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for Future Generations




# YT-400 / 405 / 430 / 435 Series

## Lock-up Valves

Product manual

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# 1 Introduction

## 1.1 General Information for the users

Thank you for purchasing Rotork YTC Limited products. Each product has been fully inspected after its production to offer you the highest quality and reliable performance. Please read the product manual carefully prior to installing and commissioning the product.

- Installation, commissioning, and maintenance of the product may only be performed by trained specialist personnel who have been authorized by the plant operator accordingly.
- The manual should be provided to the end-user.
- The manual can be altered or revised without any prior notice. Any changes in product's specification, design, and/or any components may not be printed immediately but until the following revision of the manual.
- The manual should not be duplicated or reproduced for any purpose without prior approval from Rotork YTC Limited, Gimpo-si, South Korea.
- In case of any other problems that are not stated in this manual, please make immediate contact to Rotork YTC Limited.

## 1.2 Manufacturer Warranty

- For the safety, it is important to follow the instructions in the manual. Manufacturer will not be responsible for any damages caused by user's negligence.
- Any modifications or repairs to the product may only be performed if expressed in this manual. Injuries and physical damages caused by customer's modifying or repairing the product without a prior consultation with Rotork YTC Limited will not be compensated. If any alterations or modifications are necessary, please contact Rotork YTC Limited directly.
- Standard type with NBR rubber (ambient temperature range option 1) is subject to damage by ozone. If you suspect that ozone may be present at the site or if supplied air is likely to contain ozone, select a high temperature version (ambient temperature range option 2) or a low temperature version (ambient temperature range option 3) with SILICONE rubber.
- The warranty period for the product is (12) months from the date of shipment unless otherwise stated. Customers can extend the warranty period by an additional (12) months by registering the product's serial number or lot number, customer information, and installation address on the warranty extension application site Product Registration (https://www.rotork.com/en/service/product-registration).
- Manufacturer warranty will not cover products that have been subjected to abuse, accidents, alterations, modifications, tampering, negligence, misuse, faulty installation, lack of reasonable care, repair or service in any way that is not contemplated in the documentation for the product, or if the model or serial number has been altered, tampered with, defaced or removed; damages that occurs in shipment, due to act of God, failure due to power surge, or cosmetic damage. Improper or incorrectly performed maintenance will void this limited warranty.

- For detailed warranty information, please contact the corresponding local Rotork YTC Limited office or main office in South Korea.

# 2 Product Description

## 2.1 General

The lock-up valve detects the plant's main pneumatic pressure as a signal pressure, and when the signal pressure drops below the set pressure, it blocks the flow path inside the lock-up valve to completely block the flow of pneumatic pressure. For general use, it is installed on the control valve, and when the main pneumatic pressure from the plant compressor is lower than the required pressure due to power failure or pipe breakage. It basically senses and blocks the flow path between the actuator and the positioner to maintain the current valve opening.

## 2.2 Main Features and Functions

- It can be installed using only piping without a separate bracket.
- Hysteresis is below 0.01 MPa.
- Built-in 80 mesh screen prevents foreign matter from entering and prevents malfunction.
- Highly corrosion-resistant polyester powder coated aluminum body or stainless steel body for high durability in various environments.

## 2.3 Label Description

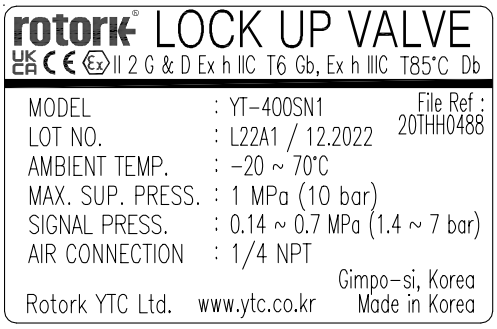



Fig. L-1: YT-400 (UKEX, ATEX)

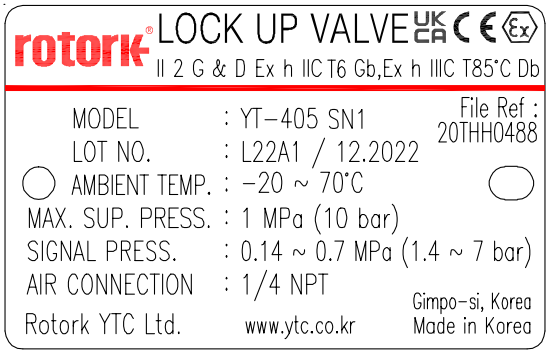



Fig. L-3: YT-405 (UKEX, ATEX)

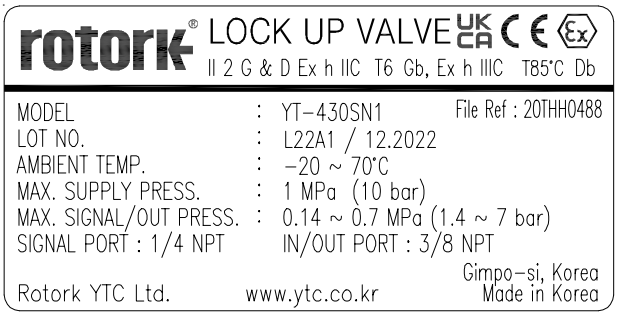



Fig. L-5: YT-430 (UKEX, ATEX)

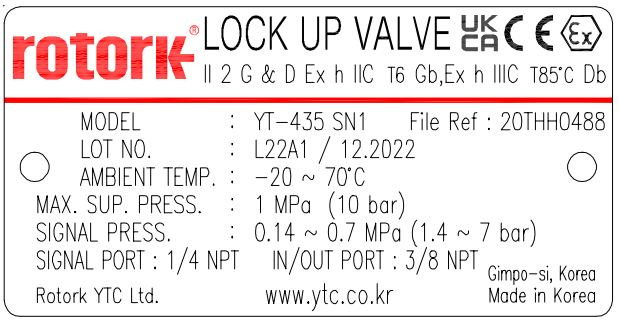



Fig. L-7: YT-435 (UKEX, ATEX)

- MODEL : Indicates the model number and additional symbols.
- LOT NO. : Indicates unique lot number.
- MONTH.YEAR : Indicates manufactured month and year.
- AMBIENT TEMP. : Indicates the allowable ambient temperature.
- MAX. SUPPLY : Indicates max. supply air pressure level.
- SIGNAL PRESSURE : Indicates the signal pressure range.
- AIR CONNECTION : Indicates connection thread type.

## 2.4 Product Code

**YT-400 / 405 / 430 / 435 [1] [2] [3]**

| | | |
|---|---|---|
| [1] | Acting type | S : Single acting<br>D : Double acting |
| [2] | Air Connection type | P : Rc : N/A for YT-405 / 430 / 435<br>N : NPT |
| [3] | Ambient Temperature | 1 : -20 to 70 °C (-4 to 158 °F)<br>2 : -20 to 120 °C (-4 to 248 °F)<br>3 : -40 to 70 °C (-40 to 158 °F)<br>4 : -50 to 70 °C (-58 to 158 °F) |

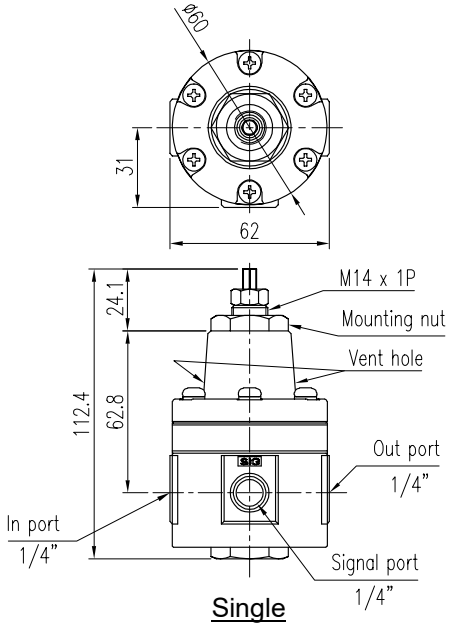
## 2.5 Product Specification

| **Model** | | **YT-400** | **YT-405** | **YT-430** | **YT-435** |
|---|---|---|---|---|---|
| **Max. Supply Pressure** | | Max. 1 MPa (10 bar) | | | |
| **Signal Pressure Setting Range** | | 0.14 to 0.7 MPa (1.4 to 7 bar) | | | |
| **Hysteresis** | | Below 0.01 MPa (0.1 bar) | | | |
| **Flow Capacity (CV)** | | 0.9 | | 1.8 | |
| **Input / Output Connection** | | Rc 1/4 or 1/4 NPT | 1/4 NPT | 3/8 NPT | |
| **Signal Connection** | | Rc 1/4 or 1/4 NPT | 1/4 NPT | 1/4 NPT | |
| **Ambient Temperature** | **Standard** | -20 to 70 °C (-4 to 158 °F) | | | |
| | **High** | -20 to 120 °C (-4 to 248 °F) | | | |
| | **Low** | -40 to 70 °C (-40 to 158 °F) | | | |
| | **Arctic** | -50 to 70 °C (-58 to 158 °F) | | | |
| **Housing Material** | | Aluminum | Stainless Steel 316 | Aluminum | Stainless Steel 316 |
| **Weight** | **Single** | 0.47 kg (1.1 lb) | 1.3 kg (2.2 lb) | 1.5 kg (3.3 lb) | 3.3 kg (7.3 lb) |
| | **Double** | 0.66 kg (1.5 lb) | 1.5 kg (3.3 lb) | 2.7 kg (6 lb) | 5.8 kg (12.8 lb) |

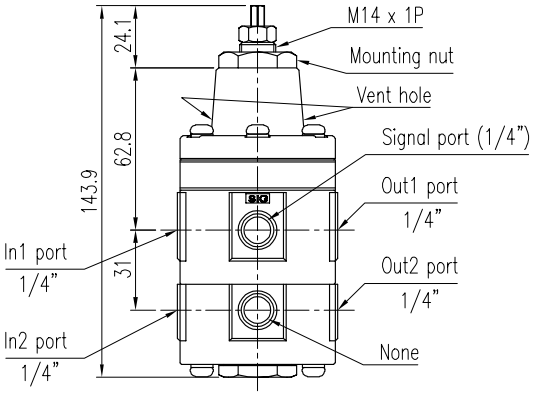
⚠ Tested under ambient temperature of 20 °C, absolute pressure of 760 mmHg, and humidity of 65 %.
Please contact Rotork YTC Limited for detailed testing specification.

## 2.6 Product Dimension

### 2.6.1 YT-400 / 405

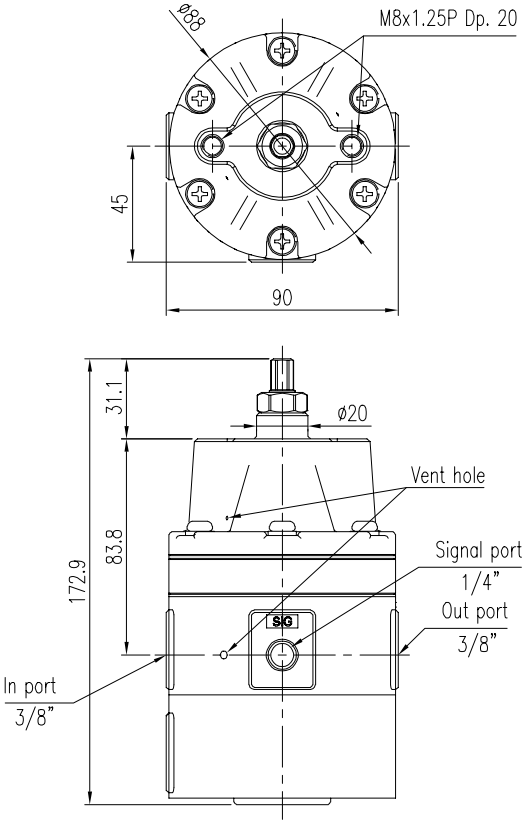



Single

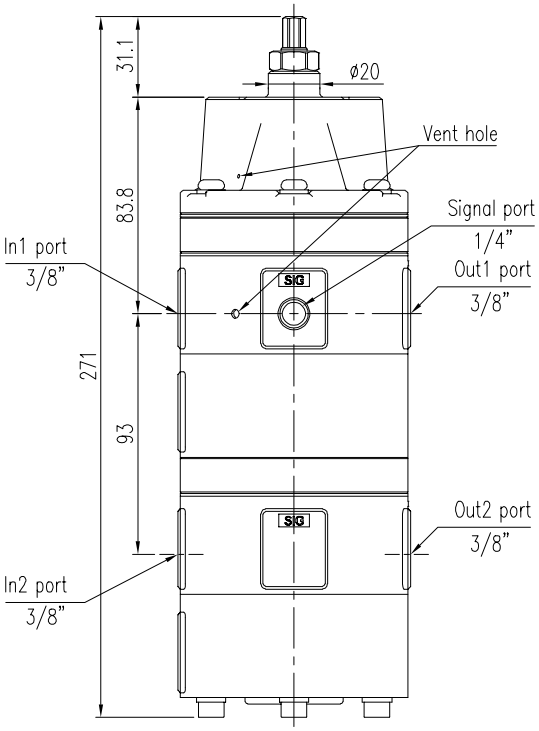



Double

### 2.6.2 YT-430 / 435

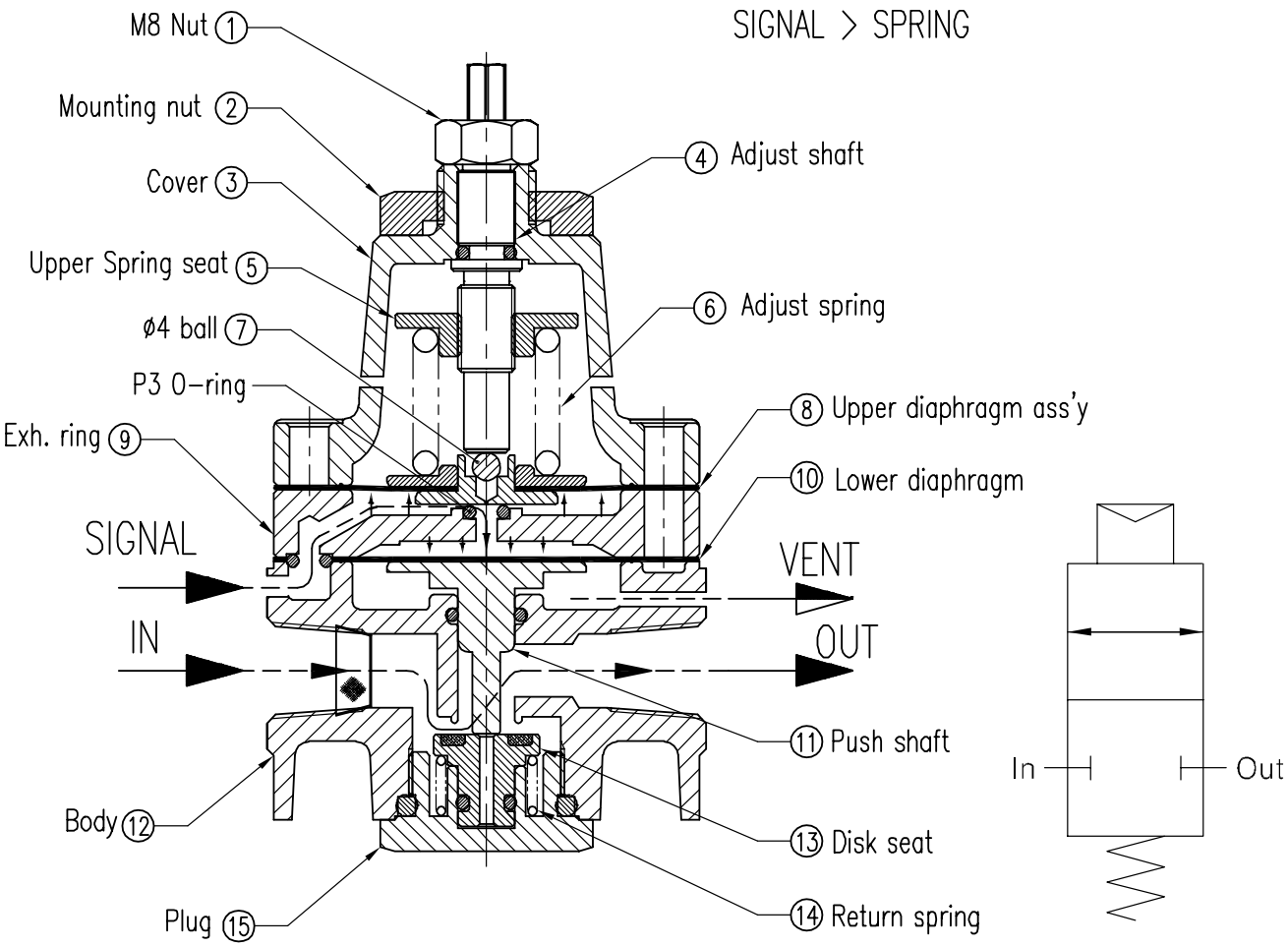



Single




Double

## 2.7 Operation Logic



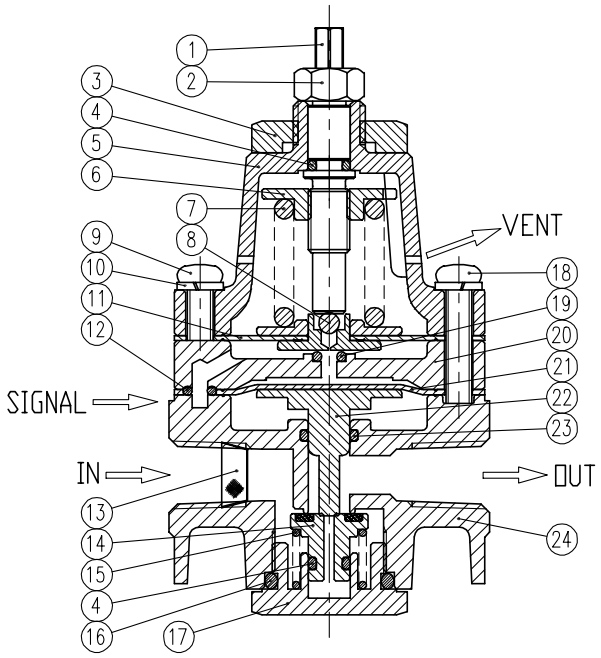

If the signal pressure is larger than the setting pressure (⑥adjustment spring force), the signal pressure lifts the ⑧upper diaphragm assembly upward. The signal pressure pushes the ⑪push shaft and ⑬disc seat down while pushing the ⑩lower diaphragm through the middle hole. As a result, the IN port is connected to the OUT port.

On the contrary, if the signal pressure is smaller than the setting pressure (⑥adjustment spring force), ⑧the upper diaphragm assembly will come down and the signal pressure will not go to the ⑩lower diaphragm, and the ⑦Ø4 ball will be separated from the ⑧upper diaphragm assembly. As a result, the air that has pushed down through the ⑩lower diaphragm is exhausted through the ⑦Ø4 ball, and the ⑭return spring raises the ⑬disc seat. As a result, the IN and OUT ports are blocked.

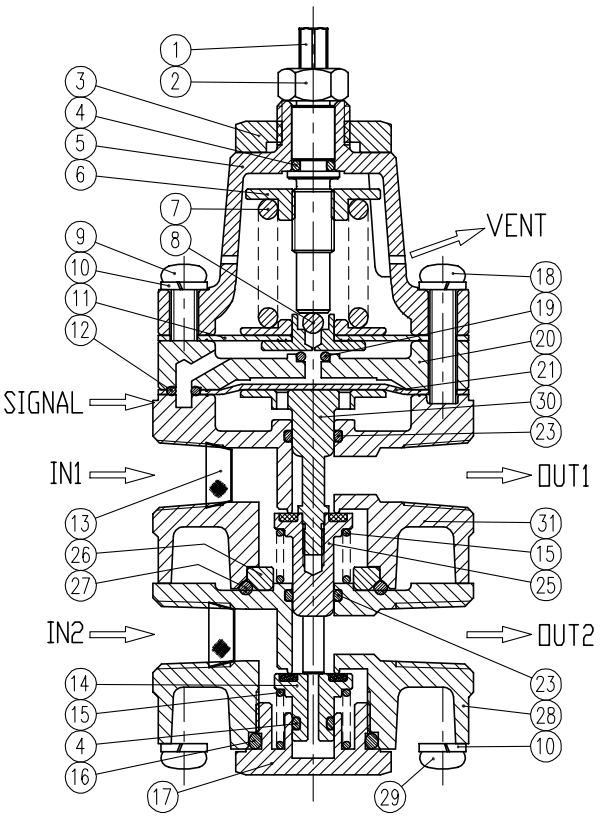
## 2.8 Section drawings

### 2.8.1 YT-400 / 405

Single




Double



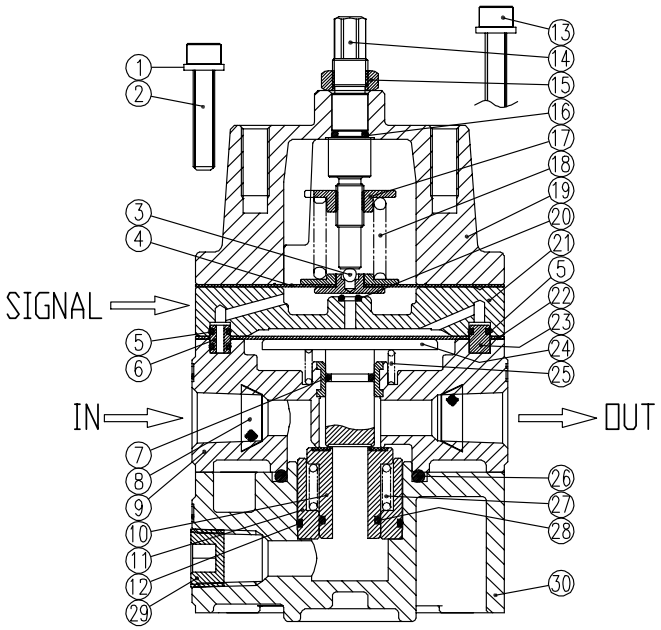

| NO. | PART NAME |
|---|---|
| 1 | ADJUST SHAFT |
| 2 | NUT (M8x1P) |
| 3 | MOUNTING NUT |
| 4 | O-RING (P5) |
| 5 | BASE COVER |
| 6 | UPPER SPRING SEAT |
| 7 | ADJUST SPRING |
| 8 | BALL(ø4) |
| 9 | BOLT (M5x27, RH, 후가공) |
| 10 | SPRING WASHER (M5) |

| NO. | PART NAME |
|---|---|
| 11 | UPPER DIAPHRAGM ASS'Y |
| 12 | O-RING(P3) |
| 13 | SCREEN (80MESH, 1/4") |
| 14 | LOWER SEAT |
| 15 | RETURN SPRING |
| 16 | O-RING (G20) |
| 17 | PLUG |
| 18 | BOLT(M5x30, RH, W/S) |
| 19 | O-RING (P3) |
| 20 | EXHAUST RING |

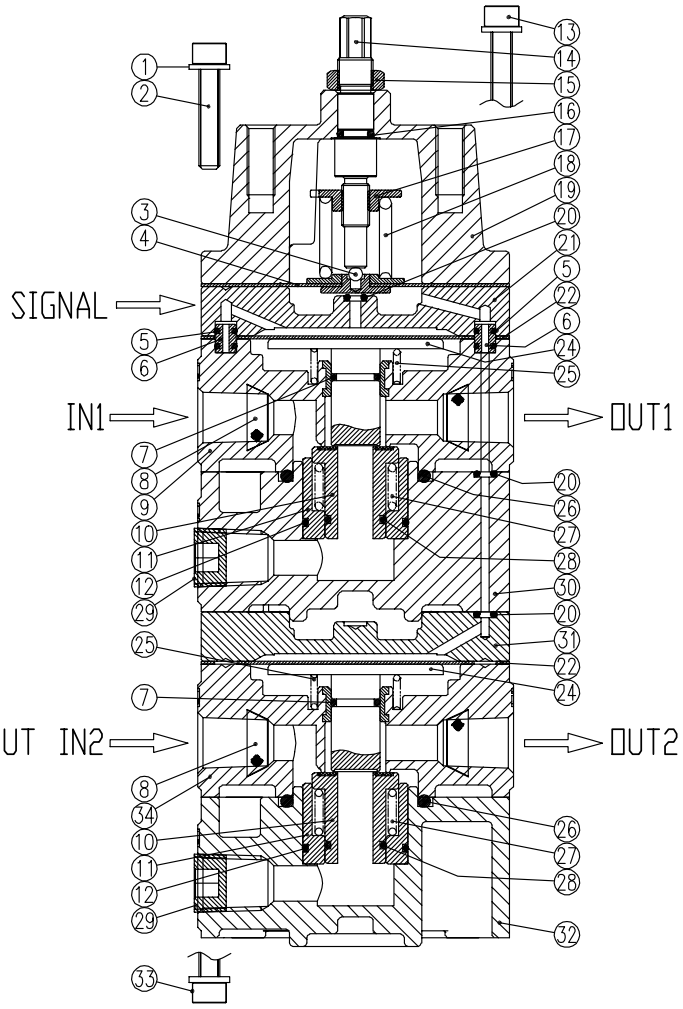
| NO. | PART NAME |
|---|---|
| 21 | LOWER DIAPHRAGM |
| 22 | SINGLE PUSH SHAFT |
| 23 | O-RING (P8) |
| 24 | SINGLE BASE BODY |
| 25 | LOWER PUSH SHAFT |
| 26 | SPRING BUSH |
| 27 | O-RING (AN119) |
| 28 | LOWER BASE BODY |
| 29 | BOLT (M5x40, RH) |
| 30 | DOUBLE PUSH SHAFT |
| 31 | UPPER BASE BODY |

## 2.8.2 YT-430 / 435

Single




Double




| NO. | PART NAME |
|---|---|
| 1 | SPRING WASHER (M6) |
| 2 | BOLT (M6*30, WH) |
| 3 | BALL(ø4) |
| 4 | UPPER DIAPHRAGM ASS'Y |
| 5 | O-RING (S4) |
| 6 | SIGNAL TUBE-1 |
| 7 | O-RING (P10) |
| 8 | SCREEN |
| 9 | BASE BODY-1 |
| 10 | SEAT |
| 11 | LOWER BODY INSERT |

| NO. | PART NAME |
|---|---|
| 12 | O-RING (S26) |
| 13 | BOLT (M6*70, WH) |
| 14 | ADJUST SHAFT |
| 15 | LOCK NUT |
| 16 | O-RING (P7) |
| 17 | UPPER SPRING SEAT |
| 18 | ADJUST SPRING |
| 19 | BASE COVER |
| 20 | O-RING (P3) |
| 21 | EXHAUST RING-1 |
| 22 | LOWER DIAPHRAGM |

| NO. | PART NAME |
|---|---|
| 23 | SIGNAL TUBE-2 |
| 24 | PUSHER |
| 25 | PUSHER SPRING |
| 26 | O-RING(P36) |
| 27 | SEAT SPRING |
| 28 | O-RING(AN015) |
| 29 | PLUG (NPT 3/8") |
| 30 | LOWER BODY-1 |
| 31 | EXHAUST RING-2 |
| 32 | LOWER BODY-2 |
| 33 | BOLT (M6*110, WH) |
| 34 | BASE BODY-2 |

# 3 Installation

## 3.1 Safety

When installing a unit, please ensure to read and follow safety instructions.

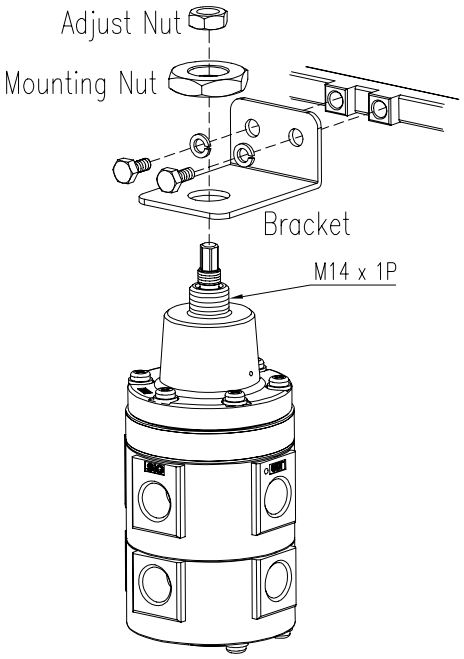
- Be sure to have protective equipment and comply with safety regulations.
- Use within specifications specified in the manual. Exceeding the specification may result in damage to the product or accident.
- The supply pressure must be clean, dry air and non-corrosive gas and must be filtered.
- Do not let impurities or foreign materials enter the lock-up valve, especially to the signal pressure port.



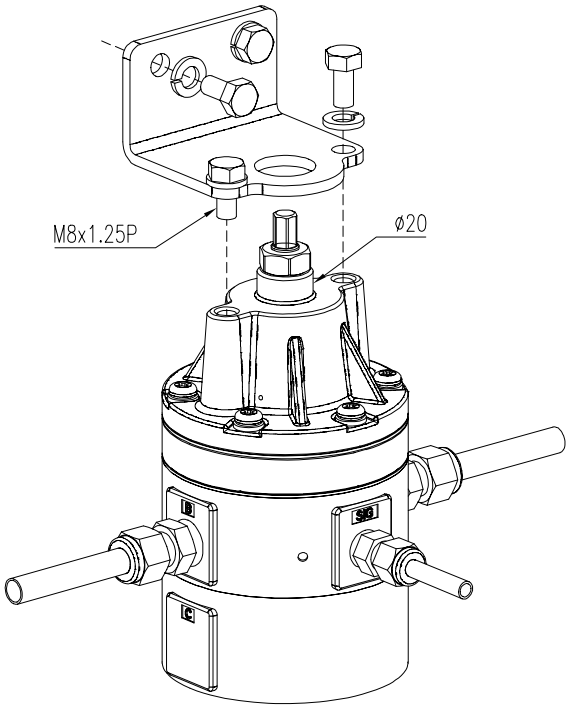
- Do not apply the signal pressure beyond the specified specification after piping connection. If the signal pressure exceeds the specified specification, the diaphragm may be damaged and the product may malfunction.
- When adjusting the set pressure after installation, temporarily install a pressure gauge or other equipment that can read the signal pressure and adjust the set pressure while reading the signal pressure. If the set pressure is adjusted without an instrument such as a pressure gauge, the product may be damaged by exceeding the specified specification or turning the adjustment screw too much.
- Be sure that the difference between setting pressure and signal pressure is over 0.1MPa.
- After setting the pressure, secure the nut so that the adjustment bolt does not turn.
- If there is any impact on the product, it may cause malfunction or failure, so be careful during handling, installation and operation.

## 3.2 Installation

- The lock up valve can be installed with or without a bracket depending on the field conditions. The product can be installed using only pneumatic piping without a separate bracket.
- If you require brackets for installation, you can check the dimensions mentioned in the diagram on previous page and make the desired bracket type to suit each models. Below is an example of the lock up valve with bracket installation.



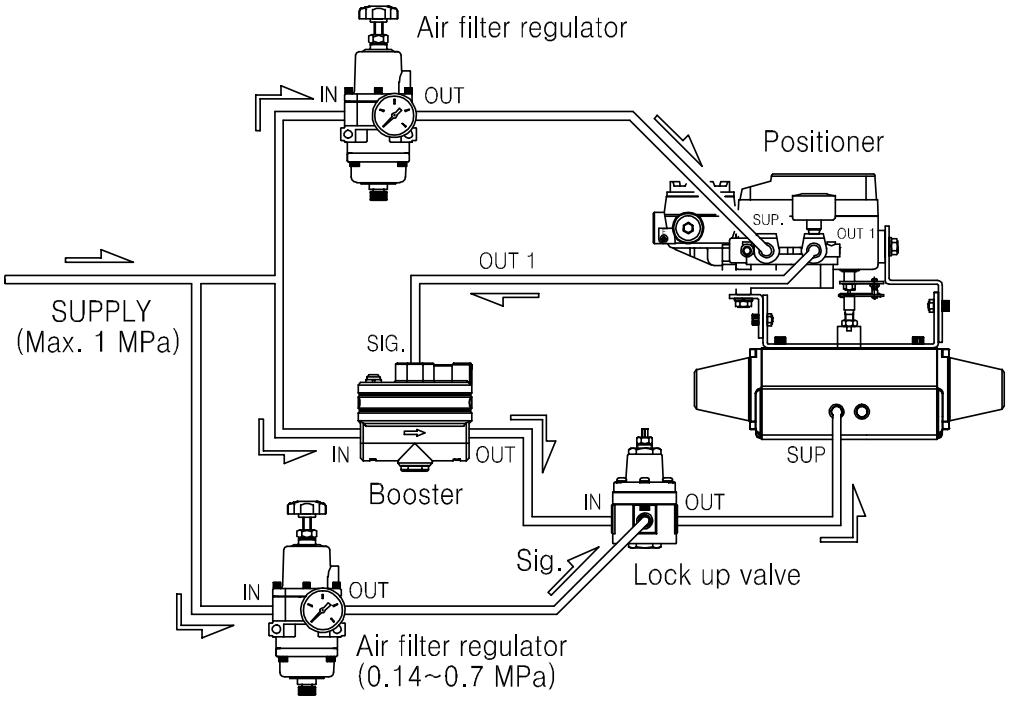

YT-400 / 405



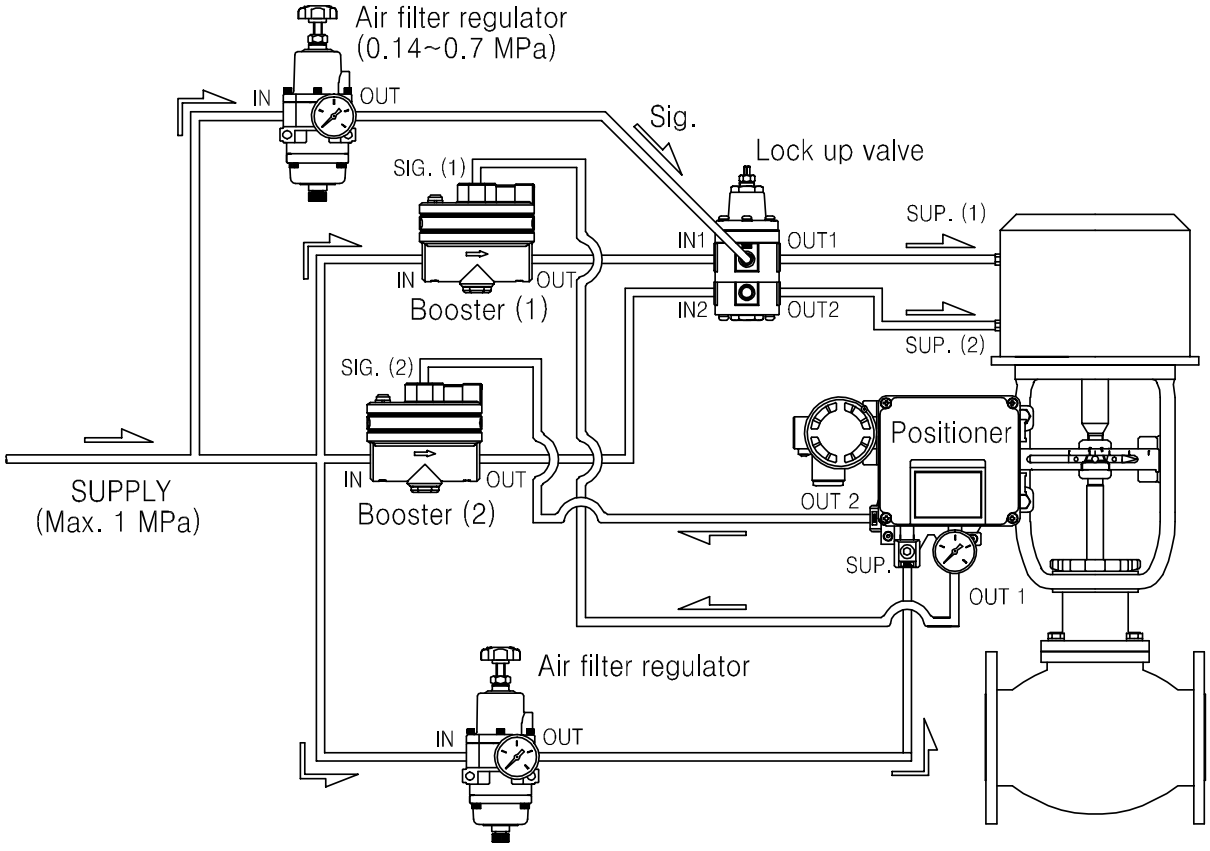

YT-430 / 435

- Before connecting, be sure to blow out all piping to prevent impurities from entering in to the product and ensure that it is the right size meeting the required capacity.
- Turning the adjustment bolt clockwise increases the signal pressure setting.

## 3.3 Installation Example




Single




Double

# 4 Maintenance

## 4.1 Replacement of Parts (Repair kit)

The lock up valves require regular maintenance. If necessary, replace the following part.

- Upper diaphragm ass'y : 1 ea

## 4.2 Replacing Upper diaphragm ass'y

1) When replacing the upper diaphragm ass'y, the main supply pressure to the product must be shut down completely.
2) Loosen the nut of the adjust bolt and turn the adjust bolt counterclockwise until it does not feel repulsive force.
3) Unscrew 6 bolts on spring case assembly in diagonal direction.
4) Replace the upper diaphragm assembly with a new one and be careful not to lose the 4-pie steel ball on the top diaphragm assembly and the O-ring (P3) on the bottom.
5) Lock the six bolts back on the base cover. Be careful not to damage the diaphragm due to excessive torque when tightening.
6) Turn the adjust bolt to adjust the signal pressure setting. Then, lock the locking nut.

# 5 Trouble-Shooting

- Lock up valve does not block pressure when signal pressure is lower than setting pressure level.
  ➔ Please check if the setting pressure level is correct. If the setting pressure level is extremely high, please lower the setting pressure level. The factory default setting pressure level is 0.3 MPa

- Lock up valve blocks pressure when signal pressure is higher than setting pressure level.
  ➔ Please check if the setting pressure level is correct. If the setting pressure level is extremely low, please raise the setting pressure level.

- When the air pressure is continuously discharged from the exhaust hole of the base cover.
  ➔ The upper diaphragm may be damaged or foreign material may be attached to the steel ball placed in the middle of the upper diaphragm assembly. Replace the upper diaphragm assembly or clean any debris from the steel ball and reassemble.

- When the air pressure is continuously discharged from the exhaust hole in the lock-up valve body.
  ➔ The inner rubber part may be damaged. Please contact our Customer Support Department for repair.

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