

# Direct Operated 2 Port Solenoid Valve For Oil

Series VC

# Series VCL



## How to Order Valves (Single Unit)

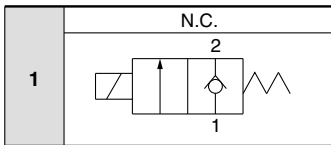
VC L **2** **1** - **1** **G** - **2** - **02** - - -

For oil

### Series

2	Class 2
3	Class 3
4	Class 4

### Valve type



### 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
J	230 VAC

\* Class B in AC has a rectifying circuit built-in.  
 \*\* Class H is AC only. No rectifying circuit.  
 \*\*\* Please consult with SMC regarding other voltages.

### Electrical entry

<b>G – Grommet</b>	<b>C – Conduit</b>
<b>T – Conduit terminal</b>	<b>D – DIN terminal</b> <b>DL – DIN terminal with light</b> <b>DO – DIN terminal (without connector, with gasket)</b>

\* All class B coils come with surge voltage suppressor.  
 \*\* Available types of electrical entry for type H coil are either G, C and T.  
 (Surge voltage suppressor, light are not equipped.)

### Option

Nil	None
F	Foot type bracket

\* Bracket is packed in the same container as the main body.

### Material and insulation type

Symbol	Body material	Seal material	Coil insulation type
Nil	Brass (C37)	FKM	Class B
D			Class H
H	Class B		
N	Class H		
	Stainless steel		

### Thread type

Nil	Rc
N	NPT
F	G

### 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 diameter

Symbol	Orifice dia. (mmø)	Class 2	Class 3	Class 4
2	2	○	—	—
3	3	○	○	○
4	4	○	○	○
5	5	○	○	○
7	7	—	○	○
10	10	—	○	○

\* Refer to the below table for orifice and port size combinations.

### Orifice diameter and Port Size Combinations

Class	Port size	Orifice diameter (mmø)					
		2	3	4	5	7	10
2	1/8 ( 6A)	●	●	●	●	—	—
	1/4 ( 8A)	●	●	●	●	—	—
3	1/4 ( 8A)	—	●	●	●	●	—
	3/8 (10A)	—	●	●	●	●	●
4	1/2 (15A)	—	—	—	—	—	●
	1/4 ( 8A)	—	●	●	●	●	—
	3/8 (10A)	—	●	●	●	●	●
	1/2 (15A)	—	—	—	—	—	●
	3/4 (20A)	—	—	—	—	—	●

VX2

VXD

VXZ

VXE

VXP

VXR

VXH

VXF

VX3

VXA

VCH□

VDW

VQ

LVM

VCA

VCB

VCL

VCS

VCW



## Specifications

		Standard specifications	High temperature specifications		
Valve specifications	Valve construction	Direct operated poppet			
	Fluid	Oil [50 mm <sup>2</sup> /s] or less			
	Withstand pressure (MPa)	5.0			
	Body material	Brass (C37), Stainless steel			
	Seal material	FKM			
	Ambient temperature (°C) <sup>Note 1)</sup>	-20 to 60	-20 to 100		
	Fluid temperature (°C) <sup>Note 1)</sup>	-10 to 60 (No freezing)	-10 to 100		
	Enclosure	Dusttight, Low jetproof (IP65)			
	Environment	Location without corrosive or explosive gases			
	Valve leakage (cm <sup>3</sup> /min)	0.1 or less (with oil pressure)			
	Exterior leakage (cm <sup>3</sup> /min)	0.1 or less (with oil pressure)			
	Mounting orientation	Unrestricted			
Vibration/Impact resistance (m/s <sup>2</sup> ) <sup>Note 3)</sup>	30/150 or less				
Coil specifications	Rated voltage	24 VDC, 12 VDC, 48 VAC, 100 VAC, 110 VAC, 200 VAC, 220 VAC, 230 VAC, 240 VAC (50/60 Hz)	48 VAC, 100 VAC, 200 VAC, 220 VAC, 230 VAC, 240 VAC (50/60 Hz)		
	Allowable voltage fluctuation	±10% of rated voltage			
	Coil insulation type	Class B	Class H		
	Power consumption	DC	VCL20: 6 W, VCL30: 8 W, VCL40: 11.5 W	—	
	Apparent power	AC 50/60 Hz	VCL20: 8.5 VA VCL30: 10 VA VCL40: 13 VA	Inrush	VCL20: 22/19 VA VCL30: 36/30 VA VCL40: 45/37 VA
				Holding	VCL20: 10/8 VA VCL30: 15/13 VA VCL40: 19/16 VA

Note 1) When the ambient temperature or fluid temperature is 60°C or more, use high temperature specifications (class H coil).

Note 2) Since a rectifier circuit is used for class B coils with AC, there is no difference in apparent power between inrush and holding.

Note 3) Vibration resistance .... Conditions when tested with one sweep 10 to 250 Hz in the axial direction and at a right angle to the armature, in both energized and deenergized states. No malfunction occurred when tested. (Value at the initial state)

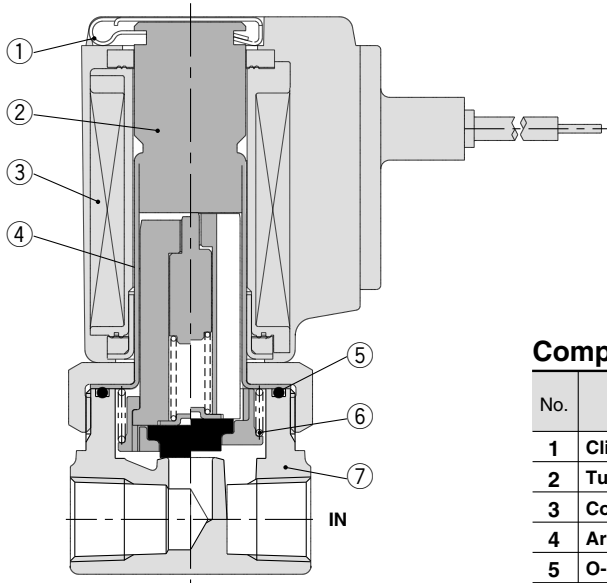
Impact resistance .... Conditions when tested with a drop tester in the axial direction and at a right angle to the armature, one time each in energized and deenergized states. No malfunction occurred when tested. (Value at the initial state)

## Characteristic Specifications

Model	Class	Note 1) Port size	Note 1) Orifice diameter (mmø)	N.C. Max. operating pressure differential (MPa)	Flow characteristics		Max. system pressure (MPa)	Note 2) Mass (kg)
					Av x 10 <sup>-6</sup> (m <sup>2</sup> )	Cv converted		
VCL2	2	1/8 ( 6A) 1/4 ( 8A)	2	1.5	3.8	0.16	2.0	1/8 : 0.21 1/4 : 0.24
			3	0.8	7.9	0.33		
			4	0.4	12	0.51		
			5	0.25	16	0.65		
VCL3	3	1/4 ( 8A) 3/8 (10A) 1/2 (15A)	3	1.5	8.4	0.35	2.0	1/4 : 0.42 3/8 : 0.40 1/2 : 0.49
			4	0.8	13	0.54		
			5	0.5	19	0.80		
			7	0.2	33	1.4		
			10	0.1	50	2.1		
VCL4	4	1/4 ( 8A) 3/8 (10A) 1/2 (15A) 3/4 (20A)	3	2.0	8.4	0.35	2.0	1/4 : 0.58 3/8 : 0.55 1/2 : 0.62 3/4 : 0.78
			4	1.1	14	0.60		
			5	0.7	20	0.85		
			7	0.3	33	1.4		
			10	0.12	50	2.1		

Note 1) Refer to page 333 in model selection regarding port size and orifice diameter combinations.  
Note 2) The mass is the value for the grommet type.

## Construction

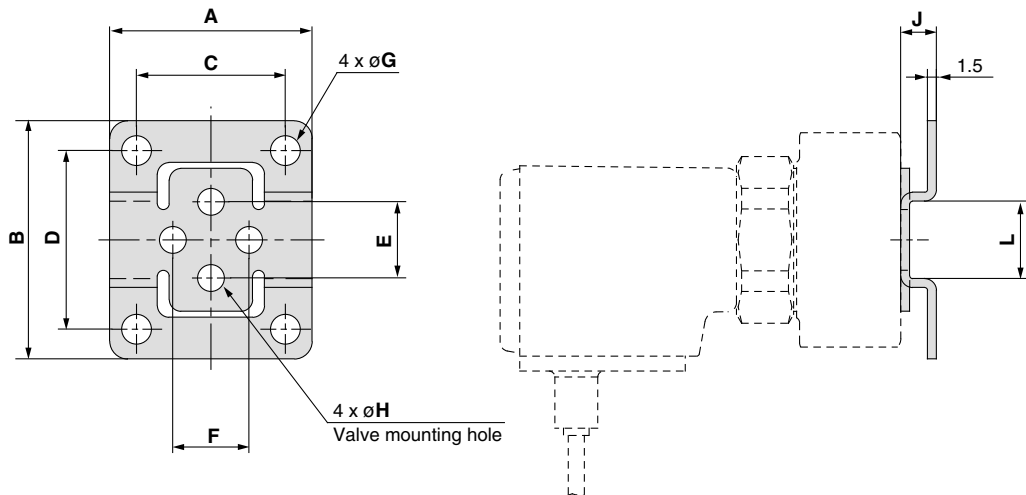


### Component Parts

No.	Description	Material	
		Standard	Option
1	Clip	Stainless steel	—
2	Tube assembly	Stainless steel, Cu	Ag
3	Coil assembly	Class B	Class H
4	Armature assembly	Stainless steel, FKM, PPS (Class B only)	—
5	O-ring	FKM	—
6	Return spring	Stainless steel	—
7	Body	Brass (C37)	Stainless steel

Refer to pages 314 and 315 for solenoid coil replacement and replacement parts.

## Dimensions: Bracket



### Bracket Mounting Dimensions/Bracket Material: Stainless Steel

Valve model	Port size	Bracket part no.	A	B	C	D	E	F	G	H	J	L
VCL2□	1/8, 1/4	VCW20-12-01A	34	40	25	30	12.8	12.8	5	4.5	6	13
VCL3□	1/4, 3/8	VCW30-12-02A	42	52	30	40	19	19	6	5.5	7	19
	1/2	VCW30-12-04A	48	56	36	44	23	23	6	5.5	7	23
VCL4□	1/4, 3/8	VCW40-12-02A	42	52	30	40	23	23	6	5.5	7	19
	1/2	VCW30-12-04A	48	56	36	44	23	23	6	5.5	7	23
	3/4	VCW40-12-06A	56	65	44	53	28.2	28.2	6	5.5	7	26

\* 2 Mounting screws (for mounting bracket) are included in bracket part no.

VX2

VXD

VXZ

VXE

VXP

VXR

VXH

VXF

VX3

VXA

VCH□

VDW

VQ

LVM

VCA

VCB

VCL

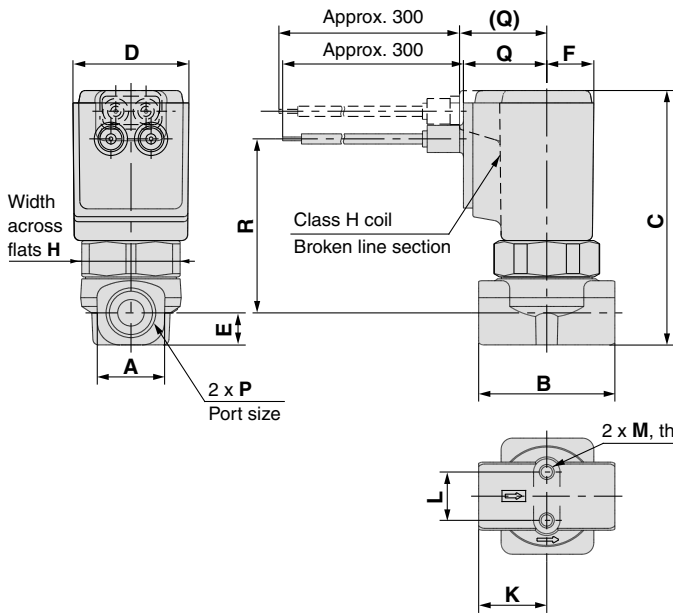
VCS

VCW

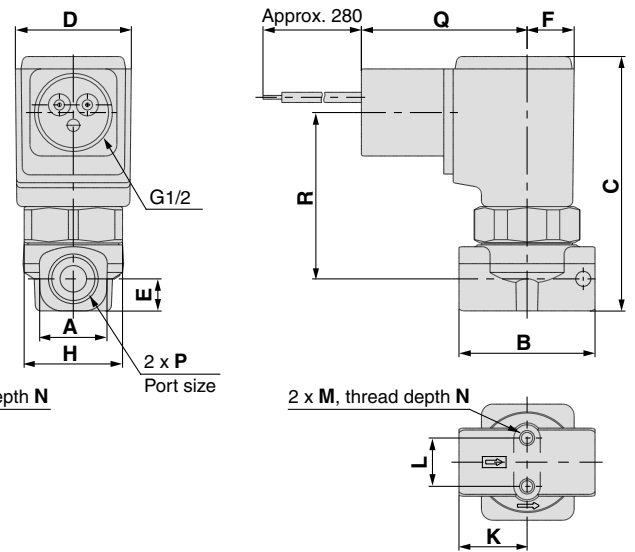
# Series VCL

## Dimensions (N.C.)

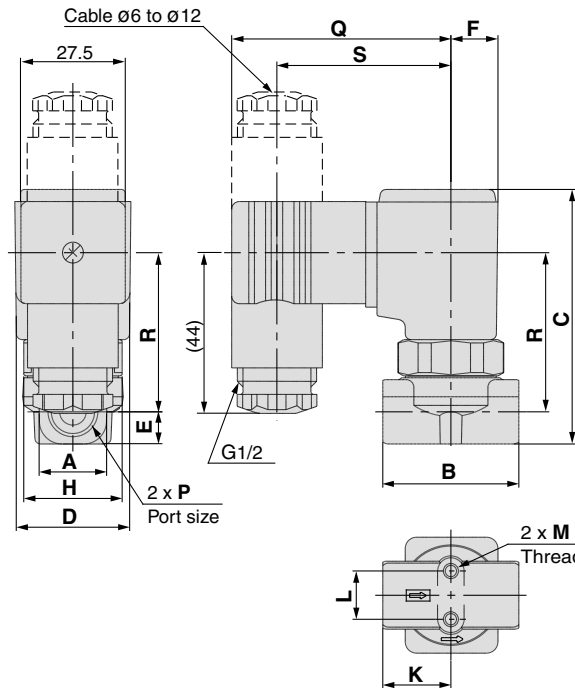
### Grommet: G



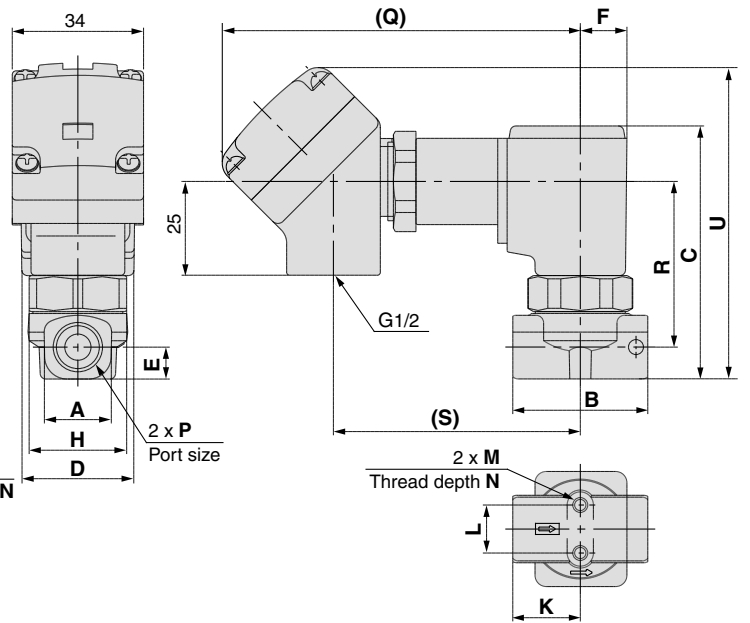
### Conduit: C



### DIN terminal: D



### Conduit terminal: T



### N.C. Dimensions

Model	P Port size	A	B	C	D	E	F	H	K	L	M	N	Grommet: G		Conduit: C		DIN terminal: D			Conduit terminal: T					
													(Note)		Q	R	Q	R	Q	R	S	Q	R	S	U
													Q	R											
VCL21	1/8	13.5	28	64	31	6.5	12.5	27	14	12.8	M4	4.5	22 (23)	45 (52)	44	43	58	40.5	46.5	99	43	66	83		
	1/4	18	36	67.5	31	8.5	12.5	27	18	12.8	M4	6	22 (23)	46 (53)	44	44	58	41.5	46.5	99	44	66	86		
VCL31	1/4, 3/8	22	40	81.5	36.5	11	15	32	20	19	M5	8	24 (25)	56.5 (63.5)	46	54.5	60	52	48.5	101	54.5	68	99		
	1/2	30	50	86	36.5	13.5	15	32	25	23	M5	8	24 (25)	59 (66)	46	57	60	54.5	48.5	101	57	68	104		
VCL41	1/4, 3/8	22	45	90	41	11	17	36	22.5	23	M5	8	26 (26.5)	64.5 (71.5)	48	62.5	62	60	50.5	103	62.5	70	107		
	1/2	30	50	94	41	13.5	17	36	25	23	M5	8	26 (26.5)	66.5 (73.5)	48	64.5	62	62	50.5	103	64.5	70	111.5		
	3/4	35	60	102	41	17.5	17	36	30	28.2	M5	8	26 (26.5)	70 (77)	48	68	62	65.5	50.5	103	68	70	119		

Note) ( ) indicates class H.



### How to Order Manifold

**VV2C L 2 - 02 01**

For oil ●

**Series**

2	Class 2
3	Class 3
4	Class 4

**Material**

Symbol	Base material	Seal material
Nil	Brass (C37)	FKM
H	Stainless steel	FKM

**Thread type**

Symbol	Thread type
Nil	Rc
N	NPT
F	G

**OUT port size**

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

\* All IN ports are 3/8.

**Stations**

02	2 stations
⋮	⋮
10	10 stations

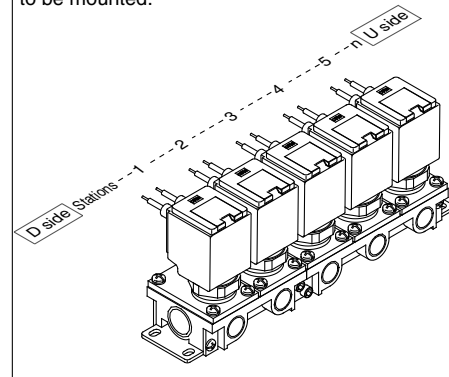
### How to Order Manifold Assembly

Enter the mounting valve and option part numbers under the manifold base part number.

**<Ordering Example>**  
**VV2CL2-0501**..... 1 set   Manifold part no.  
 \* **VCL23-5G-2**..... 5 sets   Valve part no.  
 (Stations 1 to 5)

"\*" is the symbol for assembly. Add an "\*" 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.



- VX2
- VXD
- VXZ
- VXE
- VXP
- VXR
- VXH
- VXF
- VX3
- VXA
- VCH□
- VDW
- VQ
- LVM
- VCA
- VCB
- VCL**
- VCS
- VCW

### How to Order Valves (For manifold)

**VC L 2 3 - 1 G - 2 -**

For oil ●

**Series**

2	Class 2
3	Class 3
4	Class 4

**Valve type**

3	N.C. for manifold
---	-------------------

**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
J	230 VAC

\* Class B in AC has a rectifying circuit built-in.  
 \*\* Class H is AC only. No rectifying circuit.  
 \*\*\*Please consult with SMC regarding other voltages.

**Material and insulation type**

Symbol	Body material	Seal material	Coil insulation type
Nil	Brass (C37)	FKM	Class B
D			Class H
H	Stainless steel		Class B
N		Class H	

**Orifice diameter**

Symbol	Orifice dia. (mmø)	Class 2	Class 3	Class 4
2	2	○	—	—
3	3	○	○	○
4	4	○	○	○
5	5	○	○	○
7	7	—	○	○

**Electrical entry**

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

\* All class B coils come with surge voltage suppressor.  
 \*\* Available types of electrical entry for type H coil are either G, C or T. (without surge voltage suppressor, light.)

### Manifold Option

#### Blanking plate assembly

**VVCW 2 0 - 3A - H**

**Series**

2	Class 2
3	Class 3
4	Class 4

**Material**

Symbol	Plate material	Seal material
H	Stainless steel	FKM

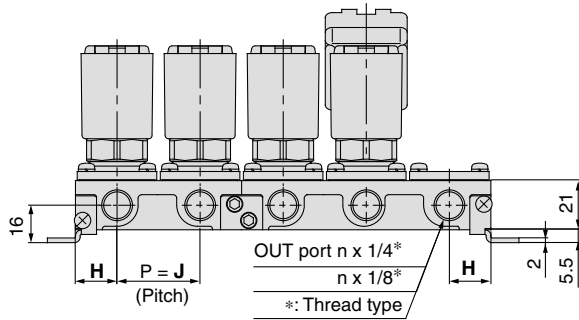
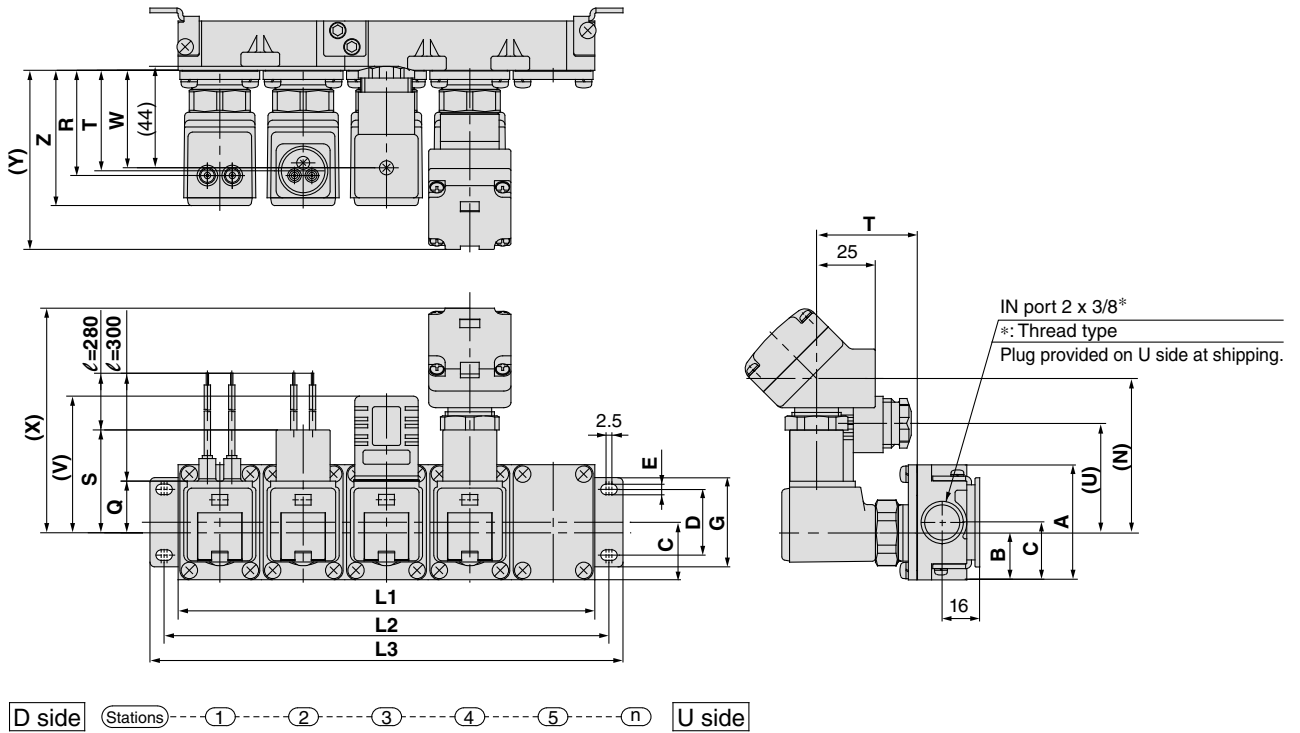
JIS Symbol



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.

# Series VCL

## Dimensions (N.C.)



### L Dimension

Model	Dimensions	n (stations)								
		2	3	4	5	6	7	8	9	10
VV2CL2	L1	70	105	140	175	210	245	280	315	350
	L2	82	117	152	187	222	257	292	327	362
	L3	94	129	164	199	234	269	304	339	374
VV2CL3	L1	78	117	156	195	234	273	312	351	390
	L2	90	129	168	207	246	285	324	363	402
	L3	102	141	180	219	258	297	336	375	414
VV2CL4	L1	84	126	168	210	252	294	336	378	420
	L2	96	138	180	222	264	306	348	390	432
	L3	108	150	192	234	276	318	360	402	444
Manifold composition		2 stns. x 1	3 stns. x 1	2 stns. x 2	2 stns. + 3 stns.	3 stns. x 2	2 stns. x 2 + 3 stns.	2 stns. + 3 stns. x 2	3 stns. x 3	2 stns. x 2 + 3 stns. x 2

Note) Manifold base is consisted of the junction of 2 and 3 station bases.

### Dimensions

Model	A	B	C	D	E	G	H	J	Z	Electrical entry									
										Grommet		Conduit		DIN terminal			Conduit terminal		
										Q (Note)	R (Note)	S	T	U	V	W	N	X	Y
VV2CL2	49	20	24.5	28	4.5	38	17.3	34.5	56	22 (23)	45.5 (52.5)	44	43.5	46	58	41.5	66	99	77
VV2CL3	57	25.5	28.5	30	5.5	42	19.3	38.5	66	24 (25)	55 (62)	45.5	53	48	60	51	68	101	86.5
VV2CL4	57	25.5	28.5	30	5.5	42	20.8	41.5	74	26 (26.5)	62.5 (69.5)	47.5	60.5	50	62	58.5	70	103	94

Note) ( ) indicates class H.

# Direct Operated 2 Port Solenoid Valve For Heated Water

## Series VCB



### How to Order Valves

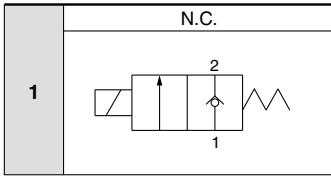
VC B 2 1 - 1 G - 2 - 02

For heated water

**Series**

2	Class 2
3	Class 3
4	Class 4

**Valve type**



**Voltage**

1	100 VAC
2	200 VAC
3	110 VAC
4	220 VAC
7	240 VAC
8	48 VAC
J	230 VAC

\* Please consult with SMC regarding other voltages.

**Electrical entry**

<b>G – Grommet</b>	<b>C – Conduit</b>
<b>T – Conduit terminal</b>	

\* Available types of electrical entry are either G, C and T. (Surge voltage suppressor is not equipped.)

Made to order specifications

X10 Oil-free specification

**Option**

Nil	None
F	Foot type bracket

\* Bracket is packed in the same container as the main body.

**Material and insulation type**

Symbol	Body material	Seal material	Coil insulation type
Nil	CAC407 (BC7)	FKM	Class H
M		EPDM	
N	Stainless steel	FKM	
P		EPDM	

**Thread type**

Nil	Rc
N	NPT
F	G

**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 dia. (mmØ)	Class 2	Class 3	Class 4
2	2	○	—	—
3	3	○	○	○
4	4	○	○	○
5	5	○	○	○
7	7	—	○	○
10	10	—	○	○

\* Refer to the below table for orifice and port size combinations.

**Orifice diameter and Port Size Combinations**

Class	Port size	Orifice dia. (mmØ)					
		2	3	4	5	7	10
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)	—	—	—	—	—	●

VX2

VXD

VXZ

VXE

VXP

VXR

VXH

VXF

VX3

VXA

VCH□

VDW

VQ

LVM

VCA

VCB

VCL


VCS

VCW



## Standard Specifications


Valve specifications	Valve construction	Direct operated poppet
	Fluid	Heated water (99°C or less)
	Withstand pressure (MPa)	5.0
	Body material	CAC407, Stainless steel
	Seal material	FKM, EPDM
	Ambient temperature (°C)	-20 to 100
	Fluid temperature (°C)	1 to 99
	Enclosure	Dusttight, low jetproof (equivalent to IP65)
	Environment	Location without corrosive or explosive gases
	Valve leakage (cm <sup>3</sup> /min)	0.1 or less (With water pressure)
	Exterior leakage (cm <sup>3</sup> /min)	0.1 or less (With water pressure)
Coil specifications	Mounting orientation	Unrestricted
	Vibration/Impact resistance (m/s <sup>2</sup> ) <sup>Note 1)</sup>	30/150 or less
	Rated voltage	48 VAC, 100 VAC, 110 VAC, 200 VAC, 220 VAC, 230 VAC, 240 VAC (50/60 Hz)
	Allowable voltage fluctuation	±10% of rated voltage
	Coil insulation type	Class H
	Power consumption (W) 50/60 Hz	VCB2: 4.9/4.1, VCB3: 7.7/6.6, VCB4: 10.5/9.3
	Apparent power (VA) 50/60 Hz	Inrush
Holding		VCB2: 10/8, VCB3: 15/13, VCB4: 19/16

 Note1) Vibration resistance .... Conditions when tested with one sweep of 10 to 250 Hz in the axial direction and at a right angle to the armature, in both energized and deenergized states. No malfunction occurred when tested. (Value at the initial state)

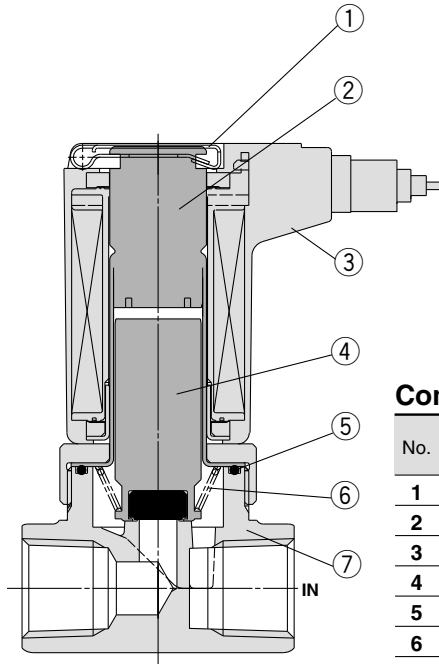
Impact resistance .... Conditions when tested with a drop tester in the axial direction and at a right angle to the armature, one time each in energized and deenergized states. No malfunction occurred when tested. (Value at the initial state)

## Characteristic Specifications

Model	Class	Note 1) Port size	Note 1) Orifice diameter (mm $\varnothing$ )	Max. operating pressure differential (MPa)	Flow characteristics		Max. operating pressure (MPa)	Mass (kg)
					Av x 10 <sup>-6</sup> (m <sup>2</sup> )	Cv converted		
VCB2	2	1/8 (6A) 1/4 (8A)	2	2.0	3.8	0.16	3.0	1/8 : 0.21 1/4 : 0.24
			3	0.8	7.9	0.33		
			4	0.5	12	0.51		
			5	0.3	16	0.65		
VCB3	3	1/4 (8A) 3/8(10A) 1/2(15A)	3	2.0	8.4	0.35	3.0	1/4 : 0.42 3/8 : 0.40 1/2 : 0.49
			4	0.8	13	0.54		
			5	0.5	19	0.80		
			7	0.2	33	1.4		
VCB4	4	1/4 (8A) 3/8(10A) 1/2(15A) 3/4(20A)	3	3.0	8.4	0.35	3.0	1/4 : 0.58 3/8 : 0.55 1/2 : 0.62 3/4 : 0.78
			4	1.3	14	0.60		
			5	0.7	20	0.85		
			7	0.3	33	1.4		
			10	0.12	50	2.1		

 Note 1) Refer to model selection on page 329 regarding port size and orifice diameter combinations.  
Note 2) Mass values are for the grommet type.

**Construction**

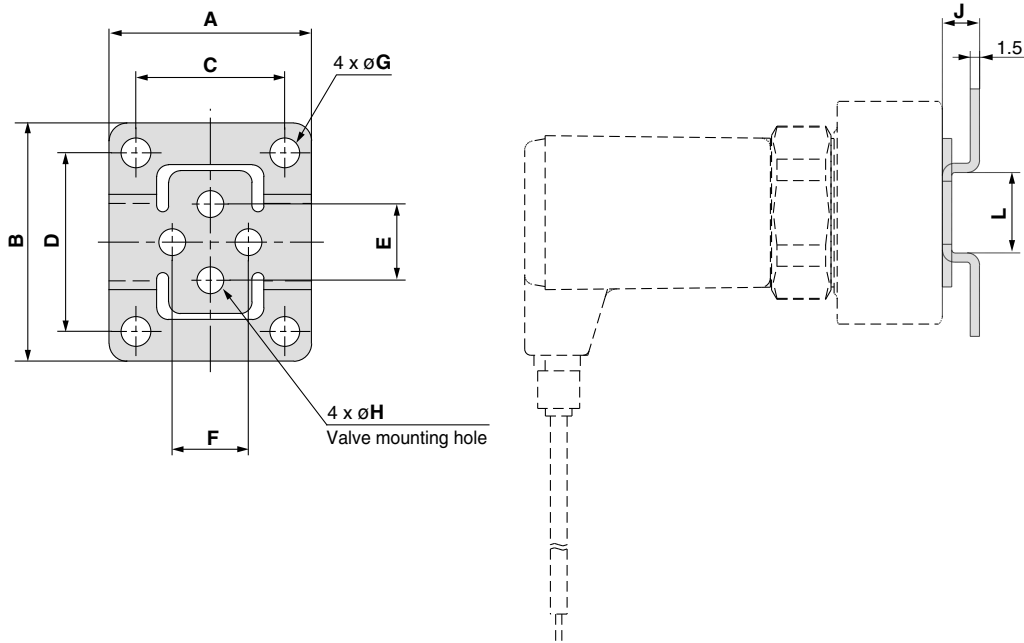


**Component Parts**

No.	Description	Material	
		Standard	Option
1	Clip	Stainless steel	—
2	Tube assembly	Stainless steel/Cu	Stainless steel/Ag
3	Coil assembly	Class H	—
4	Armature assembly	Stainless steel/FKM	Stainless steel/EPDM
5	Seal	FKM	EPDM
6	Return spring	Stainless steel	—
7	Body	CAC407	Stainless steel

Refer to pages 314 and 315 for solenoid coil replacement and replacement parts.

**Dimensions: Bracket**



**Bracket Mounting Dimensions/Bracket Material: Stainless Steel**

Valve model	Port size	Bracket part no.	A	B	C	D	E	F	G	H	J	L
VCB2□	1/8, 1/4	VCW20-12-01A	34	40	25	30	12.8	12.8	5	4.5	6	13
VCB3□	1/4, 3/8	VCW30-12-02A	42	52	30	40	19	19	6	5.5	7	19
	1/2	VCW30-12-04A	48	56	36	44	23	23	6	5.5	7	23
VCB4□	1/4, 3/8	VCW40-12-02A	42	52	30	40	23	23	6	5.5	7	19
	1/2	VCW30-12-04A	48	56	36	44	23	23	6	5.5	7	23
	3/4	VCW40-12-06A	56	65	44	53	28.2	28.2	6	5.5	7	26

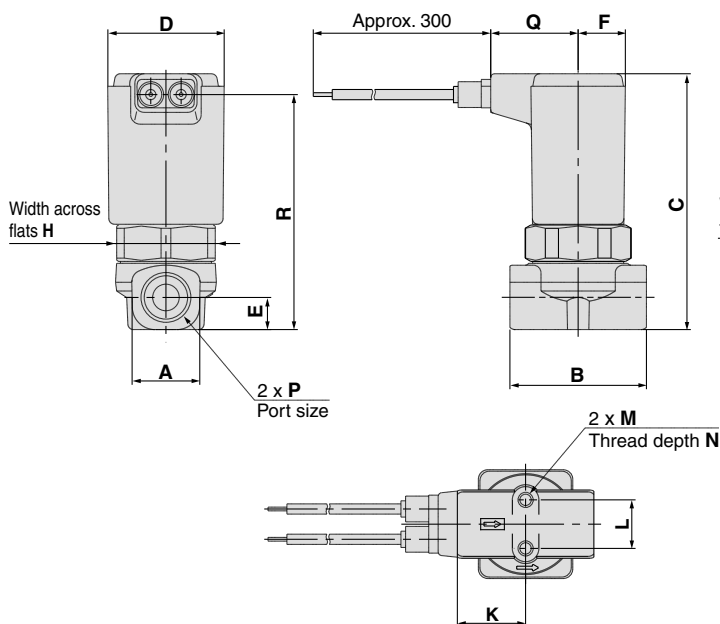
\* 2 mounting screws (for mounting bracket) are included in bracket part no.

VX2  
VXD  
VXZ  
VXE  
VXP  
VXR  
VXH  
VXF  
VX3  
VXA  
VCH□  
VDW  
VQ  
LVM  
VCA  
VCB  
VCL  
VCS  
VCW

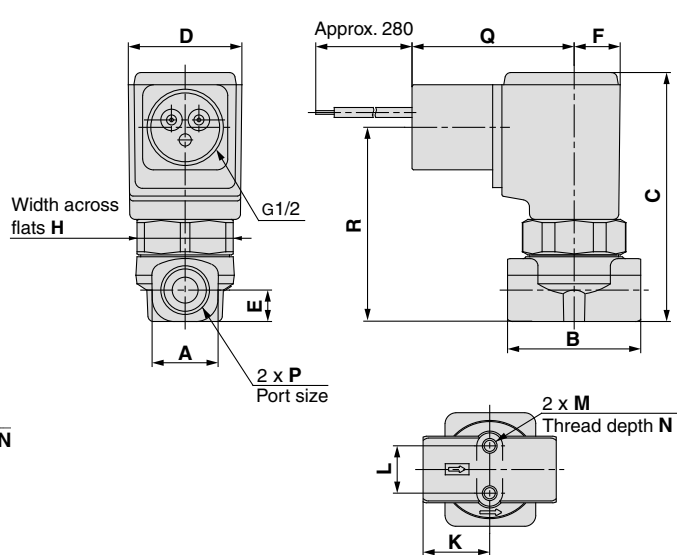
# Series VCB

## Dimensions

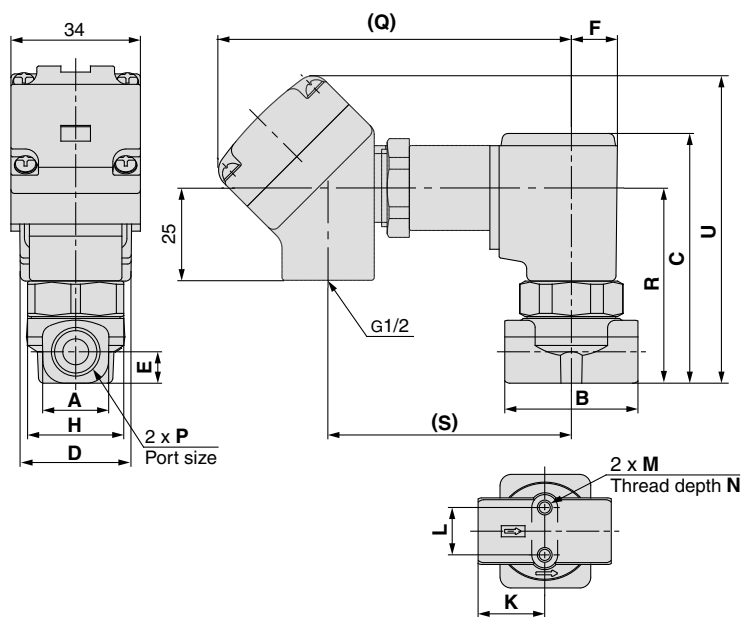
### Grommet : G



### Conduit: C



### Conduit terminal: T



(mm)

Model	P Port size	A	B	C	D	E	F	H	K	L	M	N	Electrical entry							
													Grommet: G		Conduit: C		Conduit terminal: T			
													Q	R	Q	R	Q	R	S	U
VCB21	1/8	13.5	28	64	31	6.5	12.5	27	14	12.8	M4	4.5	22	59	44	50	99	50	66	83
	1/4	18	36	67.5	31	8.5	12.5	27	18	12.8	M4	6	22	62	44	53	99	53	66	86
VCB31	1/4, 3/8	22	40	81.5	36.5	11	15	32	20	19	M5	8	24	76	46	66.5	101	66.5	68	99
	1/2	30	50	86	36.5	13.5	15	32	25	23	M5	8	24	80	46	71	101	71	68	104
VCB41	1/4, 3/8	22	45	90	41	11	17	36	22.5	23	M5	8	26	84	48	74.5	103	74.5	70	107
	1/2	30	50	94	41	13.5	17	36	25	23	M5	8	26	88	48	78.5	103	78.5	70	111.5
	3/4	35	60	102	41	17.5	17	36	30	28.2	M5	8	26	96	48	86.5	103	86.5	70	119

# Direct Operated 2 Port Solenoid Valve For Steam

Series VC

# Series VCS



## How to Order Valves (Single Unit)

**VC S 2 1 - 1 G - 2 - 02** [ ] - [ ] - [ ]

**For steam** •

**Series** •

2	Class 2
3	Class 3
4	Class 4

**Valve type** •

N.C.

**Voltage** •

1	100 VAC
2	200 VAC
3	110 VAC
4	220 VAC
7	240 VAC
8	48 VAC
J	230 VAC

\* Please consult with SMC regarding other voltages.

**Option**

Nil	None
F	Foot type bracket

\* Bracket is packed in the same container as the main body.

**Material and insulation type**

Symbol	Body material	Seal material	Coil insulation type
Nil	Brass (C37)	PTFE	Class H
D		FKM	
R	Stainless steel	PTFE	
N		FKM	

**Thread type**

Nil	Rc
N	NPT
F	G

**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)	—	—	○

**Electrical entry** •

G - Grommet	C - Conduit
<b>T - Conduit terminal</b>	

\* Available types of electrical entry are either G, C and T. (Surge voltage suppressor, light are not equipped.)

**Orifice diameter**

Symbol	Orifice dia. (mmø)	Class 2	Class 3	Class 4
2	2	○	—	—
3	3	○	○	○
4	4	○	○	○
5	5	○	○	○
7	7	—	○	○
10	10	—	○	○

\* Refer to the below table for orifice and port size combinations.

**Orifice diameter and Port Size Combinations**

Class	Port size	Orifice diameter (mmø)					
		2	3	4	5	7	10
2	1/8 ( 6A)	●	●	●	●	—	—
	1/4 ( 8A)	●	●	●	●	—	—
3	1/4 ( 8A)	—	●	●	●	●	—
	3/8 (10A)	—	●	●	●	●	●
4	1/2 (15A)	—	—	—	—	—	●
	1/4 ( 8A)	—	●	●	●	●	—
	3/8 (10A)	—	●	●	●	●	●
	1/2 (15A)	—	—	—	—	—	●
	3/4 (20A)	—	—	—	—	—	●

Note 1) ø10 is available with seal material FKM only.

VX2

VXD

VXZ

VXE

VXP

VXR

VXH

VXF

VX3

VXA

VCH□

VDW

VQ

LVM

VCA

VCB

VCL

**VCS**

VCW



## Standard Specifications

Valve specifications	Valve construction	Direct operated poppet		
	Fluid	Steam (184°C or less)		
	Withstand pressure (MPa)	5.0		
	Body material	Brass (C37), Stainless steel		
	Seal material	PTFE, FKM		
	Ambient temperature (°C)	-20 to 100		
	Fluid temperature (°C)	184 or less (PTFE), 120 or less (FKM) <sup>Note 1)</sup>		
	Enclosure	Dusttight, Low jetproof (IP65)		
	Environment	Location without corrosive or explosive gases		
	Valve leakage (cm <sup>3</sup> /min)	300 or less (PTFE), 1 or less (FKM) measured by air		
	Exterior leakage (cm <sup>3</sup> /min)	1 or less with air		
	Mounting orientation	Unrestricted		
	Vibration/Impact resistance (m/s <sup>2</sup> ) <sup>Note 2)</sup>	30/150 or less		
Coil specifications	Rated voltage	48 VAC, 100 VAC, 110 VAC, 200 VAC, 220 VAC, 230 VAC, 240 VAC (50/60 Hz)		
	Allowable voltage fluctuation	±10% of rated voltage		
	Coil insulation type	Class H		
	Power consumption (W) 50/60 Hz	VCS2: 4.9/4.1, VCS3: 7.7/6.6, VCS4: 10.5/9.3		
	Apparent power (VA) 50/60 Hz	Inrush	VCS2: 22/19, VCS3: 36/30, VCS4: 45/37	
		Holding	VCS2: 10/8, VCS3: 15/13, VCS4: 19/16	



Note 1) For low pressure steam at a temperature of 120°C or less, use FKM for the seal material.

Note 2) Vibration resistance .... Conditions when tested with one sweep of 10 to 250 Hz in the axial direction and at a right angle to the armature, in both energized and deenergized states.

No malfunction occurred when tested. (Value at the initial state)

Impact resistance ..... Conditions when tested with a drop tester in the axial direction and at a right angle to the armature, one time each in energized and deenergized states.

No malfunction occurred when tested. (Value at the initial state)

## Characteristic Specifications

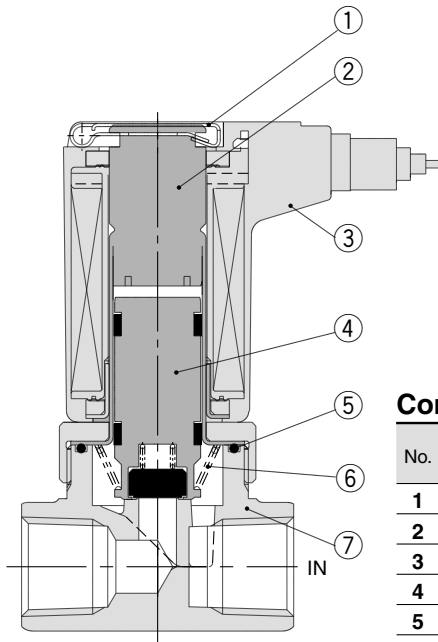
Model	Class	Port size <sup>Note 1)</sup>	Orifice diameter (mm $\varnothing$ ) <sup>Note 1)</sup>	Max. operating pressure differential (MPa)	Flow characteristics		Max. system pressure (MPa)	Mass (kg)
					Av x 10 <sup>3</sup> (m <sup>2</sup> )	Cv converted		
VCS2	2	1/8 ( 6A) 1/4 ( 8A)	2	1.0	3.8	0.16	1.0	1/8: 0.21 1/4: 0.24
			3	0.8	7.9	0.33		
			4	0.5	12	0.51		
			5	0.3	16	0.65		
VCS3	3	1/4 ( 8A) 3/8 (10A) 1/2 (15A)	3	1.0	8.4	0.35	1.0	1/4: 0.42 3/8: 0.40 1/2: 0.49
			4	0.8	13	0.54		
			5	0.5	19	0.80		
			7	0.2	33	1.4		
			10	0.1	50	2.1		
VCS4	4	1/4 ( 8A) 3/8 (10A) 1/2 (15A) 3/4 (20A)	3	1.0	8.4	0.35	1.0	1/4: 0.58 3/8: 0.55 1/2: 0.62 3/4: 0.78
			4	1.0	14	0.60		
			5	0.7	20	0.85		
			7	0.3	33	1.4		
			10	0.12	50	2.1		



Note 1) Refer to page 339 in model selection regarding port size and orifice diameter combinations.

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

## Construction

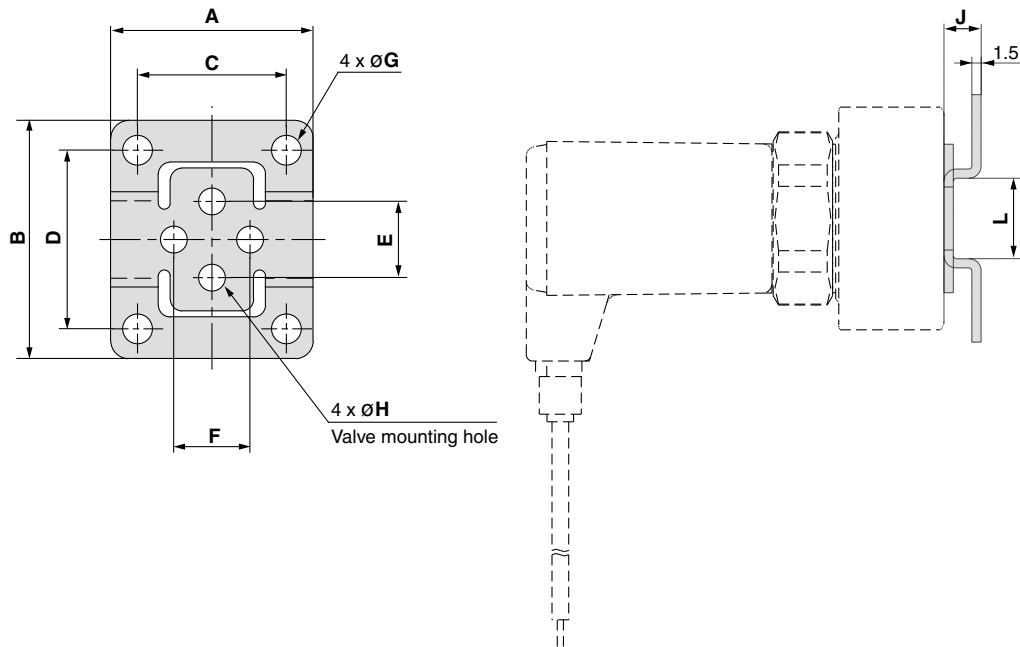


### Component Parts

No.	Description	Material	
		Standard	Option
1	Clip	Stainless steel	—
2	Tube assembly	Stainless steel, Cu	Stainless steel, Ag
3	Coil assembly	Class H	—
4	Armature assembly	Stainless steel, PTFE	Stainless steel, FKM
5	Seal	PTFE	FKM
6	Return spring	Stainless steel	—
7	Body	Brass (C37)	Stainless steel

Refer to pages 314 and 315 for solenoid coil replacement and replacement parts.

## Dimensions: Bracket



### Bracket Mounting Dimensions/Bracket Material: Stainless Steel

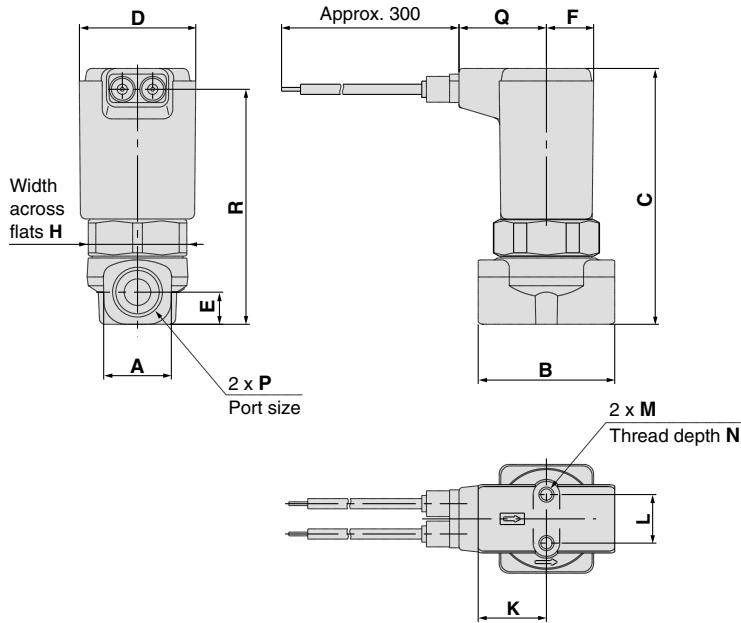
Valve model	Port size	Bracket part no.	A	B	C	D	E	F	G	H	J	L
VCS21	1/8, 1/4	VCW20-12-01A	34	40	25	30	12.8	12.8	5	4.5	6	13
VCS31	1/4, 3/8	VCW30-12-02A	42	52	30	40	19	19	6	5.5	7	19
	1/2	VCW30-12-04A	48	56	36	44	23	23	6	5.5	7	23
VCS41	1/4, 3/8	VCW40-12-02A	42	52	30	40	23	23	6	5.5	7	19
	1/2	VCW30-12-04A	48	56	36	44	23	23	6	5.5	7	23
	3/4	VCW40-12-06A	56	65	44	53	28.2	28.2	6	5.5	7	26

\* 2 mounting screws (for mounting bracket) are included in bracket part no.

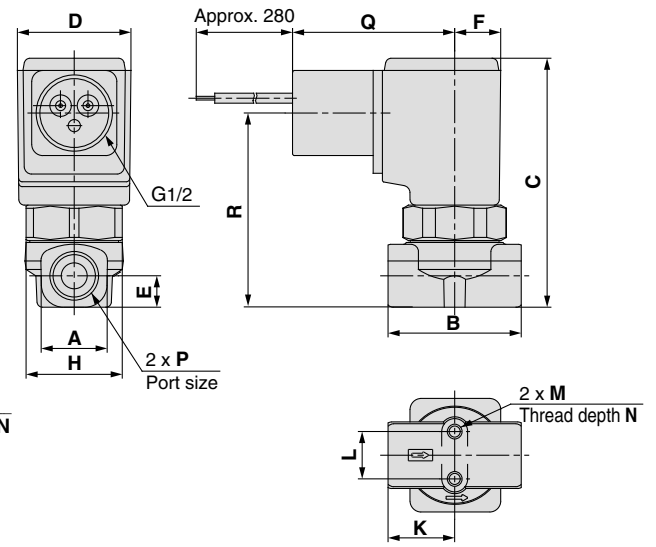
# Series VCS

## Dimensions

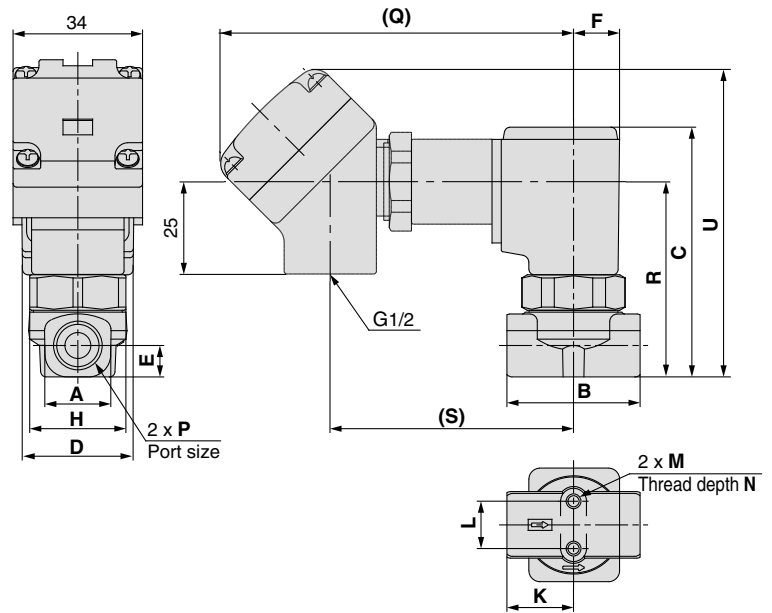
### Grommet: G



### Conduit: C



### Conduit terminal: T



### N.C.

(mm)

Model	P Port size	A	B	C	D	E	F	H	K	L	M	N	Electrical entry							
													Grommet: G		Conduit: C		Conduit terminal: T			
													Q	R	Q	R	Q	R	S	U
VCS21	1/8	13.5	28	64	31	6.5	12.5	27	14	12.8	M4	4.5	22	59	44	50	99	50	66	83
	1/4	18	36	67.5	31	8.5	12.5	27	18	12.8	M4	6	22	62	44	53	99	53	66	86
VCS31	1/4, 3/8	22	40	81.5	36.5	11	15	32	20	19	M5	8	24	76	46	66.5	101	66.5	68	99
	1/2	30	50	86	36.5	13.5	15	32	25	23	M5	8	24	80	46	71	101	71	68	104
VCS41	1/4, 3/8	22	45	90	41	11	17	36	22.5	23	M5	8	26	84	48	74.5	103	74.5	70	107
	1/2	30	50	94	41	13.5	17	36	25	23	M5	8	26	88	48	78.5	103	78.5	70	111.5
	3/4	35	60	102	41	17.5	17	36	30	28.2	M5	8	26	96	48	86.5	103	86.5	70	119

### How to Order Manifold

**VV2C S 2 - D 02 01**

For steam

**Series**

2	Class 2
3	Class 3
4	Class 4

**Material**

Symbol	Body material	Seal material
D	Brass (C37)	FKM
N	Stainless steel	FKM

**Thread type**

Symbol	Thread type
Nil	Rc
N	NPT
F	G


**OUT port size**

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

\* All IN ports are 3/8.

**Stations**

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



### How to Order Manifold Assembly

Enter the mounting valve and option part numbers under the manifold base part number.

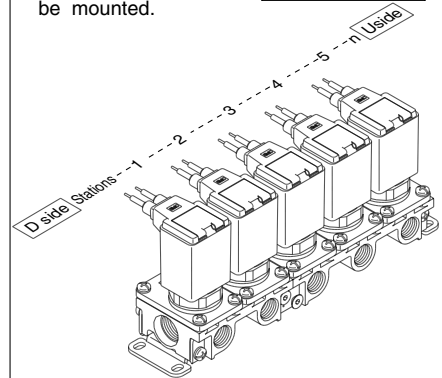
<Ordering Example>

VV2CS2-D0501.....1 set Manifold part no.

\* VCS23-1G-2.....5 sets Valve part no. (Stations 1 to 5)

"\*" is the symbol for assembly. 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 S 2 3 - 1 G - 2 -**

For steam

**Series**

2	Class 2
3	Class 3
4	Class 4

**Valve type**

3	N.C. for manifold
---	-------------------

**Voltage**

1	100 VAC
2	200 VAC
3	110 VAC
4	220 VAC
7	240 VAC
8	48 VAC
J	230 VAC

\* Please consult SMC regarding other voltages.

**Material and insulation type**

Symbol	Body material	Seal material	Coil insulation type
Nil	Brass (C37)	PTFE	Class H
D		FKM	
R	Stainless steel	PTFE	
N		FKM	

**Orifice diameter**

Symbol	Orifice dia. (mm)	Class 2	Class 3	Class 4
2	2	○	—	—
3	3	○	○	○
4	4	○	○	○
5	5	○	○	○
7	7	—	○	○

**Electrical entry**

G	Grommet
C	Conduit
T	Conduit terminal

\* Available types of electrical entry are either G, C and T. (Surge voltage suppressor, light are not equipped.)

### Manifold Option

#### Blanking plate assembly

**VVCW 2 0 - 3A - K**

**Series**

2	Class 2
3	Class 3
4	Class 4

**Material**

Symbol	Plate material	Seal material
K	Stainless steel	PTFE
H		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.

VX2

VXD

VXZ

VXE

VXP

VXR

VXH

VXF

VX3

VXA

VCH□

VDW

VQ

LVM

VCA

VCB

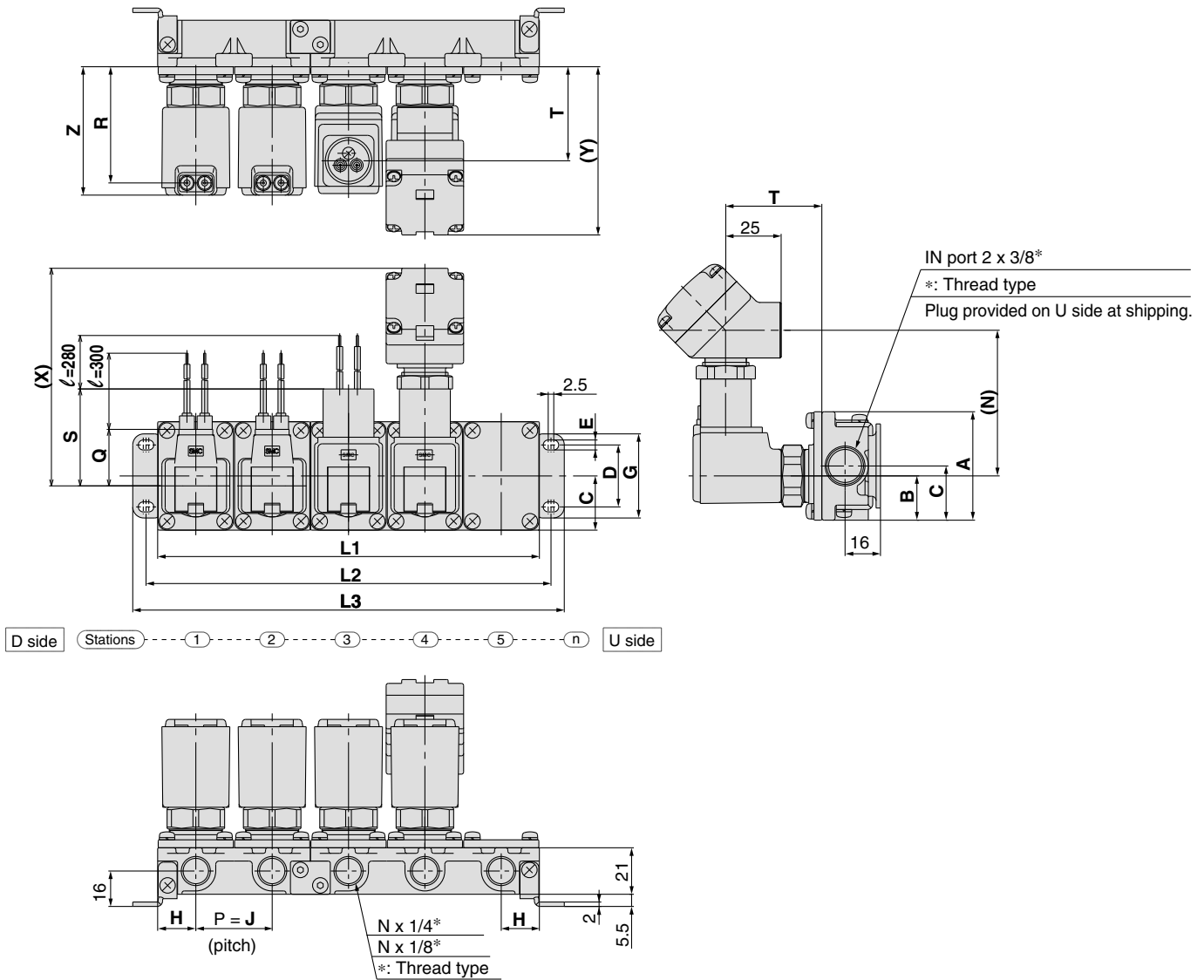
VCL

VCS

VCW

# Series VCS

## Dimensions



### L Dimension

(mm)

Model	Dimensions	n (stations)									
		2	3	4	5	6	7	8	9	10	
VV2CS2	L1	70	105	140	175	210	245	280	315	350	
	L2	82	117	152	187	222	257	292	327	362	
	L3	94	129	164	199	234	269	304	339	374	
VV2CS3	L1	78	117	156	195	234	273	312	351	390	
	L2	90	129	168	207	246	285	324	363	402	
	L3	102	141	180	219	258	297	336	375	414	
VV2CS4	L1	84	126	168	210	252	294	336	378	420	
	L2	96	138	180	222	264	306	348	390	432	
	L3	108	150	192	234	276	318	360	402	444	
Manifold composition		2 stns. x 1	3 stns. x 1	2 stns. x 2	2 stns. + 3 stns.	3 stns. x 2	2 stns. x 2 + 3 stns.	2 stns. + 3 stns x 2	3 stns. x 3	2 stns. x 2 + 3 stns. x 2	

Note) Manifold base is consisted of the junction of 2 and 3 station bases.

### Dimensions

(mm)

Model	A	B	C	D	E	G	H	J	Z	Electrical entry						
										Grommet: G			Conduit: C		Conduit terminal: T	
										Q	R	S	T	N	X	Y
VV2CS2	49	20	24.5	28	4.5	38	17.3	34.5	56	22	50.5	44	41.5	66	99	77
VV2CS3	57	25.5	28.5	30	5.5	42	19.3	38.5	66	24	60	45.5	51	68	101	86.5
VV2CS4	57	25.5	28.5	30	5.5	42	20.8	41.5	74	26	68	47.5	58.5	70	103	94