



NS70-18A

Series VC

# Series VCL

Direct Operated 2 Port Solenoid Valve for Oil



Splash Proof: IP65 Enclosure  
Compact Size  
Long Life  
Manifoldable  
Durable

# Multipurpose Valve for Oil

## Direct Operated 2 Port Solenoid Valve for Oil

# Series VCL

Kerosene, Fuel oil class 1 (fuel oil A), Silicone oil, Machine oil,  
Compressor oil, Gas oil, Hydraulic fluid, Turbine oil

### Improved durability (nearly twice the life of the previous VX series)

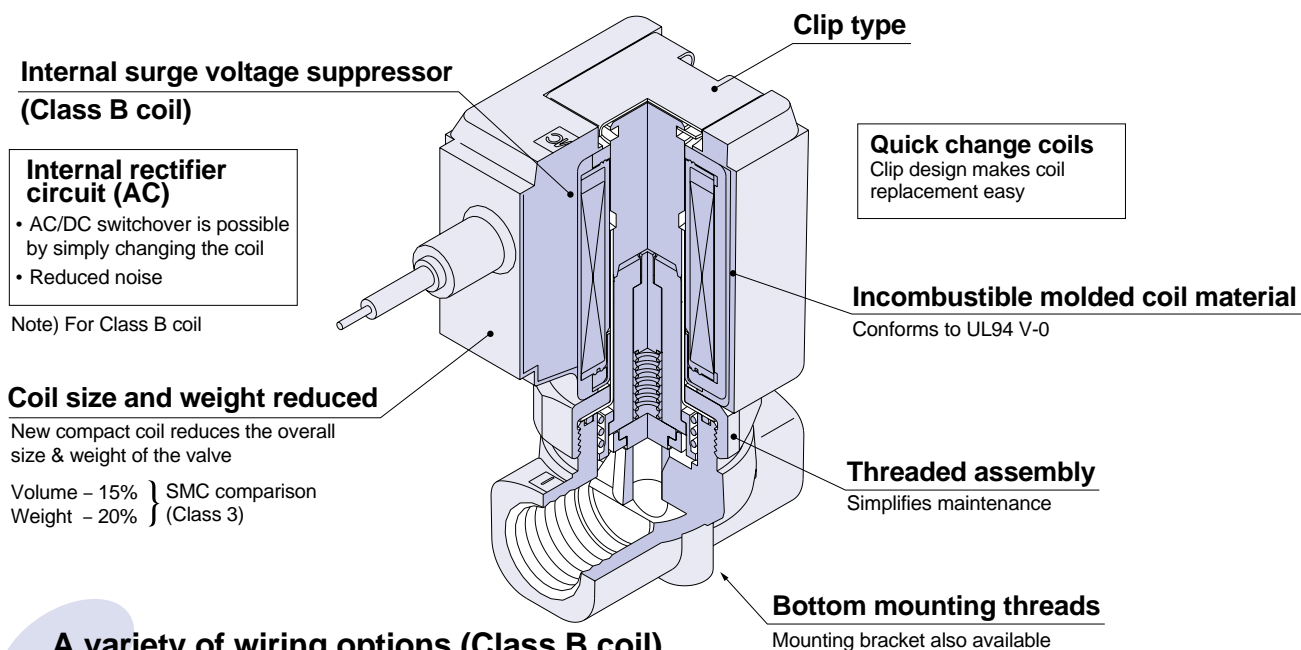
The internal wear of moving parts has been reduced through the use of a unique magnetic material. Service life, durability and corrosion resistance have been increased.

### High speed response (nearly twice the previous VX series) (Class 3)

### High flow rate: Cv factor 0.16 to 2.1

### Smaller size: Single valve – 15% reduction in volume (Class 3)

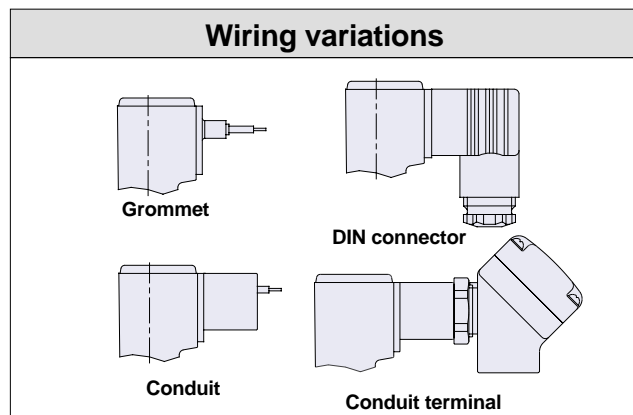
### Manifold length – Reduced by 18% (Class 3: 5 stations) (SMC comparison)



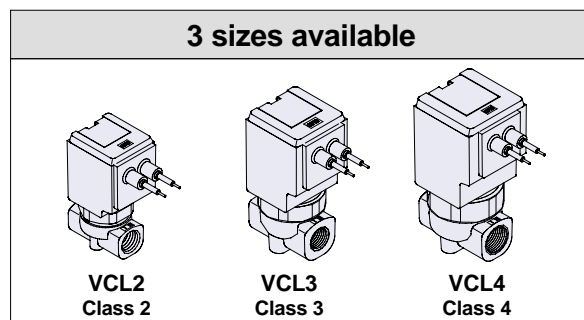
### A variety of wiring options (Class B coil)

Grommet, DIN connector, Conduit, Conduit terminal

### Wiring specifications (Class B coil)



### Enclosure: Dust tight and splash proof (equivalent to IP65)



## How to Order Valves (Single Type)

VC L 2 1 - 1 G 2 02

### For oil

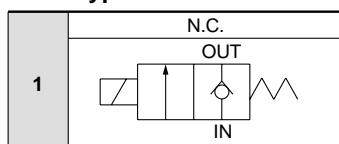
When no symbol is shown for material and insulation type

- Body material: C37
- Seal material: FKM
- 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
36	230VAC

\* Class B with AC has a built-in rectifying circuit.  
\*\* Class H is AC only. Without rectifying circuit.  
\*\*\* 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 class B coils are equipped with surge voltage suppressor.  
\*\* Class H are available only with "G-Grommet" electrical entry.  
(Not equipped with surge voltage suppressor.)

### Option

Nil	None
F	Foot type bracket

### Material and insulation type

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

### Thread type

Nil	Rc
N	NPT
T	NPTF
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 diameter	Class 2	Class 3	Class 4
2	ø2mm	○	—	—
3	ø3mm	○	○	○
4	ø4mm	○	○	○
5	ø5mm	○	○	○
7	ø7mm	—	○	○
10	ø10mm	—	○	○

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

### Orifice and port size combinations

Class	Port size	Orifice diameter					
		ø2	ø3	ø4	ø5	ø7	ø10
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)	—	—	—	—	—	●
4	3/4 (20A)	—	—	—	—	—	●

## Specifications



		Standard specifications	High temperature specifications
Valve specifications	Valve construction	Direct operated poppet	
	Fluid	Oil [50mm <sup>2</sup> /s {50cSt} ] or less	
	Withstand pressure MPa	5.0 (725 psi)	
	Body material	C37, Stainless steel	
	Seal material	FKM	
	Ambient temperature <sup>Note 1)</sup>	-20 to 60°C (-4 to 140°F)	-20 to 100°C (-4 to 212°F)
	Fluid temperature <sup>Note 1)</sup>	-10 to 60 (14 to 140°F) (with no freezing)	-10 to 100°C (14 to 212°F)
	Enclosure	Splash-proof (equivalent to IP65)	
	Environment	Location without corrosive or explosive gases	
	Valve leakage cm <sup>3</sup> /min	0 (with oil pressure)	
	Mounting position	Unrestricted	
Coil specifications	Rated voltage	24VDC, 12VDC, 100VAC, 110VAC, 200VAC, 220VAC, 230VAC (50/60Hz)	100VAC, 200VAC, 220VAC, 230VAC (50/60Hz)
	Allowable voltage fluctuation	±10% of rated voltage	
	Coil insulation type	Class B	Class H
	Power consumption	DC VCL20: 6W, VCL30: 8W, VCL40: 11.5W	—
	Apparent power	AC 50/60Hz VCL20: 8.5VA, VCL30: 10VA, VCL40: 13VA	Inrush <sup>Note 2)</sup> VCL20: 22/19VA, VCL30: 36/30VA, VCL40: 45/37VA Holding VCL20: 10/8VA, VCL30: 15/13VA, VCL40: 19/16VA

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 for starting or holding.

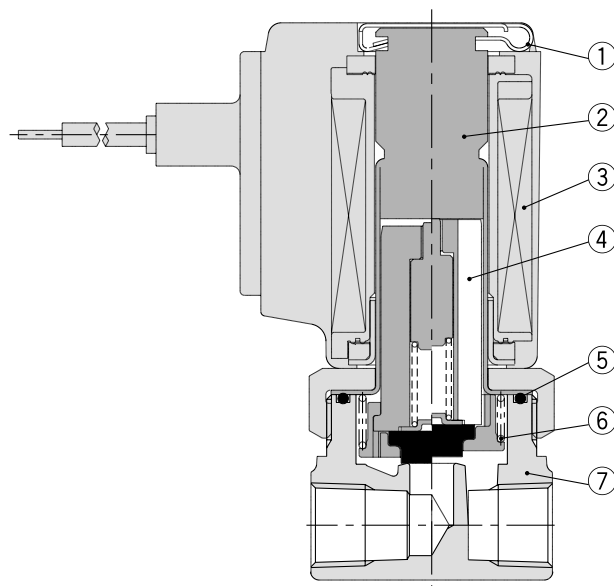
## Characteristic Specifications

Model	Class	Port size <sup>Note 1)</sup>	Orifice diameter mm (in) <sup>Note 1)</sup>	N.C. Max. operating pressure difference MPa (psi)	Effective area mm <sup>2</sup> (Cv factor)	Max. system pressure MPa (psi)	Weight kg (lb) <sup>Note 2)</sup>
VCL2	2	1/8 (6A) 1/4 (8A)	ø2 (0.08)	1.5 (217)	2.8 (0.16)	2.0 (290)	1/8: 0.21 (0.46) 1/4: 0.24 (0.53)
			ø3 (0.12)	0.8 (116)	5.9 (0.33)		
			ø4 (0.16)	0.4 (58)	9.2 (0.51)		
			ø5 (0.20)	0.25 (36)	11.7 (0.65)		
VCL3	3	1/4 (8A) 3/8 (10A) 1/2 (15A)	ø3 (0.12)	1.5 (217)	6.3 (0.35)	2.0 (290)	1/4: 0.42 (0.93) 3/8: 0.40 (0.88) 1/2: 0.49 (1.08)
			ø4 (0.16)	0.8 (116)	9.7 (0.54)		
			ø5 (0.20)	0.5 (72)	14.4 (0.80)		
			ø7 (0.28)	0.2 (29)	24.8 (1.38)		
			ø10 (0.39)	0.1 (14)	37.8 (2.10)		
VCL4	4	1/4 (8A) 3/8 (10A) 1/2 (15A) 3/4 (20A)	ø3 (0.12)	2.0 (290)	6.3 (0.35)	2.0 (290)	1/4: 0.58 (1.28) 3/8: 0.55 (1.21) 1/2: 0.62 (1.37) 3/4: 0.78 (1.72)
			ø4 (0.16)	1.1 (159)	10.8 (0.60)		
			ø5 (0.20)	0.7 (101)	15.3 (0.85)		
			ø7 (0.28)	0.3 (43)	24.8 (1.38)		
			ø10 (0.39)	0.12 (17)	37.8 (2.10)		

Note 1) Refer to model selection on page 7 regarding port size and orifice size combinations.

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

## Construction

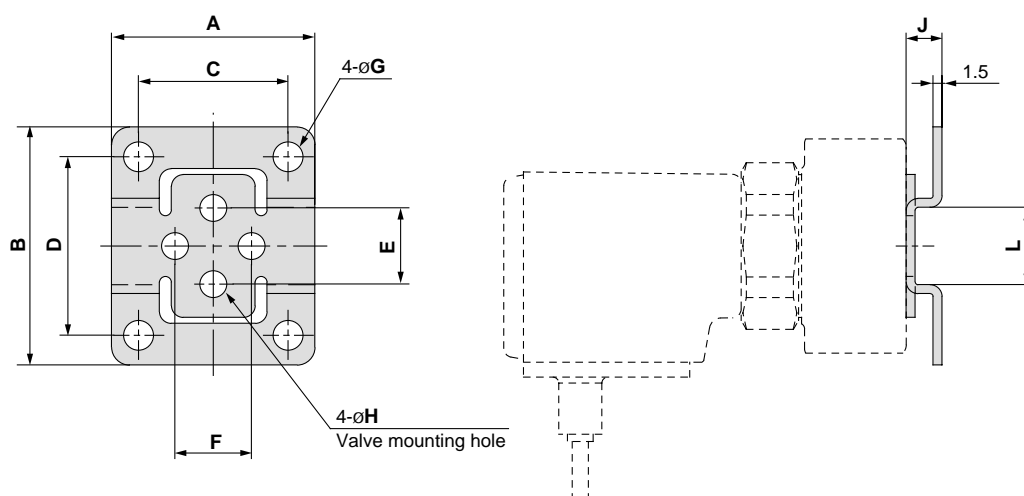


### Parts list

No.	Description	Material	
		Standard	Optional
1	Clip	Stainless steel	—
2	Tube assembly	Stainless steel	Stainless steel, Cu (for class H coil)
3	Coil assembly	Class B	Class H
4	Armature assembly	Stainless steel, FKM	—
5	O-ring	FKM	—
6	Return spring	Stainless steel	—
7	Body	C37	Stainless steel

## Dimensions (mm) /Bracket

1in = 25.4mm



### Bracket mounting dimensions

Valve model	Port size	Bracket part no.	A	B	C	D	E	F	G	H	J	L
VCL2□	1/8, 1/4	VCW20-12-01	34	40	25	30	12.8	12.8	5	4.5	6	13
VCL3□	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
VCL4□	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

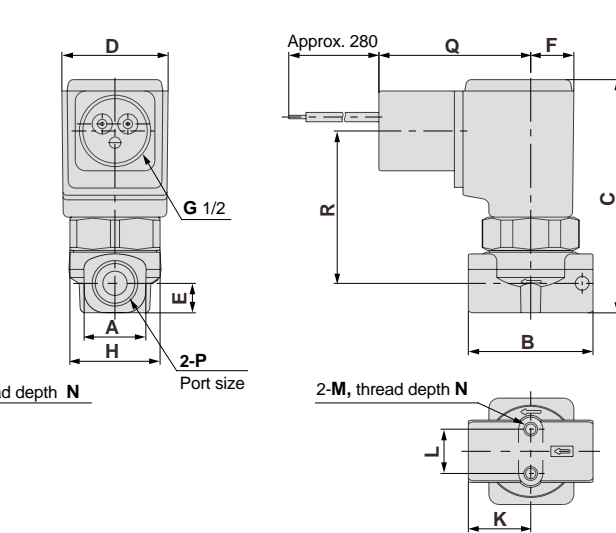
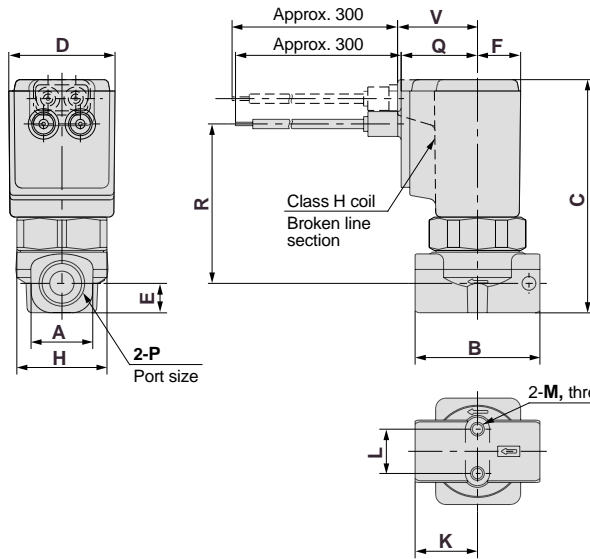
\* Bracket material: Stainless steel

## Dimensions (mm) (N.C.)

1in = 25.4mm

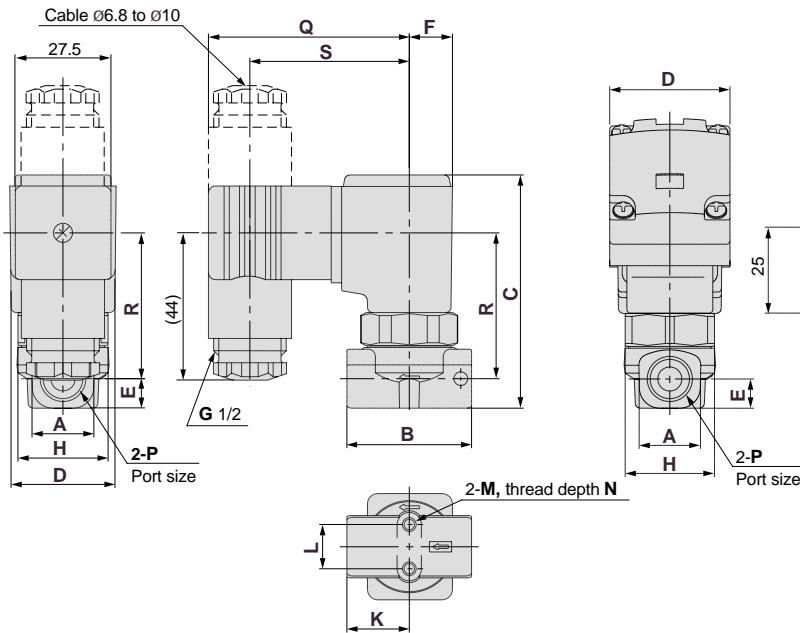
### Grommet: G

### Conduit: C



### DIN terminal: D

### Conduit terminal: T



## N.C. dimensions

(mm)

Model	P Port size Rc	A	B	C	D	E	F	H	K	L	M	N	Grommet: G			Conduit: C		DIN terminal: D			Conduit terminal: T			
													Q	V	R	Q	R	Q	R	S	Q	R	S	U
VCL21	1/8	13.5	28	64	31	6.5	12.5	28	14	12.8	M4	4.5	22	23	45	44	43	58	40.5	46.5	99	43	66	83
	1/4	18	36	67	31	8.5	12.5	28	18	12.8	M4	6	22	23	46	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	46	54.5	60	52	48.5	101	54.5	68	99
	1/2	30	50	84	36.5	13.5	15	32	25	23	M5	8	24	25	59	46	57	60	54.5	48.5	101	57	68	104
VCL41	1/4, 3/8	22	45	89	41	11	17	36	22.5	23	M5	8	26	26.5	64.5	48	62.5	62	60	50.5	103	62.5	70	107
	1/2	30	50	93.5	41	13.5	17	36	25	23	M5	8	26	26.5	66.5	48	64.5	62	62	50.5	103	64.5	70	111.5
	3/4	35	60	101	41	17.5	17	36	30	28.2	M5	8	26	26.5	70	48	68	62	65.5	50.5	103	68	70	119

Note) For class H

**VV2C L 2 02 01 01**

**For oil** ●

Manifold material: C37

**Series** ●

2	Class 2
3	Class 3
4	Class 4

**Material** ●

Symbol	Body material	Seal material
Nil	C37	FKM
H	Stainless steel	FKM

**Stations** ●

02	2 stations
:	:
10	10 stations

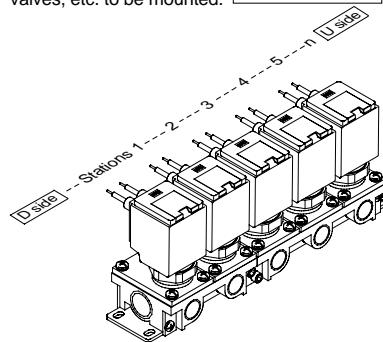
**OUT p** ●

Symbol	
01	
02	

\* All In port

\* Refer to the "L" dimensions on page 6 regarding the maximum number of stations.

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



**For oil**

When there is no symbol for material and insulation type

- Body material: C37
- Seal material: FKM
- Coil insulation: Class B

**Series**

2	Class 2
3	Class 3
4	Class 4

**Valve type**

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

**Voltage**

1	100VAC
2	200VAC
3	110VAC
4	220VAC
5	24VDC
6	12VDC
36	230VAC

\* Class B with AC has a built-in rectifying circuit.  
 \*\* Class H is AC only. Without rectifying circuit.  
 \*\*\* Contact SMC regarding other voltages.

**Material and insulation type**

Symbol	Body material	Seal material	Coil insulation
NII	C37	FKM	Class B
D			Class H
H	Stainless steel		Class B
N			Class H

**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 class B coils are equipped with surge voltage suppressor.  
 \*\* Class H coils are available with "G-Grommet" electrical entry only. (Not equipped with surge voltage suppressor.)

VVCW **2** 0 – 3A – **A**

Series ●

<b>2</b>	Class 2
<b>3</b>	Class 3
<b>4</b>	Class 4

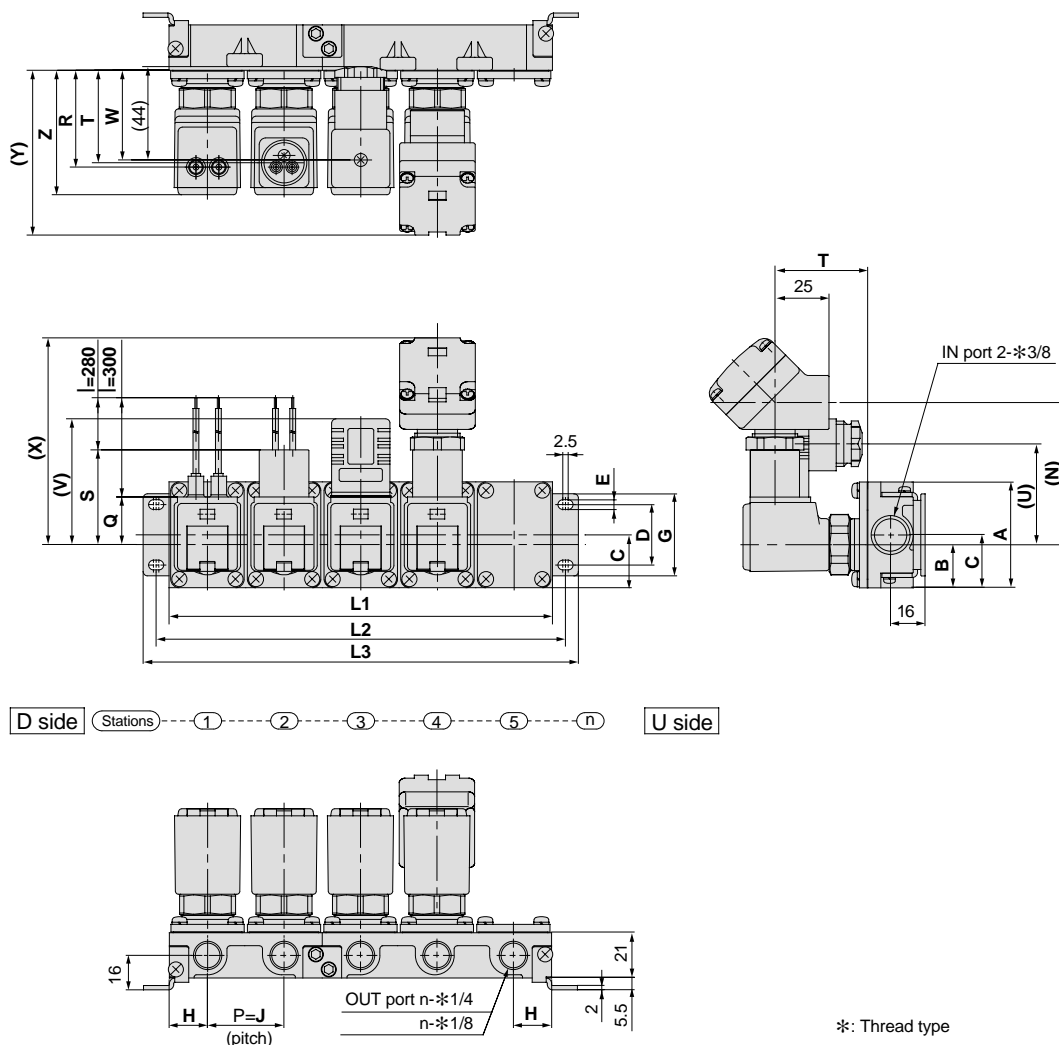
A circuit diagram showing a battery connected to two resistors in parallel. The resistors are represented by rectangles with diagonal lines through them. The circuit is enclosed in a rectangular loop.

Symbol	Plate material	Seal material
A	C37	FKM
H	Stainless steel	



## Dimensions (mm) (N.C.)

1in = 25.4mm



※: Thread type

## L dimensions

(mm)

Model	Dimension	n (stations)								
		2	3	4	5	6	7	8	9	10
VV2CL2	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
VV2CL3	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
VV2CL4	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		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 bases are composed by connecting 2 station and 3 station bases.

## Dimensions

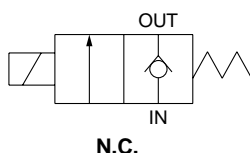
(mm)

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
VV2CL2	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
VV2CL3	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
VV2CL4	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

## Model Selection

## VCL (for oil) 2 port solenoid valve (N.C.)

Model	Material		Class	Port size	Orifice diameter					
	Body	Seal			ø2	ø3	ø4	ø5	ø7	ø10
VCL (for oil) 2 port solenoid valve	Brass (Stainless steel)	FKM	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)	—	—	—	—	—	●



## How to find the flow rate for oil

- Formula based on Cv factor

$$Q = 14.2 \cdot C_v \cdot \sqrt{\frac{10.2 \cdot \Delta P}{G}} \text{ /min}$$

- Formula based on effective area (Smm<sup>2</sup>)

$$Q = 0.8 \cdot S \cdot \sqrt{\frac{10.2 \cdot \Delta P}{G}} \text{ /min}$$

Q : Flow rate (/min)

ΔP: Pressure differential (P<sub>1</sub>– P<sub>2</sub>)

P<sub>1</sub>: Upstream pressure (MPa)

P<sub>2</sub>: Downstream pressure (MPa)

S : Effective area (mm<sup>2</sup>)

Cv: Cv factor

G : Fluid specific gravity (water = 1)

Note) In case of a viscous fluid, there may be a difference between the flow rate found with the above formulas and the actual flow rate, depending on the viscosity.

$$1 \text{ /min} = 0.035 \text{ SCFM}$$

$$1 \text{ MPa} = 145 \text{ psi}$$

$$1 \text{ in} = 25.4 \text{ mm}$$

## Explanation of Terminology

## Pressure Terminology

## 1. Maximum operating pressure differential

This indicates the maximum pressure differential (upstream 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 no more 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


FKM: Fluoro rubber – Trade names: Viton®, Dai-el, etc.


## 2. Symbols

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

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 system or decides its specifications.**

Since the products specified here are used in various operating conditions, their compatibility for the specific 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 machinery and equipment.**

The fluid can be dangerous if handled incorrectly. Assembly, handling or repair of 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 and measures to prevent danger from the fluid.
2. When equipment is to be removed, confirm the safety process as mentioned above and be certain there is no danger from fluid leakage or fluid remaining 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 the type of fluid or additives, etc.
3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.

## 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. Fluids**

Before using a fluid, confirm whether or not it is compatible by referring to the fluids listed in this catalog. Use fluids with a viscosity of no more than 50mm<sup>2</sup>/s (50cSt).

Consult SMC regarding any further questions.

**3. Fluid temperature**

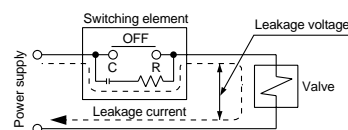
Operate within the fluid temperature range. The temperature range varies depending on the seal material, coil insulation and type of power supply, etc.

**4. Fluid quality**

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

**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 test.

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

When tightening is performed, 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 freeze prevention on the piping and body only. They can cause the coil to burn out.

**4. Secure with brackets, except in the case of steel piping and copper fittings.****5. Avoid sources of vibration, or set the arm from the body to the minimum length so that resonance will not occur.****6. Instruction manual**

Mount 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.

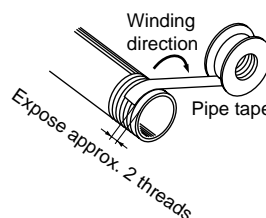
**Piping****⚠ Caution****1. Preparation before piping**

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

**2. Wrapping of pipe tape**

When connecting pipes and fittings, etc., be sure that 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 1/8	7 to 9
Rc 1/4	12 to 14
Rc 3/8	22 to 24
Rc 1/2	28 to 30
Rc 3/4	28 to 30

1N·m = 0.7375ft·lb

**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.

### Wiring

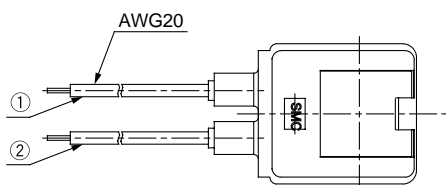
## ⚠ Caution

- As a rule, use electrical wire of 0.5 to 1.25mm<sup>2</sup>.  
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.
- When using class H coils where the electrical circuit system does not allow solenoid surge, install a surge absorber, etc., in parallel with the solenoid.

### Electrical Connections

## ⚠ Caution

### Grommet/Conduit

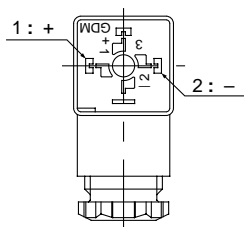


Rated voltage	Lead wire color	
	①	②
DC	Black	Red
100VAC	Blue	Blue
200VAC	Red	Red
Other AC	Gray	Gray

\* 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.



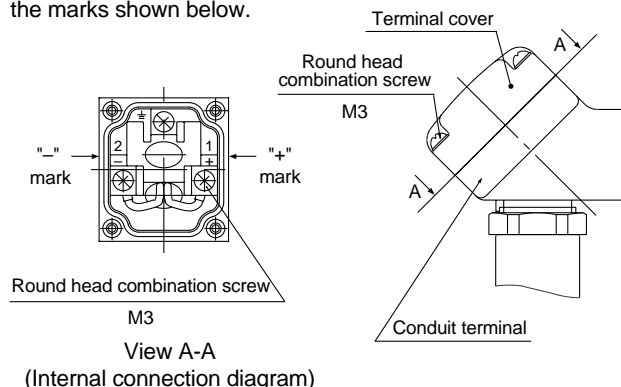
Terminal No.	1	2
DIN terminal	+	-

\* There is polarity only when equipped with light.

Note) Tighten the DIN connector mounting screws and terminal screws with a torque of 0.5N·m.

### 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.

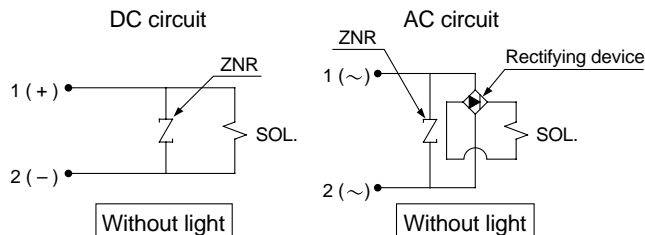
Note) Tighten the terminal cover mounting screws and terminal screws with a torque of 0.5N·m.

### Electrical Circuits

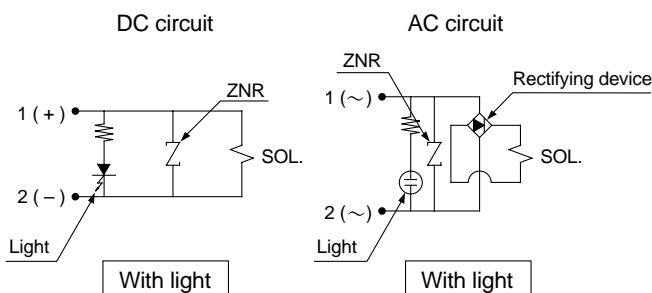
## ⚠ Caution

### Class B

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

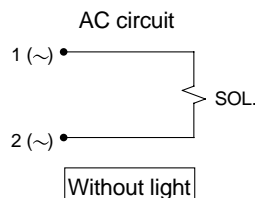


### Conduit terminal, DIN connector



### Class H

### Grommet



**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. Perform maintenance in accordance with the procedures in the instruction manual.

Improper handling can cause damage or malfunction of 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

Switch valves at least once every 30 days to prevent malfunction.

**⚠ Caution**

1. Filters and strainers

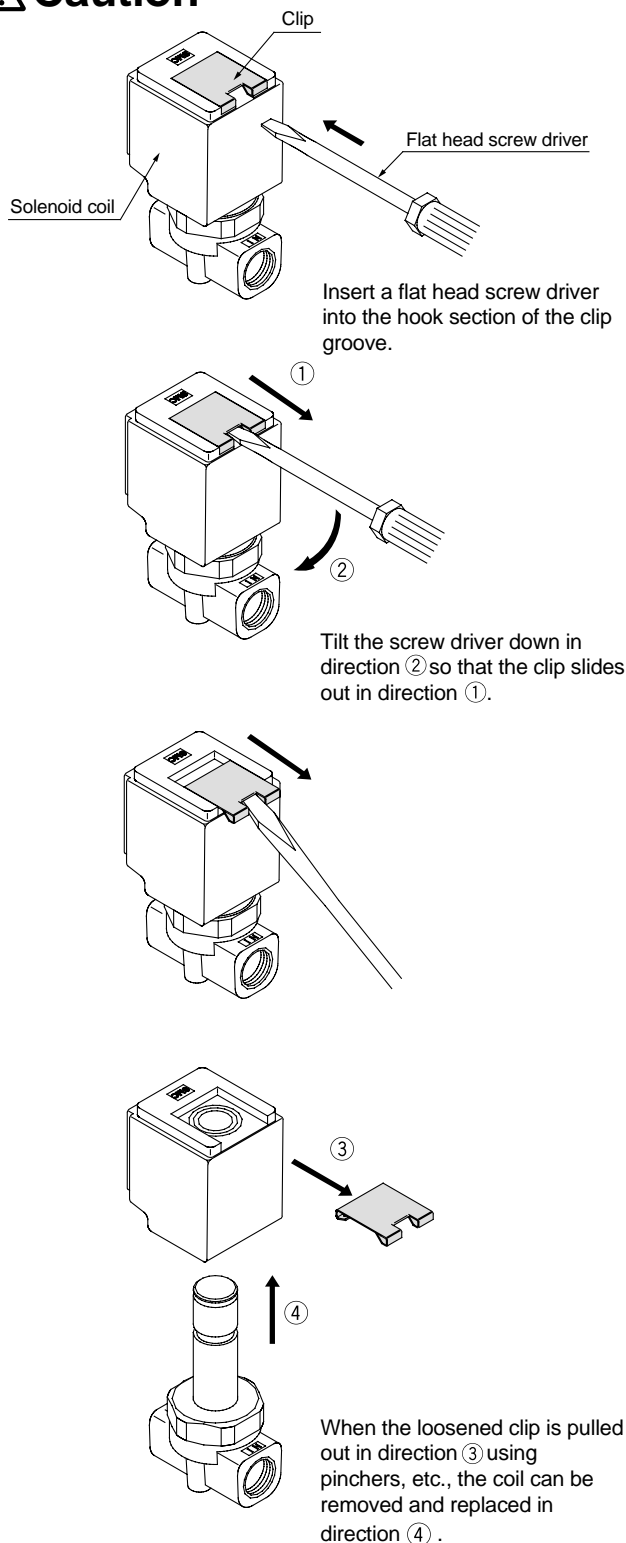
1. Be careful regarding clogging of filters and strainers.
2. Replace filters after one year of use, or earlier if the amount of pressure drop reaches 0.1MPa.
3. Clean strainers when the amount of pressure drop reaches 0.1MPa.

Specific Product Precautions  
Be sure to read before handling

Refer to pages 8 through 12 for safety instructions and precautions regarding 2 port solenoid valve for fluid control

## How to Replace the Solenoid Coil

### ⚠ Caution



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

## Replacement Parts

### Solenoid coil part numbers (Class B)

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
36	230VAC

#### 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

### Solenoid coil part numbers (Class H)

VCS 20-1 G

#### Series

20	Class 2
30	Class 3
40	Class 4

#### Voltage

1	100VAC
2	200VAC
3	110VAC
4	220VAC
36	230VAC

#### Lead wire length

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

#### Electrical entry

G	Grommet
---	---------

### Clip part numbers

AZ-T-VCL

How to Order Valves → Page 1 Valve model  
Page 5 Valve model

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

# World Wide SMC Support...

**North American Branch Offices** For a branch office near you call: 1-800-SMC-SMC1 (762-7621)

**SMC Pneumatics Inc. (Atlanta)**  
1440 Lakes Parkway, Suite 600  
Lawrenceville, GA 30043  
Tel: (770) 624-1940  
FAX: (770) 624-1943

**SMC Pneumatics Inc. (Cleveland)**  
2305 East Aurora Rd., Unit A-3  
Twinsburg, OH 44087  
Tel: (330) 963-2727  
FAX: (330) 963-2730

**SMC Pneumatics Inc. (Milwaukee)**  
16850 W. Victor Road  
New Berlin, WI 53151  
Tel: (262) 827-0080  
FAX: (262) 827-0092

**SMC Pneumatics Inc. (Richmond)**  
5377 Glen Alden Drive  
Richmond, VA 23231  
Tel: (804) 222-2762  
FAX: (804) 222-5221

**SMC Pneumatics Inc. (Austin)**  
9101 Wall Street, Suite 1030  
Austin, TX 78754  
Tel: (512) 926-2646  
FAX: (512) 926-7055

**SMC Pneumatics Inc. (Columbus)**  
3687 Corporate Drive  
Columbus, OH 43231  
Tel: (614) 895-9765  
FAX: (614) 895-9780

**SMC Pneumatics Inc. (Mnpls.)**  
990 Lone Oak Road, Suite 162  
Eagan, MN 55121  
Tel: (651) 688-3490  
FAX: (651) 688-9013

**SMC Pneumatics Inc. (Rochester)**  
245 Summit Point Drive  
Henrietta, NY 14467  
Tel: (716) 321-1300  
FAX: (716) 321-1865

**SMC Pneumatics Inc. (Boston)**  
Zero Centennial Drive  
Peabody, MA 01960  
Tel: (978) 326-3600  
Fax: (978) 326-3700

**SMC Pneumatics Inc. (Dallas)**  
12801 N. Stemmons Frwy, Ste. 815  
Dallas, TX 75234  
Tel: (972) 406-0082  
FAX: (972) 406-9904

**SMC Pneumatics Inc. (Nashville)**  
5000 Linbar Drive, Suite 297  
Nashville, TN 37211  
Tel: (615) 331-0020  
FAX: (615) 331-9950

**SMC Pneumatics Inc. (S.F.)**  
85 Nicholson Lane  
San Jose, CA 95134  
Tel: (408) 943-9600  
FAX: (408) 943-9111

**SMC Pneumatics Inc. (Charlotte)**  
5029-B West W.T. Harris Blvd.  
Charlotte, NC 28269  
Tel: (704) 597-9292  
FAX: (704) 596-9561

**SMC Pneumatics Inc. (Detroit)**  
2990 Technology Drive  
Rochester Hills, MI 48309  
Tel: (248) 299-0202  
FAX: (248) 293-3333

**SMC Pneumatics Inc. (Newark)**  
3434 US Hwy. 22 West, Ste. 110  
Somerville, NJ 08876  
Tel: (908) 253-3241  
FAX: (908) 253-3452

**SMC Pneumatics Inc. (St. Louis)**  
4130 Rider Trail North  
Earth City, MO 63045  
Tel: (314) 209-0080  
FAX: (314) 209-0085

**SMC Pneumatics Inc. (Chicago)**  
27725 Diehl Road  
Warrenville, IL 60555  
Tel: (630) 393-0080  
FAX: (630) 393-0084

**SMC Pneumatics Inc. (Houston)**  
9001 Jameel, Suite 180  
Houston, TX 77040  
Tel: (713) 460-0762  
FAX: (713) 460-1510

**SMC Pneumatics Inc. (Phoenix)**  
2001 W. Melinda Lane  
Phoenix, AZ 85027  
Tel: (623) 492-0908  
FAX: (623) 492-9493

**SMC Pneumatics Inc. (Tampa)**  
8507-H Benjamin Road  
Tampa, FL 33634  
Tel: (813) 243-8350  
FAX: (813) 243-8621

**SMC Pneumatics Inc. (Cincinnati)**  
4598 Olympic Blvd.  
Erlanger, KY 41018  
Tel: (606) 647-5600  
FAX: (606) 647-5609

**SMC Pneumatics Inc. (L.A.)**  
14191 Myford Road  
Tustin, CA 92780  
Tel: (714) 669-1701  
FAX: (714) 669-1715

**SMC Pneumatics Inc. (Portland)**  
14107 N.E. Airport Way  
Portland, OR 97230  
Tel: (503) 252-9299  
FAX: (503) 252-9253

**SMC Pneumatics Inc. (Tulsa)**  
10203 A East 61st Street  
Tulsa, OK 74146  
Tel: (918) 252-7820  
FAX: (918) 252-9511

**Europe**  
ENGLAND  
**SMC Pneumatics (U.K.) Ltd.**  
GERMANY  
**SMC Pneumatik GmbH**  
ITALY  
**SMC Italia SpA**  
FRANCE  
**SMC Pneumatique SA**  
HOLLAND  
**SMC Controls BV**  
SWEDEN  
**SMC Pneumatics Sweden AB**  
SWITZERLAND  
**SMC Pneumatik AG**  
AUSTRIA  
**SMC Pneumatik GmbH**  
SPAIN  
**SMC España, S.A.**  
IRELAND  
**SMC Pneumatics (Ireland) Ltd.**  
**Asia**  
JAPAN

**SMC Corporation**  
KOREA  
**SMC Pneumatics Korea Co., Ltd.**  
CHINA  
**SMC (China) Co., Ltd.**  
HONG KONG  
**SMC Pneumatics (Hong Kong) Ltd.**  
SINGAPORE  
**SMC Pneumatics (S.E.A.) Pte. Ltd.**  
PHILIPPINES  
**SMC Pneumatics (Philippines), Inc.**  
MALAYSIA  
**SMC Pneumatics (S.E.A.) Sdn. Bhd.**  
TAIWAN  
**SMC Pneumatics (Taiwan) Co., Ltd.**  
THAILAND  
**SMC Thailand Ltd.**  
INDIA  
**SMC Pneumatics (India) Pvt., Ltd.**  
**North America**  
CANADA  
**SMC Pneumatics (Canada) Ltd.**  
MEXICO  
**SMC Pneumatics (Mexico) S.A. de C.V.**

**South America**  
ARGENTINA  
**SMC Argentina S.A.**  
CHILE  
**SMC Pneumatics (Chile) Ltda.**

**Oceania**  
AUSTRALIA  
**SMC Pneumatics (Australia) Pty. Ltd.**  
NEW ZEALAND  
**SMC Pneumatics (N.Z.) Ltd.**

## SMC offers the same quality and engineering expertise in many other pneumatic components

**Valves**  
Directional Control Valves  
Manual Valves  
Mufflers  
Exhaust Cleaners  
Quick Exhaust Valves

**Valves**  
Proportional Valves  
Mechanical Valves  
Miniature Valves  
Fluid Valves

**Cylinders/Actuators**  
Compact Cylinders  
Miniature Cylinders  
Rodless Cylinders  
Rotary Actuators  
Pneumatic Grippers

**Vacuum**  
Vacuum Ejectors  
Vacuum Accessories  
**Instrumentation**  
Pneumatic Positioners  
Pneumatic Transducers

**Air Preparation Equipment**  
Filters-Regulators-Lubricators  
Coalescing Filters  
Micro Mist Separators  
**Fittings**  
Air Fittings

## SMC Pneumatics Inc.

P.O. Box 26640, Indianapolis, IN 46226  
Tel: (317) 899-4440 • FAX: (317) 899-3102