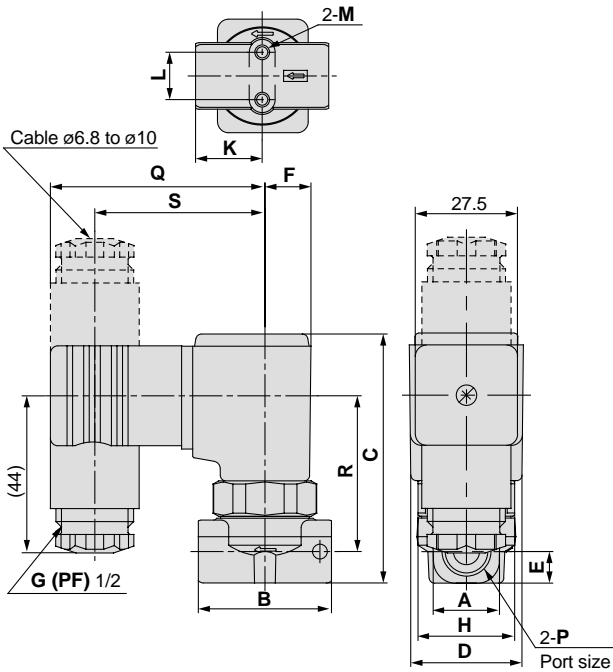
Grommet: G



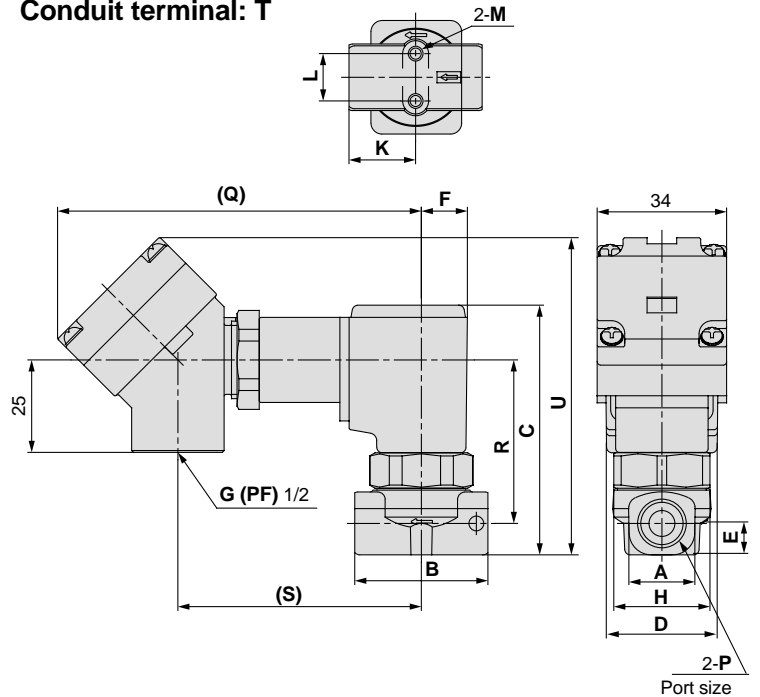
Conduit: C



DIN connector: D



Conduit terminal: T



## N.C.

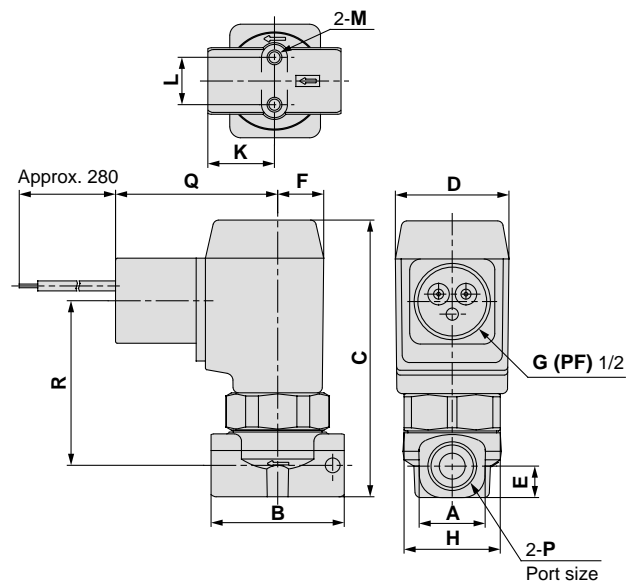
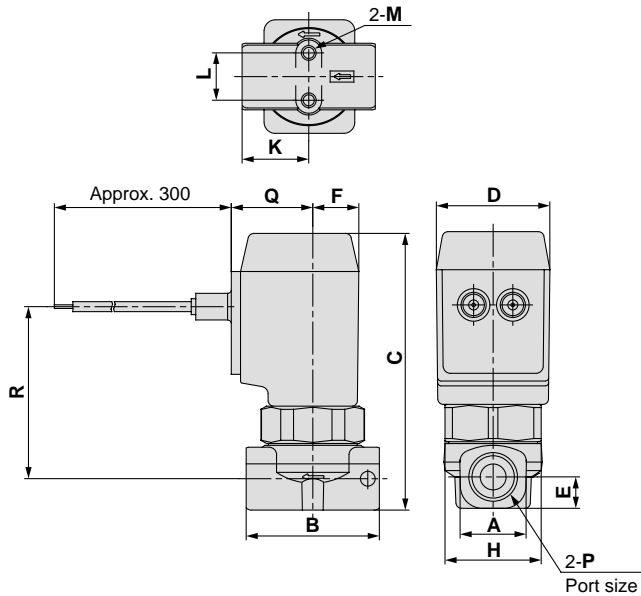
(mm)

Model	P Port size	A	B	C	D	E	F	H	K	L	M	Electrical entry									
												Grommet: G		Conduit: C		DIN connector: D			Conduit terminal: T		
												Q	R	Q	R	Q	R	S	Q	R	S
VCW21	1/8	13.5	28	64	31	6.5	12.5	28	14	12.8	M4	22	45	44	43	58	40.5	46.5	99	43	66
	1/4	18	36	67	31	8.5	12.5	28	18	12.8	M4	22	46	44	44	58	41.5	46.5	99	44	66
VCW31	1/4, 3/8	22	40	80.5	36.5	11	15	32	20	19	M5	24	56.5	46	54.5	60	52	48.5	101	54.5	68
	1/2	30	50	85.5	36.5	13.5	15	32	25	23	M5	24	59	46	57	60	54.5	48.5	101	57	68
VCW41	1/4, 3/8	22	45	89	41	11	17	36	22.5	23	M5	26	64.5	48	62.5	62	60	50.5	103	62.5	70
	1/2	30	50	93.5	41	13.5	17	36	25	23	M5	26	66.5	48	64.5	62	62	50.5	103	64.5	70
	3/4	35	60	101	41	17.5	17	36	30	28.2	M5	26	70	48	68	62	65.5	50.5	103	68	70

## Dimensions (N.O.)

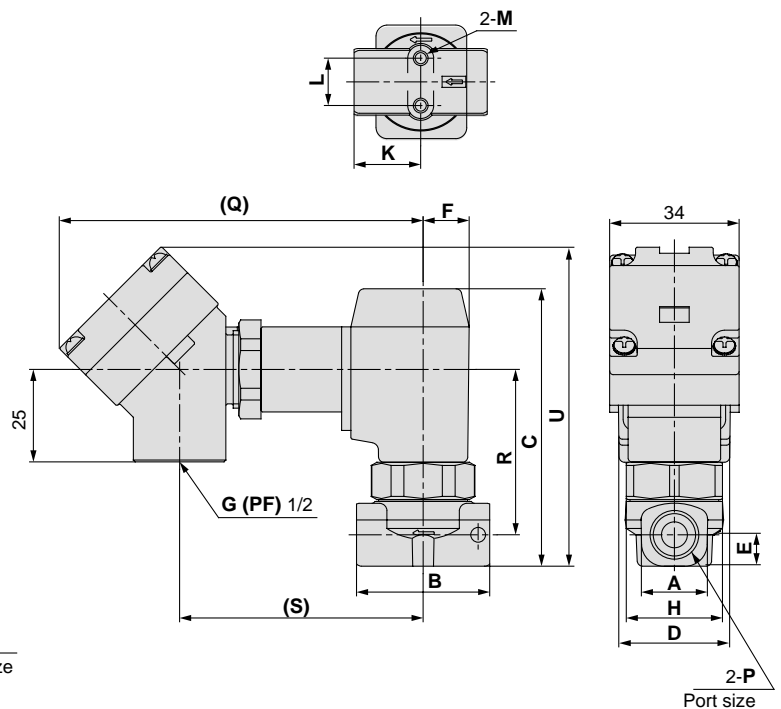
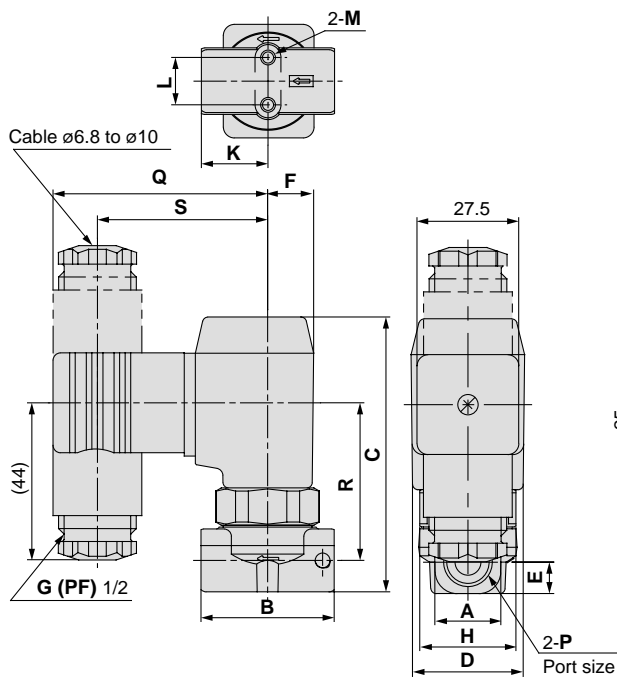
Grommet: G

Conduit: C



DIN connector: D

Conduit terminal: T



N.O.

(mm)

Model	P Port size	A	B	C	D	E	F	H	K	L	M	Electrical entry											
												Grommet: G			Conduit: C			DIN connector: D			Conduit terminal: T		
												Q	R		Q	R		Q	R	S	Q	R	S
VCW22	1/8	13.5	28	71.5	31	6.5	12.5	28	14	12.8	M4	22	45.5	44	43.5	58	41	46.5	99	43.5	66		
	1/4	18	36	74.5	31	8.5	12.5	28	18	12.8	M4	22	46.5	44	44.5	58	42	46.5	99	44.5	66		
VCW32	1/4, 3/8	22	40	88	36.5	11	15	32	20	19	M5	24	57	46	55	60	52.5	48.5	101	55	68		
	1/2	30	50	93	36.5	13.5	15	32	25	23	M5	24	59.5	46	57.5	60	55	48.5	101	57.5	68		
VCW42	1/4, 3/8	22	45	96.5	41	11	17	36	22.5	23	M5	26	65	48	63	62	60.5	50.5	103	63	70		
	1/2	30	50	101	41	13.5	17	36	25	23	M5	26	67	48	65	62	62.5	50.5	103	65	70		
	3/4	35	60	108.5	41	17.5	17	36	30	28.2	M5	26	70.5	48	68.5	62	66	50.5	103	68.5	70		

# Series VCW

## How to Order Manifolds

**VV2C W 2** — **02** **01** —

**For water** ●  
Manifold material: Brass

**Series** ●

2	Class 2
3	Class 3
4	Class 4

**Material** ●

Symbol	Material
Nil	Brass
S	Stainless steel

**Stations** ●

02	2 stations
:	:
10	10 stations

\* Refer to the L dimension table on page 7 regarding the maximum number of stations.


**Thread type** ●

Symbol	Thread type
Nil	Rc
N	NPT
T	NPTF
F	G

**OUT port size** ●

Symbol	Port size
01	1/8 (6A)
02	1/4 (8A)

\* All IN ports are 3/8.



## How to Order Manifold Assemblies (Example)

Enter the valve and option models to be mounted under the manifold base part number.

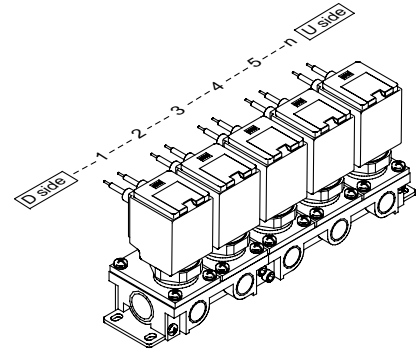
### <Example>

VV2CW2-0501 ..... 1 set Manifold part no.

\* VCW23-5G-2 ..... 5 sets Valve part no. (Stations 1 to 5)

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

Enter together in order, counting from station 1 on the D side.



## How to Order Valves (for Manifold)

**VC W 2 3** — **1** **G** — **2** —

**For water** ●

- Body material: Brass
- Seal material: NBR
- Coil insulation: Class B

**Series** ●

2	Class 2
3	Class 3
4	Class 4

**Valve type** ●

3	N.C. for manifold
4	N.O. for manifold

**Material and insulation type** ●

Symbol	Body material	Seal material	Coil insulation	Note
Nil	Brass	NBR	B	
A		FKM		
B		EPDM		
C		PTFE		
G	Stainless steel	NBR		
H		FKM		
J		EPDM		
K		PTFE		
L	FKM		For pure water <sup>Note)</sup>	

Note) A high corrosion resistant specification is used for the core.

**Orifice size** ●

Symbol	Orifice diameter	Class 2	Class 3	Class 4
2	ø2mm	○	—	—
3	ø3mm	○	○	○
4	ø4mm	○	○	○
5	ø5mm	○	○	○
7	ø7mm	—	○	○

**Electrical entry** ●

G	Grommet
C	Conduit
T	Conduit terminal
TL	Conduit terminal with light
D	DIN connector
DL	DIN connector with light
DO	For DIN connector (without connector)

\* All are equipped with surge voltage suppressor.

**Voltage** ●

1	100VAC
2	200VAC
3	110VAC
4	220VAC
5	24VDC
6	12VDC

\* Contact SMC regarding other voltages.

## Manifold Options

### Blanking plate assembly

**VVCW 2 0** — **3A** — **C**

**Series** ●

2	Class 2
3	Class 3
4	Class 4

**Material and insulation type** ●

Symbol	Plate material	Seal material
Nil	Brass	NBR
A		FKM
B		EPDM
C		PTFE
G	Stainless steel	NBR
H		FKM
J		EPDM
K		PTFE
L	FKM	

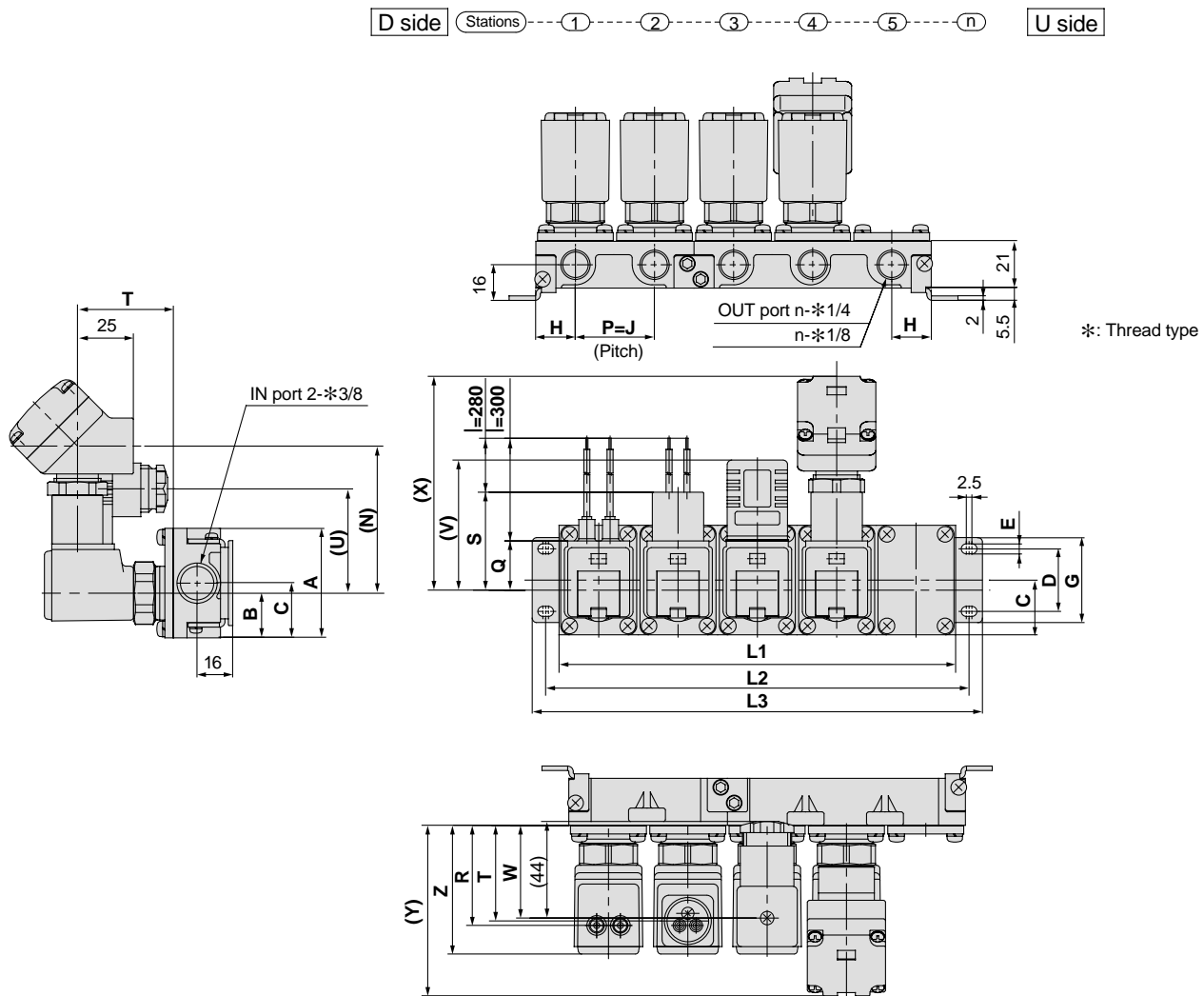
### JIS symbol



This is used by mounting it on the manifold block when a valve is removed for maintenance, or when the mounting of an additional valve is planned, etc.



## Dimensions (N.C.)



### L dimensions

(mm)

Model	Dimension	n (stations)								
		2	3	4	5	6	7	8	9	10
VV2CW2	L1	69	103.5	138	172.5	207	241.5	276	310.5	345
	L2	81	115.5	150	184.5	219	253.5	288	322.5	357
	L3	93	127.5	162	196.5	231	265.5	300	334.5	369
VV2CW3	L1	77	115.5	154	192.5	231	269.5	308	346.5	385
	L2	89	127.5	166	204.5	243	281.5	320	358.5	397
	L3	101	139.5	178	216.5	255	293.5	332	370.5	409
VV2CW4	L1	83	124.5	166	207.5	249	290.5	332	373.5	415
	L2	95	136.5	178	219.5	261	302.5	344	385.5	427
	L3	107	148.5	190	231.5	273	314.5	356	397.5	439
Manifold composition		2stns. x 1	3stns. x 1	2stns. x 2	2stns. + 3 stns.	3stns. x 2	2stns. x 2 + 3stns.	2stns. + 3stns. x 2	3stns. x 3	2stns. x 2 + 3stns. x 2

Note) Manifold bases are composed by connecting 2 station and 3 station bases.

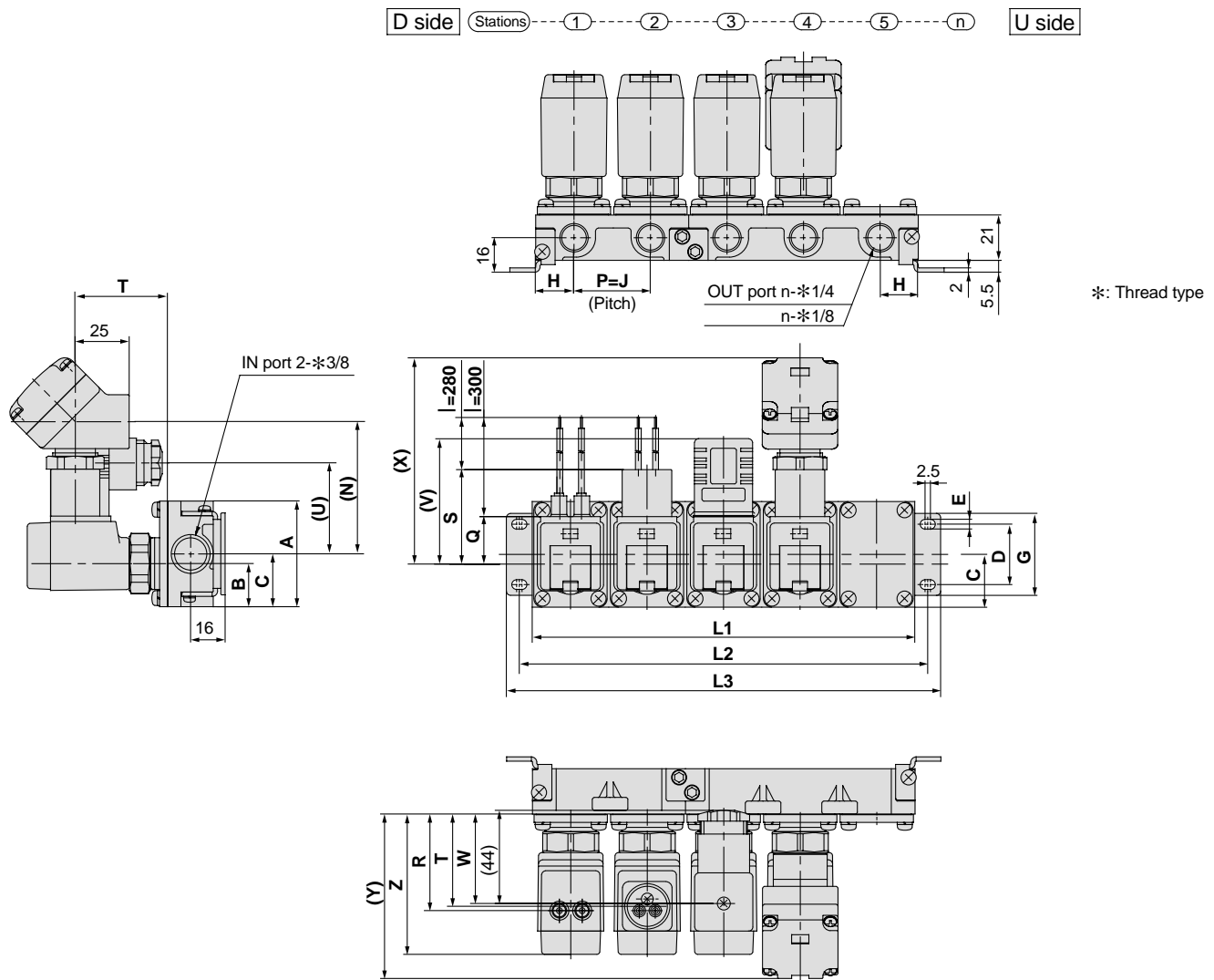
### Dimensions

(mm)

Model	A	B	C	D	E	G	H	J	Z	Electrical entry									
										Grommet		Conduit		DIN connector			Conduit terminal		
										Q	R	S	T	U	V	W	N	X	Y
VV2CW2	49	20	24.5	28	4.5	38	17.3	34.5	58	22	45.5	44	43.5	46	58	41.5	66	99	77
VV2CW3	57	25.5	28.5	30	5.5	42	19.3	38.5	68	24	55	45.5	53	48	60	51	68	101	86.5
VV2CW4	57	25.5	28.5	30	5.5	42	20.8	41.5	76	26	62.5	47.5	60.5	50	62	58.5	70	103	94

# Series VCW

## Dimensions (N.O.)



### L dimensions

Model	Dimension	n (stations)								
		2	3	4	5	6	7	8	9	10
VV2CW2	L1	69	103.5	138	172.5	207	241.5	276	310.5	345
	L2	81	115.5	150	184.5	219	253.5	288	322.5	357
	L3	93	127.5	162	196.5	231	265.5	300	334.5	369
VV2CW3	L1	77	115.5	154	192.5	231	269.5	308	346.5	385
	L2	89	127.5	166	204.5	243	281.5	320	358.5	397
	L3	101	139.5	178	216.5	255	293.5	332	370.5	409
VV2CW4	L1	83	124.5	166	207.5	249	290.5	332	373.5	415
	L2	95	136.5	178	219.5	261	302.5	344	385.5	427
	L3	107	148.5	190	231.5	273	314.5	356	397.5	439
Manifold composition		2stns. x 1	3stns. x 1	2stns. x 2	2stns. + 3stns.	3stns. x 2	2stns. x 2 + 3stns.	2stns. + 3stns. x 2	3stns. x 3	2stns. x 2 + 3stns. x 2

Note) Manifold bases are composed by connecting 2 station and 3 station bases.

### Dimensions

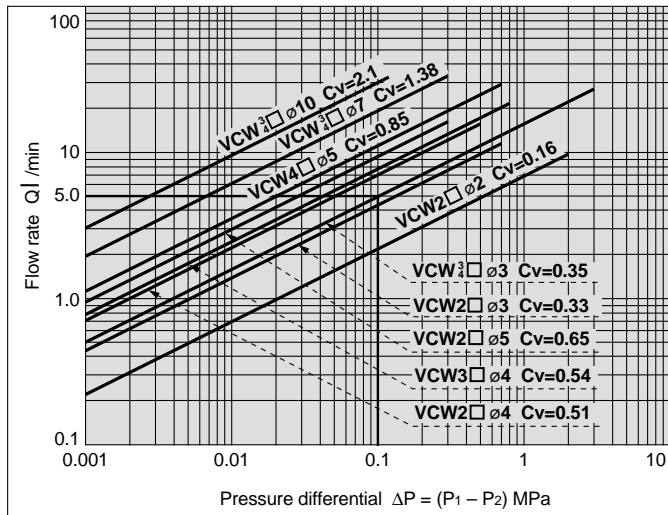
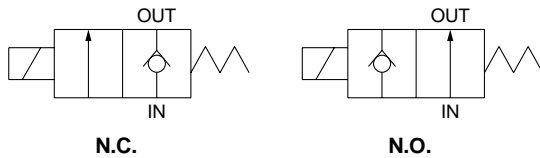
Model	A	B	C	D	E	G	H	J	Z	Electrical entry									
										Grommet		Conduit		DIN connector			Conduit terminal		
										Q	R	S	T	U	V	W	N	X	Y
VV2CW2	49	20	24.5	28	4.5	38	17.3	34.5	65.5	22	45.5	44	43.5	46	58	41.5	66	99	77
VV2CW3	57	25.5	28.5	30	5.5	42	19.3	38.5	75.5	24	55	45.5	53	48	60	51	68	101	86.5
VV2CW4	57	25.5	28.5	30	5.5	42	20.8	41.5	83.5	26	62.5	47.5	60.5	50	62	58.5	70	103	94

# Series VCW Model Selection

## VCW (for water) 2 port solenoid valve (N.C., N.O.)

Model	Material		Class	Port size	Orifice diameter					
	Body	Seal			ø2	ø3	ø4	ø5	ø7	ø10
VCW (for water) 2 port solenoid valve	Brass (Stainless steel)	NBR (FKM) (EPDM) (PTFE)	2	1/8 ( 6A)	●	●	●	●	–	–
				1/4 ( 8A)	●	●	●	●	–	–
			3	1/4 ( 8A)	–	●	●	●	●	–
				3/8 (10A)	–	●	●	●	●	●
				1/2 (15A)	–	–	–	–	–	●
			4	1/4 ( 8A)	–	●	●	●	●	–
				3/8 (10A)	–	●	●	●	●	●
				1/2 (15A)	–	–	–	–	–	●
				3/4 (20A)	–	–	–	–	–	●

Note 1) ø10 is N.C. (normally closed) only.



### How to read the graph

When a water flow of 5 /min is desired with a pressure differential of 0.1MPa, an effective area with a Cv factor of 035 (VCW<sub>4</sub><sup>3</sup>ø3) is required.

### How to find the flow rate for water

- Formula based on Cv factor  
 $Q=14.2 \cdot Cv \cdot \sqrt{10.2 \cdot \Delta P} \dots \text{ /min}$
- Formula based on effective area (Smm<sup>2</sup>)  
 $Q=0.8 \cdot S \cdot \sqrt{10.2 \cdot \Delta P} \dots \text{ /min}$

Q : Flow rate ( /min)  
 ΔP: Pressure differential (P1– P2)  
 P1 : Upstream pressure (MPa)  
 P2 : Downstream pressure (MPa)  
 S : Effective area (mm<sup>2</sup>)  
 Cv: Cv factor

## Explanation of Terminology

### Pressure Terminology

#### 1. Maximum operating pressure differential

This indicates the maximum pressure differential (upstream pressure and downstream pressure differential) which can be allowed for operation with the valve closed or open. When the downstream pressure is 0MPa, this becomes the maximum operating pressure.

#### 2. Maximum system pressure

This indicates the limit of pressure that can be applied inside the pipelines. (line pressure)

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

#### 3. Withstand pressure

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

### Electrical Terminology

#### 1. Surge voltage

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

### Other

#### 1. Materials

NBR: Nitrile rubber  
 FKM: Fluoro rubber – Trade names: Viton®, Dai-el, etc.  
 EPDM: Ethylene propylene rubber = EPR  
 PTFE: Tetrafluoroethylene resin – Trade names: Teflon®, Polyflon, etc.

#### 2. Symbols

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








*Series VCW*

# Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by a label of "**Caution**", "**Warning**" or "**Danger**". To ensure safety, be sure to observe ISO 4414 Note 1) and other safety practices.

 **Caution** : Operator error could result in injury or equipment damage.

 **Warning** : Operator error could result in serious injury or loss of life.

 **Danger** : In extreme conditions, there is a possible result of serious injury or loss of life.

Note 1) ISO 4414 : Pneumatic fluid power – Recommendations for the application of equipment to transmission and control systems.

## **Warning**

### **1. The compatibility of equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.**

Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements. Be particularly careful in determining the compatibility of the fluid to be used.

### **2. Only trained personnel should operate pneumatically operated machinery and equipment.**

The fluid can be dangerous if handled incorrectly. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

### **3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.**

1. Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
3. Restart machinery carefully, confirming that safety measures are being implemented.

### **4. Contact SMC if the product is to be used in any of the following conditions:**

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. With fluids whose application causes concern due to type of additives, etc.
3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.



## Series VCW

# 2 Port Solenoid Valve for Fluid Control/Precautions 1

Be sure to read before handling.

### Precautions on Design

#### ⚠ Warning

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

The valves presented in this catalog are not designed for safety applications such as an emergency shutoff valve. If the valves are used in this type of system, other reliable safety assurance measures should also be adopted.

##### 2. Extended periods of continuous energization

Contact SMC if valves will be continuously energized for extended periods of time.

##### 3. Liquid seals

In cases with a flowing liquid, provide a by-pass valve in the system to prevent the liquid from entering the liquid seal circuit.

##### 4. This solenoid valve cannot be used for explosion protection.

##### 5. Maintenance space

The installation should allow sufficient space for maintenance activities (removal of valve, etc.).

### Selection

#### ⚠ Warning

##### 1. Confirm the specifications.

Give careful consideration to operating conditions such as the application, fluid and environment, and use within the operating ranges specified in this catalog.

##### 2. Fluid temperature

Operate within the fluid temperature range. The temperature range varies depending on the seal material, coil insulation and type of power supply, etc.

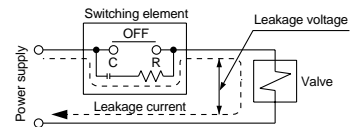
##### 3. Fluid quality

Since the use of fluid which contains foreign matter can cause problems such as malfunction and seal failure by promoting wear of the valve seat and core, and by sticking to the sliding parts of the armature, etc., install a suitable filter (strainer) immediately upstream from the valve. As a general rule, use 80 to 100 mesh.

#### ⚠ Caution

##### 1. Leakage voltage

Particularly when using a resistor in parallel with a switching element and using a C-R element (surge voltage suppressor) to protect the switching element, take note that leakage current will flow through the resistor and C-R element, etc. creating a danger that the valve may not shut OFF.



With AC coil

10% or less of rated voltage

With DC coil

2% or less of rated voltage

##### 2. Low temperature operation

1. The product can be used at an ambient temperature as low as  $-20^{\circ}\text{C}$ , but take measures to prevent the solidification or freezing of impurities, etc.
2. When using for water, etc. in a cold area, devise a means to prevent freezing, such as draining the water from pipelines after stopping supply and exhaust water for a pump or other device. When using a heater, etc. for warming, avoid the coil unit. Also implement freezing prevention measures such as warming the body.



# Series VCW

## 2 Port Solenoid Valve for Fluid Control/Precautions 2

Be sure to read before handling.

### Mounting

#### ⚠ Warning

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

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

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

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

- 3. Do not warm the coil assembly with a heat insulator, etc.**

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

- 4. Secure with brackets, except in the case of steel piping and copper fittings.**

- 5. In cases where there is a source of vibration, either avoid it, or set the arm from the body to the minimum length so that resonance will not occur.**

- 6. Instruction manual**

Mount and operate the product after reading the manual carefully and understanding its contents. Also keep the manual where it can be referred to as necessary.

- 7. Painting and coating**

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

### Piping

#### ⚠ Caution

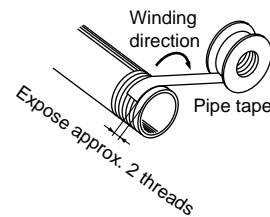
- 1. Preparation before piping**

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

- 2. Wrapping of pipe tape**

When connecting pipes and fittings, etc., be sure that cutting chips from the pipe threads and sealing material do not get inside the valve.

Further, when pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the pipe/fitting.



- 3. Avoid connection of ground lines to piping, as this may cause electric corrosion of the system.**

- 4. Always fasten threads with the proper tightening torque.**

When screwing fittings into valves, fasten with the proper tightening torques as shown below.

#### Tightening torque for piping

Connection threads	Proper tightening torque N·m
Rc(PT) 1/8	7 to 9
Rc(PT) 1/4	12 to 14
Rc(PT) 3/8	22 to 24
Rc(PT) 1/2	28 to 30
Rc(PT) 3/4	28 to 30

- 5. Connection of piping to products**

When connecting piping to a product, refer to its instruction manual to avoid mistakes regarding the supply port, etc.



# Series VCW

## 2 Port Solenoid Valve for Fluid Control/Precautions 3

Be sure to read before handling.

### Wiring

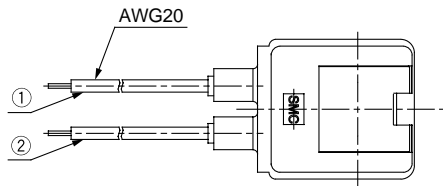
#### ⚠ Caution

- As a rule, use electrical wire of 0.5 to 1.25mm<sup>2</sup> or larger for wiring.  
Further, do not allow excessive force to be applied to the lines.
- Use electrical circuits which do not generate chattering in their contacts.
- Use voltage which is within  $\pm 10\%$  of the rated voltage. In cases with a DC power supply where importance is placed on responsiveness, stay within  $\pm 5\%$  of the rated value. The voltage drop is the value in the lead wire section connecting the coil.

### Electrical Connections

#### ⚠ Caution

##### Grommet/Conduit

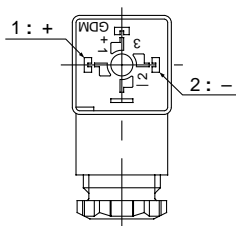


Rated voltage	Lead wire color	
	①	②
DC	Black	Red
100VAC	Blue	Blue
200VAC	Red	Red
Other AC	Gray	Gray

\* DC does not have polarity.

##### DIN connector

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

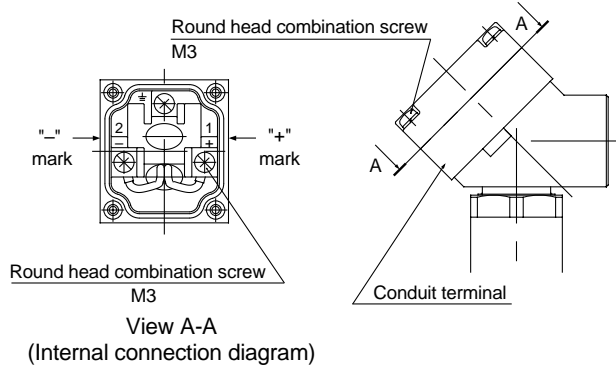


Terminal No.	1	2
DIN terminal	+	-

\* There is polarity only when equipped with light.

##### Conduit terminal

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

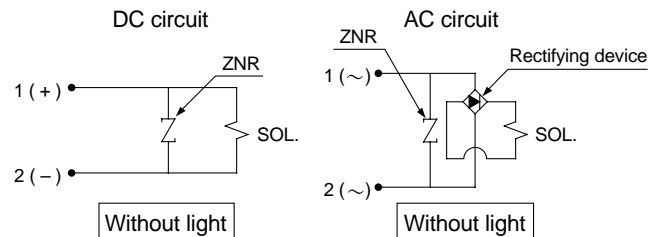


\* There is polarity only when equipped with light.

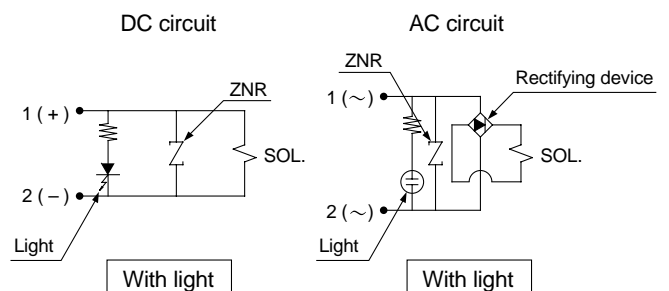
### Electrical Circuits

#### ⚠ Caution

##### Grommet, Conduit, Conduit terminal, DIN connector



##### Conduit terminal, DIN connector







## Series VCW

# 2 Port Solenoid Valve for Fluid Control/Precautions 4

Be sure to read before handling.

### Operating Environment

#### Warning

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

### Maintenance

#### Warning

1. Maintenance should be performed in accordance with the procedures in the instruction manual.

If handled improperly, this can cause damage or malfunction in equipment and devices, etc.

2. Demounting of the product

1. Shut off the fluid supply and release the fluid pressure in the system.
2. Shut off the power supply.
3. Demount the product.

3. Low frequency operation

Valves should be switched at least once every 30 days to prevent malfunction.

#### Caution

1. Filters and strainers

1. Be careful regarding clogging of filters and strainers.
2. Replace filters after one year of use, or earlier if the amount of pressure drop reaches 0.1MPa.
3. Replace strainers when the amount of pressure drop reaches 0.1MPa.
4. Flush drainage from filters regularly.

2. Storage

In case of long term storage after use with water, first thoroughly remove all moisture to prevent rust and deterioration of rubber materials, etc.



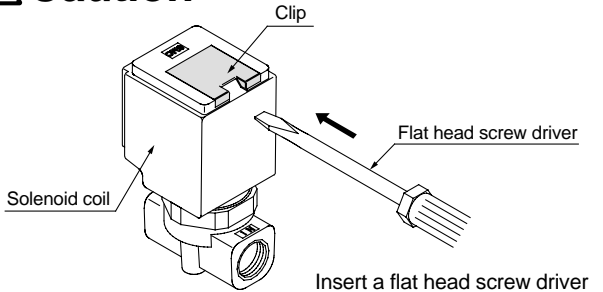
# Series VCW Specific Product Precautions

Be sure to read before handling.

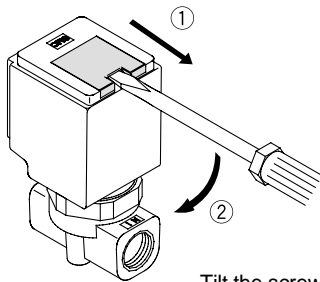
Refer to pages 11 through 15 for safety instructions and 2 port solenoid valve for fluid control precautions.

## How to Replace the Solenoid Coil

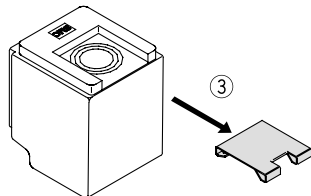
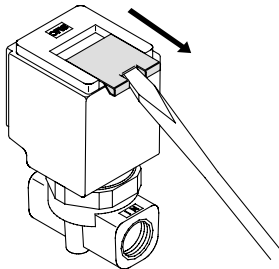
### Caution



Insert a flat head screw driver into the hook section of the clip groove.



Tilt the screw driver down in direction ② so that the clip slides out in direction ①.



When the loosened clip is pulled out in direction ③ using pinchers, etc., the coil can be removed and replaced in direction ④.

After replacing the coil, the clip is reinstalled by pushing it back in the direction opposite to its removal.

## Replacement Parts

Solenoid coil part number

VCW **20** - **1** **G** - **□**

Series ●

20	Class 2
30	Class 3
40	Class 4

Voltage ●

1	100VAC
2	200VAC
3	110VAC
4	220VAC
5	24VDC
6	12VDC

Lead wire length ●

Nil	300mm
L1	600mm
L2	1000mm
L3	1500mm
L4	3000mm

Electrical entry ●

G	Grommet
D	DIN connector
DL	DIN connector with light
DO	For DIN connector (without connector)
C	Conduit
T	Conduit terminal
TL	Conduit terminal with light

Clip part number

**AZ-T-VCW**

How to Order Valves → Page 1 Valve model  
Page 6 Valve model

Note) Indicate the valve model, as a name plate is attached to the clip.

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**Newton Aycliffe**

ONCAD AUTOMATION  
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Fax: 01325 307562

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**Redditch**

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