



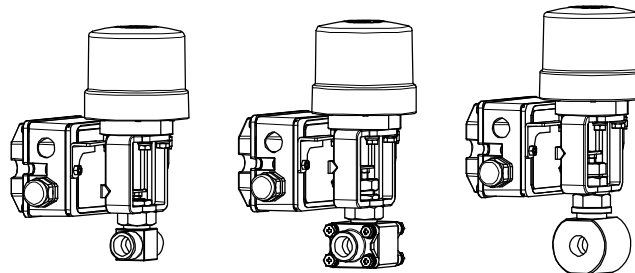
**Please read this manual before installation and use.**

**GENERAL**

Needle valve with pneumatic actuator. (linear)

**Actuator**

- Single-acting type
- PLO (Airless: SHUT)
- PLC (Airless: OPEN)



Threaded End Rc

Wafer

**Positioner**

EX type Lightweight and high-grade smart positioner.

Note) For the handling of EX type positioner, refer to the instruction manual of smart positioner.

**Valve**

- NS type For general use
- NH type 3 piece / For high pressure and high temp.
- NP type For Corrosive fluid

**PRODUCT CODE**

|                  |       |   |            |
|------------------|-------|---|------------|
| NS type (Linear) | □ □ □ | NS 9 0 5 U U F □ 0 □ □                        | - EX - □ □ |
| (EQ%)            | □ □ □ | NS 9 0 5 U U F X E 1 5                        | - EX - □ □ |
| NH type          | □ □ □ | NH 9 0 5 U U T □ 0 □ □                        | - EX - □ □ |
| NP type          | □ □ □ | NP 9 0 1 K K T □ 0 1 5                        | - EX - □ □ |
|                  |       | (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) | (12) (13)  |

|   |  |   |
|---|--|---|
| (1) Actuator<br>PLO<br>PLC                                | (6) Body material<br>U : SUS14A / SUS316<br>K : PEEK                                     | (10) Flow characteristics<br>0 : Linear<br>E : EQ%  |
| (2) Valve<br>NS<br>NH<br>NP                               | (7) Trim material<br>U : SUS316<br>K : PEEK  | (11) Size [mm]<br>ex. 10 A → 10   |
| (3) Voltage<br>9 : Air                                    | (8) Stem packing material<br>F : F-PTFE<br>T : PTFE                                      | (12) Option<br>54 : O-ring (NBR)  |
| (4) Sizing code<br>0 : Standard<br>1 : Light<br>2 : Heavy | (9) Cv value<br>S : 0.05<br>M : 0.13<br>L : 0.34<br>H : 0.8 (NP: 1.4)<br>X : 2 (NP: 0.8) | (13) Positioner control pattern (PLO)<br>C : OPEN by 20 mA ↔ SHUT by 4 mA (Airless: SHUT)<br>D : OPEN by 4 mA ↔ SHUT by 20 mA (Airless: SHUT) |
| (5) Connection<br>1 : JIS 10K<br>5 Threaded End Rc        |  | (13) Positioner control pattern (PLC)<br>E : SHUT by 4 mA ↔ OPEN by 20 mA (Airless: OPEN)<br>T : SHUT by 20 mA ↔ OPEN by 4 mA (Airless: OPEN) |

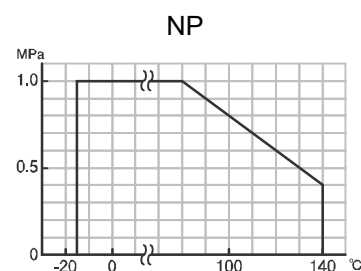
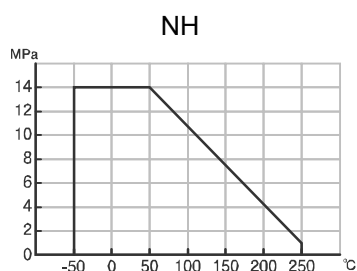
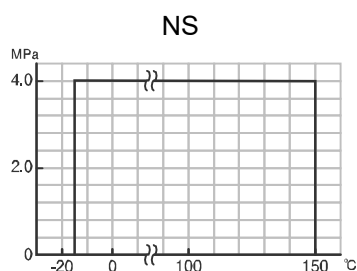
**VALVES SPECIFICATIONS**

Water 
 Oil 
 Air, Gas 
 Steam 
 Chemicals 
 Sea water 
 Slurry 
 Negative pressure

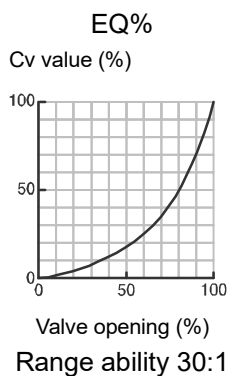
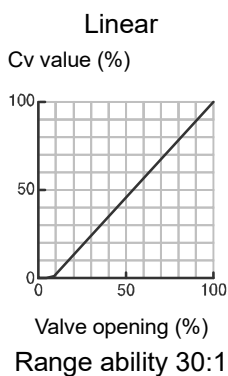
NS NH NP type

|                                   |         |                         |  |                    |
|-----------------------------------|---------|-------------------------|--|--------------------|
| Valve type                        |         | NS                      | NH   | NP                 |
| Design                            |         | 2-way                   | 2-way  | 2-way, Wafer       |
| Connection                        |         | Threaded End Rc         | Threaded End Rc  | JIS10K Flanged-end |
| Fluid                             |         |                         |  |                    |
| Max pressure                      |         | 4 MPa                   | 14 MPa   | 1 MPa              |
| Size [mm]                         |         | 10 to 15                | 10 to 15   | 15                 |
| Material                          | Body    | SCS14A                  | SUS316   | PEEK               |
|                                   | Trim    | SUS316                  | SUS316 + HCr PLTD  | PEEK               |
|                                   | Seat    | F-PTFE                  | SUS316   | None               |
| Stem seal                         | Packing | F-PTFE                  | PTFE   | PTFE               |
| Flow characteristics              |         | Linear EQ%              | Linear   | Linear             |
| Allowable Leak Rate (JIS B2005-4) |         | Bubble-tight (Class VI) | $10^{-4} \times$ rated Cv value or less. (Class IV or less.) |                    |

**PRESSURE & TEMPERATURE RATING**



**INHERENT FLOW CHARACTERISTIC**

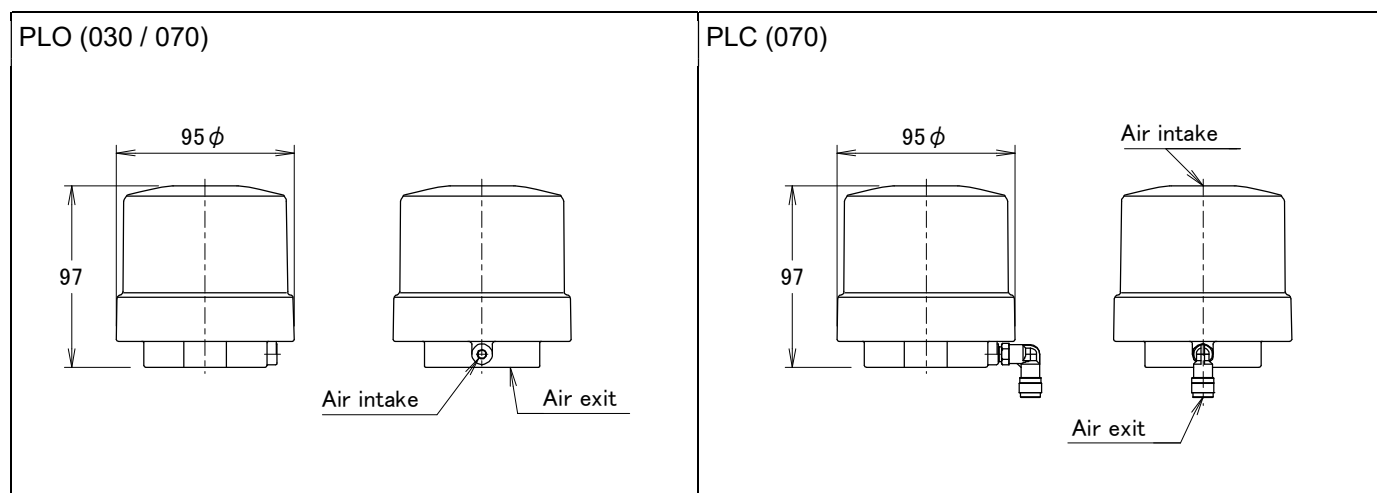


## PNEUMATIC ACTUATOR SPECIFICATIONS

PLO PLC type

|                                  |  |         |                   |
|----------------------------------|--|---------|-------------------|
| Classification                   | Single-acting type (Spring-return)   |         |                   |
| Actuator type                    | PLO-030  | PLO-070 | PLC-070           |
| Weight [kg]                      | 0.81   | 0.85    | 0.71              |
| Air consumption (round-trip) [ℓ] | 0.11   |         | 0.17              |
| Air exit                         | Bottom of pneumatic actuator   |         | Pneumatic Fitting |
| Operation time [s]               | Less than 1.   |         |                   |
| Operation                        | PLO : OPEN by air to intake port. ↔ SHUT by spring-return. (Airless: SHUT)<br>PLC : SHUT by air to intake port. ↔ OPEN by spring-return. (Airless: OPEN) |         |                   |
| Air pressure                     | 0.4 to 0.7 MPa   |         | 0.4 MPa           |
| Piping connection                | M5 × 0.8   |         |                   |
| Method of operation              | Linear motion  |         |                   |
| Housing material                 | PPS resin SCS13A   |         |                   |
| Ambient temperature              | -10 to 50 °C (Please be careful when you use in 5 °C or less, so that there no freeze.)  |         |                   |
| Manual operation                 | No manual operation.   |         |                   |

## DIMENSIONS



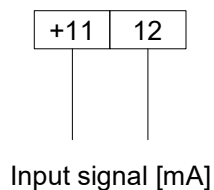
**PNEUMATIC ACTUATOR SPECIFICATIONS**

3 way valve: SHUT / Position①, OPEN / Position②

## POSITIONER

|                     |   |
|---------------------|---|
| Positioner type     | EX  |
| Input current       | 4 to 20 mA  |
| Air pressure        | 0.4 to 0.5 MPa (Max 0.7 MPa)                            |
| Piping connection   | Rc 1/8  |
| Hysteresis          | ≤ 0.3 %   |
| Sensitivity         | ≤ 0.1 %   |
| Delay time [s]      | < 0.5   |
| Ambient temperature | -10 to 50 °C  |
| Enclosure           | IP66  |
| Housing material    | Body: Polyphthalamide (Cover: Polycarbonate)            |
| Terminal block      | For 0.5 to 1.5 mm <sup>2</sup> wire Cage clamp terminal |
| Conduct port        | M20 × 1.5 G3/8 Cable gland (for Φ6 to 12 mm cable)      |
| Weight              | 0.5 kg  |
| Manufacturer        | SAMSON (Type 3725)                                      |

## WIRING



## POSITIONER OPERATION

|  | Code | PLO | PLC |
|--|------|-----|-----|
| OPEN by 20 mA. ↔ SHUT by 4 mA. (Airless: SHUT) | C    | ○   |     |
| OPEN by 4 mA. ↔ SHUT by 20 mA. (Airless: SHUT) | D    | ○   |     |
| SHUT by 4 mA. ↔ OPEN by 20 mA. (Airless: OPEN) | E    |     | ○   |
| SHUT by 20 mA. ↔ OPEN by 4 mA. (Airless: OPEN) | T    |     | ○   |

## INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS

### HANDLING & STORAGE

#### ①HANDLING

Do not drop or throw the product as it may break.

#### ②STORAGE

- Store away from dust, moisture and direct sunlight. If possible, store in the original package.
- Do not remove a dust proof cap until the piping.

#### ③CHECKING

- Check the product code before installation.
- Make sure that the bolts are not loose.

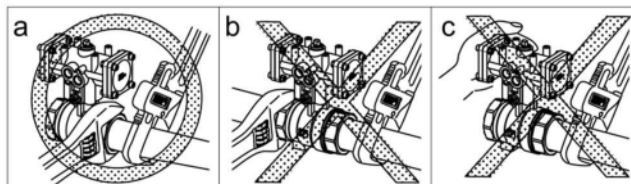
### INSTALLATION

#### ①PRECAUTIONS

- Flush the pipeline carefully before installing the valve. Foreign particles, such as sand or pieces of welding electrode, will damage the trim and seats.
- For valves with specified flow direction (NS, NH, NP), check the arrows on the product before piping.
- When the Cv value is small, the foreign object contained in the fluid causes blockage. Use a filter before the valve.

#### ②PIPING (NS, NH)

- Using a pipe with too long a thread will damage the valve.
- If sealing tape or sealant gets inside the valve, the valve seat leaks or malfunctions.
- To prevent the valve from being damaged by stress, always hang a wrench on the end of the valve on the side where the pipe is to be connected when screwing in the pipe or when unscrewing it after correcting the angle (Fig a and b) and do not use a pipe wrench on the valve. Do not apply force to the actuator when working on the piping. (Fig. c)



- Refer to the recommended tightening torque table and do not apply excessive torque.

| Valve size [mm] | Torque [N·m] |
|-----------------|--------------|
| 010             | 15 to 20     |
| 015             | 25 to 35     |

#### ③Flanged-end (NP)

- Use only rubber gasket for plastic flange.
- Use spring washer to prevent from decreasing surface pressure gasket when the temperature change happens frequently.
- Tighten all bolts using crossover method to load the joint evenly.
- Wafer type needle valve is put between two seats of flanged-end and tightened with long bolts.

#### ④SUPPORT (NP)

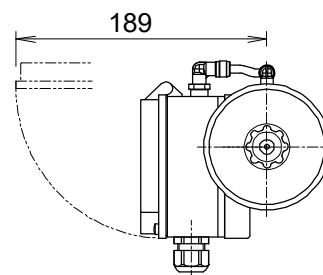
Use proper support to prevent distortion of the valve.

#### ⑤ENVIRONMENT

- Do not install in place where corrosive gas is present or where vibration is heavy (0.5 G or more).
- When radiant heat causes the surface temperature of the control unit to exceed 50 °C, provide an appropriate shielding plate.
- If there is a possibility that the fluid and drive part freeze, please take measures to prevent freezing.
- For single-acting type, prevent water and dust from coming into air exit.

#### ⑥POSITIONING

Should be positioned through 90° upward from horizontal. Provide space around the product to allow manual operation, inspection and replacement work.



Maintenance space  
(Top view of actuator)

**INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS****AIR PIPING**

- Piping of single-acting type is put seal tape only on the air intake port.
- Air supply port may be damaged if over tighten, please lightly tighten by hand.
- Never put anything on the actuator or make it into a foothold.

**OPERATION**

## ①AIR SOURCE

- Use the filtered dry air (less than 40 μ).
- Extra attention is needed where it's cold climate (below 5 °C).
- When air pressure is high, reduce it to standard pressure (0.4 to 0.5 MPa). Air pressure should not exceed 0.7 MPa during operation test.
- Capacity of compressor and air tank are to be calculated by capacity of piping and air consumption. A margin of 30 % is required.

## ②TESTING

After piping, check following points.

- Piping is correct.
- Air or fluid leakage from connection. Flow direction of air is correct.
- Air pressure is in the range.

**MANUAL OPERATION**

Manual operation is not possible.

**MAINTENANCE**

- Do the routine maintenance at least once in half a year.
- Do not set or take spring unit parts apart after installing the pneumatic single-acting actuator.

Can be used with no oil supply.

- Confirm the air leakage.
- Confirm the air supply pressure.
- Confirm the dirt or grit inside of cylinder.

Inspection items

- Confirm operation of opening and closing.
- Confirm whether screws are loose or not.
- Confirm the fluid temperature or pressure.
- Confirm the leak from valve stem.

**TROUBLESHOOTING**

| Problem                   | Cause   | Solution                                    |
|---------------------------|---|---|
| Fail to operate.          | Air doesn't come out.   | Supply air.                                 |
|                           | Air pressure is too low.  | Adjust to standard pressure level.          |
| Stop in the mid position. | <ul style="list-style-type: none"> <li>• Biting of valve seat.</li> <li>• The scale has adhered to the valve trim.</li> </ul> | Remove a foreign object.                    |
|                           |   | Clean or replace valve parts.<br>NH         |
| Leakage from valve body   | <ul style="list-style-type: none"> <li>• Valve cap get loose.</li> <li>• Valve body is damaged.</li> </ul>                    | Replace the valve.<br>NS NP                 |
| Leakage from valve seat   | Seat is worn or damaged.  | Replace the valve.<br>Replace the actuator. |
| Leakage from valve trim   | Packing is worn or distorted.   | Replace the valve.                          |
|                           |   | Tighten the gland nut.<br>NH                |

Note) Needle valve product repair must be done at our factory.

For more information contact  
NIPPON VALVE CONTROLS, INC. for consultation.