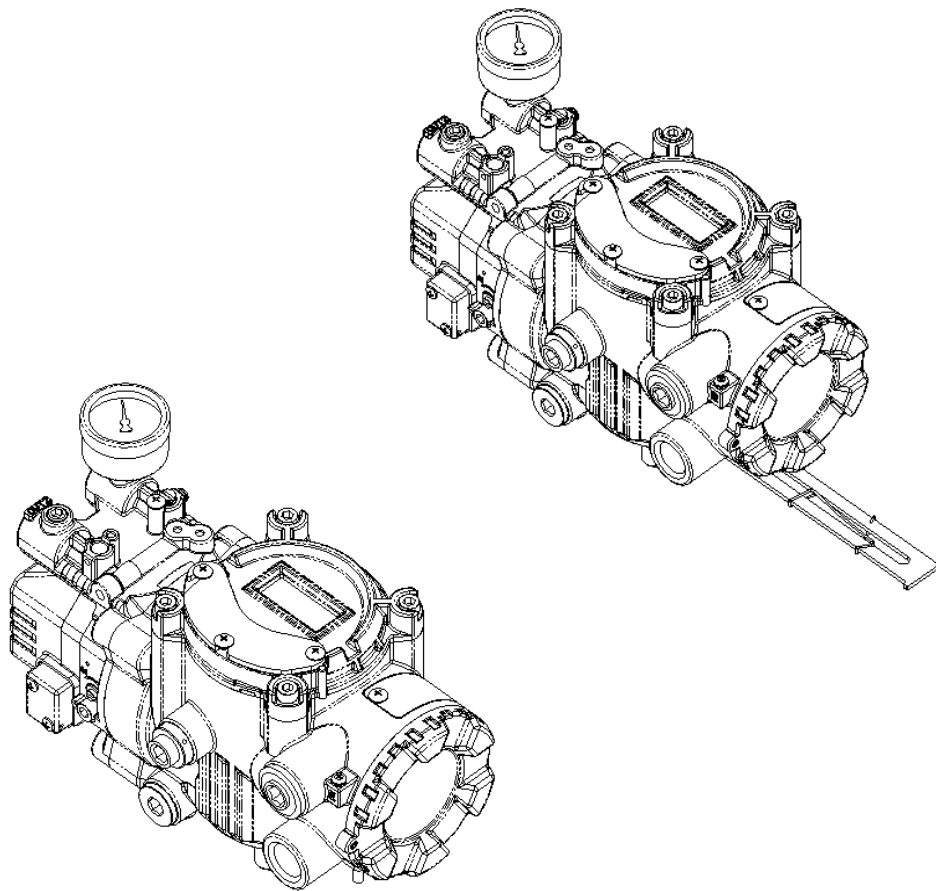




SMART POSITIONER

YT-3400 SERIES



USER'S MANUAL



V.1.02

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Introduction

Thank you for choosing OMC product. Each product is fully inspected after the production to offer you the highest quality. In order to fully utilize the product, we strongly recommend users to read the manual carefully and fully understood.

- 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, structure, and/or any components may not result immediate revised version of the manual.
- The manual should not be duplicated or reproduced for any purpose without any approval from OMC s.r.l.

Manufacturer Warranty

- For the safety, it is imperative to follow instructions in the manual. It is not manufacturer's liability for any damages which caused by users' negligence.
- It is not manufacturer's liability for any damages or accidents which resulted by any alteration or modification of the product and parts. If alteration or modification is necessary, please contact the manufacturer directly.
- Manufacturer warrants the product from the date of original retail purchase of the product for one (1) year, except as otherwise stated.
- Manufacturer warranty will not cover the products that the product have been subjected to abuse, accident, alteration, modification, 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, and cosmetic damage. Improper or incorrectly performed maintenance or report voids this Limited Warranty.
- For detailed warranty information, please contact the corresponding local OMC s.r.l.

Explosion Proof Warning

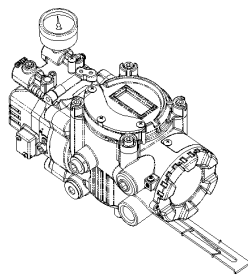
- Please ensure the unit is being used and installed in explosion proof certified environment.
- YT-3400 series' explosion proof grade is Ex D IIC T6. It can be used in zone 1 and 2.
- Explosion proof type cable and gasket shall be used, when explosion gases are present at the site.
- Power should be off completely when opening the cover. When opening the cover, please ensure that there is no remaining power in any electrical parts.
- YT-3400 series have 2 ports for power. Explosion proof type wires and packing should be used. Blind plug should be used when the port is not being used.



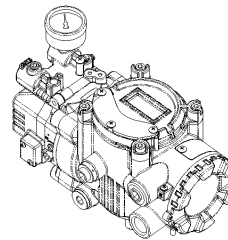
- When connecting the power, cable rug with surface area of more than 0.195mm^2 with M4 spring washer. For external ground terminal, cable rug with surface area of more than 5.5mm^2 should be used.

Product Description

YT-3400 Smart Valve Positioner accurately controls valve stroke, according to input signal of 4-20mA, which is being input from the controller. In addition, built-in micro-processing operator optimizes the positioner's performance and provides unique functions such as Auto calibration, PID control, Alarm, and Hart protocol.



YT-3400L



YT-3400R

Main Features and Functions

1. LCD display enables users to monitor the status of the positioner.
2. The positioner operates normally even if there are sudden changes in supply pressure and in high vibration environment.
3. The method of Auto Calibration is very simple.
4. Due to the small size of the positioner, it can be installed on a small actuator.
5. Low air consumption level and low voltage use (8.5V) yield to lower operating cost. The positioner is compatible with most of controllers.
6. Variable orifice can minimize the hunting occurrence and optimize operating condition.
7. Various sets of information can be interchanged by HART communication protocol between a valve and a positioner.
8. Valve system becomes more stable by outputting analog feedback signal.
9. Various characteristics of valve can be adjusted – Linear, Quick open, and Equal percentage.
10. Tight Shut – Close and Shut-Open can be set.
11. PID parameters can be adjusted in the field without any additional communicator.
12. A/M switch can change the flow of the pressure, whether to send directly to actuator or to operate by positioner.
13. Split range 4-12mA or 12-20mA can be set.
14. Hand calibration function can be set Zero and Span values.
15. It has IP66 protection grade.



16. Air filter regulator can be attached with only one linear nipple. It does not require extra piping.
17. Epoxy polyester powder coating resists against the corrosion process.
18. Maintenance of the positioner is easy because of modularized inner structure.

Label Description

| | |
|--------------------------|-----------------------------------------------------|
| Model Number: | Indicates model name and any option (if any). |
| Explosion Proof: | Indicates the protection grade. |
| Input Signal: | Indicates current input signal range. |
| Operating Temperature: | Indicates ambient temperature for normal operation. |
| Supply Pressure: | Indicates the range of supply pressure. |
| Protection of Enclosure: | Indicates the IP grade |



Suffix Symbol

YT-3400 series follows suffix symbols as follows.

YT-3400 [1] [2] [3] [4] [5] [6] [7]

| | | | |
|----------------------------------|---|---|--------------------|
| [1] Motion Type | L | : | Linear |
| | R | : | Rotary |
| [2] Acting Type | S | : | Single Acting |
| | D | : | Double Acting |
| [3] Explosion Proof | C | : | Ex dIIC T6 |
| [4] Feedback Lever (YT-3400L) | 1 | : | 10 ~ 40 mm |
| | 2 | : | 20 ~ 70 mm |
| | 3 | : | 50 ~ 100 mm |
| | 4 | : | 100 ~ 150 mm |
| [4] Feedback Lever (YT-3400R) | 1 | : | M6 X 40L |
| | 2 | : | M6 X 63L |
| | 3 | : | M8 X 40L |
| | 4 | : | M8 X 63L |
| | 5 | : | NAMUR Standard |
| [5] Connection Type | 1 | : | PT 1/4 |
| | 2 | : | NPT 1/4 |
| [6] Communication | 0 | : | None |
| | 2 | : | HART Communication |
| [7] Option | 0 | : | None |
| | 1 | : | PTM |
| | 2 | : | L/S |
| | 3 | : | PTM + L/S |



- Explosion proof certification is currently in progress.

Specification

| Model | YT-3400L | | YT-3400R | |
|--------------------------|-----------------------------------------------|--------|----------|--------|
| Acting Type | Single | Double | Single | Double |
| Input Signal | 4~20mA DC | | | |
| Minimum Current Signal | 3.2mA(Standard), 3.8mA(Hart Included) | | | |
| Supply Pressure | 1.4~7kgf/cm ² (0.14~0.7 MPa) | | | |
| Stroke | 10 - 150 mm | | 60 - 90° | |
| Impedance | Max.500 Ohm/20mA DC | | | |
| Air Connection | PT 1/4, NPT 1/4 | | | |
| Gauge Connection | PT 1/8, NPT 1/8 | | | |
| Conduit Entry | PF(G) 1/2(Standard), NPT1/2(Option) | | | |
| Explosion Proof | Ex d IIC T6 | | | |
| Ambient Temperature | Explosion Proof :-40~70℃, Operating :-40~80℃ | | | |
| Linearity | ±0.5% F.S. | | | |
| Hysteresis | 0.5% F.S. | | | |
| Sensitivity | ±0.2% F.S. | | | |
| Repeatability | 0.3% F.S. | | | |
| Flow Capacity | 70 LPM | | | |
| Air Consumption | Below 2 LPM (sup=1.4K), Below 3 LPM (sup.=7K) | | | |
| LCD Temp. Condition | Storage Temp:-30~85℃, Operating Temp:-10~70℃ | | | |
| Output Characteristic | Linear, Quick Open, EQ%, User Set (16 Point) | | | |
| Vibration Effect | 6G | | | |
| Humidity | 5-95% RH at 40℃ | | | |
| Communication (Option) | HART Communication | | | |
| Feedback Signal (Option) | 4-20mA (DC 10 - 30V) | | | |
| Material | Aluminum Diecasting | | | |
| Weight | 3.4 kg (7.5 lb) | | | |
| Painting | Epoxy Polyester Powder Coating | | | |
| Color | Black | | | |

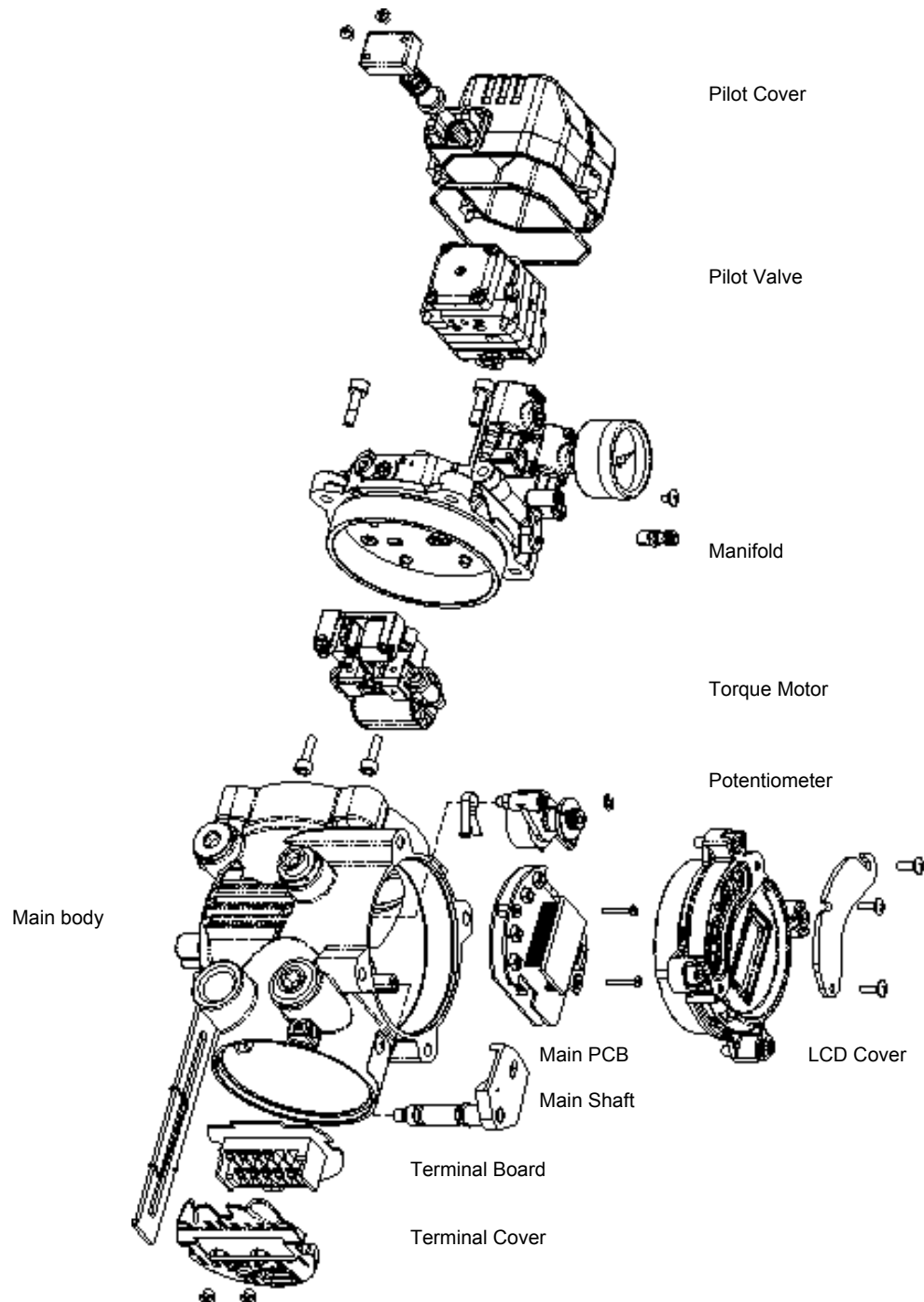
* Tested under ambient temperature of 20℃, absolute pressure of 760mmHg, and humidity of 65%. Please contact OMC for the more detailed specification.

* Explosion Proof certification is in progress. Please contact OMC for most current progress.



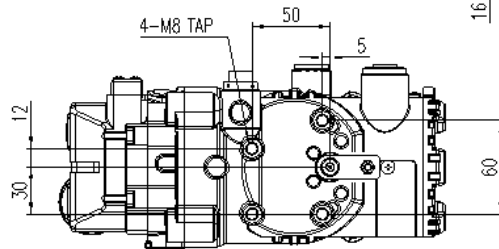
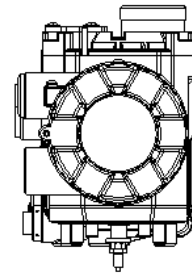
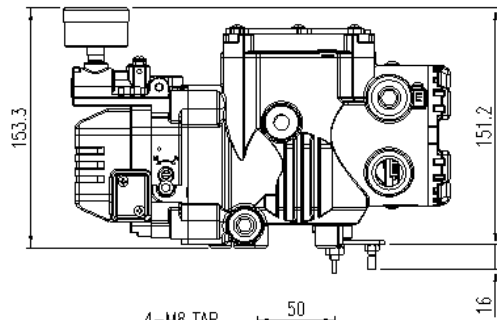
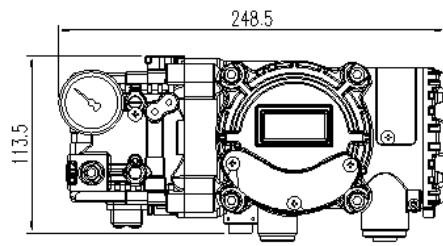
Parts and Assembly

The structure of YT-3400 series are as follows. The only difference between YT-3400L and YT-3400R is lever.

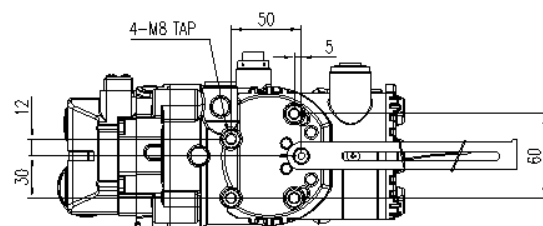
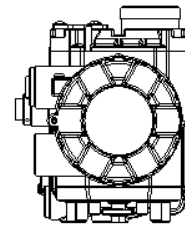
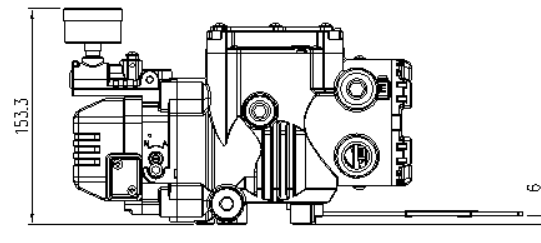
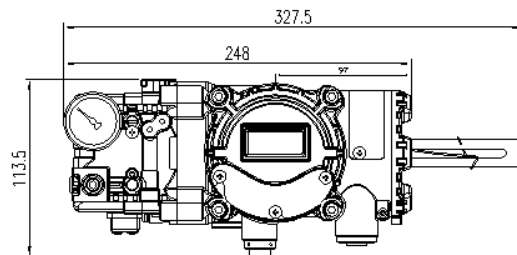




Dimensions



<YT-3400R>

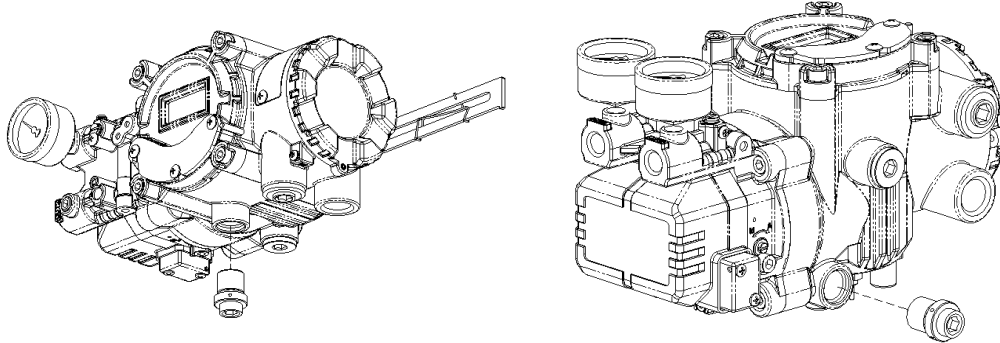




<YT-3400L>

Drain Plug

YT-3400 series have two drain ports for water to be drained.



Installation

Safety Warning

When installing a positioner, please ensure to read and follow safety instruction.

- All input and supply pressure to valve, actuator, and other related devices must be turned off.
- Use bypass valve or other equipment to avoid entire system "shut down."
- Make sure there is no remaining pressure in the actuator.

Tools for Installation

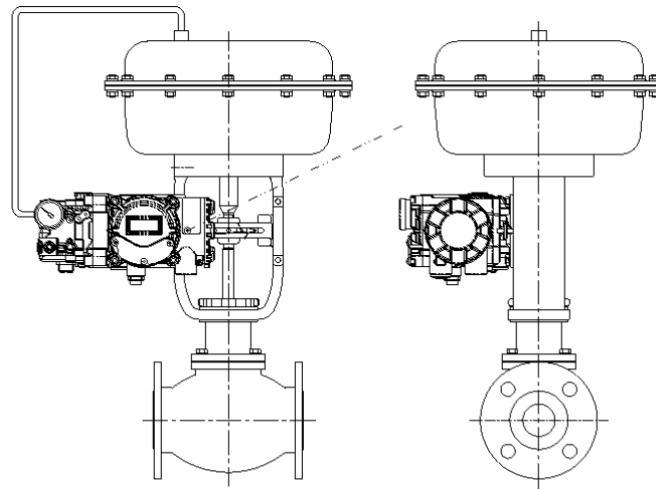
- ① Hexagonal wrench
- ② Screw drivers (+) & (-)
- ③ Spanners for hexagonal-head bolts

YT-3400L Installation

YT-3400L should be installed on linear motion valve such as globe valve or gate valve using spring return type of diaphragm or piston actuator. Before installation, be sure to check for following installation components.

- ① YT-3400 main body
- ② Feedback lever and lever spring
- ③ Flange nut (bottom side of YT-3400L)
- ④ 4 pcs of hexagon head bolts (M8 x 1.25P)
- ⑤ 4 pcs of M8 plate washer

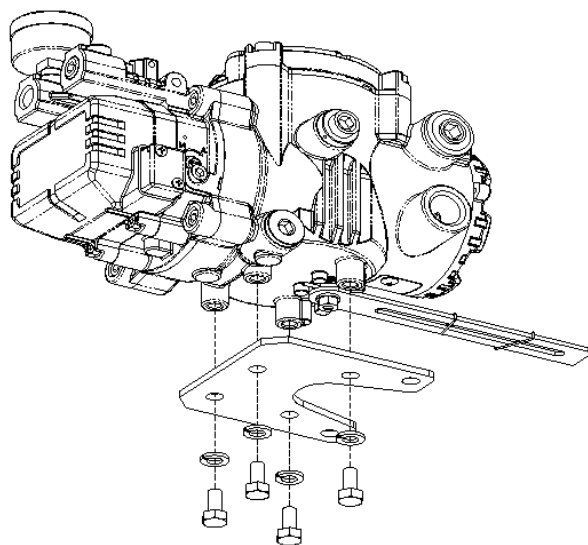
Installation Example



<YT-3400L>

Installation Steps

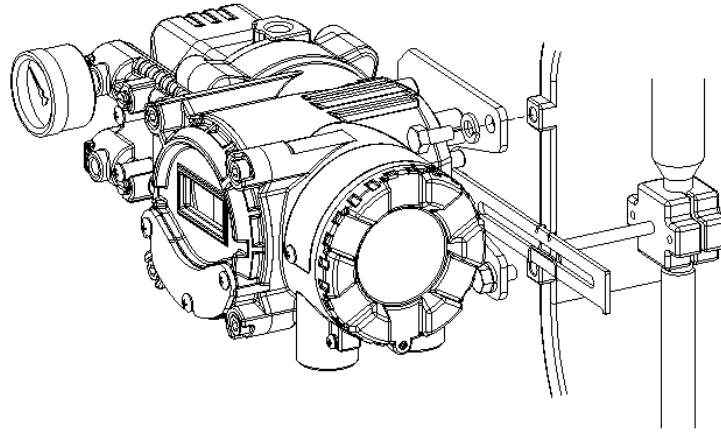
- 1) Proper bracket must be made in order to attach positioner on the actuator yoke. Please consider following when making a bracket.
 - ① Feedback lever should be leveled at 50% of the valve stroke.
 - ② Feedback lever connection bar of actuator clamp should be installed at the positioner that the valve stroke and numbers which indicated on the feedback lever must be fitted.
- 2) Attach YT-3400L to the bracket, which was made in earlier step, by using bolts. Please refer to backside of the product for size of the bolts. The standard size of bolt is M8 x 1.25P, and other bolt sizes are available. Please contact OMC sales department.



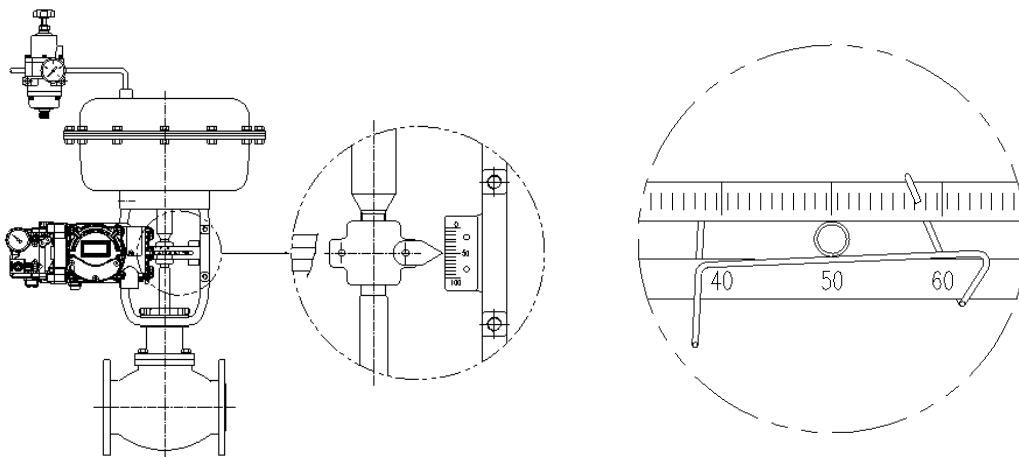


< Installing YT-3400L with bracket>

- 3) Attach YT-3400L (with bracket) to the actuator yoke – DO NOT TIGHTEN COMPLETELY.
- 4) Connect YT-3400L feedback lever to the actuator clamp. The gap on the YT-3400L feedback lever is 6.5mm. The connection bar thickness should be less than 6.3mm.

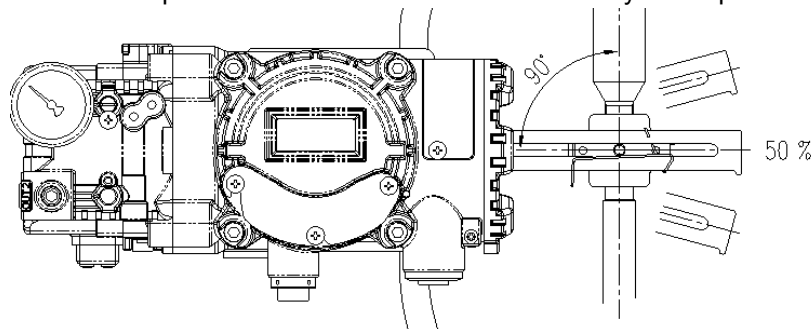


- 5) Connect air filter regulator to the actuator temporarily. Set supply pressure of the regulator in order to position the actuator clamp at 50% of valve stroke.
- 6) Insert connection bar into the YT-3400L feedback lever. The connection bar should be inserted at the 50% point on the feedback lever, which would help to reduce hysteresis.



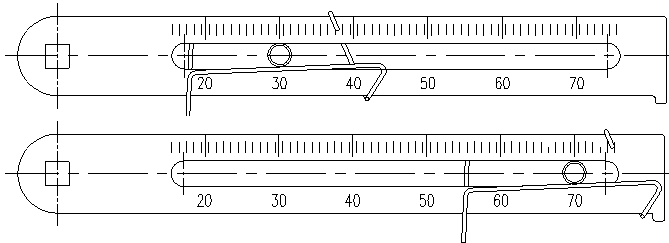
<correct way to install feedback lever and lever spring>

- 7) If connection bar does not point at 50% point, then adjust bracket or feedback link bar position. Failure to position at 50% would lower the linearity of the poistioner.





- 8) Check valve stroke. The stroke numbers are indicated on the feedback lever. Position connection bar at the number on the feedback lever according to the valve stroke. To adjust, move the bracket or the connection bar.

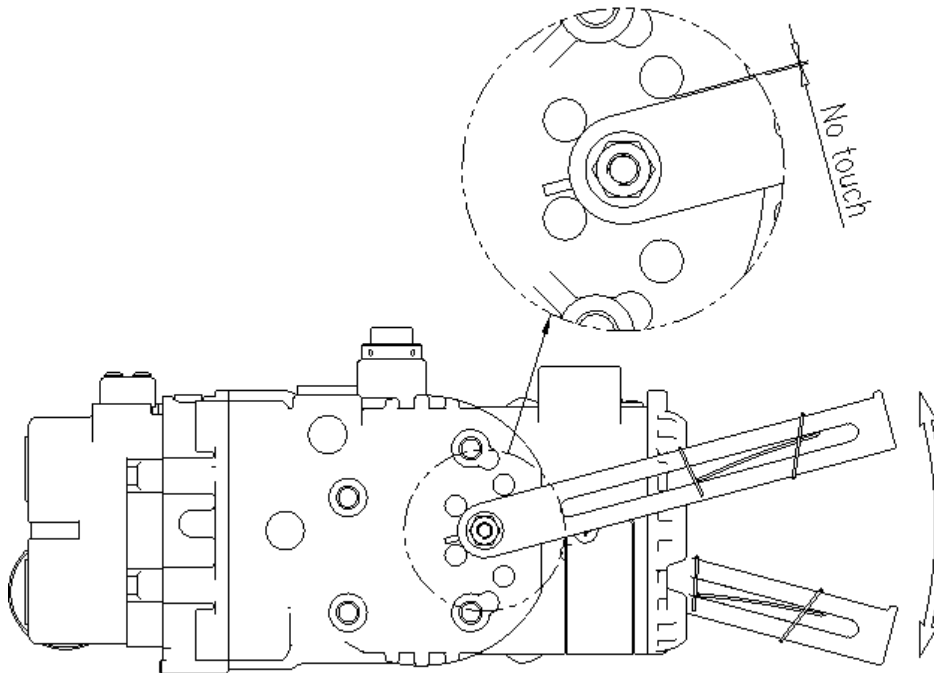


Stroke 30mm

Stroke 70mm

Note

After installing YT-3400L, operate the valve from 0% to 100% stroke by using air filter regulator on the actuator. Both of 0% and 100%, the feedback lever should not touch the lever stopper, which is located on the backside of YT-3400L. If the feedback lever touches the lever stopper, YT-3400L should be installed further away from the center of the yoke.



- 9) After the proper installation, tighten all of the bolts on the bracket, the feedback lever, and the connection bar.



YT-3400R Installation

YT-3400R should be used for rotary motion valve, that is ball valve, butterfly valve using rack and pinion, scotch yoke or complex type actuator, which its stem rotates 90 degrees. Before installation, be sure to check for following installation components.

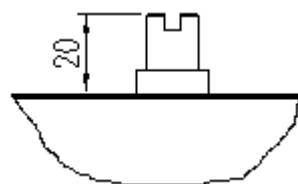
- ① YT-3400R main body
- ② Fork lever and lever spring
- ③ 1 set of bracket
- ④ 4 pcs of hexagon head bolts (M8 x 1.25P)
- ⑤ 4 pcs of M8 plate washer

Bracket Information

YT-3400R is supplied with standard bracket. The bracket can be used for Fork lever and NAMUR bracket.

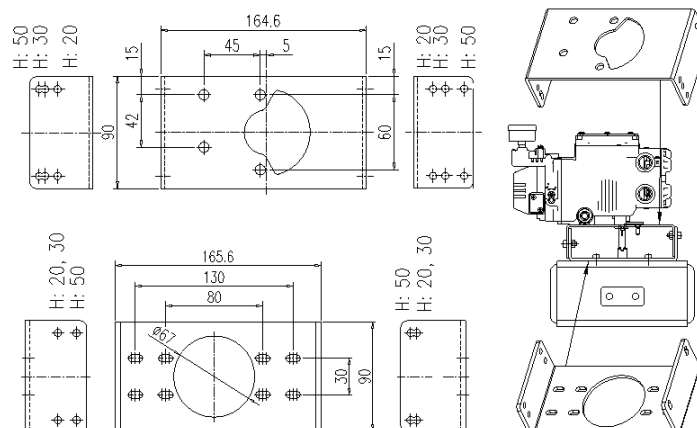
| Actuator stem height (H) | Markings of bolt holes | | | |
|--------------------------|------------------------|------------|--------|------------|
| | A-L | B-L | A-R | B-R |
| 20mm | H : 20 | H : 20, 30 | H : 20 | H : 20, 30 |
| 30mm | H : 30 | H : 20, 30 | H : 30 | H : 20, 30 |
| 50mm | H : 50 | H : 50 | H : 50 | H : 50 |

- 1) Standard actuator stem height (H) is 20, 30, or 50 mm. After checking “H”, assemble with the bracket as shown below



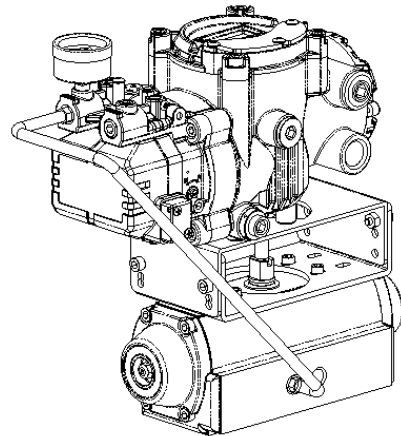
Actuator Stem (H)

Actuator

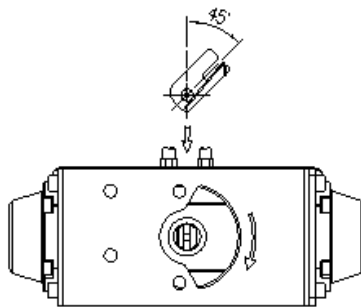




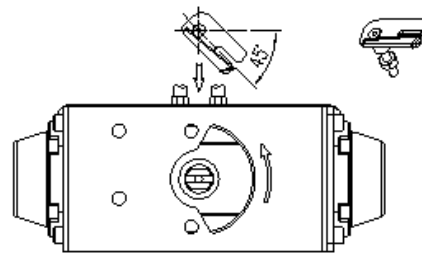
- 2) Attach bracketed YT-3400R to the actuator by using hexagon-headed and wrench bolts. Size of the bracket hole is 6mm. When tightening bolts, please use spring washer or similar for firm attachment to the actuator, so YT-3400R will not be affected by vibration or any other impact. The direction of bracket is different by operating condition, but normally, the positioner is installed as shown on the right.



- 3) Set rotation position of the actuator stem at zero point, "0%". For a single type of actuator, it is easy to check zero point, because the actuator stem is positioned at zero point when there is no supply pressure. If double acting actuator is used, check actuator stem's rotation direction (clockwise or counter-clockwise) by supplying pressure.
- 4) Install the fork lever as shown below after setting actuator stem at zero point. Check the direction of the actuator stem – clockwise or counter-clockwise. Installation angle of the fork lever should be 45 degrees based on the linear shaft. For NAMUR shaft, the angle does not matter.

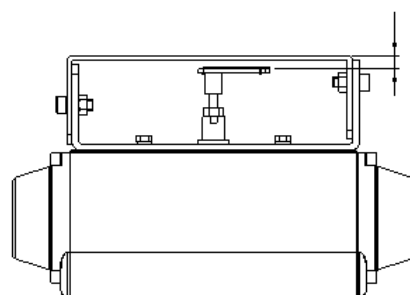


counter-clockwise



clockwise

- 5) After setting fork lever position, assemble lock nuts which are located on the bottom of the fork lever. Make sure to set the height of upper fork lever between 6-11 mm, which is lower than upper bracket height.



bracket

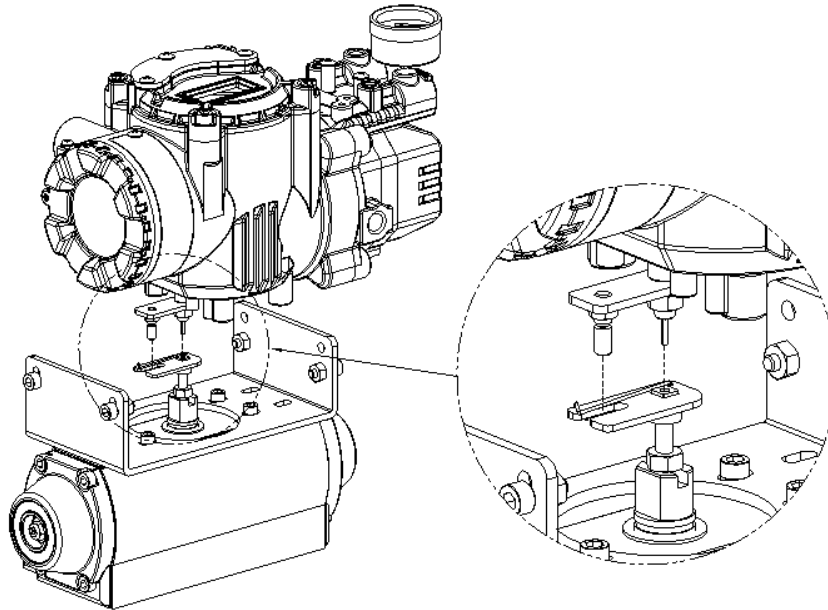
6-11mm

Fork Lever

Actuator



- 6) Attach YT-3400R to the bracket. Fix the clamping pin on the main shaft's center of YT-3400R and insert connection bar into the fork lever slot, so it can be locked to the fork lever spring. This sets the alignment of the main shaft of YT-3400R and center of the actuator stem. Bad alignment of the main shaft and the actuator stem lowers YT-3400R's durability, because too much force will be on the main shaft of YT-3400R.



- 7) Tighten YT-3400R base and the bracket with hexagon-headed bolts and plate washer. It is recommended to tighten four bolts after checking YT-3400R's position.

Connection

Connection - Piping

Note

- To avoid entering moisture, oil, or dust into the product, please carefully make selection of supply pressure compressor.
- It is recommended to attach air filter regulator before supply port of YT-3400R.

Supply Pressure Condition

- ① Dry air with at least 10°C lower than ambient temperature.
- ② Avoid from dusty air. Filter can only sort 5 micron or larger.
- ③ Avoid any oil.
- ④ Comply with ANSI/ISA-57.3 1975(R1981) or ISA S7.3-1975(R1981).
- ⑤ Not to be used beyond the range of 1.4 - 7 kgf/cm² (140 - 700 kPa).
- ⑥ Set air filter regulator's supplied pressure 10% higher than actuator's spring range pressure.

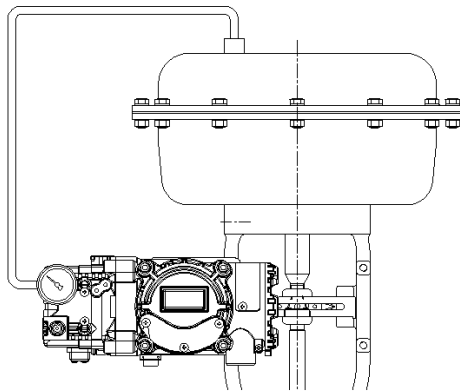
Pipe Connection

- ① Make sure inside of pipe is emptied.
- ② Do not use pipeline that is squeezed or has hole.
- ③ To maintain flow rate, use the pipeline that has more than 6mm inner diameter. (10mm outer diameter)
- ④ Do not use extremely long pipeline system. It may affect flow rate due to the friction inside of the pipeline.

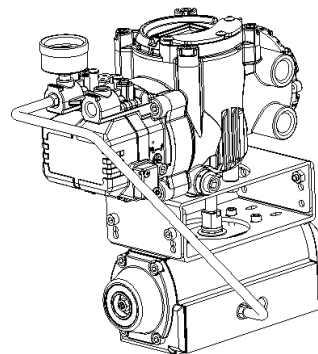
Piping Connection with Actuator

Single acting actuator

YT-3400 series single acting type is set to use OUT1 port. OUT1 port should be connected with supply pressure port from actuator when using single acting type of spring return actuator.



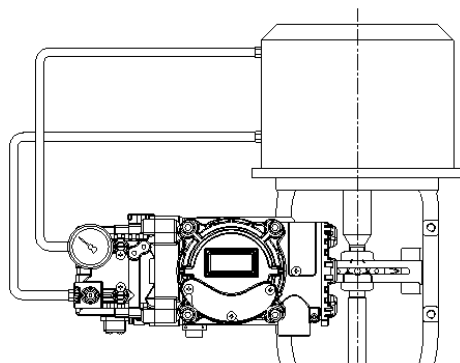
<YT-3400L single acting>



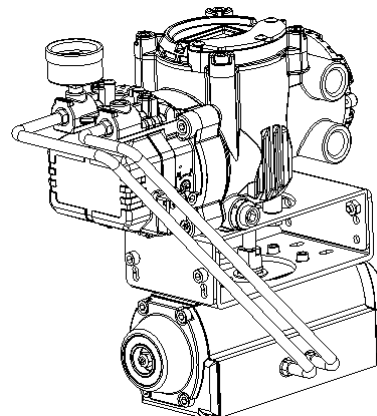
<YT-3400R single acting>

Double acting actuator

For YT-3400 series double acting type, when inputting current signal, supply pressure is out from OUT1.



<YT-3400L double acting>



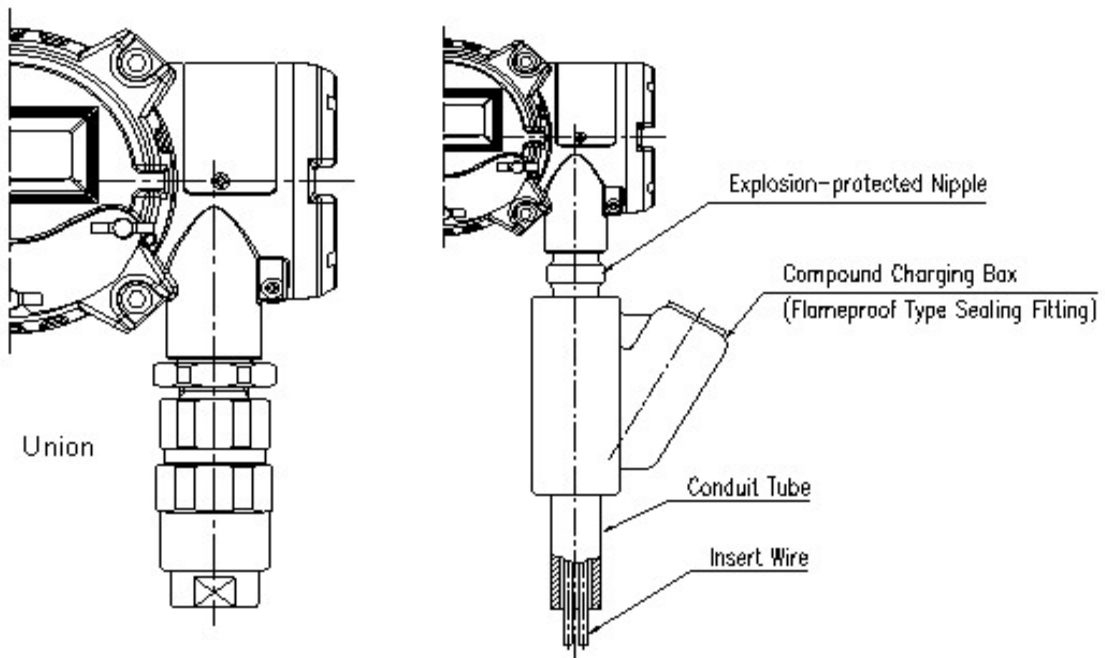
<YT-3400R double acting>



Connection - Power

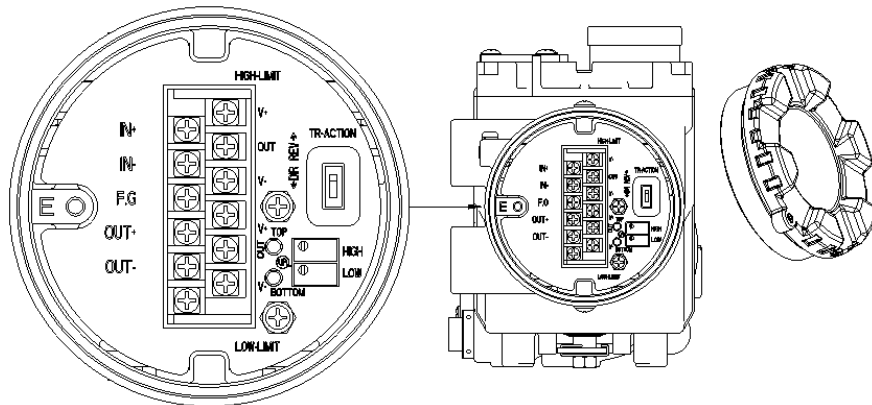
Note

- Before connecting terminal, please make sure that power is off completely.
- Use ring type terminal to protect against oscillation or other impacts.
- YT-3400 series (except internal PTM or L/S type) must use DC 4-20mA. Minimum supply current should be 3.2mA for standard YT-3400, and minimum 3.8mA should be supplied for YT-3400 with HART communication. The power should not exceed 24mA.
- ☐ YT-3400 series with PTM or L/S option, separate power should be supplied to PTM. The voltage should be between DC 10~28V and not exceeding 30V.
- ☐ YT-3400 must be grounded.
- ☐ Please use twisted cable with conductor section area 1.25 mm^2 and that is suitable for 600V (complying to the conductor table of NEC Article 310.) The outer diameter of the cable should be between 6.35~10mm. Use shield wire to protect against electro-magnetic field and noise.
- ☐ Please do not install the cable near the equipments such as high-capacity transformer or motor which creates noise.
- When installing in hazardous area including explosive gas area, conduit tube or pressure-proof packing union must be used.

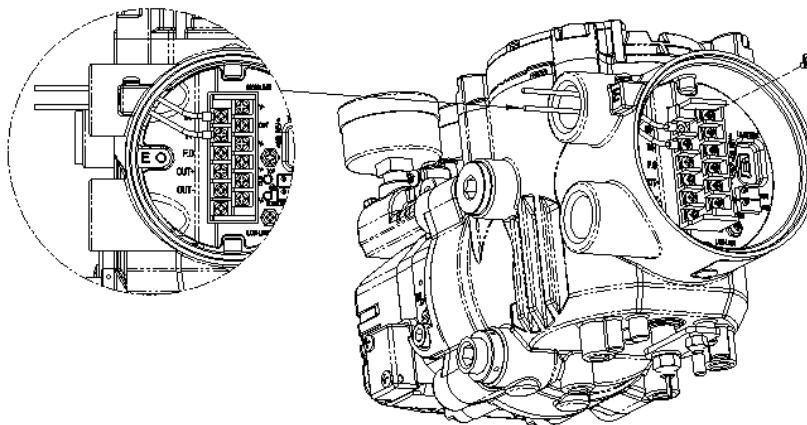


Connection – Feedback Signal

- 1) Open product cover by opening 4 M4 bolts.
- 2) Locate two entries on the right hand bottom part of YT-3400 body. When connecting power, either pressure-proof packing union or conduit tube can be used. Please choose most appropriate connection type by considering the operating condition. Insert cable with terminal port.
- 3) Locate terminal of current input signal on the left hand bottom side of YT-3400. Insert terminal bolts into the cable terminal entries and secure them with (+) and (-) terminals on the plate. Make sure to tighten terminal bolts with 1,5 fNm (15kgf/cm) torque. Please check the polarity of the terminals.



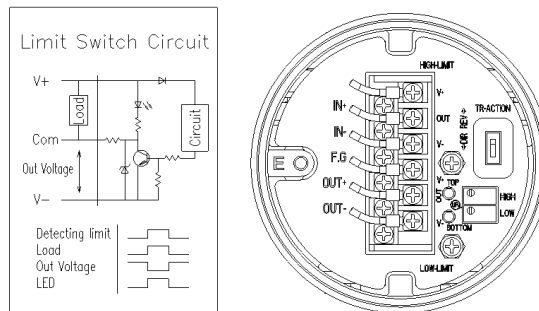
| | |
|-------|---------------------|
| IN + | Input Signal (+) |
| IN - | Input Signal (-) |
| FG | Ground |
| OUT + | Feedback Output (+) |
| OUT - | Feedback Output (-) |





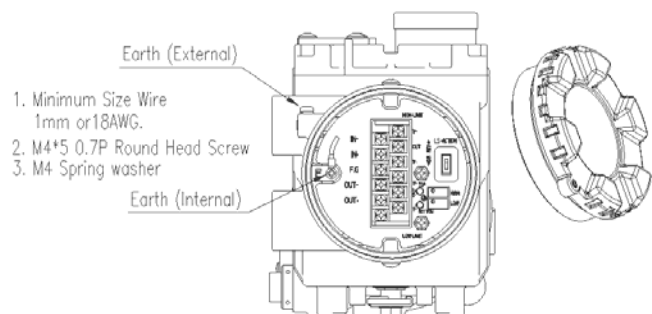
Connection – Limit Switch

- 1) Open the terminal box cover by using 3mm wrench.
- 2) There are two entries on the right hand bottom part of YT-3400. When connecting power, either pressure-proof packing union or conduit tube can be used. Choose most appropriate connection type with consideration of the operating condition. Insert cable into terminal port.
- 3) Limit switch terminals are located at the top of the terminal plate. Top three terminals on the right indicate valve's 0% position and bottom three terminals indicate valve's 100% position. Insert terminal bolts into the cable terminal holes, and lock them with (+) and (-) terminals on the plate. Make sure to tighten terminal bolts with 1.5 fNm (15kfg/cm) torque. Check the polarity of the terminal.
- 4) After connecting terminals, close the cover and lock bolts using 3mm wrench.
- 5) Direct Action (DA) or Reverse Action (RA) can be set by adjusting can be set by adjusting a switch on the right hand side of the terminal plate.



Connection - Ground

- 1) Ground must be done before operating YT-3400.
- 2) Inside of terminal box, locate ground terminal plate on right hand bottom side of the terminal plate. The outer cable entry is located at outside of the terminal. Please make sure that the resistance must be less than 100 ohms.
- 3) When using outside ground, use (+) screw driver to unscrew the ground bolts. Insert outside ground ring bolts and spring washer into ring type terminal of the ground cables and tighten them with bolts.
- 4) When using inside ground, use 3mm wrench the loose locking bolts of the terminal box cover.
- 5) After opening the cover, locate two entries on right hand bottom side of YT-3400. When connecting power, either pressure-proof packing union or conduit tube can be used.
- 6) Locate two terminals on the right, either of terminals can be used. Insert terminal bolts into the ring-typed terminal entries and lock them with 1.5 fNm (15kfg/cm) torque.
- 7) Close the cover and lock cover bolts tightly.

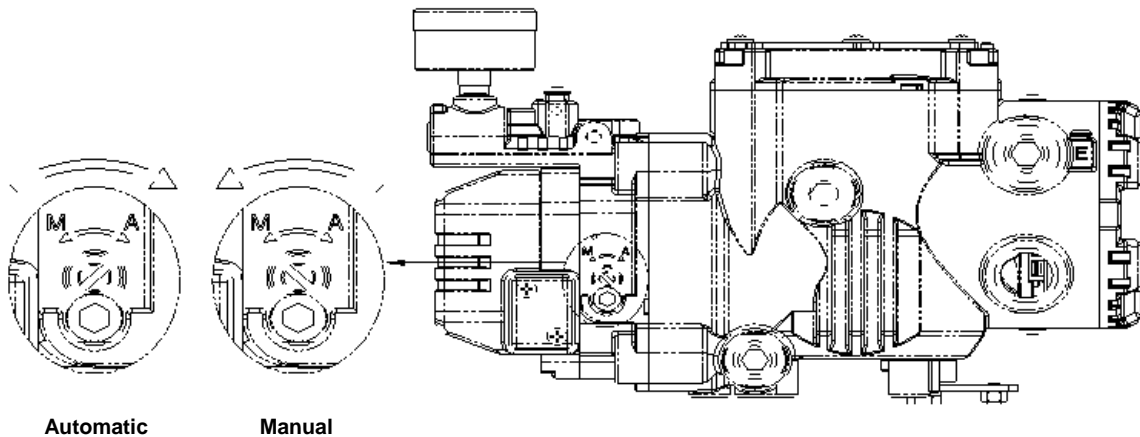


Adjustment

Adjustment - A/M Switch (Auto/Manual Switch)

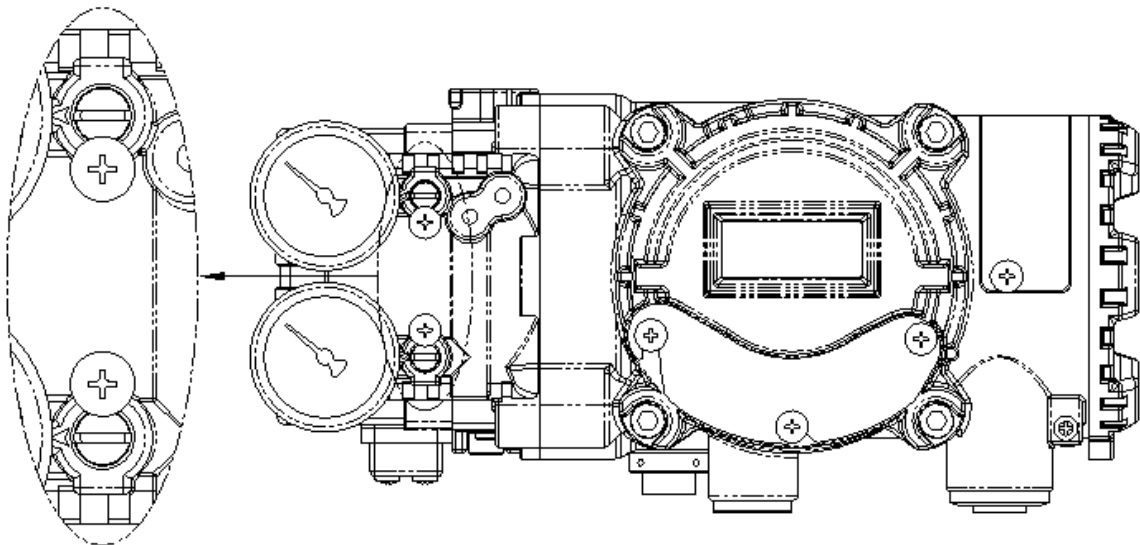
On the bottom of the YT-3400 body, there is A/M Switch (Auto/Manual). If the switch is set as "A" (Auto), then the supply pressure will be transferred through YT-3400 operation. On the other hand, if the setting is "M" (Manual), then the pressure from the air filter regulator will directly supplied to the actuator regardless of YT-3400 operation. It is extremely important to check the pressure level when the switch is set as "M" (Manual).

- ① Check whether the supply pressure of air filter regulator is too high.
- ② Turn the switch clockwise to set as "A" and turn counter-clockwise to set as "M"



Adjustment - Variable Orifice

Hunting can be occurred when the actuator's volume is too small. In order to prevent hunting, orifice can be adjusted. By adjusting orifice, the flow rate of supply pressure to actuator can be adjusted. To adjust, use (-) driver to control the orifice.



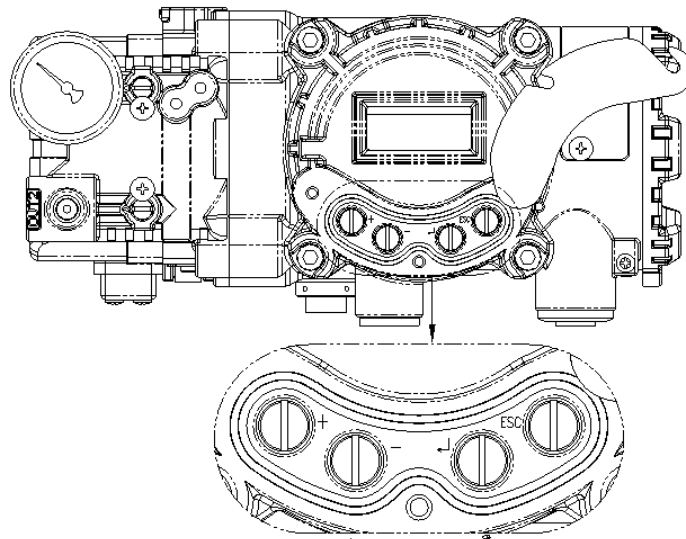


Auto Calibration and Basic Operation

Note

Following process will operate valve and actuator. Before starting Auto Calibration, please separate valve from the entire system, so Auto Calibration will not affect entire valve process.

Button Description



YT-3400 series has 4 buttons and enable to perform various functions. Please refer to the below table for further description..

| Button | Function |
|------------------|------------------------------------------------------------------------|
| <ENTER> | Enter to main menu and sub-menus, save adjusted parameter values, etc. |
| <ESC> | Return to previous menu. |
| <UP> & <DOWN> | Move to next menu, change parameter values, etc. |

Run Mode (RUN)

After power connection to YT-3400 series, following message will appear on LCD screen within 6 seconds.





"RUN" indicates that YT-3400 adjusts valve stroke with receiving signals (4~20mA) and "PV" indicates the process value. In RUN mode, the valve stroke continuously changes according to the input signal. There are six types of display message in RUN mode.

| | | | |
|---|-----------|------------------|--------------------------------------------|
| ① | Run PV | Process Value | Valve Stroke (%) |
| ② | Run SV % | Set Value | Input Signal (0~100%) |
| ③ | Run SV mA | Set Value | Input Signal (4~20mA) |
| ④ | Run MV | Manipulate Value | Motor/Piezo Valve Manipulate Value (Digit) |
| ⑤ | Run Vel | Velocity | Current Valve Stem's Velocity (Digit) |
| ⑥ | Run Err | Error | Difference between SV and PV (%) |

To change display, push <ESC> and <UP> at same time. The display will change in order indicated above. If <ESC> and <DOWN> pushed simultaneously, the order will be displayed in opposite order. By pressing <ESC>, the display will return to RUN Mode.

Auto Calibration (AUTO CAL)

Auto Calibration (Auto Cal) automatically calibrates YT-3400 in very simple manner. Auto Cal process takes about 2~3 minutes, and the duration of the process varies upon the size of the actuator as well. There are 3 types of Auto Cal.

| | Zero Point | End Point | KP KI KD | RA / DA |
|---------|------------|-----------|-------------------------------------------|---------|
| AUTO1 | ○ | ○ | × | × |
| AUTO2 | ○ | ○ | ○ | ○ |
| AUTO HF | ○ | ○ | ○ | ○ |

* It is recommended to calibrate the positioner under AUTO2 when setting the system initially.

Auto 1 Calibration

Auto 1 Calibration is mainly used when YT-3400 has not been set. The parameter which needs to be calibrated in order for valve system to operate, will be calibrated; however, KP, KI, and KD values do not change.

- ① After connecting power, "READY 6,5,4,3,2,1" message will be appeared on LCD screen.
- ② Push <ENTER> button for 6 seconds at RUN mode and AUTO CAL message will be appeared.



- ③ Push <ENTER> and AUTO1 mode will be displayed.
- ④ Push <ENTER> and AUTO1 will be started.
- ⑤ After several minute, COMPLETE message will be appeared to indicate that AUTO1 calibration has been completed.



Auto 2 Calibration

Auto 2 Calibration sets all of the parameter which needs to be calibrated in order for valve system to operate. Auto 2 Calibration is recommended when YT-3400 is first installed on the valve system.

- ① After connecting power, "READY 6,5,4,3,2,1" message will be appeared on LCD screen.
- ② Push <ENTER> button for 6 seconds at RUN mode and AUTO CAL message will be appeared.
- ③ Push <ENTER> and AUTO1 mode will be displayed.
- ④ Push <DOWN> and AUTO2 mode will be displayed.
- ⑤ Push <ENTER> and AUTO2 will be started.
- ⑥ After several minute, COMPLETE message will be appeared to indicate that AUTO2 calibration has been completed.



Auto HF Calibration

Auto HF Calibration sets all of the parameters, like Auto 2; however, it is used for high friction valve environment



Manual Mode (MANUAL)

MANUAL MODE is used to move valve stem manually. During MANUAL MODE, YT-3400 moves valve strokes, not by input signal. The movement of the stroke does not affect YT-3400 saved data values, and it just moves valve strokes up/down physically.



Tip when increasing/decreasing value

| | |
|------------------|-----------------------------|
| <UP> only | Increase stem value slowly |
| <UP> + <ENTER> | Increase stem value quickly |
| <DOWN> only | Decrease stem value slowly |
| <DOWN> + <ENTER> | Decrease stem value quickly |

Parameter Mode (PARAM)

AUTO CAL optimizes most of the valve actuator controls. However, in some instances, there can be exceptions. Usually hunting or oscillation occurs when the valve actuator controls did not optimize. When this occurs, hunting or oscillation can be prevented by adjusting parameter values and DeadZone.



4 Types of Parameter and Adjustment

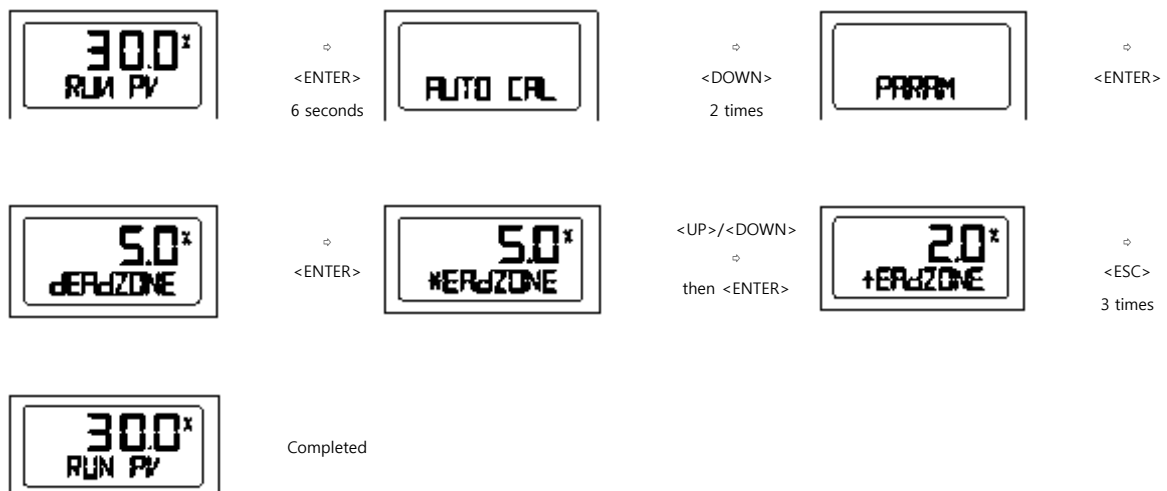
- ① Dead-Zone (dEAdZONE)
- ② P-value (KP)
- ③ D-value (Kd)

Note

When parameter values are changed, the positioner shows the status of the changes in real-time. In another words, you do not need to return to the RUN mode to observe the adjustments. However, in order to save the change, <ENTER> button must be pressed.

Dead-Zone (dEAdZONE)

Dead-Zone indicates the percentage of error allowance. When there is high packing friction level, hunting or oscillation can be occurred. In this case, by adjusting Dead-Zone, hunting or oscillation can be prevented.



P-Value (KP)

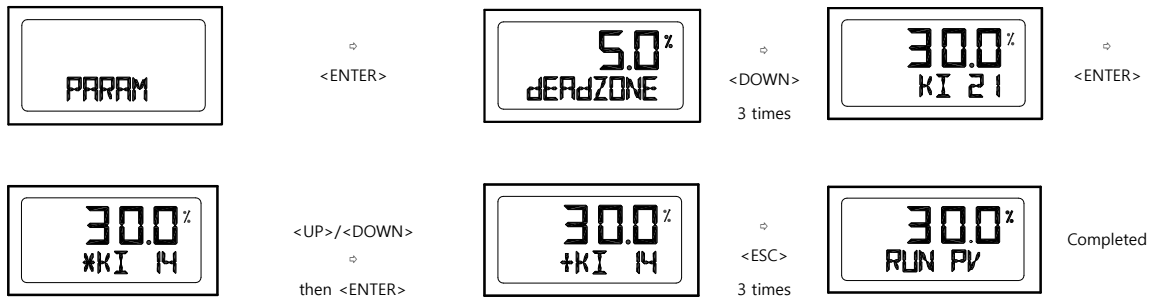
P-value indicates the ratio of the compensation signal based on the percentage of error allowance. As KP increases, the positioner finds the target value quickly, but it is more likely to occur hunting. On the other hand, as KP decreases, the positioner finds the target value rather slowly, but it is less likely to occur hunting.



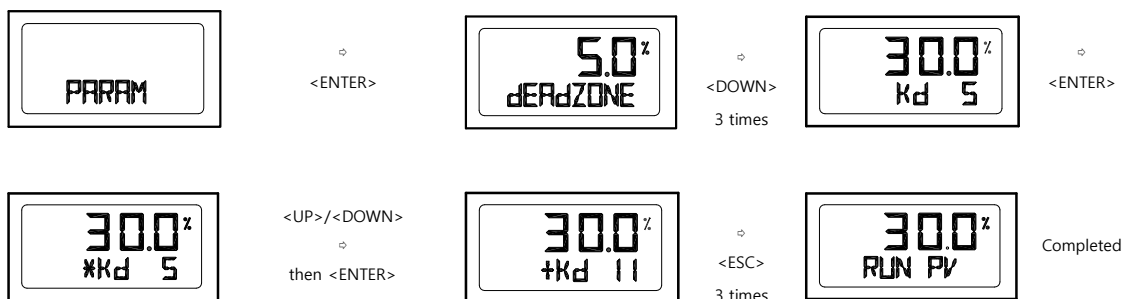


I-Value (KI)

I-value is differential value of which will be added on to the compensation signal based on the percentage of error allowance. As KI increase, the positioner will be more likely to have oscillation, and as KI decreases, the positioner will become slower to find its target position.



D-Value (Kd)



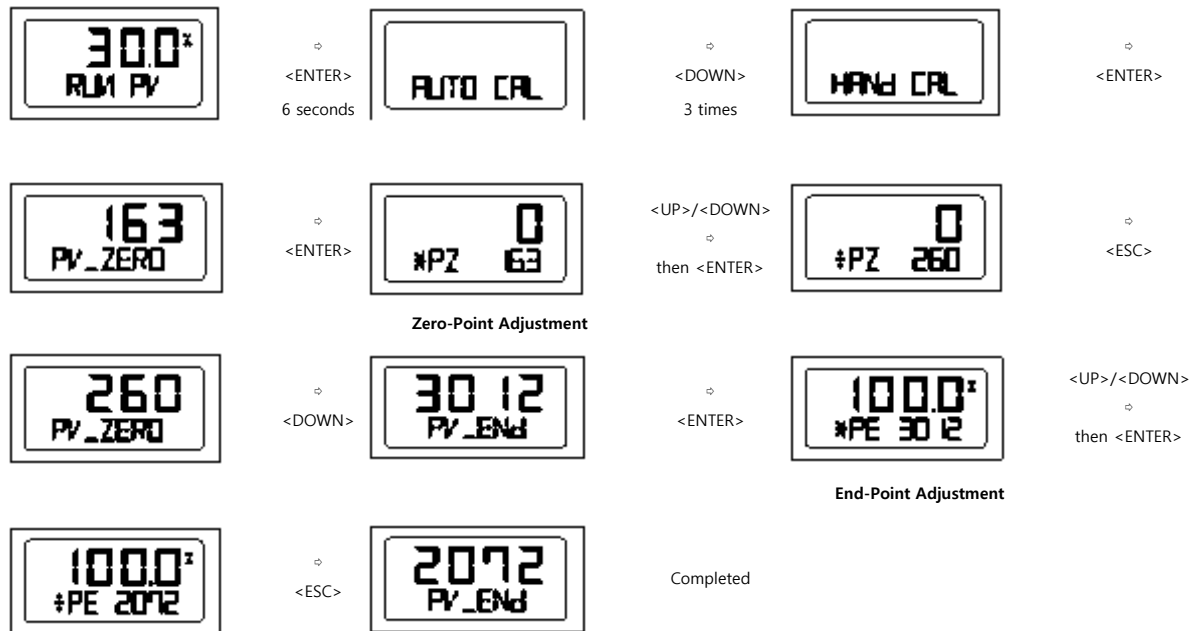
Hand Calibration Mode (HAND CAL)

When user wants to confirm the calibration of the positioner after AUTO Calibration has been completed, user can manually calibrate the positioner as well by entering into Hand Calibration Mode.



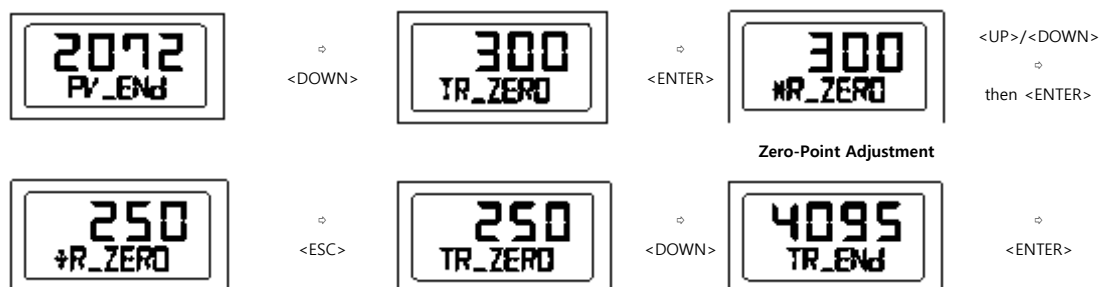
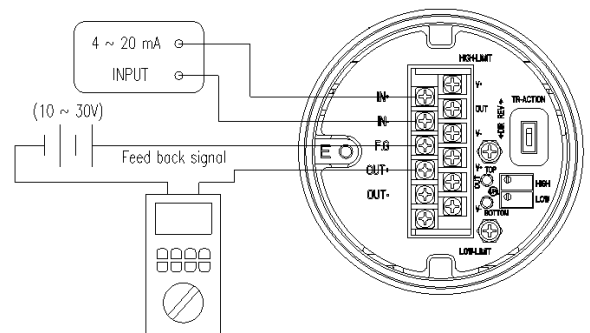
Zero-Point (PZ_ZERO) and End-Point (PZ_END) for Valves

In PZ_ZERO mode, the zero point of valve can be adjusted, and in PV_END mode, the end point of the valve can be adjusted.



Zero-Point (TR_ZERO) and End-Point (TR_END) for Transmitter

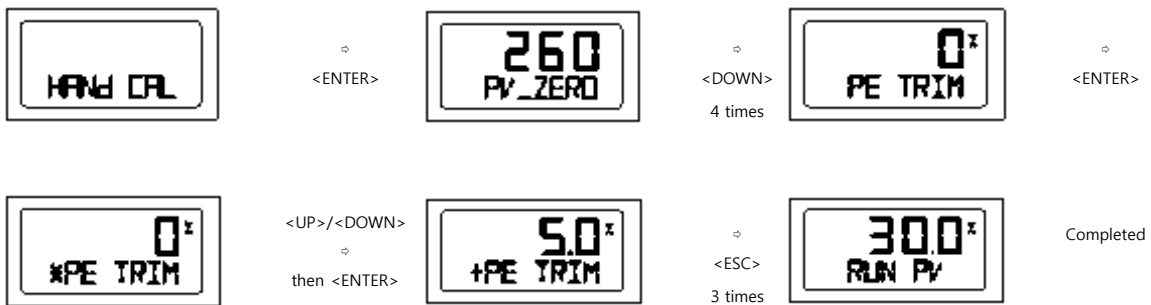
In TR_ZERO mode, the zero point of transmitter can be adjusted, and in TR_END mode, the end point of the transmitter can be adjusted. These points should be adjusted when output signal is not constant, and/or the user wants to set transmitter output signal and actual stroke not equally.





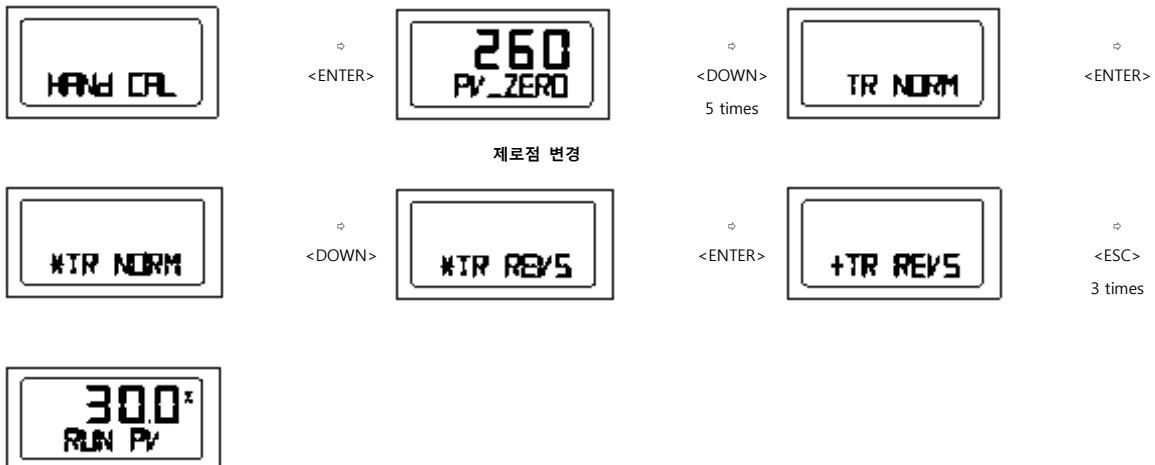
End-Point Ratio for Valve (PE TRIM)

When reverse acting <RA> actuator is used, End-Point can be adjusted within 10% of total stroke, without adjusting valve's Zero-Point.



Normal/Reverse Feedback Signal (TR NORM/REV)

The feedback signal from position transmitter can be viewed as normal or as reverse. For example, actual input signal of 4mA can be viewed as output signal of 20mA.



Valve Mode (VALVE)

Acting Adjustment (ACT)

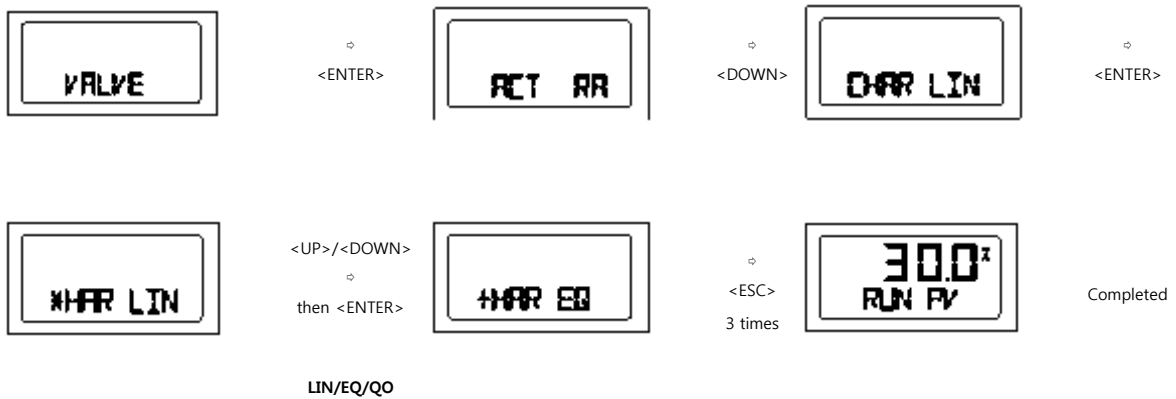
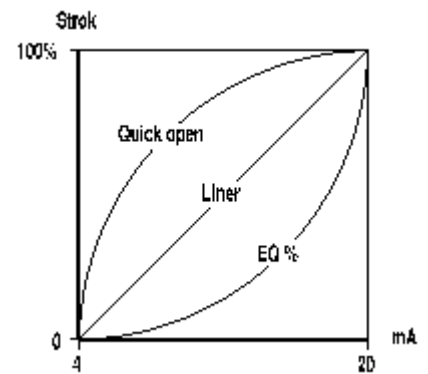
The positioner can be set as D/A (Direct Action) or R/A (Reverse Action.) <Figure 42>





Characteristics Adjustment (CHAR)

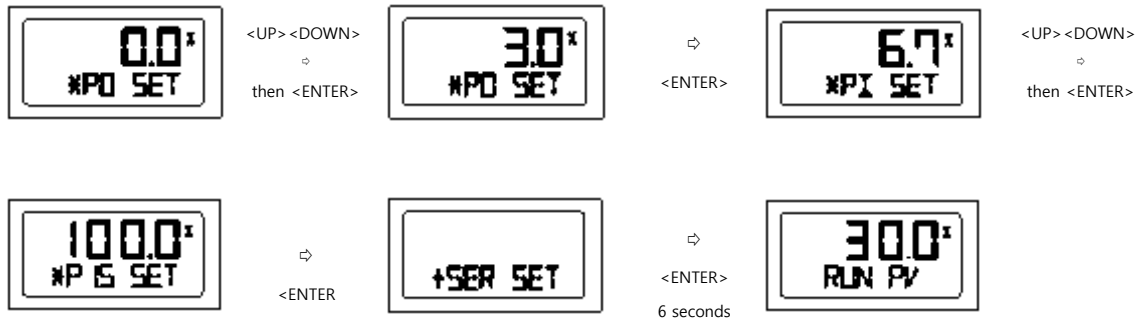
The positioner's characteristics can be set depends on user's preference. There are 3 types of characteristics - Linear (LIN), Equal Percentage (EQ), and Quick Open (QO). Following diagram, graphically shows each characteristics.



User Characteristics (USER SET)

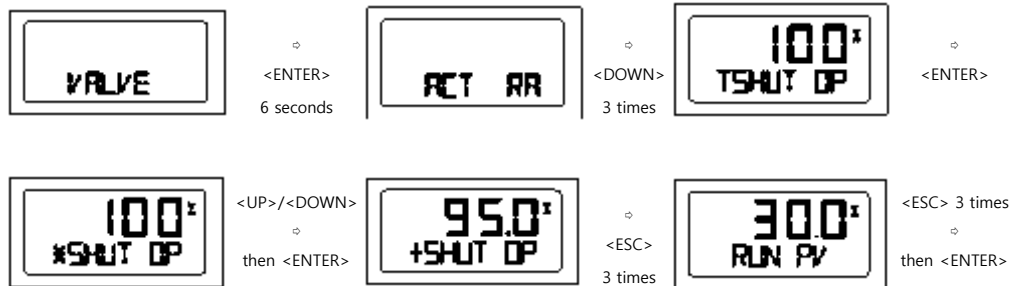
When user has a specific characteristic which is not included in above section, the characteristic curve can be made by selecting 16 points of the curve.





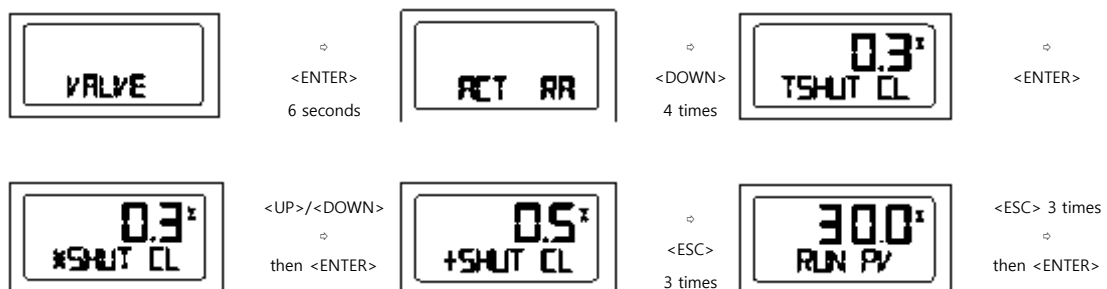
Tight Shut Open (TSHUT OP)

TSHUT OP allows the valve to open completely when the input signal reaches around 20mA.



Tight Shut Close (TSHUT CL)

TSHUT CL allows the valve to close completely when the input signal reaches around 4mA.



Split Range Control (SPLIT)

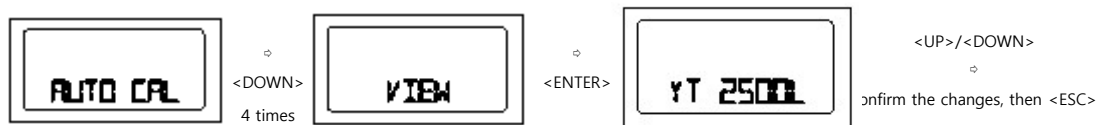
The valve can be controlled by three input signal - 4~20mA, 4~12mA, or 12~20mA.





View Mode (VIEW)

In this mode, user can set the positioner to display different information such as stroke value in percentage (%) or in values. <Figure 49>



| | Description |
|-----------------|------------------------------------------------------------------------------------------------|
| YT-3300L | Positioner model |
| VERSION | Main software version |
| HART V | HART Protocol version |
| POL Addr | Channel address that is used in HART Protocol |
| BIAS VI | BIAS value for motor/piezo valve control. Can be adjusted only by manufacturer. |
| 0Y 0d | Total used time duration. If a unit was used less than 1 minute, the time does not accumulate. |
| FULL_OP | Time elapsed for valve to fully open |
| FULL_CL | Time elapsed for valve to fully close |
| VM NOR | Display type of valve stroke on LCD. (either in percentage or value) |
| Erro | Display error code or warning message. |
| VALUE I | Current I-Value. Can be adjusted only by manufacturer. |
| ABS | Display absolute resistance value. |



Error and Warning Code

YT-3400 series provides error and warning codes if there is/are problem/s.

Error Code

Error code will be displayed when the positioner cannot be operated.

| Error Code | Code Description and Cause | Action |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MT ERR L | Positioner is improperly installed. Positioner lever is not parallel to the ground at 50% point. Lever is at lower position than actual 50% point. | <ul style="list-style-type: none"> • Re-install/mount the positioner. • Make sure the feedback lever does not touch the stopper at both 0% and 100%. |
| MT ERR H | Positioner is improperly installed. Positioner lever is not parallel to the ground at 50% point. Lever is at higher position than actual 50% point. | <ul style="list-style-type: none"> • Re-install/mount the positioner. • Make sure the feedback lever does not touch the stopper at both 0% and 100%. |
| CHK AIR | Valve does not operate when positioner receives "Full Open" signal during Auto Calibration. | <ul style="list-style-type: none"> • Check if supply pressure is stable and appropriate. |
| RNG ERR | Operating angle is too small due to improper mounting of positioner. | <ul style="list-style-type: none"> • Adjust bracket so the positioner can be mounted closer to actuator. |
| C | Error 10% or above persists more than 1 minute. No valve movement. <ul style="list-style-type: none"> • Friction of valve is too large. • Setting pressure of actuator changes. | <ul style="list-style-type: none"> • Perform BIAS Calibration. • Check setting pressure of actuator and set the pressure as recommended. |
| D | I-Value reaches at maximum or minimum limit point. <ul style="list-style-type: none"> • Friction of valve changes. • Setting pressure of actuator changes. | <ul style="list-style-type: none"> • Perform AUTO Calibration. • Check setting pressure of actuator and set the pressure as recommended. |

Warning Code

| Warning Code | Code Description and Cause | Action |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B | Pv End - Pv Zero range is below 500. The angle of feedback lever is too small. | <ul style="list-style-type: none"> • Re-install/mount the positioner. • Make sure the feedback lever does not touch the stopper at both 0% and 100%. • After re-installation, perform AUTO1 Calibration. |
| F | <ul style="list-style-type: none"> • Time elapsed for either Full Open or Full Close is less than 1 second. • The size of actuator is too small. | <ul style="list-style-type: none"> • Use variable orifice. • Replace actuator with larger capacity. |
| G | <ul style="list-style-type: none"> • Pv Zero is below 100. • The angle of feedback lever is too large. | <ul style="list-style-type: none"> • Re-install/mount the positioner. • After re-installation, perform AUTO1 Calibration. |
| H | <ul style="list-style-type: none"> • Pv End is over 4000. • The angle of feedback lever is too large. | <ul style="list-style-type: none"> • Re-install/mount the positioner. • After re-installation, perform AUTO1 Calibration. |



Warning code will be displayed when the positioner has a possibility of not operating.

Main Software Map

