

# Coolant valve

CVE2/CVE3 Series (air operated type)

CVSE2/CVSE3 Series (with solenoid valve)

## COOLANT VALVE



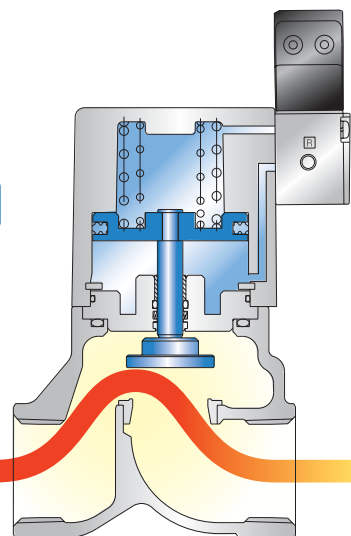
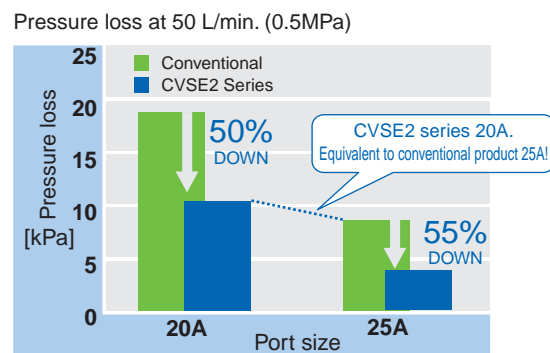
Reducing energy loss!

# Low pressure loss/large flow rate coolant

Low pressure (0.5MPa) to high pressure (7.0MPa) is available with port size 10A to 80F. Coolant needs are handled with a wide range of products.

## Pressure loss 50% reduction

An ideal flow rate shape has been pursued focusing on zero pressure loss. Pressure loss 50% reduced comparing to conventional. (59% reduced maximum, CKD comparison)



## Flow UP

Port size	Conventional	CVSE2 Series
15A	5	6.5
20A	8	11
25A	12	18

Low pressure loss 3 port valve  
**CVSE3 Series**



Reliable operation  
Cylinder drive method using external pilot air ensures reliable operation.

# CVSE<sup>2</sup>/<sub>3</sub> Series

Coolant valve 2, 3 port valve

Valve side mounted low wattage actuator

Reliable direct acting

Cutting chip, etc., resistant  
This valve has the metal seal structure to prevent foreign matters, such as cutting dust and abrasive grains, etc., from entering into the valve inside.

Low pressure loss type 2 port valve

**CVSE2 Series**

Low pressure loss  
Ideal valve flow path shape (patent acquired and patent pending)

Useful to different machines and equipment

# valve, 45 types available.



**RoHS**

## Compatible designs with conventional products

The product is compatible with conventional products in face-to-face dimensions and specifications, enabling installation in existing facilities. **Current consumption is reduced by 50% with accurate direct-acting type**

An accurate direct-acting solenoid valve is used to open and close the valve. Power consumption is reduced to 2 W from the conventional 4 W. Easy installation

## Actuator mounted on the valve side

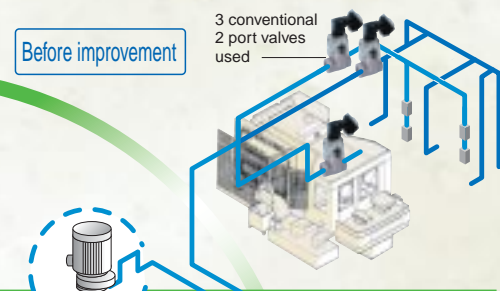
The actuator is generally smaller and easier to install.

## Proposals for improving coolant devices

An optimum coolant system is realized by reviewing the valves and system.

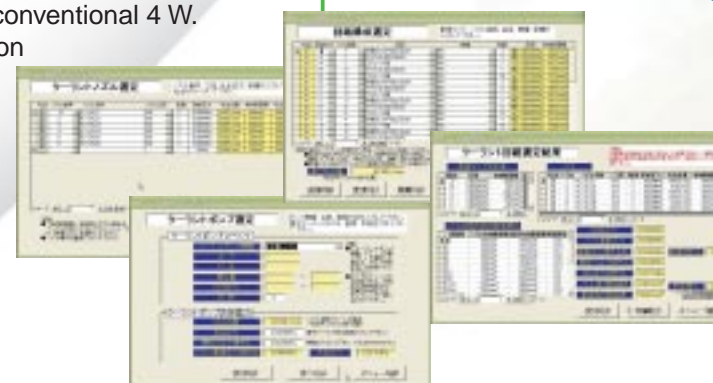
### STEP1

- Adequate reviewing coolant discharge
- Reviewing pressure loss of coolant valve



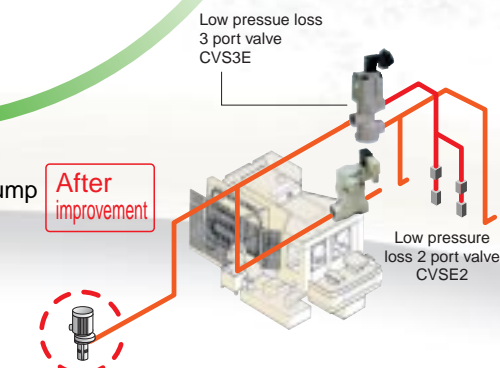
### STEP2

The coolant system's optimum circuit can be found with sizing software.



### STEP3





- Downsizing of coolant pump
- Achieving energy saving coolant system



## CVSE series variations

Model	Pressure	Port size									
		10A	15A	20A	25A	32A/F	40A/F	50A/F	65F	80F	
2 port valve CVSE2	Low pressure 0.5MPa	●	●	●	●	●	●	●	●	●	●
	1.0MPa	●	●	●	●	●	●	●	●	●	●
	Medium pressure 1.6MPa	●	●	●	●	●	●	●	●	●	●
3 port valve CVSE3	High pressure 3.0MPa	●	●	●	●	●	●	●	●	●	●
	7.0MPa	●	●	●	●	●	●	●	●	●	●
3 port valve CVS3E	Medium pressure 3.5MPa	●	●	●	●	●	●	●	●	●	●
	7.0MPa	●	●	●	●	●	●	●	●	●	●
3 port valve CVS3E	High pressure 7.0MPa	●	●	●	●	●	●	●	●	●	●
	Low pressure 0.3MPa	●	●	●	●	●	●	●	●	●	●

\*1: This model does not incorporate a low-pressure loss shape.  
\*2: Only Rc screw-in type is available.  
\*3: Listed in the General purpose valve (CB-03-1SA).

No. of port	Category		Model name	Working pressure range MPa	Port size		Port size										Page		
					Rc3/8	Rc1/2	Rc3/4	Rc1	Rc1 1/4	32 flange	Rc1 1/2	40 flange	Rc2	50 flange	65 flange	80 flange			
2 port		Low pressure	Air operated type	CVE2-***-05	0 to 0.5	●	●	●	●	●	●	●	●	●	●	●	●	1	
			With solenoid valve	CVSE2-***-05		●	●	●	●	●	●	●	●	●	●	●	●	●	1
		Low pressure	Air operated type	CVE2-***-10	0 to 1	●	●	●	●	●	●	●	●	●	●	●	●	●	1
			With solenoid valve	CVSE2-***-10		●	●	●	●	●	●	●	●	●	●	●	●	●	1
		Medium pressure	Air operated type	CVE2-***-16	0 to 1.6	●	●											11	
			With solenoid valve	CVSE2-***-16		●	●												11
		Medium pressure	Air operated type	CVE2-***-30	0 to 3.0	●	●												11
			With solenoid valve	CVSE2-***-30		●	●												11
		High pressure	Air operated type	CVE2-***-70	0 to 7.0	●	●											19	
			With solenoid valve	CVSE2-***-70		●	●												19
3 port		Medium pressure	Air operated type	CVE3-***-35	0 to 3.5	●	●		●			●		●				25	
			With solenoid valve	CVSE3-***-35		●	●		●			●		●		●			25
		High pressure	Air operated type	CVE3-***-70	0 to 7.0	●	●		●										25
			With solenoid valve	CVSE3-***-70		●	●		●										25

# Flow characteristics

## 1. Flow characteristics indication

The catalog specifications indicate the flow as followings.

Components	indication	Unit	Standard
Pneumatic components	New JIS compliant indication	C and b	ISO 6358: 1989 Pneumatic fluid power - Components using compressible fluids - Determination of flow-rate characteristics JIS B8390: 2000 (ISO 6358 translation)
	Conventional indication	S	JIS B8373: 1993 " pneumatic 2 port solenoid valve " JIS B8374: 1993 " pneumatic 3 port solenoid valve " JIS B8375: 1993 " pneumatic 4,5 port solenoid valve " JIS B8379: 1995 " pneumatics noise reduction device "
		Cv	ANSI (NFPA) T3.21.3: 1990
General purpose valves	New JIS compliant indication	Cv	IEC 60534-2-3: 1997 Industrial-process control valves - Part 2-3: Flow capacity - Test procedures JIS B2005-2-3: 2004 (IEC 60534-2-3 translation) JIS B8471: 2004 " solenoid valve for water " JIS B8472: 1994 " solenoid valve " for steam JIS B8473: 1994 " solenoid valve for fuel "
	Conventional indication		

## 2. Explanation of general purpose valves

The general purpose valve flow characters are indicated with capacity coefficient Cv. To comply with old IEC Standards, attempts were made to indicate features with capacity coefficient Av to unify indications with SI units. The Av value was eliminated from the control valve capacity coefficient with JIS B 2005-2-3: 2004 revisions, and only Kv and Cv types are used.

The Cv indication is still used to indicate flow features of the general purpose valves. For Av values, conversion values are listed for reference as needed.

- Capacity : The non-SI adjustment valve capacity coefficient is used commonly worldwide. U.S. gal value indicating the flow coefficient Cv of 40 to 100°F city water for one minute through the valve (test part) when the differential pressure is 1 psi.

$$Cv=Q \sqrt{\frac{\rho}{\rho_w} \frac{1}{\Delta P}} : (1)$$

Cv : Capacity coefficient

Q : Flow (U.S. gal/min) (1U.S.gal/min. = 6,309 x 10<sup>-5</sup>m<sup>3</sup>/s)

ρ : Fluid density (1b/ft<sup>3</sup>) (1b/ft<sup>3</sup> = 16,018kg/m<sup>3</sup>)

ρ<sub>w</sub> : 40°F to 100°F (4°C to 38°C) water density (1b/ft<sup>3</sup>)

ΔP: Differential pressure (psi) (1psi=6.8948kPa)

- Capacity : Value indicating city water flow rate passing through valve (test part) as m<sup>3</sup>/s unit at pressure difference 1 Pa. coefficient Av The value is calculation based on the following formula.

$$Av = Q \sqrt{\frac{\rho}{\Delta P}} : (2)$$

Av : Capacity coefficient (m<sup>2</sup>)

Q : Flow (m<sup>3</sup>/s)

ρ : Density of fluid (kg/m<sup>3</sup>)

ΔP: Differential pressure (Pa)

## Flow formula

is indicated as followings in accordance with practical unit

- Capacity coefficient Cv

For liquid:

$$Q = 45.16 Cv \sqrt{\frac{\Delta P}{G}} : (3)$$

Cv : Flow factor

Q : Flow ( ℓ /min.)

ΔP: Differential pressure (MPa)

G : Specific gravity (water G=1)

For steam:

$$\text{For } P_2 \leq \frac{P_1}{2} \quad W = \frac{97 Cv P_1}{K} : (4)$$

Cv : Flow factor

W : Flow (kg/h)

P<sub>1</sub> : Primary absolute pressure (MPa)

P<sub>2</sub> : Secondary absolute pressure (MPa)

K : (1 + 0.0013ts) ts: Degree of superheat  
(Saturated vapor K = 1)

$$\text{For } P_2 > \frac{P_1}{2} \quad W = \frac{194 Cv \sqrt{(P_1 - P_2) P_2}}{K} : (5)$$

## Flow formula

is indicated as followings in accordance with practical unit

### ● Capacity coefficient $A_v$

For liquid:

$$Q = 1.9 \times 10^6 A_v \sqrt{\frac{\Delta P}{G}} \quad : (6)$$

$Q$  : Flow (  $\ell$ /min.)  
 $A_v$  : Capacity coefficient ( $m^2$ )  
 $\Delta P$  : Differential pressure (MPa)  
 $G$  : Specific gravity (water = 1)

For steam:

$$Q = 8.1 \times 10^6 A_v \sqrt{\Delta P (P_2 + 0.1)} \quad : (7)$$

$Q$  : Flow (kg/h)  
 $A_v$  : Capacity coefficient ( $m^2$ )  
 $\Delta P$  : Differential pressure (MPa)  
 $P_1$  : Primary side pressure (MPa):  
 $\Delta P = P_1 - P_2$   
 $P_2$  : Secondary side pressure (MPa)

Conversion of capacity coefficient

$$A_v = 28 \times 10^{-6} K_v = 24 \times 10^{-6} C_v \quad : (8)$$

$K_v$  : Value indicating the flow of 5 to 40°C city water as  $m^3/h$  passing through the valve when the differential pressure is 1 bar.  
 $C_v$  : Value indicating 60°F city water flow rate passing through valve as US gal/min unit at pressure difference 1lb $f$ /in $^2$  (psi).  
Values do not match because test methods for  $K_v$  and  $C_v$  for pneumatic use differ.



# Safety precautions

Always read this section before starting use.

When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that device safety mechanical mechanism, pneumatic control circuit, or water control circuit and the system operated by electrical control that controls the devices is secured.

It is important to select, use, handle, and maintain the product appropriately to ensure that the CKD product is used safely.

Observe warnings and precautions to ensure device safety.

Check that device safety is ensured, and manufacture a safe device.

## WARNING

**1** This product is designed and manufactured as a general industrial machine part. It must be handled by an operator having sufficient knowledge and experience in handling.

**2** Use this product in accordance of specifications.

This product must be used within its stated specifications. It must not be modified or machined.

This product is intended for use as a general-purpose industrial device or part. It is not intended for use outdoors or for use under the following conditions or environment.

(Note that this product can be used when CKD is consulted prior to use and the customer consents to CKD product specifications. The customer must provide safety measures to avoid risks in the event of problems.)

① Use for special applications requiring safety including nuclear energy, railroad, aviation, ship, vehicle, medical equipment, equipment or applications coming into contact with beverage or food, amusement equipment, emergency shutoff circuits, press machine, brake circuits, or for safeguard.

② Use for applications where life or assets could be adversely affected, and special safety measures are required.

**3** Observe corporate standards and regulations, etc., related to the safety of device design and control, etc.

ISO4414, JIS B8370 (pneumatic system rules)

JFPS2008 (principles for pneumatic cylinder selection and use)

Including High Pressure Gas Maintenance Law, Occupational Safety and Sanitation Laws, other safety rules, body standards and regulations, etc.

**4** Do not handle, pipe, or remove devices before confirming safety.

① Inspect and service the machine and devices after confirming safety of the entire system related to this product.


② Note that there may be hot or charged sections even after operation is stopped.


③ When inspecting or servicing the device, turn off the energy source (air supply or water supply), and turn off power to the facility. Discharge any compressed air from the system, and pay enough attention to possible water leakage and leakage of electricity.


④ When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.

**5** Observe warnings and cautions on the pages below to prevent accidents.

■ The safety cautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

 **DANGER** : When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, or when there is a high degree of emergency to a warning.

 **WARNING** : When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.

 **CAUTION** : When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as "CAUTION" may lead to serious results depending on the situation. In any case, important information that must be observed is explained.

### Disclaimer

1. CKD cannot be held liable for any business interruption, loss of profit, personal injury, delay cost, or any other ancillary or indirect loss, cost, or damage resulting from the use of or faults in the use of CKD products.

2. CKD cannot be held responsible for the following damage:

(1) Damage resulting from failure of CKD parts due to fire from reasons not attributable to CKD, or by intentional or negligence of a third party or customer.

(2) When a CKD product is assembled into customer equipment, damage that could have been avoided if customer equipment were provided with functions and structure, etc., generally accepted in the industry.

(3) Damage resulting from use exceeding the scope of specifications provided in CKD catalogs or instruction manuals, etc., or from actions not following precautions for installation, adjustment, or maintenance, etc.,

(4) Damage resulting from product modifications not approved by CKD, or from faults due to combination with other software or other connected devices.



Of to secure safety.

# Fluid control components warning and cautions

Always read this section before starting use.

## Design & Selection

### 1. Safety designing

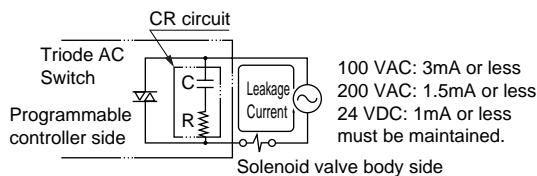
#### WARNING

■ This product can not be used as an emergency shut off valve. Valves in this catalog are not designed to ensure safety such as emergency shutoff. When using in this system, take separate measures that will ensure safety.

■ Take measures to prevent harm to operators or objects if this product fails

#### CAUTION

■ Leakage current from other fluid control components  
When operating the solenoid valve with a programmable controller, etc., check that leakage current from the programmable controller's output is within the specifications below. Failure to observe this could lead to malfunctions.



#### ■ Liquid ring

In fluid flow, if a liquid ring circuit is created, pressure could rise when temperature fluctuates and prevent operation. Provide a relief valve so that a liquid ring circuit is not created.

#### ■ Vibration

Mount and use in a place with no vibration.

### 2. Working fluid

#### WARNING

#### ■ Working fluid

(1) The adequacy of coolants has not been evaluated. If coolant contains high levels of chlorine or sulfur, materials used at wetted sections could be adversely affected. Confirm the adequacy when making a selection. Non-corrosive fluids refers to fluids that do not affect or are not affected when they contact the valve's wetted section materials.

Wetted section materials: Cast steel (nickel plating), stainless steel, copper, nitrile rubber or fluoro rubber, epoxy resin adhesive

(2) Wear powder could be generated when internal parts are worn through valve operation. This could flow to the secondary side of the valve.

#### ■ Quality of fluid

Rust and dirt in fluid could cause operation faults or leaks and obstruct product performance.

#### ■ Fluid temperature

Use within the fluid temperature range.

#### ■ External pilot air

(1) Drainage measures: Compressed air contains high levels of drainage (water, oxidized oil, tar, foreign matter) that may reduce pneumatic component reliability. Improve air quality by dehumidifying with an after cooler or dryer, removing foreign matter with a filter, and removing tar with a tar removal filter, etc.

(2) Pre-lubrication: This series is used with pre-lubrication specifications, so a lubricator is not required. When lubricating, continuously lubricate so that the component does not run out of lubrication. Use the turbine oil Class 1/ISOVG32 (#90) or equivalent.

(3) Filter: Install a filter with a  $5\mu$  m or less filter element.

### 3. Working environment

#### WARNING

■ CVSE Series can not be used in the flammable environment. When using in a flammable environment, change the model to the CVE Series and provide a separate explosion-proof solenoid valve in the pilot air circuit.

■ Do not use this product in an environment in which corrosive gases could impregnate configuration materials.

■ Do not use this product near heat-generating elements or where it may be subject to radiated heat.

■ Use the product within the ambient temperature range.

■ Take the appropriate freezing prevention such as the countermeasures for cold district use.

When insulating the solenoid valve, etc., do not treat the coil.

■ Take appropriate safeguards for protective structures listed in catalog specifications. Consult with CKD when using outdoors.

■ Take appropriate safeguards when using this product in places where oil or spatter from welding, etc., contact could occur.

■ If levels of dust are high in the area, provide a silencer on the exhaust port or face the elbow joint downward so that dust does not get inside.

■ Take appropriate safeguards when using this product in places where water contact could occur.

## 4. How to use

### ⚠ WARNING

- Do not touch coils or actuators with hands or otherwise while power is on or immediately after turning power on. The solenoid valve's coil and actuator will heat up when electricity is passed through them. Depending on the product, directly touching these sections could cause burns.
- Do not touch electric wiring connections with hands or otherwise (bare charged sections) while power is on. An electric shock could occur. Touching electric wire connections while power is on could lead to electrical shock.
- Use the product within the working pressure range.

### ⚠ CAUTION

- Pilot air pressure  
Use the pilot air in accordance with specifications.
- Do not step the valve, nor put the heavy things on it.

- When using the product with continuous energizing and low frequency, consult with CKD.
- If the product has not been used for more than a month, carry out trial operation.
- If suspending use for more than a month after a fluid is used, completely remove fluid remaining inside. Rust could form if fluids are left inside, and could result in operation faults or leaks. If residual water cannot be removed, operate the valve several times a days to ensure correct use.

## 5. Securing of space

### ⚠ CAUTION

- Secure sufficient space for maintenance and inspection.

## Installation & Adjustment

### 1. Installation

#### ⚠ CAUTION

- Always thoroughly read the Instruction Manual before installing this product.
- Do not apply external force on the coil section of solenoid valve at installation.
- After installing, check for leaks from pipes and for wire connections, and check that the product is correctly installed.

### 2. Piping

#### ⚠ CAUTION

- Observe the valid thread length for piping. Chamfer the end of the screw a half-pitch.
- Before piping, flush the inside of the pipe with 0.3 MPa of air, and remove foreign matter such as dirt, metal chips, rust, and sealing tape.
- If excessive sealant (tape, gel) is applied when piping, it could enter the product and cause operation faults.
- When applying or wrapping sealant on piping material, apply it or wind it from the pipe end along the screw and leave 1.5 to 2 threads uncovered.

- Dirt or foreign matter in fluid may prevent the product from functioning correctly. Install an 80 mesh or higher filter for water flow, and a 5 $\mu$  m or less filter for air flow.
- Do not pipe with using the solenoid valve section. Failure to observe this the product could be damaged. (For solenoid valve)
- Install the by-pass circuit, and use the elbow union when piping to simplify the maintenance or repair work.
- When controlling fluid in a tank, pipe at a level slightly above the bottom of the tank.
- When piping the CVE or CVSE Series, note the supply port on the unit and pilot operation side.

Model no.	Supply port pilot operation side	Supply port pilot operation side
CVE2	IN	X
CVE22		Y
CVSE2/CVSE22		P
CVE3		Y
CVSE3		P

Note) Pipe the unit supply port so that the arrow on the body matches the fluid flow direction. If supplied in reverse, internal components could be damaged when the valve operates.



- Refer to the table below for tightening torque when piping.

<<Products/body section piping>>

Nominal piping diameter	Recommended piping tightening torque (N·m)
Rc1/4	23 to 25
Rc3/8	31 to 33
Rc1/2	41 to 43
Rc3/4	62 to 65
Rc1	83 to 86
Rc1 1/4	97 to 100
Rc1 1/2	104 to 108
Rc2	132 to 136

- Refer to the table below for tightening torque when pilot air piping.

Nominal piping diameter	Recommended piping tightening torque (N·m)
Rc1/8	7 to 9

### 3. Wiring

#### ⚠ CAUTION

- Use the product within the allowable voltage range. Use outside of the allowable voltage range may lead to operation faults or coil damage.
- Use a breaker such as the fuse, etc., on the control circuit for maintenance of electric equipment.

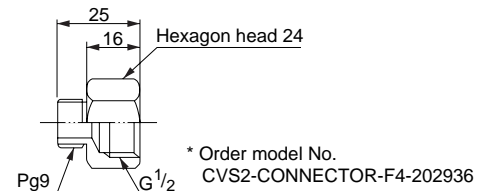
- If the electrical circuit is susceptible to solenoid surge, use a solenoid with a surge suppressor (option), or insert a surge absorber, etc., parallel to the solenoid.

- Use a wire more than 0.5mm<sup>2</sup> of nominal section area as the reference. Check that no excessive force is applied to leads.

- Use of a switching circuit that does not cause contact chatter will lengthen the life of the solenoid valve and motorized valve.

- Wiring when a solenoid valve is installed

- (1) Refer to connections on page 10 in the introduction when wiring to a DIN terminal box or T-type terminal box.
- (2) The size of the screw for the DIN terminal box's junction box outlets can be changed from Pg9 to G1/2 using the optional connector below.



- (3) Coil orientation is changed by 180°. Turn the coil only when reversing the electric wire connection method. Do not lose internal parts when removing the coil.

## During Use & Maintenance

### 1. Maintenance & Inspection

#### ⚠ WARNING

- To ensure that the product is used optimally, regularly inspect the product every six months. This frequency varies with the frequency of use.

#### ⚠ CAUTION

- Read the instruction manual thoroughly before starting maintenance to ensure correct operation.
- Turn power off and release fluids or pressure before starting maintenance.
- Care must be taken not to clog the strainer-filter.

### 2. Assembling & Disassembling

#### ⚠ WARNING

- A spring is used in the cylinder cover. When disassembling this type, the spring could pop out and cause injuries, so take care.

The 2-port NC (normally closed) has a snap ring to prevent the spring from popping out. Do not remove the snap ring.

#### ⚠ CAUTION

- When cleaning the product, use a low-polluting cleaning agent such as a neutral detergent. (Note that rubber parts must be replaced if they expand.)
- Consult with CKD on questions about consumables, etc.

# CVE/CVSE Series

## ■ Assembling pilot solenoid valve (for solenoid valve)

If the pilot solenoid valve has been disassembled, assemble it as follows.

### (1) Coil side

- Disassembling  
Loosen the cross headed pan head machine screw, and lift up the coil assembly. The outer spring, plunger assembly, and O ring are removed.
- Reassembling  
Set parts in the sequence of the O ring, plunger assembly, outer spring, and coil assembly. Tighten cross headed pan head machine screw with  $0.7$  to  $1.1\text{N} \cdot \text{m}$ .

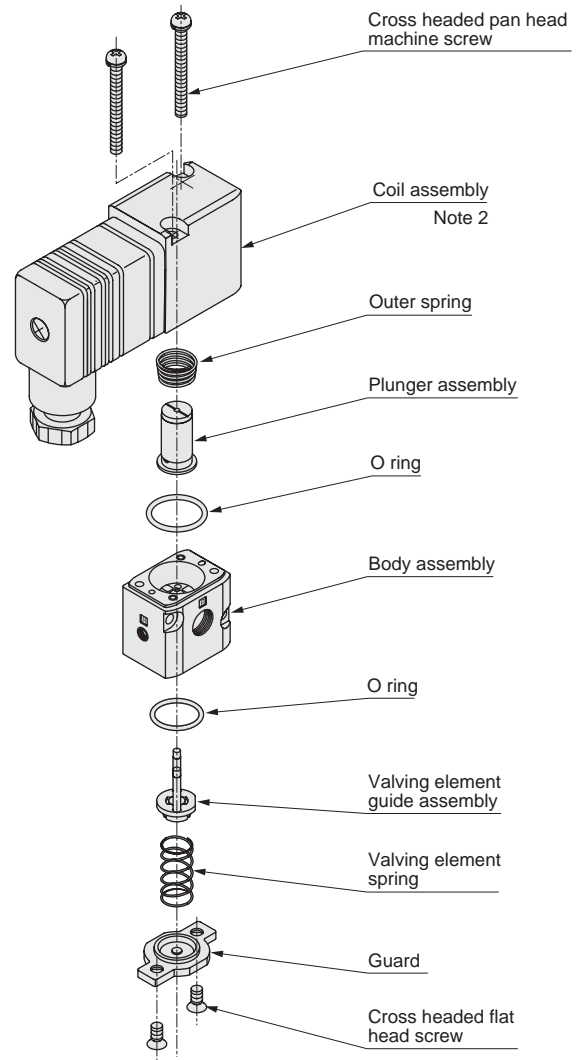
### (2) Guard side

- Disassembling  
Loosen the cross headed pan head machine screw, and remove the cover. The valve element spring, valve element guide assembly, and O ring are removed.
- Reassembling  
Set parts in the sequence of the O ring, valve element guide assembly, valve element spring, and cover. Tighten cross headed pan head machine screw with  $0.7$  to  $1.1\text{N} \cdot \text{m}$ .

Note 1: Do not lose the components such as springs during disassembly.

Note 2: The coil assembly direction is changed  $180^\circ$ . Loosen and change the cross-headed pan head machine screw.

Note 3: Turbine oil is applied to the plunger as a lubricant.



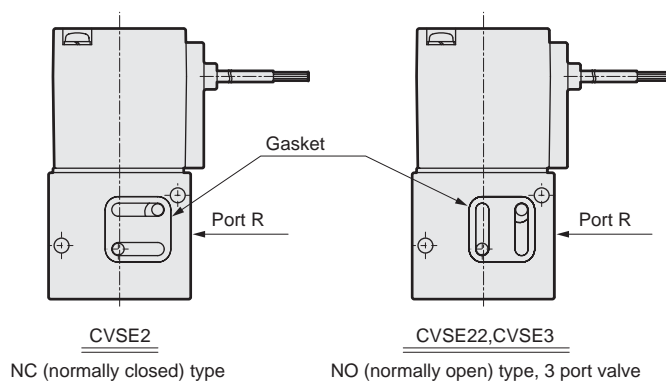
## ■ Pilot solenoid valve (actuator assembly kit) model no. for CVSE

\*1  
CVSE2-ACTUATOR-0  -  (Rated voltage)

Note 1: Indicate the coil option symbol in field \*1.

## ■ Gasket direction (for solenoid valve)

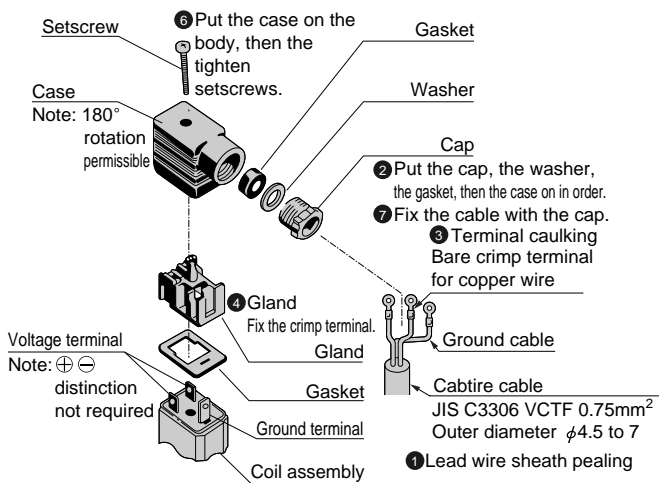
Check the gasket installation direction. Check the installation direction before reassembling.



## ⚠ How to wire terminal box

### ■ DIN terminal box (Pg9), DIN terminal box with indicator light DIN terminal box (Pg9)

- (1) Use the following cabtire cable.
  - Cable outer diameter:  $\phi$  4.5 to  $\phi$  7, Nominal sectional area:  $0.75 \text{ mm}^2$
- (2) Insert the crimp terminal for copper wires into the cabtire cable's lead wire, and crimp the terminal with the designated tool. M3 terminal screws are used with the terminal box.
- (3) Tighten screws with the following tightening torque.
  - Set screw tightening torque:  $0.5 \text{ N}\cdot\text{m}$
  - Terminal screw tightening torque:  $0.5 \text{ N}\cdot\text{m}$



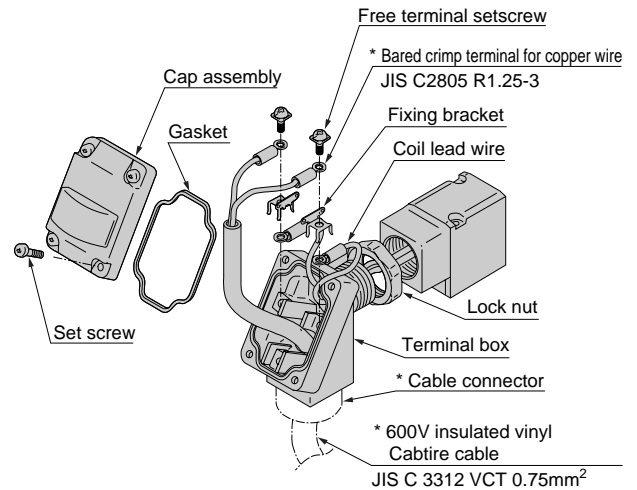
⑤ Insert the gasket and gland into the coil terminal.

Wire as ① to ⑦ steps.

\* The orientation of the cable lead out port is changed by removing the terminal box from the case, rotating it by  $180^\circ$ , then replacing the terminal box into the case.

### ■ T type terminal box (G1/2), T type terminal box with indicator light

- (1) Use the following cabtire cable.
  - Nominal section area:  $0.75 \text{ mm}^2$
- (2) Insert the crimp terminal for copper wires into the cabtire cable's lead wire, and crimp the terminal with the designated tool. M3 terminal screws are used with the terminal box.
- (3) Tighten screws with the following tightening torque.
  - Set screw tightening torque:  $0.5 \text{ N}\cdot\text{m}$
  - Terminal screw tightening torque:  $0.5 \text{ N}\cdot\text{m}$



\* marked parts are not included.

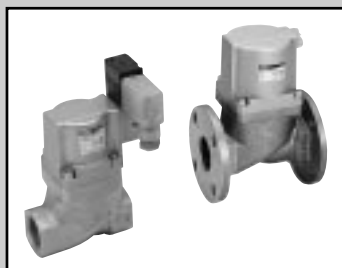
#### \*Changing direction of T type terminal box

Change the orientation of the T-type terminal block from the default state as follows.

- (1) Hold the width across flats (25 width) of the T-type terminal box with a tool (monkey wrench, spanner, etc.), and loosen it by turning counterclockwise.
- (2) Loosen the lock nut.
- (3) Rotate the T-type terminal box clockwise to  $15^\circ$  before the required position.
- (4) Tighten the lock nut to the coil by hand until it is moderately tight.
- (5) Hold the width across flats of the T-type terminal box with a tool, and rotate it (approx.  $15^\circ$ ) to tighten it to the required position.

Note: When further tightening the terminal box to change the orientation from the default, rotate it within 1/2-turn.

Air operated 2 port valve for low pressure  
(Coolant valve)



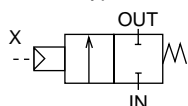
# CVSE2/CVSE22-05/10 Series CVE2/CVE22-05/10 Series

- NC (normally closed) type, NO (normally open) type
- Port size: Rc3/8 to Rc2, 32 to 80 flange
- Low pressure 0.5MPa, 1.0MPa

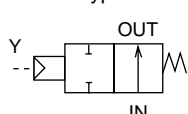


## JIS symbol

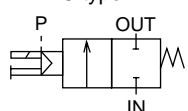
- CVE2 (air operated type)  
: NC type



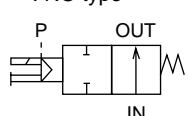
- CVE22 (air operated type)  
: NO type



- CVSE2 (with solenoid valve)  
: NC type



- CVSE22 (with solenoid valve)  
: NO type



## Common specifications for 0.5MPa

Model no.	CVE2/CVSE2	CVE22/CVSE22
Actuation	NC (normally closed) type	NO (normally open) type
Working fluid	Coolant, other non-corrosive fluid (*1)	
Fluid viscosity mm <sup>2</sup> /s	500 or less	
Working pressure range MPa	0 to 0.5	
Withstanding pressure (with water pressure) MPa	2.0	
Fluid temperature °C	-10 to 60 (no freezing)	
Ambient temperature °C	-10 to 60	
Valve seat leakage cm <sup>3</sup> /min	20 or less (with water pressure)(*2)	
Mounting attitude	Free	
Pilot air pressure MPa	0.25 to 0.7	
Water-hammer (references) MPa	1 or less (with steel pipe 10m, full pressure 0.5MPa and velocity of moving fluid 5m/sec.)	

\*1: Fluid that does not affect cast steel (nickel plating), stainless steel, nitrile rubber, fluoro rubber, or epoxy resin adhesive

\*2: 1cm<sup>3</sup>/min. or less for port size 10A (Rc3/8)

## Electric specifications (common specifications with solenoid valve)

Rated voltage	100 VAC (50/60Hz)/110 VAC (60Hz), 200 VAC (50/60Hz)/220 VAC (60Hz) and 24 VACDC	
Apparent power (VA)	At holding	3.6 (50Hz), 2.8 (60Hz)
	At starting	11 (50Hz), 9 (60Hz)
Power consumption (W)	AC	1.9 (50Hz), 1.5 (60Hz)
	DC	2.0
Heat proof class	B	
Protective structure (IEC standards 529)	Grommet lead wire	IPX2
	With DIN terminal box (Pg9)	IPX5
	T type terminal box (G1/2)	IPX5

\*3: The allowable voltage range should be within ±10% of rated voltage.

## Individual specifications for 0.5MPa

Descriptions Model no.	Port size	Orifice (mm)	Cv flow factor	Pilot Port size	Weight (kg)	
					CVE2 (2)	CVSE2 (2)
CVE2 (2)/CVSE2 (2)-10A-05	Rc3/8	10	2.8	Rc1/8	0.35	0.45
CVE2 (2)/CVSE2 (2)-15A-05	Rc1/2	14	6.5		0.6	0.7
CVE2 (2)/CVSE2 (2)-20A-05	Rc3/4	19	11		1.2	1.3
CVE2 (2)/CVSE2 (2)-25A-05	Rc1	24	18		1.8	1.9
CVE2 (2)/CVSE2 (2)-32A-05	Rc1 1/4	31	28		2.7	2.8
CVE2 (2)/CVSE2 (2)-32F-05	32 flange	31	28		5.3	5.4
CVE2 (2)/CVSE2 (2)-40A-05	Rc1 1/2	40	43		4.4	4.5
CVE2 (2)/CVSE2 (2)-40F-05	40 flange	40	43		7.0	7.1
CVE2 (2)/CVSE2 (2)-50A-05	Rc2	50	70		6.5	6.6
CVE2 (2)/CVSE2 (2)-50F-05	50 flange	50	70		9.6	9.7
CVE2 (2)/CVSE2 (2)-65F-05	65 flange	65	70		19.5	19.5
CVE2 (2)/CVSE2 (2)-80F-05	80 flange	79	100		24.0	24.0

### Common specifications for 1.0MPa

Model no.	CVE2/CVSE2	CVE22/CVSE22
Actuation	NC (normally closed) type	NO (normally open) type
Working fluid	Coolant, other non-corrosive fluid (*1)	
Fluid viscosity mm <sup>2</sup> /s	500 or less	
Working pressure range MPa	0 to 1.0	
Withstanding pressure (with water pressure) MPa	2.0	
Fluid temperature °C	-10 to 60 (no freezing)	
Ambient temperature °C	-10 to 60	
Valve seat leakage cm <sup>3</sup> /min	20 or less (with water pressure)(*2)	
Mounting attitude	Free	
Pilot air pressure MPa	0.25 to 0.7	
Water-hammer (references) MPa	2 or less (with steel pipe 10m, full pressure 1MPa and velocity of moving fluid 5m/sec.)	

\*1: Fluid that does not affect cast steel (nickel plating), stainless steel, nitrile rubber, fluoro rubber, or epoxy resin adhesive

\*2: 1cm<sup>3</sup>/min. or less for port size 10A (Rc3/8)

Electric specifications (common specifications with solenoid valve)		
Rated voltage	100 VAC (50/60Hz)/110 VAC (60Hz), 200 VAC (50/60Hz)/220 VAC (60Hz) and 24 VDC	
Apparent power (VA)	At holding	3.6 (50Hz), 2.8 (60Hz)
	At starting	11 (50Hz), 9 (60Hz)
Power consumption (W)	AC	1.9 (50Hz), 1.5 (60Hz)
	DC	2.0
Heat proof class	B	
Protective structure (IEC standards 529)	Grommet lead wire	IPX2
	With DIN terminal box (Pg9)	IPX5
	T type terminal box (G1/2)	IPX5

\*3: The allowable voltage range should be within  $\pm 10\%$  of rated voltage.

### Specifications for 1.0MPa

Descriptions Model no.	Port size	Orifice (mm)	Cv flow factor	Pilot Port size	Weight (kg)	
					CVE2 (2)	CVSE2 (2)
CVE2 (2)/CVSE2 (2)-10A-10	Rc3/8	7	1.7	Rc1/8	0.35	0.45
CVE2 (2)/CVSE2 (2)-15A-10	Rc1/2	10	4.5		0.6	0.7
CVE2 (2)/CVSE2 (2)-20A-10	Rc3/4	14	7		1.2	1.3
CVE2 (2)/CVSE2 (2)-25A-10	Rc1	17	11		1.8	1.9
CVE2 (2)/CVSE2 (2)-32A-10	Rc1 1/4	23	20		2.7	2.8
CVE2 (2)/CVSE2 (2)-32F-10	32 flange	23	20		5.3	5.4
CVE2 (2)/CVSE2 (2)-40A-10	Rc1 1/2	29	30		4.4	4.5
CVE2 (2)/CVSE2 (2)-40F-10	40 flange	29	30		7.0	7.1
CVE2 (2)/CVSE2 (2)-50A-10	Rc2	35	48		6.5	6.6
CVE2 (2)/CVSE2 (2)-50F-10	50 flange	35	48		9.6	9.7
CVE2 (2)/CVSE2 (2)-65F-10	65 flange	49	50		19.5	19.5
CVE2 (2)/CVSE2 (2)-80F-10	80 flange	57	73		24.0	24.0

# CVE2/CVSE2-05/10 Series

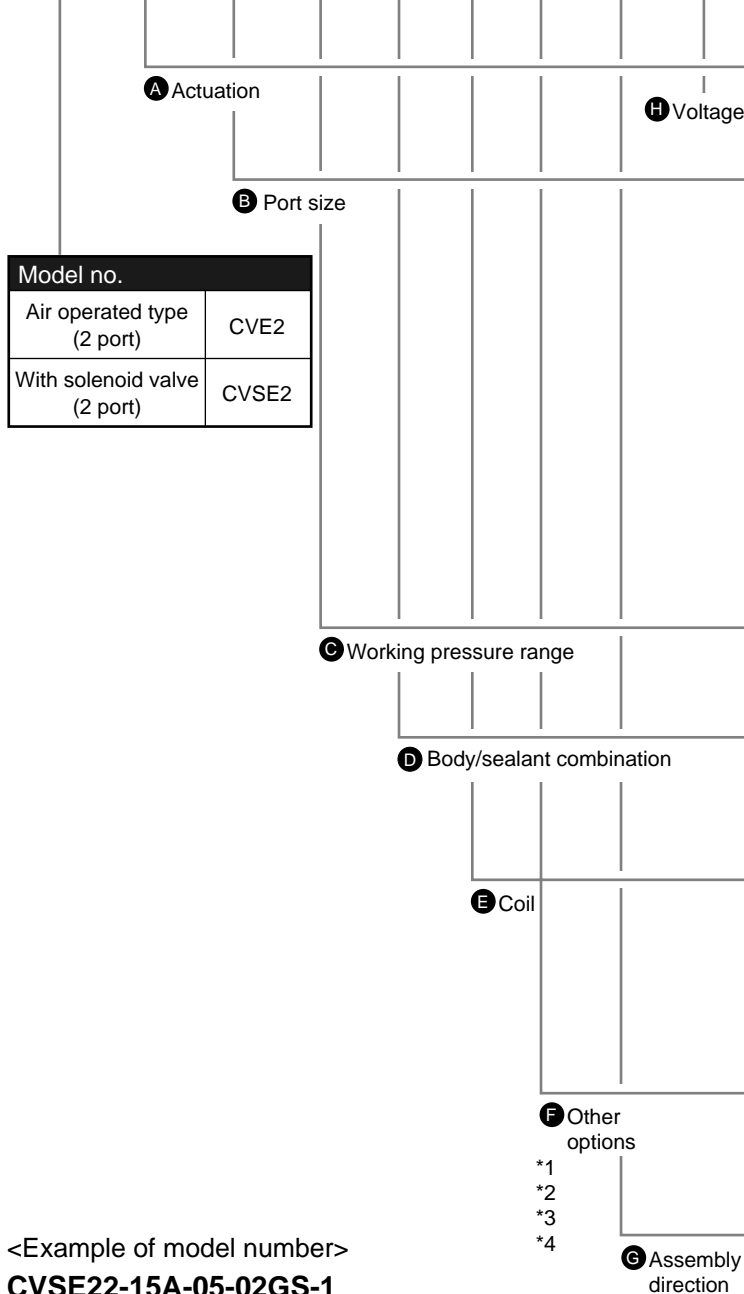
## How to order

- Air operated type

**CVE2** **2** - **20A** - **10** - **0**      **B** - **○**

- With solenoid valve

**CVSE2** **2** - **15A** - **05** - **0** **2G** **S** - **○** - **1**



Model no.	
Air operated type (2 port)	CVE2
With solenoid valve (2 port)	CVSE2

		Model no.			
		CVE2	CVSE2		
Symbol	Descriptions				
<b>A Actuation</b>					
Blank	NC (normally closed) type	●	●		
2	NO (normally open) type	●	●		
<b>B Port size</b>					
10A	Rc3/8	●	●		
15A	Rc1/2	●	●		
20A	Rc3/4	●	●		
25A	Rc1	●	●		
32A	Rc1 1/4	●	●		
32F	32 flange	●	●		
40A	Rc1 1/2	●	●		
40F	40 flange	●	●		
50A	Rc2	●	●		
50F	50 flange	●	●		
65F	65 flange	●	●		
80F	80 flange	●	●		
<b>C Working pressure range</b>					
05	0 to 0.5MPa	●	●		
10	0 to 1.0MPa	●	●		
<b>D Body/sealant combination</b>					
		Body	Sealant		
0	Standard	Cast iron (plating)	Nitrile rubber	●	●
B	Option	Cast iron (plating)	Fluoro rubber	●	●
<b>E Coil</b>					
2C	Standard	Grommet lead wire			●
2G		With DIN terminal box (Pg9)			●
2H	Option	With DIN terminal box with indicator light (Pg9)			●
3T		T type terminal box (G1/2)			●
3R		With T type terminal box with indicator light (G1/2)			●
<b>F Other options</b>					
Blank	No option		●	●	
S	With surge suppressor			●	
B	Mounting plate		●	●	
<b>G Assembly direction</b>					
Blank	No option		●	●	
X	Cylinder guard 90° rotation			●	
Y	Cylinder guard 180° rotation			●	
Z	Cylinder guard 270° rotation			●	
R	Mounting plate 180° reverse rotation <air operated type>				
	Coil 180° reverse rotation <with solenoid valve>		●	●	
	Mounting plate and coil 180° reverse rotation <with solenoid valve>				
Refer to the following page for the layout drawing.					
<b>H Voltage</b>					
1	100 VAC (50/60Hz)				
	110 VAC (60Hz)			●	
2	200 VAC (50/60Hz)				
	220 VAC (60Hz)			●	
3	24 VDC			●	

<Example of model number>

**CVSE22-15A-05-02GS-1**

Model: CVSE2 : With solenoid valve (2 port)

**A** G Actuation : NO (normally open) type

**B** Port size : Rc1/2

**C** Working pressure range : 0 to 0.5MPa

**D** Body/sealant combination

: Body-cast iron (plating) and sealant-nitrile rubber

**E** Coil : With DIN terminal box (Pg9)

**F** Other options : With surge suppressor

**G** Assembly direction : No option

**H** G Voltage : 100 VAC (50/60Hz) and 110 VAC (60Hz)

\*1: Mounting plate (B in **F**) can be installed for port size 10A, 15A, 20A or 25A.

\*2: Indicate SB in **F** if both surge suppressor and mounting plate are selected.

\*3: A surge suppressor is attached for the lead wire coil, while assembled in the terminal box for the coil with terminal box.

\*4: Manual override (non-locking) specifications are standard for solenoid valve.

## ⊙ Assembly direction

CVSE2 (with solenoid valve) *5					
Symbol	Blank (standard)	X *6	Y *6	Z *6	R *6
Direction	Without rotation	Cylinder guard 90° rotation	Cylinder guard 180° rotation	Cylinder guard 270° rotation	Coil reverse rotation
Arrangement					

CVSE2 (with solenoid valve) *1,5					
Symbol	B (mounting plate)	B-X	B-Y *7	B-Z *7	B-R *8
Direction	Without rotation	Cylinder guard 90° rotation	Cylinder guard 180° rotation Mounting plate reverse rotation	Cylinder guard 270° rotation Mounting plate reverse rotation	Coil reverse rotation Mounting plate reverse rotation
Arrangement					

CVE2 (air operated type) *1,5		
Symbol	B (mounting plate)	B-R *9
Direction	Without rotation	Mounting plate reverse rotation
Arrangement		

⇐ indicates flow path direction, while → indicates pilot ports IN.

\*5: Facing IN port right and viewed from top, turning angle to clockwise is indicated.

\*6: Not available for port size 65F/80F.

\*7: Mounting plate is assembled in the 180° opposite side.

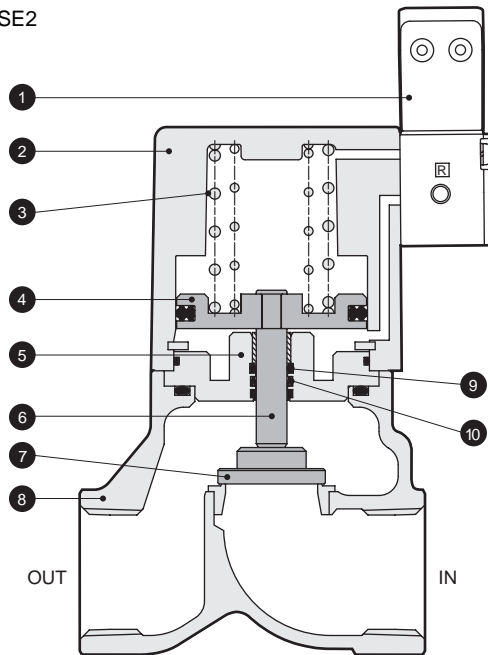
\*8: Mounting plate of port size 10A is installed from bottom, so only coil is reversely rotated.

\*9: Not available for port size 10A.

# CVSE2-05/10 Series

## Internal structure and parts list

### ● CVSE2



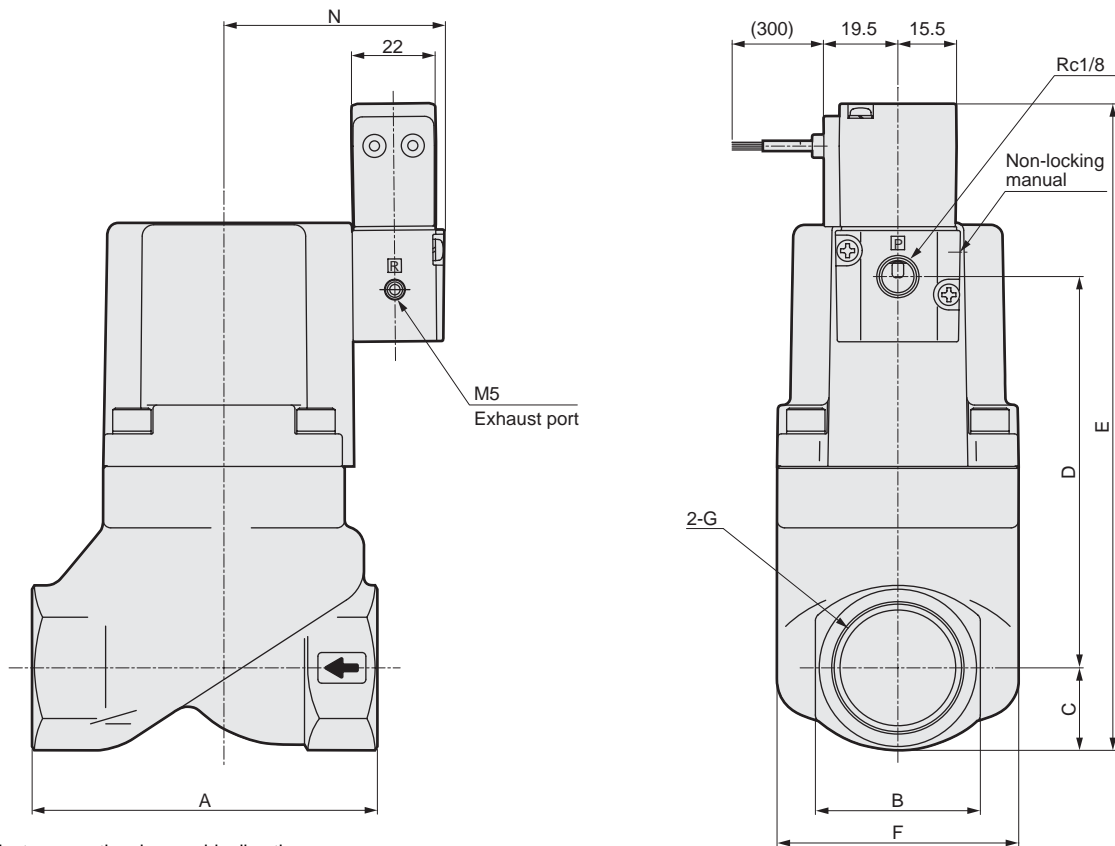
No.	Parts name	Material	
1	Pilot solenoid valve	-	
2	Cylinder guard	ADC12	Aluminum alloy die-casting
3	Spring	SWP	Piano wire
4	Piston	A2017	Aluminum
5	Adaptor	SUS303	Stainless steel
6	Piston rod	SUS304	Stainless steel
7	Main valving element	SUS420J2	Stainless steel
8	Body	FCD450	Cast iron (plating)
	Valve seat	SUS420J2	Stainless steel
9	O ring	NBR (FKM)	Nitrile rubber (Fluoro rubber)
10	Rod packing seal	NBR (FKM)	Nitrile rubber (Fluoro rubber)

\*1: The value in ( ) indicates an option.

\*2: This internal structure drawing is for 15A to 50A.  
For 10A, 65F or 80F, consult with CKD.

## Dimensions

### ● CVSE2/CVSE22-10A to 50A-05/10-\*2C (Rc screw-in type)



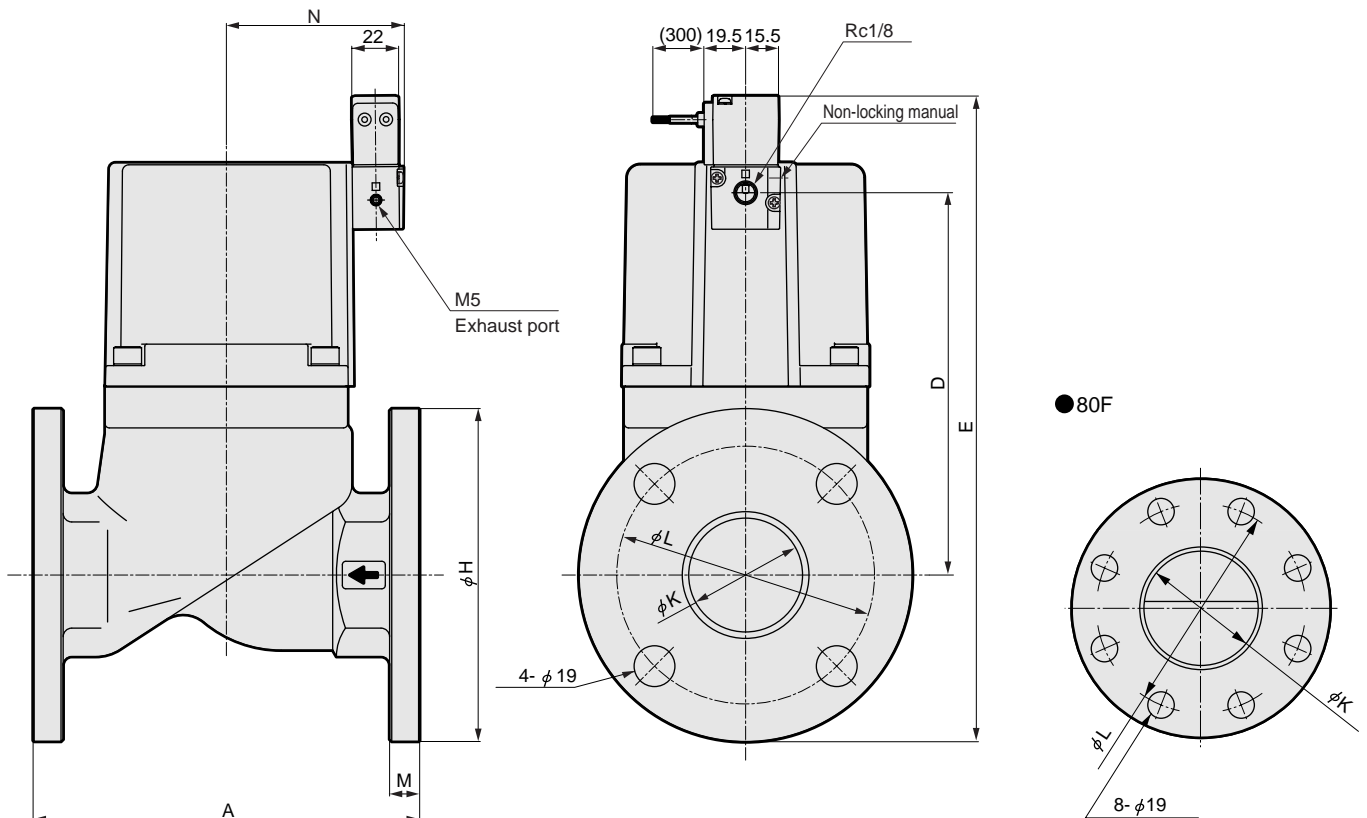
\*Drawing indicates no optional assembly direction.

Model no.	A	B	C	D	E	F	G	N
CVSE*-10A-05/10-*2C	50	24	12	47.5	104.5	32	Rc3/8	48.5
CVSE*-15A-05/10-*2C	71	29	14.5	71.5	131	43	Rc1/2	49.5
CVSE*-20A-05/10-*2C	80	35	17.5	83.5	146	53	Rc3/4	53
CVSE*-25A-05/10-*2C	90	43	21.5	102	168.5	63	Rc1	57.5
CVSE*-32A-05/10-*2C	125	55	27.5	130.5	203	77	Rc1 1/4	64.5
CVSE*-40A-05/10-*2C	140	61	30.5	156.5	232	95	Rc1 1/2	72.5
CVSE*-50A-05/10-*2C	160	76	38	178	261	113	Rc2	82.5



## Dimensions

- CVSE2/CVSE22-32F to 80F-05/10-\*2C (flange type)



\*Drawing indicates no optional assembly direction.

Model no.	A	D	E	H	K	L	M	N
CVSE*-32F-05/10-*2C	170	130.5	243	135	35	100	12	64.5
CVSE*-40F-05/10-*2C	180	156.5	271.5	140	41	105	12	72.5
CVSE*-50F-05/10-*2C	180	178	300.5	155	53	120	14	82.5
CVSE*-65F-05/10-*2C	210	199	347.5	175	68	140	16	101
CVSE*-80F-05/10-*2C	240	214	367.5	185	82	150	16	111

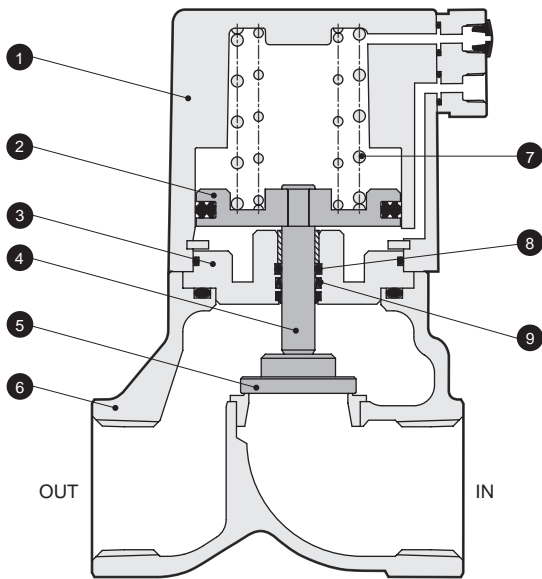
## Optional dimensions

Refer to pages 9 and 10 for details on the coil options and mounting plates.

# CVE2-05/10 Series

## Internal structure and parts list

### ● CVE2



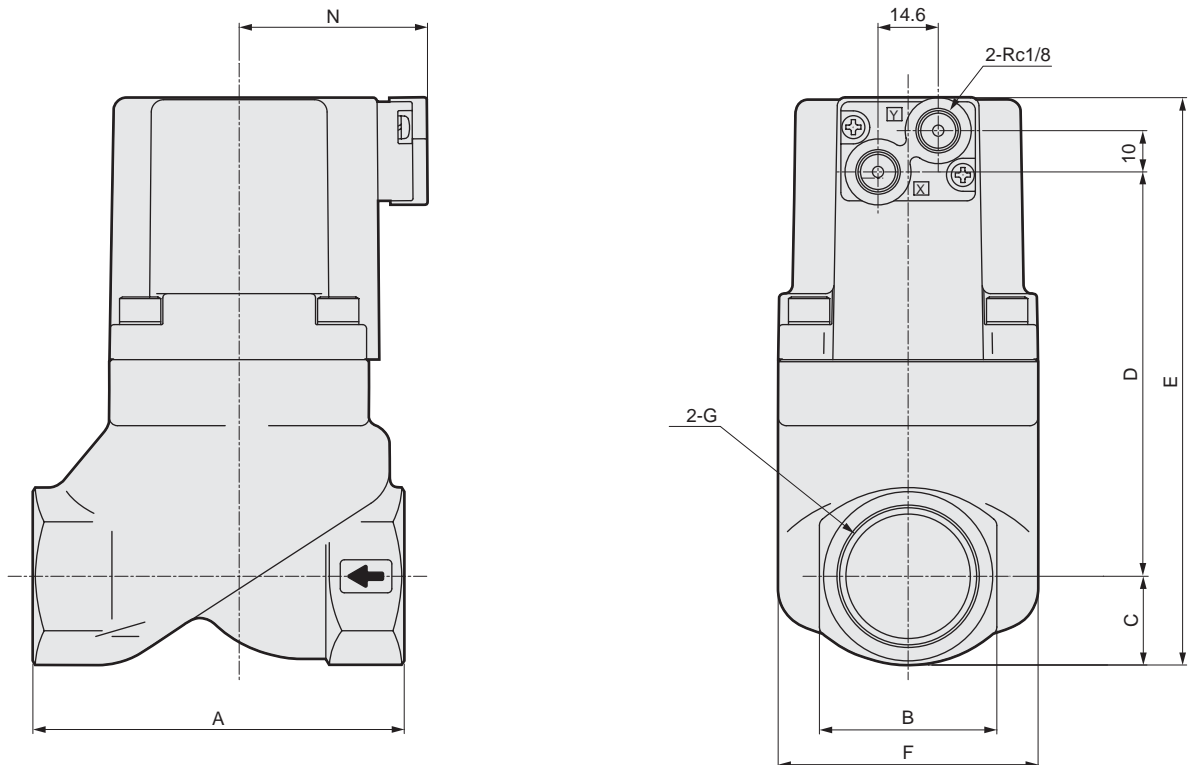
No.	Parts name	Material	
1	Cylinder guard	ADC12	Aluminum alloy die-casting
2	Piston	A2017	Aluminum
3	Adaptor	SUS303	Stainless steel
4	Piston rod	SUS304	Stainless steel
5	Main valving element	SUS420J2	Stainless steel
6	Body	FCD450	Cast iron (plating)
	Valve seat	SUS420J2	Stainless steel
7	Spring	SWP	Piano wire
8	O ring	NBR (FKM)	Nitrile rubber (Fluoro rubber)
9	Rod packing seal	NBR (FKM)	Nitrile rubber (Fluoro rubber)

\*1: The value in ( ) indicates an option.

\*2: This internal structure drawing is for 15A to 50A.  
For 10A, 65F or 80F, consult with CKD.

## Dimensions

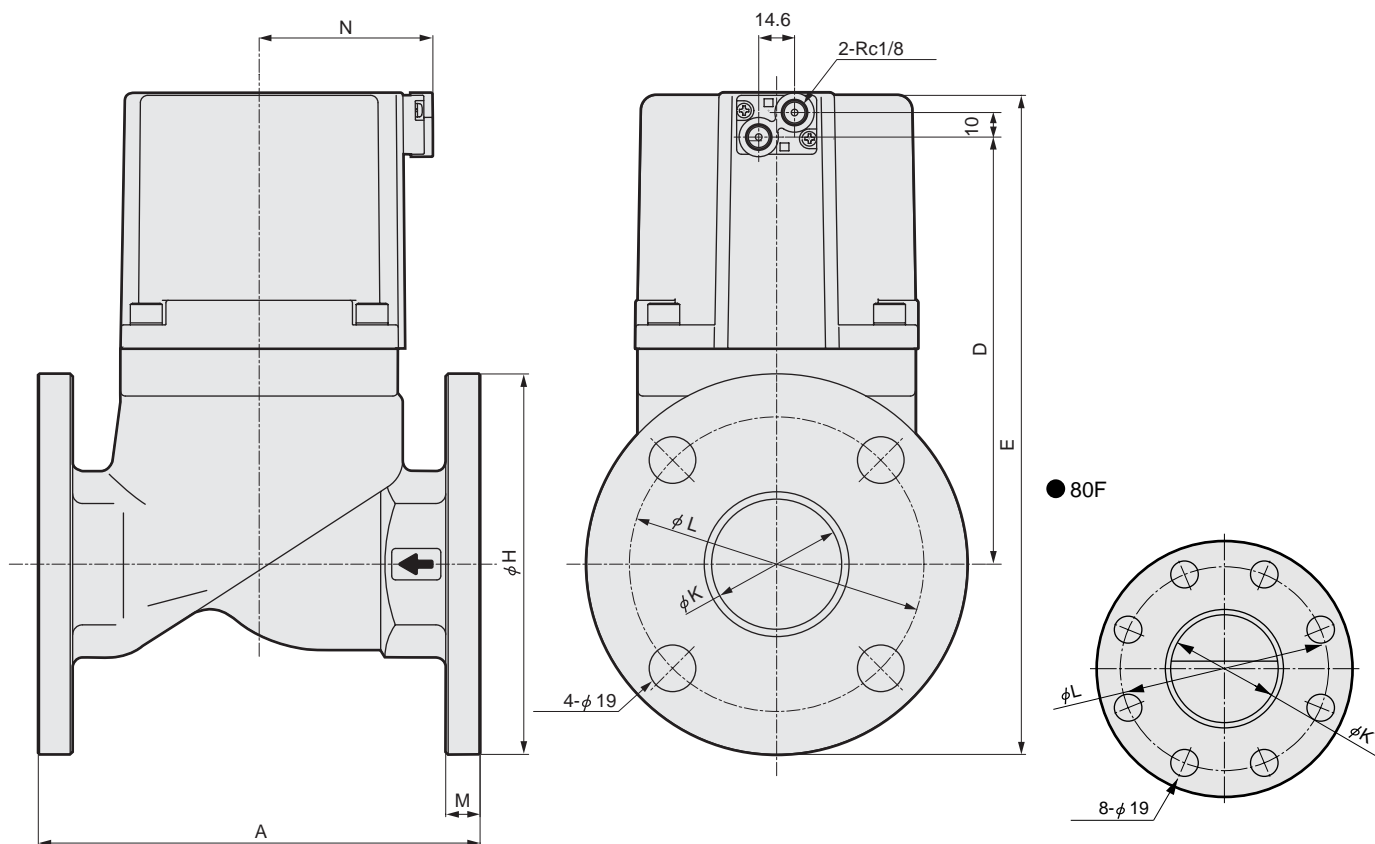
### ● CVE2/CVE22-10A to 50A-05/10-\*\* (Rc screw-in type)



Model no.	A	B	C	D	E	F	G	N
CVE*-10A-05/10-*	50	24	12	43.5	73.5	32	Rc3/8	37
CVE*-15A-05/10-*	71	29	14.5	67.5	100	43	Rc1/2	38
CVE*-20A-05/10-*	80	35	17.5	79.5	115	53	Rc3/4	41.5
CVE*-25A-05/10-*	90	43	21.5	98	137.5	63	Rc1	46
CVE*-32A-05/10-*	125	55	27.5	126.5	172	77	Rc1 1/4	53
CVE*-40A-05/10-*	140	61	30.5	152.5	201	95	Rc1 1/2	61
CVE*-50A-05/10-*	160	76	38	174	230	113	Rc2	71

## Dimensions

- CVE2/CVE22-32F to 80F-05/10-\*\* (flange type)



Model no.	A	D	E	H	K	L	M	N
CVE*-32F-05/10-*	170	126.5	212	135	35	100	12	53
CVE*-40F-05/10-*	180	152.5	240.5	140	41	105	12	61
CVE*-50F-05/10-*	180	174	269.5	155	53	120	14	71
CVE*-65F-05/10-*	210	199	347.5	175	68	140	16	101
CVE*-80F-05/10-*	240	214	367.5	185	82	150	16	111

## Optional dimensions

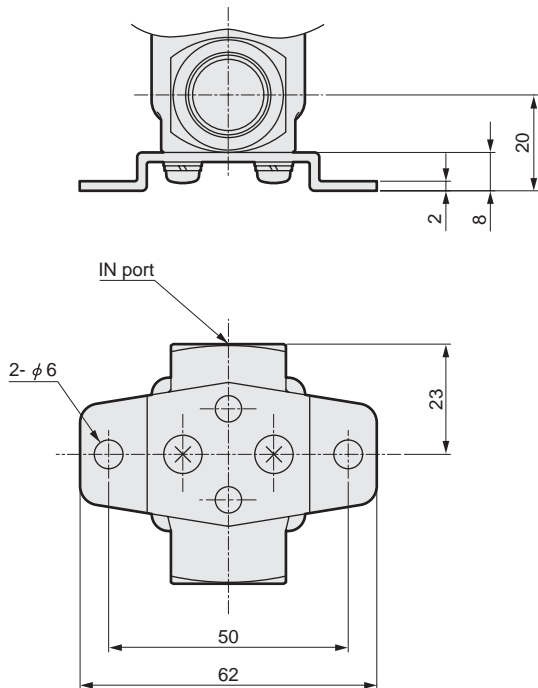
Refer to page 9 for the mounting plate.

# CVE2/CVSE2-05/10 Series

## Optional dimensions

- Mounting plate

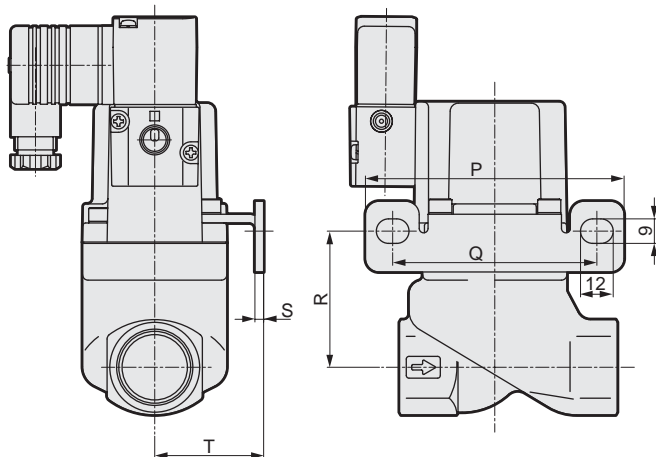
CVE2/CVE22 -10A-05/10-\*\* **B**  
 CVSE2/CVSE22



\*Use the body setscrews if fixed without mounting plate.  
 (Thread size: M4 depth 7)

- Mounting plate

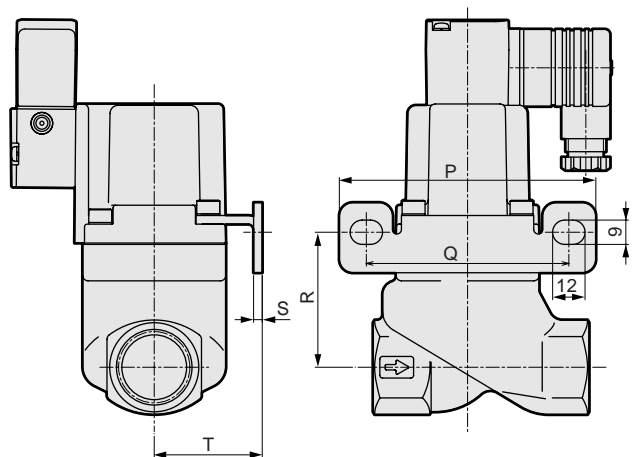
CVE2/CVE22 -15A/20A/25A-05/10-\*\* **B** / **B-R** / **B-Y**  
 CVSE2/CVSE22



\*Drawing indicates **B**.

- Mounting plate

CVE2/CVE22 -15A/20A/25A-05/10-\*\* **B-X** / **B-Z**  
 CVSE2/CVSE22

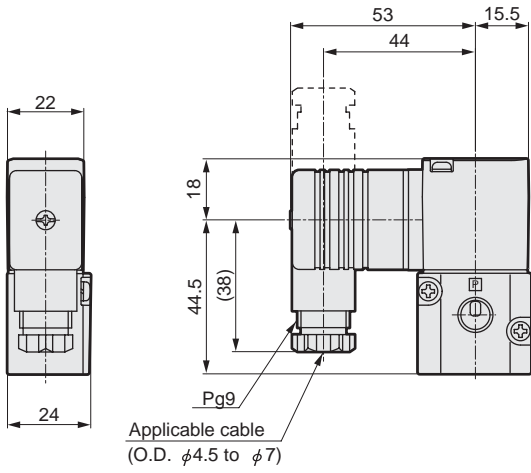


\*Drawing indicates **B-X**.

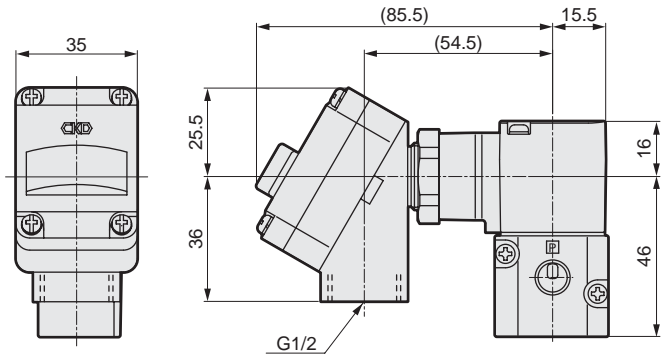
Model no.	P	Q	R	S	T
CV*E2*-15A-05/10-**B	90	70	45	2.3	30
CV*E2*-20A-05/10-**B	95	75	50	3.2	40
CV*E2*-25A-05/10-**B	105	85	55	3.2	45

## Optional dimensions

- With DIN terminal box (Pg9)  
DIN terminal box with indicator light (Pg9)  
CVE2/CVSE22-\*-05/10-\* 2G  
2H



- T type terminal box (G1/2)  
T type terminal box with indicator light (G1/2)  
CVE2/CVSE22-\*-05/10-\* 3T  
3R



Air operated 2 port valve for medium pressure  
(Coolant valve)



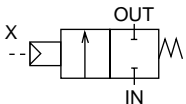
# CVSE2/CVSE22-16/30 Series CVE2/CVE22-16/30 Series

- NC (normally closed) type, NO (normally open) type
- Port size: Rc3/8 to Rc1
- Medium pressure 1.6MPa, 3.0MPa

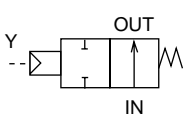


## JIS symbol

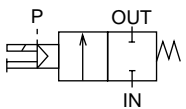
- CVE2 (air operated type)  
: NC type



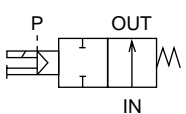
- CVE22 (air operated type)  
: NO type



- CVSE2 (with solenoid valve)  
: NC type



- CVSE22 (with solenoid valve)  
: NO type



## Common specifications for 1.6MPa

Model no.	CVE2/CVSE2	CVE22/CVSE22
Actuation	NC (normally closed) type	NO (normally open) type
Working fluid	Coolant, other non-corrosive fluid (*1)	
Fluid viscosity	mm <sup>2</sup> /s 500 or less	
Working pressure range	MPa 0 to 1.6	
Withstanding pressure (with water pressure)	MPa 6.0	
Fluid temperature	°C -10 to 60 (no freezing)	
Ambient temperature	°C -10 to 60	
Valve seat leakage	cm <sup>3</sup> /min 20 or less (with water pressure)	
Mounting attitude	Free	
Pilot air pressure	MPa 0.25 to 0.7	

\*1: Fluid that does not affect cast steel (nickel plating), stainless steel, copper, nitrile rubber or fluoro rubber

## Electric specifications (common specifications with solenoid valve)

Rated voltage (*2)	100 VAC (50/60Hz)/110 VAC (60Hz), 200 VAC (50/60Hz)/220 VAC (60Hz) and 24 VDC	
Apparent power (VA)	At holding	3.6 (50Hz), 2.8 (60Hz)
	At starting	11 (50Hz), 9 (60Hz)
Power consumption (W)	AC	1.9 (50Hz), 1.5 (60Hz)
	DC	2.0
Heat proof class	B	
Protective structure (IEC standards 529)	With DIN terminal box (Pg9)	IPX5
	T type terminal box (G1/2)	IPX5

\*2: The allowable voltage range should be within  $\pm 10\%$  of rated voltage.

## Individual specifications for 1.6MPa

Descriptions Model no.	Port size	Orifice (mm)	Cv flow factor	Pilot Port size	Weight (kg)	
					CVE2 (2)	CVSE2 (2)
CVE2 (2)/CVSE2 (2)-10A-16	Rc3/8	10.5	3.6	Rc1/8	0.9	1.0
CVE2 (2)/CVSE2 (2)-15A-16	Rc1/2	10.5	4.6		0.9	1.0
CVE2 (2)/CVSE2 (2)-20A-16	Rc3/4	14.5	7		1.3	1.4
CVE2 (2)/CVSE2 (2)-25A-16	Rc1	18.5	11.5		2.2	2.3

### Common specifications for 3.0MPa

Model no.	CVE2/CVSE2	CVE22/CVSE22
Actuation	NC (normally closed) type	NO (normally open) type
Working fluid	Coolant, other non-corrosive fluid (*1)	
Fluid viscosity mm <sup>2</sup> /s	500 or less	
Working pressure range MPa	0 to 3.0	
Withstanding pressure (with water pressure) MPa	6.0	
Fluid temperature °C	-10 to 60 (no freezing)	
Ambient temperature °C	-10 to 60	
Valve seat leakage cm <sup>3</sup> /min	20 or less (with water pressure)	
Mounting attitude	Free	
Pilot air pressure MPa	0.25 to 0.7	

\*1: Fluid that does not affect cast steel (nickel plating), stainless steel, copper, nitrile rubber or fluoro rubber

Electric specifications (common specifications with solenoid valve)		
Rated voltage (*2)	100 VAC (50/60Hz)/110 VAC (60Hz), 200 VAC (50/60Hz)/220 VAC (60Hz) and 24 VDC	
Apparent power (VA)	At holding	3.6 (50Hz), 2.8 (60Hz)
	At starting	11 (50Hz), 9 (60Hz)
Power consumption (W)	AC	1.9 (50Hz), 1.5 (60Hz)
	DC	2.0
Heat proof class	B	
Protective structure (IEC standards 529)	With DIN terminal box (Pg9)	IPX5
	T type terminal box (G1/2)	IPX5

\*2: The allowable voltage range should be within  $\pm 10\%$  of rated voltage.

### Individual specifications for 3.0MPa

Descriptions Model no.	Port size	Orifice (mm)	Cv flow factor	Pilot Port size	Weight (kg)	
					CVE2 (2)	CVSE2 (2)
CVE2 (2)/CVSE2 (2)-10A-30	Rc3/8	8	2.6	Rc1/8	0.9	1.0
CVE2 (2)/CVSE2 (2)-15A-30	Rc1/2	10.5	4.2		1.3	1.4
CVE2 (2)/CVSE2 (2)-20A-30	Rc3/4	14	7.5		2.2	2.3
CVE2 (2)/CVSE2 (2)-25A-30	Rc1	18.5	11		3.4	3.5

# CVE2/CVSE2-16/30 Series

## How to order

● Air operated type

**CVE2** **2** - **20A** - **30** - **0**      **B** - **○**

● With solenoid valve

**CVSE2** **2** - **15A** - **16** - **0** **2G** **S** - **○** - **1**

Model no.	
Air operated type (2 port)	CVE2
With solenoid valve (2 port)	CVSE2

**A** Actuation

**B** Port size

**C** Working pressure range

**D** Body/sealant combination

**E** Coil

**F** Other options

\*1

\*2

\*3

\*4

**G** Assembly direction

**H** Voltage

<Example of model number>

**CVSE22-15A-16-02GS-1**

Model: CVSE2 : With solenoid valve (2 port)

**A** G Actuation : NO (normally open) type

**B** Port size : Rc1/2

**C** Working pressure range : 0 to 1.6MPa

**D** Body/sealant combination

: Body-cast iron (plating) and sealant-nitrile rubber

**E** Coil : With DIN terminal box (Pg9)

**F** Other options : With surge suppressor

**G** G Assembly direction : No option

**H** G Voltage : 100 VAC (50/60Hz) and 110 VAC (60Hz)

		Model no.	
		CVE2	CVSE2
Symbol	Descriptions		
<b>A Actuation</b>			
Blank	NC (normally closed) type	●	●
2	NO (normally open) type	●	●
<b>B Port size</b>			
10A	Rc3/8	●	●
15A	Rc1/2	●	●
20A	Rc3/4	●	●
25A	Rc1	●	●
<b>C Working pressure range</b>			
16	0 to 1.6MPa	●	●
30	0 to 3.0MPa	●	●
<b>D Body/sealant combination</b>			
		Body	Sealant
0	Standard	Cast iron (plating)	Nitrile rubber
B	Option	Cast iron (plating)	Fluoro rubber
<b>E Coil</b>			
2G	With DIN terminal box (Pg9)		●
2H	With DIN terminal box with indicator light (Pg9)		●
3T	T type terminal box (G1/2)		●
3R	With T type terminal box with indicator light (G1/2)		●
<b>F Other options</b>			
Blank	No option	●	●
S	With surge suppressor		●
B	Mounting plate	●	●
<b>G Assembly direction</b>			
Blank	No option	●	●
X	Cylinder guard 90° rotation		●
Y	Cylinder guard 180° rotation		●
Z	Cylinder guard 270° rotation		●
R	Mounting plate 180° reverse rotation <air operated type> Coil 180° reverse rotation <with solenoid valve> Mounting plate and coil 180° reverse rotation <with solenoid valve>	●	●
Refer to the following page for the layout drawing.			
<b>H Voltage</b>			
1	100 VAC (50/60Hz) 110 VAC (60Hz)		●
2	200 VAC (50/60Hz) 220 VAC (60Hz)		●
3	24 VDC		●

\*1: The mounting plate (**F** "B") cannot be installed when the **B** and **C** combination is 20A-30, 25A-16 or 25A-30.

\*2: Indicate SB in **F** if both surge suppressor and mounting plate are selected.

\*3: A surge suppressor is assembled in the terminal box.

\*4: Manual override (non-locking) specifications are standard for solenoid valve.



## ⊙ Assembly direction

CVSE2 (with solenoid valve) *5					
Symbol	Blank (standard)	X	Y	Z	R
Direction	Without rotation	Cylinder guard 90° rotation	Cylinder guard 180° rotation	Cylinder guard 270° rotation	Coil reverse rotation
Arrangement					

CVSE2 (with solenoid valve) *1,5					
Symbol	B (mounting plate)	B-X	B-Y *6	B-Z *6	B-R
Direction	Without rotation	Cylinder guard 90° rotation	Cylinder guard 180° rotation Mounting plate reverse rotation	Cylinder guard 270° rotation Mounting plate reverse rotation	Coil reverse rotation Mounting plate reverse rotation
Arrangement					

CVE2 (air operated type) *1,5		
Symbol	B (mounting plate)	B-R
Direction	Without rotation	Mounting plate reverse rotation
Arrangement		

⇐ indicates flow path direction, while → indicates pilot ports IN.

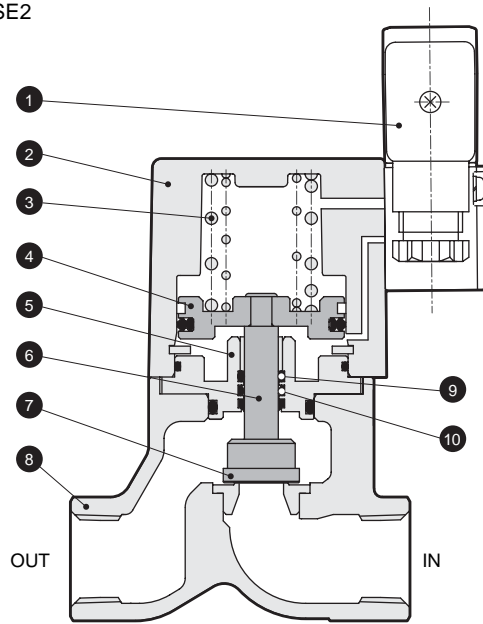
\*5: Facing IN port right and viewed from top, turning angle to clockwise is indicated.

\*6: Mounting plate is assembled in the 180° opposite side.

# CVSE2-16/30 Series

## Internal structure and parts list

### ● CVSE2

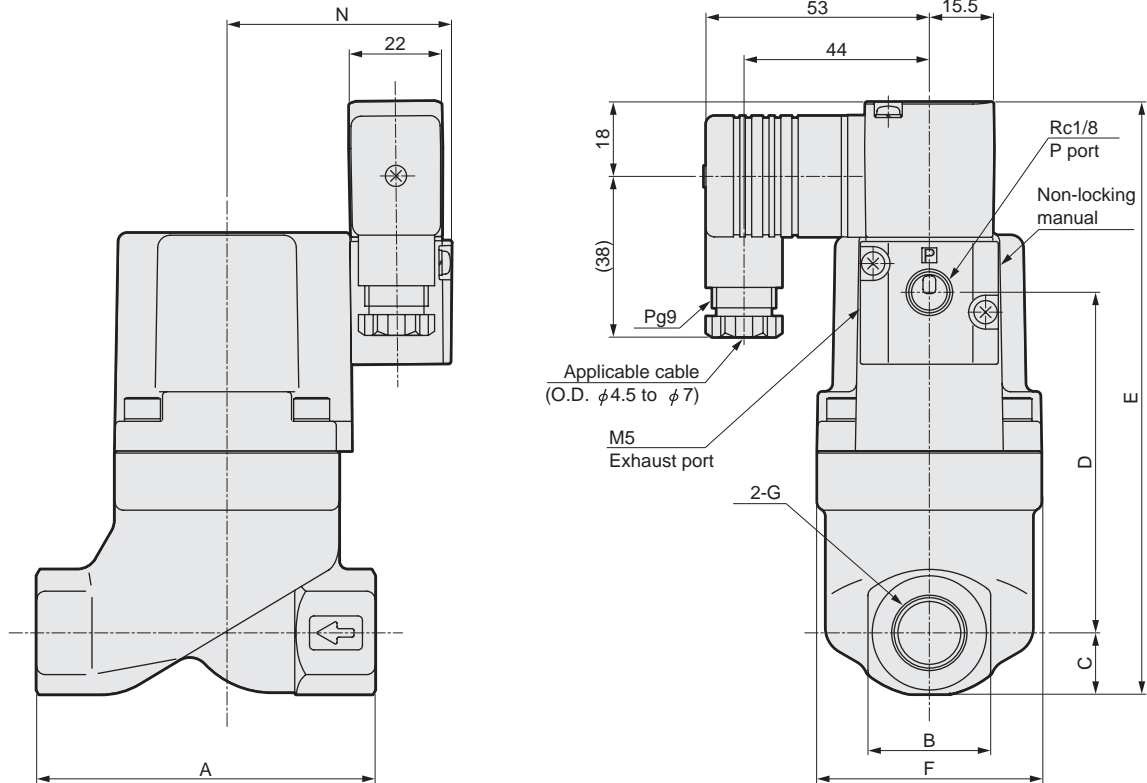


No.	Parts name	Material	
1	Pilot solenoid valve	-	
2	Cylinder guard	ADC12	Aluminum alloy die-casting
3	Spring	SWP	Piano wire
4	Piston	A2017	Aluminum
5	Adaptor	SUS303	Stainless steel
6	Piston rod	SUS304	Stainless steel
7	Main valving element	SUS420J2	Stainless steel
8	Body	FCD450	Cast iron (plating)
	Valve seat	SUS420J2	Stainless steel
9	O ring	NBR (FKM)	Nitrile rubber (Fluoro rubber)
10	Rod packing seal	NBR (FKM)	Nitrile rubber (Fluoro rubber)

## Dimensions

### ● With DIN terminal box (Pg9)

CVSE2/CVSE22-10A to 50A-16/30-\*2G

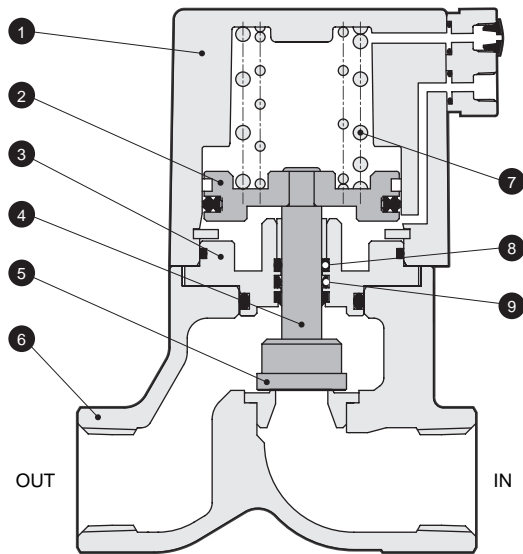


\*Drawing indicates no optional assembly direction.

Model no.	A	B	C	D	E	F	G	N
CVSE2*-10A-16-*2G	80	29	14.5	80.5	140	53	Rc3/8	53
CVSE2*-15A-16-*2G	80	29	14.5	80.5	140	53	Rc1/2	53
CVSE2*-20A-16-*2G	90	35	17.5	100.5	163	63	Rc3/4	57.5
CVSE2*-25A-16-*2G	90	43	21.5	120	186.5	77	Rc1	64.5
CVSE2*-10A-30-*2G	80	29	14.5	80.5	140	53	Rc3/8	53
CVSE2*-15A-30-*2G	90	35	17.5	100.5	163	63	Rc1/2	57.5
CVSE2*-20A-30-*2G	90	43	21.5	120	186.5	77	Rc3/4	64.5
CVSE2*-25A-30-*2G	90	43	21.5	145.5	212	95	Rc1	72.5

## Internal structure and parts list

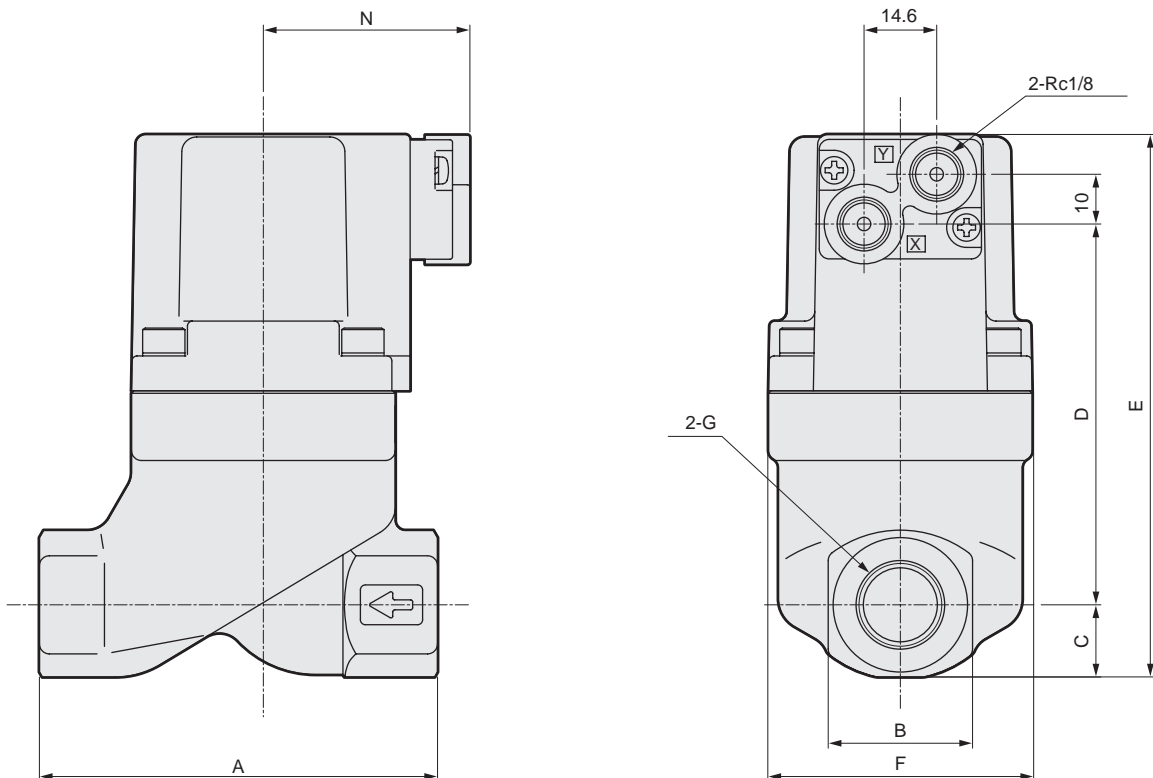
### ● CVE2



No.	Parts name	Material	
1	Cylinder guard	ADC12	Aluminum alloy die-casting
2	Piston	A2017	Aluminum
3	Adaptor	SUS303	Stainless steel
4	Piston rod	SUS304	Stainless steel
5	Main valving element	SUS420J2	Stainless steel
6	Body	FCD450	Cast iron (plating)
	Valve seat	SUS420J2	Stainless steel
7	Spring	SWP	Piano wire
8	O ring	NBR (FKM)	Nitrile rubber (Fluoro rubber)
9	Rod packing seal	NBR (FKM)	Nitrile rubber (Fluoro rubber)

## Dimensions

### ● CVE2/CVE22-10A to 50A-16/30-\*\*



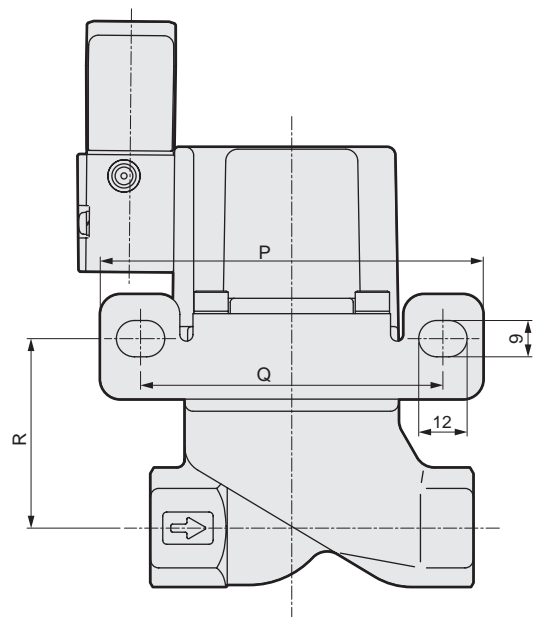
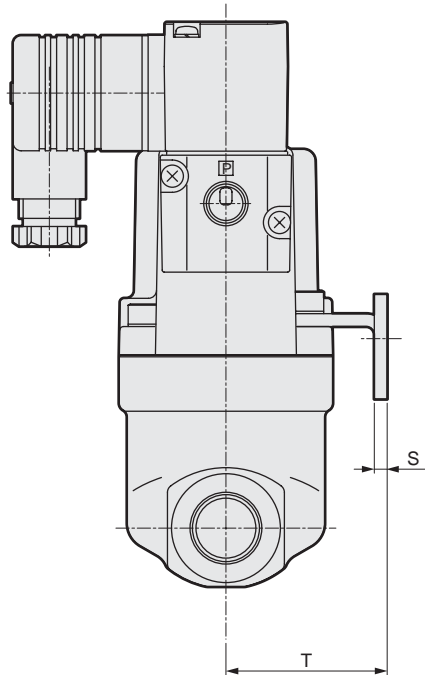
Model no.	A	B	C	D	E	F	G	N
CVE2*-10A-16*	80	29	14.5	76.5	109	53	Rc3/8	41.5
CVE2*-15A-16*	80	29	14.5	76.5	109	53	Rc1/2	41.5
CVE2*-20A-16*	90	35	17.5	96.5	132	63	Rc3/4	46
CVE2*-25A-16*	90	43	21.5	116	155.5	77	Rc1	53
CVE2*-10A-30*	80	29	14.5	76.5	109	53	Rc3/8	41.5
CVE2*-15A-30*	90	35	17.5	96.5	132	63	Rc1/2	46
CVE2*-20A-30*	90	43	21.5	116	155.5	77	Rc3/4	53
CVE2*-25A-30*	90	43	21.5	141.5	181	95	Rc1	61

# CVE2/CVSE2-16/30 Series

## Optional dimensions

● Mounting plate

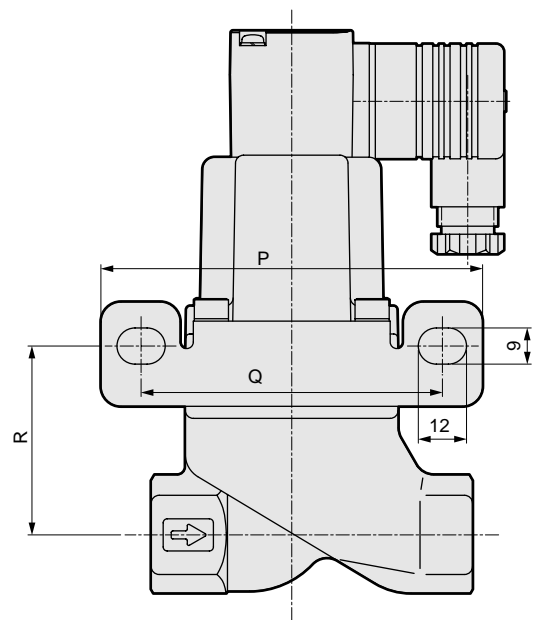
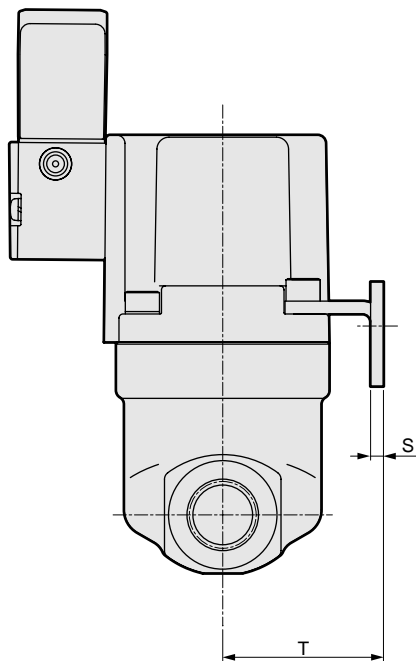
CVE2/CVE22 -10A to 25A-16/30-\*\* **B** / **B-R** / **B-Y**  
 CVSE2/CVSE22



\*Drawing indicates **B**.

● Mounting plate

CVE2/CVE22 -10A to 25A-16/30-\*\* **B-X** / **B-Z**  
 CVSE2/CVSE22



\*Drawing indicates **B-X**.

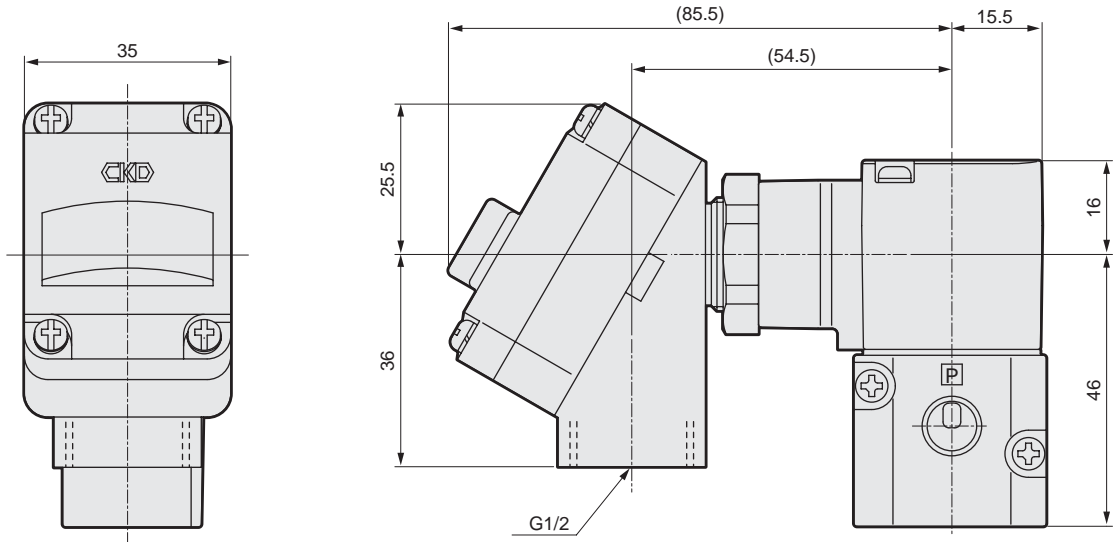
Model no.	P	Q	R	S	T
CV*E2*-10A-16-*B	95	75	47	3.2	40
CV*E2*-15A-16-*B	95	75	47	3.2	40
CV*E2*-20A-16-*B	105	85	53.5	3.2	45
CV*E2*-10A-30-*B	95	75	47	3.2	40
CV*E2*-15A-30-*B	105	85	53.5	3.2	45

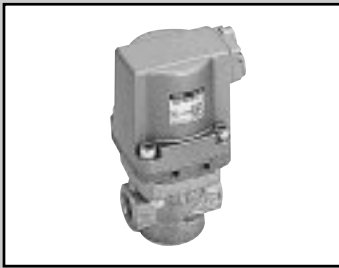
\* A mounting plate is enclosed only with the above model numbers.

## Optional dimensions

- T type terminal box (G1/2)
- T type terminal box with indicator light (G1/2)
- CVSE2/CVSE22-\*-16/30-\* 

3T
3R





Air operated 2 port valve for high pressure  
(Coolant valve)

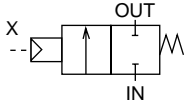
# CVSE2/CVSE22-70 Series CVE2/CVE22-70 Series

- NC (normally closed), NO (normally open) types
- Port size: Rc3/8 to Rc1
- High pressure 7.0MPa

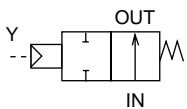


## JIS symbol

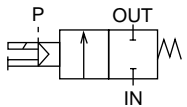
- CVE2 (air operated type)  
: NC type



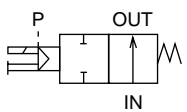
- CVE22 (air operated type)  
: NO type



- CVSE2 (with solenoid valve)  
: NC type



- CVSE22 (with solenoid valve)  
: NO type



## Common specifications

Model no.	CVE2/CVSE2	CVE22/CVSE22
Actuation	NC (normally closed) type	NO (normally open) type
Working fluid	Coolant, other non-corrosive fluid (*1)	
Fluid viscosity	mm <sup>2</sup> /s 500 or less	
Working pressure range	MPa 0 to 7.0	
Withstanding pressure (with water pressure)	MPa 14	
Fluid temperature	°C -10 to 60 (no freezing)	
Ambient temperature	°C -10 to 60	
Valve seat leakage	cm <sup>3</sup> /min 20 or less (with water pressure)	
Mounting attitude	Free	
Pilot air pressure	MPa 0.25 to 0.7	

\*1: Fluid that does not affect cast steel (nickel plating), stainless steel, copper, nitrile rubber or fluoro rubber

## Electric specifications (common specifications with solenoid valve)

Rated voltage (*2)	100 VAC (50/60Hz)/110 VAC (60Hz), 200 VAC (50/60Hz)/220 VAC (60Hz) and 24 VDC	
Apparent power (VA)	At holding	3.6 (50Hz), 2.8 (60Hz)
	At starting	11 (50Hz), 9 (60Hz)
Power consumption (W)	AC	1.9 (50Hz), 1.5 (60Hz)
	DC	2.0
Heat proof class	B	
Protective structure (IEC standards 529)	With DIN terminal box (Pg9)	IPX5
	T type terminal box (G1/2)	IPX5

\*2: The allowable voltage range should be within  $\pm 10\%$  of rated voltage.

## Individual specifications for 7.0MPa

Descriptions Model no.	Port size	Orifice (mm)	Cv flow factor	Pilot Port size	Weight (kg)	
					CVE2 (2)	CVSE2 (2)
CVE2 (2)/CVSE2 (2)-10A-70	Rc3/8	6.5	1.7	Rc1/8	1.4	1.5
CVE2 (2)/CVSE2 (2)-15A-70	Rc1/2	8	2.8		2.4	2.5
CVE2 (2)/CVSE2 (2)-20A-70	Rc3/4	10.5	4.7		3.9	4.0
CVE2 (2)/CVSE2 (2)-25A-70	Rc1	13	7.0		6.1	6.2

### How to order

- Air operated type

**CVE2** **2** - **20A** - **70** - **0** **B**

- With solenoid valve

**CVSE2** **2** - **15A** - **70** - **0** **2G** **S** - **1**

Model no.	
Air operated type (2 port)	CVE2
With solenoid valve (2 port)	CVSE2

**A** Actuation

**B** Port size

**C** Working pressure range

**D** Body/sealant combination

**E** Coil

**F** Other options

**G** Assembly direction

**H** Voltage

<Example of model number>

**CVSE22-15A-70-02GS-1**

Model: CVSE2 : With solenoid valve (2 port)

**A** G Actuation : NO (normally open) type

**B** Port size : Rc1/2

**C** Working pressure range : 0 to 7.0MPa

**D** Body/sealant combination

: Body-cast iron (plating) and sealant-nitrile rubber

**E** Coil : With DIN terminal box (Pg9)

**F** Other options : With surge suppressor

**G** G Assembly direction : No option

**H** G Voltage : 100 VAC (50/60Hz) and 110 VAC (60Hz)

\*1  
\*2  
\*3  
\*4

\*5

\*1: Indicate SB in **F** if both surge suppressor and mounting plate are selected.

\*2: A surge suppressor is assembled in the terminal box.

\*3: Manual override (non-locking) specifications are standard for solenoid valve.

\*4: Mounting plate is attached.

\*5: Optional assembly direction can not be selected for air operated type.

\*6: Facing to IN port right and viewed from the top, turning angle to clockwise is indicated.

### G Assembly direction

CVSE2 (with solenoid valve) \*6

Symbol	Blank (standard)	X	Y	Z	R
Direction	Without rotation	Cylinder guard 90° rotation	Cylinder guard 180° rotation	Cylinder guard 270° rotation	Coil reverse rotation
Arrangement					

Model no.	
CVE2	CVSE2

Symbol	Descriptions	CVE2	CVSE2
<b>A Actuation</b>			
Blank	NC (normally closed) type	●	●
2	NO (normally open) type	●	●

<b>B Port size</b>			
10A	Rc3/8	●	●
15A	Rc1/2	●	●
20A	Rc3/4	●	●
25A	Rc1	●	●

<b>C Working pressure range</b>			
70	0 to 7.0MPa	●	●

<b>D Body/sealant combination</b>					
		Body	Sealant		
0	Standard	Cast iron (plating)	Nitrile rubber	●	●
B	Option	Cast iron (plating)	Fluoro rubber	●	●

<b>E Coil</b>			
2G	With DIN terminal box (Pg9)		●
2H	With DIN terminal box with indicator light (Pg9)		●
3T	T type terminal box (G1/2)		●
3R	With T type terminal box with indicator light (G1/2)		●

<b>F Other options</b>			
Blank	No option	●	●
S	With surge suppressor		●
B	Mounting plate	●	●

<b>G Assembly direction</b>			
Blank	No option	●	●
X	Cylinder guard 90° rotation		●
Y	Cylinder guard 180° rotation		●
Z	Cylinder guard 270° rotation		●
R	Coil 180° reverse rotation <with solenoid valve>		●

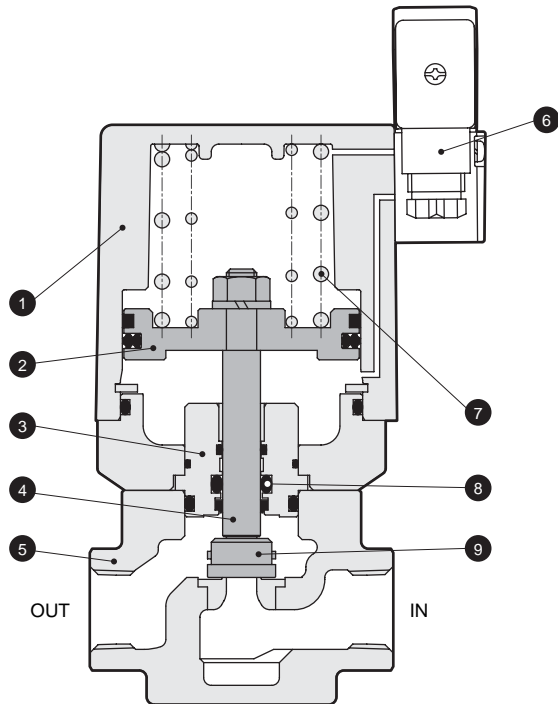
Refer to the following diagram for the layout drawing.

<b>H Voltage</b>			
1	100 VAC (50/60Hz) 110 VAC (60Hz)		●
2	200 VAC (50/60Hz) 220 VAC (60Hz)		●
3	24 VDC		●

# CVSE2-70 Series

## Internal structure and parts list

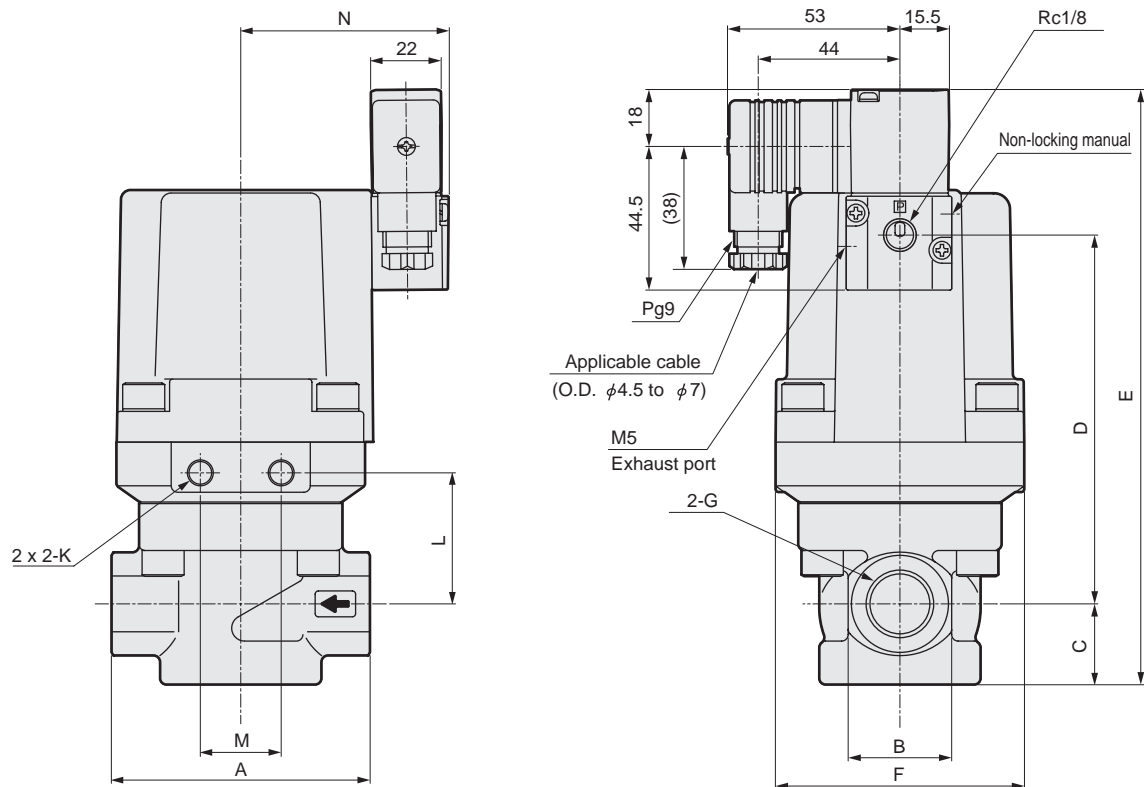
### ● CVSE2



No.	Parts name	Material	
1	Cylinder guard	ADC12	Aluminum alloy die-casting
2	Piston	A2017	Aluminum
3	Adaptor	SUS303	Stainless steel
4	Piston rod	SUS304	Stainless steel
5	Body	FCD450	Cast iron (plating)
6	Pilot solenoid valve	-	-
7	Spring	SWP	Piano wire
8	Rod packing seal	NBR (FKM)	Nitrile rubber (Fluoro rubber)
9	Main valving element	SUS420J2	Stainless steel

## Dimensions

### ● With DIN terminal box (Pg9) CVSE2/CVSE22-10A to 25A-70-\*2G



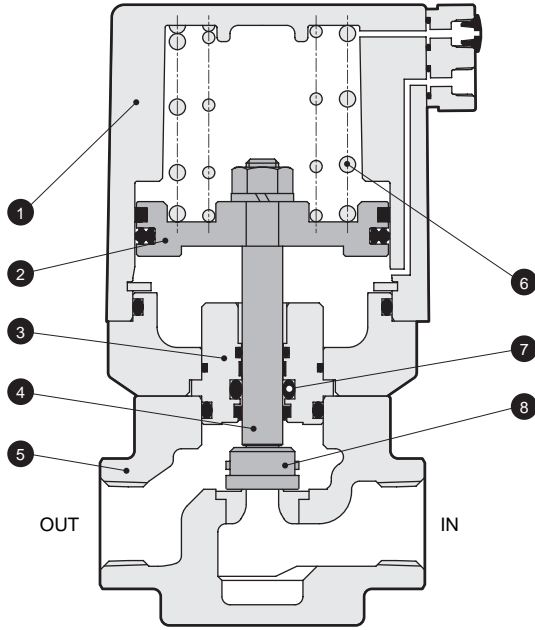
\*Drawing indicates no optional assembly direction.

Model no.	A	B	C	D	E	F	G	K	L	M	N
CVSE2/CVSE22-10A-70-*2G	60	28	22	92.5	159.5	63	Rc3/8	M6 thread length 9	38	20	57.5
CVSE2/CVSE22-15A-70-*2G	80	32	25	114	184	77	Rc1/2	M8 thread length 10	40.5	25	64.5
CVSE2/CVSE22-20A-70-*2G	90	40	29	136.5	210.5	95	Rc3/4	M8 thread length 10	45.5	25	72.5
CVSE2/CVSE22-25A-70-*2G	110	48	33.5	149.5	228	113	Rc1	M12 thread length 14	49	45	82.5



### Internal structure and parts list

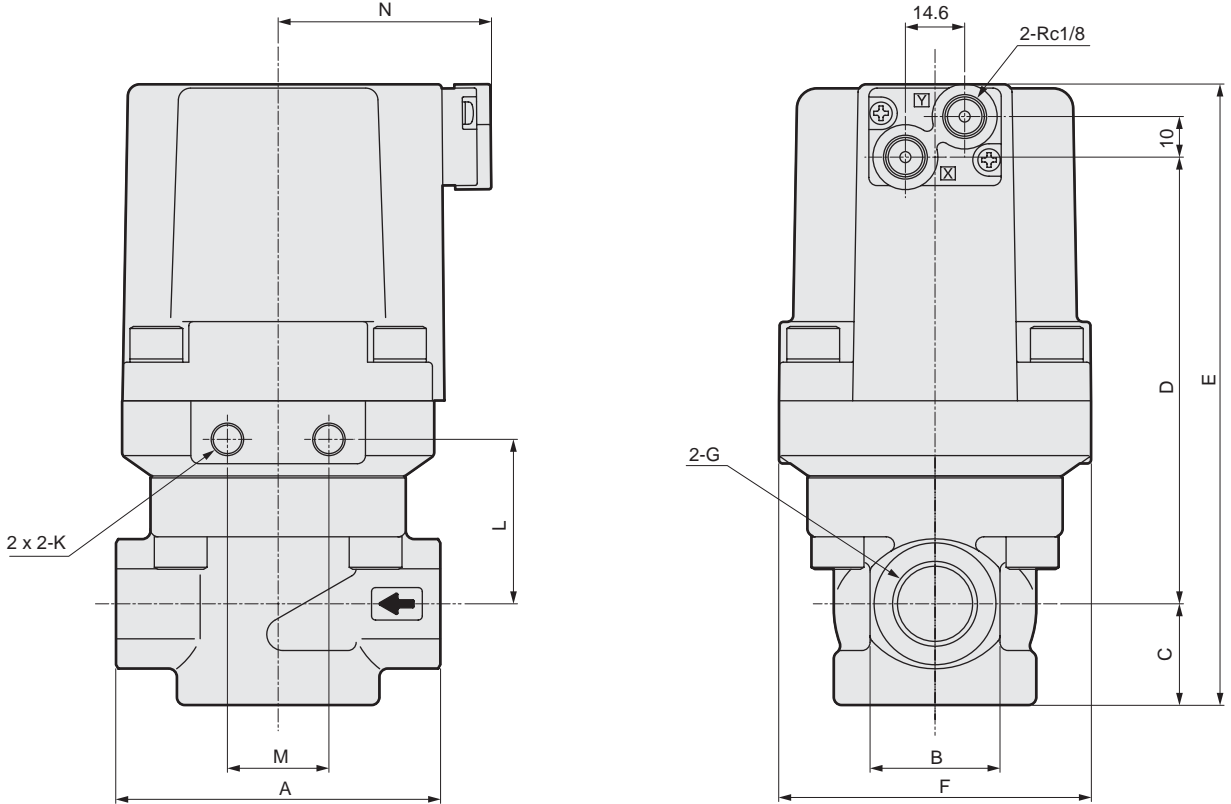
● CVE2



No.	Parts name	Material	
1	Cylinder guard	ADC12	Aluminum alloy die-casting
2	Piston	A2017	Aluminum
3	Adaptor	SUS303	Stainless steel
4	Piston rod	SUS304	Stainless steel
5	Body	FCD450	Cast iron (plating)
6	Spring	SWP	Piano wire
7	Rod packing seal	NBR (FKM)	Nitrile rubber (Fluoro rubber)
8	Main valving element	SUS420J2	Stainless steel

### Dimensions

● CVE2/CVE22-10A to 25A-70-\*\*



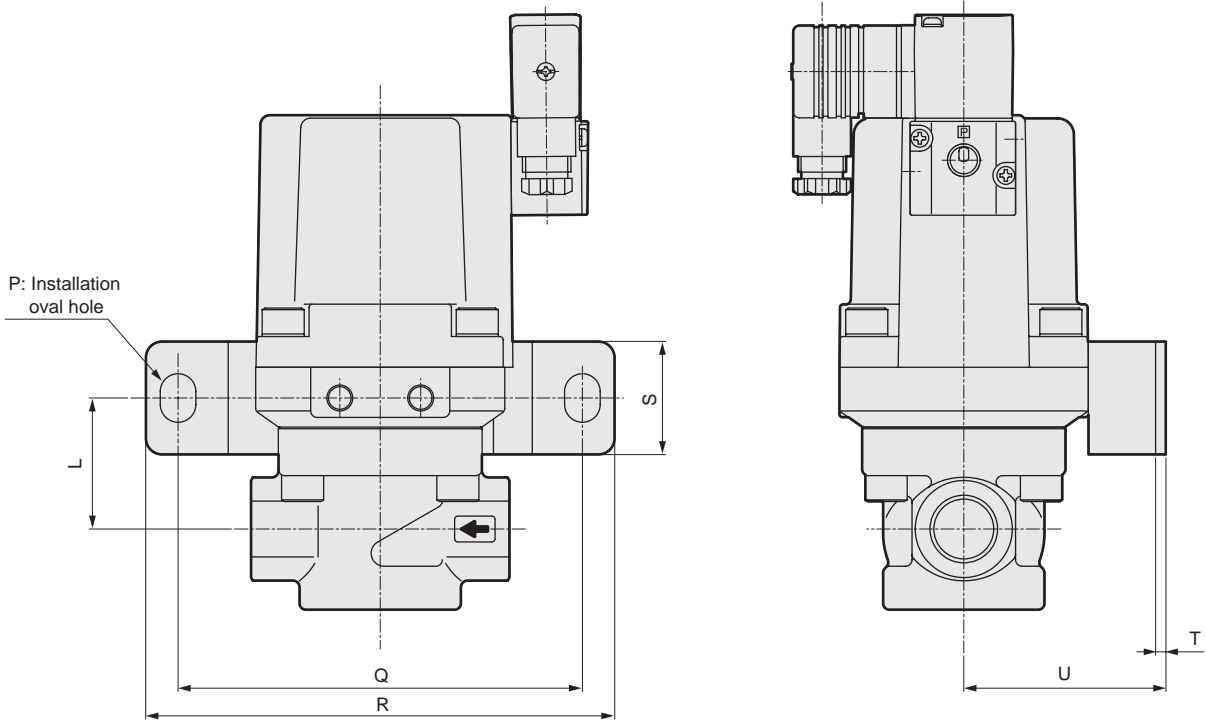
Model no.	A	B	C	D	E	F	G	K	L	M	N
CVE2/CVE22-10A-70-*	60	28	22	88.5	128.5	63	Rc3/8	M6 thread length 9	38	20	46
CVE2/CVE22-15A-70-*	80	32	25	110	153	77	Rc1/2	M8 thread length 10	40.5	25	53
CVE2/CVE22-20A-70-*	90	40	29	132.5	179.5	95	Rc3/4	M8 thread length 10	45.5	25	61
CVE2/CVE22-25A-70-*	110	48	33.5	145.5	197	113	Rc1	M12 thread length 14	49	45	71

# CVE2/CVSE2-70 Series

## Optional dimensions

● Mounting plate

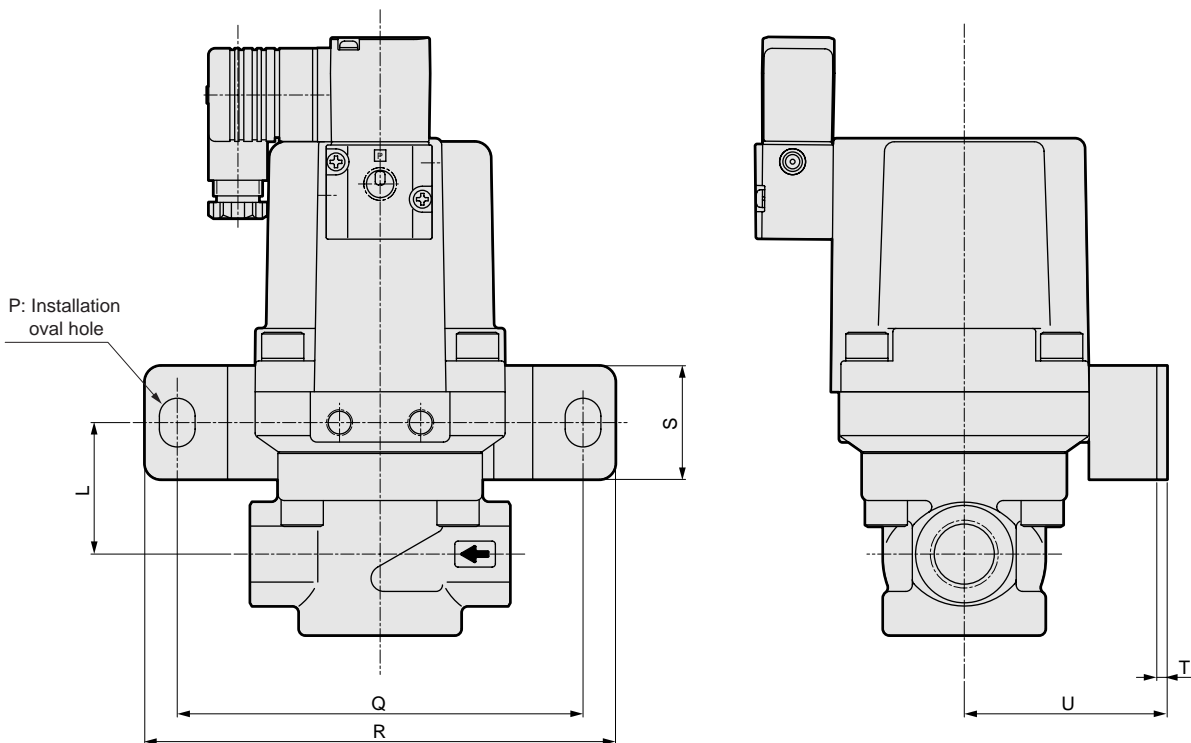
CVE2/CVE22 -10A to 25A-70-\*\* B / B-R / B-Y  
 CVSE2/CVSE22



\*Drawing indicates B.

● Mounting plate

CVE2/CVE22 -10A to 25A-70-\*\* B-X / B-Z  
 CVSE2/CVSE22



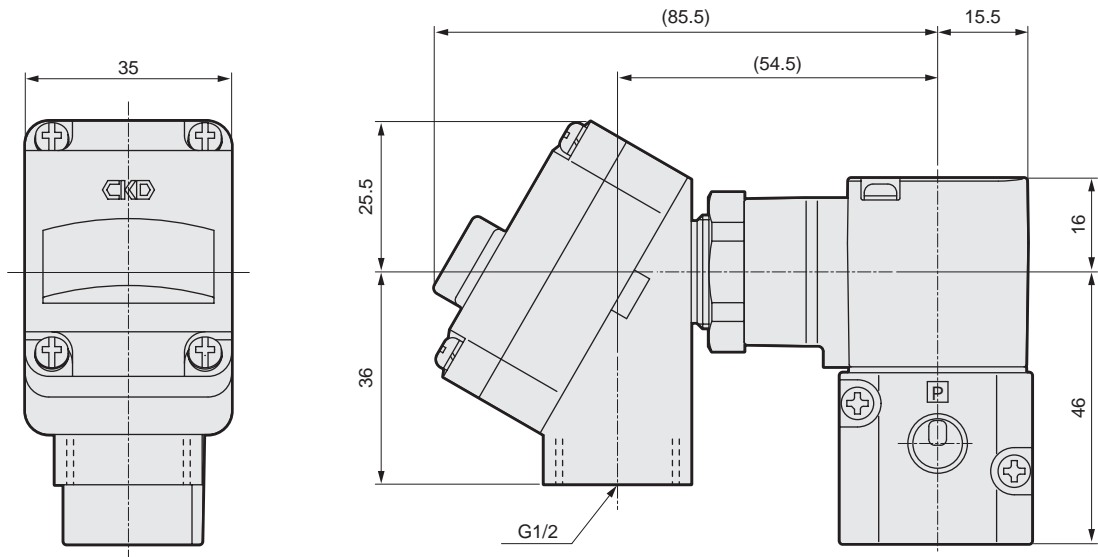
\*Drawing indicates B-X.

Model no.	L	P	Q	R	S	T	U
CV*E2*-10A-70*B	38	9 x 12	85	100	25	3.2	45
CV*E2*-15A-70*B	40.5	11 x 15	125	145	35	3.2	62.5
CV*E2*-20A-70*B	45.5	11 x 15	125	145	35	3.2	71.5
CV*E2*-25A-70*B	49	14 x 20	160	190	40	4	84

## Optional dimensions

- T type terminal box (G1/2)
- T type terminal box with indicator light (G1/2)
- CVSE2/CVSE22-\* -70-\* 

3T
3R



Air operated 3 port valve for medium and high pressure  
(Coolant valve)



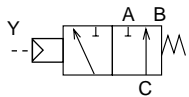
# CVSE3-35/70 Series CVE3-35/70 Series

- Directional type (C port pressurization only)
- Medium pressure 3.5MPa: Port size: Rc3/8 to Rc2
- High pressure 7.0MPa: Port size: Rc3/8 to Rc1

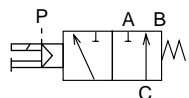


## JIS symbol

- CVE3 (air operated type)



- CVSE3 (with solenoid valve)



## Common specifications

Descriptions	Standard specifications
Actuation	Directional type (C port pressurization only)
Working fluid	Coolant, other non-corrosive fluids (*1)
Fluid viscosity mm <sup>2</sup> /s	500 or less
Working pressure range MPa	0 to 7.0 (Note that this differs with the type, so refer to the working pressure range in each model's specifications.)
Fluid temperature °C	-10 to 60 (no freezing)
Ambient temperature °C	-10 to 60
Valve seat leakage cm <sup>3</sup> /min	20 or less (with water pressure)
Mounting attitude	Free
Pilot air pressure MPa	0.25 to 0.5

\*1: Fluid that does not affect cast steel (nickel plating), stainless steel, nitrile rubber or fluoro rubber

## Electric specifications

Rated voltage (*2)	100 VAC (50/60Hz)/110 VAC (60Hz), 200 VAC (50/60Hz)/220 VAC (60Hz) and 24 VDC	
Apparent power (VA)	At holding	3.6 (50Hz) and 2.8 (60Hz)
	At starting	11 (50Hz) and 9 (60Hz)
Power consumption (W)	AC	1.9 (50Hz) and 1.5 (60Hz)
	DC	2.0
Heat proof class	B	
Protective structure	With DIN terminal box (Pg9)	IPX5
(IEC standards 529)	T type terminal box (G1/2)	IPX5

\*2: The allowable voltage range should be within ±10% of rated voltage.

## Individual specifications for 7.0MPa for 3.5MPa

Descriptions Model no.	Port size	Orifice (mm)		Cv flow factor		Pilot Port size	Working pressure range (MPa)	Withstanding pressure (with water pressure) (MPa)	Weight (kg)	
		NC side	NO side	NC side	NO side				CVE3	CVSE3
CVE3/CVSE3-10A-35	Rc3/8	5.8 or equivalent	4.5	1.3	1	RC 1/8	0 to 3.5	7	1.0	1.1
CVE3/CVSE3-15A-35	Rc1/2	7.1 or equivalent	6	2.2	1.8				1.6	1.7
CVE3/CVSE3-20A-35	Rc3/4	8.9 or equivalent	8	3.6	3				2.7	2.8
CVE3/CVSE3-25A-35	Rc1	13.2 or equivalent	9	6	3.8				4.3	4.4
CVE3/CVSE3-32A-35	Rc1 1/4	22 or equivalent	20	23	18.5				13.8	13.9
CVE3/CVSE3-40A-35	Rc1 1/2	22 or equivalent	20	23	17				13.5	13.6
CVE3/CVSE3-50A-35	Rc2	28.5 or equivalent	26	31	27				22.7	22.8
CVE3/CVSE3-10A-70	Rc3/8	5.8 or equivalent	4.5	1.3	1	0 to 7.0	14	1.4	1.5	
CVE3/CVSE3-15A-70	Rc1/2	7.1 or equivalent	6	2.2	1.8			2.4	2.5	
CVE3/CVSE3-20A-70	Rc3/4	8.9 or equivalent	8	3.6	3			3.9	4.0	
CVE3/CVSE3-25A-70	Rc1	10.7 or equivalent	9	4.9	3.8			6.1	6.2	

### How to order

- Air operated type

**CVE3** - **20A** - **70** - **0**      **B**

- With solenoid valve

**CVSE3** - **15A** - **35** - **0** **2G** **S** -      - **1**

**A** Port size

**F** Assembly direction  
\*5

Model no.	
Air operated type (3 port)	CVE3
With solenoid valve (3 port)	CVSE3

**B** Working pressure range

**C** Body/sealant combination

**D** Coil

**E** Other options  
\*1, \*2  
\*3, \*4

<Example of model number>

**CVSE3-15A-35-02GS-1**

Model: CVSE3 : with solenoid valve (3 port)

**A** G Port size : Rc1/2

**B** Working pressure range : 0 to 3.5MPa

**C** Body/sealant combination

: Body-cast iron (plating) and sealant-nitrile rubber

**D** Coil : With DIN terminal box (Pg9)

**E** Other options : With surge suppressor

**F** G Assembly direction : No option

**G** G Voltage : 100 VAC (50/60Hz) and 110 VAC (60Hz)

\*1: Mounting plate (B in **E**) is attached. This plate can be installed on port size 10A, 15A, 20A or 25A.

\*2: Indicate SB in **E** if both surge suppressor and mounting plate are selected.

\*3: A surge suppressor is assembled in the terminal box.

\*4: Manual override (non-locking) specifications are standard for solenoid valve.

\*5: The assembly direction option cannot be selected for the air-operated type or 32A to 50A.

\*6: Facing to IN port right and viewed from the top, turning angle to clockwise is indicated.

		Model no.			
		CVE3		CVSE3	
Symbol	Descriptions	Medium pressure (3.5MPa)	High pressure (7.0MPa)	Medium pressure (3.5MPa)	High pressure (7.0MPa)

<b>A</b> Port size		Medium pressure (3.5MPa)	High pressure (7.0MPa)	Medium pressure (3.5MPa)	High pressure (7.0MPa)
10A	Rc3/8	●	●	●	●
15A	Rc1/2	●	●	●	●
20A	Rc3/4	●	●	●	●
25A	Rc1	●	●	●	●
32A	Rc1 1/4	●	●	●	●
40A	Rc1 1/2	●	●	●	●
50A	Rc2	●	●	●	●

<b>B</b> Working pressure range		Medium pressure (3.5MPa)	High pressure (7.0MPa)	Medium pressure (3.5MPa)	High pressure (7.0MPa)
35	0 to 3.5MPa	●	●	●	●
70	0 to 7.0MPa	●	●	●	●

<b>C</b> Body/sealant combination		Medium pressure (3.5MPa)	High pressure (7.0MPa)	Medium pressure (3.5MPa)	High pressure (7.0MPa)
	Body	Sealant			
0	Standard	Cast iron (plating)	Nitrile rubber	●	●
B	Option	Cast iron (plating)	Fluoro rubber	●	●

<b>D</b> Coil		Medium pressure (3.5MPa)	High pressure (7.0MPa)	Medium pressure (3.5MPa)	High pressure (7.0MPa)
2G	With DIN terminal box (Pg9)	●	●	●	●
2H	With DIN terminal box with indicator light (Pg9)	●	●	●	●
3T	T type terminal box (G1/2)	●	●	●	●
3R	With T type terminal box with indicator light (G1/2)	●	●	●	●

<b>E</b> Other options		Medium pressure (3.5MPa)	High pressure (7.0MPa)	Medium pressure (3.5MPa)	High pressure (7.0MPa)
Blank	No option	●	●	●	●
S	With surge suppressor	●	●	●	●
B	Mounting plate	●	●	●	●

<b>F</b> Assembly direction		Medium pressure (3.5MPa)	High pressure (7.0MPa)	Medium pressure (3.5MPa)	High pressure (7.0MPa)
Blank	No option	●	●	●	●
X	Cylinder guard 90° rotation	●	●	●	●
Y	Cylinder guard 180° rotation	●	●	●	●
Z	Cylinder guard 270° rotation	●	●	●	●
R	Coil 180° reverse rotation <with solenoid valve>	●	●	●	●

Refer to the following diagram for the layout drawing.

<b>G</b> Voltage		Medium pressure (3.5MPa)	High pressure (7.0MPa)	Medium pressure (3.5MPa)	High pressure (7.0MPa)
1	100 VAC (50/60Hz) 110 VAC (60Hz)	●	●	●	●
2	200 VAC (50/60Hz) 220 VAC (60Hz)	●	●	●	●
3	24 VDC	●	●	●	●

### **F** Assembly direction

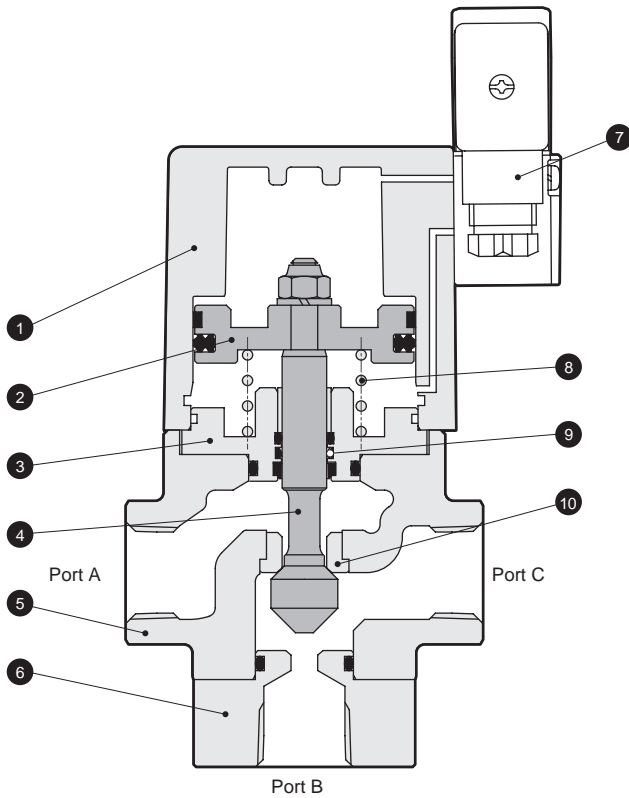
CVSE3 <with solenoid valve> \*6

Symbol	Blank (standard)	X	Y	Z	R
Direction	Without rotation	Cylinder guard 90° rotation	Cylinder guard 180° rotation	Cylinder guard 270° rotation	Coil reverse rotation
Arrangement					

# CVSE3-35/70 Series

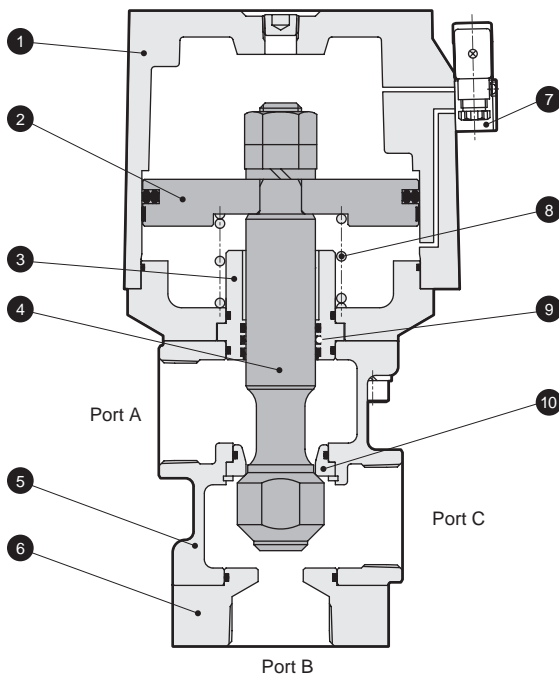
## Internal structure and parts list

### ● CVSE3-10A to 25A-35



No.	Parts name	Material	
1	Cylinder guard	ADC12	Aluminum alloy die-casting
2	Piston	A2017	Aluminum
3	Adaptor	SUS303	Stainless steel
4	Valve stem	SUS420J2	Stainless steel
5	Body	FCD450	Cast iron (plating)
6	NO body	SUS303	Stainless steel
7	Pilot solenoid valve	-	-
8	Spring	SWP	Piano wire
9	Rod packing seal	NBR (FKM)	Nitrile rubber (Fluoro rubber)
10	NC valve seat	SUS303	Stainless steel

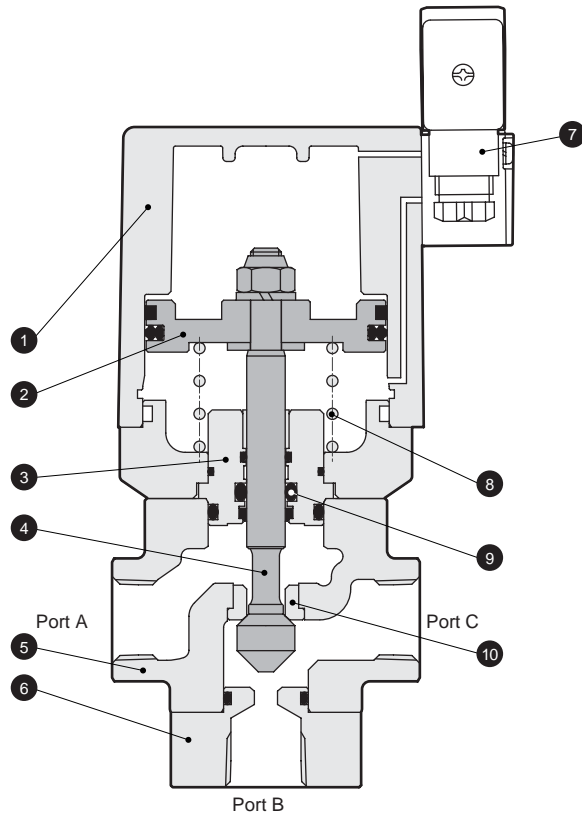
### ● CVSE3-32A/40A/50A-35



No.	Parts name	Material	
1	Cylinder guard	AC7A	Aluminum casting
2	Piston	A2017	Aluminum
3	Adaptor	SUS303	Stainless steel
4	Valve stem	SUS420J2	Stainless steel
5	Body	FCD450	Cast iron (plating)
6	NO body	SUS303	Stainless steel
7	Pilot solenoid valve	-	-
8	Spring	SWP	Piano wire
9	Rod packing seal	NBR (FKM)	Nitrile rubber (Fluoro rubber)
10	NC valve seat	SUS303	Stainless steel

## Internal structure and parts list

● CVSE3-10A to 25A-70

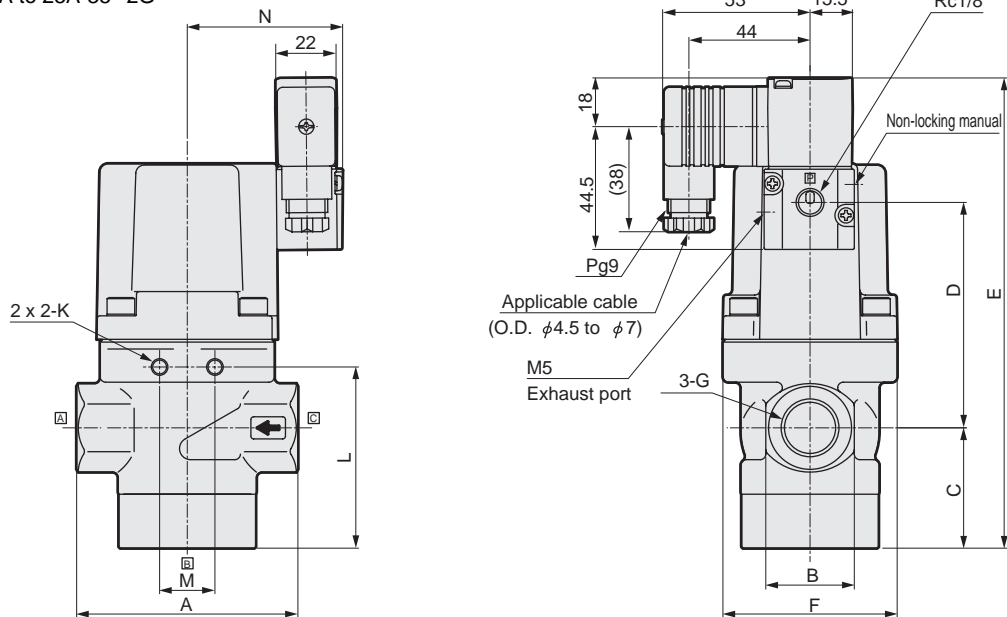


No.	Parts name	Material	
1	Cylinder guard	ADC12	Aluminum alloy die-casting
2	Piston	A2017	Aluminum
3	Adaptor	SUS303	Stainless steel
4	Valve stem	SUS420J2	Stainless steel
5	Body	FCD450	Cast iron (plating)
6	NO body	SUS303	Stainless steel
7	Pilot solenoid valve	-	-
8	Spring	SWP	Piano wire
9	Rod packing seal	NBR (FKM)	Nitrile rubber (Fluoro rubber)
10	NC valve seat	SUS303	Stainless steel

# CVSE3-35/70 Series

## Dimensions

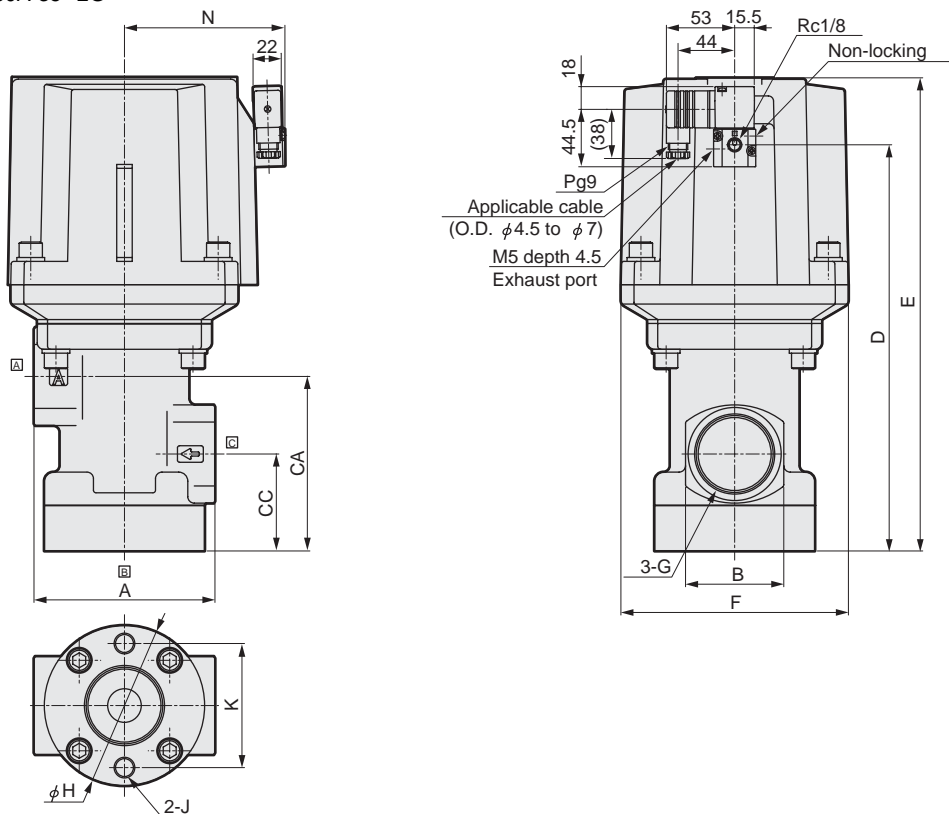
- With DIN terminal box (Pg9)  
CVSE3-10A to 25A-35-\*2G



\*Drawing indicates no optional assembly direction.

Model no.	A	B	C	D	E	F	G	K	L	M	N
CVSE3-10A-35-*2G	60	28	35.5	69	149.5	53	Rc3/8	M6 thread length 9	59	20	53
CVSE3-15A-35-*2G	80	32	43.5	81.5	170	63	Rc1/2	M6 thread length 9	65.5	20	57.5
CVSE3-20A-35-*2G	90	40	52	102	199	77	Rc3/4	M8 thread length 10	79.5	25	64.5
CVSE3-25A-35-*2G	110	48	61	122.5	228.5	95	Rc1	M8 thread length 10	91	25	72.5

- With DIN terminal box (Pg9)  
CVSE3-32A/40A/50A-35-\*2G

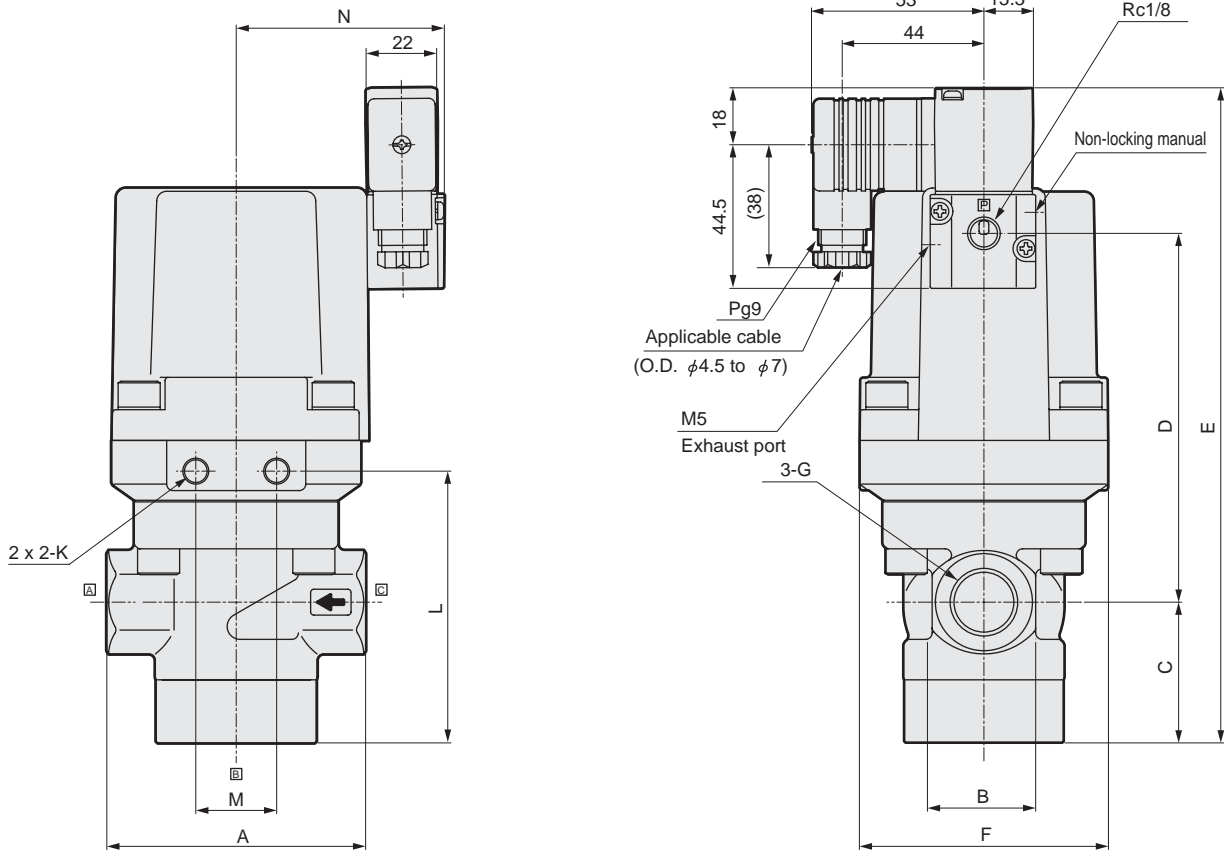


Model no.	A	B	CA	CC	D	E	F	G	H	J	K	N
CVSE3-32A-35-*2G	120	61	118	63	264.5	309.5	145	Rc1 1/4	φ 109	M12 depth 30	90	103
CVSE3-40A-35-*2G	120	61	118	63	264.5	309.5	145	Rc1 1/2	φ 109	M12 depth 30	90	103
CVSE3-50A-35-*2G	140	76	135	75	314	366	176	Rc2	φ 124	M16 depth 35	96	123



## Dimensions

- With DIN terminal box (Pg9)  
CVSE3-10A to 25A-70-\*2G



\*Drawing indicates no optional assembly direction.

Model no.	A	B	C	D	E	F	G	K	L	M	N
CVSE3-10A-70-*2G	60	28	35.5	92.5	173	63	Rc3/8	M6 thread length 9	73.5	20	57.5
CVSE3-15A-70-*2G	80	32	43.5	114	202.5	77	Rc1/2	M8 thread length 10	84	25	64.5
CVSE3-20A-70-*2G	90	40	52	136.5	233.5	95	Rc3/4	M8 thread length 10	97.5	25	72.5
CVSE3-25A-70-*2G	110	48	61	149.5	255.5	113	Rc1	M12 thread length 14	110	45	82.5

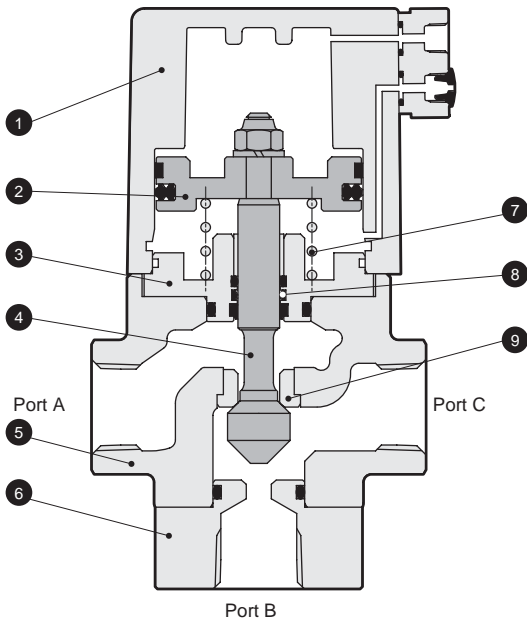
## Optional dimensions

Refer to page 35 for coil option/mounting plate.

# CVE3-35/70 Series

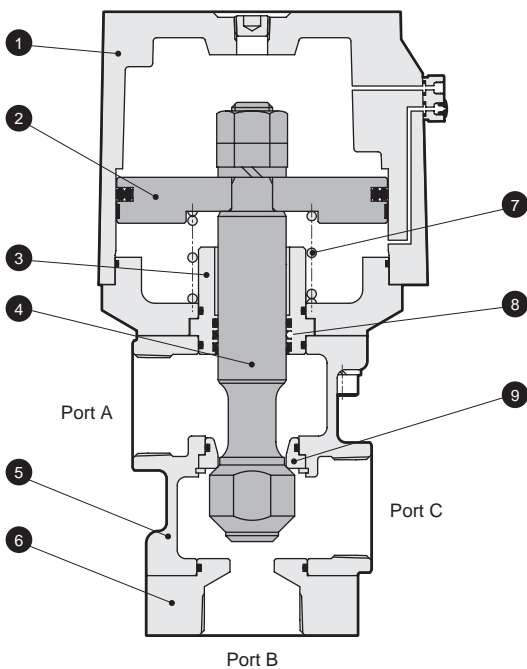
## Internal structure and parts list

### ● CVE3-10A to 25A-35



No.	Parts name	Material	
1	Cylinder guard	ADC12	Aluminum alloy die-casting
2	Piston	A2017	Aluminum
3	Adaptor	SUS303	Stainless steel
4	Valve stem	SUS420J2	Stainless steel
5	Body	FCD450	Cast iron (plating)
6	NO body	SUS303	Stainless steel
7	Spring	SWP	Piano wire
8	Rod packing seal	NBR (FKM)	Nitrile rubber (Fluoro rubber)
9	NC valve seat	SUS303	Stainless steel

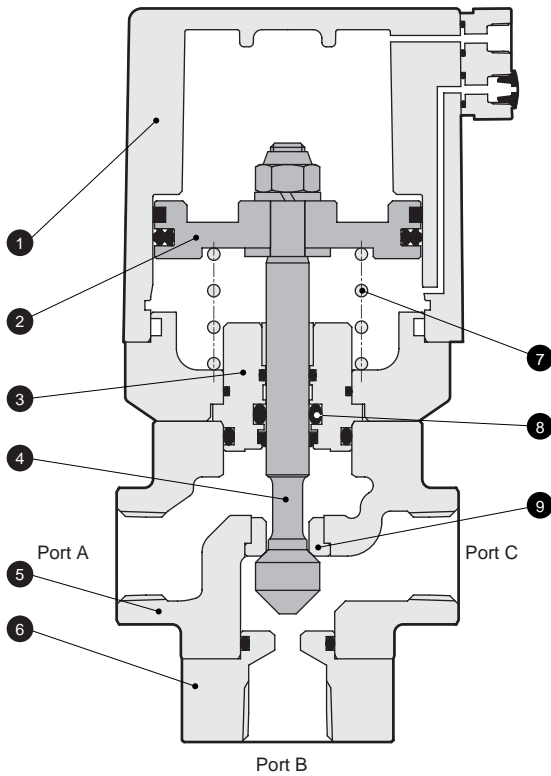
### ● CVE3-32A/40A/50A-35



No.	Parts name	Material	
1	Cylinder guard	AC7A	Aluminum casting
2	Piston	A2017	Aluminum
3	Adaptor	SUS303	Stainless steel
4	Valve stem	SUS420J2	Stainless steel
5	Body	FCD450	Cast iron
6	NO body	SUS303	Stainless steel
7	Spring	SWP	Piano wire
8	Rod packing seal	NBR (FKM)	Nitrile rubber (Fluoro rubber)
9	NC valve seat	SUS303	Stainless steel

## Internal structure and parts list

● CVE3-10A to 25A-70

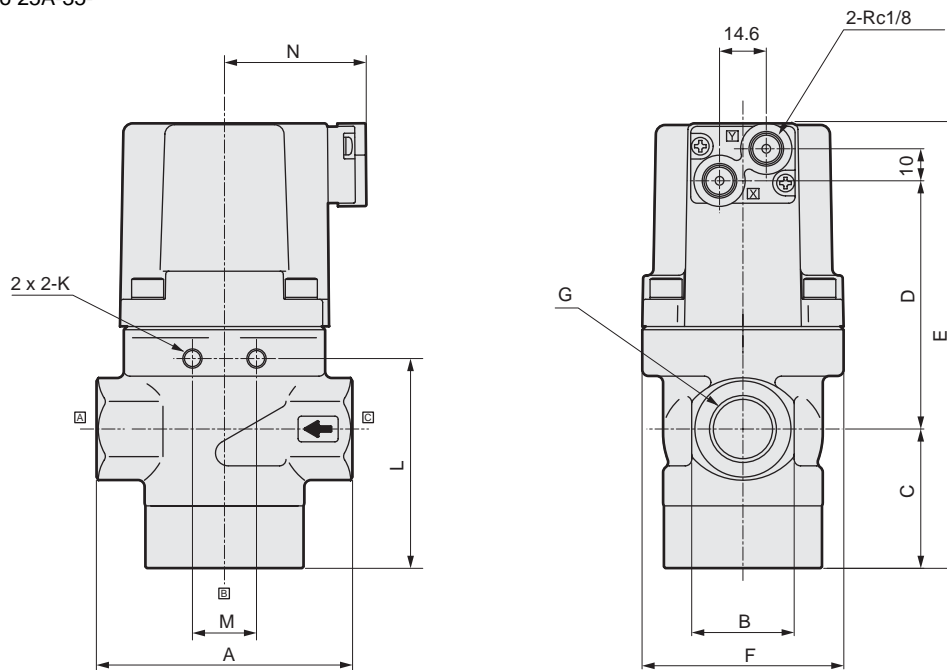


No.	Parts name	Material	
1	Cylinder guard	ADC12	Aluminum alloy die-casting
2	Piston	A2017	Aluminum
3	Adaptor	SUS303	Stainless steel
4	Valve stem	SUS420J2	Stainless steel
5	Body	FCD450	Cast iron
6	NO body	SUS303	Stainless steel
7	Spring	SWP	Piano wire
8	Rod packing seal	NBR (FKM)	Nitrile rubber (Fluoro rubber)
9	NC valve seat	SUS303	Stainless steel

# CVE3-35/70 Series

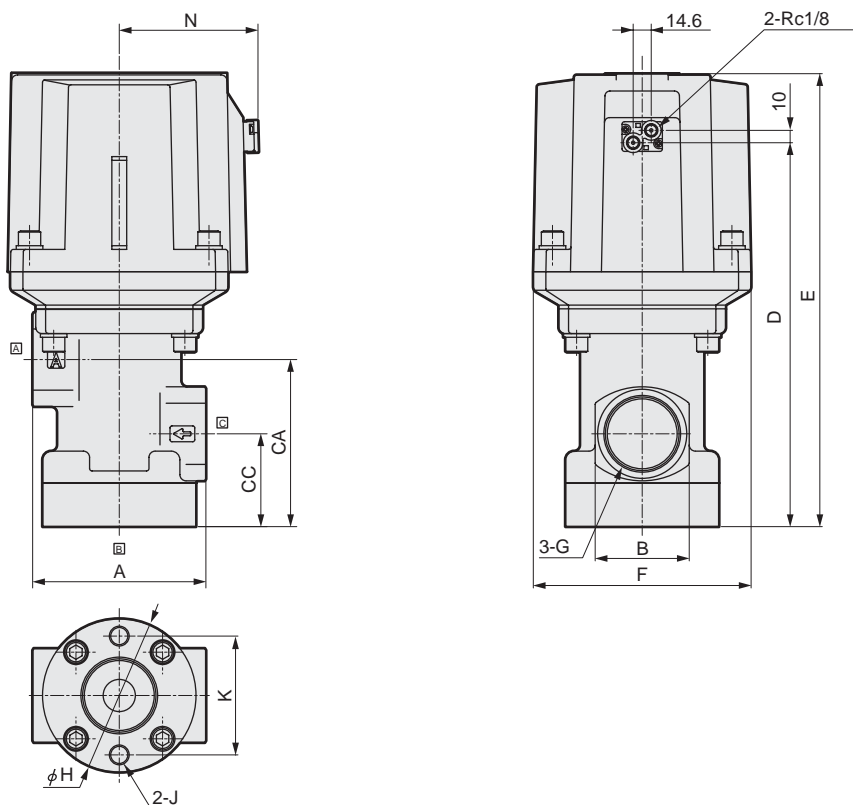
## Dimensions

● CVE3-10A to 25A-35-\*\*



Model no.	A	B	C	D	E	F	G	K	L	M	N
CVE3-10A-35-*	60	28	35.5	65	118.5	53	Rc3/8	M6 thread length 9	59	20	41.5
CVE3-15A-35-*	80	32	43.5	77.5	139	63	Rc1/2	M6 thread length 9	65.5	20	46
CVE3-20A-35-*	90	40	52	98	168	77	Rc3/4	M8 thread length 10	79.5	25	53
CVE3-25A-35-*	110	48	61	118.5	197.5	95	Rc1	M8 thread length 10	91	25	61

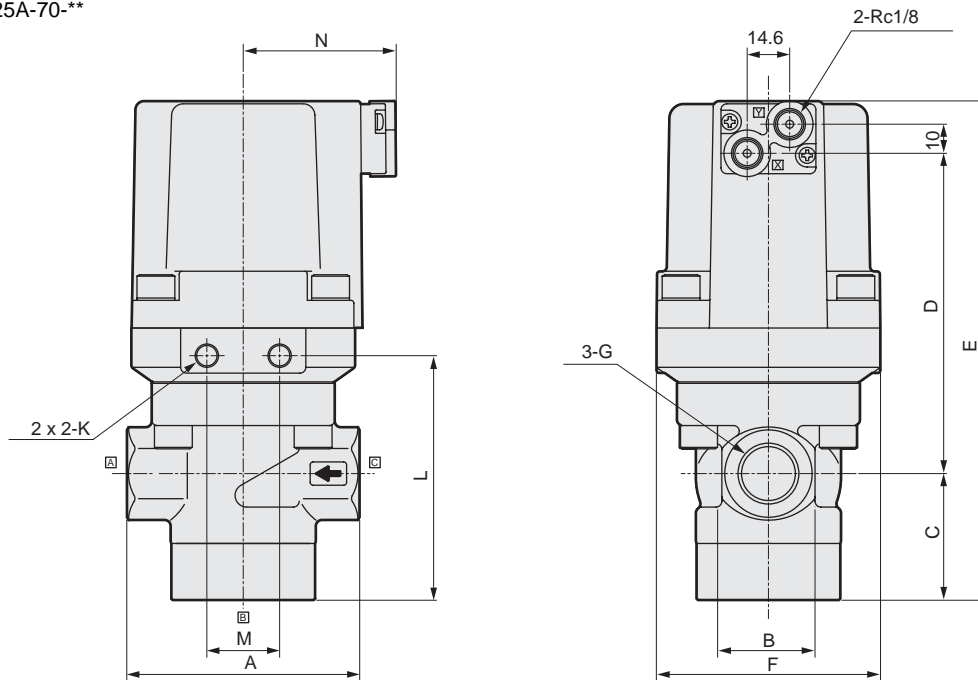
● CVE3-32A/40A/50A-35-\*\*



Model no.	A	B	CA	CC	D	E	F	G	H	J	K	N
CVE3-32A-35-*	120	61	118	63	260.5	301	145	Rc1 1/4	φ109	M12 depth 30	90	91
CVE3-40A-35-*	120	61	118	63	260.5	301	145	Rc1 1/2	φ109	M12 depth 30	90	91
CVE3-50A-35-*	140	76	135	75	310	366	176	Rc2	φ124	M16 depth 35	96	111

## Dimensions

- CVE3-10A to 25A-70-\*\*



Model no.	A	B	C	D	E	F	G	K	L	M	N
CVE3-10A-70-*	60	28	35.5	88.5	142	63	Rc3/8	M6 thread length 9	73.5	20	46
CVE3-15A-70-*	80	32	43.5	110	171.5	77	Rc1/2	M8 thread length 10	84	25	53
CVE3-20A-70-*	90	40	52	132.5	202.5	95	Rc3/4	M8 thread length 10	97.5	25	61
CVE3-25A-70-*	110	48	61	145.5	224.5	113	Rc1	M12 thread length 14	110	45	71

## Optional dimensions

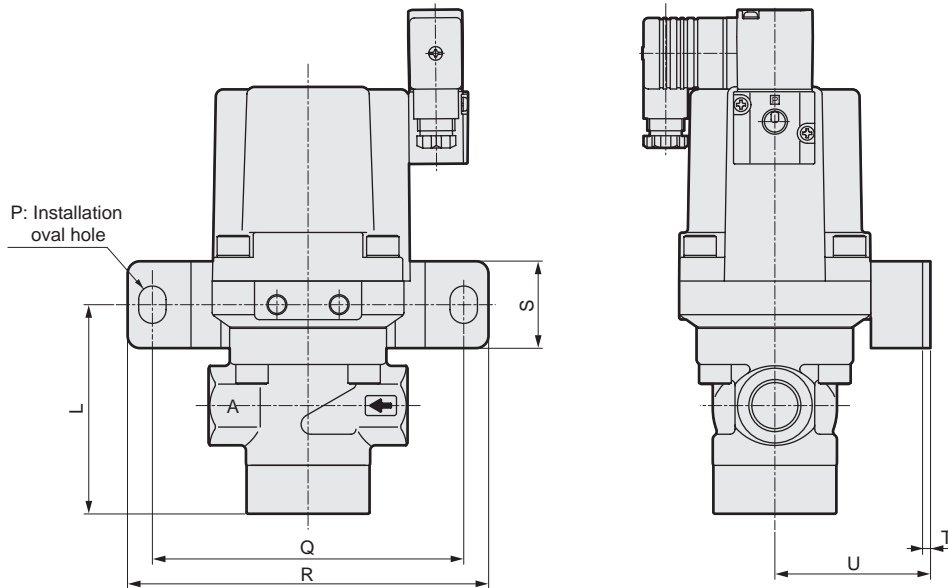
Refer to page 35 for mounting plate.

# CVE3 / CVSE3-35 / 70 Series

## Optional dimensions

### ● Mounting plate

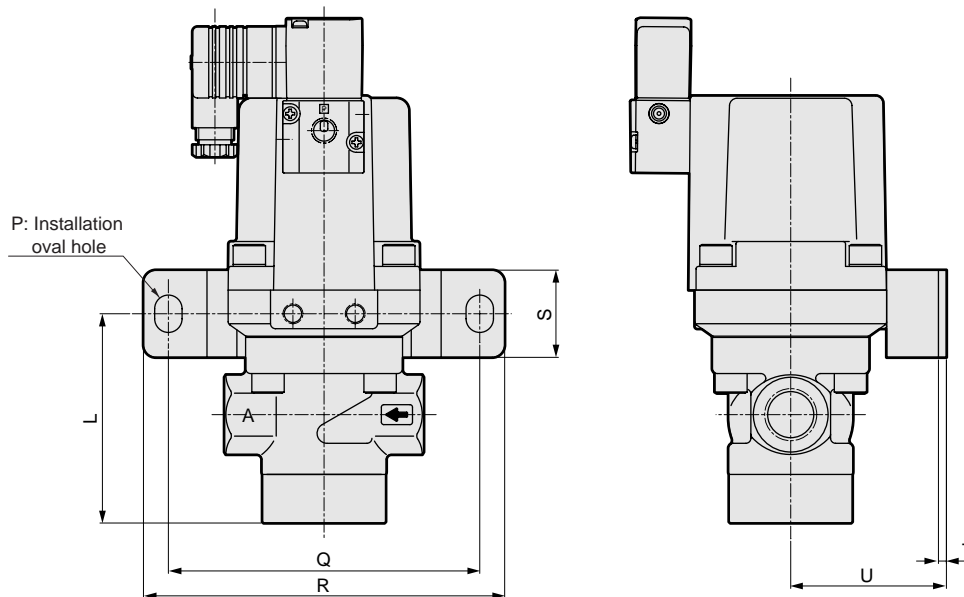
CVE3/CVSE3-10A to 25A-35/70-\*\*  $\boxed{B}$  /  $\boxed{B-R}$  /  $\boxed{B-Y}$



\*Drawing indicates  $\boxed{B}$ .

### ● Mounting plate

CVE3/CVSE3-10A to 25A-35/70-\*\*  $\boxed{B-X}$  /  $\boxed{B-Z}$



\*Drawing indicates  $\boxed{B-X}$ .

Model no.	L	P	Q	R	S	T	U
CV*E3-10A-35-*B	59	9 x 12	85	100	25	3.2	40
CV*E3-15A-35-*B	65.5	9 x 12	85	100	25	3.2	45
CV*E3-20A-35-*B	79.5	11 x 15	125	145	35	3.2	62.5
CV*E3-25A-35-*B	91	11 x 15	125	145	35	3.2	71.5
CV*E3-10A-70-*B	73.5	9 x 12	85	100	25	3.2	45
CV*E3-15A-70-*B	84	11 x 15	125	145	35	3.2	62.5
CV*E3-20A-70-*B	97.5	11 x 15	125	145	35	3.2	71.5
CV*E3-25A-70-*B	110	14 x 20	160	190	40	4	84

### ● T type terminal box (G1/2)

T type terminal box with indicator light (G1/2)

CVSE3-\*-35/70-\*  $\boxed{3T}$   
 $\boxed{3R}$

Refer to page 24 for optional dimensions.

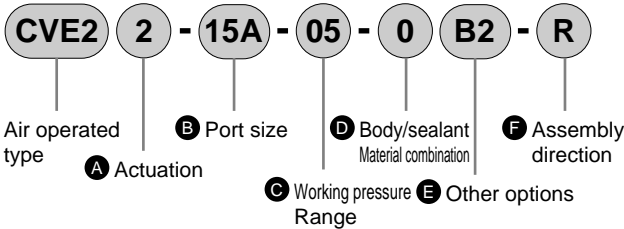
## Options for interchanging old/new models Old/new complete interchangeable mounting plate (air operated type)

Compatible mounting plates with old (CV2) installation plate type are available.

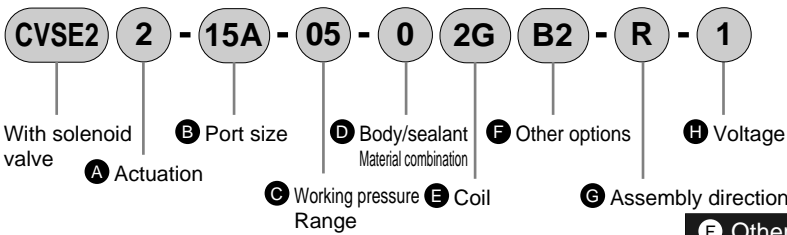
Series: CVE2 (2)-05/10/16/30/70  
 CVSE2 (2)-05/10/16/30/70  
 CVE3/CVSE3-35/70

\* Refer to How to order explanations on pages 3, 13, 20, and 26 for details on models for which the mounting plate option is selected.

### How to order

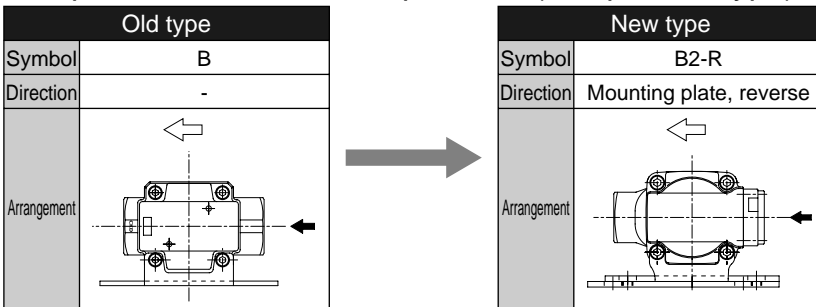


E Other options	
B	Mounting plate
B2	Old products compatible mounting plate

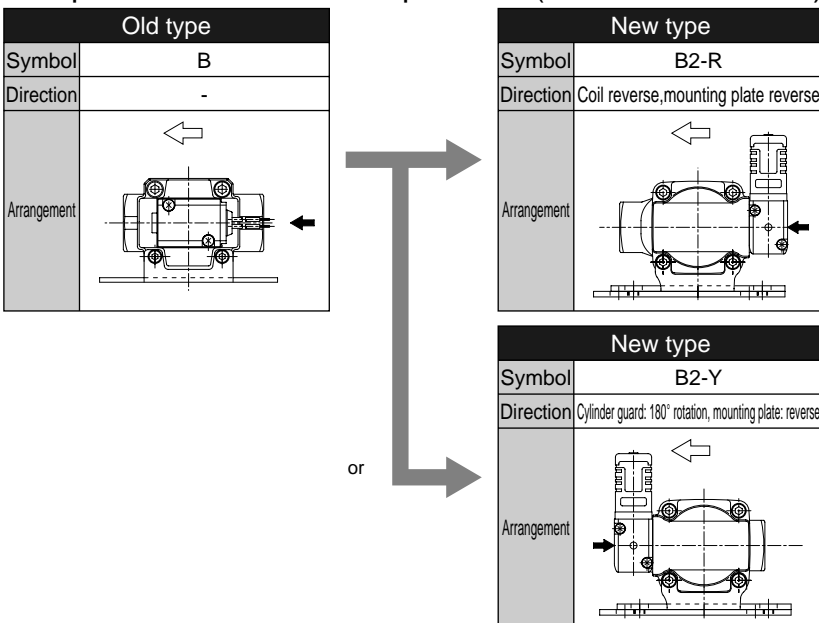


F Other options	
B	Mounting plate
B2	Old products compatible mounting plate

### Comparison of new and old products (air operated type)



### Comparison of new and old products (with solenoid valve)



\*Mounting plate is assembled in the 180° opposite side, if "B2-R" is selected.

\*Mounting plate is assembled in the 180° opposite side, if "B2-Y" is selected.

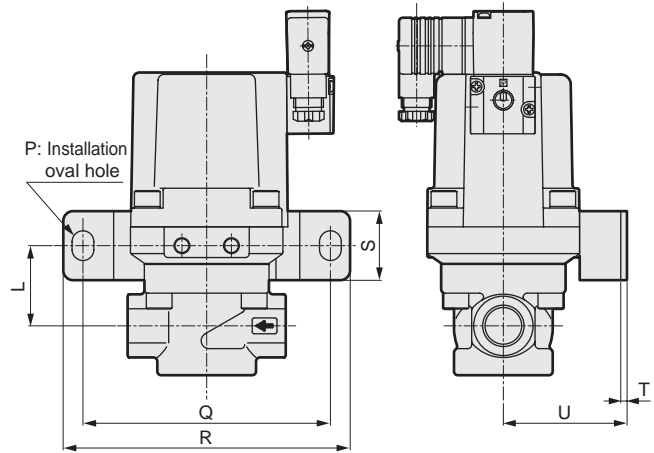
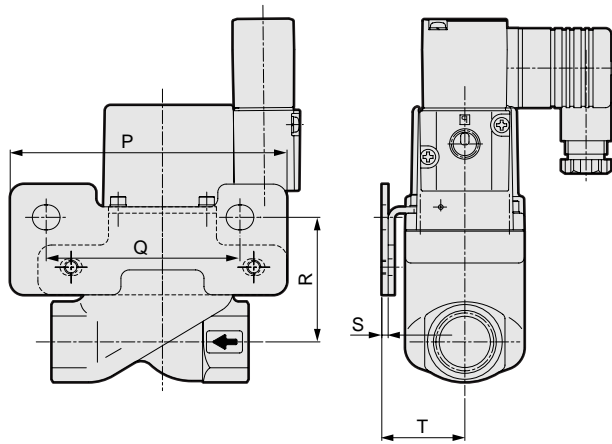
⇌ indicates flow path direction, while ← indicates pilot ports IN.

## Dimensions

### ● 2 port valve

CVSE2 (2)-\*-05/10/16/30

CVSE2 (2)-\*-70



\*The drawing indicates an example when solenoid valve is installed.

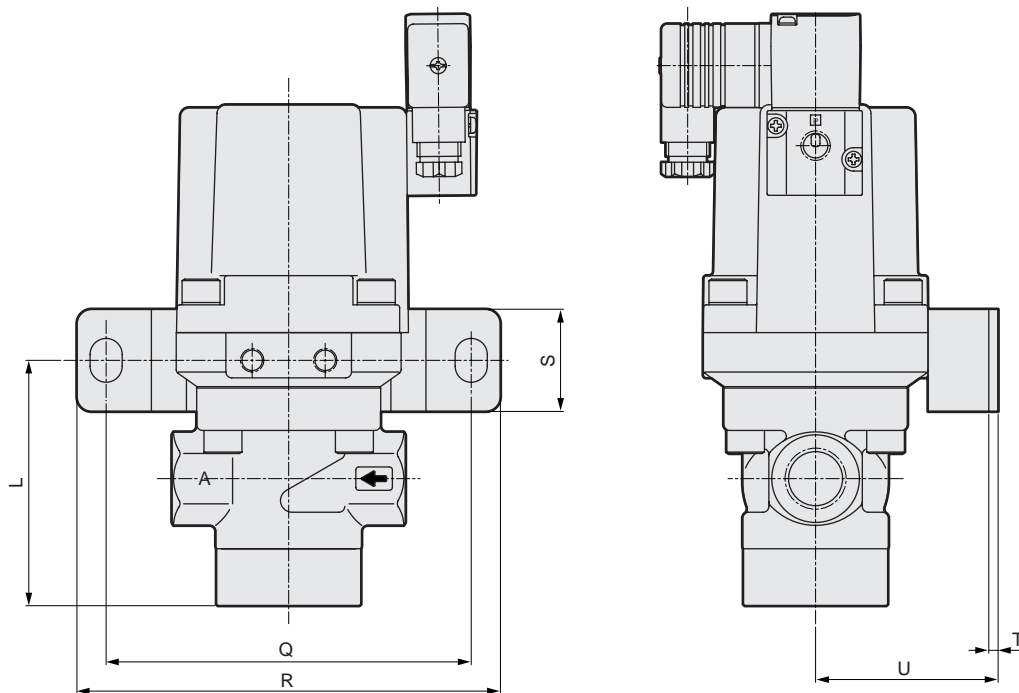
\*The drawing indicates an example when solenoid valve is installed.

Model no.	P	Q	R	S	T
CV*E2 (2)-15A-05/10	100	70	45	2.3	30
CV*E2 (2)-20A-05/10	110	75	50	3.2	40
CV*E2 (2)-25A-05/10	120	85	55	3.2	45
CV*E2 (2)-10A-16	110	75	50	3.2	40
CV*E2 (2)-15A-16	110	75	50	3.2	40
CV*E2 (2)-20A-16	120	85	55	3.2	45
CV*E2 (2)-10A-30	110	75	50	3.2	40
CV*E2 (2)-15A-30	120	85	55	3.2	45

Model no.	L	P	Q	R	S	T	U
CV*E2 (2)-10A-70	35.5	9 x 12	85	100	25	3.2	45

### ● 3 port valve

CVSE3-\* -35/70



\*The drawing indicates an example when solenoid valve is installed.

Model no.	L	P	Q	R	S	T	U
CV*E3-10A-35	56.5	9 x 12	85	100	25	3.2	40
CV*E3-10A-70	71	9 x 12	85	100	25	3.2	45

\*L dimensions of 3 port valves is for oval hole.



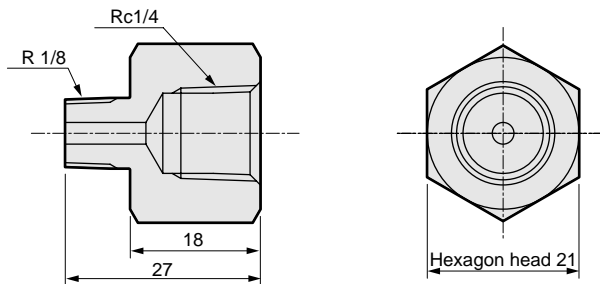
## Old/new replacement option Old/new pilot port size conversion connector

Conversion connectors are available to correspond with differences in the old and new pilot port sizes.

**Series:** CVSE2 (2), CVE2 (2)  
CVSE3, CVE3

**How to order**  
CVSE2-P-CONNECTOR-D4-162163

### Dimensions



### Introducing custom order parts

■ A pilot solenoid valve is installed on the valve top.

**Series:** CVSE2 (2), CVSE3

Consult with CKD, your nearest sales office, for "How to order: model no."

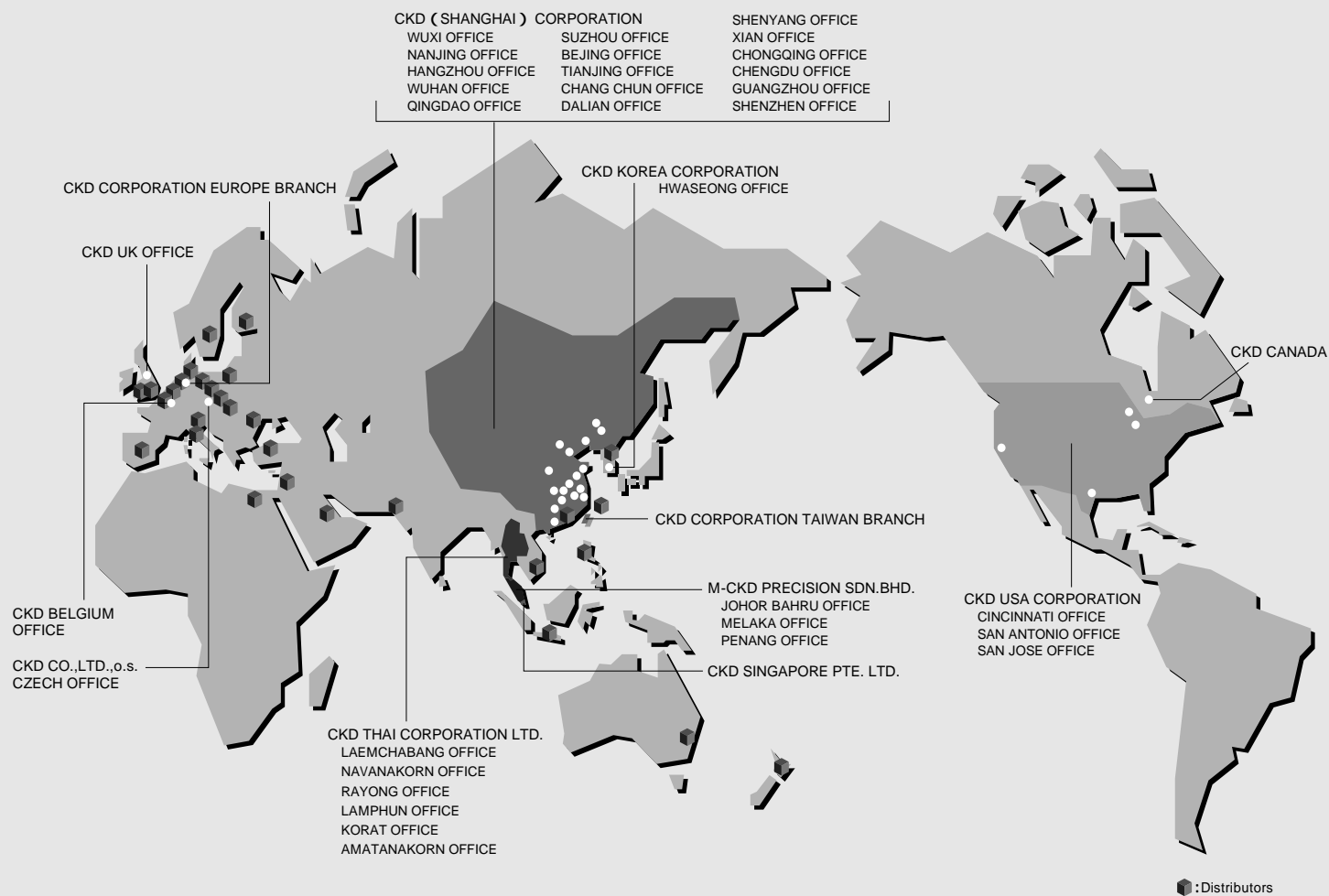
■ A valve open/close detection switch is installed on the coolant valve.

2 types are available in open and close signal detection switch of valve, both sides installation.

**Series:** CVE2 (2), CVSE2 (2)  
CVE3, CVSE3

Consult with CKD, your nearest sales office, for "How to order: model no."

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