CKD

SM－50539－A

INSTRUCTION MANUAL

PULSE JET VALVE

PD3 SERIES

PDV3 SERIES

- Please read this instruction manual carefully before using this product, particularly the section describing safety.
- Retain this instruction manual with the product for further consultation whenever necessary.

Ver.7

CKD Corporation

Safety precautions

When designing and manufacturing a device using CKD products, the manufacturer is obligated to manufacture a safe product by confirming safety of the system comprising the following items:

■ Device mechanism
■ Pneumatic or water control circuit
■ Electric control that controls the above

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 someone having sufficient knowledge and experience.**

2. **Use this product within its specifications.**
   Consult with CKD for details when using the product beyond the unique specification range, outdoors, or in the following conditions or environment: Additionally, the product must not be modified or machined.
   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 B 8370 (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.

Precautions with regard to guarantee

● Guarantee period

The guarantee period of our product shall be one (1) year after it is delivered to the place specified by the customer.

● Guarantee coverage

If any falure for which CKD CORPORATION is recognized to be responsible occurs within the above warranty period, a substitute or necessary replacement parts shall be provided free of charge, or the product shall be repaired free of chargeat the plant of CKD CORPORATION.

However, the guarantee excludes following cases:

① Defects resulting from operation under conditions beyond those stated in the catalogue or specifications.
② Failure resulting from malfunction of the equipment and/or machine manufactured by other companies.
③ Failure resulting from wrong use of the product.
④ Failure resulting from modification or repairing that CKD CORPORATION is not involved in.
⑤ Failure resulting from causes that could not be foreseen by the technology available at the time of delivery.
⑥ Failure resulting from disaster that CKD is not responsible of.

Guarantee stated here covers only the delivered products. Any other damage resulting from failure of the delivered products is not covered by this guarantee.

● Confirmation of product compatibility

Our customer shall be responsible of confirming compatibility of our product used in our customer's system, machinery or device.

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1. Unpacking

⚠CAUTION	Do not remove the packing bag until just before piping work. Otherwise, foreign matter enters from the port and cause malfunction or bad operation.

(1) Check that the model No. shown on the face plate of the product agrees with that you ordered.
(2) Check that the product has no external damages.
(3) When storing the product, attach a sealing plug to prevent the intrusion of foreign matter to the valve. Remove the sealing plug when piping the valve.

2. Installation

⚠WARNING	Contact CKD if the product is to be used beyond specifications, or in special applications.

2.1 Conditions for installation

⚠WARNING	a) Prevent dust from entering the valve. For use in a dusty atmosphere, prevent dust intruding from the pilot air exhaust port by the following method: ・ Attach a silencer to the exhaust port ・ Attach an elbow connector and face it down. b) Do not use the product under corrosive gas atmosphere, or atmosphere that degrades product material. c) Vibration / shock ・ Please use it in a place without vibration and impact. d) Avoid humid environments, since condensation may occur with change in temperature.

(1) Outdoor use
Air operated type can be used outdoors. However, as water may accumulate in the pilot exhaust port part, there is a possibility of malfunction, so install it so that the pilot exhaust port is on the bottom side, or install it in a cover or a panel to protect it. Solenoid valve mounted type cannot be used outdoors. Installing the valves in a cover or panel should protect them.

(2) Use in a cold district
When using the valve in a cold district, an proper provision is required to prevent freezing of the valve.

(3) Corrosive environment
Please do not use in an atmosphere with corrosive gas or explosive gas around the fluid and surroundings.
If the treatment gas of the dust collector contains corrosive gas, care should be taken that the corrosive gas will not flow into valves.
Moreover, seal material cannot even use product of urethane under the environment that a small amount of corrosive fluid enters.

(4) The valve cannot be used in a place where it will be exposed to the vibration larger than 42.2m/s^2.

2.2 Installation method

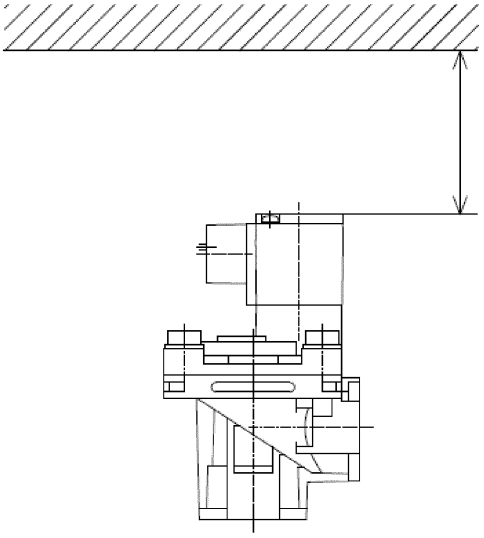
2.2.1 Installation

⚠CAUTION	a) Always thoroughly read the Instruction Manual before installing this product. b) After installing, check for leak from the pipe and make sure that the product is correctly installed.

(1) Although the installation posture is free, we recommend that the drain does not accumulate in the OUT port.

2.2.2 Space for maintenance

・An adequate space shall be provided around the valve to assure the safety during the maintenace/troubleshooting work.



Secure the space for the tool removing loincloth as shown in Figure 2－1 above the valve. Secure space about other space to do the installation putting up and detaching the valve.

(Figure 2－1)

2.3 Piping method

⚠CAUTION	a) Fix the product when tightening or reinstalling the piping. b) Fix and support the pipes so that the weight and vibration of the pipes are not directly applied on the valves. c) Torque required to tightening pipes are shown in Table 2-1 for reference.

(1) Cleaning the pipes

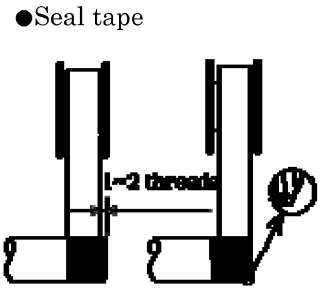
・Before piping the valve, check that the pipes are free from foreign matter, cutting chips and burrs. If the pipes need to clean, remove the foreign matter, cutting chips and/or burrs inside the pipes using compressed air with a pressure of 0.3 MPa or more.

(2) Removal of foreign matter

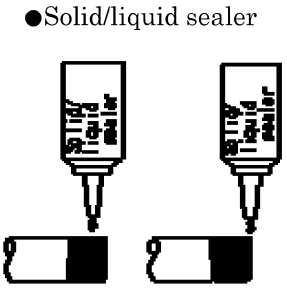
・Dust and foreign matter within the fluid causes the valve to malfunction and leak. Install a filter 5 μ m or finer at the primary side of the valve.

Sealer

・The sealer shall be used with great care to prevent it from entering the pipes or leaking out. When taping a threaded portion, one or two threads at the end of the portion shall be exposed (see Figure 2-2). When using liquid sealer, take care not to apply too much sealer. Similarly to the case of taping, one or two threads at the end of the threaded portion shall be exposed (see Figure 2-3). Do not apply to the female screw of the apparatus.



(Figure 2-2)



(Figure 2-3)

(3) Torques required for tightening pipes

・The torques required for tightening pipes are shown in Table 2-1 for reference.

Table 2-1. Recommended values of the torques for tightening pipes

Nominal size of pipe	Torque for tightening (recommended)
Rc 1/8	7 ～ 9 [N・m]
Rc 3/4	31 ～ 33 [N・m]
Rc 1	36 ～ 38 [N・m]
Rc 1½	48 ～ 50 [N・m]

(4) Lubricated or non-lubricated operation

・The valve dose not require lubrication. Therefore, no lubricator is needed.

(5) Minimum differential pressure

・ Operation becomes unstable when the minimum working differential pressure in the table below can not be secured at opening and closing.

Table 2-2.

Minimum differential pressure
0.1 MPa

If the sectional area of the pipe at the fluid supply port is too small, the valve operation may become instable due to the insufficient differential pressure. For the fluid supply port, use a pipe of the size that fits the inside diameter of the connector port of the valve. Moreover, avoid piping with the nipple with a small inside diameter.

Please select capacity of the header tank enough so that the header tank pressure should not fall on the lowest operation differential pressure in the valve actuation.

(6) Air supply quantity

・Secure about is two to three times the consumed quantity of air for the supply capacity in the air source.

(7) Capacity of header tank

・If header tank is small, the tank pressure may become lower during valve operation causing vibration. The same or more capacity than those in Table 2-2 is recommended.

Table 2－2. Lowest capacity of header tank “recommendation”

Energizing time		100ms		200ms	
Tank pressure		0.3 to 0.5MPa	0.5 to 0.7MPa	0.3 to 0.5MPa	0.5 to 0.7MPa
Caliber	20A	20 Liter	30 Liter	40 Liter	60 Liter
	25A	30 Liter	40 Liter	60 Liter	80 Liter
	40A	50 Liter	80 Liter	100 Liter	160 Liter

(8) Piping the valve for control (Air operated type)

・Connect the IN port of the solenoid vaive for control (2 port solenoid valve) to the pilot operating port of the pilot operated type air operated valve, and leave the OUT port of the solenoid valve for control open to the atmosphere (install a silencer if needed). Do not supply air from an external sonrce to a pilot operating port.

The response of the pilot operated type air oprated valve changes based on the effective cross-sectional area of the solenoid valve for control and the inner diameter and length of tubing connecting the pilot operationg port.

The effective cross-sectional area of the solenoid valve for control should be 5.8 to 15 mm^2 (equivalent to an orifice diameter of φ3 to 5). Tubing should have an inner diameter of 4 mm or 6 mm and be 1 m long or less.

2.4 Wiring method (Solenoid valve mounted type)

⚠ CAUTION

a) Confirm the voltage and the alternating or direct current type.

b) Leakage current from other fluid control components.

・When operating the solenoid valve using a programmable controller or equivalent, ensure that the leaked current from the output line of the programmable controller will not exceed the following level.

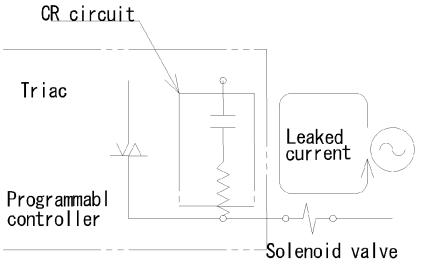
The leaked current may lead to a malfunction. (Figure 2-4)

Rated voltage: 6 mA or less for the rated voltage AC100V

Rated voltage: 3 mA or less for the rated voltage AC200V

Rated voltage: 1 mA or less for the rated voltage DC24V

Rated voltage: 2 mA or less for the rated voltage DC12V



(Figure 2-4)

(1) Polarity of the solenoid valve

・There is not a polarity of (+) (-) when the voltage rating is DC voltage in the solenoid valve either. The lamp addition is also similar.

(2) Continuous power supply

・Long continuous electric current will raise surface temperature of coils of solenoid valves. Be careful not to touch directly for rear of a burn.

(3) Surge in the electric circuit

In case your electric circuits hesitate the surge of solenoid, put a surge-absorber in parallel to the solenoid.

(4) Maintenance of electric installation

Use the breaker such as fuses for the control circuit side to maintain the electric installation.

(5) The voltage variation shall be within ±10% of the rated voltage.

2.4.1 Electric connection of grommet lead wire (Coil option 2C)

(1) The lead shall be connected using a crimped terminal or sleeve specially designed for copper leads.

(2) If there is a possibility of leaked electricity at the electric connection, it shall be adequately insulated.

2.4.2 Electric connection of DIN terminal box (Coil option 2E, 2G, 2H)

⚠ CAUTION

a) Take care not to connect the terminal box in a wrong manner.
The terminals with markings ① and ② on the terminal block are for conductors.
The terminal with a marking GND on the terminal block is for grounding.

(1) For the cabtyre cord, used.

Code outside diameter : φ6 to φ10

Nominal sectional area : 0.75mm²

(2) If there is a possibility of leaked electricity at the electric connection, it shall be adequately insulated.

(3) Pass a cap, washer, gasket and casing through the cabtyre cord.

(4) Pass a crimped terminal specially designed for copper leads through the lead of the cabtyre cord and crimp the terminal.

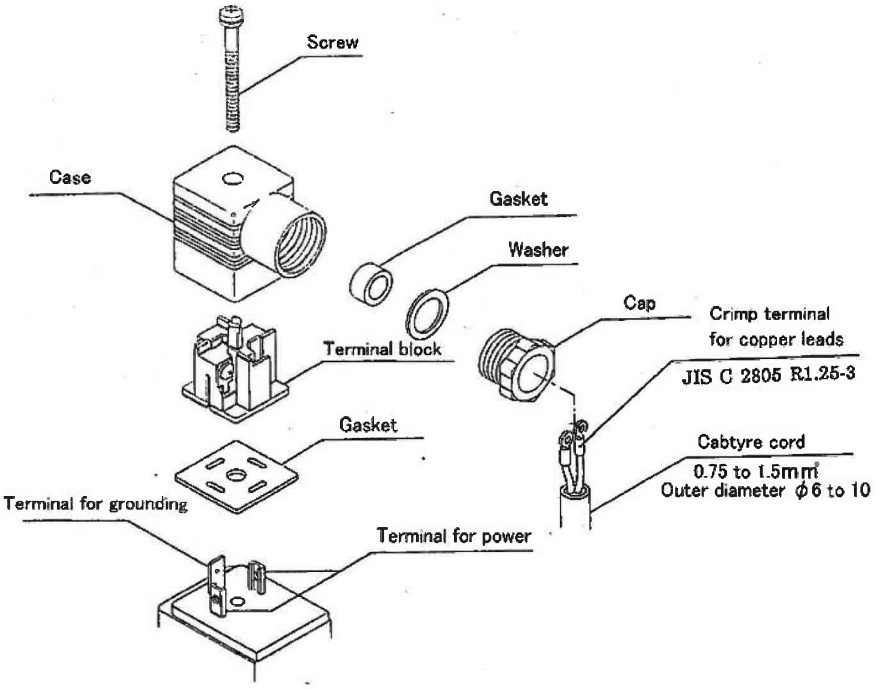
(5) Fix the crimped terminal on the terminal block.

(6) Enclose the terminal block with the casing.

(7) Tighten the cap to fix the cabtyre cord so that it will not come off.

(8) Insert the DIN terminal box to the coil with the grounding terminal of the coil aligned with that on the terminal block. Tighten fitting screw in the terminal box with 0.5N・m.

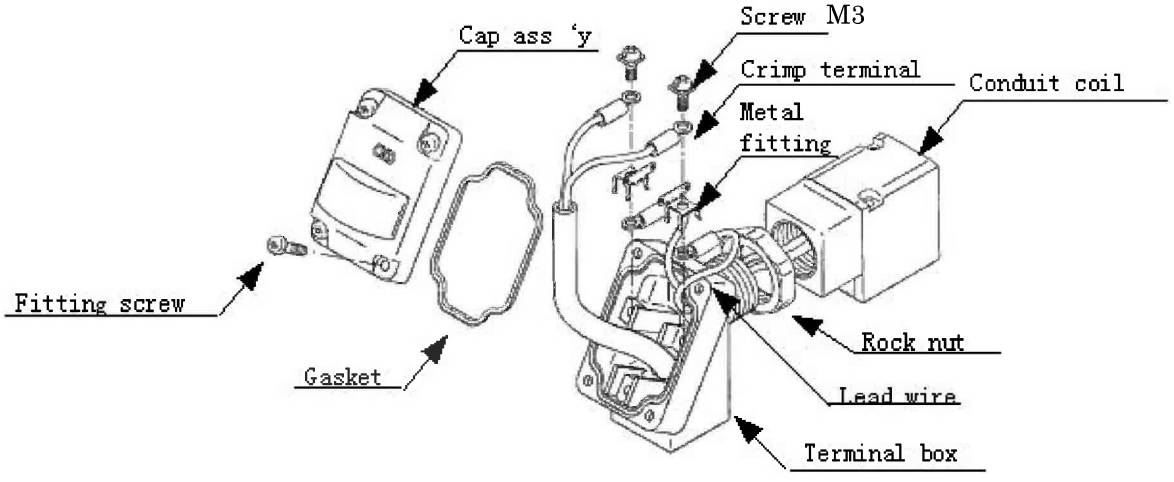
(9) To change for the code taking out, the terminal box is put out from the case, it rotates by 180°, and it pushes it into the case.



2.4.2 Electric connection of T type terminal box

This subsection applies to the ones with T type terminal box.

(1) The cabtyre code uses the one of 0.75mm² in an official sectional area.
(2) Pass the cabtiye cord to the terminal box.
(3) Pass a crimped terminal specially designed for copper leads through the lead of the cabtyre cord and crimp the terminal. The size of the stop screw of the terminal stand in the terminal box is M3.
(4) Tighten the free terminal screw to fix the crimped terminal.
(5) Install the gasket and cap assembly and fitting screw is tightened with 0.5N·m.



・Changing the orientation of the T type terminal box

Use the following steps to change the orientation of the T type terminal block from the default state.

(1) Hold the width across flats (25 width) of the T type terminal box with a tool (adjustable spanner, spanner, etc.), and loosen it by turning counterclockwise.
(2) Loosen the lock nut.
(3) Rotate the T type terminal box clockwise to approx. 15°before the required position.
(4) Tighten the lock nut to the coil side by hand until it is lightly tightened.
(5) Hold the width across flats of the T type terminal box with a tool, and rotate it (approx 15°) to tighten it to the required poison.

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

3. Pre-operation (post-installation) check

3.1 Appearance check

⚠WARNING	a) Shut off the fluid flow. (The main cock is shut.) b) Exhaust the fluid remaining in the valve(in header tank). c) Turn off the power supply.

(1) Push the valve with hand to check that the valve has been fixed to the pipe.
(2) Check that the screw parts securing the valve are not loose.

3.2 Check for leakage

(1) Compress the fluid to check for leakage at pipe joints.
It is recommended to check for leakage by supplying compressed air having a pressure of 0.3 to 0.5MPa with soapy water applied to the joints. Air bubbles will be found If a joint is faulty.

3.3 Electrical check (Solenoid valve mounted type)

⚠WARNING	a) Turn off the power supply. Do not touch the wiring connection sections (bare live part) when energized. There is a risk of electric shock.

(1) Check the dielectric resistance.
Measure the dielectric resistance using a 1000V DC mega ohmmeter between a metallic part such as screw fixing the valve and the active part of the lead. The measured dielectric resistance shall be 100M ohms or more.
(2) Check the supply voltage.
The voltage fluctuation shall be within ±10% of the rated voltage.
Usage in a out range of allowable voltage cause a misoperation or coil burning.

4. Instructions for proper use

4.1 Precautions at use

⚠WARNING	a) Do not use this product for an emergency shut off valve. ・The valves listed in this catalog are not designed as valves to ensure safety such as emergency shut off valves. When using in this type of system, always take separate measures that will absolutely ensure safety. b) Take measures to prevent harm to operators or objects if this product fails. c) Don't touch a hand and a body in the electric wiring part while it is energized. There is fear of the electric shock. d) Working fluids ・ Do not use this product for fluids other than the working fluids listed in the specifications. ・ Before starting use, confirm the compatibility of the product and applicable fluid with the catalog Applicable Fluid Check List. ・ As wearing of internal parts during valve operation causes abrasion powder, it may flow to the secondary side of valve, so please be careful.

⚠CAUTION	a) Use it within the range of the specification pressure. b) Please observe frequency of operation strictly. Durability will be shortened if exceeding specified value. c) Install a silencer at the exhaust port of the valve to reduce the noise to be given to the personnel working around the machine. d) If there is a possibility that the operator may trip on a power cable, it may lead to an accident. Protect the power cable using a conduit or equivalent.

(1) Do not use the product as footing, or place heavy loads on the product.
(2) The working pressure range and temperature range of the fluid and ambient temperature range shall be satisfied.
(3) Do not use in an atmosphere with corrosive gas or explosive gas around the fluid and surroundings.
(4) Do not lubricate the air supplied to the vale with a lubricator, etc.
(5) If operation noise becomes an obstacle, attach a silencer to the exhaust port. Also, please use the proper silencer for fluid temperature.
(6) Please be careful not to disturb exhaust of the exhaust port.
(7) Please decide the energization time by the dust collection efficiency of the dust collector.
(8) If the valve has been out of use for seven days or longer, a commissioning shall be performed before operating the valve.
(9) Periodically remove the drain accumulated in the air filter.
(10) If the filter element of the air filter turns black, it means that it has been contaminated with tar. Periodically clean the filter element.
(11) If any abnormal condition is found, see section "6.Troubleshooting."
(12) Take the required measures to prevent this product from adversely affecting people or objects in the event of failure.

(13) For the PD3 series, connect a solenoid valve (2 way valve) for operation to the pilot operation port (see 8. Operating description).
Connect the IN side of the operation solenoid valve to the operation port of the PD3 series and open the OUT side to the atmosphere.

(14) The response of PD3 series changes in the effective sectional area of solenoid valve for the operation. Moreover, the inside diameter and the length etc. of tube connected with the pilot operation port change. We will recommend that the operation piping condition be made common with each valve so that there is no difference in the payment drop of bag filter and durability. Refer to Table 4-1 for operation piping condition.

Table 4－1. Recommended operation piping condition

Operation piping length	Operation piping inside diameter	Orifice of solenoid valve for operation	Effective sectional area of solenoid valve for operation
1m or less (recommendation)	ϕ4 (※2)	ϕ3 corresponding (※3)	5.8 to 6.2mm^2
1m or more (※1)		ϕ3.5 to 5 corresponding (※3)	8.2 to 15.3mm^2

※1: When the operation piping becomes long, open time of solenoid valve for the operation to energizing time tends to shorten, and to fall the pulse pressure.
The payment drop ability can be properly adjusted by lengthening energizing time, and raising tank pressure. Confirm the operation test is executed beforehand when it is longer that the piping length for operation than 1m, and the valve operates normally under real machine condition.

※2: Select φ6 about the piping inside diameter when the orifice of solenoid valve for operation is φ5.

※ 3: Select size with a large orifice diameter when it is long that the piping length for the operation.
There is no problem even if size with a large orifice diameter is selected when the length of piping for operation is short.

(15) Solenoid valve for operation of PD3 series recommends product of our company in Table 4-2.

Table 4－2. Recommended solenoid valve for operation

Recommended product	Usage
PJVB series	Six valves or more are installed in outdoor.
FAB31 and 41 series GFAB35, 45, and 55 series	Number of valves is little, and valve is installed in room or panel.
AB31 and 41 series GAB352,452 series (However, coil option 3A,3I and 3J type.)	Number of valves is little, and the waterproof property is necessary.
AB41E4 series	Resisting pressure explosion-proof type.

(16) Do not apply pressure to the exhaust port of the PDV3 series or the operation port of the PD3 series. It may not only be unnecessary for operation, but may cause damage or deformation of parts.

(17) Do not use in the corrosive gas atmosphere or in the explosive gas atmosphere.
If the treatment gas of the dust collector contains corrosive gas, care should be taken that the corrosive gas will not flow into valves.
Moreover, seal material cannot even use product of urethane under the environment that a small amount of corrosive fluid enters.

(18) When the fluid and ambient temperature fall below freezing, breakage due to freezing and sticking of sealed part will occur. Please use after heating and thawing.

4. 2 Disassembly procedure

⚠ CAUTION	a) Stop the flow of fluid. b) Exhaust the fluid inside the valve (inside heater tank) c) Turn off the power supply. d) Please note that the parts fall.

(1) Before disassembly, be sure to turn off the power supply, and exhaust fluid /pressure.

(2) When disassembling, refer to "8.1 Internal structure drawing".

4.2.1 Removal of Diaphragm Assembly

(1) When removing the diaphragm (PD 3: ③, PDV 3: ⑦) and the diaphragm assembly (PD 3: ⑨, PDV 3: ⑬)Remove 4 hex bolts (PD 3: ⑤, PDV 3: ⑤). Be careful of falling parts, such as springs.

4.2.2 Removal of plunger assembly (solenoid valve mounting type)

(1) Please remove 2 ② Cross Recessed Head Machine Screw with Washer.
③ Coil assembly, ④ Plunger assembly, ⑨ O ring and ⑩ Plunger spring come off.

Clean each part with neutral detergent, ethyl alcohol (Pure water).
Moreover, don't use any organic solvent either, because the rubber and resin products could be swollen/deteriorated by it.

4. 2 Assembly procedure

(1) Follow the procedure opposite to disassembly when re-assembly. Make sure all parts are assembled.

(2) Tighten each bolt evenly with tightening torque of the following value.

Table 4-1 Screw and bolt tightening torque estimate

	Screw size	Tightening torque
Solenoid valve section	M4	1.1～1.8 [N・m]
20A	M6	4.9～6.4 [N・m]
25A	M8	12.2～18.3 [N・m]
40A	M10	24.5～36.8 [N・m]

Please note that the diaphragm bolt may be damaged if it is over tightened.

5. Maintenance

5. 1 Maintenance and inspection

(1) Read this Instruction manual thoroughly and understand the contents well before performing maintenance and inspection.

(2) To keep the product in the good condition, inspect it twice a year unless otherwise specified.

(3) For the content of the inspection, see section 3 “Pre-operation check.”

5. 2 Service parts

The parts shown below are consumable parts. Please prepare spare parts for stable operation. Also, we ask that you exchange regularly according to the usage situation.

(1) Diaphragm part

Please check diaphragm assembly when leak, operation delay, abnormality etc. are observed during use. If cracks or deterioration is confirmed in the diaphragm and main valve part, please exchange. Refer to Table 5-1 for the guideline of replacement timing.

Table 5-1 Diaphragm replacement timing Estimated number of operations

Sealant material	Cycles number
Urethane rubber (Blank)	1,000,000
Nitrile rubber (N)	500,000
Fluoro rubber (F)	300,000

(2) Coil assembly

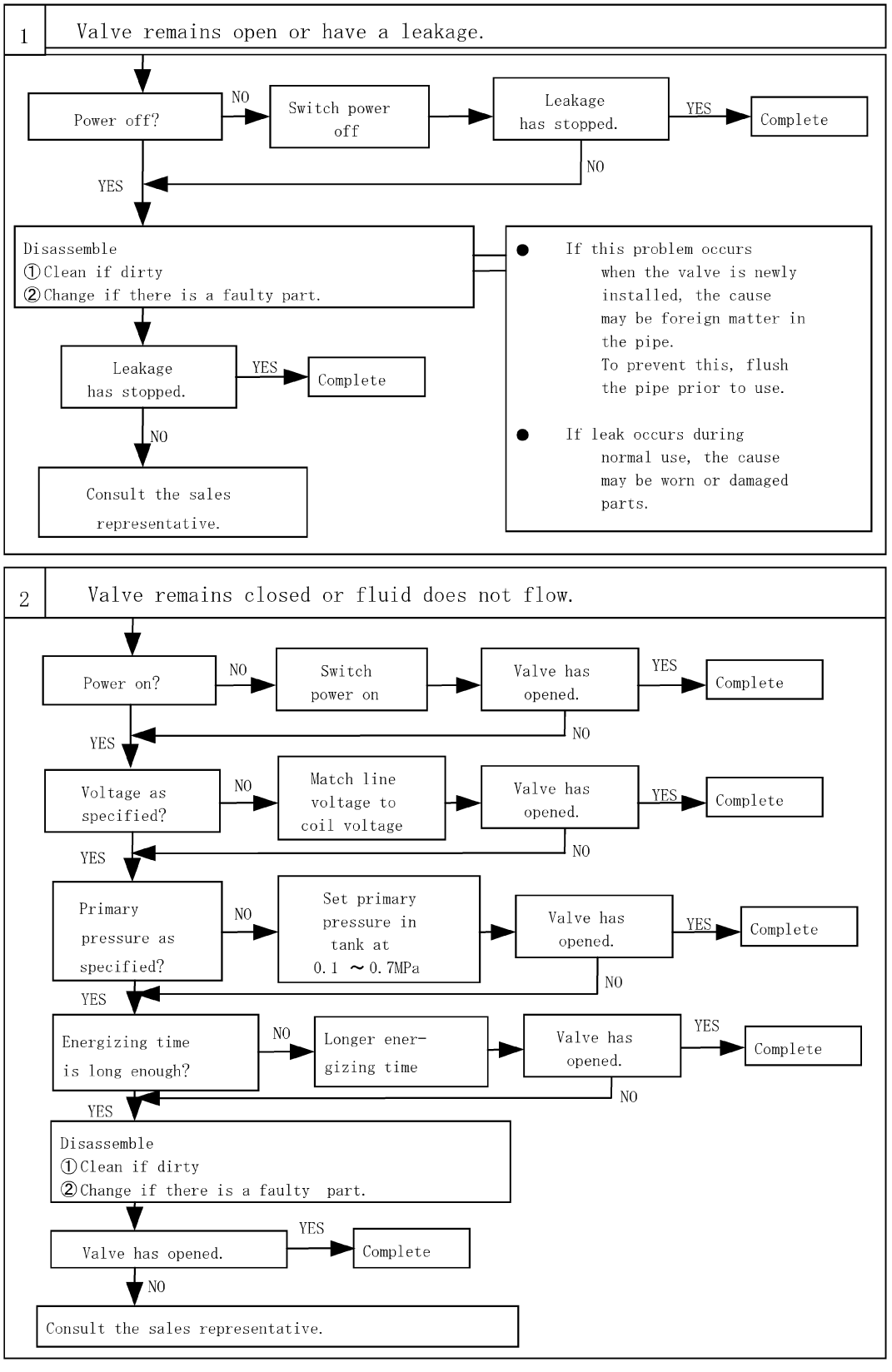
Exchange coil assembly when electrical fault and abnormality are found.

・Exchange standard

Cycles number ・・・ 10,000,000

6. Troubleshooting

Check according to the following float chart when the valve doesn't operate according to use.

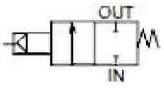


7.Specifications for the product

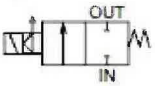
7. 1 Specifications for the product

JIS symbol

● PD3
(air operated type)



● PDV3
(solenoid valve mounted type)



Common specifications

Item		Air operated type	Solenoid valve mounted type
		PD3	PDV3
Working fluid		Air (no corrosive gas)	
Min. working pressure dif. MPa		0.1	
Max. working pressure dif. MPa		0.7	
Max. working pressure MPa		0.7	
Withstanding pressure (water) MPa		2.0	
Fluid temperature °C		-10 to 60, -10 to 100 for fluoro rubber seal (no freezing)	
Ambient temperature °C		-10 to 60, -10 to 100 for fluoro rubber seal	
Atmosphere		Place free of corrosive gas and explosive gas	
Valve structure		Pilot operated poppet structure	
Valve seat leakage cm³/min		300 or less, urethane rubber used for sealant material: 50 or less	
Pilot port size		Rc1/8	
Mounting attitude		Free	
Working environment		Indoors/outdoors	Indoors
Electric specifications		PDV3	
Rated voltage		100 VAC (50/60 Hz), 110 VAC (60 Hz); 200 VAC (50/60 Hz), 220 VAC (60 Hz); 12 VDC; 24 VDC	
Voltage fluctuation range		-10 to +10% of rated voltage	
Apparent power (VA)	Holding	7.5 (50 Hz), 5.5 (60 Hz)	
	Starting	20 (50 Hz), 17 (60 Hz)	
Power consumption (W)	AC	4.0 (50 Hz), 3.4 (60 Hz)	
	DC	6.5	
Thermal class		Class 130 (B) (coil option 4A: Class 180 (H) or equivalent)	
Degree of structure		IP65 or equivalent (Note 1)	

*1: The T type terminal box type is IP61 or equivalent

Individual specifications

Item / Model no.	Port size	Orifice (mm)	Cv flow factor	Weight (kg)
● Air operated type				
PD3-20A	Rc3/4	23	11	0.26
PD3-25A	Rc1	28	18	0.40
PD3-40A	IN: Rc1 1/2 - OUT: DD ø48 Length 52	37	45	0.86
PD3-40A-RC	Rc1 1/2	37	45	0.75
● Solenoid valve mounted type				
PDV3-20A	Rc3/4	23	11	0.41
PDV3-25A	Rc1	28	18	0.55
PDV3-40A	IN: Rc1 1/2 - OUT: DD ø48 Length 52	37	45	1.01
PDV3-40A-RC	Rc1 1/2	37	45	0.90

*1: For a solenoid valve for driving the air operated type PD3, use FAB31-6-3 (page 26), AB31-01-3 (page 130), AB41E4-02-3-03T (explosion proof, page 360) or PJVB (page 690).
*2: The combination of PD3 and PJVB is recommended for outdoors.
*3: Consult with CKD when using the valve at a garbage incineration plant for smoke treatment, or in a dust collector for combustible gas, etc.

7. 2 Meaning of the model No.

How to order

● Air operated type

PD3 - 20A - N

● Solenoid valve mounted type

PDV3 - 20A - N - 2C - AC100V

Model no.

Ⓐ Port size
*2
*3

Ⓑ Sealant
*3
*4
*5

Ⓒ Coil option
*5
*6

Ⓓ Voltage
*6
*7

Symbol	Descriptions		Model no. PD3	Model no. PDV3
Ⓐ Port size				
20A	Rc3/4		●	●
25A	Rc1		●	●
40A	IN: Rc1 1/2, OUT: OD ø48 length 52		●	●
40A-RC	Rc1 1/2		●	●
Ⓑ Sealant				
Blank	Urethane rubber		●	●
N	Nitrile rubber		●	●
F	Fluoro rubber		●	●
Ⓒ Coil option				
2C	Stcl.	Grommet lead wire		●
2CS	Option	Grommet lead wire + surge suppressor		●
2E	Option	DIN terminal box (G1/2)		●
2ES	Option	DIN terminal box + surge suppressor (G1/2)		●
2G	Option	DIN terminal box (Pg11)		●
2H	Option	DIN terminal box + light (Pg11)		●
2HS	Option	DIN terminal box + light + surge suppressor (Pg11)		●
2CG	Option	Conduit (CTC19)		●
2CH	Option	Conduit (G1/2)		●
3T	Option	T type terminal box (G1/2)		●
3R	Option	T type terminal box light (G1/2)		●
3RS	Option	T type terminal box + light + surge suppressor (G1/2)		●
4A	Option	Grommet lead wire (equivalent to heat proof class H)		●
Ⓓ Voltage				
AC100V	100 VAC (50/60 Hz), 110 VAC (60 Hz)			●
AC200V	200 VAC (50/60 Hz), 220 VAC (60 Hz)			●
DC24V	24 VDC			●
DC12V	12 VDC			●

*1: The combinations indicated with ● in the above table are available.
*2: Pipe plug-in method is available for 20A. Consult with CKD. (Custom order)
*3: For Ⓑ, blank (sealant: urethane rubber) is not available when port size is 40A or 40A-RC.
*4: When Ⓑ is N or F (sealant: nitrile rubber or fluoro rubber), the main valve material is nylon resin. Consult with CKD about other materials. (Custom order)
*5: For PDV3 Series, when Ⓑ is F (sealant: fluoro rubber), only 4A is available for Ⓒ (coil option).
*6: When Ⓒ (coil option) is 4A, only AC voltage is available.
*7: For voltages other than above, consult with CKD.

<Example of model number>

PDV3-20A-2C-AC100V
Model no.: PDV3

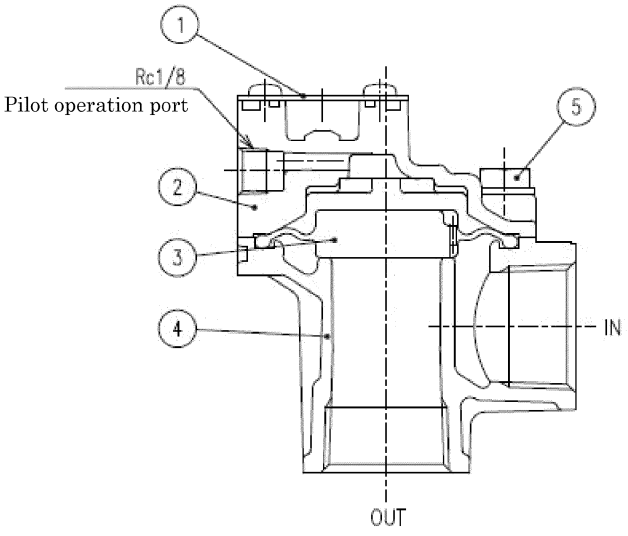
Ⓐ Port size : Rc3/4
Ⓑ Sealant : Urethane rubber
Ⓒ Coil option : Grommet lead wire
Ⓓ Voltage : 100 VAC (50/60 Hz), 110 VAC (60 Hz)

8. Internal construction drawings and operation mechanism

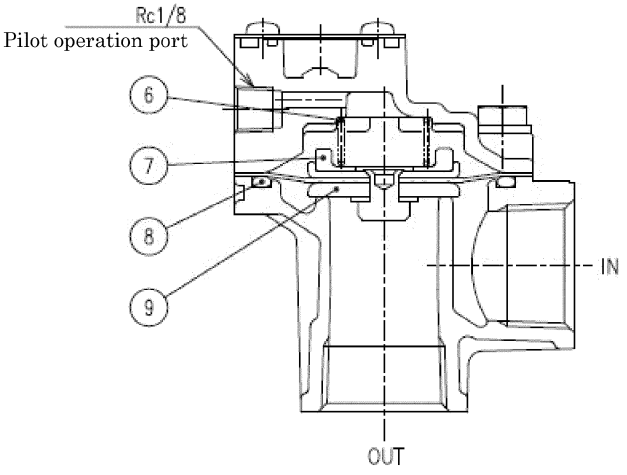
8. 1 Internal construction drawings

・PD3

●Sealant : Urethane rubber
PD3-20A,25A



●Sealant : Nitrile rubber
Fluoro rubber
PD3-25A,25A,40A-(N,F) *1
PD3-40A-RC-(N,F)

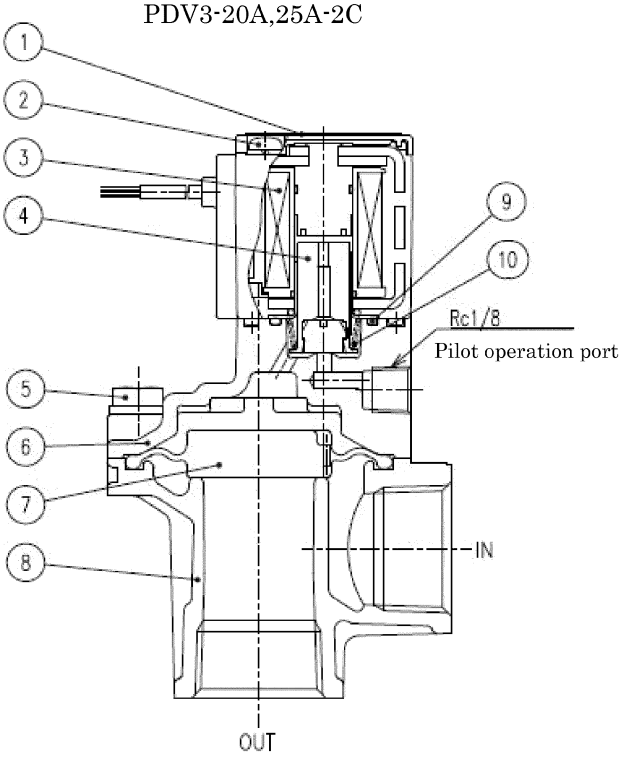


*1 : 40A has a different shape than above.

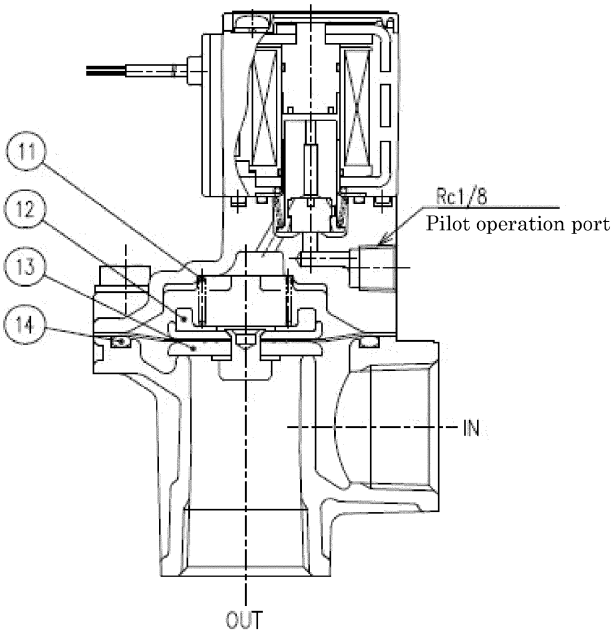
№	Parts name	Note
①	Name plate	
②	Cover	
③	Diaphragm	
④	Body	
⑤	Hexagon head bole	
⑥	Spring	Repair parts
⑦	Spacer	
⑧	O ring	
⑨	Diaphragm assembly	Repair parts

・PDV3

●Sealant：Urethane rubber
PDV3-20A,25A-2C



●Sealant：Nitrile rubber
Fluoro rubber
PD3-25A,25A,40A(N2C,F4A) *1
PD3-40A-RC-(N2C,F4A)



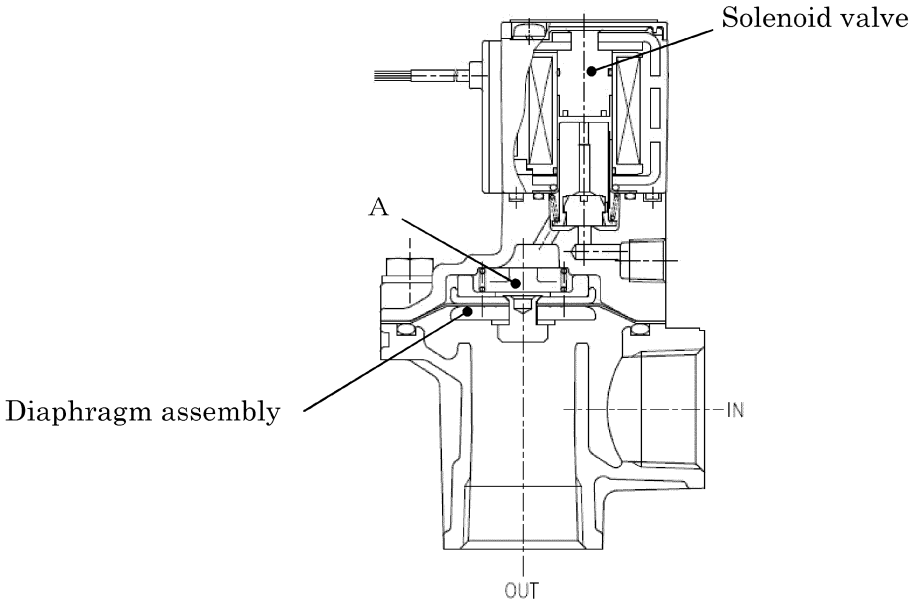
*1：40A has a different shape than above.

№	Parts name	Note
①	Name plate	
②	Cross recessed pan head machine screw with spring lock washer	
③	Coil assembly	
④	Plunger assembly	
⑤	Hexagon head bole	
⑥	Cover	
⑦	Diaphragm	Repair parts
⑧	Body	
⑨	O ring	
⑩	Plunger spring	Repair parts
⑪	Spring	Repair parts
⑫	Spacer	
⑬	Diaphragm assembly	Repair parts
⑭	O ring	Repair parts

8. 2 Operation mechanism

・OPEN

When the solenoid valve is energized, room A pilot's fluid is exhausted into atmosphere.
Room A pilot's pressure lowers more than pressure on IN side, diaphragm assembly lifts by this differential pressure, and fluid flows to IN→OUT.



・CLOSE

When energizing the solenoid valve is stopped, plunger assembly descends, and valve seat B is shut. The exhaust stops, fluid is supplied to room A pilot through air orifice of diaphragm assembly. Room A pilot's pressure becomes same pressure as IN side, valve seat is shut by descent of diaphragm assembly, and fluid is stopped.