CKD

SM－50519－A

INSTRUCTION MANUAL

3-PORT, SOLENOID VALVE

NP13 Series

NP14 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.2
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.

【 Contents 】

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) Do not splash fluids such as water or cutting oil directly. ・Fluids (such as water or cutting oil) splashed onto the coil part of the pilot solenoid valve causes the coil to burn. b) Coil generates heat. ・If the product will be installed in a control panel, of if the product will be energized for a long time, provide measures such as ventilation to release heat. The product temperature will be high. c) The product cannot be used in a corrosive or solvent atmosphere. d) Avoid using the product in a humid atmosphere, since change in temperature may cause bedewing. e) The product cannot be used in an explosive gas atmosphere. f) Prevent dust from entering the valve interior. ・If there are high levels of dust in the area , provide protection by installing a silencer or an elbow joint facing downward onto the exhaust port so that dust does not enter. g) Use the product away from radiant heat.

(1) When using the valve in a cold district, an proper provision is required to prevent freezing of the valve.
(2) This product cannot be used outdoors. Protect the product by a cover or by installing it in a panel.
(3) After the product is installed, avoid washing or painting the product using water or solvents. Otherwise, resin parts may break.
(4) Do not subject this product to vibration or inertia.

2.2 Installation

2.2.1 Installation

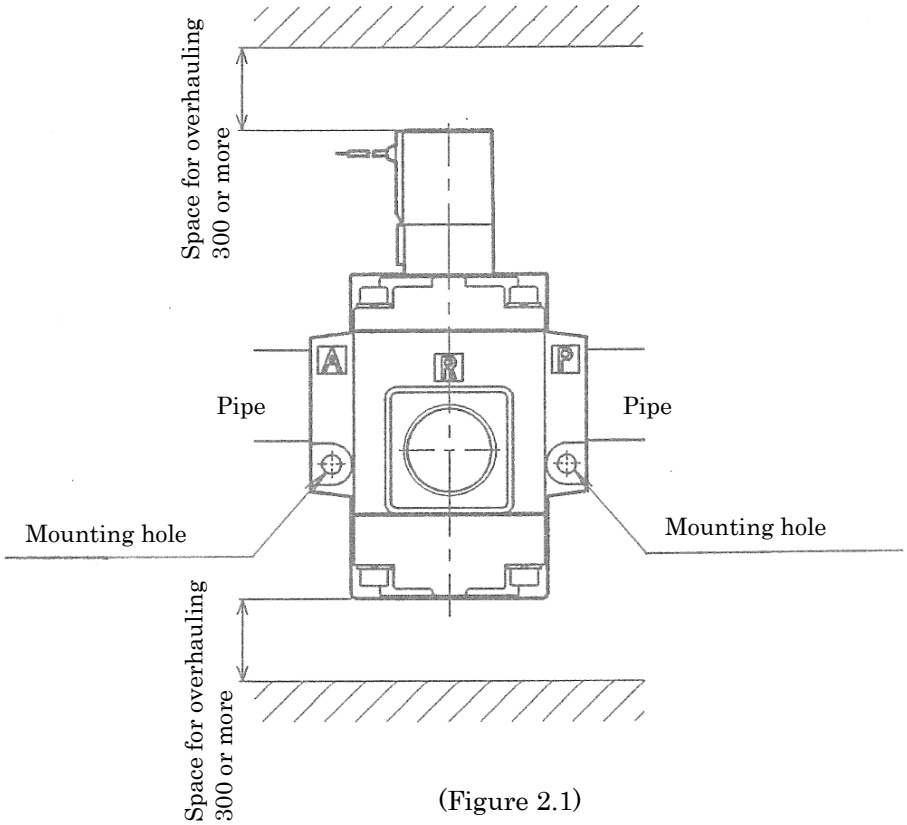
⚠ CAUTION	a) Always thoroughly read the Instruction Manual before installing this product. b) Always hold the body when handling or installing the product. c) After installing, check for leak from the pipe and make sure that the product is correctly installed.

(1) The mounting posture of the valve is not specified.

(2) Fix the valve using the mounting hole on the valve except when using a metallic pipe.

2.2.2 Space for maintenance

・An adequate space shall be provided around the valve to assure the safety during the maintenace/troubleshooting work (see Figure 2-1).



(Figure 2.1)

2.3 Piping method

⚠ CAUTION	a) Fix the product when tightening or reinstalling the piping. When piping to the body side, fix the body, and when piping to the cap side, fix the cap. 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, flush the inside of the pipe with 0.3MPa air, and remove any foreign matter, metal powder, rust and sealing tape, etc.

(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.

・The rusting of the inside of the pipes may lead to a malfunction and/or leakage.

(3) Prevention of dust being mixed

・If the valve is used in the atmosphere containing much dust, it will be likely to malfunction or cause a leakage.

・ In this case, a silencer or filter shall be installed at the exhaust or air intake port to prevent the intrusion of dust.

(4) Flowing direction of the fluid

・The valve shall be piped in such a manner that the flowing direction of the fluid will match the direction of the arrow indicated on the JIS symbol of the product.

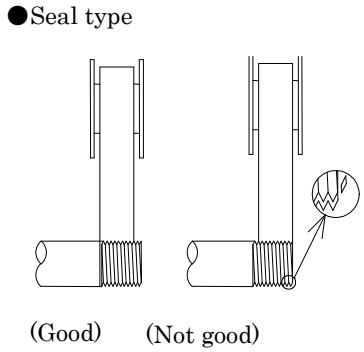
(5) Sealer

・The sealer shall be used with great care to prevent it from entering the pipes or leaking out.

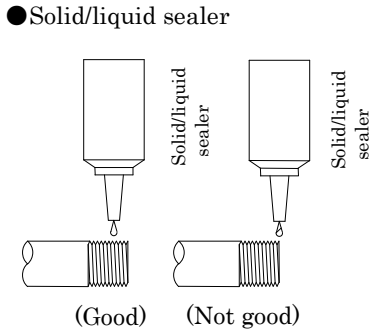
・When taping a threaded portion, one or two threads at the end of the portion shall be exposed (see Figure 2-2).

・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)

(6) 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 pipe
Rc 1/8	7 - 9 [N・m]
Rc 1/4	12 - 14 [N・m]
Rc 3/8	22 - 24 [N・m]
Rc 1/2	28 - 30 [N・m]
Rc 3/4	31 - 33 [N・m]
Rc 1	36 - 38 [N・m]
Rc 1 1/4	40 - 42 [N・m]
Rc 1 1/2	48 - 50 [N・m]
Rc 2	54 - 56 [N・m]

(7) Lubricated or unlubricated operation

・This valve does not require lubrication. Therefore, no lubricator is needed.

・If the valve is to be lubricated, use type 1 turbine oil, ISO VG 32 (no additives).

(8) Minimum differential pressure

・A differential pressure of 0. 2 MPa or more is required for the valve to operate.

・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.

(9) Provision for drain

・ The compressed air contains high levels of drain (water, oxidized oil, tar, foreign matter) which can cause the reliability of the pneumatic components to drop remarkably. Improve the quality of the air (create clean air) by removing moisture with an after cooler or dryer, by removing the foreign matter with a filter, and by removing the tar with a tar removal filter, etc.

2.4 Wiring method

(1) Continuous power supply

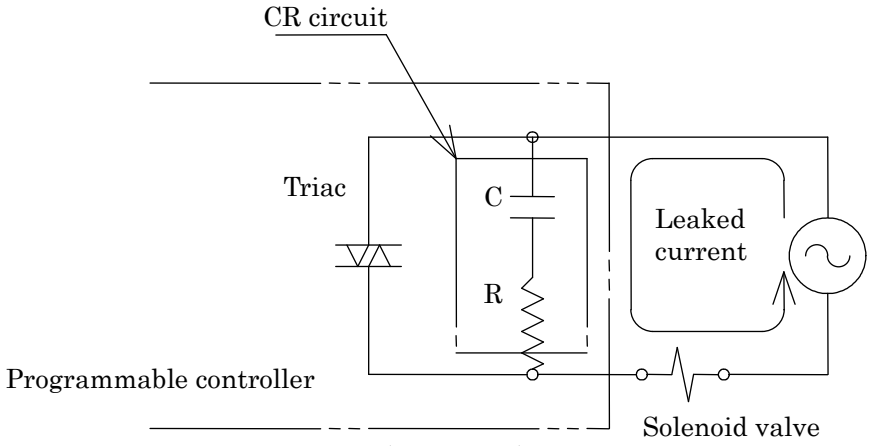
・When the solenoid valve is installed on a control panel or energized for an extended period, it will be heated to a temperature. In this case, a provision is required to discharge heat, i.e. ventilation.

(2) Permissible limit of leaked current

・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 (see Figure 2-4). ---Leaked current: 1.8 (3) mA or less

The leaked current may lead to a malfunction.

The value within parentheses represents the leaked current measured with a surge killer provided.



(Figure 2-4)

(3) Polarity of the solenoid valve

・The valve does not have positive and negative terminals although it is designed for use with a direct current. It will not have polarity even if it is used with a lamp and/ or surge killer.

2.4.1 Electric connection of grommet coil lead

This subsection applies to the one with grommet coil (optional coil code “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

This subsection applies to the ones with DIN terminal box (optional coil code “2G” or “2H”).

⚠ CAUTION	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 cabtire cord, use the one specified in Table 2-2.

Table 2-2

Specifications for cabtire cord	Connection port size of valve	
	10A - 25A	32A - 50A
O.D. of cord	φ4.5 – φ7	φ6－φ10
Nominal sectional area mm²	0.75	0.75－1.5

(2) Pass a cap, washer, gasket and casing through the cabtire cord.

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

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

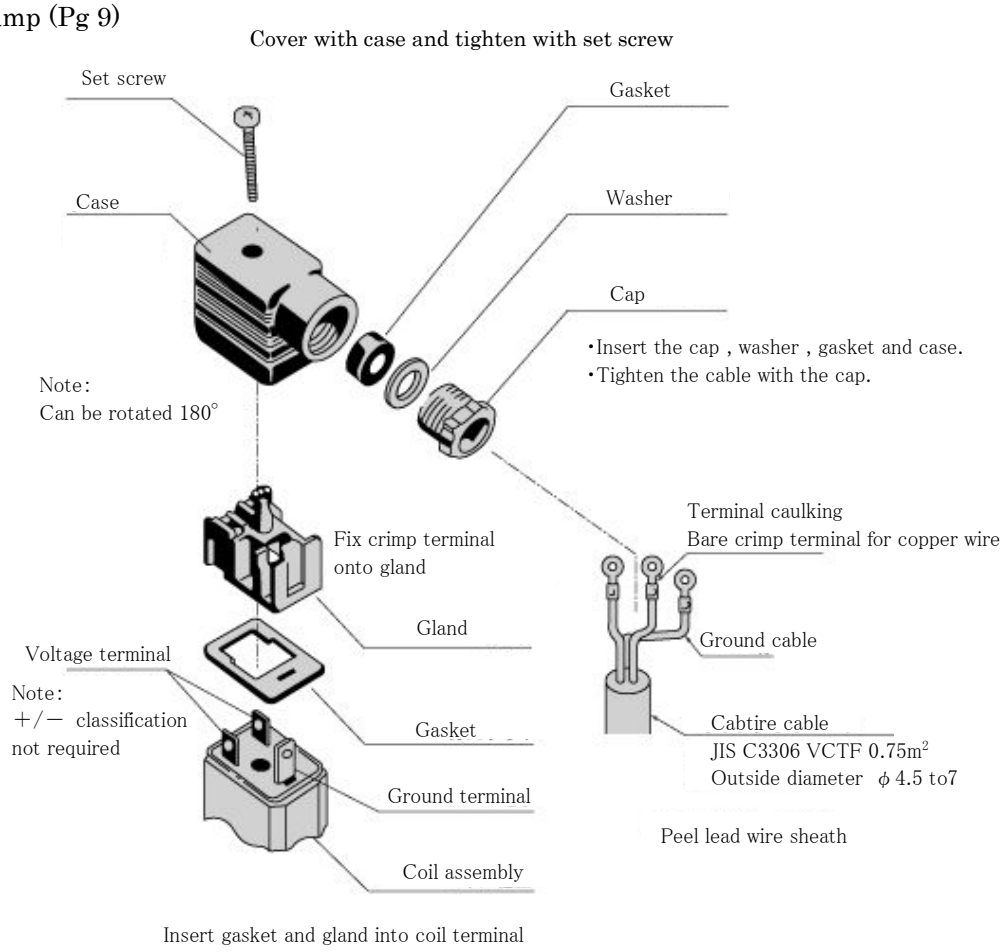
(5) Enclose the terminal block with the casing.

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

(7) Insert the DIN terminal box to the coil with the grounding terminal of the coil aligned with that on the terminal block.

- DIN terminal box (Pg 9)
- DIN terminal box with lamp (Pg 9)

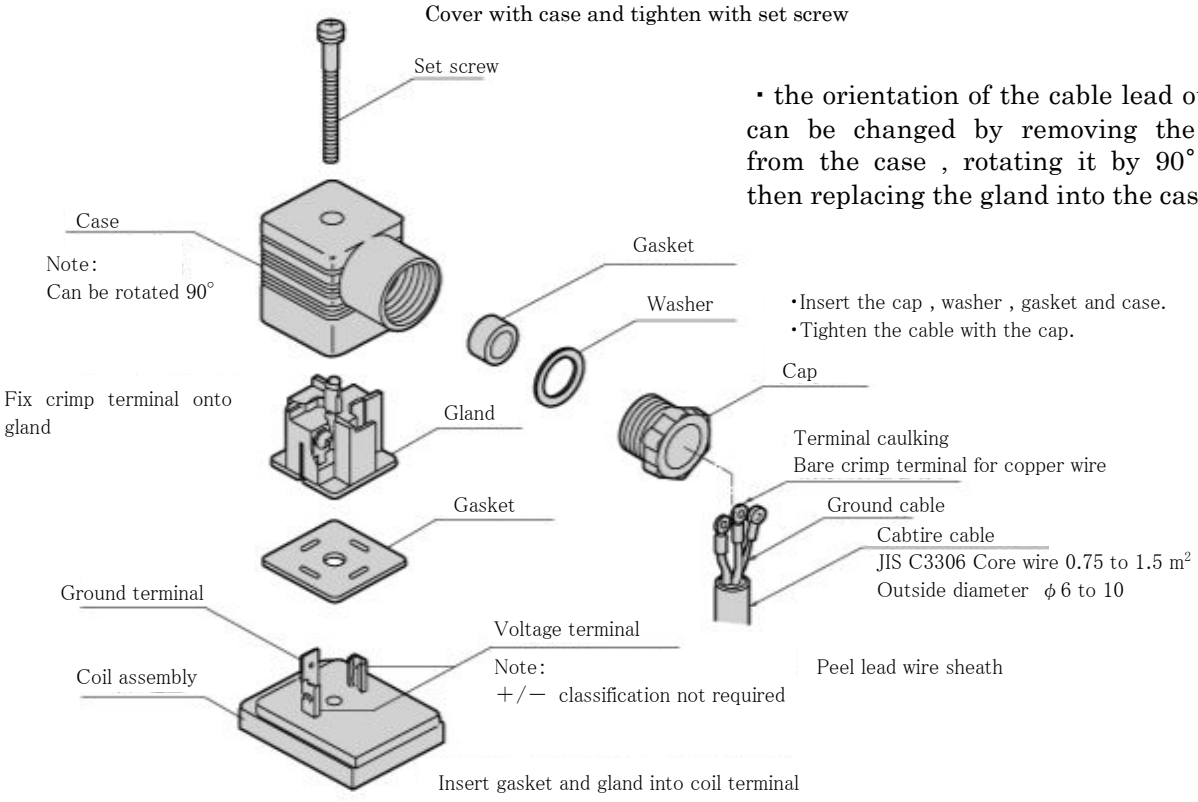
・the orientation of the cable lead out port can be changed by removing the gland from the case , rotating it by 180° , and then replacing the gland into the case.



(Figure 2-5.) Electric connection of DIN terminal box (10A to 25A)

- DIN terminal box (Pg 11)
- DIN terminal box with lamp (Pg 11)

・the orientation of the cable lead out port can be changed by removing the gland from the case , rotating it by 90° , and then replacing the gland into the case.



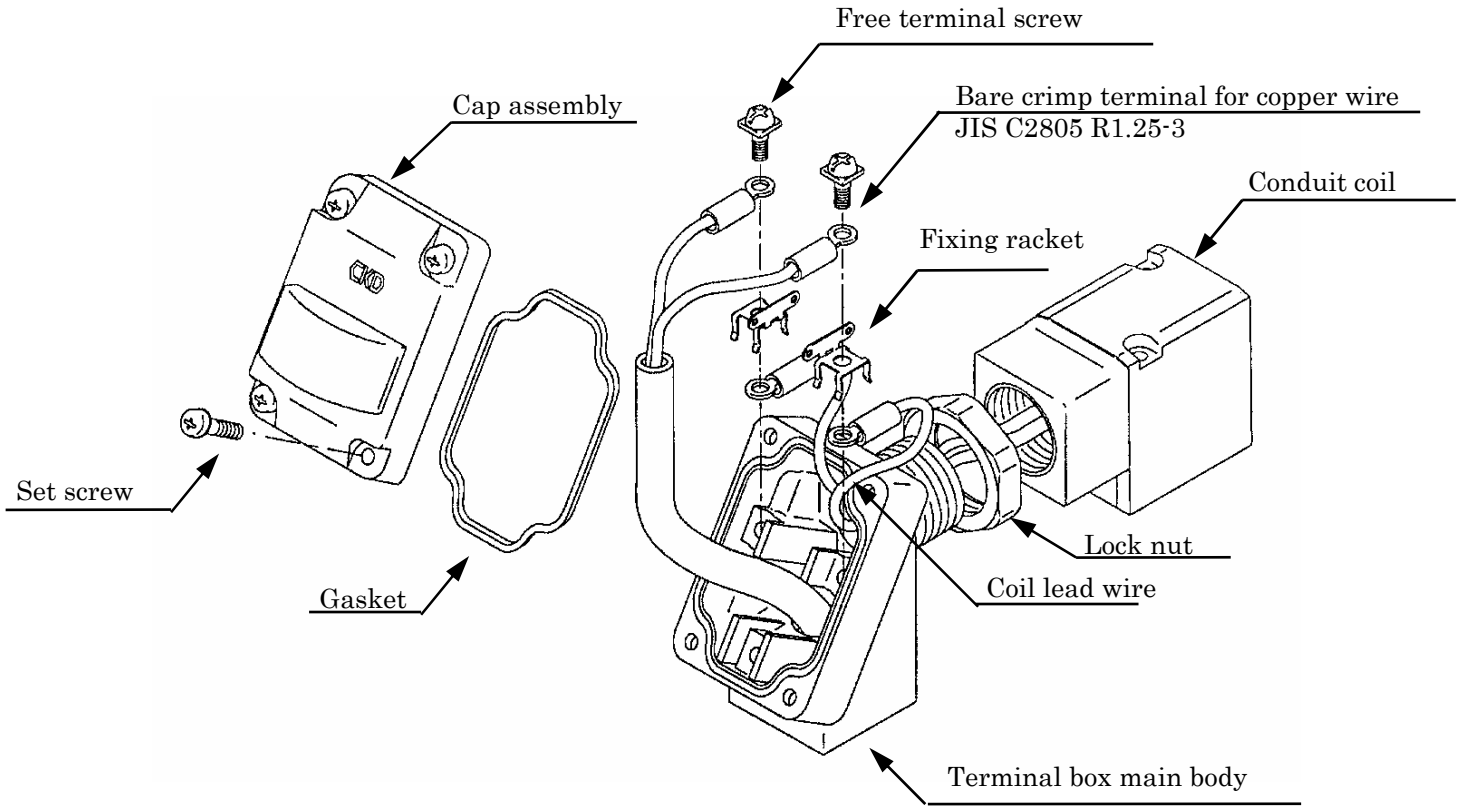
(Figure 2-6.) Electric connection of DIN terminal box (32A to 50A)

2.4.3 Electric connection of T-type terminal box

This subsection applies to the ones with T-type terminal box (optional coil code “3T” or “3R”).

(1) For the cabtire cord, use the one with a nominal sectional area ranging from 0.75 to 1.5 mm^2.
(2) Pass the cabtire cord to the terminal box.
(3) Pass a crimped terminal specially designed for copper leads through the lead of the cabtire cord and crimp the terminal.
(4) Fixing racket the Crimp Terminal by tightening the Free terminal Screw with tightening torque of 0.5Nm.
(5) After overlaying the Gasket and Cap Assembly, tighten the Set Screw with tightening torque of 0.5Nm.

●T-type terminal box (G1/2)
●T-type terminal box with lamp (G1/2)



(Figure　2－7) Electric connection of T-type terminal box

3. Pre-operation (post-installation) check

3.1 Appearance check

⚠WARNING	Shut off the fluid flow. Exhaust the fluid remaining in the valve. Turn off the power.

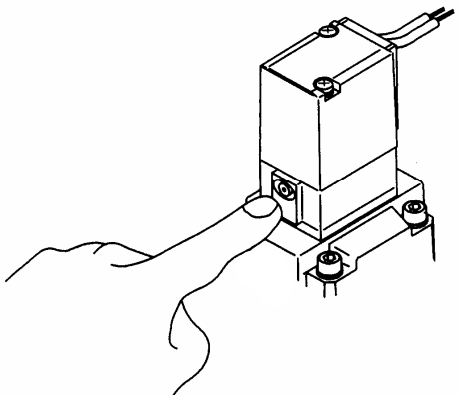
(1) Push the valve with finger to check that the valve has been fixed to the pipe or mounting hole.

(2) Check that the fasteners including hexagonal socket head cap screws and bolts have not been loosened.

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 a pneumatic pressure of 0.3 - 0.5 MPa with soapy water applied to the joints. Air bubbles will be generated at the leaking joints.

(2) Manual operation
①Compress the fluid.
②Push the manual shaft until it bottoms. The valve will be energized while the manual shaft is pushed. The valve will return when the manual shaft is released.
(See Figure 3-1.)



The valve operates while the shaft is pushed.
(Figure 3-1.)

3.3 Electrical check (With limit switch)

⚠WARNING	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 1,000 VDC megaohmmeter between a metallic part such as screw fixing the valve and the active part of the lead. The measured dielectric resistance shall be 100 Mohms or more.

(2) Check the supply voltage.
The voltage variation shall be within ±10% of the rated voltage.

(3) If the time for which the valve is energized is too short, the valve may not follow the operation of the entire system.
Check that the operating frequency specified in section 10 is satisfied

(4) If the valve has been out of use for seven days or longer, the first cycle after the restart of the valve may take approximately a second longer than usual.
In this case, a commissioning shall be performed before operating the valve.

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) Liquid-filled state ・ When conveying a liquid in a circuit, operation may fail if liquid-filled state occurs. This is because pressure rises in the liquid filled state when temperature changes. 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. ・ Internal parts may wear when the valve operates. Caution is required because wear chips could enter the secondary side of the valve.

⚠CAUTION	b) When the solenoid valve is continuously operated, it will be heated to a temperature. Do not touch it by hand while it is energized. c) 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. d) Install a silencer at the exhaust port of the main piping to the valve to reduce the noise to be given to the personnel working around the machine.

(1) Do not put any object that weighs 1 kgf or more on the valve.

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

(3) The operating frequency specified below shall be satisfied.

Table 4-1.Operating frequency

Connection port size of valve	Operating frequency
10A・15A	360 cycles/min or less
20A・25A	180 cycles/min or less
32A・50A	90 cycles/min or less

If the time for which the valve is energized is too short, the valve may not follow the operation of the entire system.

(4) If the valve has been out of use for seven days or longer, the first cycle after the restart of the valve may take approximately a second longer than usual.
In this case, a commissioning shall be performed before operating the valve.

(5) Periodically remove the drain accumulated in the air filter.

(6) If the filter element of the air filter turns black, it means that it has been contaminated with tar. Periodically clean the filter element.

(7) When supplying oil using a lubricator, periodically replenish oil to keep the oil level in the lubricator.
For lubrication, use type 1 turbine oil, ISO VG 32 (no additives).

(8) If any abnormal condition is found, see section "Troubleshooting."

4. 2 Procedures for disassembling and assembling solenoid actuator section

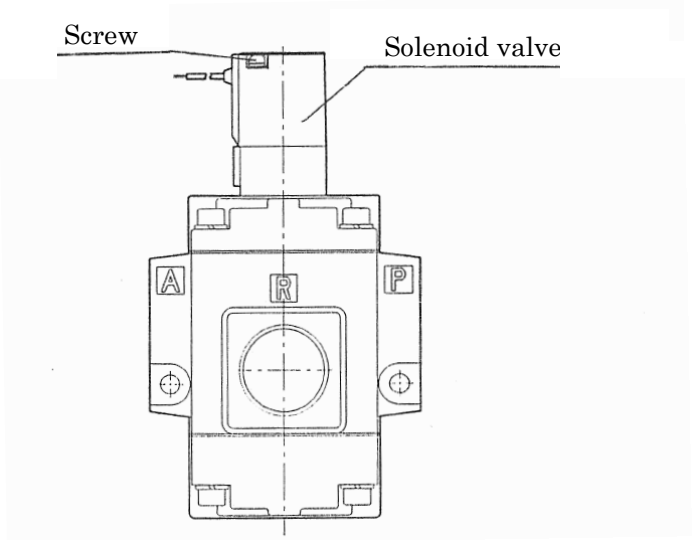
4.2.1 Disassembly procedure

⚠ CAUTION	a) Close the main valve. b) Exhaust the fluid remaining in the valve. Turn off the power.

(1) Remove wires from the solenoid valve.

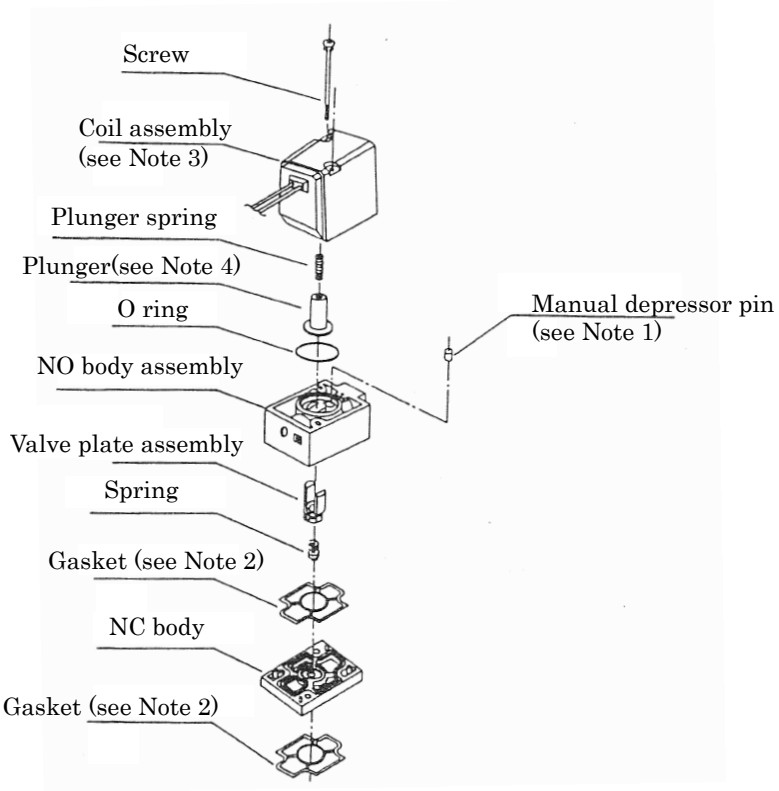
(2) Loosen the screw.

(3) Raise the solenoid valv e.



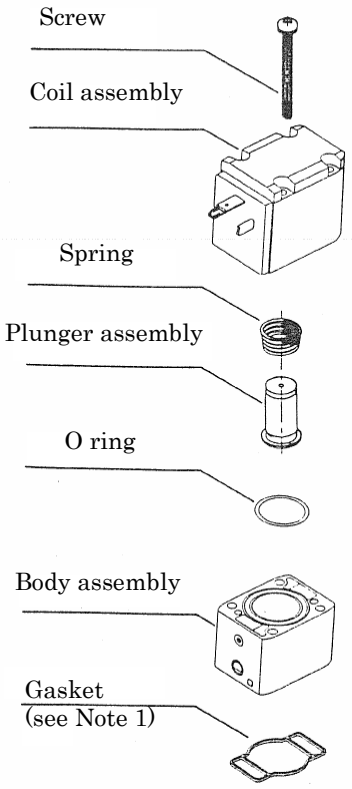
(Figure 4－1)

Note 1: When disassembling the solenoid valve, take case not to lose the manual depressor pin.
Note 2: When assembling the solenoid valve, take care not to install the gasket in the wrong direction.
Note 3: Different coil assemblies and plungers are used for AC voltage and for DC voltage. Replace the coil assembly and plunger as a unit.
Note 4: Turbine oil is applied to the plunger for lubrication.



(Figure 4－2) Developed view of the pilot solenoid valve (10A to25A)

Note 1: Take care not to install the gasket in the wrong direction.



(Figure 4－3) Developed view of the pilot solenoid valve (32A to50A)

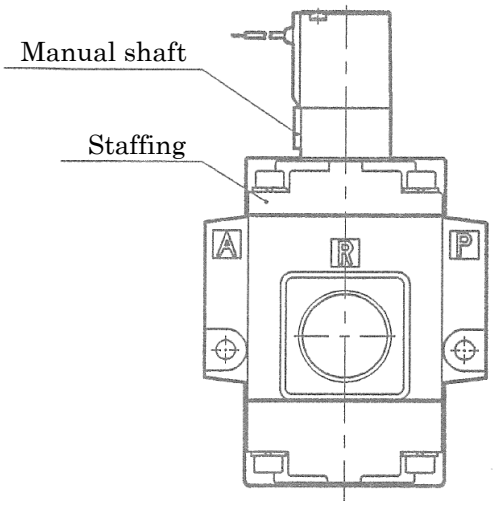
4.2.2 Assembly procedure

(1) Install the gasket to the body assembly with care not to install it in the wrong direction.
(2) Put the solenoid valve on the stauffing. Take care not to orient the manual unit in a wrong way.
(3) Tighten the screw.

Table 4-2. Torques required for tightening

Size of screw	Torque required for tightening
M3	0.7 - 1.1N･m
M4	1.1 – 1.8N･m

(4) Connect electric wires to the valve.
(5) Turn on the power and activate the fluid.



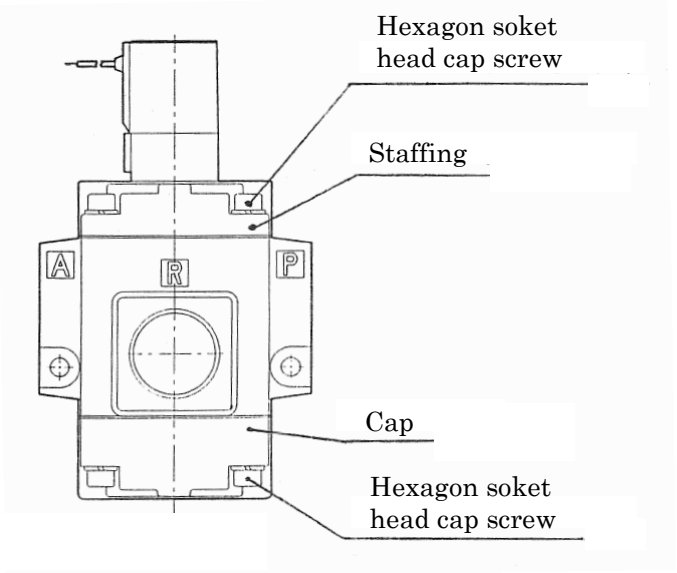
(Figure 4－4)

4. 3 Procedures for disassembling and assembling valve stem

4.3.1 Disassembly procedure

⚠ CAUTION	a) Close the main valve。 b) Exhaust the fluid remaining in the valve. c) Turn off the power.

(1) Loosen the hexagon socket head cap screw on the stauffing.
(2) Raise the stauffing.
(3) Loosen the hexagon socket head cap screw on the cap.
At this time, take care not to lose the spring located inside the cap.



（Figure 4－5）

4.3.2 Assembly procedure

(1) The assembly shall be performed with reference to section 8 “Internal construction drawings.”
(2) Apply grease to the packing and O ring.
For grease, use silicone grease G-40H, Shinetsu Kagaku Kogyo.
(3) Apply grease to the surface on which the piston slides.
(4) Apply grease to the surfaces of the body and valve seat on which the packing slides.
(5) Insert the valve stem from the bottom of the body.
(6) Insert the valve seat from the bottom of the body.
(7) Install the gasket, piston, spring and cap and tighten the hexagon socket head cap screw. At this time, the holes on the gasket shall be aligned with the body and cap respectively.
(8) Install the stauffing and tighten the hexagon socket head cap screw. Again, take care to correctly locate the holes on the gasket.
(9) Compress the fluid to check that the fluid is not leaking out.
(10) Turn on the power and activate the fluid circuit.

5. Maintenance

5. 1 Maintenance and inspection

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

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

5. 2 Service parts

(1) Solenoid valve

Replace the solenoid valve with a new one if an electric failure or another abnormal condition is observed with it.

As a guideline, replace it every 10 million cycles.

(2) Valve stem, valve seat and spring

Replace them with new ones if fluid leaks or the valve seat does not move or delays to move during the operation.

As a guideline, replace them every 10 million cycles.

(3) Packing, O ring and gasket

Replace them with new ones if fluid leaks or another abnormal condition is observed.

As a guideline, replace them every 10 million cycles.

6. Troubleshooting

If the valve does not function as specified, check it according to Table 6-1.

Table 6-1

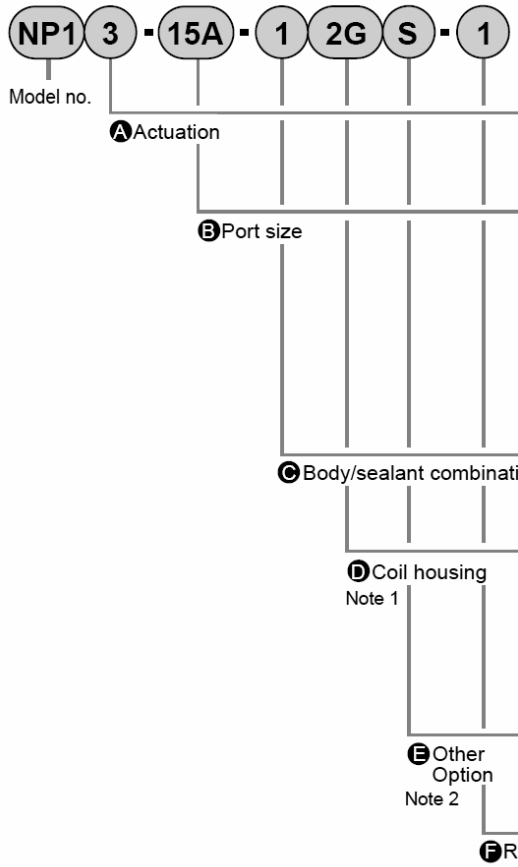
Symptom	Cause	Action
The valve does not move.	It is not energized.	Check the wiring and fuse and turn on the power supply.
	The voltage is lower than the rating.	Check the power supply and apply the rated voltage.
	The fluid pressure is too low.	Adjust the pressure.
	Too large a pressure drop during the operation.	The sectional area of the pipe at the fluid supply port is too small. Use a pipe of the size that fits the valve.
	The pilot solenoid valve does not move.	Replace the pilot solenoid valve with a new one.
	Foreign matter is entangled by the valve stem.	Overhaul the valve and clean the inside of it.
	The gasket has been installed in the wrong direction.	Overhaul and reassemble the valve.
The valve does not return.	It is not de-energized.	Check for leaked current. Modify the circuit to turn off the power supply without fail.
	The pilot solenoid valve does not return.	Replace the pilot solenoid valve with a new one.
	Foreign matter is entangled by the valve stem.	Overhaul the valve and clean the inside of it.
	The gasket has been installed in the wrong direction.	Overhaul and reassemble the valve.
	Packing is running short of grease.	Overhaul and reassemble the valve.
External leakage	The fluid pressure is too high.	Adjust the pressure.
	The packing is damaged or worn.	Overhaul the valve and replace the packing with a new one.
	O ring is damaged.	Overhaul the valve and replace the O ring with a new one.
Leakage from the valve seat	The valve seat on the body is damaged.	Replace the body with a new one.
	The sealing surface of the valve seat is damaged.	Replace the valve seat with a new one.
	The rubber or sealing surface of the valve stem is damaged or worn.	Replace the valve stem with a new one.
	Foreign matter is entangled by the valve stem.	Overhaul and clean the valve.

※If further information is required, consult us or the nearest agency.

7. Specifications for the product

7. 1 Meaning of the model No.

How to order



Symbol		Descriptions
Ⓐ Actuation		
3		N.C. (normally closed) type
4		N.O. (normally open) type
Ⓑ Port size		
10A		Rc3/8
15A		Rc1/2
20A		Rc3/4
25A		Rc 1
32A		Rc1 1/4
40A		Rc1 1/2
50A		Rc 2
Ⓒ Body/sealant combination		
	Body	Sealant
1	Aluminum	Nitrile rubber
Ⓓ Coil housing		
2C	STD	Grommet coil
2G	Option	DIN terminal box (Pg screw)
2H	Option	DIN terminal box with light (Pg screw)
3T	Option	T type terminal box (G1/2)
3R	Option	T type terminal box with light (G1/2)
Ⓔ Other options		
Blank		No option
S		With surge suppressor
Ⓕ Rated voltage		
1	Standard	100 VAC (50/60Hz), 110 VAC (60Hz)
2	Standard	200 VAC (50/60Hz), 220 VAC (60Hz)
3	Standard	24 VDC
AC110V	Custom order	110 VAC (50/60Hz)
AC220V	Custom order	220 VAC (50/60Hz)

⚠ Note on model no. selection

Note 1: The Pg screw for the DIN terminal box is Pg9 for the 10 A to 25 A port size, and Pg11 for 32 A to 50 A.
Note 2: When using grommet coil specifications, the surge suppressor is enclosed with port size 10 A to 25 A, and is incorporated for port size 32 A to 50 A. The grommet coil is mounted in the terminal box when the coil is ordered with the terminal box.
Note 3: Manual override (non-locking) is provided as standard.

<Example of model number>

NP13-15A-12GS-1

Model: NP

Ⓐ Actuation : N.C. (normally closed) type
Ⓑ Port size : Rc1/2
Ⓒ Body/sealant combination
: Body/aluminum, sealant/nitrile rubber
Ⓓ Coil housing : With DIN terminal box
Ⓔ Other options: With surge suppressor
Ⓕ Voltage : 100 VAC (50/60Hz), 110 VAC (60Hz)

7. 2Specifications for the product

Common specifications

Descriptions	NP13	NP14
Actuation	N.C. (normally closed) type	N.O. (normally open) type
Fluid pressure supply port	P port	R port
Working fluid	Compressed air	
Withstanding pressure MPa	1.2	
Working pressure range MPa	0.2 to 0.8	
Fluid temperature °C	5 to 60	
Ambient temperature °C	-5 to 60 for 10 A to 25 A, -5 to 40 for 32 A to 50 A for both NP13 and NP14	
Heat proof class	B	
Lubrication	Oil-free (Use Turbine Oil Class 1 ISO VG32 or equivalent when lubricating)	
Valve seat leakage $cm^3/min.$	1 or less (with 0.2 to 0.8 MPa pneumatic pressure)	
Valve structure	Internal pilot operated poppet valve structure	
Installation attitude	Free	

Individual specifications

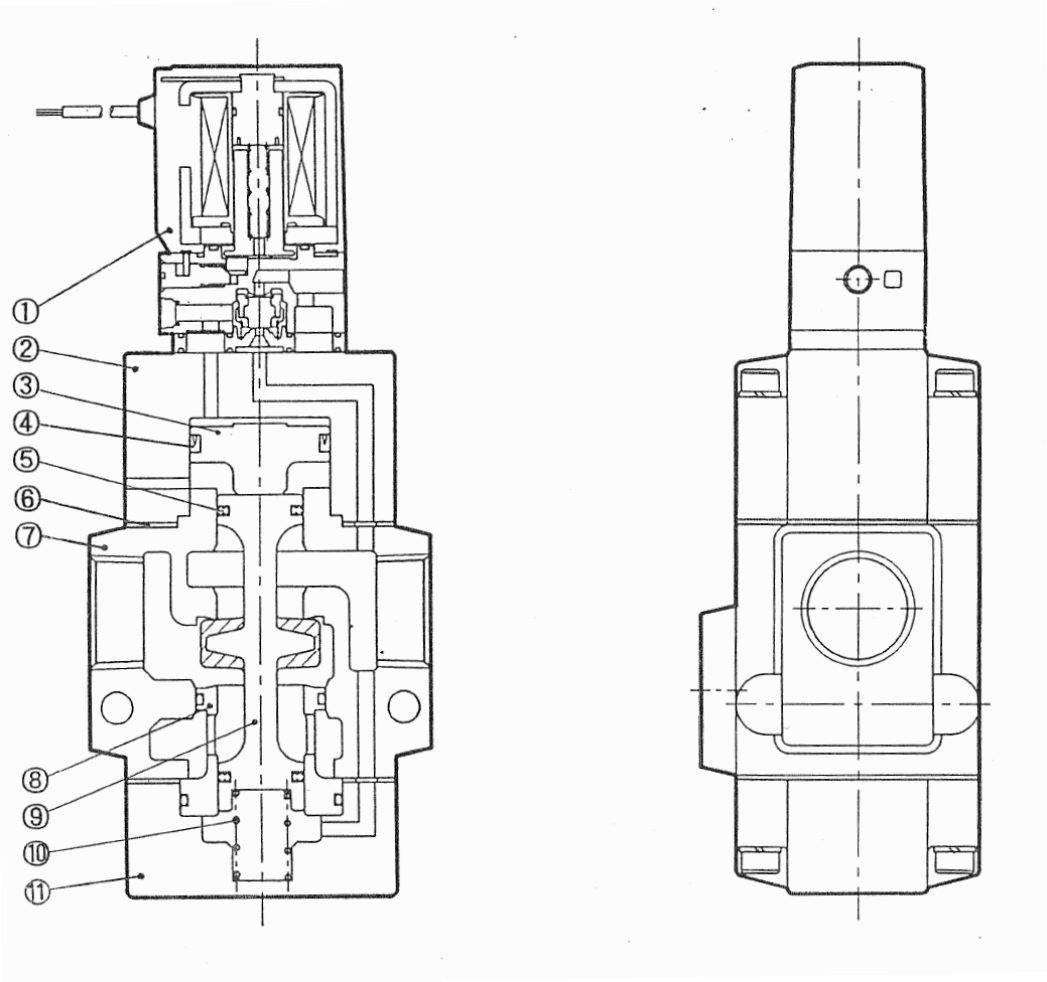
Descriptions / Model no.	Port size: P, A Port	Port size: R port	Orifice (mm)	Response time (ms)	Rated voltage	Apparent power (VA): At holding 50Hz	Apparent power (VA): At holding 60Hz	Apparent power (VA): At starting 50Hz	Apparent power (VA): At starting 60Hz	Power consumption (W): AC 50/60Hz	Power consumption (W): DC	Weight (kg)
N.C. (normally closed) type (P port pressurization)												
NP13-10A	Rc3/8	Rc1/2	14.8 or equivalent	30 or less (Note 1)	100, 200 VAC (50/60Hz) 110, 220 VAC (60Hz) 24 VDC	3.9	3.1	9.2	7.2	2.0/1.7	4	0.7
NP13-15A	Rc1/2											0.7
NP13-20A	Rc3/4	Rc 1	25.4 or equivalent	60 or less (Note 1)								1.5
NP13-25A	Rc 1											1.5
NP13-32A	Rc1 1/4	Rc 2	41.4 or equivalent	120 or less (Note 1)		15	11	40	35	7.5/6.0	8	4.5
NP13-40A	Rc1 1/2											4.5
NP13-50A	Rc 2											4.4
N.O. (normally open) type (R port pressurization)												
NP14-10A	Rc3/8	Rc1/2	14.8 or equivalent	30 or less (Note 1)	100, 200 VAC (50/60Hz) 110, 220 VAC (60Hz) 24 VDC	3.9	3.1	9.2	7.2	2.0/1.7	4	0.7
NP14-15A	Rc1/2											0.7
NP14-20A	Rc3/4	Rc 1	25.4 or equivalent	60 or less (Note 1)								1.5
NP14-25A	Rc 1											1.5
NP14-32A	Rc1 1/4	Rc 2	41.4 or equivalent	120 or less (Note 1)		15	11	40	35	7.5/6.0	8	4.5
NP14-40A	Rc1 1/2											4.5
NP14-50A	Rc 2											4.4

Note 1: Response time is the value when supply pressure 0.5 MPa, not lubricated and ON.
The value varies depending on pressure and quality of lubricant.
Note 2: The allowable voltage range must be within ±10% of the rated voltage.

8. Internal construction drawings

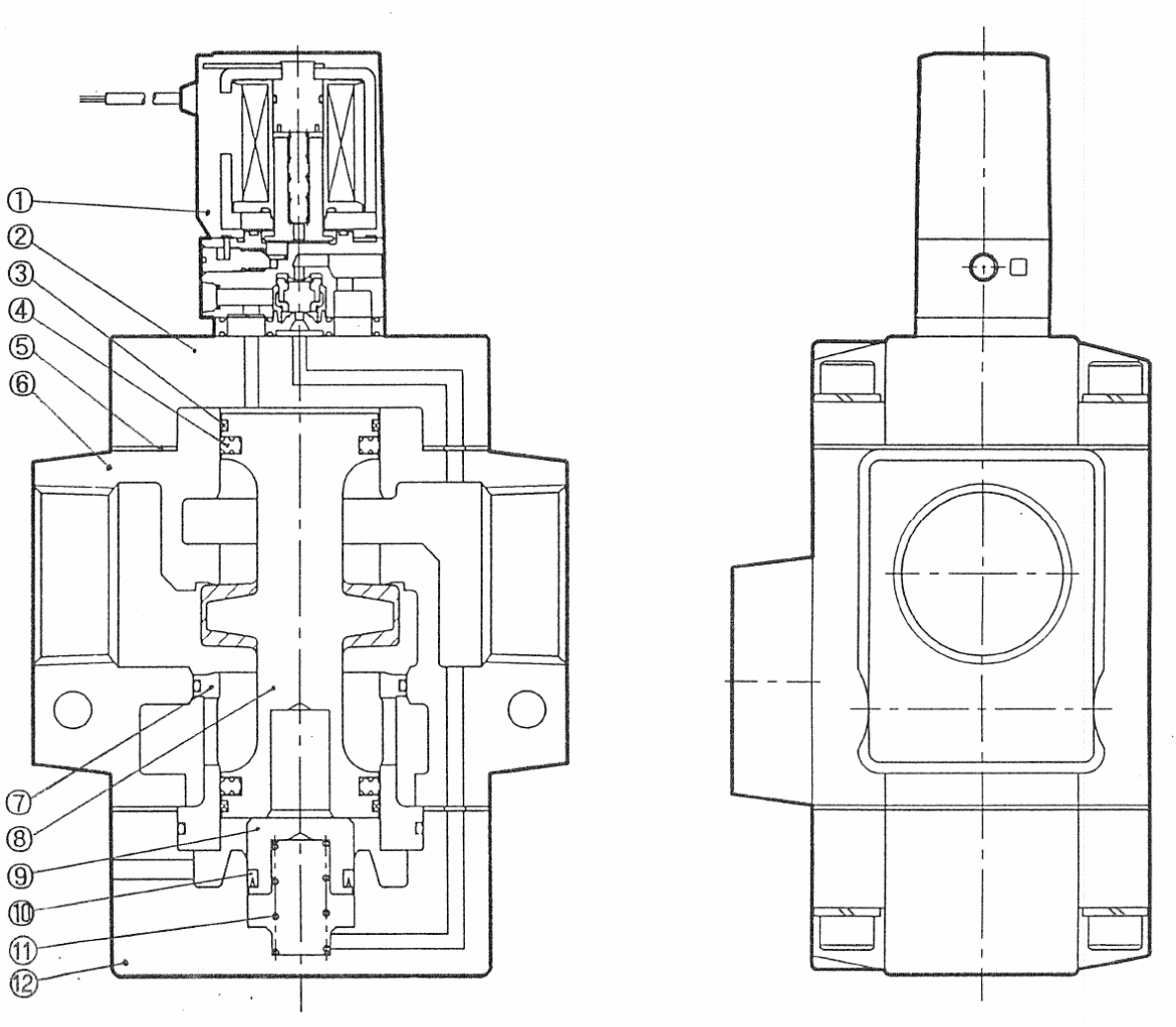
8. 1 Connection port size

No.	Part name	Qty
1	Solenoid valve	1
2	Stauffing	1
3	Piston	1
4	MY packing	1
5	Packing	2
6	Gasket	2
7	Body	1
8	Valve seat	1
9	Valve stem	1
10	Spring	1
11	Cap	1



8. 2 Connection port size： 20A to 25A

No.	Part name	Qty
1	Solenoid valve	1
2	Stauffing	1
3	Piston	2
4	MY packing	2
5	Packing	2
6	Gasket	1
7	Body	1
8	Valve seat	1
9	Valve stem	1
10	Spring	1
11	Cap	1



8. 3 Connection port size： 32A to 50A

No.	Part name	Qty
1	Solenoid valve	1
2	Stauffing	1
3	Piston	2
4	MY packing	2
5	Packing	2
6	Gasket	1
7	Body	1
8	Valve seat	1
9	Valve stem	1
10	Spring	1
11	Cap	1