Fluid Control Components: Warnings and Cautions

Be sure to read this section before use.

Precautions for each model series: product-specific cautions

Air operated 2-port valve (cylinder valve) SAB/SVB/NAB

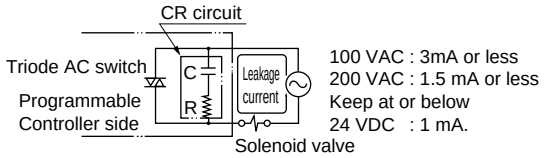
Design/selection

1. Safety design

⚠ 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.



100 VAC : 3mA or less
200 VAC : 1.5 mA or less
Keep at or below
24 VDC : 1 mA.

2. Working fluid

⚠ WARNING

■ Working fluids

(1) Do not use any fluid other than the working fluids specified in the catalog.
(2) Before starting use, check the compatibility between the product and working fluid with the working fluid check list (Intro Page 39).
(3) The durability of the rod packing (MY packing) decreases sharply if the working fluid is of poor quality and/or contains powder, sludge or foreign matter.
If rod packing sealing is poor, working fluid could leak into the cylinder and flow back into pilot air piping, damaging the devices in the air circuit.
Perform periodic maintenance or take other appropriate measures.

■ Grease for special fluids

For cylinder valve, grease is applied to the piston rod sealant sections. When using special fluids, specify the type of grease.

[Example] Oxygen : fluorine grease
Medium vacuum : silicone grease
Fluids for foods : Vaseline
Dry air for painting : Vaseline

■ Fluid temperature

Be sure to use the coolant check valve within the specified fluid temperature range.

⚠ CAUTION

■ External pilot air

(1) Draining: Compressed air contains a large amount of drainage (water, oil oxides, tar, foreign matter). This is a factor that significantly reduces the reliability of the pneumatic components. For drainage measures, 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 lubrication is required. However, once lubrication has been started, it must be continued so that the lubricant does not run out. Use turbine oil Class 1 ISO VG32 (#90) or equivalent for lubrication.
(3) Filter - Install a filter with a 5 μm or less filter element.

3. Working environment

⚠ WARNING

■ SVB Series cannot be used in an explosive gas atmosphere. When using in an explosive gas atmosphere, change to the SAB 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 fitting on the exhaust port so that dust does not enter.

■ Take appropriate safeguards when using this product in places where it can be exposed to dripping water.

■ Make sure that there is no torsion, tension or moment load applied to the fitting when using NAB or GNAB models with fittings.

Mounting, installation and adjustment

1. Piping

⚠ CAUTION

■ Make sure not to use the wrong supply port when connecting the pipes to the product.

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

■ If C18 and L18 are selected as pilot port size for NAB and GNAB, use the fiber tube for push-in fitting for pilot air piping.

■ When piping the GNAB Series, check the supply port on the pilot operation side.

Model No.	Pilot operation side supply port
GNAB1/GNAB1V	X
GNAB2/GNAB2V	Y
GNAB3/GNAB3V	X and Y

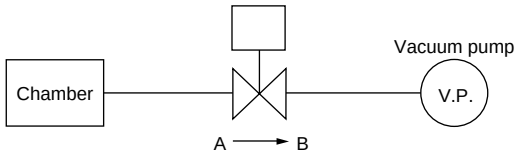
■ When piping the NAB/SAB/SVB Series, check the supply ports on the body side and pilot operation side.

Model No.	Body side supply port	Pilot operation side supply port
NAB1-8/10	A or B *1) *2)	X
NAB2-8/10	A or B *1) *2)	Y
NAB3-8/10	A or B *1) *2)	X and Y
NAB1V-8/10	A *3)	X
NAB2V-8/10	A *3)	Y
NAB3V-8/10	A *3)	X and Y
SAB1W	A	X
SAB2W	A	Y
SAB3W	A	X and Y
SAB1A	B	X
SAB2A	A	Y
SAB3A	A or B *1)	X and Y
SAB1V	A *3)	X
SAB2V	A *3)	Y
SAB3V	A *3)	X and Y
SAB1S	B	X
SAB2S	A	Y
SAB3S	A or B *1) *2)	X and Y
SVB1W	A	P
SVB2W	A	P
SVB1A	B	P
SVB2A	A	P
SVB1V	A *3)	P
SVB2V	A *3)	P
SVB1S	B	P
SVB2S	A	P

*1) When both ports A and B are pressurized, connect the normally pressurized side to port A.
If port B is connected to the normally pressurized side, the durability could degrade further than when port A is connected.

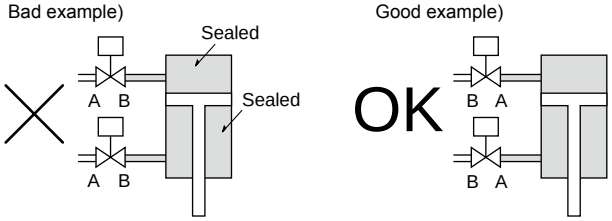
*2) If the working fluid is an incompressible fluid, e.g. water, connect the normally pressurized side to port A in order to prevent water hammer.

*3) For SAB$\frac{1}{3}$V, SVB$\frac{1}{2}$V, and NAB$\frac{1}{3}$ body-side supply ports, connect the chamber (vacuum holding side) to port A.

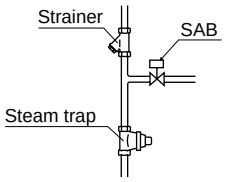


When using for vacuum burst, etc., set the pressurized port to port A.

■ When operating a hydraulic cylinder with a cylinder valve for water, if valve port B is piped to the cylinder, pressure in the port and piping rises and excessive pressure is applied on the valve body, leading to damage. In this case, pipe the valve port A to the cylinder side.



■ When using the valve for steam, external leakage could occur depending on fluid properties. Install a steam trap by tilting piping, etc., and remove drainage to prevent the inside of the pipe from rusting.

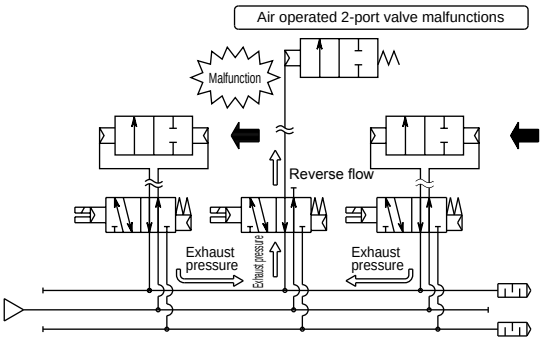


■ Refer to the table below for tightening torque of the pilot air piping.

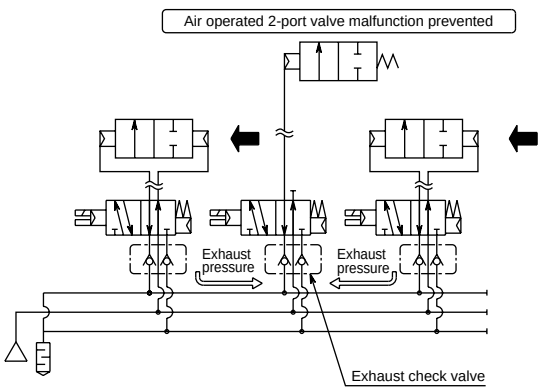
Piping nominal diameter	Recommended piping tightening torque (Nm)
Rc1/8	7 to 9

■ If a manifold is used on the SAB/NAB/GNAB Series operation valve, the exhaust pressure could be drawn in from other valves, which causes malfunctions such as a momentary opening of the valve. When using a manifold on an operation valve, use a valve with a built-in “exhaust check valve”. Similar problems could occur if exhaust is led in from the SVB Series exhaust (R) port, so when piping the exhaust (R) port, do not connect with other exhaust circuits.
A check valve is built into the CKD pilot operated 3, 5-port valve 4G Series.

Example of pneumatic pressure system that may malfunction



4G series pneumatic pressure system



Mounting, installation and adjustment

2. Wiring

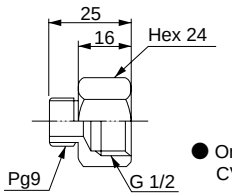
⚠ CAUTION

■ When using an explosion-proof solenoid valve, follow the Recommended Practices for Explosion-protected Electrical Installations in General Industries when wiring.

■ Wiring for models with solenoid valve

(1) Refer to Connections on Intro Pages 65 and 66 when wiring to a DIN terminal box or T type terminal box.

(2) The thread size for the junction box outlets of the DIN terminal box can be changed from Pg9 to G1/2 using the optional connector below.



● Order Model No.:
CVS2-CONNECTOR-F4-202936

(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.

Use/maintenance

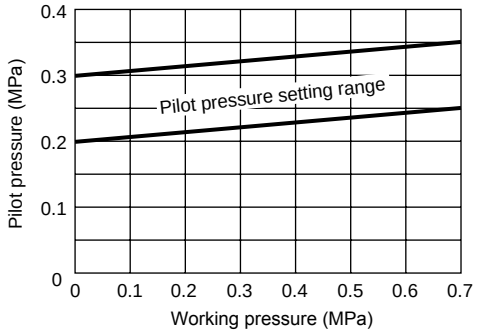
1. Maintenance and inspection

⚠ CAUTION

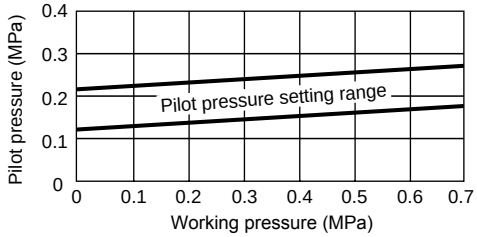
■ Pilot pressure

Set pilot air pressure within the specified range.
Set the pilot pressure for the NAB/GNAB/SAB/SVB Series NO and double acting as shown in the graph below. If the product is used with a pressure below the range shown in the graph, sealant failure may occur; if the product is used with a pressure above the range shown in the graph, durability may be compromised.
The NC is recommended when the pilot pressure cannot be controlled.

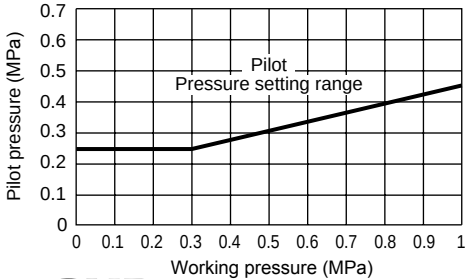
● NAB$^{2}_{2V}$ Series/GNAB$^{2}_{2V}$ Series



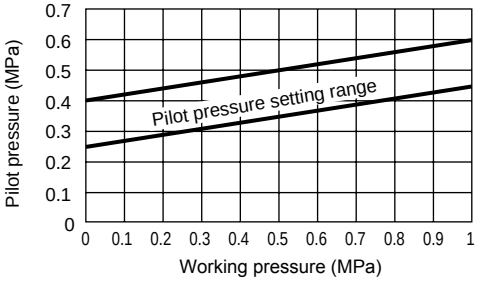
● NAB$^{3}_{3V}$ Series/GNAB$^{3}_{3V}$ Series



● SAB$^{2}_{3}{}^{W}_{A}{}_{V}$Series/SVB2$^{W}_{A}{}_{V}$Series



● SAB$^{2}_{3}$S Series/SVB2S Series



2. Disassembly/assembly

⚠ WARNING

■ A spring is used in the cylinder cover. When disassembling this type, be careful as the spring could pop out and cause injuries.
The NC has a snap ring to prevent the spring from popping out. Do not remove the snap ring.

■ When loosening the lock nut (*1) that fixes the piston rod and the main valving element, take the following precautions in order to prevent the piston rod from seizing:

*1 In the case of 8A and 10A, the lock nut that fixes the piston rod and piston

Remove any dirt and foreign matter from the thread part.

(1) Apply lubricant to the gap between the nut and the rod

(2) thread part.
When reusing the main valving element, make sure that no lubricant adheres thereto.
Fix the piston rod, attach a wrench to the lock nut, and

(3) carefully and gently turn it.
If the external thread part of the piston rod is damaged, it cannot be reused. In this case, replace the kit including the piston rod.

■ Pilot solenoid valve (with solenoid valve) assembly procedure

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

(1) Coil side

· Disassembly

Loosen the cross-recessed pan head machine screw and lift up the coil assembly. Take out the outer spring, plunger assembly, and O-ring.

· Reassembly

Assemble the parts in the sequence of O-ring, plunger assembly, outer spring and coil assembly. Tighten the cross-recessed pan machine screws with a torque of 0.7 to 1.1 N·m.

(2) Cover side

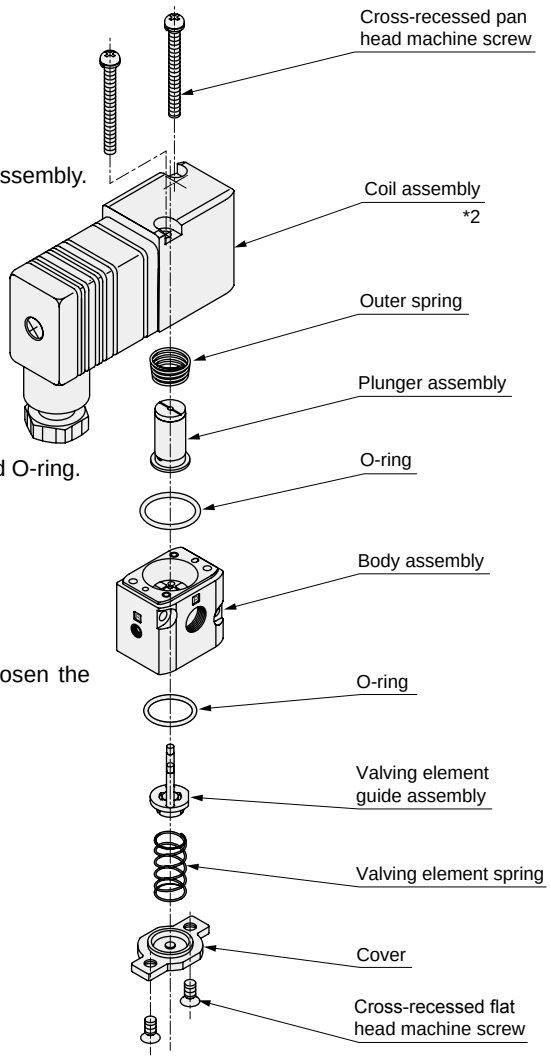
· Disassembly

Loosen the cross-recessed flat head screw to remove the cover. Take out the valving element spring, valving element guide assembly, and O-ring.

· Reassembly

Set the parts in the sequence of O-ring, valving element guide assembly, valving element spring and cover. Tighten the flat-head cross-recessed screw with a torque of 0.7 to 1.1 N·m.

*1 : Be careful not to lose components such as springs during disassembly.
*2 : The orientation of the coil assembly can be changed 180 degrees. Loosen the cross-recessed pan head machine screw to adjust the orientation.
*3 : Plunger is coated with turbine oil for lubrication.



■ For SVB*W/SVB*A/SVB*V

Model No. of pilot solenoid valve (actuator assembly kit)

CVSE2-ACTUATOR-0 *1 □□ - Rated voltage

Specify the coil option code in the *1 field.

■ Model No. of pilot solenoid valve (actuator assembly kit) for SVB*S

SVB-ACTUATOR-C *1 □□ - Rated voltage

Specify the coil option code in the *1 field.

■ Orientation of gasket (models with solenoid valve)

The gasket has an orientation. Make sure to check the orientation when re-assembling.