

HPP4000

Digital Positioner

USER'S MANUAL

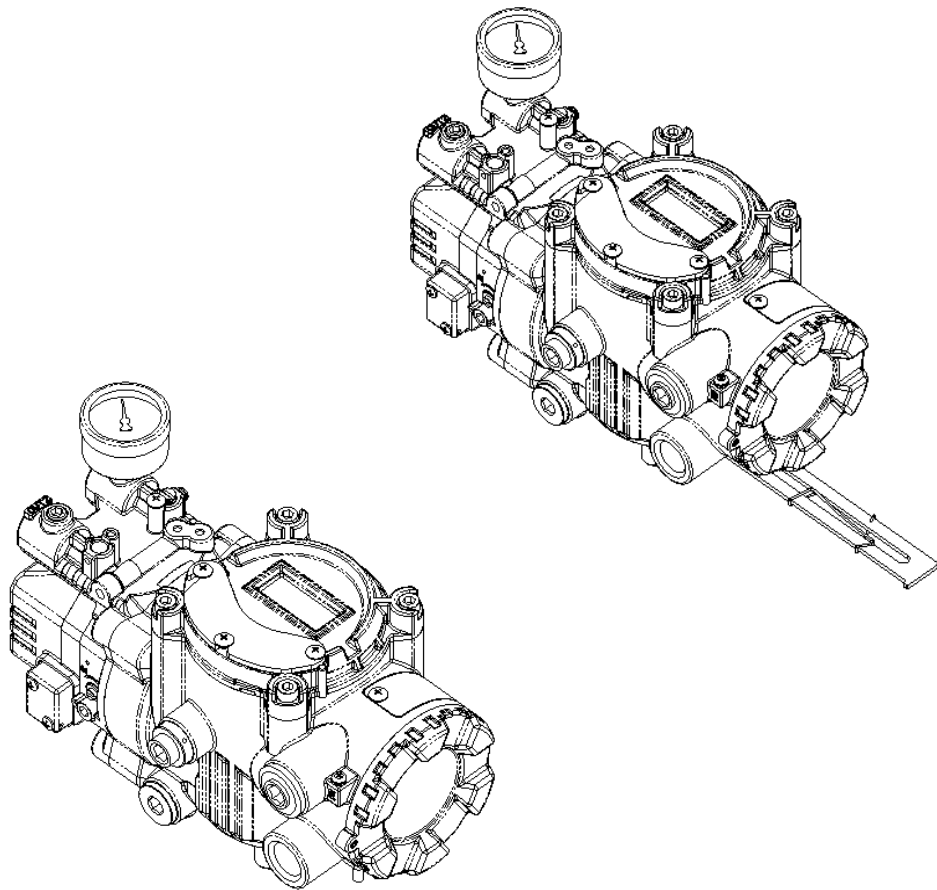


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Introduction

Thank you for choosing an Optimux® product. Each product is fully inspected after its production to offer you the highest quality. In order to fully utilize this product, we recommend users to read this manual carefully.

- This manual should be provided to the end-user with each positioner purchase.
- This 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 this manual.
- This manual should not be duplicated or reproduced for any purpose without prior approval from Trimteck LLC Coral Springs, Florida, USA.

Manufacturer Warranty

- For safety, it is important to follow the instructions in this manual. Trimteck will not be responsible for damages caused by users' negligence.
- Trimteck will not be responsible for any damages or accidents as a result of any alteration or modification of this product and its parts. If any alteration or modification are necessary, please contact Trimteck directly.
- Manufacturer warrants the product from the date of original purchase of the product for one (1) year, except as otherwise stated.
- 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 Trimteck LLC.

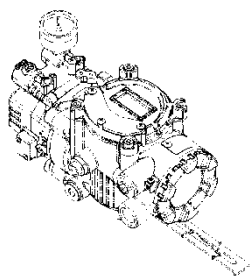
Explosion Proof Warning

- Please ensure the unit is being used and installed within a explosion proof certified environment.
- The HPP4000 explosion proof grade is **Ex D IIC T6**. It can be used in **zones 1 and 2**.
- Explosion proof type of cables and gaskets should be used, when explosion gases are present at the installation site.
- Power should be turned off completely when opening the HPP4000 cover. When opening the cover, please ensure that there is no power remaining in any electrical parts.
- The HPP4000 has 2 ports for power connection. Explosion proof type wires and packing should be used. Blind plugs should be used when the port is not being used.

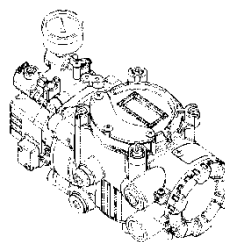
- When connecting the power, cable rug with surface area of more than 0.195mm² with M4 spring washer. For external ground terminal, cable rug with surface area of more than 5.5mm² should be used.

Product Description:

The HPP4000 Smart Valve Positioner accurately controls valve stroke in response to an input signal of 4-20mA from the controller. In addition, the built-in micro-processor optimizes the positioner's performance and provides unique functions such as **Auto calibration, PID control, Alarms, and Hart protocol communications.**



HPP4000L



HPP4000R

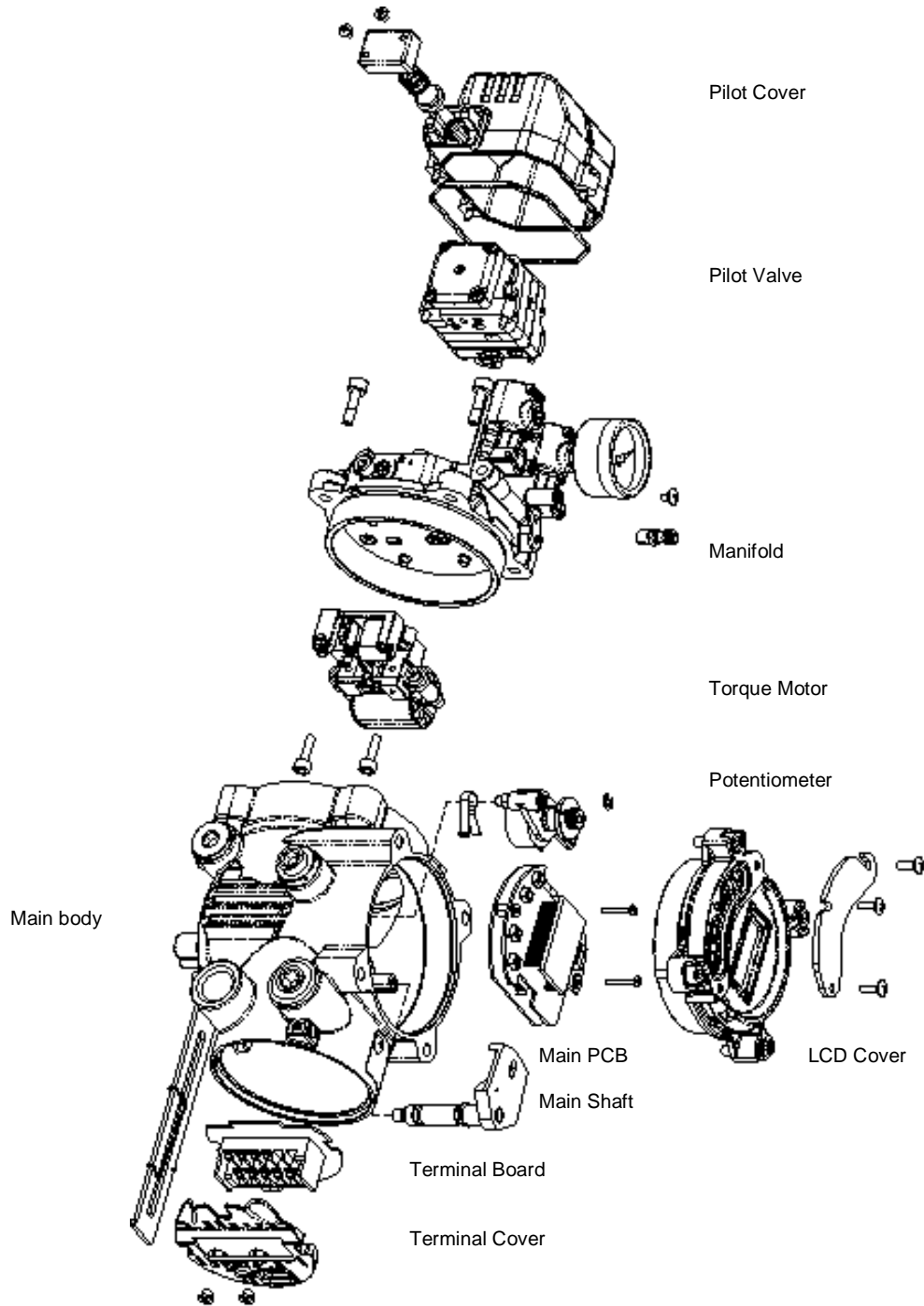
Main Features and Functions

1. LCD display enables users to monitor the positioners status.
2. The positioner will operate normally even if there are sudden changes in supply air pressure and / or high vibration.
3. An easy and reliable Auto Calibration function is available.
4. Due to the small foot print of the positioner, it can be installed on small actuators.
5. Low air consumption level and low voltage use (8.5V) yield to lower operating costs. The HPP4000 positioner is compatible with most of controllers.
6. Variable orifice can be use to minimize the hunting occurrence and optimize operating conditions.
7. HART communication protocol allows for the use of a Hart communicator for calibration or programming functions.
8. Valve system feedback is greatly improved by the accuracy and fast response of the HPP4000.
9. Various characteristics of valve can be adjusted – Linear, Quick open, and Equal percentage as well as custom made 16 points characterizations.
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 be used to direct supply air directly to the actuator or to operate the positioner.
13. Split range 4-12mA or 12-20mA can be set.
14. Manual calibration function can set Zero and Span values.
15. 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 resistant against the corrosion process.
18. Maintenance of the positioner is easy because of modularized inner design.

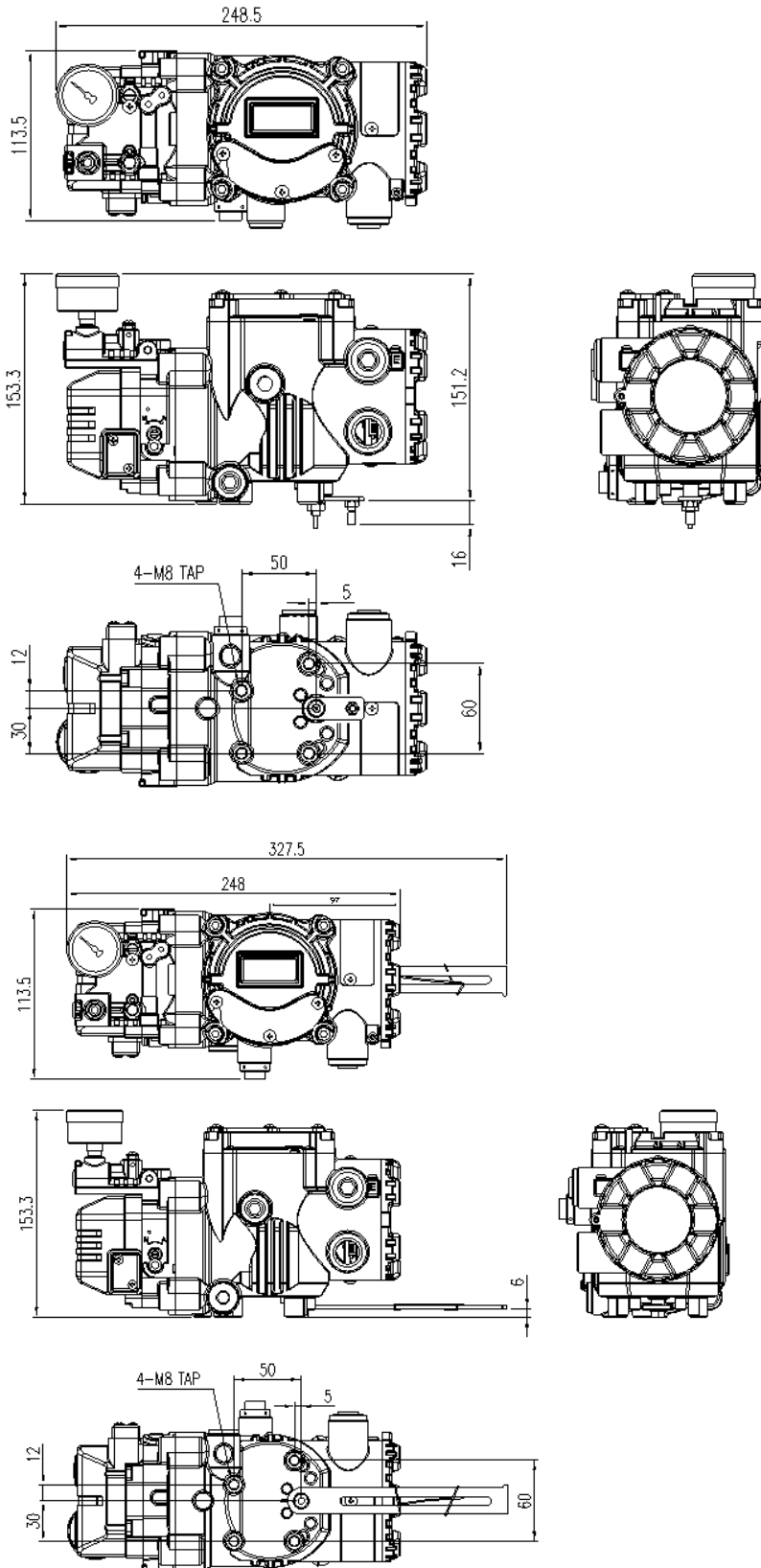
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Parts and Assembly:

The main components of the HPP4000 are as follows. The only difference between HPP4000L and HPP4000R is the lever.

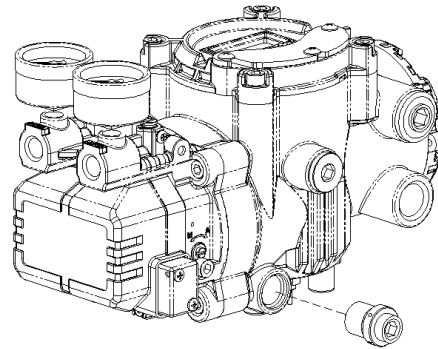
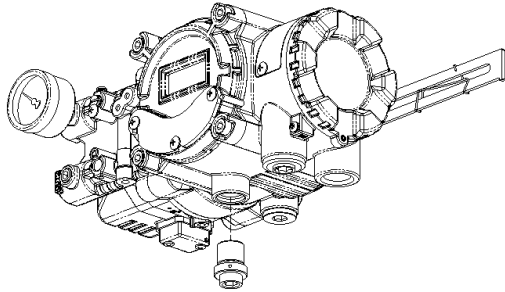


Dimensions:



Drain Plugs:

The HPP4000 has two convenient draining ports as indicated.



Installation:

Safety Warning

When installing a positioner, please be sure to read and follow the safety instruction.

- All inputs and supply pressures 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 pressure remaining in the actuator.

Tools for Installation

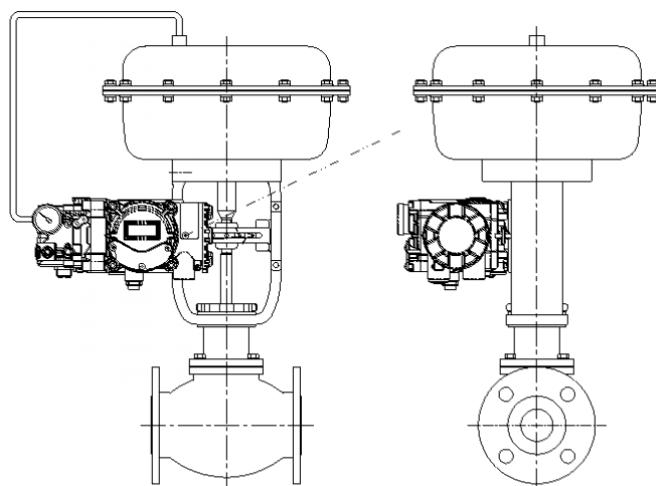
- ① Hexagonal wrench
- ② Screw drivers (+) & (-)
- ③ Spanners for hexagonal-head bolts

HPP4000 Installation

The HPP4000L should be installed on linear motion valves such as globe or gate which use spring return type diaphragm or piston actuators. Before proceeding to install the HPP4000L, be sure you have the following components:

- ① HPP4000 main body
- ② Feedback lever and lever spring
- ③ Flange nut (bottom side of HPP4000L)
- ④ 4 pcs of hexagon head bolts (M8 x 1.25P)
- ⑤ 4 pcs of M8 plate washer

Installation Example

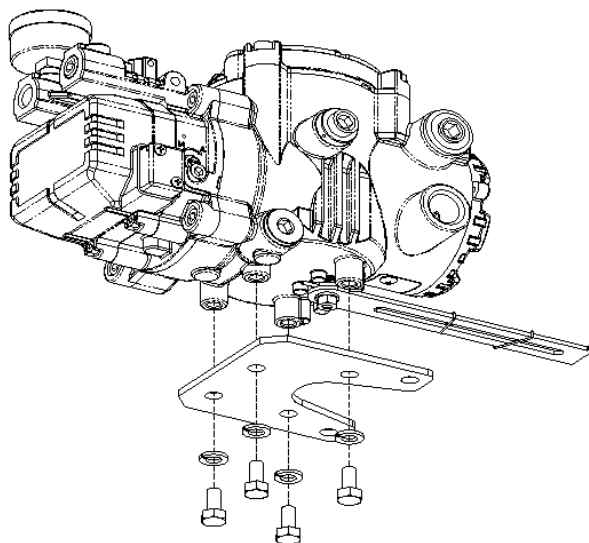


<HPP4000L>

Installation Steps

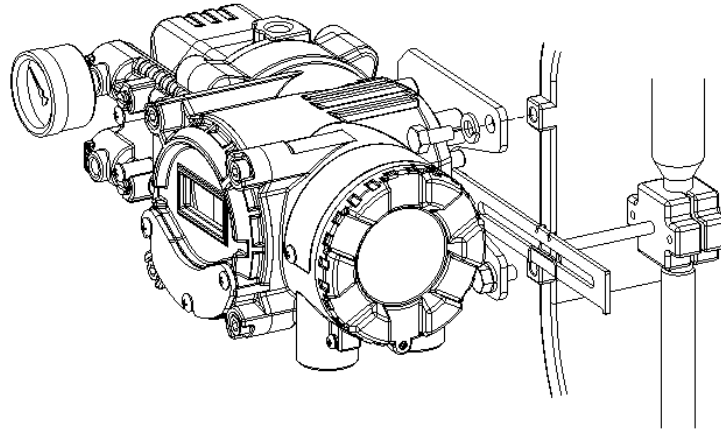
- 1) Specific brackets must be used in order to adapt the HPP4000L on the actuator yoke. Please consider the following important steps when adapting any type of bracket.
 - ① Feedback lever should be leveled at 50% of the valve stroke.
 - ② Feedback lever connection with the pin of actuator clamp should be installed in such a way that the valve stroke length coincides with the corresponding figure in mm marked on the feedback lever. This is a very important step to assure linearity and avoid unnecessary hunting.

- 2) Attach the HPP4000L to the actuator-specific bracket, 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.

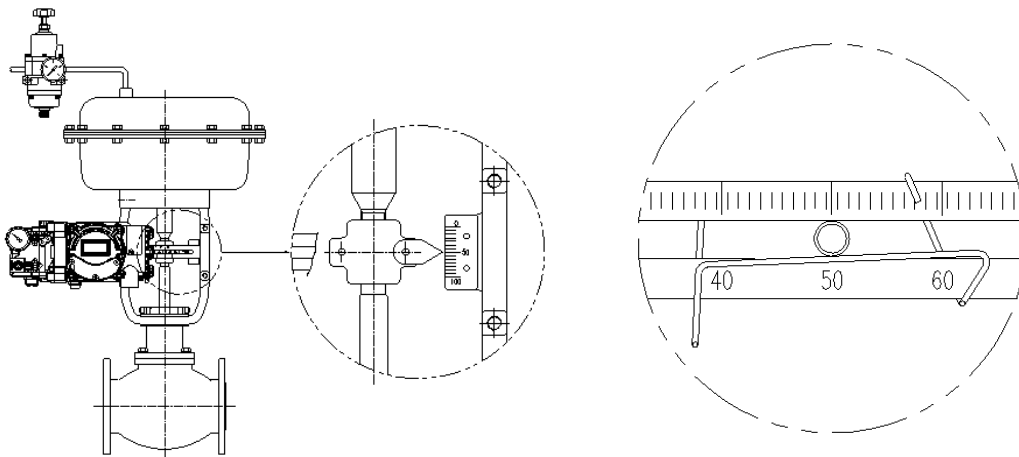


< Installing HPP400L with generic bracket>

- 3) Attach HPP4000L (with bracket) to the actuator yoke – DO NOT TIGHTEN COMPLETELY.
- 4) Connect HPP4000L feedback lever to the actuator clamp. The gap on the HPP4000L feedback lever is 6.5mm. The connection pin O.D. should be less than 6.3mm.

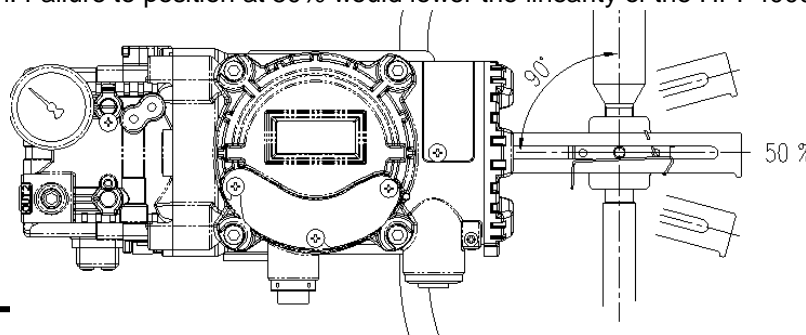


- 5) Connect air to the actuator temporarily. Supply enough air pressure order to position the actuator clamp at 50% of total valve stroke.
- 6) Insert the connection pin into the HPP400L feedback lever. The connection pin should be inserted at the 50% point on the feedback lever, which would help to reduce hysteresis.

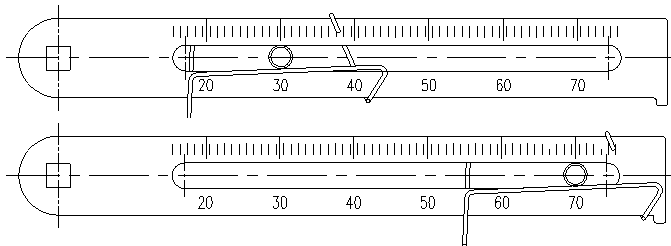


<correct way to install feedback lever and lever spring>

- 7) If the connection pin does not point at 50%, then adjust bracket or feedback link pin position. Failure to position at 50% would lower the linearity of the HPP4000L.



- 8) Check valve stroke. The stroke marks are indicated on the feedback lever. Position the connection pin right at the number on the feedback lever that corresponds to the desired valve stroke. To adjust, move the bracket, the connection pin or both.

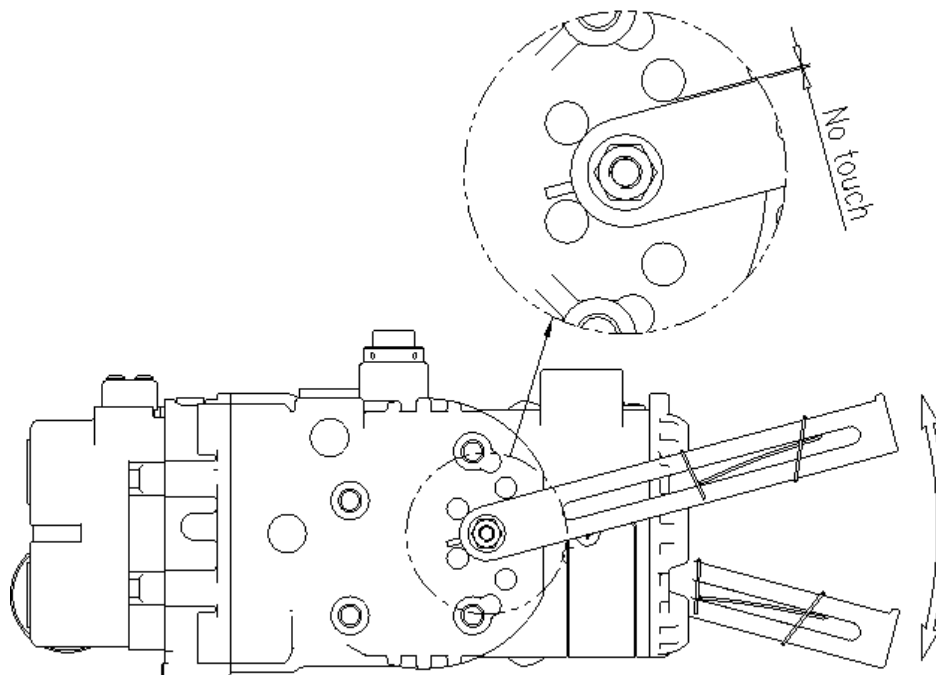


Stroke 30mm/1.18"

Stroke 70mm/2.75"

Note

After installing HPP4000L, operate the valve from 0% to 100% stroke by using direct air the actuator (manual position). On both 0% and 100%, the feedback lever should not touch the lever stopper, which is located on the backside of HPP4000L. If the feedback lever touches the lever stopper, HPP4000L 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 pin.

HPP4000R Installation:

The HPP4000R model should be used for rotary motion valves, that is ball, butterfly using rack and pinion, scotch yoke or other type of actuators which stems rotate 90 degrees. Before installation, be sure to check for following i components.

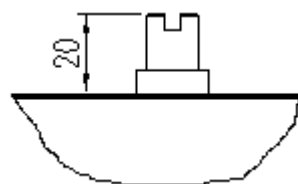
- ① HPP4000R main body
- ② Fork lever and lever spring
- ③ 1 set of bracket
- ④ 4 pcs of hexagon head bolts (M8 x 1.25P)
- ⑤ 4 pcs of M8 plate washer

Bracket Information

The HPP4000R is supplied with a standard bracket. The bracket can be used for fork lever and NAMUR bracket.

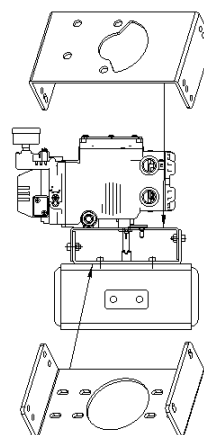
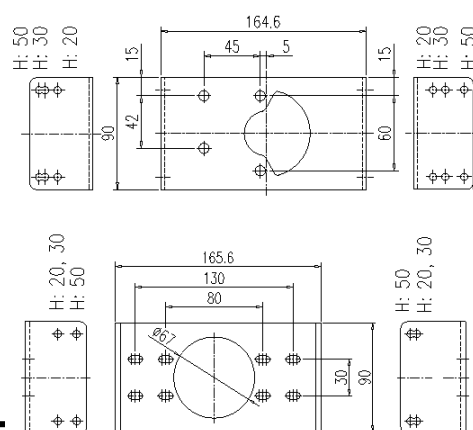
Actuator stem height (H)	Markings of bolt holes			
	A-L	B-L	A-R	B-R
20mm	H : 20	H : 20, 30	H : 20	H : 20, 30
30mm	H : 30	H : 20, 30	H : 30	H : 20, 30
50mm	H : 50	H : 50	H : 50	H : 50

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

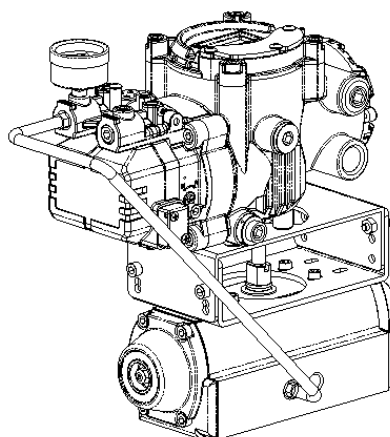


Actuator Stem (H)

Actuator

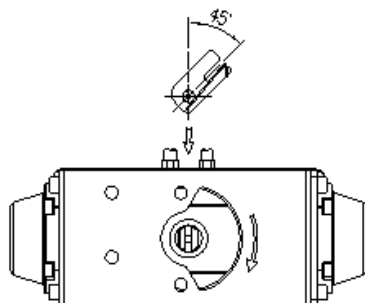


- 2) Attach
- 3) Install the HPP4000R to the actuator by using hexagon-headed and wrench bolts. Size of the bracket hole is 6mm. When tightening bolts, please use spring washers or similar for secure attachment to the actuator, and so that the HPP4000R will not be affected by vibration or any other disturbance.

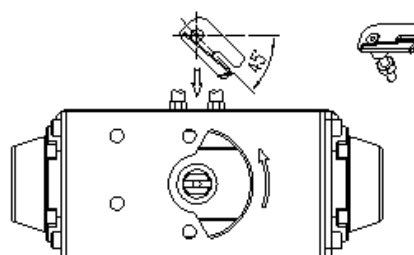


- 4) Set rotation position of the actuator stem at zero point, "0%". For a single type of actuator, it is easy to check zero point, because the actuator stem is positioned at zero point when there is no air supply pressure. If a double acting actuator is used, check actuator stem's rotation direction (clockwise or counter-clockwise) by supplying air pressure.

- 5) Install the fork lever as shown below and 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 in relation to the linear shaft. For NAMUR installations, the angle does not matter.

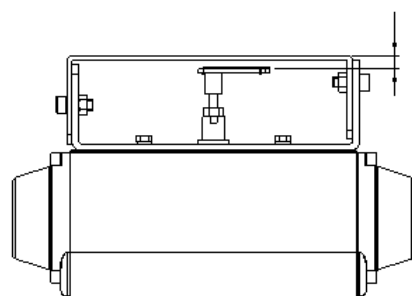


counter-clockwise



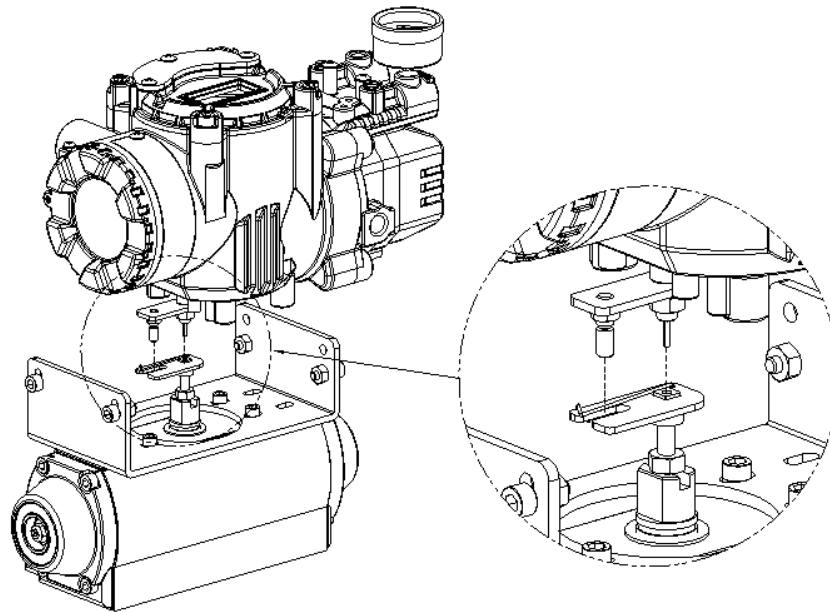
clockwise

- 6) 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

- 7) Attach the HPP4000R to the bracket. Fix the clamping pin on the main shaft's center of HPP4000R and insert connection pin into the fork lever slot, so it can be locked to the fork lever spring. This sets the alignment of the main shaft of the HPP4000R and center of the actuator stem. Poor alignment of the main shaft and the actuator stem decreases the HPP4000R durability, due to unnecessary forces on the main shaft.



- 7) Tighten the HPP4000R base and the bracket with hexagon-headed bolts and plate washer. It is recommended to tighten the four bolts after checking HPP4000R position.

Connection

Connection - Piping

Note

- Avoid moisture, oil, or dust into the HPP4000, by making sure you have clean and dry air supply.
- It is always recommended to use a good air filter regulator with our HPP4000.

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.

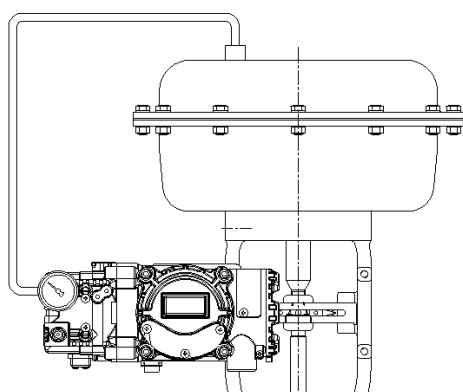
Pipe Connection

- ① Make sure inside of pipe is clean of obstructions.
- ② Do not use pipeline that is squeezed or shows any type of damage.
- ③ To maintain flow rate, use a 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 friction inside of the pipeline.

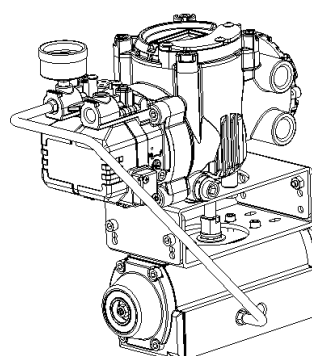
Piping Connection with Actuator

Single acting actuator

HPP4000 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.



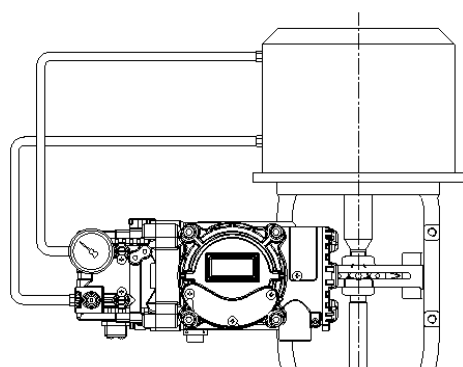
<HPP4000L single acting>



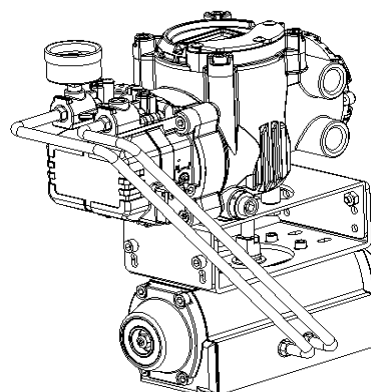
<HPP4000R single acting>

Double acting actuator

For the HPP4000R double acting type, supply pressure is out from OUT1.



<HPP4000L double acting>

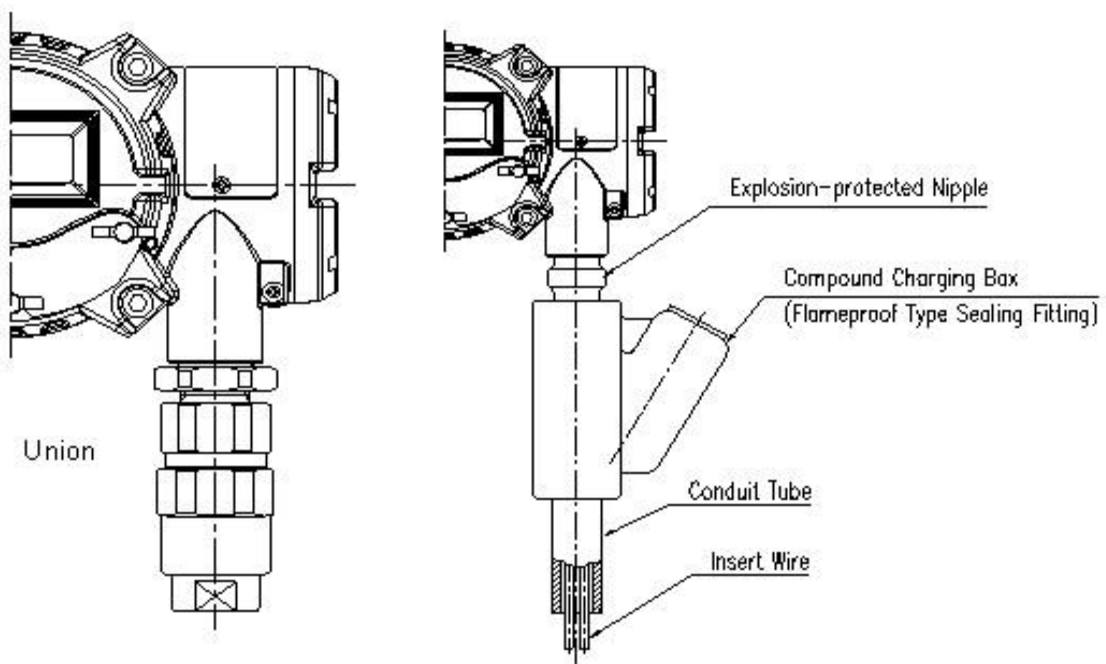


<HPP4000R double acting>

Connection - Power

Note

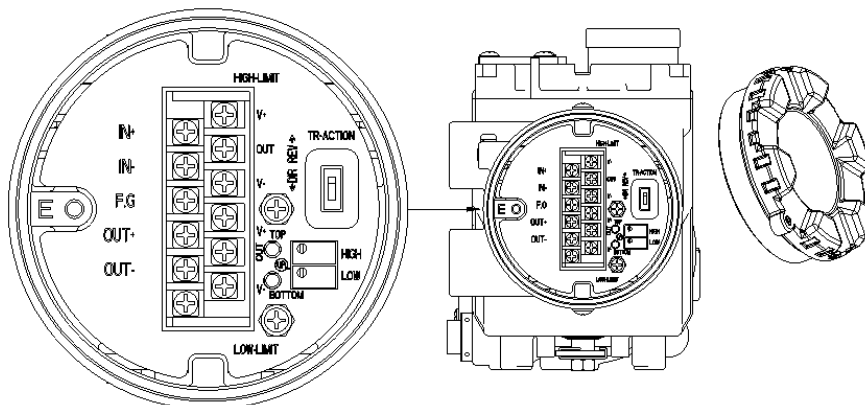
- Before connecting terminal, please make sure that power is off.
- Use ring type terminal to protect against vibration or other impacts.
- HPP4000 (except internal PTM or L/S type) must use DC 4-20mA. Minimum supply current should be 3.2mA for standard HPP4000, and minimum 3.8mA should be supplied for HPP4000 with HART communication. The power should not exceed 24mA.
- □HPP4000 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.
- □HPP4000 must be grounded.
- □Please use twisted cable with conductor section area 1.25 mm² 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.



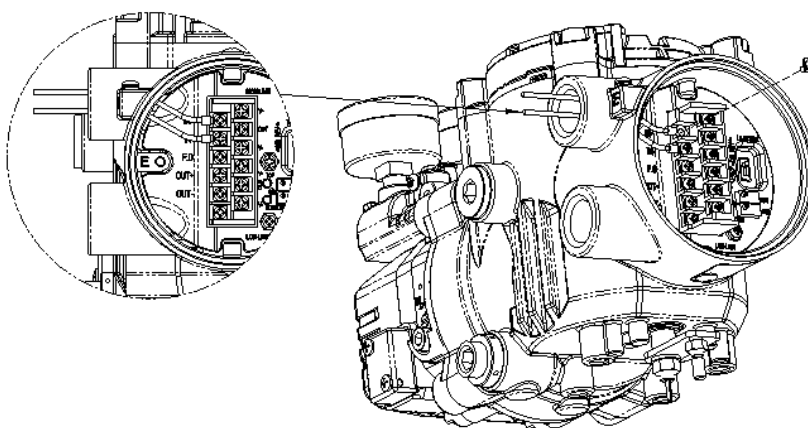
Connection – Feedback Signal

- 1) Open product cover by opening 4 M4 bolts.

- 2) Locate two entries on the right hand bottom part of the HPP4000 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 the HPP4000. 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.



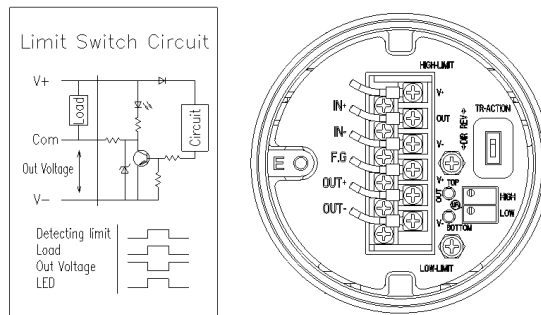
IN +	Input Signal (+)
IN -	Input Signal (-)
FG	Ground
OUT +	Feedback Output (+)
OUT -	Feedback Output (-)



Connection – Limit Switch

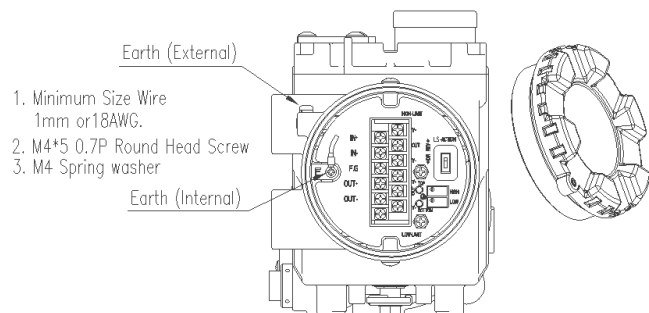
- 1) Open the terminal box cover by using 3mm wrench.

- 2) There are two entries on the right hand bottom part of the HPP4000. 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 (15kgf/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 the HPP4000.
- 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 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 the HPP4000. 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 (15kgf/cm) torque.
- 7) Close the cover and lock cover bolts tightly.

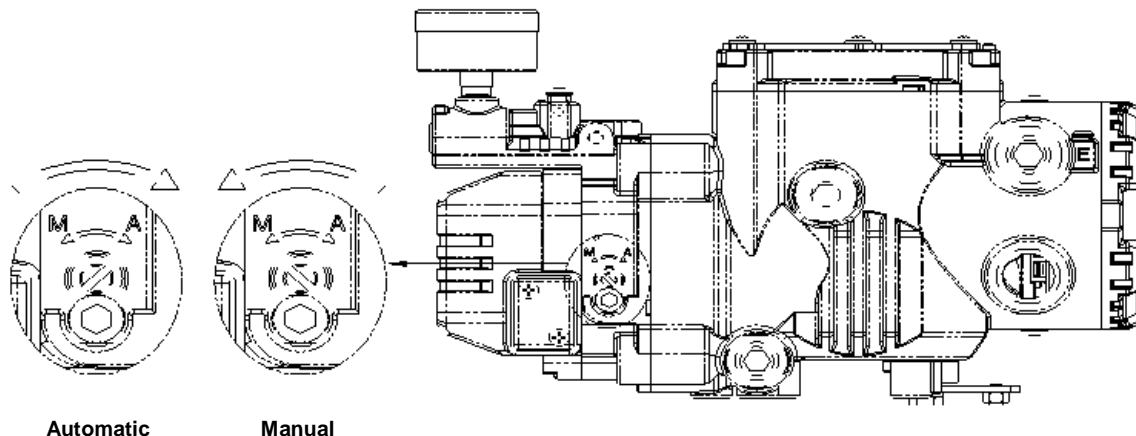


Adjustment

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

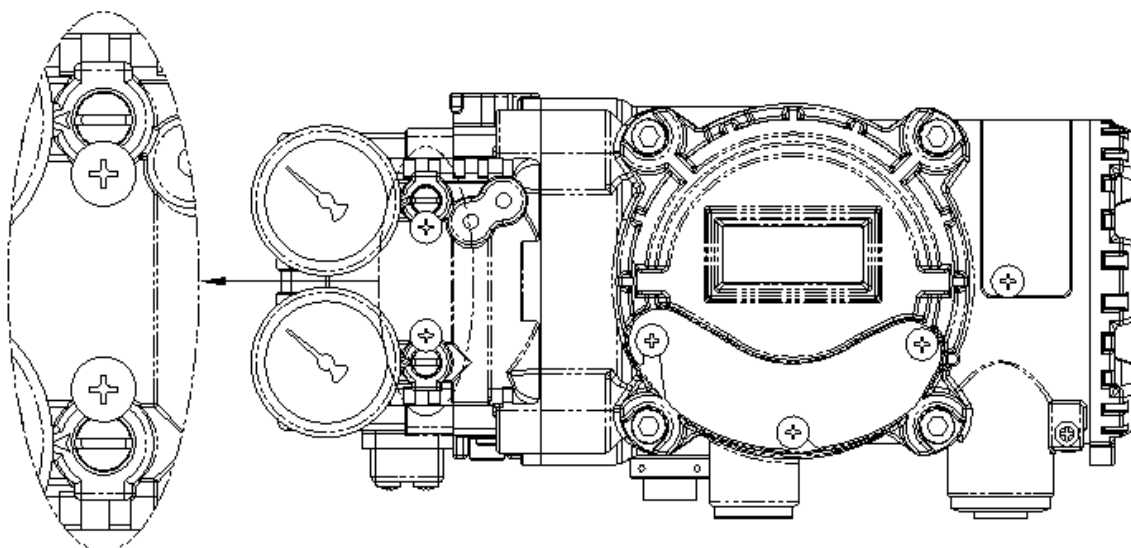
On the bottom of the HPP4000 body, there is A/M Switch (Auto/Manual). If the switch is set as "A" (Auto), then the supply pressure will be transferred through the HPP4000 operation. On the other hand, if the setting is "M" (Manual), then the pressure from the air filter regulator will directly supplied to the actuator regardless of the HPP4000 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.

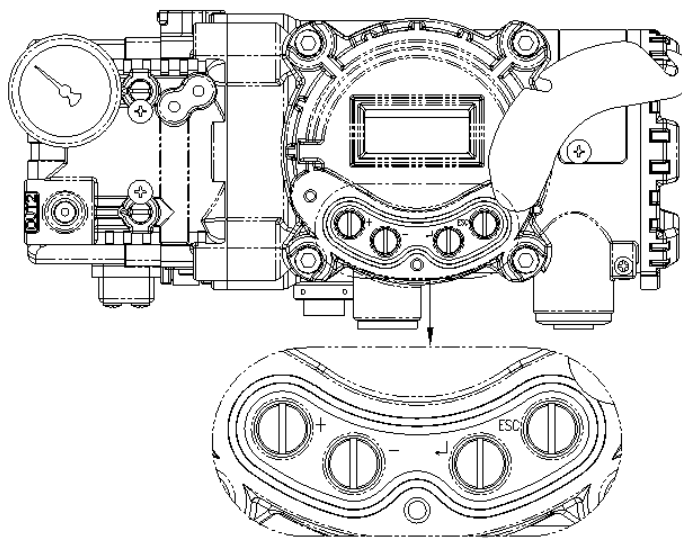


Auto Calibration and Basic Operation

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



The HPP4000 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 the HPP4000 the following message will appear on LCD screen within 6 seconds.



"RUN" indicates that the HPP4000 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.

Run PV	Process Value	Valve Stroke (%)
--------	---------------	------------------

①			
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 the HPP4000 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 the HPP4000 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 appear
- 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.



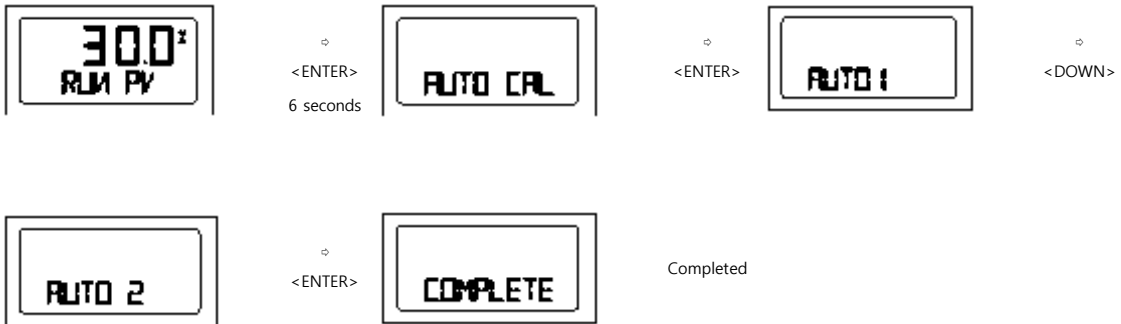


Completed

Auto 2 Calibration

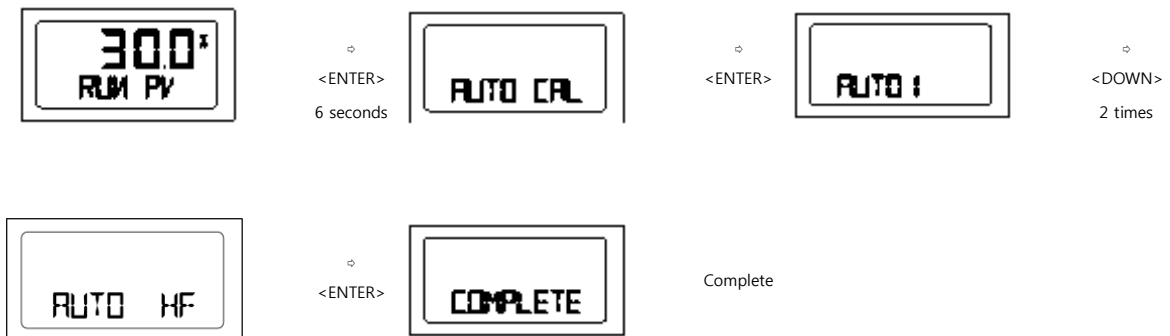
Auto 2 Calibration sets all of the parameter needed to be calibrated for valve to operate at its best. Auto 2 Calibration is recommended when the HPP4000 is first installed on the valve .

- 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 minutes, The COMPLETE message will be appeared to indicate that AUTO2 calibration has been completed.



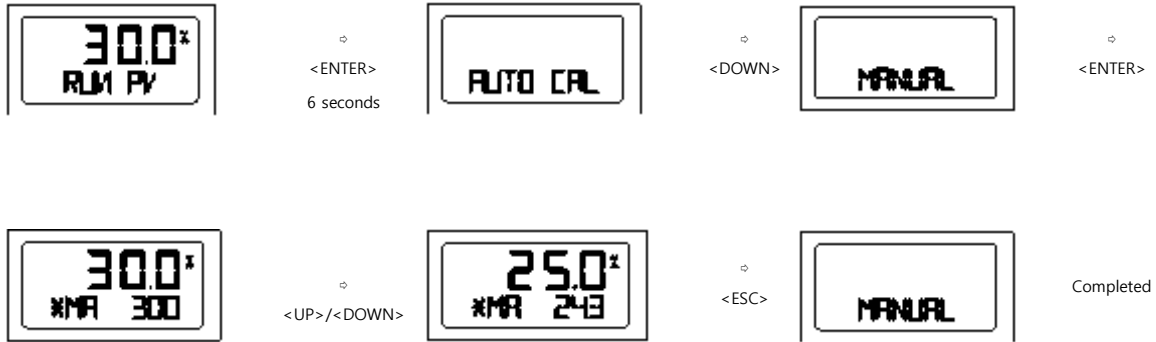
Auto HF Calibration

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, the HPP4000 bypasses supply air to to the actuator. The movement of the stroke does not affect HPP4000 saved data values, and it just moves valve strokes up/down according to air supplied.



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 is not optimized. When this occurs, hunting or oscillation can be prevented by adjusting parameter values and DeadZone.

4 Types of Parameter and Adjustment

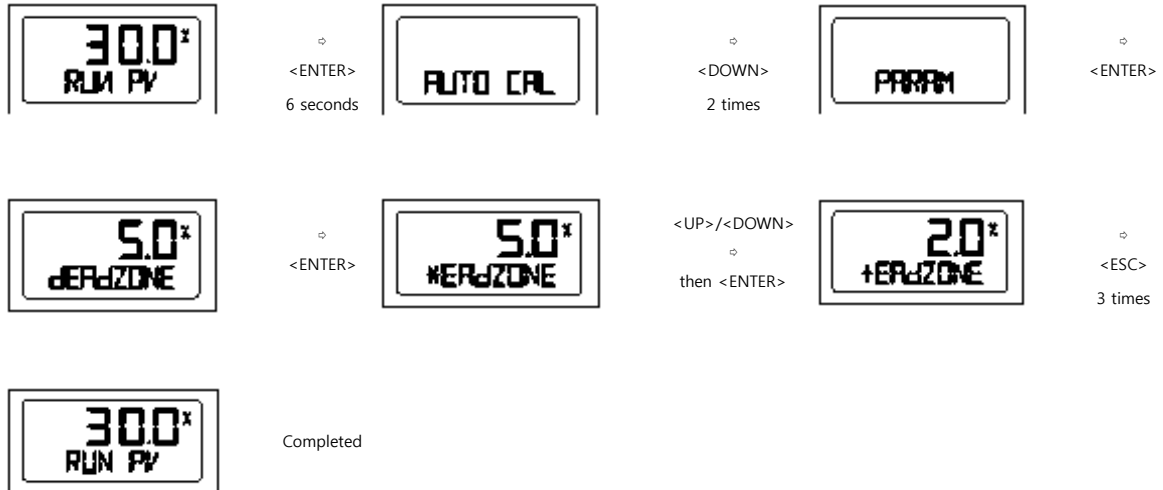
- ① Dead-Zone (dEAdZONE)
- ② P-value (KP)
- ③ D-value (Kd)

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.

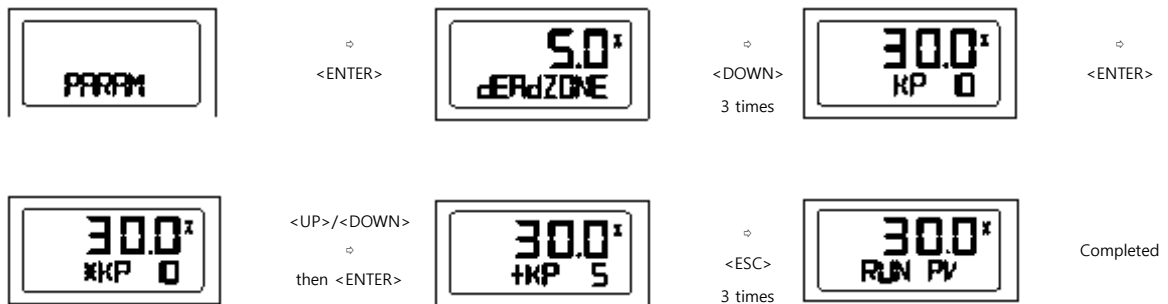
Dead-Zone (dEAdZONE)

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.



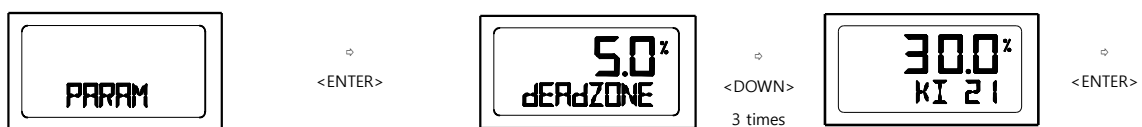
P-Value (KP)

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.



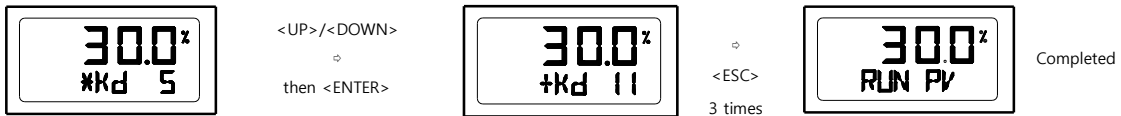
I-Value (KI)

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)

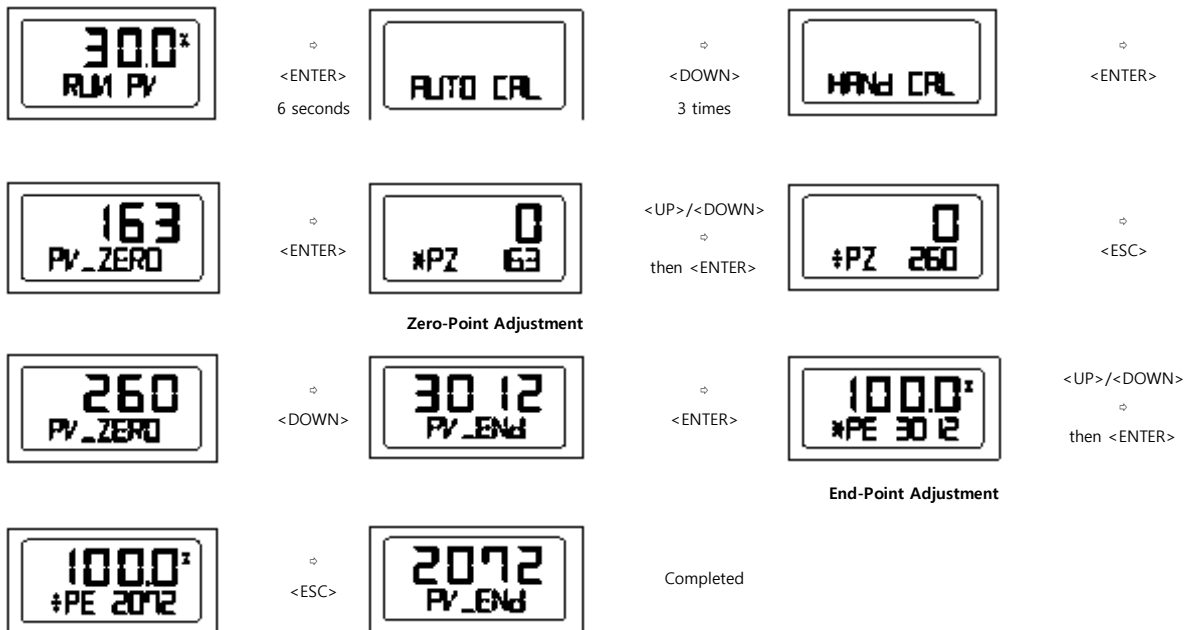


Hand Calibration Mode (HAND CAL)

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.

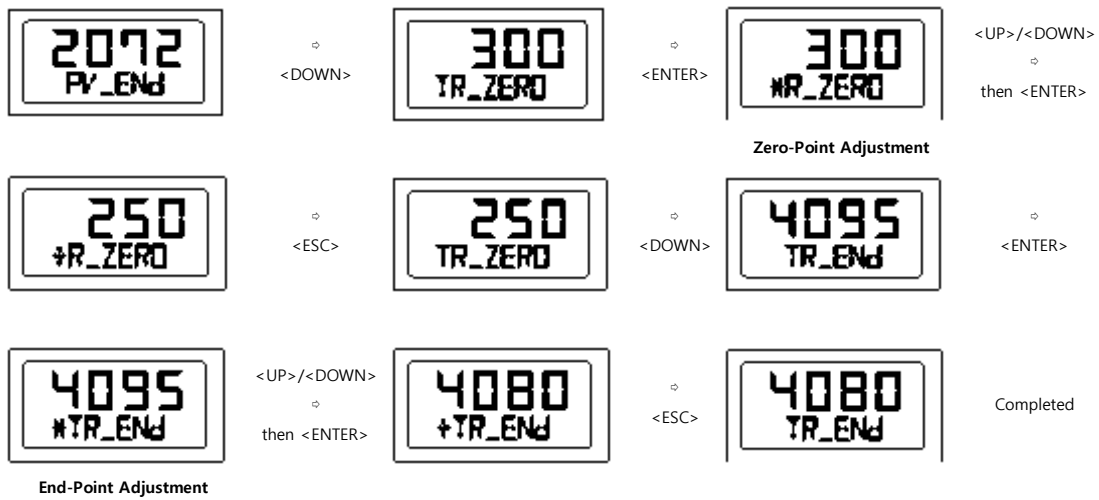
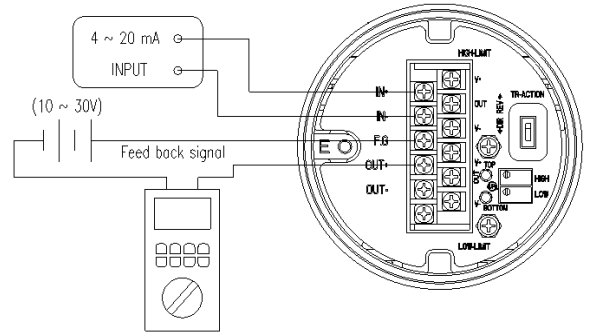
Zero-Point (PZ_ZERO) and End-Point (PZ_END) for Valves

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.



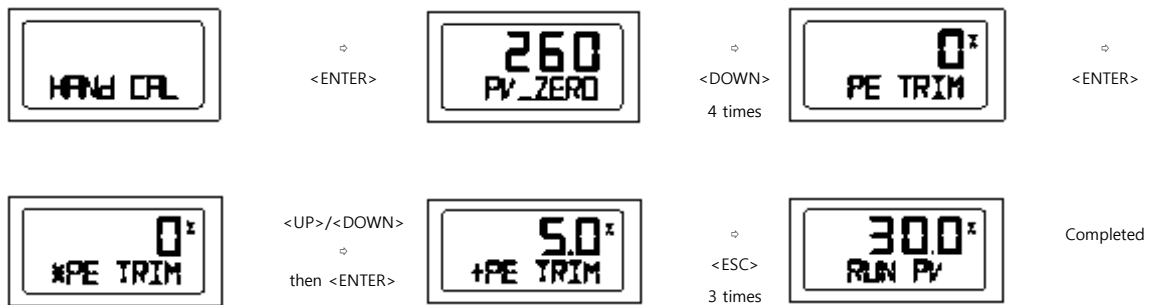
Zero-Point (TR_ZERO) and End-Point (TR_END) for Transmitter

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.



제로점 변경



Valve Mode (VALVE)

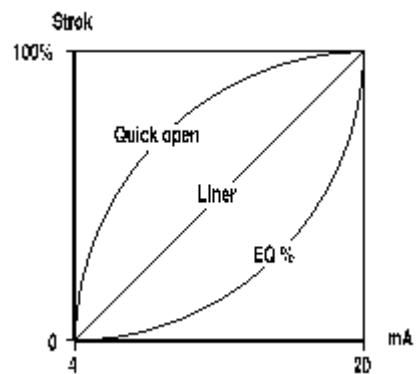
Acting Adjustment (ACT)

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



Characteristics Adjustment (CHAR)

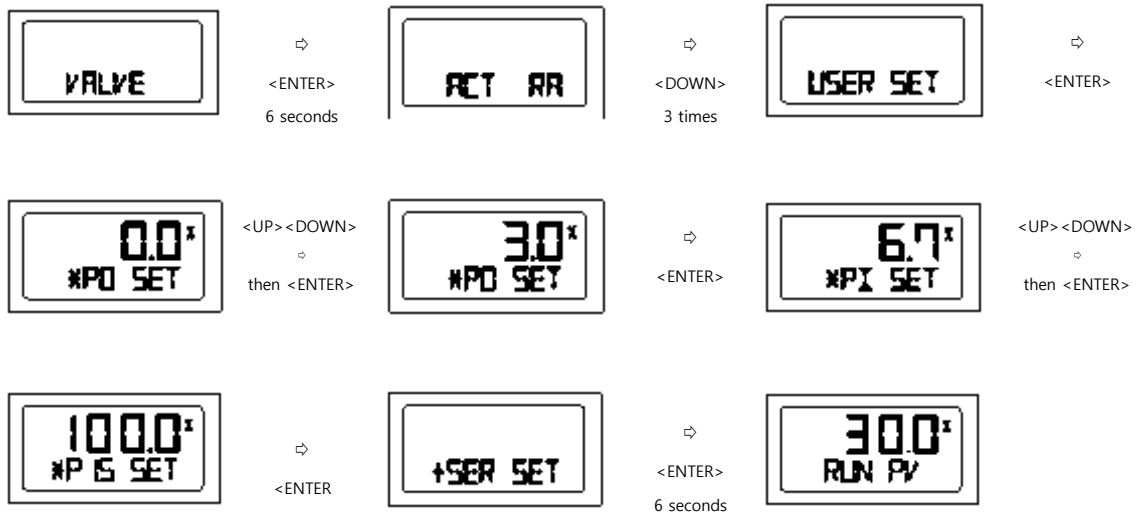
The positioner's characteristics can be set depends on user's preference. There are 3 types of characteristics - Linear (LIN), Equal Percentage (EQ), and Quick Open (QO). See graphic chart.





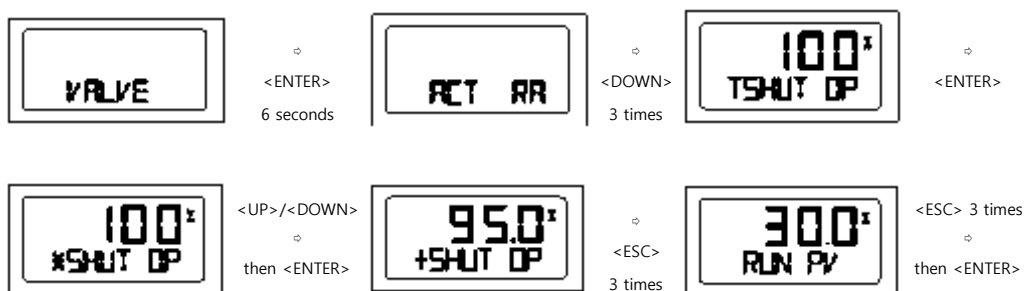
User Characteristics (USER SET)

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)

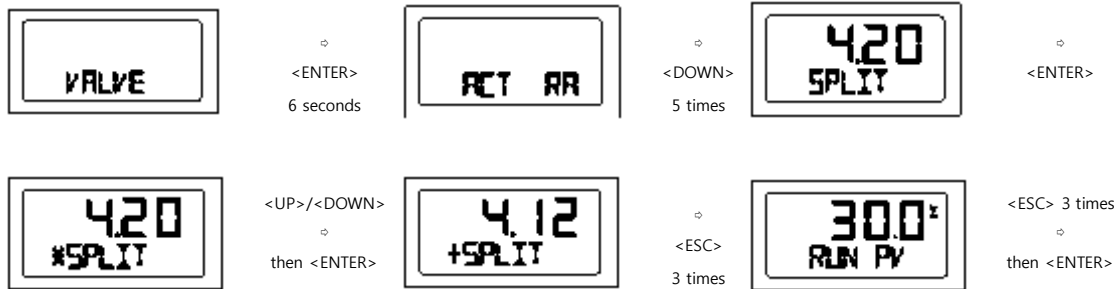
TSHUT CL allows the valve to close completely when the input signal reaches around 4mA.





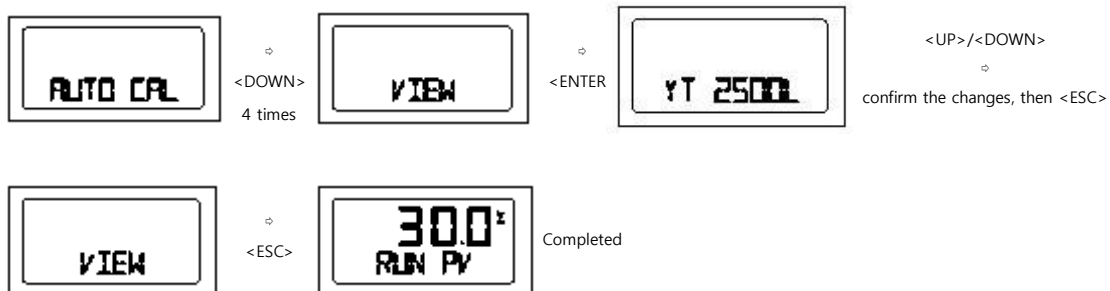
Split Range Control (SPLIT)

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
HPP400L	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.

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Error and Warning Code

The HPP4000 provides error and warning codes if there is/are problem/s.

Error Code

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

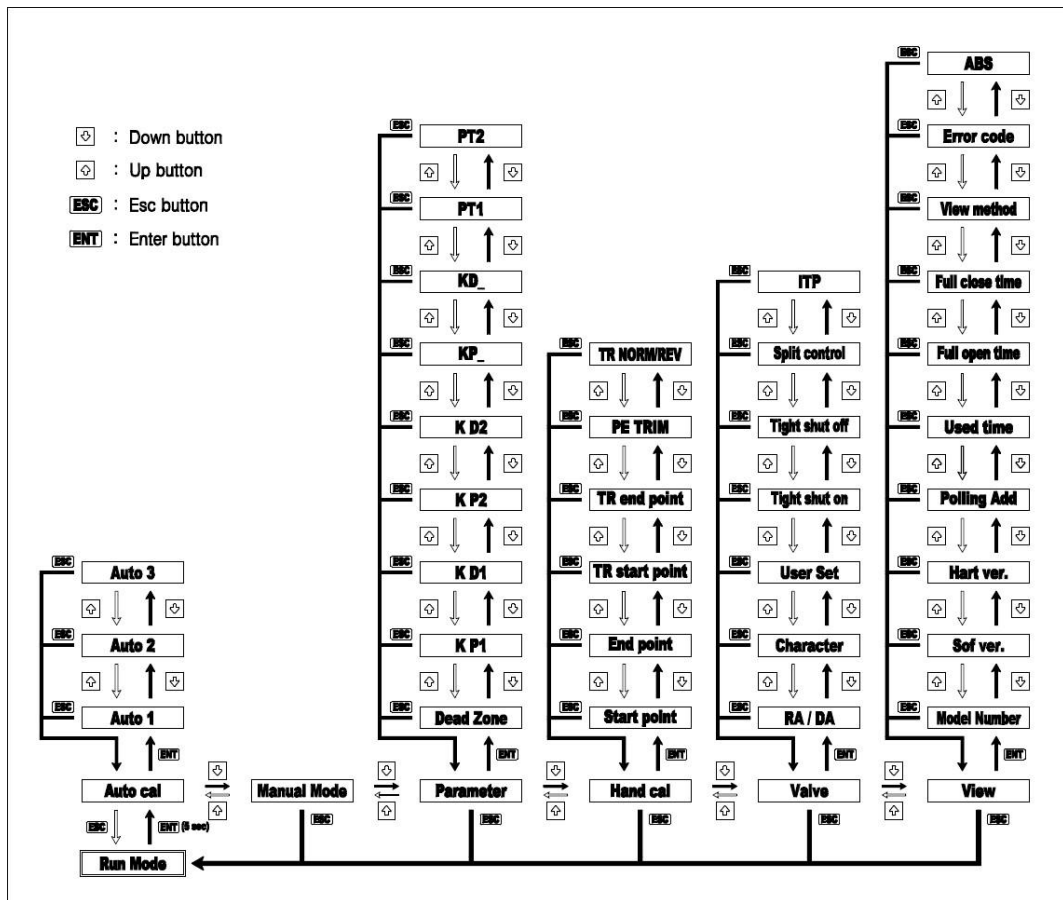
Error Code	Code Description and Cause	Action
MT ERR L	Positioner is improperly installed. Positioner lever is not parallel to the ground at 50% point. Lever is at lower position than actual 50% point.	<ul style="list-style-type: none"> • Re-install/mount the positioner. • Make sure the feedback lever 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



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This manual can be changed or revised without any prior notice. For latest version, please contact Trimteck website.

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