

# CVE2/CVSE2 CVE3/CVSE3

(Coolant valve)

Air operated 2, 3 port valve (coolant control)

## Overview

This is a reliable 2, 3 port coolant valve with cylinder drive method.

This valve for tool machine cutting oil or coolant control incorporates a metal seal to prevent the entry of cutting chips, abrasive grains and foreign debris, and ensures highly reliable control.

The air operated type and solenoid valve mounted type are available. These can be used in precise machines.

## Features

### High corrosion resistant materials

Cast iron body, and stainless steel metal seal used in valve seat. NBR or FKM packing seal can be selected. Materials optimum for coolant are used.

### Certain operation

Certain operation is enabled with external pilot air operated cylinder.

### Water hammer prevented

(Only 2 port valve)

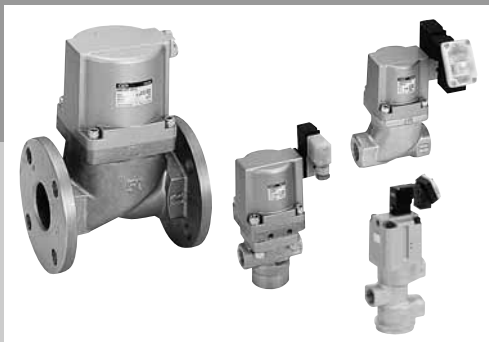
### Resistant to foreign matter

A metal seal is used.

### Usable in flammable environment.

(Air operated type)

■ For coolant



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⚠ Always read the precautions in the Introduction and page 702 before starting use.

HNB/G

USB/G

FAB/G

FGB/G

FVB

FWB/G

FHB

FLB

AB

AG

AP/  
AD

APK/  
ADK

For  
dry air

Explosion  
proof

HVB/  
HVL

SAB/  
SVB

NP/NAP/  
NVP

CHB/G

MXB/G

Other G.P.  
systems

PD/FAD/  
PJ

**CVE/  
CVSE**

CPE/  
CPD






Medical  
analysis

Custom  
order

Coolant valve  
Air operated 2, 3 port valve

# Series variation

## Air operated 2, 3 port valve (coolant control) (Coolant valve)

No. of port	Category		Model	Working pressure range MPa	Connection			
					Rc3/8	Rc1/2		
2 port		Low pressure	Air operated type	CVE2-***-05	0 to 0.5	●	●	
			Solenoid valve mounted type	CVSE2-***-05		●	●	
		Low pressure	Air operated type	CVE2-***-10	0 to 1.0	●	●	
			Solenoid valve mounted type	CVSE2-***-10		●	●	
		Medium pressure	Air operated type	CVE2-***-16	0 to 1.6	●	●	
			Solenoid valve mounted type	CVSE2-***-16		●	●	
		Medium pressure	Air operated type	CVE2-***-30	0 to 3.0	●	●	
			Solenoid valve mounted type	CVSE2-***-30		●	●	
		High pressure	Air operated type	CVE2-***-70	0 to 7.0	●	●	
			Solenoid valve mounted type	CVSE2-***-70		●	●	
3 port		Low pressure	Air operated type	CV3E-***-03	0 to 0.3			
			Solenoid valve mounted type	CVS3E-***-03				
		Medium pressure	Air operated type	CVE3-***-35	0 to 3.5	●	●	
			Solenoid valve mounted type	CVSE3-***-35		●	●	
		High pressure	Air operated type	CVE3-***-70	0 to 7.0	●	●	
			Solenoid valve mounted type	CVSE3-***-70		●	●	

	Port size										Page
	Rc3/4	Rc1	Rc1 1/4	32 flange	Rc1 1/2	40 flange	Rc2	50 flange	65 flange	80 flange	
	●	●	●	●	●	●	●	●	●	●	708
	●	●	●	●	●	●	●	●	●	●	708
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	●	●									726
	●	●									744
	●	●									744
	●	●	●		●		●				732
	●	●	●		●		●				732
	●	●									732
	●	●									732

HNB/G

USB/G

FAB/G

FGB/G

FVB

FWB/G

FHB

FLB

AB

AG

AP/  
ADAPK/  
ADKFor  
dry airExplosion  
proofHVB/  
HVLSAB/  
SVBNP/NAP/  
NVP

CHB/G

MXB/G

Other G.P.  
systemsPD/FAD/  
PJCVE/  
CVSECPE/  
CPDMedical  
analysisCustom  
orderCoolant valve  
Air operated 2, 3 port valve



## Safety precautions

Always read this section before starting use.

### Air operated 2, 3 port valve (coolant valve) (CVE/CVSE)

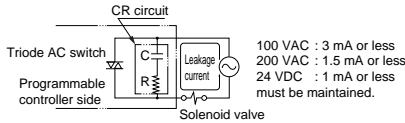
#### Design & Selection

##### 1. Safety designing

###### ⚠ CAUTION

###### ■ Leakage current from other fluid control components

When operating the solenoid valve with a programmable controller, etc., check that the output leakage current from the programmable controller is within the following specifications. Failure to observe this could lead to malfunctions.



##### 2. Working fluid

###### ⚠ WARNING

###### ■ Working fluid

The compatibility has not been evaluated with all coolants. Particularly, if coolant contains high levels of chlorine or sulfur, materials used at wetted parts could be adversely affected. Confirm the compatibility when making a selection. Non-corrosive fluids refer to fluids that do not affect or are not affected when they contact the valve's wetted part materials.

Wetted part materials: cast iron (nickel plating), stainless steel, nitrile rubber or fluoro rubber, and epoxy resin adhesive.

###### ■ External pilot air

(1) Drainage measures - Compressed air contains high levels of drainage (water, oxidized oil, tar, foreign matter) that can significantly reduce the reliability of pneumatic components. As measures against drain, 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 pre-lubricated, so no lubricator is required. However, once lubrication has been started, it must be continued so that the lubricant is not used up. For lubrication, use the turbine oil Class 1 ISO VG32 (#90) or equivalent.
- (3) Filter - Install a filter with a 5  $\mu$ m or less filter element.

##### 3. Working environment

###### ⚠ WARNING

■ CVSE Series cannot be used in an explosive gas atmosphere. When using in an explosive gas atmosphere, change to the CVE Series, and provide a separate explosion proof solenoid valve on the pilot air circuit.

■ If there are high levels of dust in the area, install a downward-facing silencer or elbow joint on the exhaust port so that dust does not enter.

■ When using in a place where water splashes on the valve, take appropriate measures to protect it.

##### 4. How to use

###### ⚠ CAUTION

###### ■ Pilot air pressure

Use pilot air pressure in accordance with the specifications.

#### Installation & Adjustment

##### 1. Piping

###### ⚠ CAUTION

■ Do not pipe using the solenoid valve section. There is a risk of damage. (For solenoid valve mounted type)

■ When piping the CVE or CVSE Series, pay attention to the supply ports on the unit and pilot operation sides.

Model no.	Unit side supply port	Pilot operation side supply port
CVE2	IN	X
CVE22		Y
CVSE2/CVSE22		P
CVE3		Y
CVSE3		P

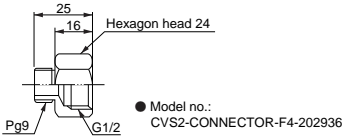
Note: Pipe the unit side supply port so that the arrow on the body matches the fluid flow direction. If supplied in reverse, internal components could be damaged when the valve operates.

### 2. Wiring

#### ⚠ CAUTION

##### ■ Wiring of solenoid valve mounted type

- (1) Refer to connections in pages 54 to 55 in the Introduction when wiring to a DIN terminal box or T type terminal box.
- (2) The size of the screw for the junction box outlets of the DIN terminal box can be changed from Pg9 to G1/2 using the optional connector below.



- (3) Coil direction can be changed 180°. To reverse the electrical connection direction, rotate only the coil. Do not lose internal parts when removing the coil.

## During Use & Maintenance

### 1. Maintenance & inspection

#### ⚠ CAUTION

##### ■ Pilot air pressure

Use pilot air pressure in accordance with the specifications.

##### ■ If water hammer occurs when a 3 port coolant valve for medium/high pressure operates, reduce the noise as follows.

- (1) Install a metering valve on the valve IN side, then adjust the metering valve to reach the required flow.  
If these countermeasures fail, contact CKD.

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

HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/ AD
APK/ ADK
For dry air
Explosion proof
HVB/ HVL
SAB/ SVB
NP/NAP/ NVP
CHB/G
MXB/G
Other G.P. systems
PD/FAD/ PJ
<b>CVE/ CVSE</b>
CPE/ CPD
Medical analysis
Custom order

Coolant valve  
Air operated 2, 3 port valve

@

## Assembling pilot solenoid valve (for solenoid valve mounted type)

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 can be removed.
- Reassembling  
Set the parts in the sequence of the O ring, plunger assembly, outer spring and coil assembly.  
Tighten the cross headed pan head machine screw with a torque of 0.7 to 1.1 N·m.

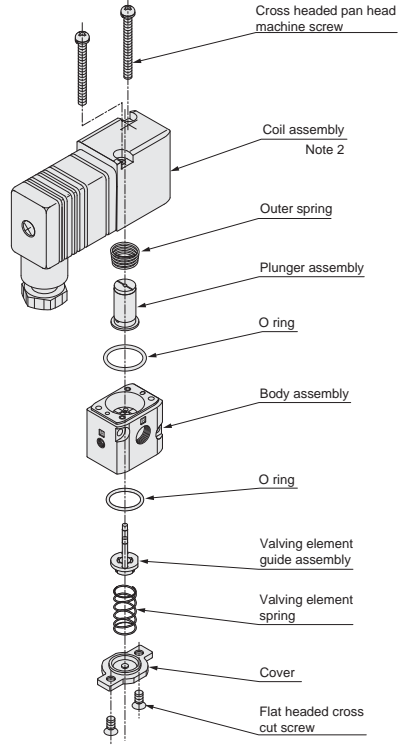
### (2) Cover side

- Disassembling  
Loosen the flat headed cross cut screw, and remove the cover.  
The valving element spring, valving element guide assembly and O ring can be removed.
- Reassembling  
Set the parts in the sequence of the O ring, valving element guide assembly, valving element spring and cover.  
Tighten the flat headed cross cut screw with a torque of 0.7 to 1.1 N·m.

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

Note 2: The coil assembly direction can be changed 180°. Loosen the cross headed pan head machine screw to change the direction.

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



## Model no. of pilot solenoid valve (actuator assembly kit) for CVSE

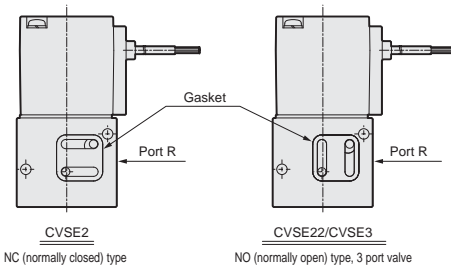
CVSE2-ACTUATOR-0  - **Rated voltage**

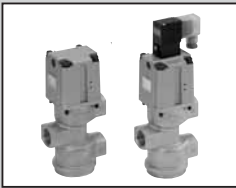
Note 1: Indicate the coil option symbol in field \*1.

Note 2: Consult with your CKD Sales Representative about the solenoid valve (actuator assembly kit) for CVS3E.

## Gasket direction (for solenoid valve mounted type)

The gasket has an orientation. Check the orientation when reassembling.





Air operated 3 port valve for low pressure (coolant control)  
(coolant valve)

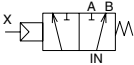
# CV3E/CVS3E Series

- Port size: Rc3/4, Rc1

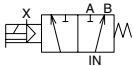


## JIS symbol

- Air operated type (CV3E)



- Solenoid valve mounted type (CVS3E)



## Common specifications

Item	CV3E/CVS3E	
	20A	25A
Actuation	Directional type (COM port pressurization only)	
Working fluid	Coolant	
Fluid viscosity mm <sup>2</sup> /s	500 or less	
Working pressure range MPa	0 to 0.3	
Withstanding pressure (water) MPa	2.0	
Fluid temperature °C	-10 to 60	
Ambient temperature °C	-10 to 60	
Valve seat leakage cm <sup>3</sup> /min.	20 or less	
Orifice mm	22.8 or equivalent	29.3 or equivalent
Cv flow factor	12.5	20
Port size	Rc3/4	Rc1
Weight kg	2.2 (2.1) *1	3.9 (3.8) *1
Pilot air pressure MPa	0.25 to 0.5	
Pilot port size	Rc1/4	
Mounting attitude	Free	

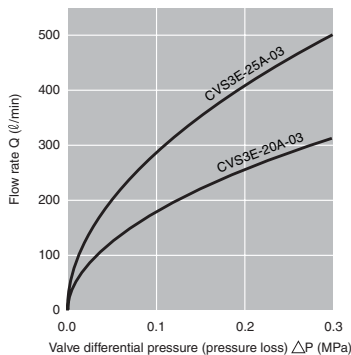
\*1: Values in ( ) in the Weight row are for the air operated type (CV3E).

## Electric specifications (solenoid valve mounted type common specifications)

Rated voltage	100 VAC (50/60 Hz), 110 VAC (60 Hz); 200 VAC (50/60 Hz), 220 VAC (60 Hz); 24 VDC	
Apparent power VA	Holding	3.9 (50 Hz), 3.1 (60 Hz)
	Starting	9.2 (50 Hz), 7.9 (60 Hz)
Power consumption W	AC	2.0 (50 Hz), 1.7 (60 Hz)
	DC	2.0
Heat proof class	B	
Protective structure (IEC standards 529)	DIN terminal box (Pg9)	IPX5
	T type terminal box (G1/2)	IPX6

\*2: Allowable voltage range must be within ±10% of the rated voltage.

## Flow characteristics



Note: Calculated assuming a specific gravity of 1.





# CVE/CVSE Series

## Electronic Catalog file list

### Air operated 2, 3 port valve (coolant control) (coolant valve)

Air operated 2 port valve for low pressure (pages 714 to 716)

Electronic Catalog file list is applied to "CAD DATA 2006".

Model no.	DXF		MICRO CADAM
	Folder name	Filename	Filename (GROUP: CAD, USER: STDLIB)
CVE2/22-10A-5/10	CVE2	cve2_22_10a_5_10	CKD-CVE2/22-10A-5/10
CVE2/22-15A-5/10		cve2_22_15a_5_10	CKD-CVE2/22-15A-5/10
CVE2/22-20A-5/10		cve2_22_20a_5_10	CKD-CVE2/22-20A-5/10
CVE2/22-25A-5/10		cve2_22_25a_5_10	CKD-CVE2/22-25A-5/10
CVE2/22-32A-5/10		cve2_22_32a_5_10	CKD-CVE2/22-32A-5/10
CVE2/22-32F-5/10		cve2_22_32f_5_10	CKD-CVE2/22-32F-5/10
CVE2/22-40A-5/10		cve2_22_40a_5_10	CKD-CVE2/22-40A-5/10
CVE2/22-40F-5/10		cve2_22_40f_5_10	CKD-CVE2/22-40F-5/10
CVE2/22-50A-5/10		cve2_22_50a_5_10	CKD-CVE2/22-50A-5/10
CVE2/22-50F-5/10		cve2_22_50f_5_10	CKD-CVE2/22-50F-5/10
CVE2/22-65F-5/10		cve2_22_65f_5_10	CKD-CVE2/22-65F-5/10
CVE2/22-80F-5/10		cve2_22_80f_5_10	CKD-CVE2/22-80F-5/10
Option and accessory (mounting plate)		cve2_f	CKD-CVE2-F

2 port valve for low pressure with solenoid valve (pages 712, 713, 716)

Electronic Catalog file list is applied to "CAD DATA 2006".

Model no.	DXF		MICRO CADAM
	Folder name	Filename	Filename (GROUP: CAD, USER: STDLIB)
CVSE2/22-10A-5/10	CVSE2	cvse2_22_10a_5_10	CKD-CVSE2/22-10A-5/10
CVSE2/22-15A-5/10		cvse2_22_15a_5_10	CKD-CVSE2/22-15A-5/10
CVSE2/22-20A-5/10		cvse2_22_20a_5_10	CKD-CVSE2/22-20A-5/10
CVSE2/22-25A-5/10		cvse2_22_25a_5_10	CKD-CVSE2/22-25A-5/10
CVSE2/22-32A-5/10		cvse2_22_32a_5_10	CKD-CVSE2/22-32A-5/10
CVSE2/22-32F-5/10		cvse2_22_32f_5_10	CKD-CVSE2/22-32F-5/10
CVSE2/22-40A-5/10		cvse2_22_40a_5_10	CKD-CVSE2/22-40A-5/10
CVSE2/22-40F-5/10		cvse2_22_40f_5_10	CKD-CVSE2/22-40F-5/10
CVSE2/22-50A-5/10		cvse2_22_50a_5_10	CKD-CVSE2/22-50A-5/10
CVSE2/22-50F-5/10		cvse2_22_50f_5_10	CKD-CVSE2/22-50F-5/10
CVSE2/22-65F-5/10		cvse2_22_65f_5_10	CKD-CVSE2/22-65F-5/10
CVSE2/22-80F-5/10		cvse2_22_80f_5_10	CKD-CVSE2/22-80F-5/10
Option and accessory (T type terminal box, mounting plate)		cvse2_f	CKD-CVSE2-F

**Air operated 3 port valve (coolant control) (coolant valve)**

3 port valve for low pressure (page 745)

Electronic Catalog file list is applied to "CAD DATA 2006".

Model no.	DXF		MICRO CADAM
	Folder name	Filename	Filename (GROUP: CAD, USER: STDLIB)
CV3E-20A-3	CV3E	cv3e_20a_3	CKD-CV3E-20A-3
CV3E-25A-3		cv3e_25a_3	CKD-CV3E-25A-3
CVS3E-20A-3		cvs3e_20a_3	CKD-CVS3E-20A-3
CVS3E-25A-3		cvs3e_25a_3	CKD-CVS3E-25A-3
Option and accessory (T type terminal box, mounting plate)		cv_e_f	CKD-CV*E-F
Accessory (T type terminal box, T type terminal box + light)		cvs2_f	CKD-CVS2-F

HNB/G

USB/G

FAB/G

FGB/G

FVB

FWB/G

FHB

FLB

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For  
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Coolant valve  
Air operated 2, 3 port valve