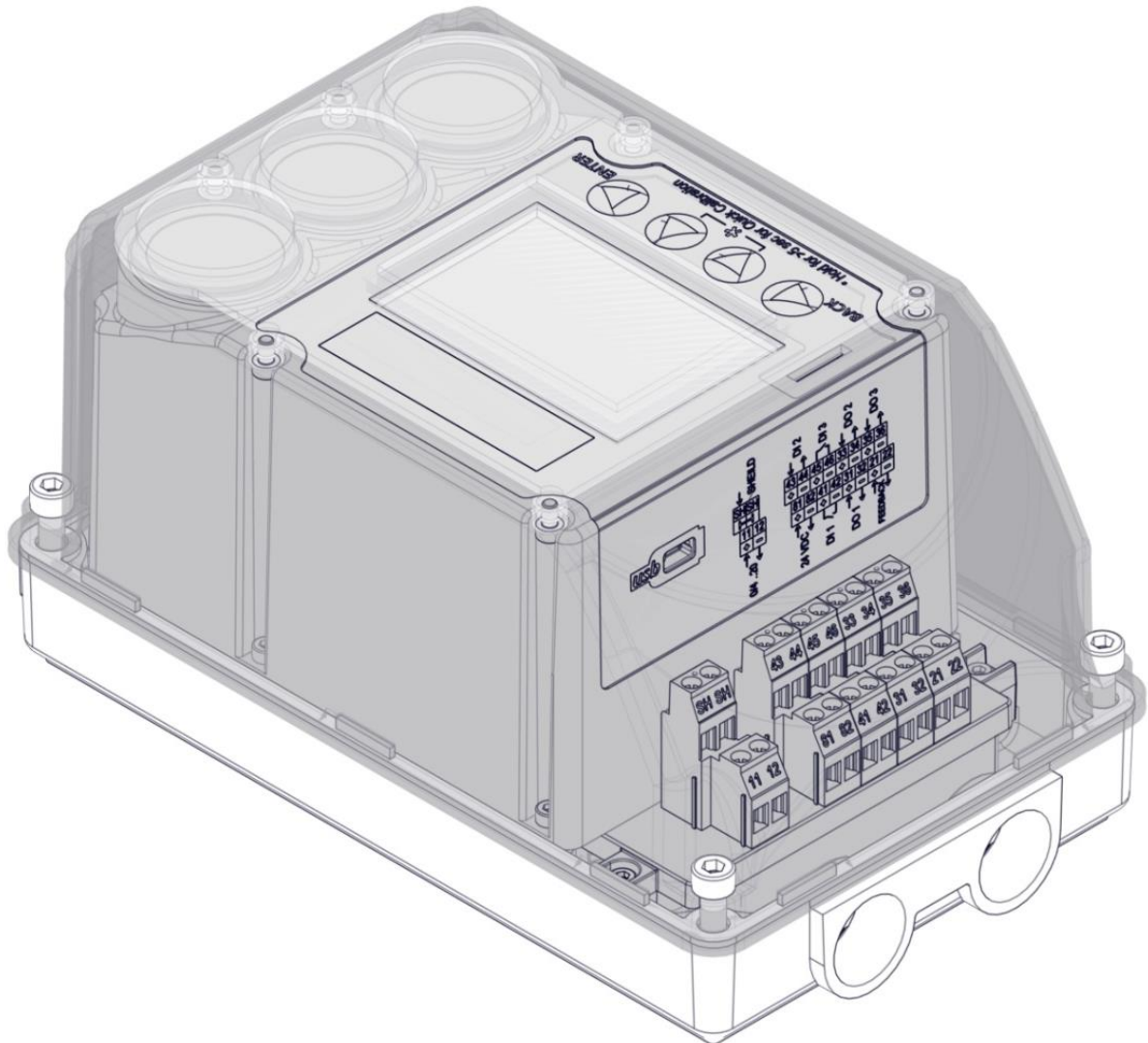


# POSITIONER

SMART POSITIONER



## Installation Operation and Maintenance

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## Safety

### Warning notice

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.



- **If not observed, user incurs a high risk of severe damage to product and/or fatal injury to personnel.**



- **If not observed, user may incur damage to product and/or injury to personnel.**



- *Advisory and information comments provided to assist maintenance personnel to carry out maintenance procedures.*

### Qualified Personnel

The product/system described in this documentation may be operated only by personnel qualified for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions.

Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

### Disclaimer of Liability

This manual provides information on installation, operation and maintenance procedures and related instructions for the ROTEX make POSITIONER (Smart positioner).

The aim of this literature is to support the use of products in correct manner, and all the technical information provided in the catalogue.

The manual should be given to the end user.

The manual can be changed 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 consent of Rotex Manufacturers & Engineers Private Limited, INDIA.

## **Manufacturer Warranty**

For the safety, it is vital to follow instructions in the manual. It is not ROTEX's liability for any damages which caused by users' negligence.

It is not ROTEX'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 ROTEX directly.

ROTEX warrants the product from the date of original retail purchase of the product for one (1) year, except as otherwise stated.

ROTEX 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, 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:

ROTEX MANUFACTURERS & ENGINEERS PRIVATE LIMITED, R852/853 T.T.C. Industrial Area, Rabale, Navi Mumbai 400701.

## 1. Posidapt Product Summary

### 1.1. Key Features

#### **LCD Display**

- Larger LCD display for readability.
- No abbreviation and short form used.
- User friendly interface
- On screen diagnostic, alarm and error messages
- Structure menu for parameter, setup and diagnostics.

#### **Contactless Feedback**

- Contactless feedback, with patented algorithm
- Blind mount, eliminated need to oriented mounting angle.
- Remote mounting

#### **Push Button**

- Push button on device allows managing menu, diagnostics and alarms.
- Quick calibration using two push buttons.

#### **IP66**

- Pre-fitted gauge, enclosed in IP66 enclosure, ensure lifetime guaranty and reliability.

#### **Electronics**

- Encapsulated electronic provide protection against moisture and humidity, avoiding latency failure of electronics.
- Modular electronic, Alarm Module and Position Transmitter.

#### **Servo Valve**

- Metal-to-metal contact, low friction and high sensitivity.
- Can accommodate wide variety of volume without need of flow control valve or volume booster.
- Build in feedback sensor.

#### **Communication**

- HART protocol
- DD/DTM for HART communication.

#### **Product Variant**

- Posidapt series has different product variant as, Modern, Expert, Super, Ultra and IPST.

## 1.2. Posidapt Series



### POSIDAPT<sup>ipst</sup>

Emergency shutdown / Trip test Advanced Performance, Diagnostics, Alerts and Offline & Online test / Hart

### POSIDAPT<sup>ultra</sup>

Advanced Performance, Diagnostics, Alerts and Offline & Online test, Hart

### POSIDAPT<sup>super</sup>

Diagnostics, Alerts, Hart, Advanced Performance

### POSIDAPT<sup>expert</sup>

No Diagnostics, No Alerts, Hart, Advance Parameters

### POSIDAPT<sup>modern</sup>

No Diagnostics, No Alerts, No Hart, Basic Parameters

Model	Basic Parameters	Advance Parameters	Alerts & Diagnostics	Advanced Diagnostics	Online Diagnostics	Offline test	Partial Storke test	Hart Compatible	Solenoid Valve Test test	Emergency Trip Test	Servo Health Test
Modern	✓	✓	-	-	-	-	-	-	-	-	✓
Expert	✓	✓	✓	-	-	-	-	✓*	-	-	✓
Super	✓	✓	✓	✓	-	✓	-	✓	-	-	✓
Ultra	✓	✓	✓	✓	✓	✓	✓	✓	-	-	✓
IPST	✓	✓	✓	✓	-	-	✓	✓	✓	✓	✓

## 2. Technical Specification

### • Overview

#### ➤ General

- Loop power no external power supply required.
- External 24V DC option available.
- Blind mount.
- Suitable for rotary and linear valves.
- Actuator connections in accordance with VDI/VDE 3845 and IEC 60534-6 standards.

#### ➤ Action

- Double or single acting.

#### ➤ Failsafe

- Failsafe or stay-put(fail freeze)

### • Actuator Travel Range

#### ➤ Linear

- 0° position can start anywhere, 3 to 200 mm stroke, other strokes on request.

#### ➤ Rotary

- 0° position can start anywhere, max 359°

#### ➤ Measurement range

- 0 to 359° with freely rotating contactless feedback shaft.

#### ➤ Actuator travel time

- 0 to 300 seconds (configurable in incremental steps of 60 seconds)

#### ➤ Actuator travel limit

- Freely configurable in 0 to 100%

#### ➤ Deadband time limit

- 0 to 300 seconds (freely configurable, monitoring parameter until deviation reaches within deadband)



- **Environmental Condition**

- **Standard temperature range**
  - -20° to +85°C / -4° to +185°F
- **Low temperature range**
  - -40° to +85°C / -40° to +185°F
  - -55° to +135°C / -67° to +185°F available on request
- **Influence of temperature on valve position**
  - 0.35% /10°K
- **Influence on valve position**
  - <1% under 10g 5-85 Hz. 2.5 85-150 Hz
  - 1.5g, 150-280 Hz, 0.5g 280-1500 Hz

- **Construction/Enclosure**

- **Material**
  - 1=Epoxy coated anodised aluminium housing & Makrolon® (Polycarbonate) cover
  - 2 =Epoxy coated anodised aluminium housing & cover with Makrolon® see through window
  - 3 =Explosion proof aluminium housing & cover with toughened glass see through window
  - 4 =Explosion proof stainless steel housing & cover with toughened glass see through window
  - 5 =Intrinsically safe, epoxy coated anodised aluminium housing & Makrolon® (Polycarbonate) cover
  - 6 =Intrinsically safe, epoxy coated anodised aluminium housing & cover with Makrolon® (Polycarbonate) cover
  - 7 =Intrinsically safe, stainless steel housing & cover with toughened glass see See through window
- **Protection class**
  - Ip66
- **Pneumatic pressure ports**
  - G1/4"
  - 1/4" NPT
- **Exhaust port**
  - G1/4"
  - 1/4" NPT

- **Cable gland**
  - ¼" NPT
  - M20 x 1.5
  
- **Weight (with gauges)**
  - Bare Positioner option 1,5 = 2.25 kgs / 5 lbs
  - Bare Positioner option 2,6 = 2.5 kgs / 5.5 lbs
  - Bare Positioner option 3 = 6.6 kgs / 10.6 lbs
  - Bare Positioner option 4,7 = 9.9 kgs / 21.9 lbs
  - Positioner transmitter /Alarm module = 0.08 kgs / 0.2 lbs
  
- **Pneumatics**
  - **Supply pressure**
    - 1.4 to 8 bar / 0 to 14 psi (10 bar on request)
  
  - **Capacity with 4 bar / 60 psi**
    - > 1 to 41 Nm<sup>3</sup>/h / 0.5 to 23 scfm (servo controlled orifice)
  
  - **Consumption with 4 bar / 60 psi (Steady state)**
    - < 1 lpm / 0.037 scfm @ 4 bar
  
- **Instrument Air**
  - **Air Quality**
    - In accordance to ISO 8573-1
  
  - **Solid particles**
    - Class 5 (maximum density 3mg/m<sup>3</sup>, 5µm filtration is recommended)
  
  - **Humidity**
    - Class 1 (Dew point 10° C below minimum operating temperature)
  
  - **Oil**
    - Class 3 (maximum concentration 5 mg/m<sup>3</sup> or < 1 ppm)

- **Electronics and Electricals**

- **Supply Power**

- 4 to 20 mA (2 wire system)
- 18 to 30 VDC (4 wire system)

- **Signal**

- 4 to 20 mA, 0 to 20 mA (only with 4 wire system), both with or without HART signal

- **Minimum Signal**

- $\geq 3.6$  mA

- **Current max**

- 36 mA (with overload protection)

- **Load Voltage**

- 9.7 VDC @ 20 mA (max 30 VDC)

- **Impedance**

- 485  $\Omega$  at 20 mA

- **Wire Cross Section**

- Screw terminals max 2.5 mm<sup>2</sup> (AWG 14)

- **Characteristics and Performance**

- **Characteristics**

- Linear 1:25, 1:33, 1:50, 25:1, 33:1, 50:1, and freely configurable

- **Deadband**

- Configurable from 0.1% to 10 %

- **Hysteresis**

- $\leq 0.5$  %

- **Deviation**

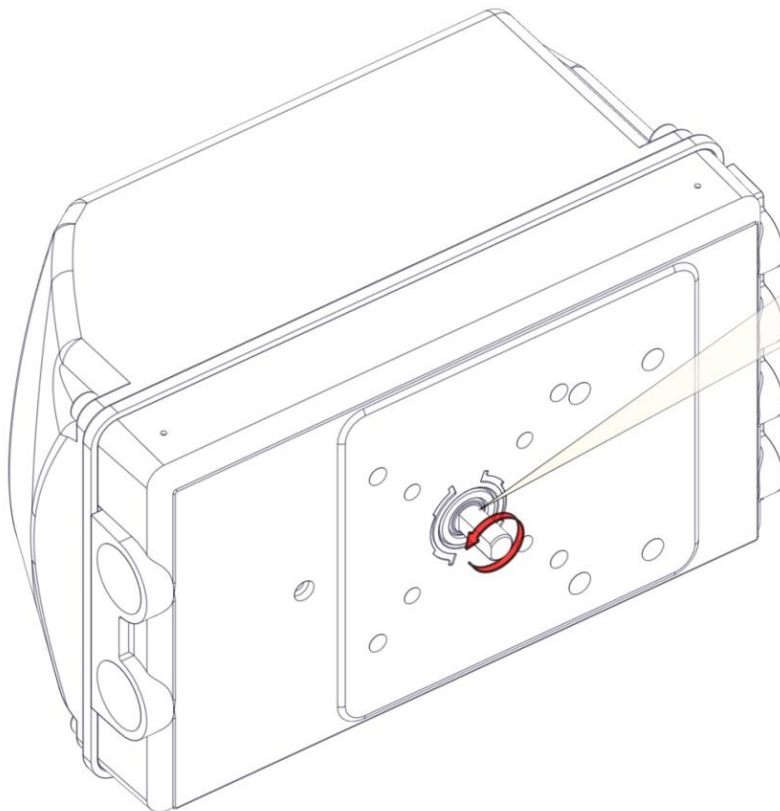
- $\leq 0.5$  %

- **Position Transmitter module**
  - **Output**
    - 4 to 20 mA (2 wire system)
  - **Supply Voltage**
    - 12 to 30 VDC
  - **Total Operating Range**
    - 3.6 to 21 mA
  - **Transmission Error**
    - $\leq 0.3 \%$
  - **Influence of temperature**
    - $0.35 \%$  /  $10^\circ \text{K}$
  
- **Alarm Module**
  - **Supply Voltage**
    - 12 to 30 VDC
  - **Max Supply Voltage**
    - $\leq 35 \text{ VDC}$
  - **Signal Current**
    - $\leq 2.1 \text{ mA}$  (Logically HIGH)
    - $\leq 1.2 \text{ mA}$  (Logically LOW)
  - **Total Digital Output**
    - 3
  - **Total Digital input**
    - $2^{\wedge}$
  - **Voltage**
    - 30 VDC

- **Communication**
  - **HART 5 & 7**
  - **Foundation Field bus**
  - **Profibus PA**
  
- **Certification**
  - **Atex**
    - II 2GD Ex ia IIC T6 Gb
    - II 2GD Ex d IIC T6 Gb
  
  - **Safety**
    - Up to SIL 3

### 3. Posidapt Overview

Simplicity in mounting, ease of operation and maintenance coupled with unmatched performance are some of the highlights of the Rotex smart Positioner, listed below are some of its unique features:





No dead zones, No "Quadrants " to align.  
Can start anywhere and end anywhere.

- LCD Display
  - a. Large LCD display for readability
  - b. No abbreviation or short form used
  - c. User friendly interface
  - d. On screen display of diagnostics, alarms and error messages
  
- Modular design with encapsulated electronics
  - a. Fewer modules make it easy to install, operate and maintain.
  - b. Fewer numbers of internal components and moving parts, increased reliability and life span.
  - c. Pre-fitted gauges, enclosed in IP66 enclosures ensure lifetime guarantee and reliability.
  - d. Encapsulated electronics provide protection against moisture and humidity, avoiding failure of electronics.
  
- Superior functionality
  - a. Contactless feedback, with patented algorithm.
  - b. Blind mount, eliminates the need to orient mounting angle.

- Feedback sensors
  - a. It has built in feedback sensor.
  - b. Preciservo operates with adaptive dual PID loop and ensures high accuracy, lower dead band and extremely steady performance of positioner, Primary loop is controlling the spool position of the Preciservo and secondary loop is controlling the actual position.
  - c. Dual PID loops eliminate overshoot, undershoot, hysteresis and “hunting”. ROTEX POSIDAPT can maintain a steady state and set point with the highest degree of confidence.
  - d. Preciservo has metal to metal contact ensuring low friction and high sensitivity.
  - e. Precise manufacturing assures negligible hysteresis and dead band.
  - f. ROTEX Preciservo valve can vary the orifice due to primary PID loop. Hence different sizes of actuators can be calibrated without the need of flow control valves or volume booster.
  - g. ROTEX Preciservo has built in self health check, ensures best performance and reliability during calibration and testing.
  
- Communication
  - a. ROTEX POSIDAPT is compatible with Foundation fieldbus, Profibus and HART version 5 & 7.
  - b. It is also compatible with DTM framework version 1.2.1
  - c. DTM and EDD based on multi-system support configuration.
  
- Remote mounting
  - a. Remote mounting is possible with a non-contact feedback.
  - b. It is ideal for extreme environments and harsh conditions – high temperature, vibration, frequency or difficult to reach locations.
  - c. Remote mounting cables with lengths of 3m, 5m, 7m and 10m available as standard. Special version up to 30m is available on request.
  
- Diagnostics
  - a. Self diagnostics available with errors and recommendations.
  - b. Alarm based on different threshold.
  - c. On screen notification up to last 3 alarms or errors.
  - d. It can record data history for 25 years based on averaging method.
  - e. Monitoring parameters can be configured with three different threshold levels.
  - f. Each threshold level can be classified based on severity and generates a digital feedback signal, once triggered.
  - g. Colour code represents nature of severity (can be communicated on HART to control system) this enables users to take necessary preventive action.

**Identification of the product**

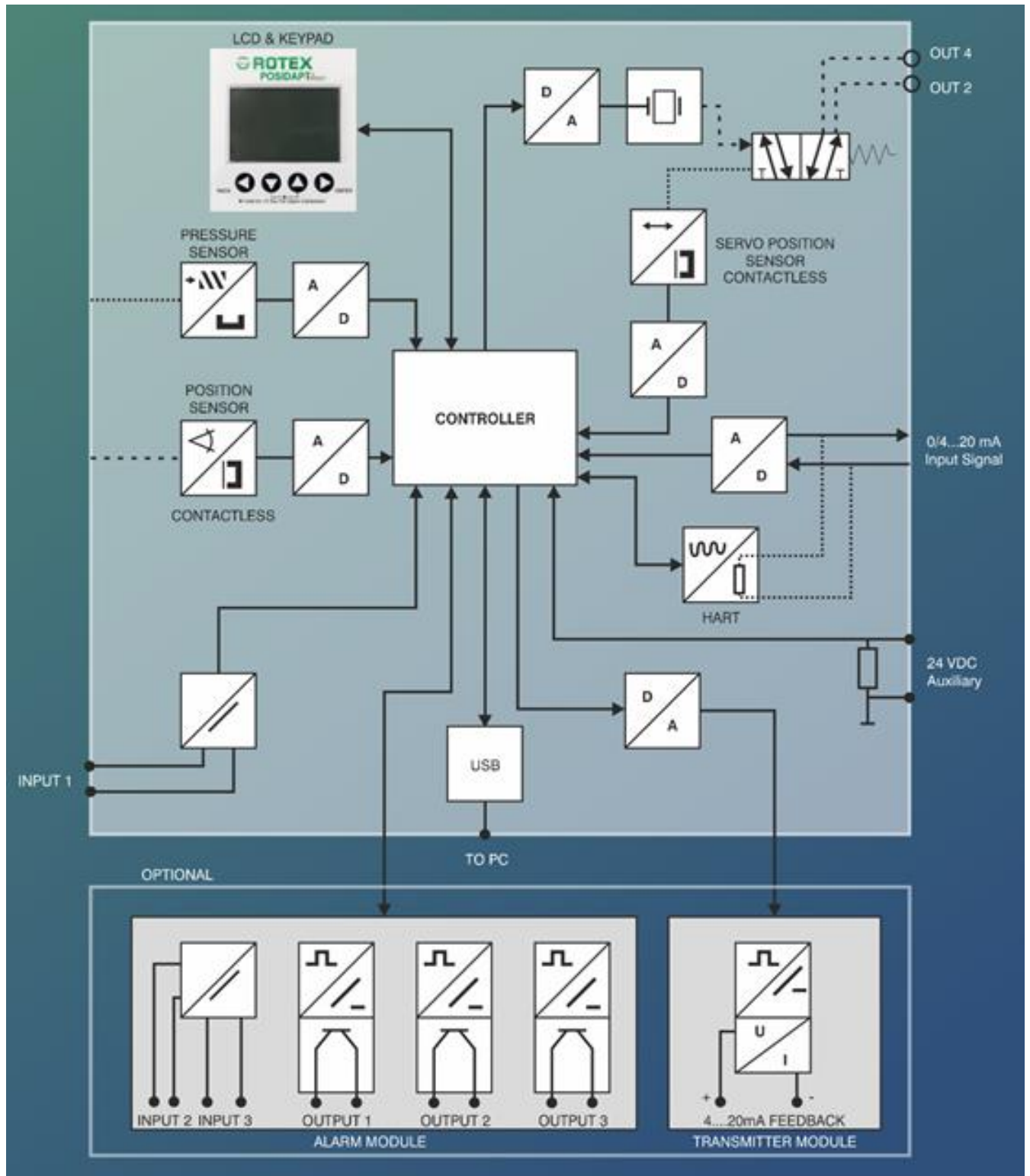
 <p>MADE IN INDIA</p>	Product Code : _____	 
	Serial No. : _____	
	Temperature : -20 °C ... +80 °C	
	Supply Pressure : 1.4 ... 7 bar	
	Input Signal : 0/4 ... 20 mA	

**Product code breakdown**

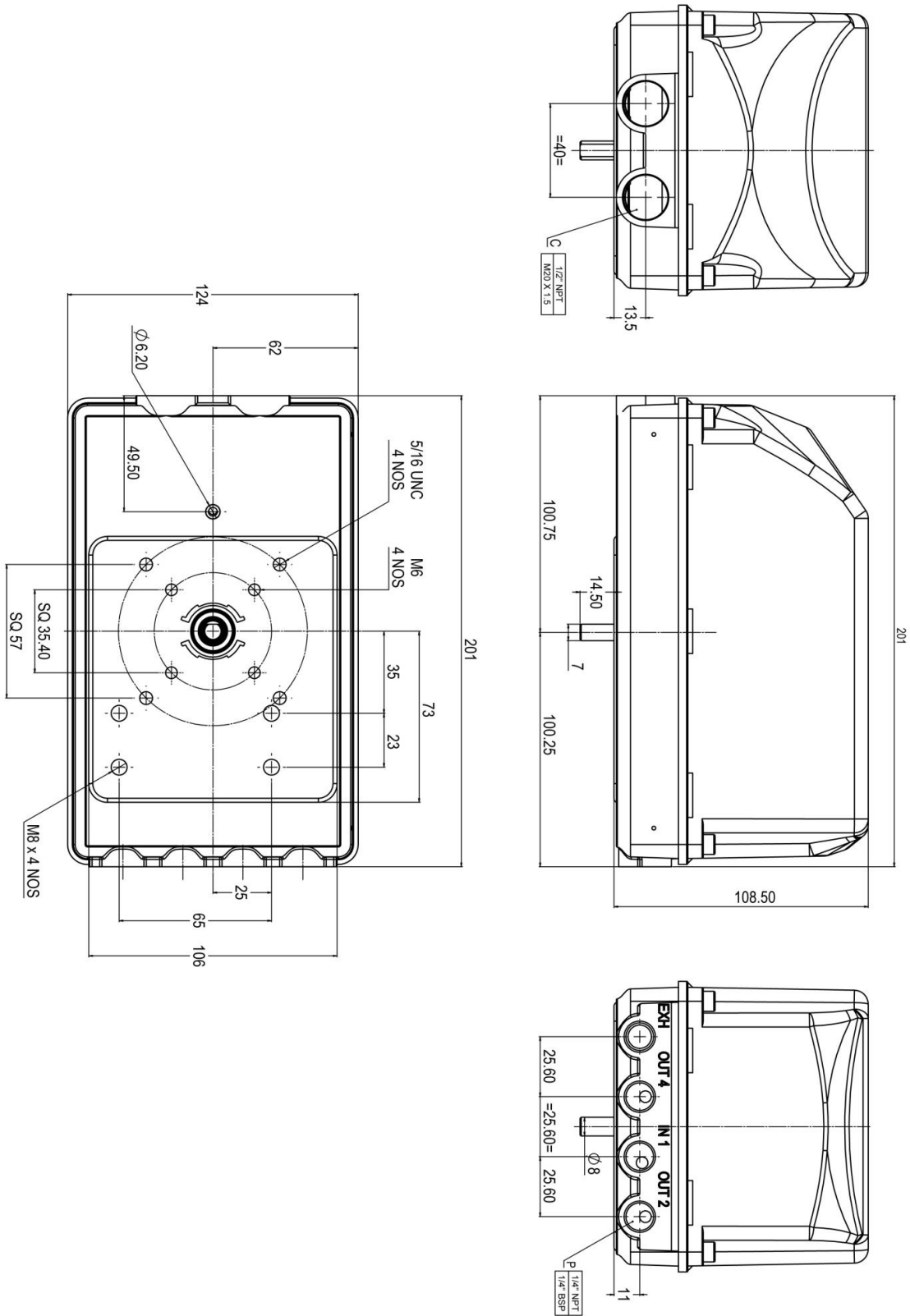
	R	7	1	1	2	H	P	4	*	*	R
	T				G			R			M
	X										0
SERIES											3
MODEL											
ENCLOSURE											
SERVO											
PORT CONNECTIONS											
COMMUNICATION											
MODULE											
CABLE ENTRY											
TEMPERATURE											
CERTIFICATION											
REMOTE MOUNT											



4. Block Diagram:



5. Dimensional Drawing:



## 6. Installation / Mounting:

### 6.1. Safety Instructions:

The equipment must be installed in the accordance with the laws, guide lines and rules applicable within the country.



#### **WARNING:**

- **ENSURE THAT SUPPLY VOLTAGE SHOULD NOT EXCEED MORE THAN > 20 % OF RATED VOLTAGE. (FOR CURRENT AND VOLTAGE RATINGS REFER CATALOGUE)**
- **NO MECHANICAL REWORK ALLOWED BY CUSTOMER. MECHANICAL REWORK CAN INCREASE CLEARANCE BETWEEN HOUSING AND COVER.**
- **DO NOT OPEN COVER / CABLE GLAND WHEN POSITIONER IS UNDER OPERATION OR IN ENERGIZED CONDITION.**



#### **CAUTION:**

**THE CURRENT AND VOLTAGE LIMITATION HAS TO BE OBSERVED AS PER THE TAG PLATE.**

**THE WIRING AND CONNECTION SHOULD BE CARRIED OUT WITH PROPER GLAND AND CARE SHOULD BE TAKEN TO AVOID WATER SEEPAGE.**

**CONFIRM THE AREA IS NON-HAZARDOUS BEFORE OPENING THE COVER OF THE ENCLOSURE FOR MAKING ELECTRICAL CONNECTIONS.**

**THE PLUGS GIVEN ALONG WITH BOX ARE TO BE REMOVED AND METALLIC PLUG TO BE USED.**

**ENSURE CABLE GLAND IS PROPERLY FITTED USING SOUND ENGINEERING PRACTICE ENSURING THAT RAIN WATER / OTHER FLUIDS DO NOT ENTER IN THE **SMART POSITIONER BOX**.**

**THE PERSON WHO OPERATES THE LIMIT SWITCH SHOULD HAVE ENOUGH KNOWLEDGE OF ELECTRICAL ENGINEERING.**



#### **CAUTION IP67 / IP68:**

**ENSURE CABLE GLAND AND GASKET IS PROPERLY FITTED USING SOUND ENGINEERING PRACTICE ENSURING THAT RAIN WATER / OTHER FLUIDS DO NOT ENTER IN THE **SMART POSITIONER BOX**.**

**TIGHTEN THE COVER BOLTS FULLY TO AVOID WATER SEEPAGE INSIDE THE **SMART POSITIONER BOX**.**

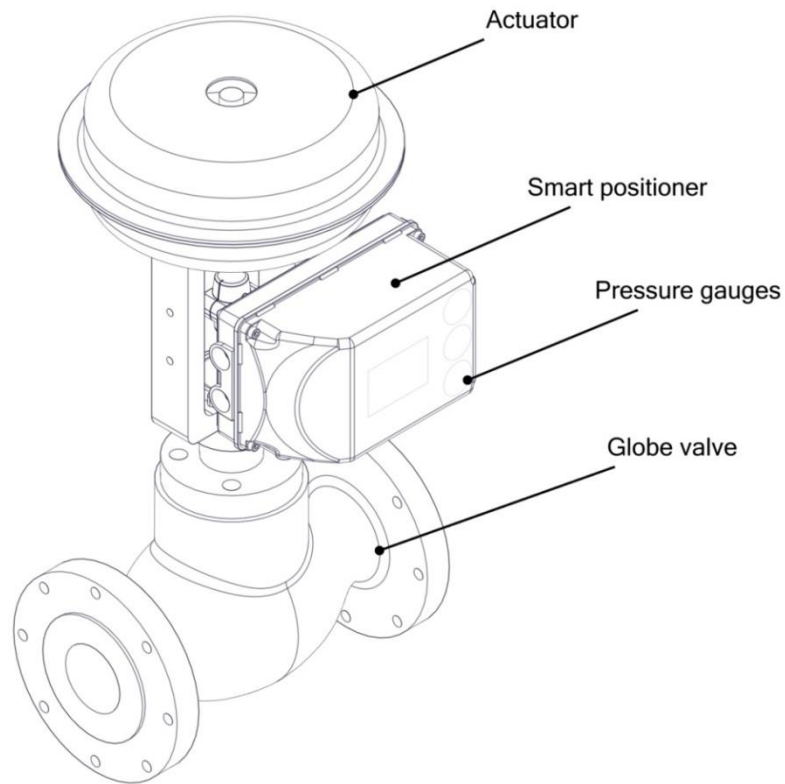
**USE UCIL SYNCEM MAKE GRIP SEAL CABLE JOINING COMPOUND OR EQUIVALENT TO SEAL CABLE GLAND. FOR PRECAUTION & APPLICATION OF SEALING COMPOUND USE ORIGINAL MANUFACTURERS OPERATIONAL MANUAL.**



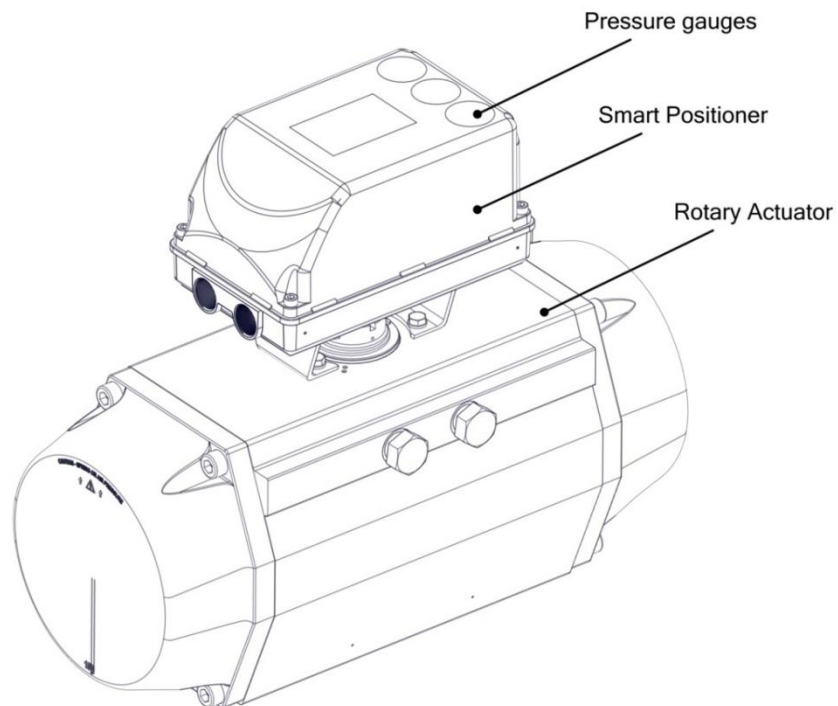
## **SPECIFIC CONDITIONS FOR USE OF Ex ia EQUIPMENT**

- **Only a damp cloth must be used while cleaning the surface of the Smart Positioner.**
- **Appropriate certified cable glands and plugs to be used.**
- **The plugs given along with box are to be removed and metallic plug to be used.**
- **Operating temperature range should not exceed then the mentioned on the tag plate**
- **Avoid electrostatic charges that can cause electrostatic discharge when installing.**
- **The information regarding the minimum ambient temperature for the positioner as provided in the datasheet must also be observed.**

**Basic layout**



**Smart positioner with Globe valve**



**Smart positioner with Rotary Actuator**

## 6.2. Mounting Positioner on Control Valve:

1. This section provides information regarding mounting of smart Positioner on a linear actuator
2. The table below provides the list of hardware components required for the installation of the smart Positioner on the linear actuator.

**Table 1**

Sr. No.	Part description	Qty	Note
1	M6 Nut	1	For fixing scale
2	Hex bolt M6 x 35	1	For fixing scale
3	Linear Scale	1	
4	M6 spring washer	1	
5	M6 Plain washer	1	
6	Spacer	1	
7	Shaft	1	
8	M8 spring washer	1	
9	M8 plain washer	1	
10	M8 Nut	1	
11	Positioner shaft	1	
12	M6 Plain washer	1	
13	M6 spring washer	1	
14	Hex bolt M6 x 30	1	
15	Mounting bracket	1	For attaching Positioner to actuator.

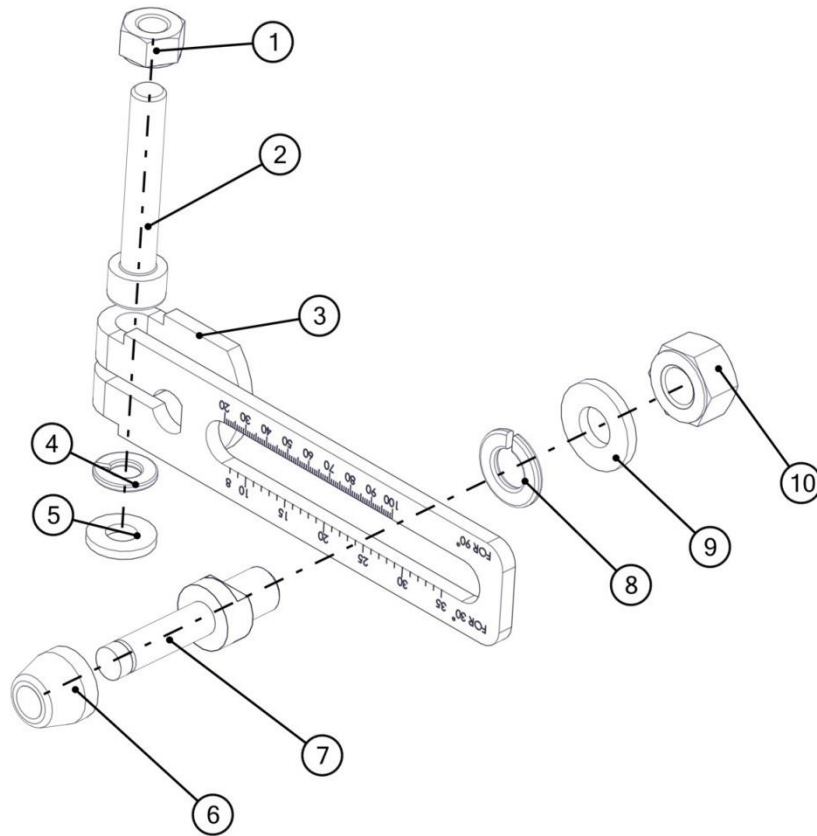


Figure 1: Linear scale assembly

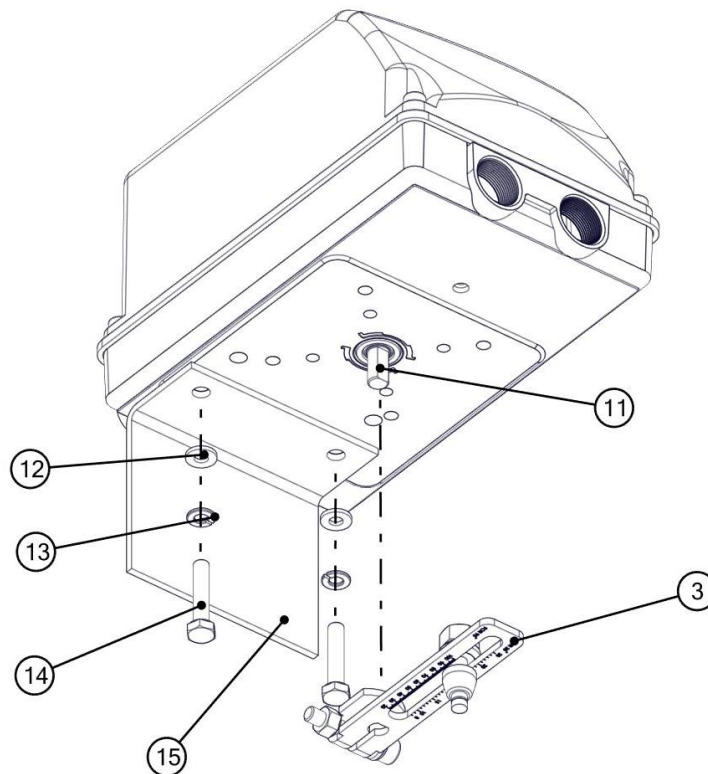
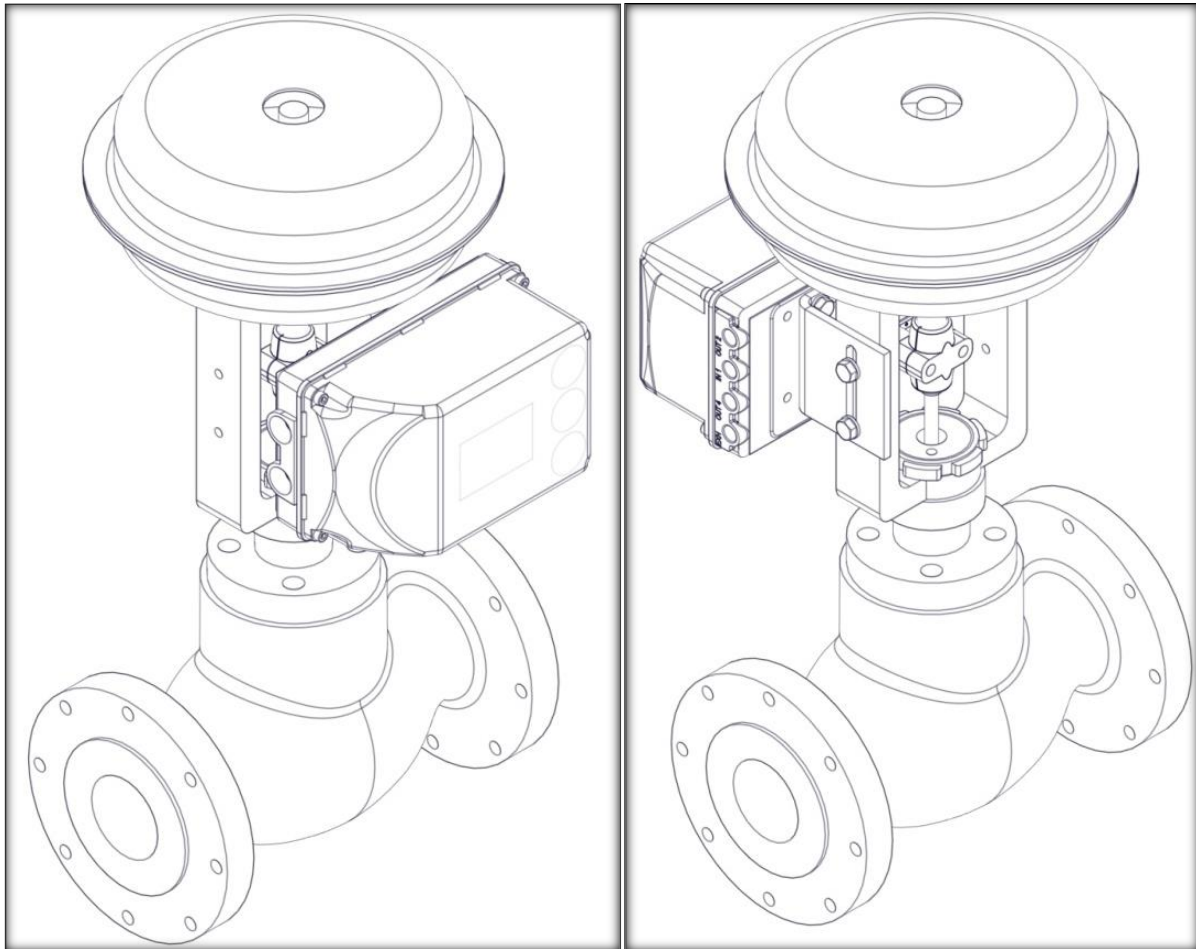


Figure 2: Attaching the linear scale and the mounting bracket



3. Assemble the linear scale assembly as shown in the figure 1.
4. Attach the mounting bracket to the Positioner as shown in the figure 2; also attach the linear scale to the shaft of the Positioner.
5. Mounting on a control valve (globe valve)



Front View

Back View



- Fix the positioner along with the mounting bracket at the centre of the control valve depending on the stroke of the control valve.
- Insert the shaft in the slot in the scale and lock it using the locking spring as shown in fig 3.
- Make sure that the scale is horizontal when calibrating the positioner.
- Secure the bolts firmly and proceed for calibration.

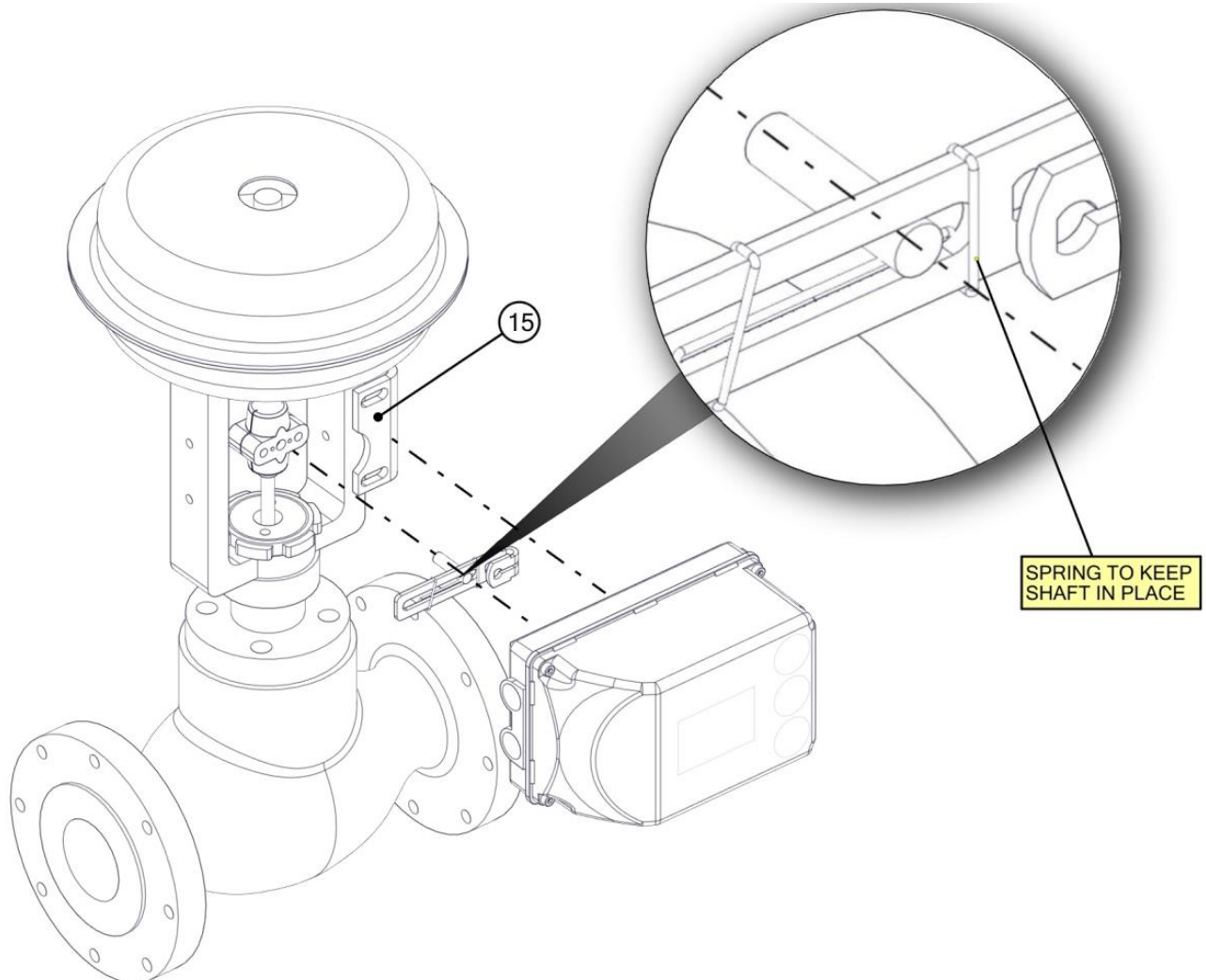


Figure 3: Detailed view of positioner with globe valve.

**Note:**

Adjust the height of the positioner on the cast iron yoke until the lever is horizontal (based on a visual check) at half stroke of the valve.

### 6.3. Mounting Positioner on a Rotary Actuator:

This section gives the instructions needed for mounting the positioner to a rotary actuator (part turn actuator).

Table 2 below gives a list of components required for the installation.

**Table 2.**

Sr. No.	Part description	Quantity	Note
1	Std Mounting bracket	1	
2	Plain washer M6	4	For attaching Positioner to bracket
3	Hex Bolt M6 x 12	4	For attaching Positioner to bracket
4	Plain washer M5	4	For attaching bracket to actuator
5	Hex bolt M5 x 12	4	For attaching bracket to actuator
6	Grub screw M5 X 10	2	For attaching coupling to shaft
7	Coupling	1	Link between Positioner and actuator

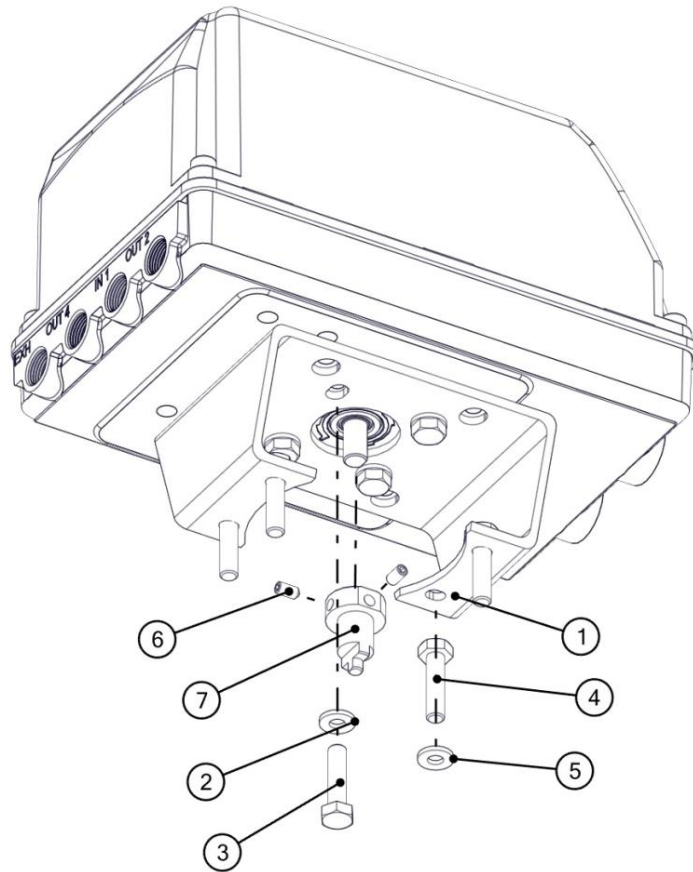


Figure 4: Attaching the coupling and the bracket to the positioner

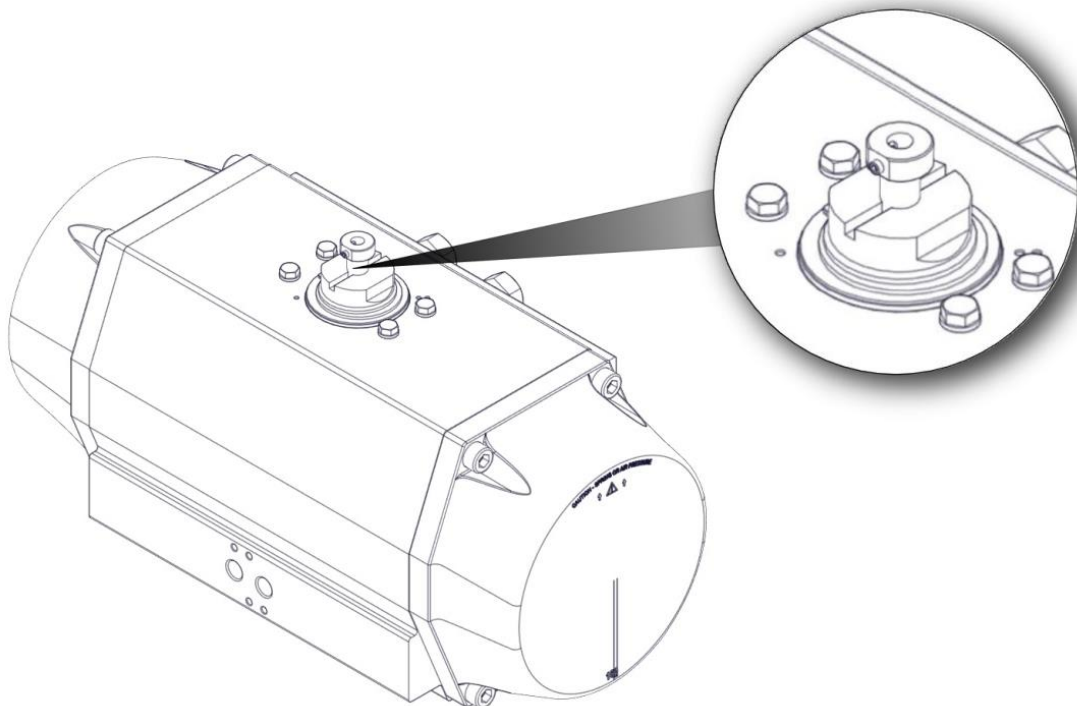


Figure 5: Inserting coupling in shaft of the rotary actuator

**Mounting Instructions (rotary actuator):**

1. Attach the mounting bracket to the smart Positioner using the Hardware items indicated in the figure above.
2. Attach the coupling securely using grub screws as indicated in the figure above.
3. The assembly is then mounted on the actuator (refer figure 6 below) while taking care that the shaft enters in the slot of the actuator pinion.
4. Assembly of Positioner and actuator should allow the play between shaft and pinion and never between actuator body and bracket.
5. Secure the bolts tightly and proceed for calibration.

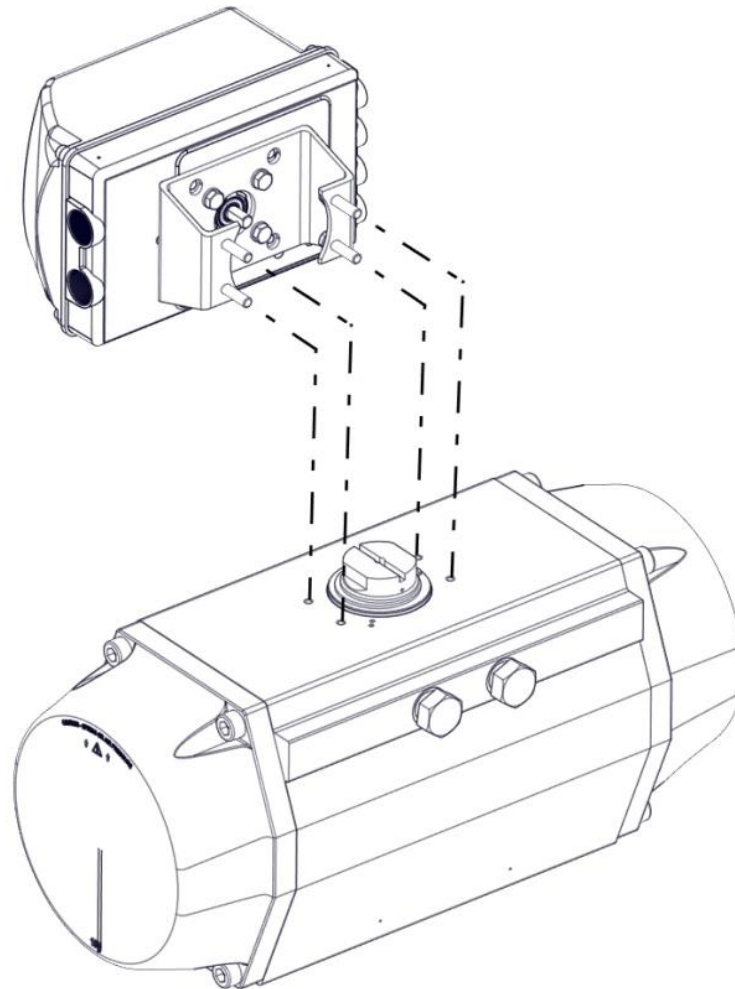


Figure 6: Mounting the Positioner on a rotary actuator

#### 6.4. Mounting Positioner with bearing assembly on a Rotary Actuator.

This section gives the instructions needed for mounting the positioner to a rotary actuator (part turn actuator).

Table 3 below gives a list of components required for the installation.

**Table 3:**

Sr. No.	Part description	Quantity	Note
1	Shaft and bearing assembly	1	
2	Grub screw M6 X 45	4	For attaching Positioner to bracket
3	Nut M6	4	For attaching Positioner to bracket
4	Coupler	1	Link between Positioner and actuator
5	Grub screw M5 X 10	2	For attaching coupling to shaft
6	Standard bracket	1	
7	Nut M5	4	For attaching bracket to actuator
8	Grub screw M5 x 20	4	For attaching bracket to actuator

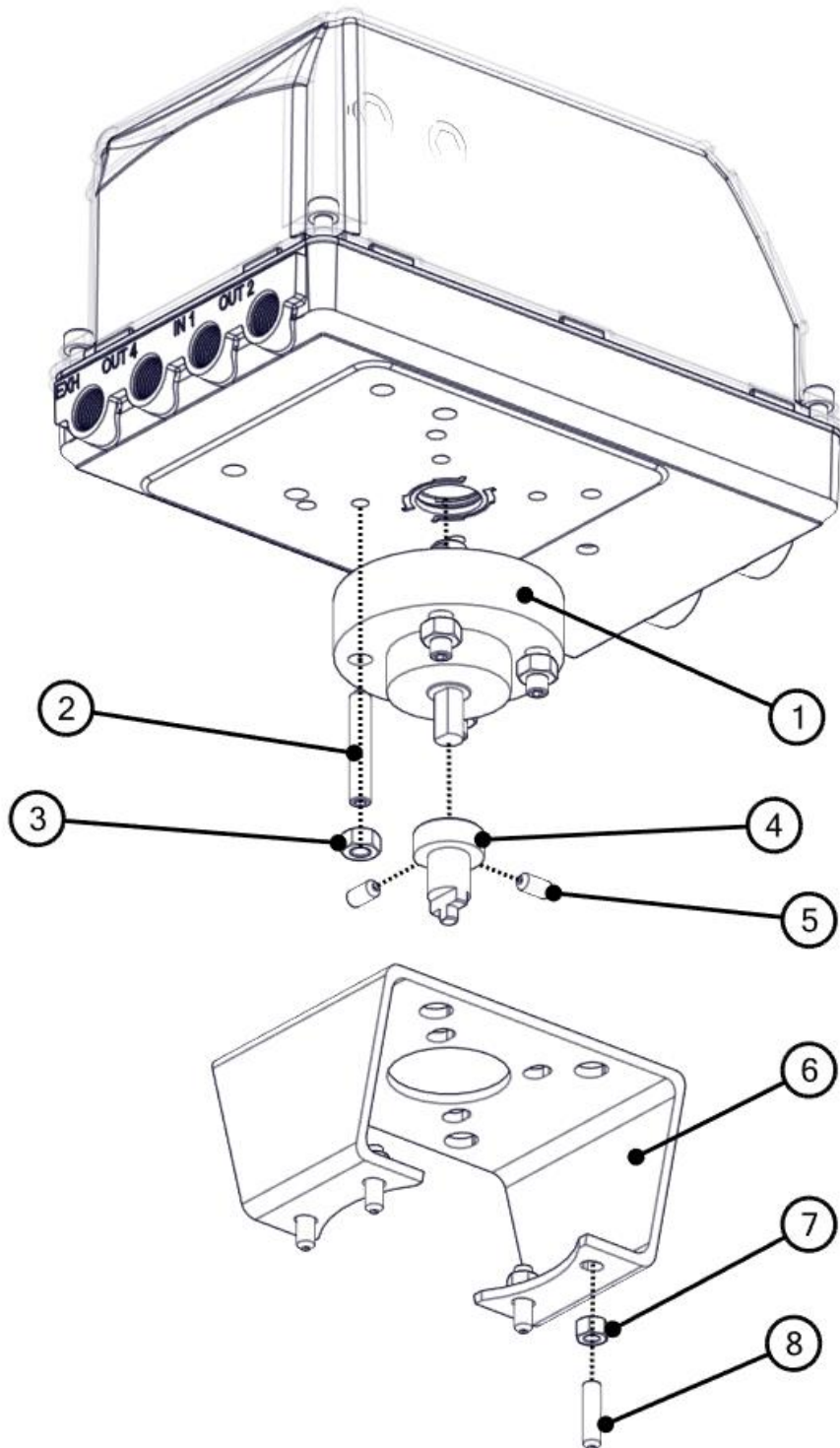


Figure 7: Attaching coupling and bracket to positioner



**Mounting Instructions (rotary actuator):**

6. Attach the mounting bracket to the smart Positioner using the Hardware items indicated in the figure above.
7. Attach the coupling securely using grub screws as indicated in the figure above.
8. The assembly is then mounted on the actuator (refer figure 8 below) while taking care that the shaft enters in the slot of the actuator pinion.
9. Assembly of Positioner and actuator should allow the play between shaft and pinion and never between actuator body and bracket.
10. Secure the bolts tightly and proceed for calibration.

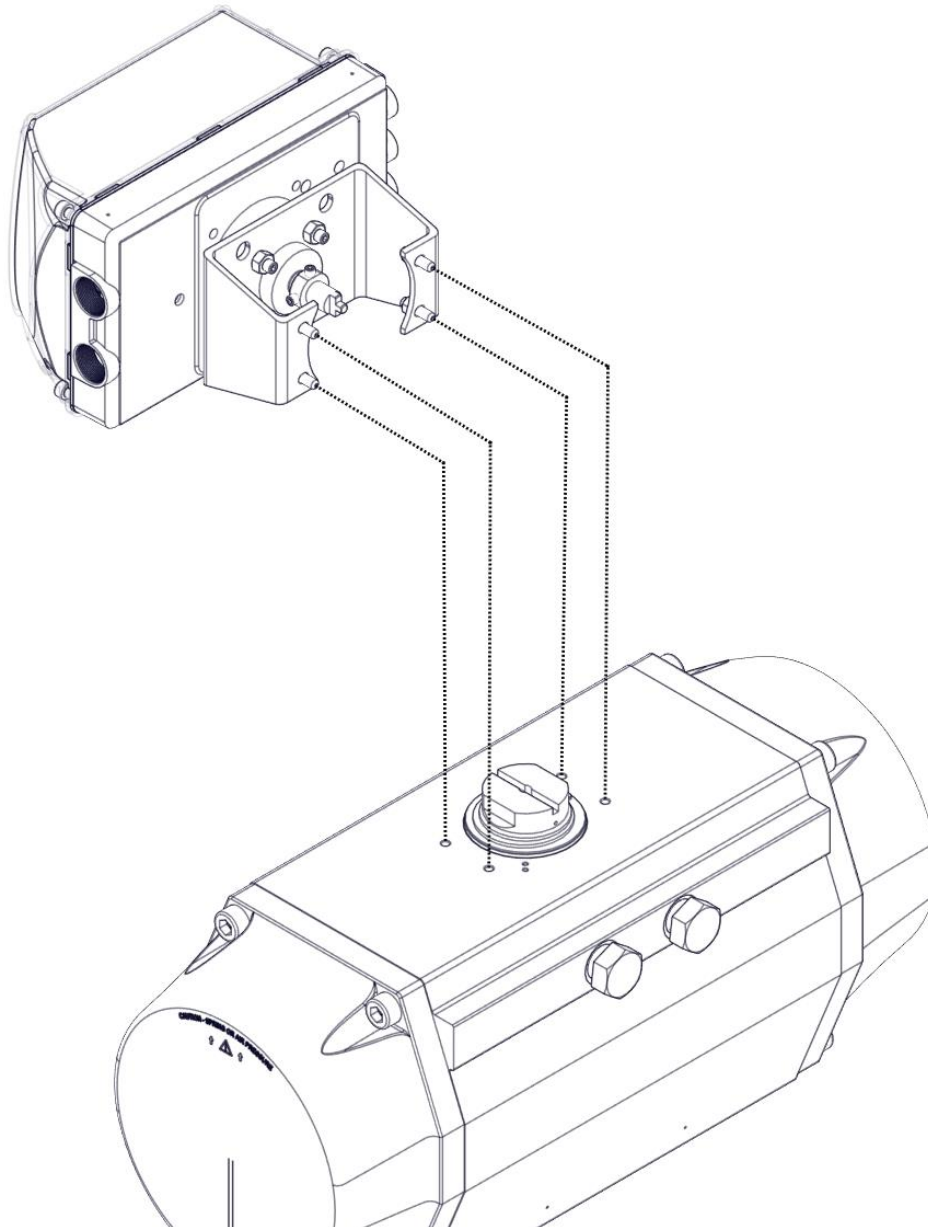
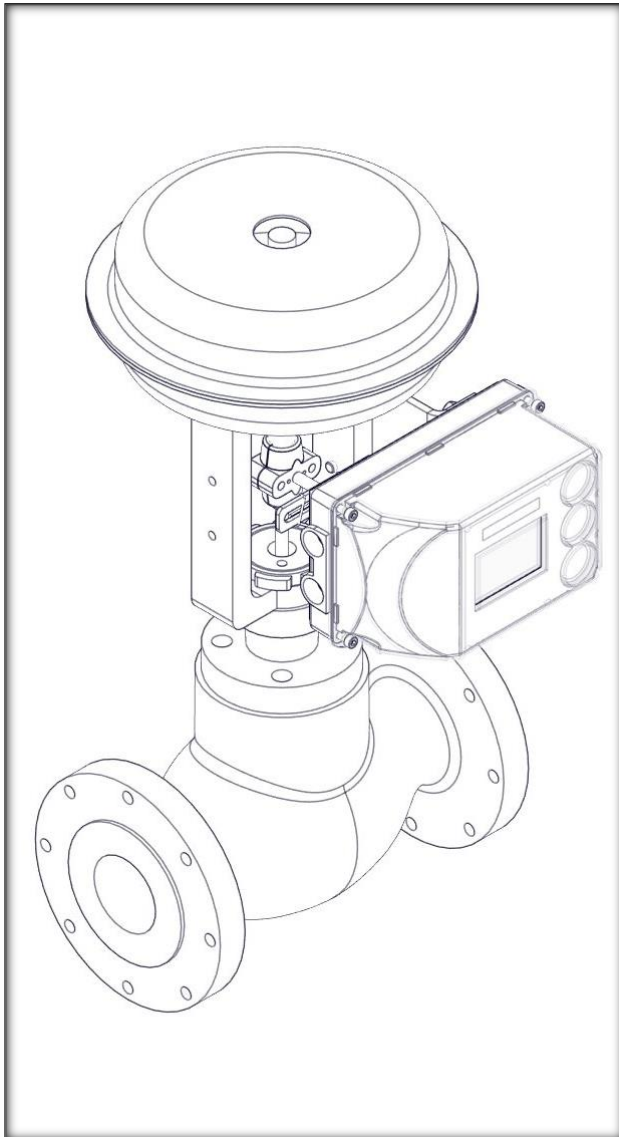


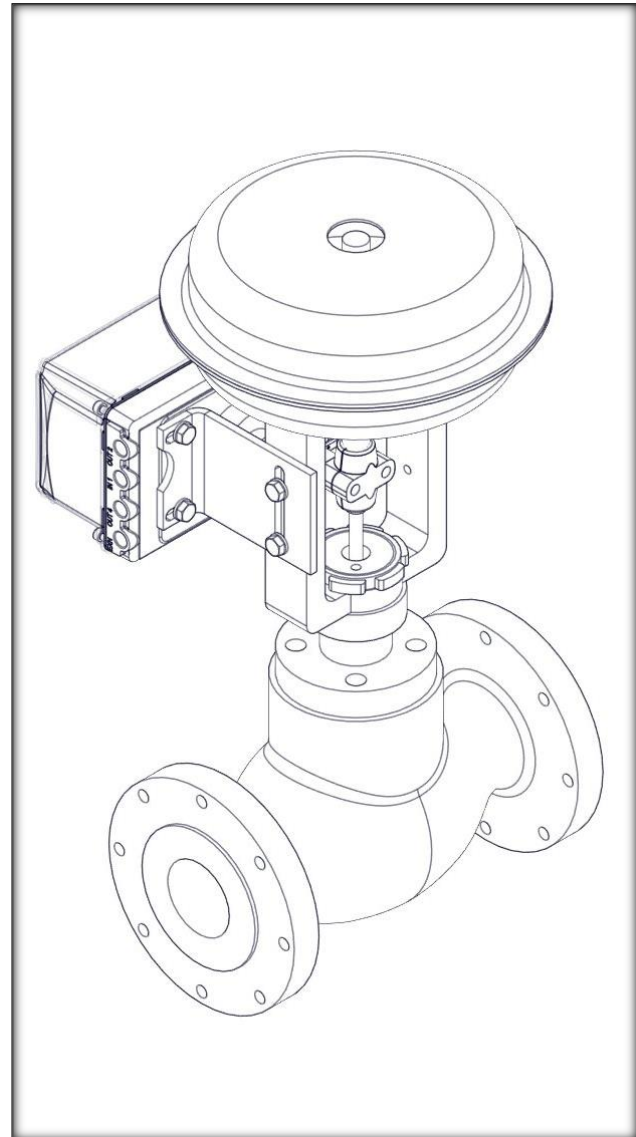
Figure 8: Mounting the Positioner on a rotary actuator

### 6.5. Mounting Positioner with the bearing assembly on a Control Valve:

- This section provides information regarding mounting of smart Positioner on a linear actuator

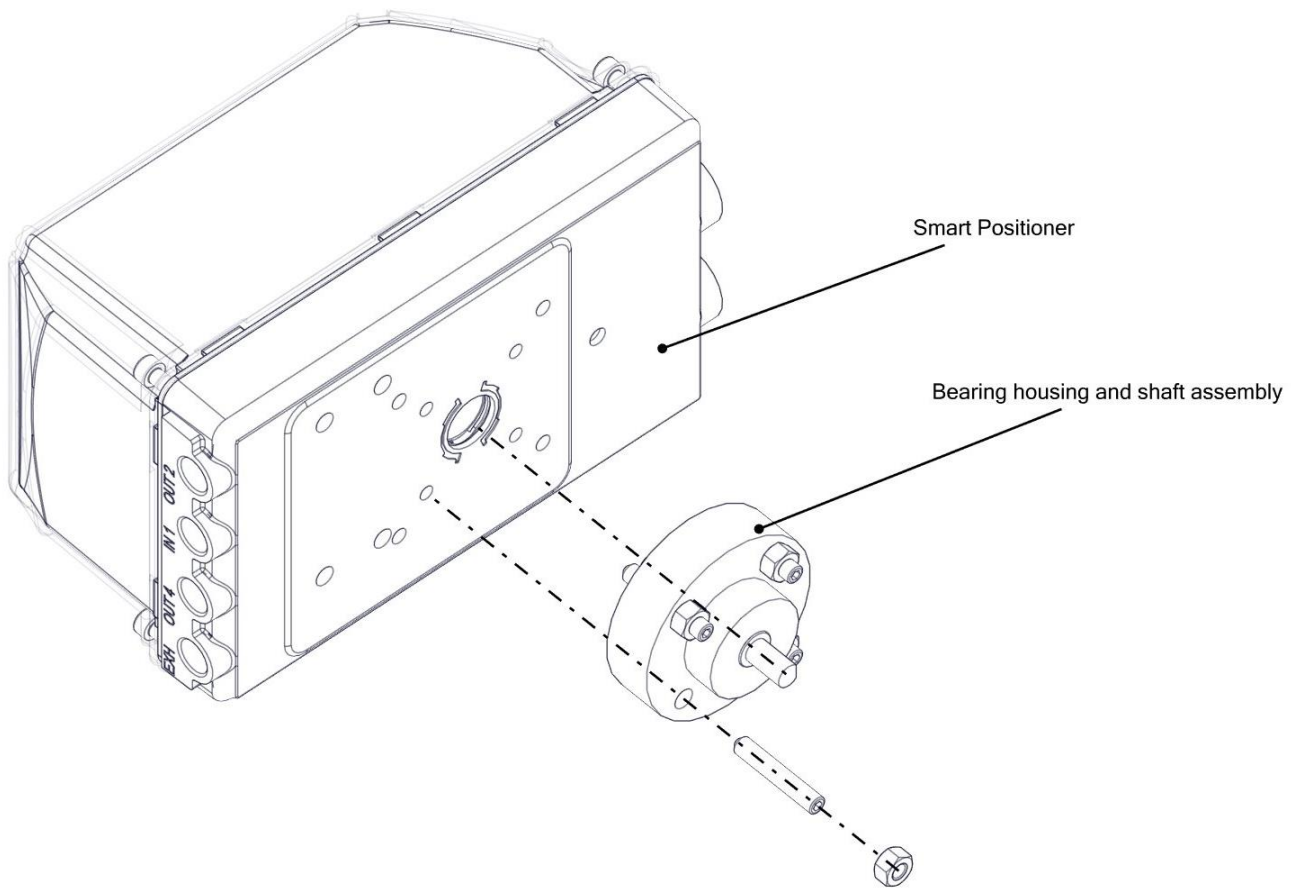


Front View



Back View





**Table 4:**

Sr. No.	Part description	Quantity	Note
1	Smart positioner	1	
2	Hex bolt M6 x 30	2	Mounting positioner on valve
3	Std Mounting bracket	1	
4	Control Valve	1	
5	Linear scale assembly	1	Refer fig 1
6	Bearing and shaft assembly	1	

- The figure 9 below gives a detailed and labelled (refer table 4) view for mounting the positioner with the bearing and shaft assembly on a control valve.

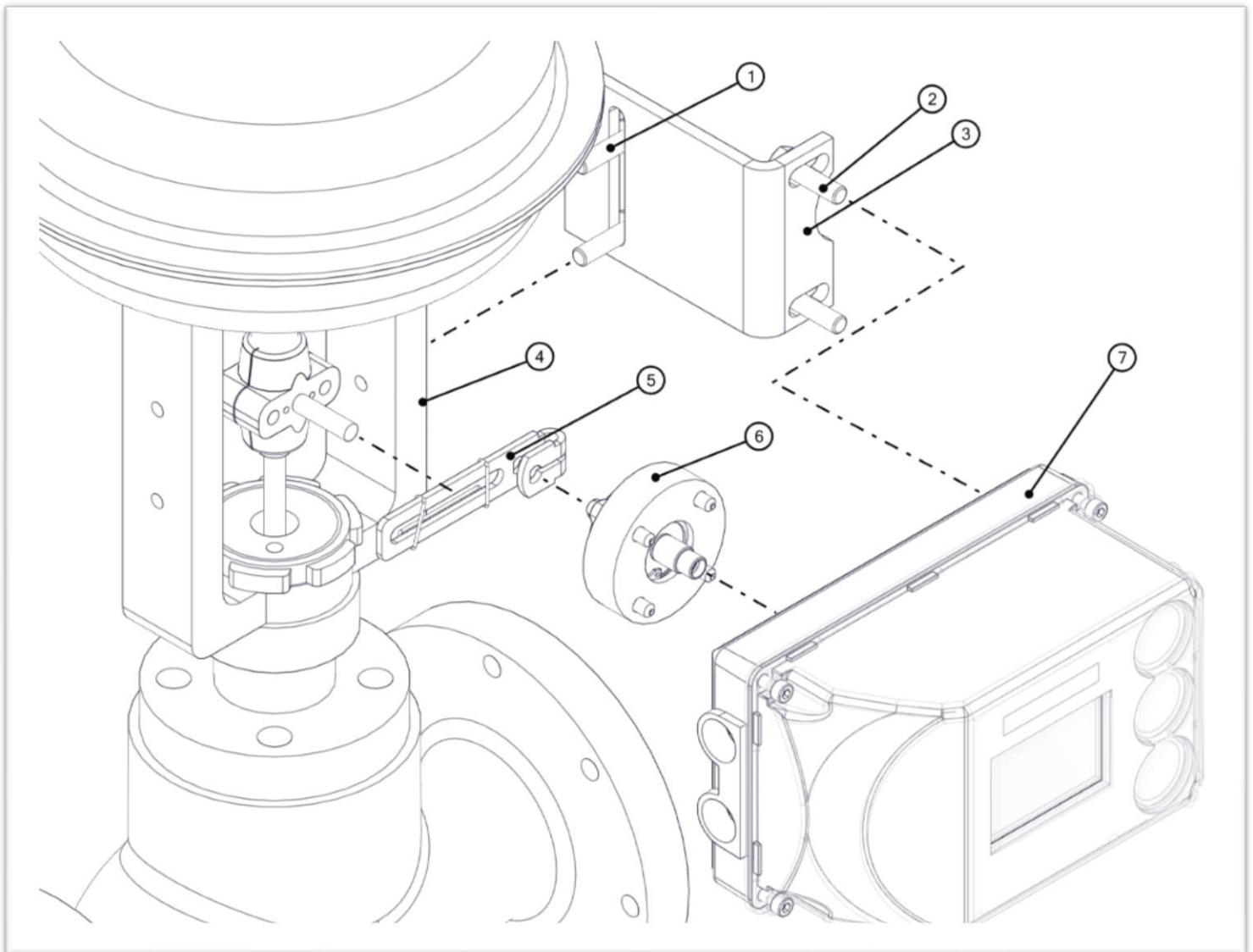


Figure 9: Mounting of positioner with bearing assembly on a control valve

### **Mounting Instructions:**

- Assemble the linear scale assembly as shown in the figure 1.
- Fix the positioner along with the mounting bracket at the centre of the control valve depending on the stroke of the control valve.
- Insert the shaft in the slot in the scale and lock it using the locking spring.
- Make sure that the scale is horizontal when calibrating the positioner.
- Secure the bolts firmly and proceed for calibration.

## 6.6. Remote Mounting.

- Remote mounting kit is available with a non contact feedback sensor.
- Remote mount cables available with lengths of 3m, 5m, 7m and 10m as standard.
- Special version of the same includes up to 30m of cables (available on request).
- ROTEX shielded cable and circular connectors ensure better connectivity.
- Ideal for extreme environments and harsh conditions – high temperature, vibration, frequency or difficult to reach locations.

## 6.7. Mounting remote unit on Rotary Actuator

This section gives the instructions needed for mounting the positioner to a rotary actuator (part turn actuator).

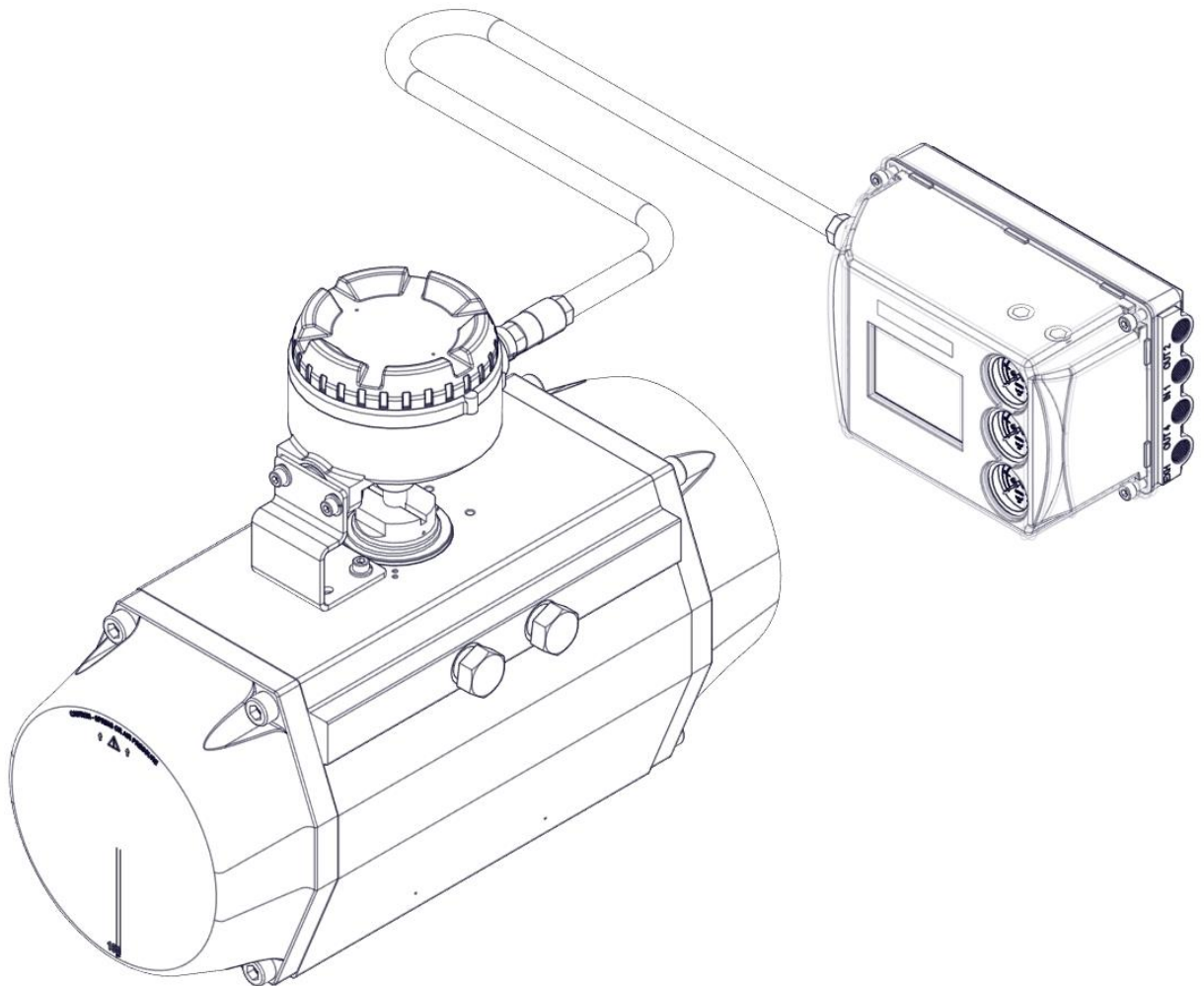


Table 5 below gives a list of components required for the installation.

**Table 5**

Sr. No.	Part description	Quantity	Note
1	Remote mount Unit	1	
2	Std Mounting bracket	1	
3	M5 nut	2	For attaching Remote Mount to bracket
4	M5 Plain washer	2	For attaching Remote Mount to bracket
5	Hex Bolt M5 x 20	2	For attaching Remote Mount to bracket
6	Grub screw M5 X 10	2	For attaching coupling to shaft
7	Coupling	1	Link between Positioner and actuator
8	Plain washer M5	4	For attaching bracket to actuator
9	Hex bolt M5 x 12	4	For attaching bracket to actuator

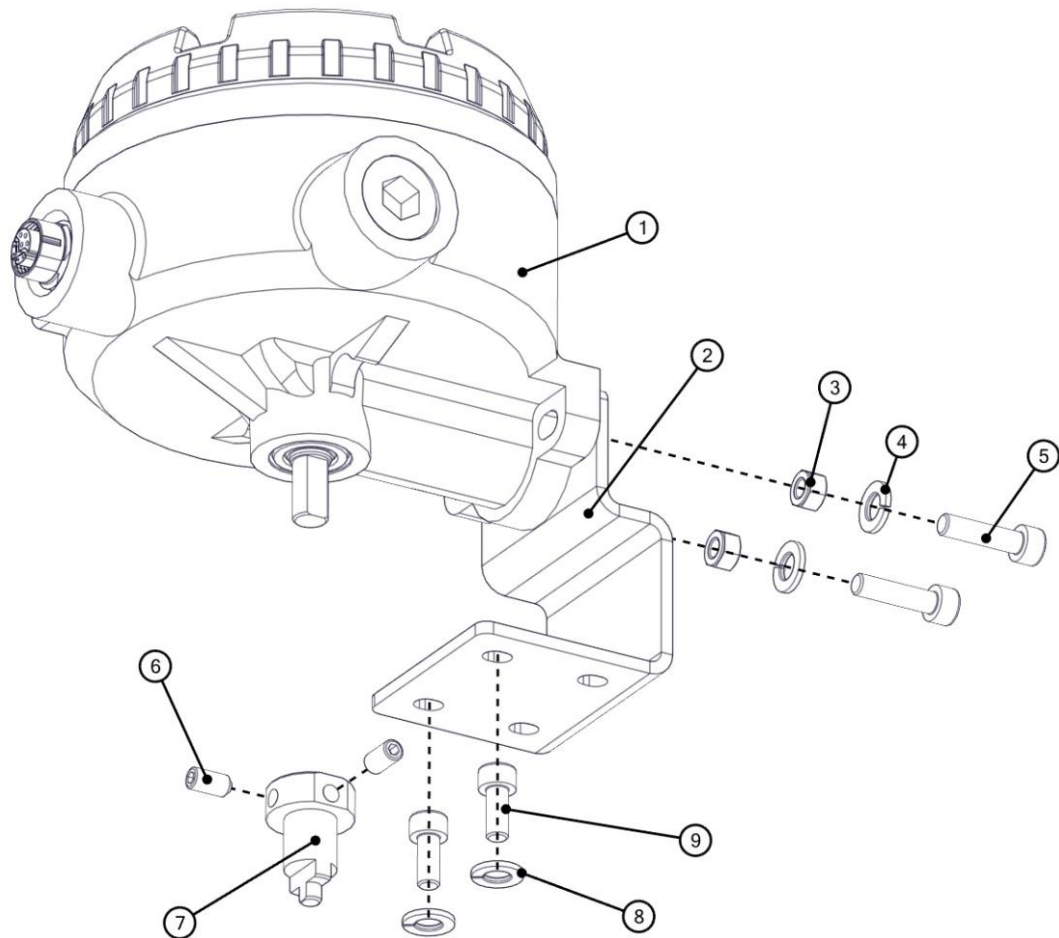


Figure 10: Attaching coupling and bracket to Remote unit

### Mounting Instructions :

11. Attach the mounting bracket to the Remote unit using the Hardware items indicated in the figure 10 above.
12. Attach the coupling securely using grub screws as indicated in the figure above.
13. The assembly is then mounted on the actuator (refer figure 11 below) while taking care that the shaft enters in the slot of the actuator pinion.
14. Assembly of Remote unit and actuator should allow the play between shaft and pinion and never between actuator body and bracket.
15. Secure the bolts tightly and proceed for calibration.

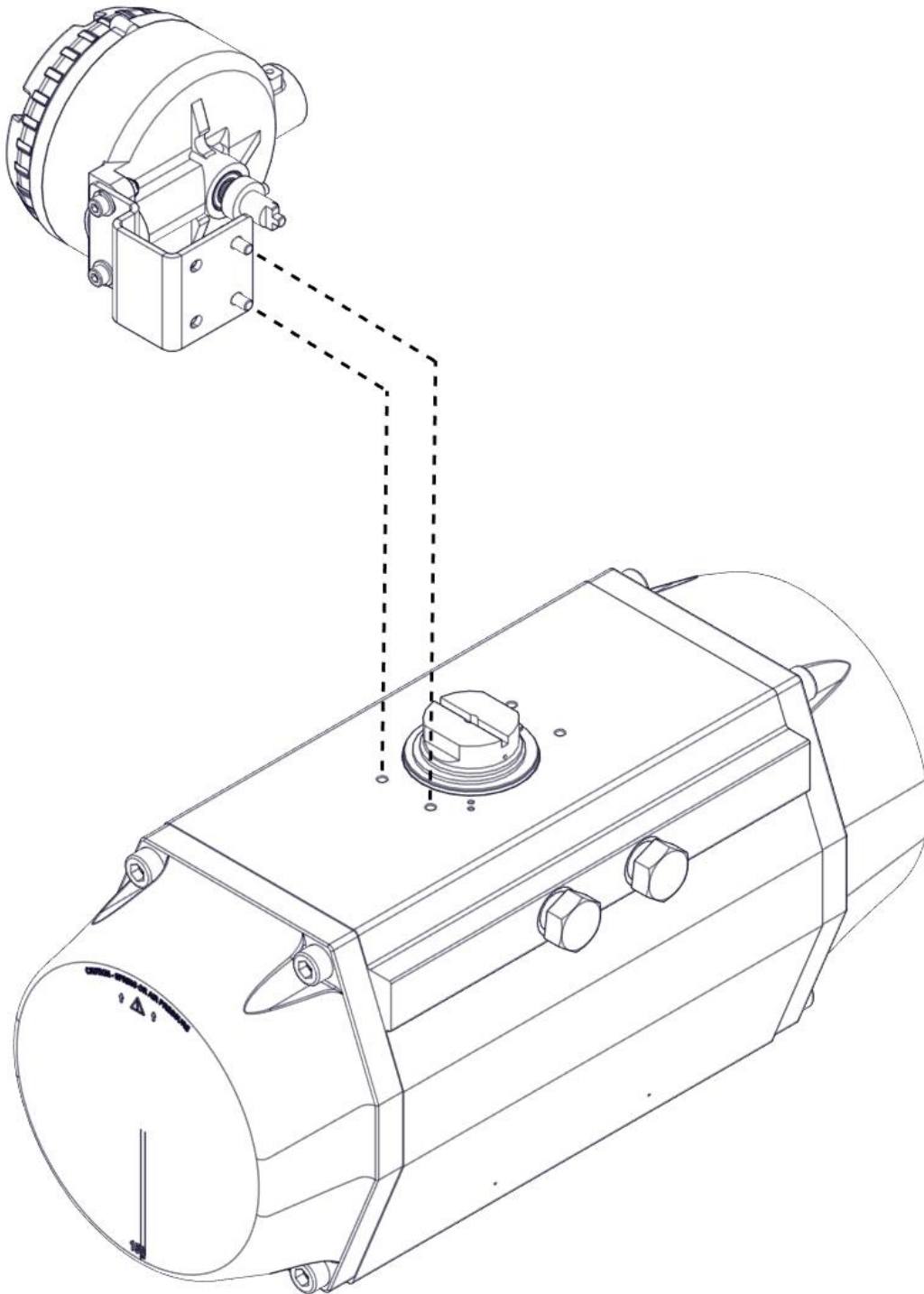
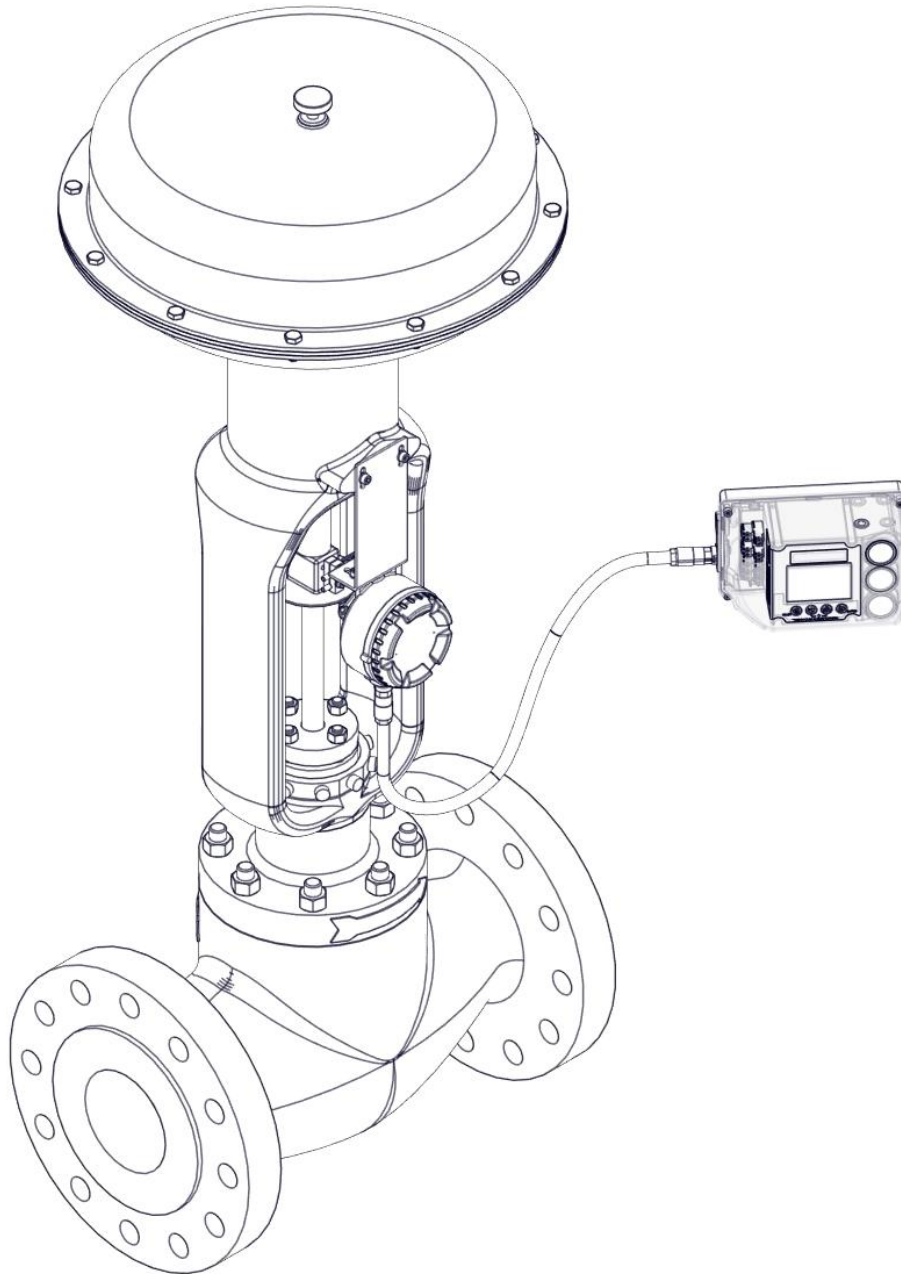


Figure 11: Mounting the Positioner on a rotary actuator



### 6.8. Mounting remote unit on a Control Valve.

This section gives the instructions needed for mounting the Remote Unit on a Control valve.





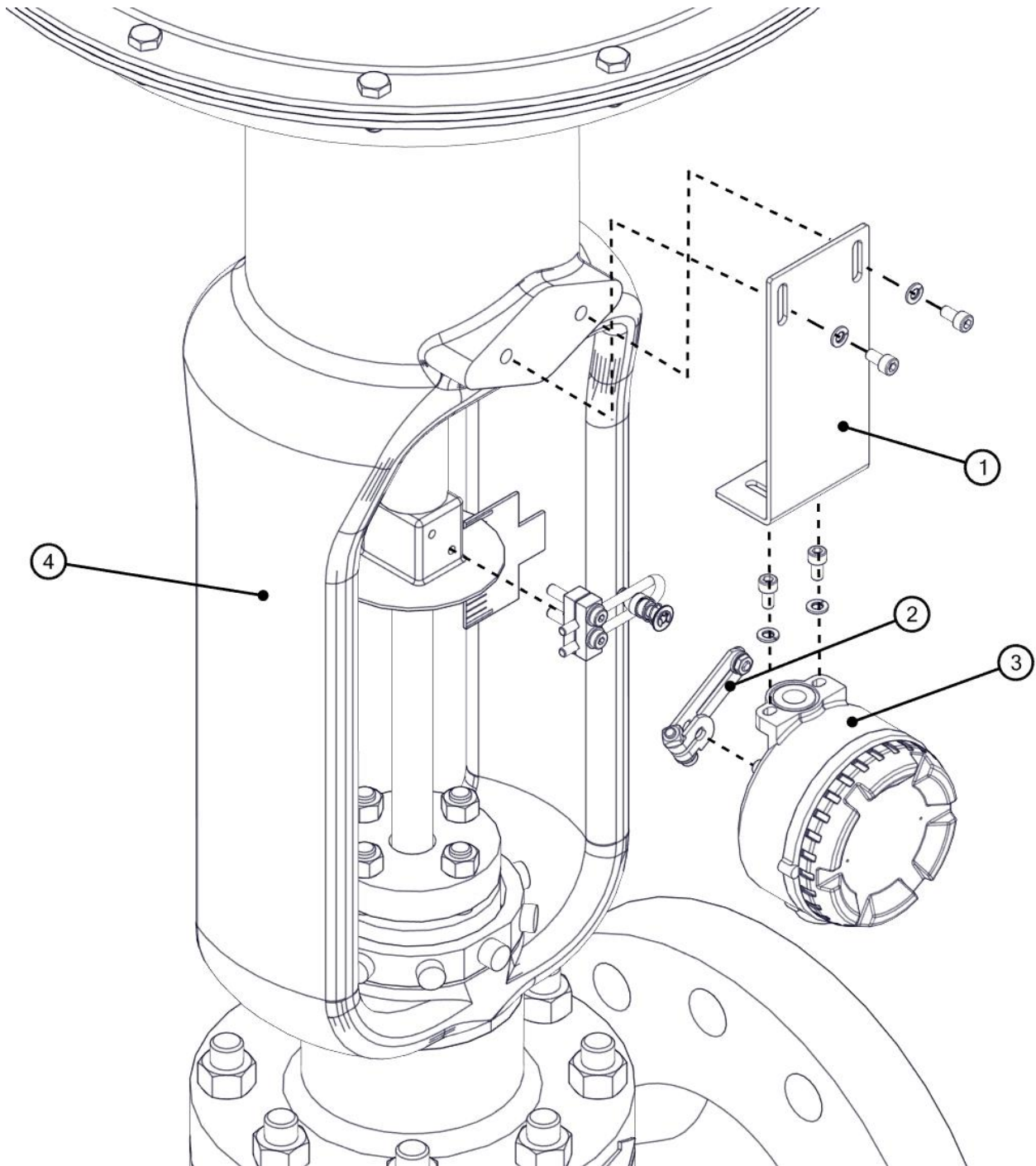


Figure 12: Detailed mounting of the remote unit on a control valve

**Table 6:**

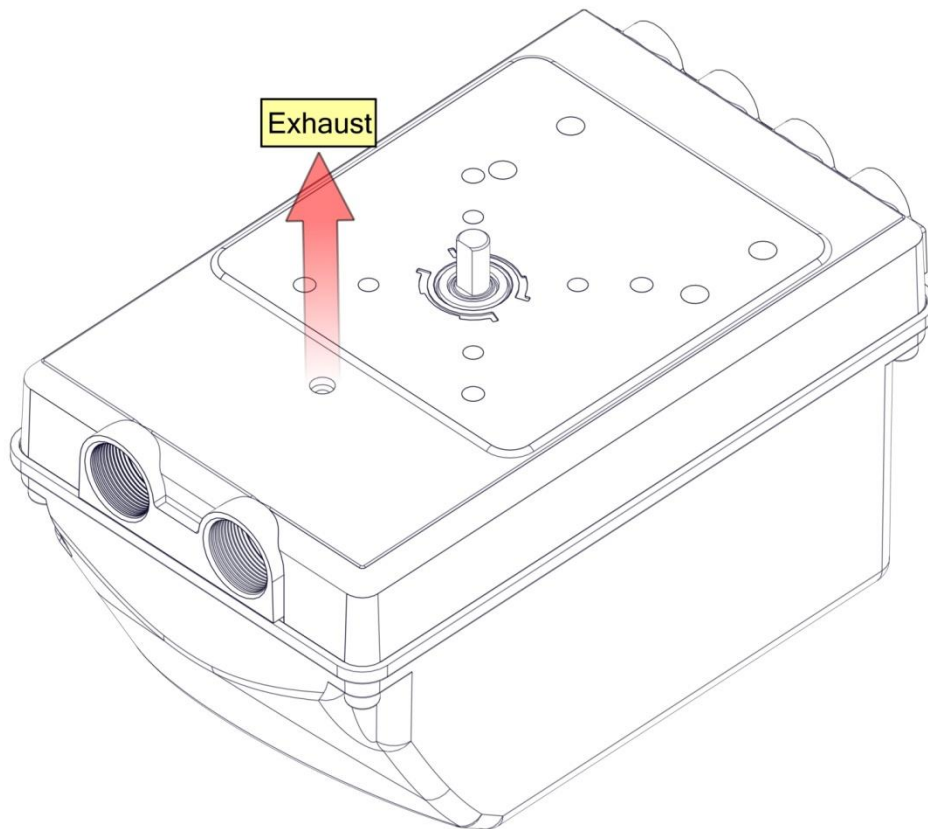
Sr. No.	Part description	Quantity	Note
1	Std Mounting bracket	1	Refer figure 9
2	Linear scale assembly	1	As shown in figure 1
3	Remote mount Unit	2	Refer figure 9
4	Control Valve	2	Refer figure 9

### Mounting Instructions :

- Assemble the linear scale assembly as shown in the figure 1.
- Attach the mounting bracket to the Remote unit.
- Fix the Remote Unit along with the mounting bracket at the centre of the control valve depending on the stroke of the control valve.
- Insert the shaft in the slot of the scale and lock it using the locking screw.
- Make sure that the scale is horizontal before calibrating the positioner.
- Secure the bolts firmly and proceed for calibration.

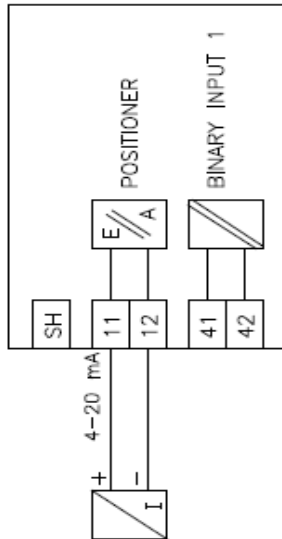
### 6.9. Unfavourable mounting conditions.

The ROTEX smart Positioner can be mounted in all orientations except the one where the exhaust is facing upwards.

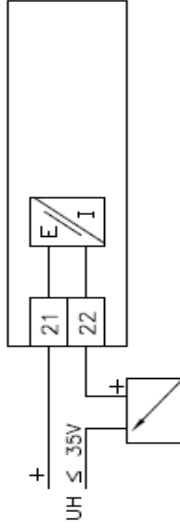


## 7. Electrical Connection

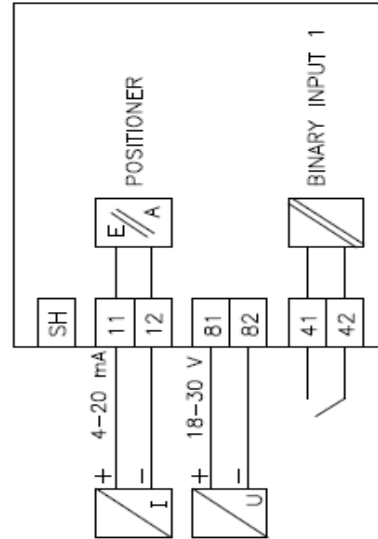
1) TWO-WIRE CONNECTION (BASIC DEVICE)



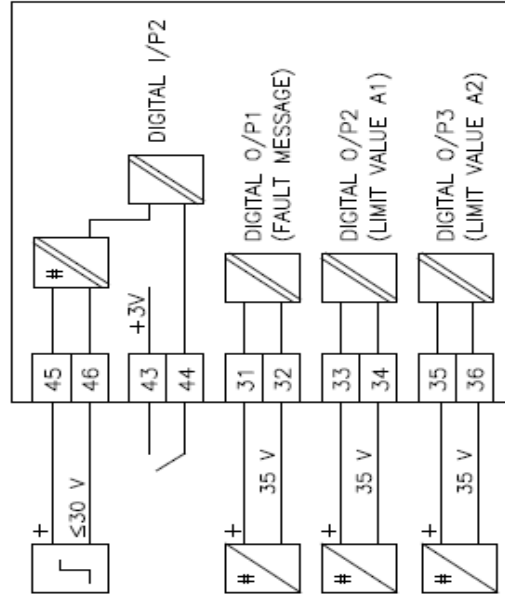
3) CURRENT OUTPUT



2) THREE-WIRE CONNECTION



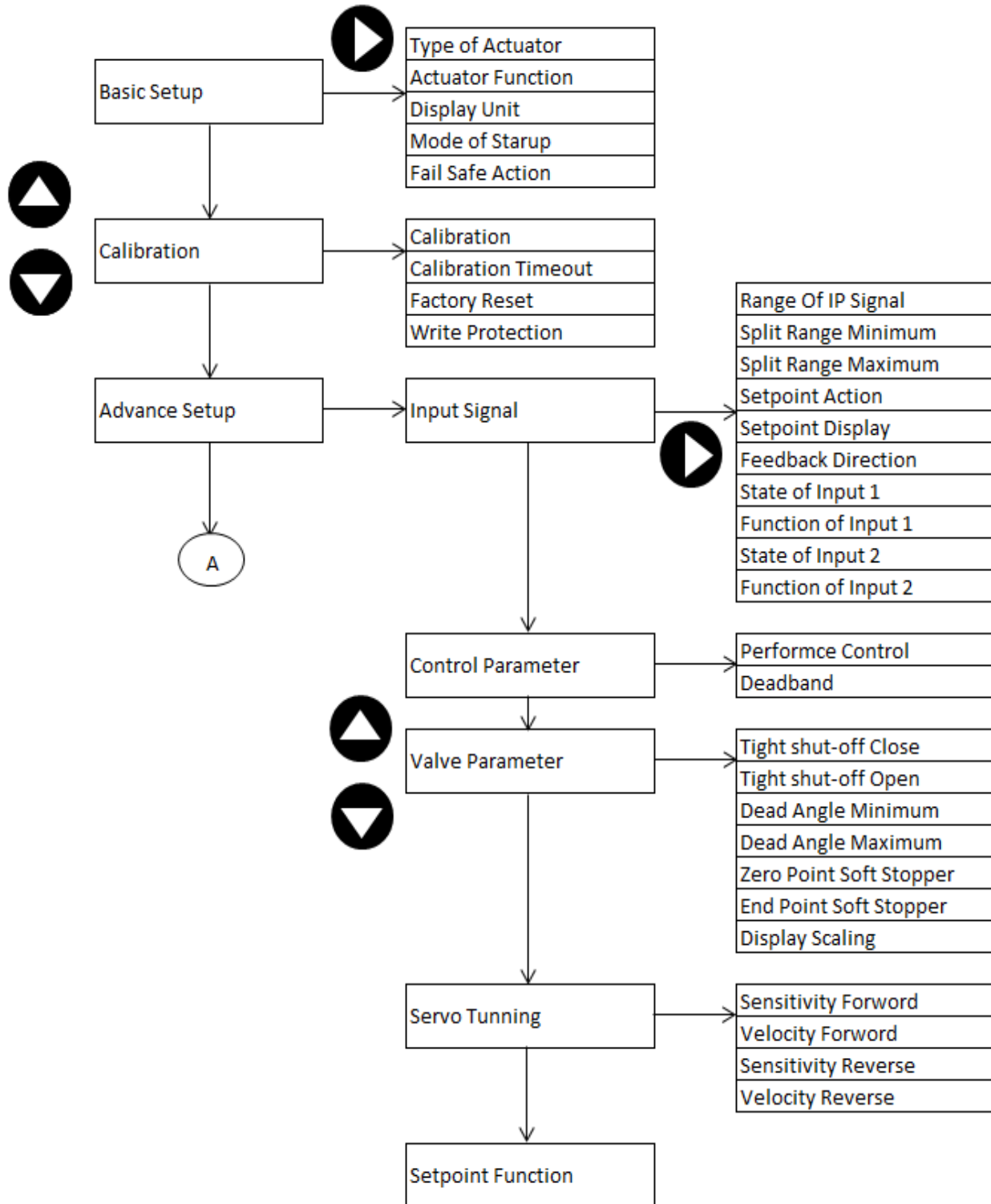
4) BINARY INPUTS & OUTPUT

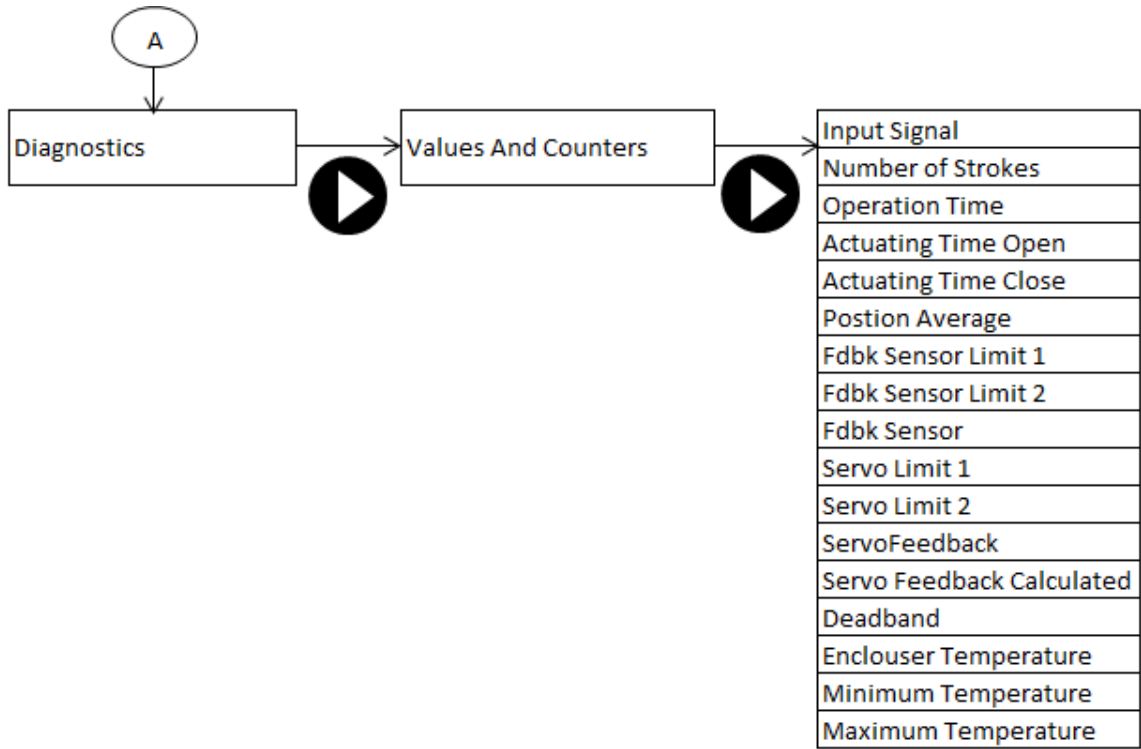


## 8. User Interface

### 8.1. Menu Structure

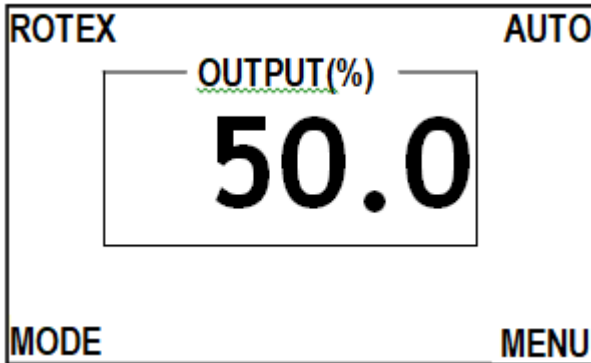
#### Posidapt Expert







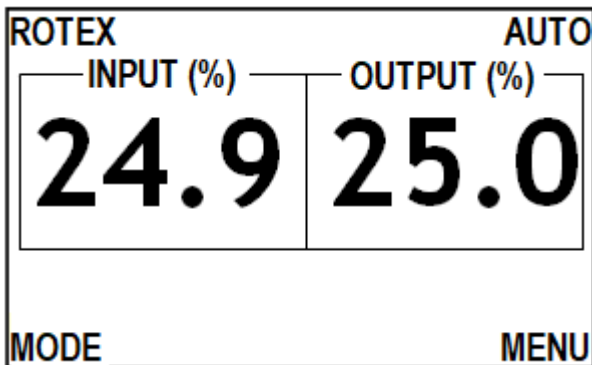
## 8.2. Display Screen

### Process Display with Position



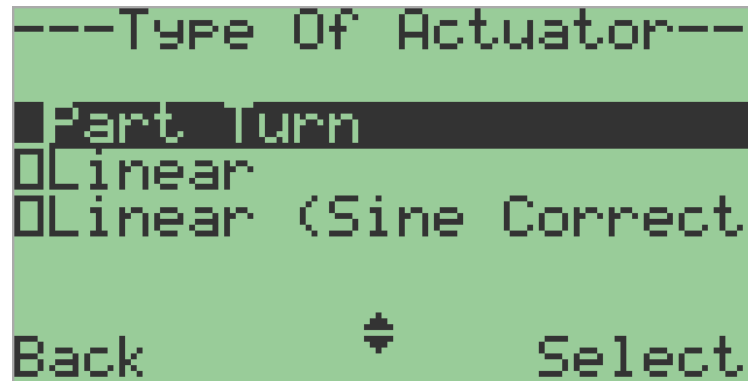
### Process Display with Set point and Position

Press Up  or Down  key for 5 second to display both set point and position values on same screens.



### 8.3. Parameter Overview – DTM & Display

#### 8.3.1. Basic Setup



#### *Type of Actuator*

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*

This parameter can be used to adjust the device as per the actuator type. Following are the sub parameters

- Part turn– Factory default

Use this parameter value for a quarter-turn actuator.

If you select "Part turn", the parameter "Rotation of angle" is automatically set to 90° and cannot be changed.

- Linear Turn

Use this parameter value for a linear actuator with mechanism movement parallel to the movement of the actuator.

The device compensates the nonlinearity caused due to the transformation of the linear movement of the linear actuator into the rotary movement of the feedback shaft.

- Linear with sine correction

Use this parameter value for a linear actuator, where movement of mechanism is not parallel to the movement of the actuator.

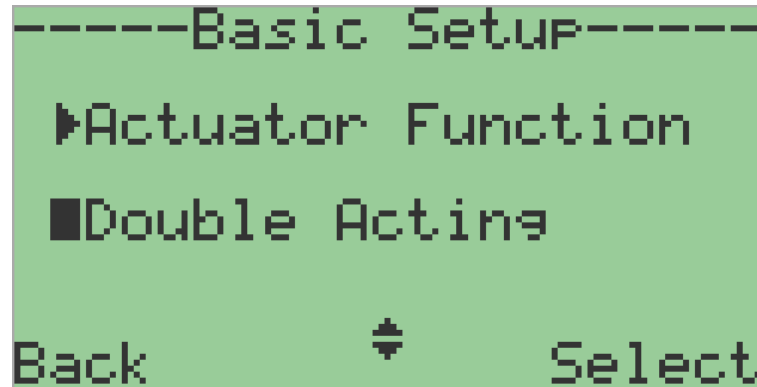
The device compensates the nonlinearity and does sine curve correction caused due to the transformation of the linear movement of the linear actuator into the rotary movement of the feedback shaft.



### Actuator Function

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*

Parameter used for a defining actuator function.

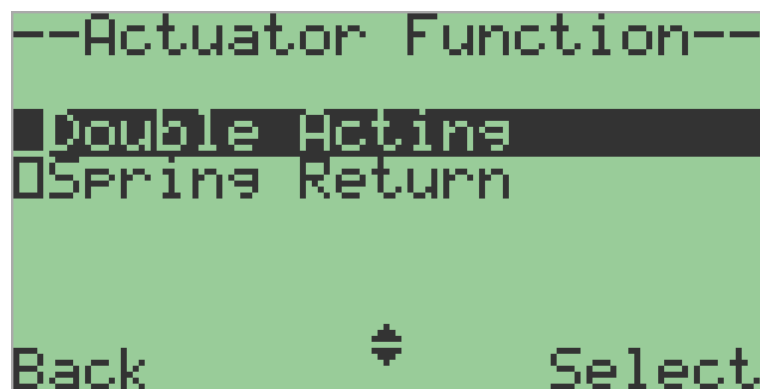


- Double acting – *Factory default*

Use this parameter value for double acting actuator.

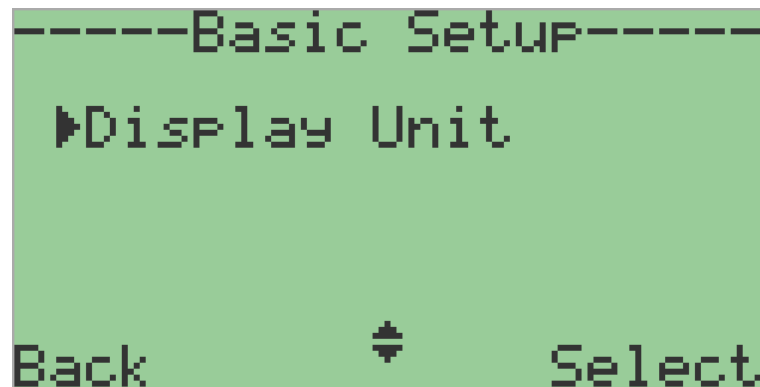
- Spring return

Use this parameter value for spring return actuator.



## Display Unit

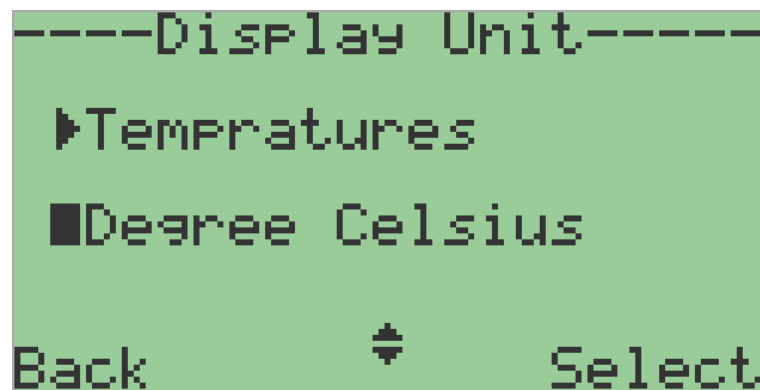
Use this parameter for a setting the unit of measure for display. The following are the parameter for which units can be set.



- Temperature

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*

This parameter is used to set the temperature unit. The selected temperature unit is then also applicable for all other temperature-based parameters.



- Degree Celsius – *Factory default*

This sub-parameter value sets the temperature unit to degrees Celsius.

- Degree Fahrenheit

This sub-parameter value sets the temperature unit to degrees Fahrenheit.



- Pressure

Applicable for Posidapt – *Super, Ultra and IPST*

This parameter is used to set the pressure unit. The selected temperature unit is then also applicable for all other pressure-based parameters.

- bar– *Factory default*

This sub-parameter value sets the pressure unit to bar.

- psi

This sub-parameter value sets the pressure unit to pound per square inches.

- kPa

This sub-parameter value sets the pressure unit to kilo Pascal.

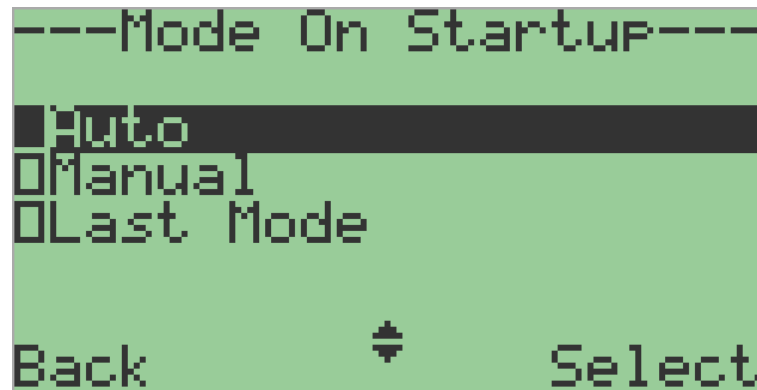
- kg/cm<sup>2</sup>

This sub-parameter value sets the pressure unit to kilogram per square centimetre.

### **Mode on Start-up**

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*

Mode on start-up function enables to choose in which operating the device should start in after restart or input signal failure.



- *Auto - Factory default*

This parameter will start the device in auto mode.

- Manual

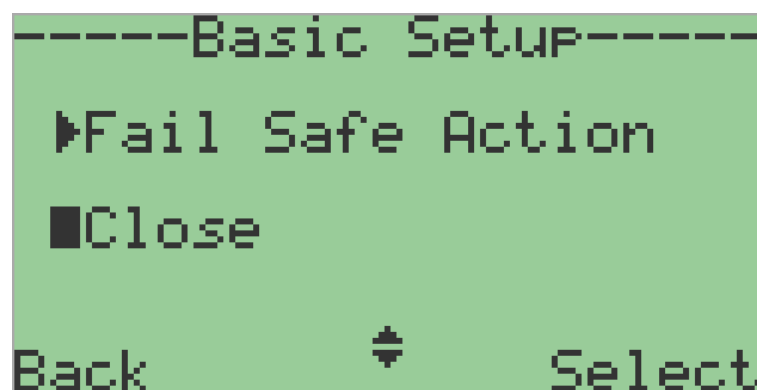
This parameter will start the device in manual mode.

- Last Mode

This parameter will resume the device in last mode it was being operated.

### **Fail Safe Action**

Defines what action takes place when there is a loss of signal pressure.



- Close - *Factory default*

This parameter will close the valve.

- Open

This parameter will open the valve.

- Stay put – *(not applicable for IPST)*

This parameter will lock the valve in current position.

- Set point - *(not applicable for IPST)*

This parameter will move the valve to user define set point.

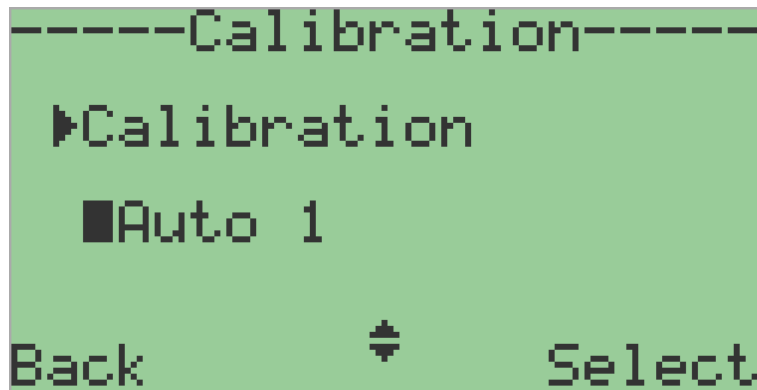
```
---Fail Safe Action---
█ Close
  Open
  Stayput
  custom Setpoint
Back          ⬇          Select
```

### 8.3.2. Calibration

#### Calibration

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*

Use this parameter to initialize automatic calibration process. If the device is not calibrated initially, only value "Auto1" is allowed for calibration.



- Auto1- Recommended

It sets all the parameter which needs to be calibrated in order for valve system to operate as desired.

- Auto2

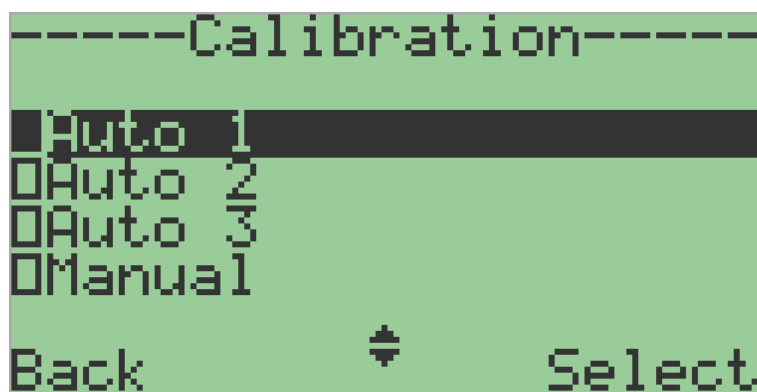
It calibrates only start point or 0.0% & end point or 100.0%.

- Auto3

It calibrates PID parameter in order to optimise the operation of the valve system.

- Manual

It calibrates PID parameter with manual values.



### Calibration Timeout

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*

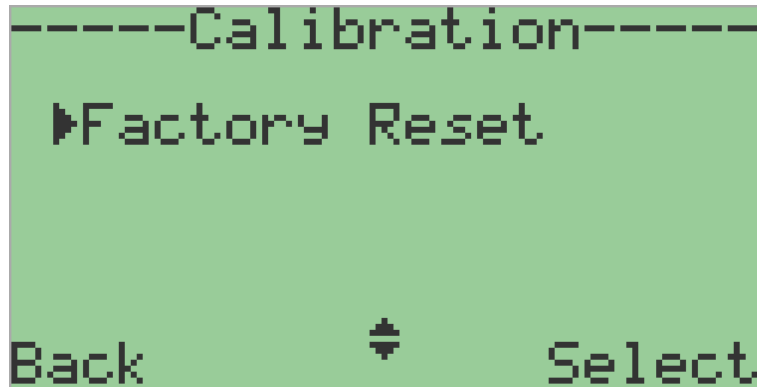
This parameter initializes timeout for calibration.



- 60 Seconds  
Set calibration time value to 60 seconds.
- 120 Seconds  
Set calibration time value to 120 seconds.
- 180 Seconds  
Set calibration time value to 180 seconds.
- 240 Seconds  
Set calibration time value to 240 seconds.
- 300 Seconds  
Set calibration time value to 300 seconds.

## Factory Reset

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*



This parameter is used to reset the device to factory settings & reset calibration.

- Parameter reset

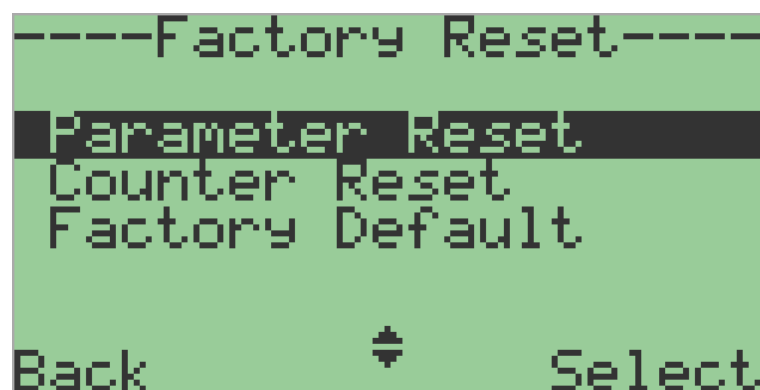
This parameter is used to reset the custom values of parameters set by user to factory setting default values.

- Counter reset

This parameter is used to reset all counter values to factory reset values.

- Reset to factory Default

This parameter is used to reset the device to factory settings& reset calibration. This will not reset the counter values.



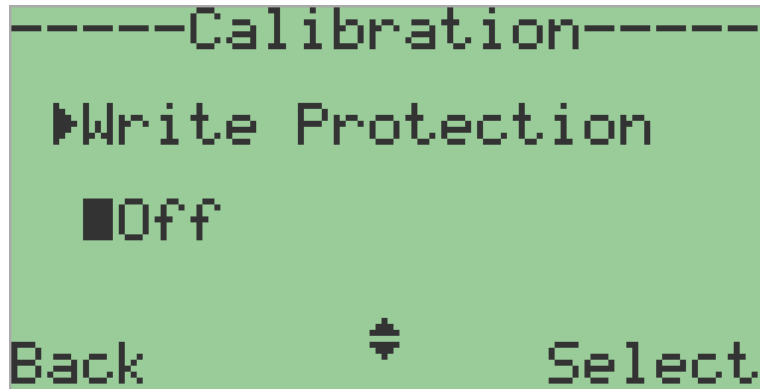
To reset the device press enter for >5s, will display “Done” once the reset is complete.



### Write Protect

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*

This parameter is used for write protect for HART communication.



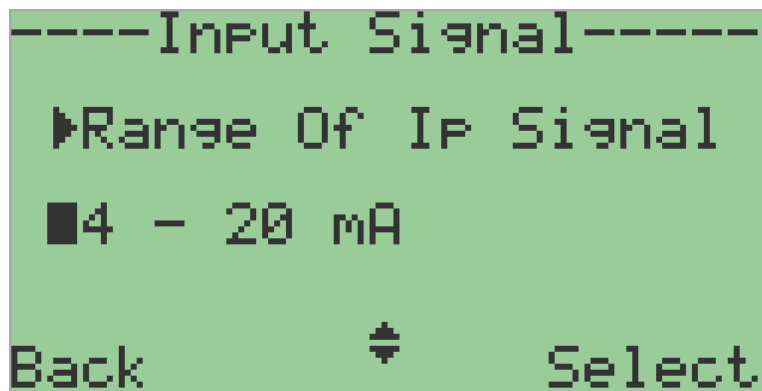
- Off  
This parameter disable write protect.
- On  
This parameter enable write protect.

### 8.3.3. Advanced Setup

#### Input Signal

##### *Range Of Input Signal*

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*



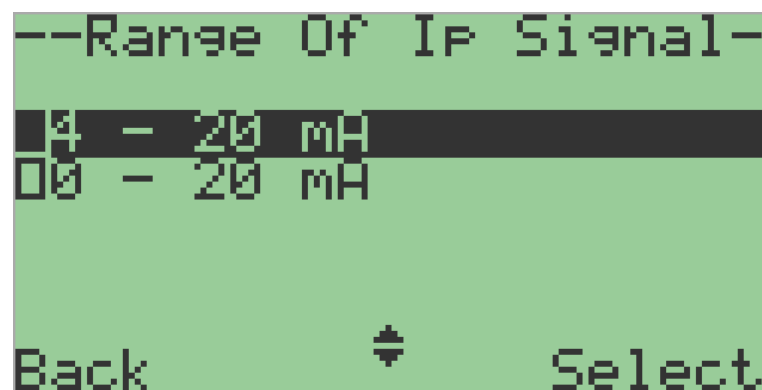
This parameter is used to set the current range. The selection of the current range depends on the type of connection.

- 4-20 mA - *Factory default*

Use this parameter when the supply input signal current range is from 4-20 mA.

- 0-20 mA

Use this parameter when the supply input signal current range is from 0-20 mA. This selection is only possible for 3-4 wire system. Externally 24 VDC supply required.



### **Split Range Minimum**

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*

This parameter used to set the start range for input signal. It allows limiting the effective start set point.

- Off- Factory Default

This parameter disable split range minimum feature.

- Custom

This parameter allows limiting effective start set point.

The default value is 0.0%. Value can be set from 0.0 % to 99.0 %.



### **Split Range Maximum**

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*

This parameter used to set the end range for input signal. It allows limiting the effective end set point.

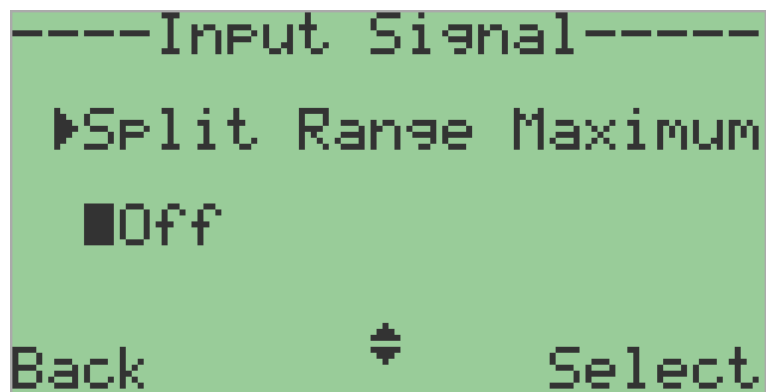
- Off- Factory Default

This parameter disable split range maximum feature.

- Custom

This parameter allows limiting effective end set point.

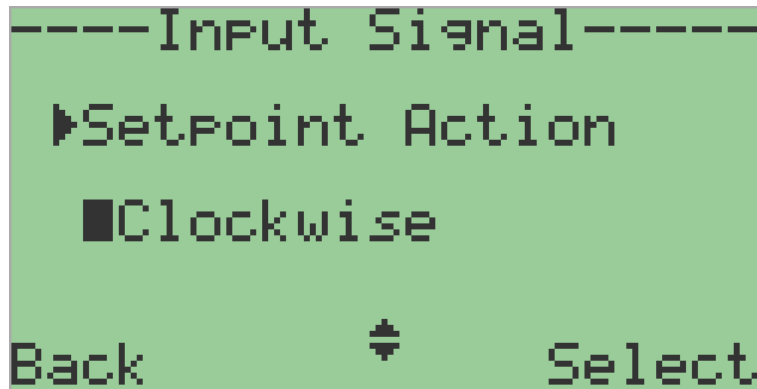
The default value is 100.0%. Value can be set from 100.0 % to 1.0 %.



### Set point Action

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*

This parameter is used to set the action of set point direction. This parameter is used to reverse the set point direction of action from forward to reverse & vice versa.

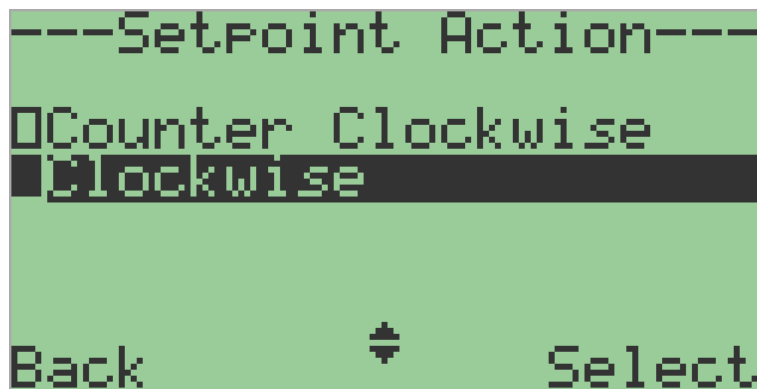


- Counter-clockwise

This parameter is use to set the action of set point direction to counter clockwise or forward.

- Clockwise

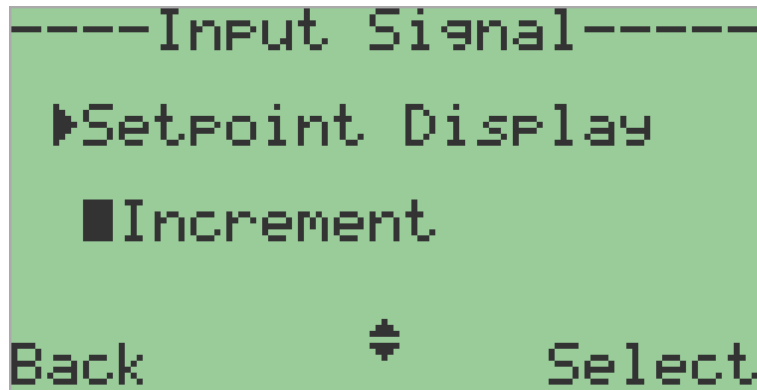
This parameter is use to set the action of set point direction clockwise or reverse.



### Set point Display

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*

This parameter is used to set the set point direction of action for display. The set point direction of action for display is used to reverse the direction of action from forward to reverse & vice versa.



- Increment

This parameter is use to set the set point direction of action for display to counter clockwise or forward.

- Decrement

This parameter is use to set the set point direction of action for display to clockwise or reverse.



### **Feedback Direction**

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*

This parameter is used to set the Position transmitter output direction depending on position.

10



- Increment - Factory default

This parameter is use to set the position transmitter output to increment depending on position.

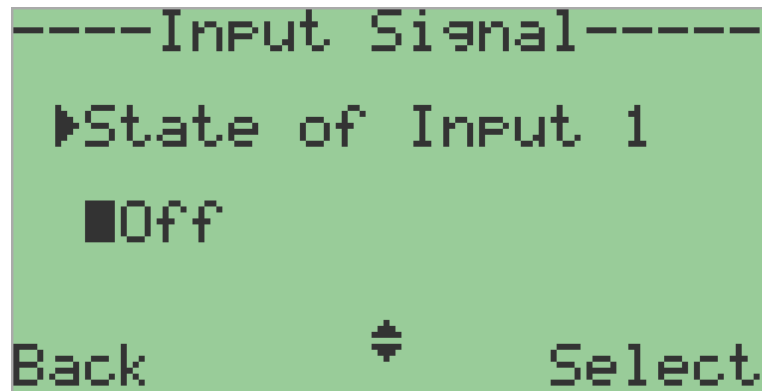
- Decrement

This parameter is use to set the position transmitter output to decrement depending on position.

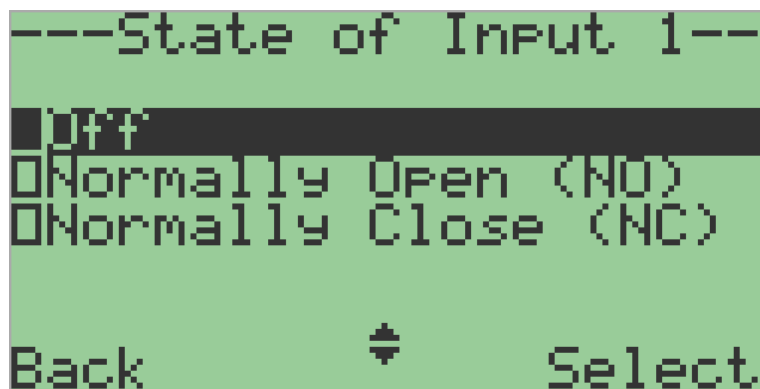
### State of Input 1

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*

This parameter selects functionality of Input pin value for function of input



- Off - Factory default  
Disable state of input function
- Normally Open(NO)  
Detect logic 1 on input pin (Connector Pin 41& 42).
- Normally Close (NC)  
Detect logic 0 on input pin (Connector Pin 41& 42).

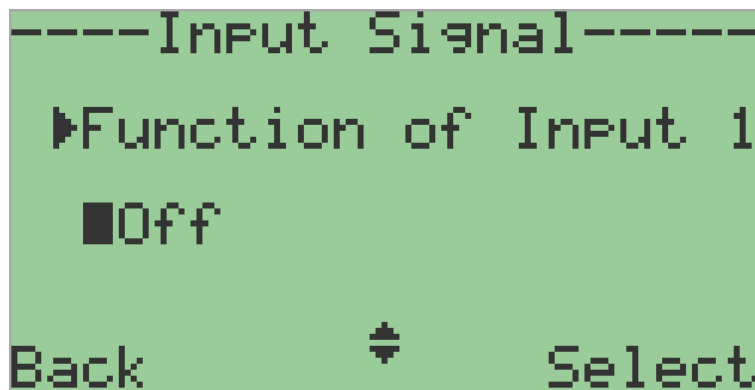




### Function of Input 1

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*

These parameters are used to determine the action based on function of input. The direction of action can be adapted to normally open or normally close depending upon the sub-parameters.



- Off - *Factory default*

This valve deactivates the parameter. No function.

- Message only (NO/NC)

Binary messages from peripherals, e.g. from pressure or temperature switches, can be read over the communication interface or fed through a logical OR combination with other messages to trigger the fault message output.

- Block Configuration (NO/NC)

This parameter value can lock the "configuration" operation mode against reconfiguration. The lock can be made active by installing a jumper between INP1 terminals.

- Block configuration & manual mode (NO/NC) – *(not applicable for IPST)*

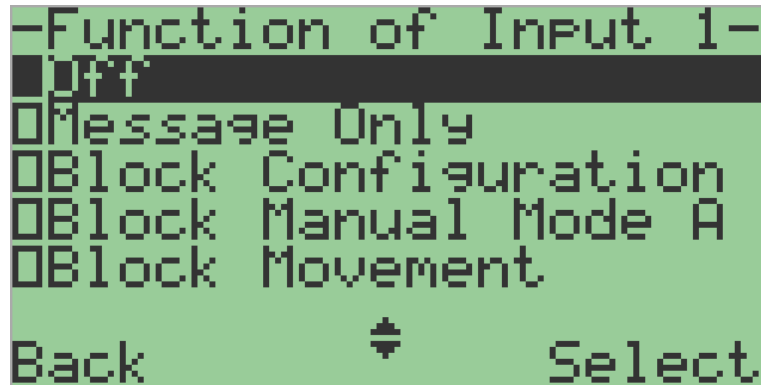
If input 1 is activated, then manual mode is also blocked in addition to the configuration operation mode.

- Block Movement (NO/NC) – *(not applicable for IPST)*

If input 1 is activated, then the movement of the actuator is block to the last position.

- Move valve position to open (NO/NC)

If input 1 is activated, then the actuator regulates to the value specified in parameter “End point soft stopper”.



- Move Valve position to close (NO/NC)

If input 1 is activated, then the actuator regulates to the value specified in parameter “Zero point soft stopper”.

- Move Valve position to user set point (NO/NC) – *(not applicable for IPST)*

If input 1 is activated, then the actuator regulates to the value set by user. The Value can set from 0.0 to 100%.

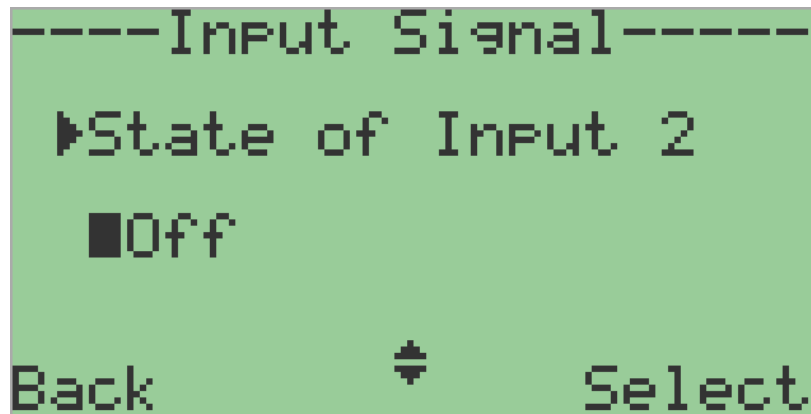
- Partial Stroke test (NO/NC)

Using input 1, a partial-stroke test can be triggered by actuation of your choice of a normally closed or normally open switch. For this function, the parameter in “Partial stroke test” should be selected to “Input”.

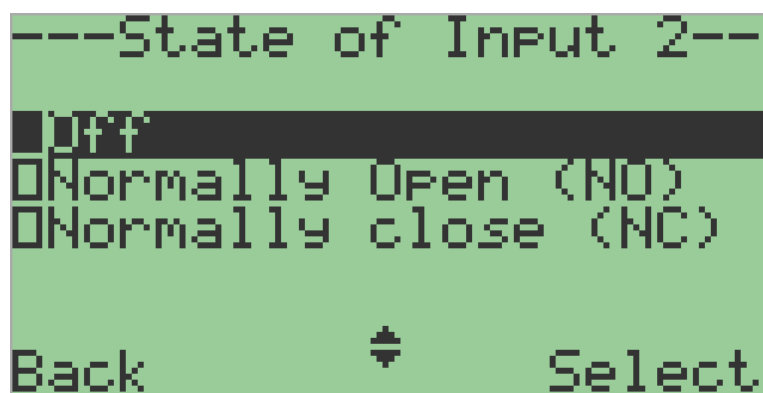
### State of Input 2

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*

This parameter selects functionality of Input pin value for function of input



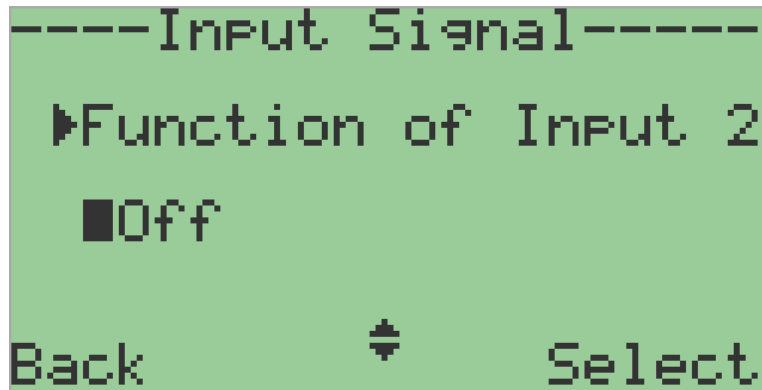
- Off - Factory default  
Disable state of input function
- Normally Open(NO)  
Detect logic 1 on input pin (Connector Pin 43 & 44).
- Normally Close (NC)  
Detect logic 0 on input pin (Connector Pin 43 & 44).



## Function of Input 2

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*

These parameters are used to determine the action based on function of input. The direction of action can be adapted to normally open or normally close depending upon the sub-parameters.



- Off - *Factory default*

This valve deactivates the parameter. No function.

- Message only (NO/NC)

Binary messages from peripherals, e.g. from pressure or temperature switches, can be read over the communication interface or fed through a logical OR combination with other messages to trigger the fault message output.

- Block Configuration (NO/NC)

This parameter value can lock the "configuration" operation mode against reconfiguration. The lock can be made active by installing a jumper between INP1 terminals.

- Block configuration & manual mode (NO/NC) – *(not applicable for IPST)*

If input 2 is activated, then manual mode is also blocked in addition to the configuration operation mode.

- Block Movement (NO/NC) – *(not applicable for IPST)*

If input 2 is activated, then the movement of the actuator is block to the last position.

- Move valve position to open (NO/NC)

If input 2 is activated, then the actuator regulates to the value specified in parameter “End point soft stopper”.

- Move Valve position to close (NO/NC)

If input 2 is activated, then the actuator regulates to the value specified in parameter “Zero point soft stopper”.

- Move Valve position to user set point (NO/NC) – *(not applicable for IPST)*

If input 2 is activated, then the actuator regulates to the value set by user. The Value can set from 0.0 to 100%.

- Partial Stroke test (NO/NC)

Using input 2, a partial-stroke test can be triggered by actuation of your choice of a normally closed or normally open switch. For this function, the parameter in “Partial stroke test” should be selected to “Input”.

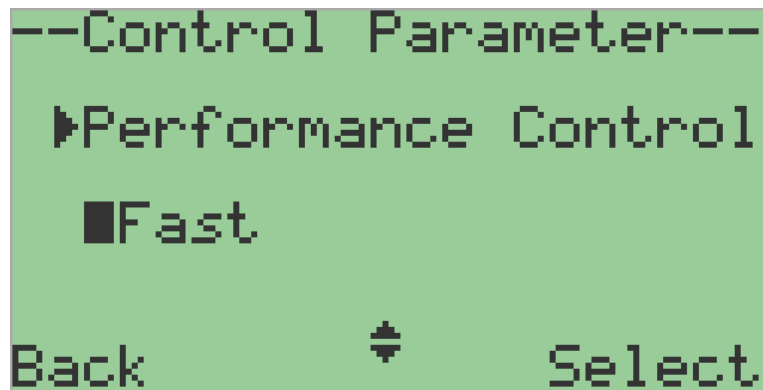
```
-Function of Input 2-  
Off  
[ ] Message Only  
[ ] Block Configuration  
[ ] Block Manual Mode A  
[ ] Block Movement  
Back      ⌂      Select
```

## Control Parameter

### *Performance Control*

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*

This parameter defines the target performance level of the valve position control of the device.



- Quickest

In order to optimize the control performance the device responds immediately to input signal changes, overshoots occurs while achieving the target position.

- Quick

In order to optimize the control performance the device responds quickly to input signal changes, small overshoots occurs while achieving the target position.

- Fast - *Factory default*

Fast response to input signal changes, no overshoots occurs while achieving the target position.

- Optimum Control

No overshoots, optimum control while achieving the target position.

- Slow

No overshoots, but slow response to input signal to achieve target position.

- Fine Control

No overshoots, most stable, very slow response to input signal to achieve target position.



### ***Dead band***

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*

This parameter is used to adjust the dead-band of the controller.

- *Auto -Factory default*

This parameter continuously & adaptively adjusts the dead band to the requirement of the control loop, if a regulating oscillation is detected.

- *Custom*

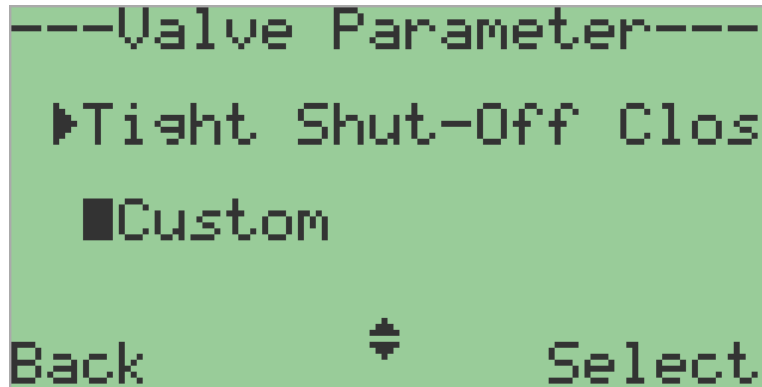
In other discrete settings the dead band value can be adjusted manually. The value can be set from 0.1 to 10.0%



## Valve Parameter

### *Tight shut-off Close*

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*



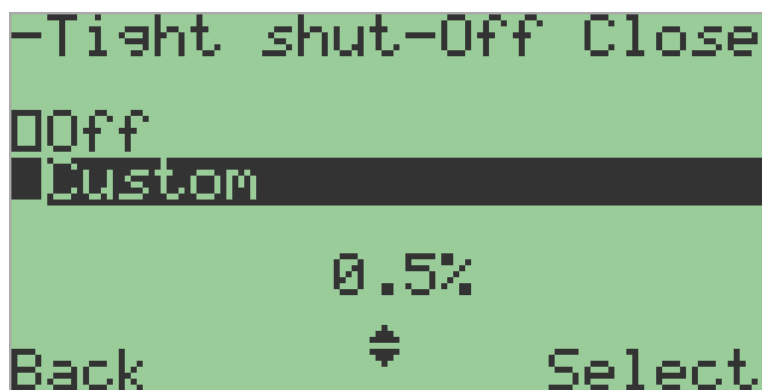
This parameter is used to move the valve into its seat with the maximum force of the actuator.

- Off

This parameter will deactivate the tight shut-off function at close position. This parameter controls 0.0% (start position) of the device; the device is in controlled state.

- Custom – Factory Default

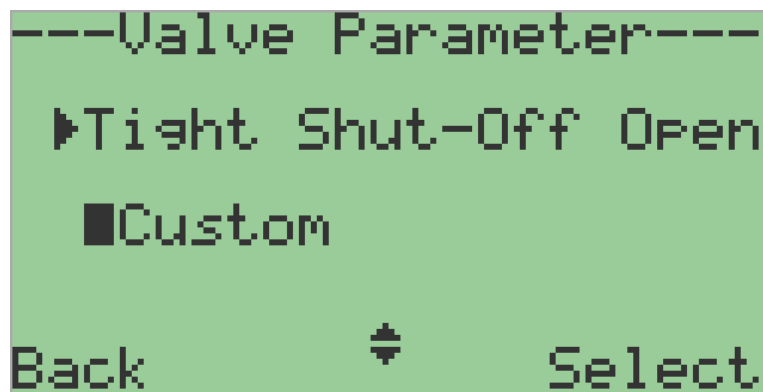
This parameter used for setting the tight shut-off value of start (close) position. The value can be set from 0.0 to 20.0%.



### *Tight shut-off Open*

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*





This parameter is used to move the valve into its seat with the maximum force of the actuator.

- Off

This parameter will deactivate the tight shut-off function at open position. This parameter controls 100.0% (end position) of the device; the device is in controlled state.

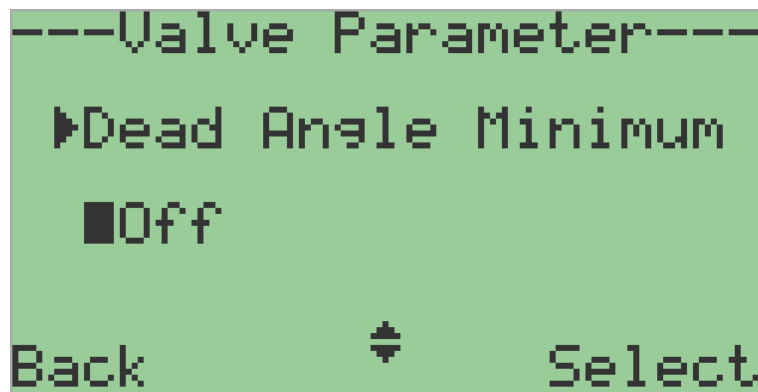
- Custom

This parameter used for setting the tight shut-off value of end (open) position. The value can be set from 100.0 to 80.0%.



### ***Dead Angle Minimum***

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*



This parameter is used to cut off unusable range of the control valve from the point of control.

- Off – Factory Default

In this mode the valve will follow the input signal linearly. The valve start position is same as the actual start position of the actuator determined during auto calibration.

- Custom

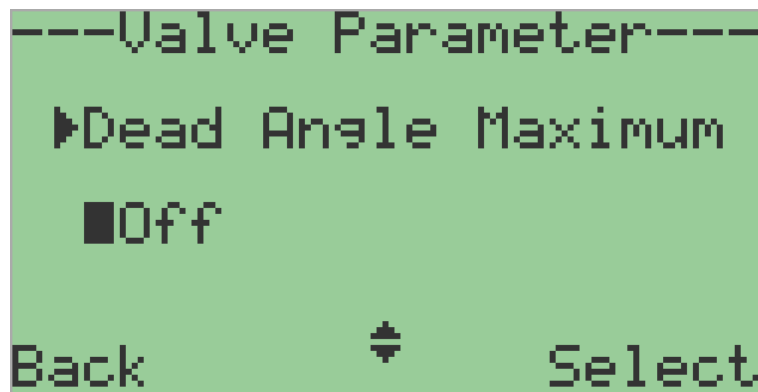
This parameter is used to cut off start position (0.0%) unusable range of the control valve. It is the percentage of the working range to which to which the valve is moved with minimum input signal to move valve forward.

The value can be set from 0.0 to 20.0%



### ***Dead Angle Maximum***

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*



This parameter is used to cut off unusable range of the control valve from the point of control.

- Off

In this mode the valve will follow the input signal linearly. The valve end position is same as the actual end position of the actuator determined during auto calibration.

- Custom

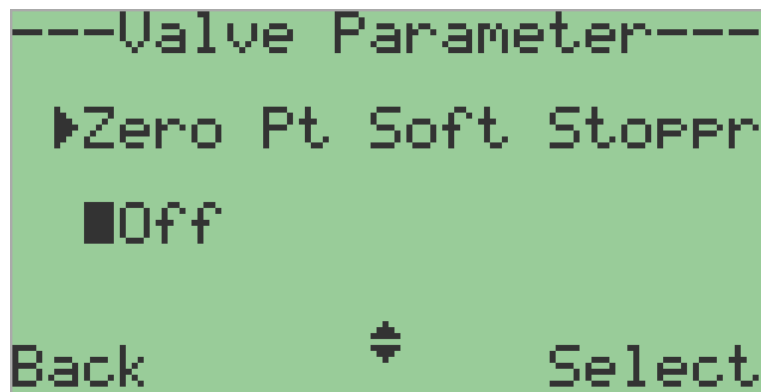
This parameter is used to cut off end position (100.0%) unusable range of the control valve. It is the percentage of the working range to which to which the valve is moved with minimum input signal to move valve reverse.

The value can be set from 100.0 to 80.0



### **Zero Point Soft Stopper**

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*



This parameter is used to limit the mechanical travel of the zero point (start point) of actuator.

- Off -Factory default

In this mode the start (zero) mechanical position is the same as the actual start position of the actuator determined during auto calibration.

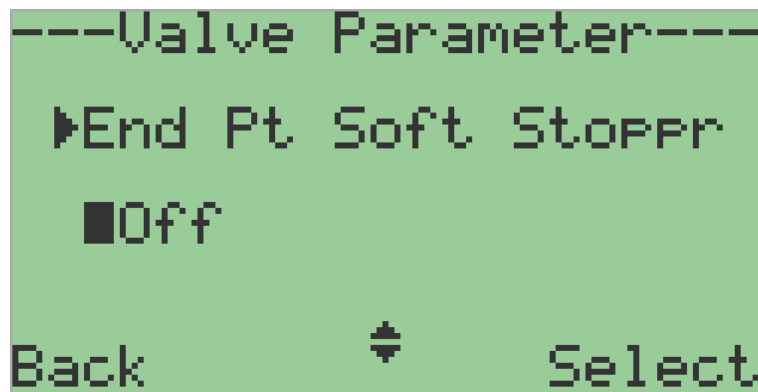
- Custom

The start (zero) position can be configured to desired value. This allows limiting the start (zero) position of actuator. The value can be set from 0.0 to 100.0%.



### ***End Point Soft Stopper***

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*



This parameter is used to limit the mechanical travel of the end point of actuator.

- Off - *Factory default*

In this mode the end mechanical position is the same as the actual end position of the actuator determined during auto calibration.

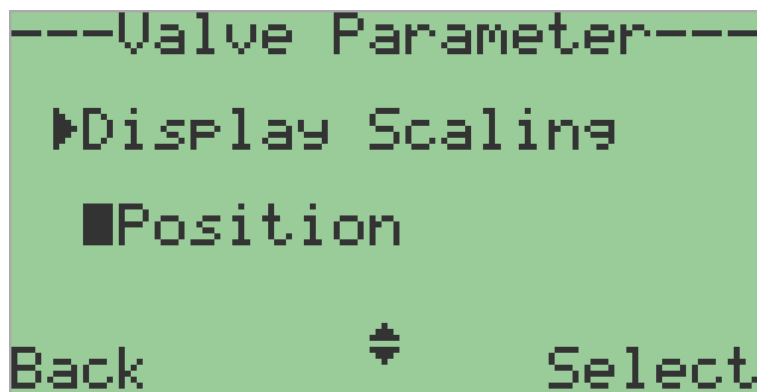
- Custom

The end position can be configured to desired value. This allows limiting the end position of actuator. The value can be set from 100.0 to 0.0%.



### ***Display Scaling***

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*



Using “Zero point soft stopper” & “End point soft stopper” parameters causes two different scaling types, Position & Scale, for display & position feedback parameter “Feedback direction”. Refer the following figure.

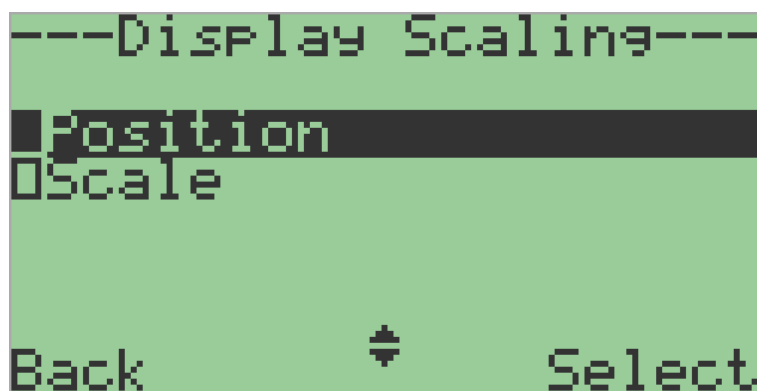
- Position- *Factory default*

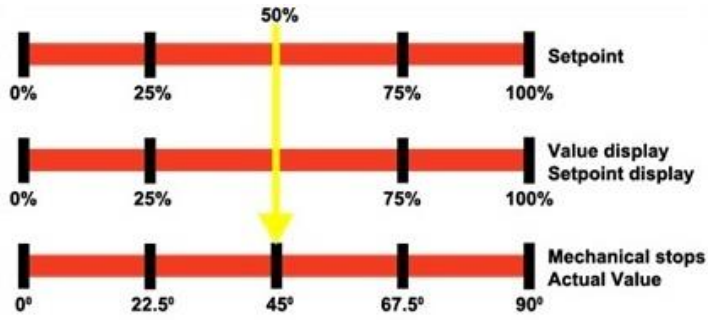
This parameter value shows the mechanical position from 0.0% to 100.0% between the actual mechanical stops of the actuator irrespective of the “Zero point soft stopper” & “End point soft stopper” parameters.

- Scale

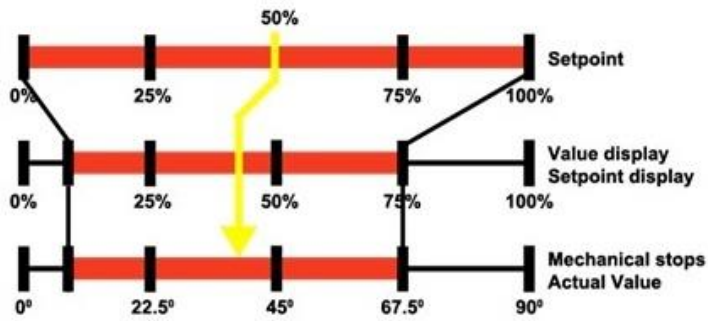
This parameter value shows the mechanical position from 0.0% to 100.0% over the range of “Zero point soft stopper” & “End point soft stopper” parameters. This results in proportional scale of display & position feedback.

The following example shows a 90° part turn actuator angle of rotation dependence on the scaling (“Soft stopper display scaling”) as well as “Zero point soft stopper” & “End point soft stopper” parameters.

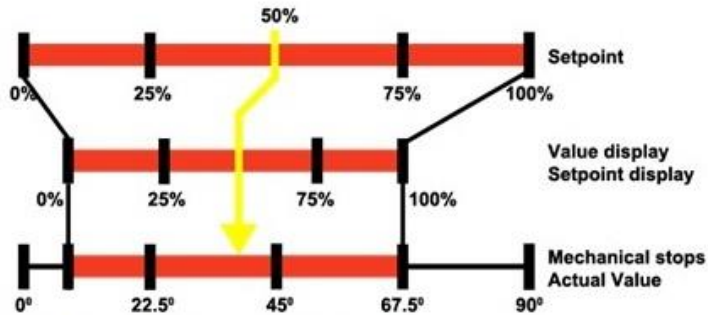




Soft stopper display scaling = Position OR Scale  
Zero point soft stopper = 0% & End point soft stopper = 100%



Soft stopper display scaling = Position  
Zero point soft stopper = 10% & End point soft stopper = 75%

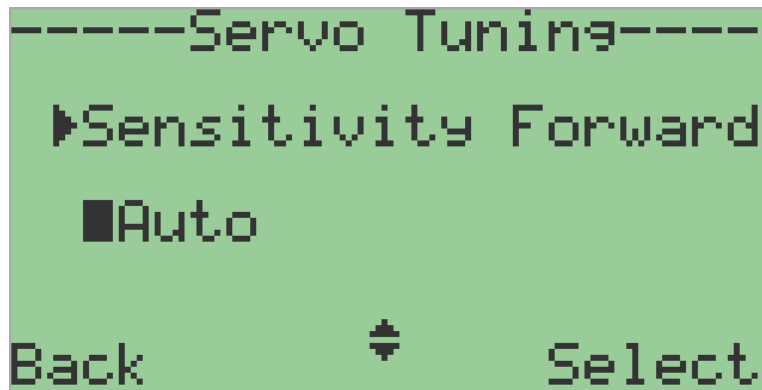


Soft stopper display scaling = Scale  
Zero point soft stopper = 10% & End point soft stopper = 75%

## Servo Tuning

### *Sensitivity Forward*

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*



This parameter control servo valve spool forward sensitivity.

- Auto

It is the minimum spool movement, to achieve minimum set point change in forward direction.

- Custom

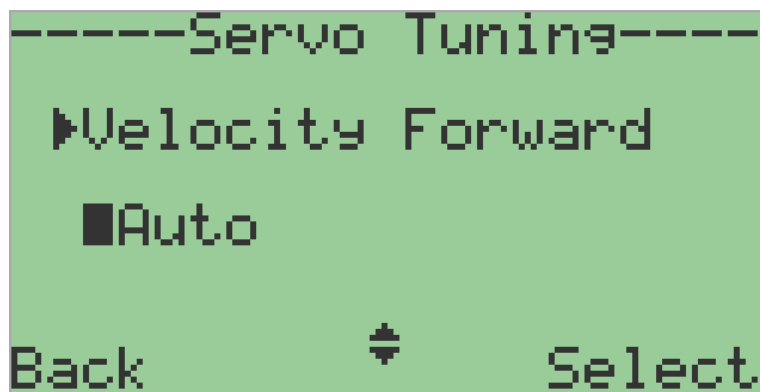
It sets the sensitivity/aggressiveness of the positioner, not recommended to change manually. The value can be set from 0.0 to 20.0 factors.



### *Velocity Forward*

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*





This parameter control servo valve spool forward velocity.

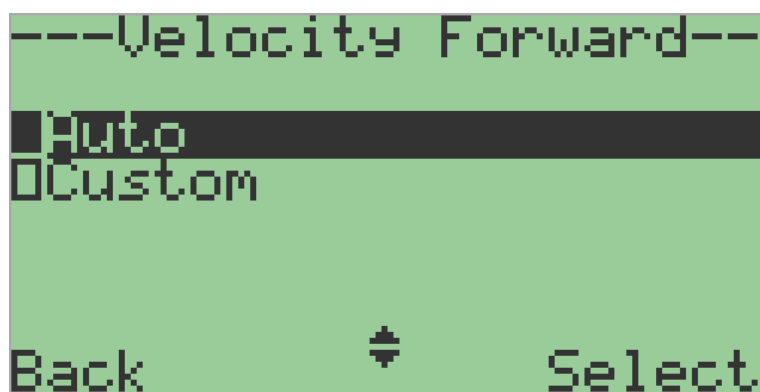
- Auto

It is the maximum forward velocity of the positioner to achieve the set point, without being overshoot.

- Custom

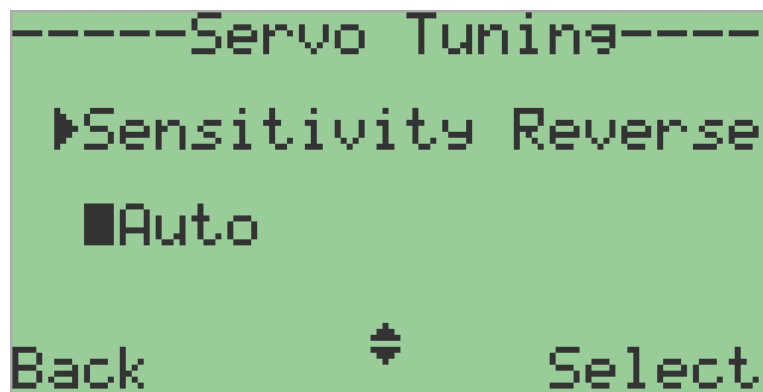
It sets the velocity of the positioner. Not recommended to change it manually.

The value can be set from 100.0 to 80.0 factors.



### ***Sensitivity Reverse***

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*



This parameter control servo valve spool reverse sensitivity.

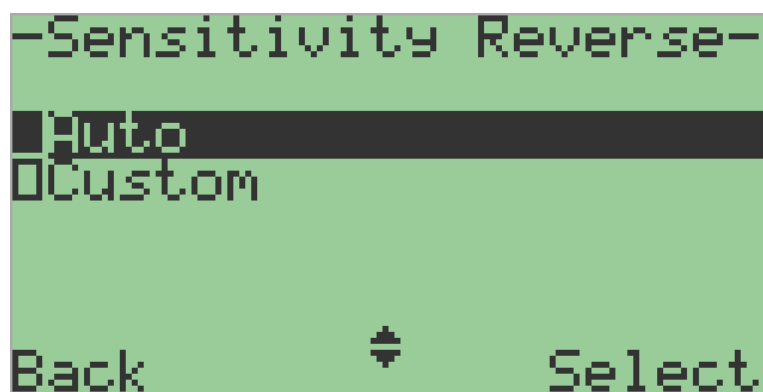
- Auto

It is the minimum spool movement, to achieve minimum set point change in reverse direction.

- Custom

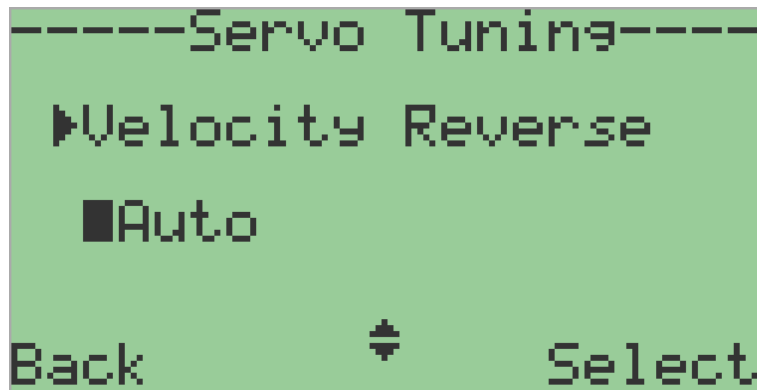
It sets the sensitivity/aggressiveness of the positioner, not recommended to change manually.

The value can be set from 0.0 to 20.0 factors.



### ***Velocity Reverse***

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*



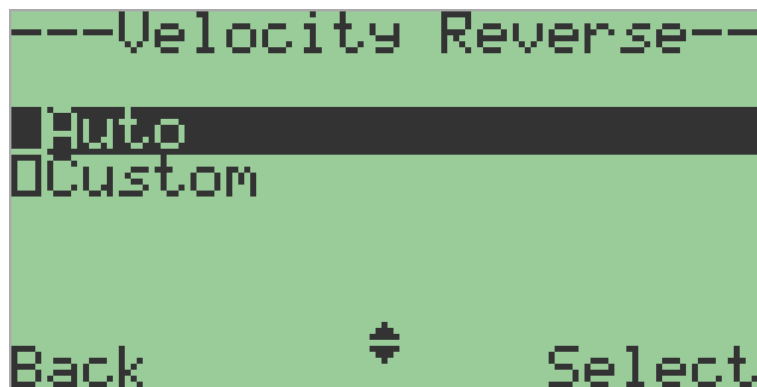
This parameter control servo valve spool reverse sensitivity.

- Auto

It is the maximum reverse velocity of the positioner to achieve the set point, without being overshoot.

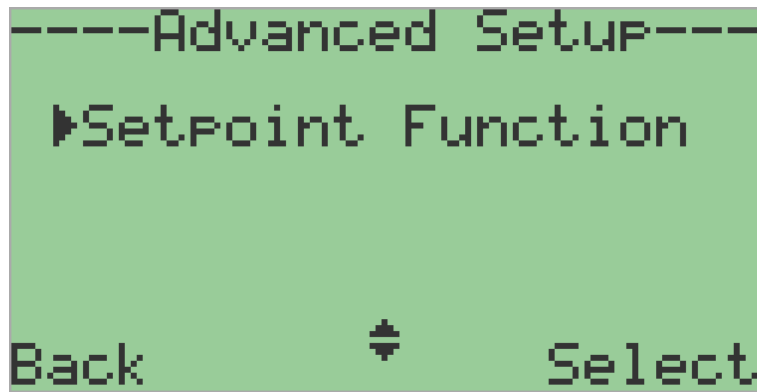
- Custom

It sets the velocity of the positioner. Not recommended to change it manually  
The value can be set from 100.0 to 80.0%



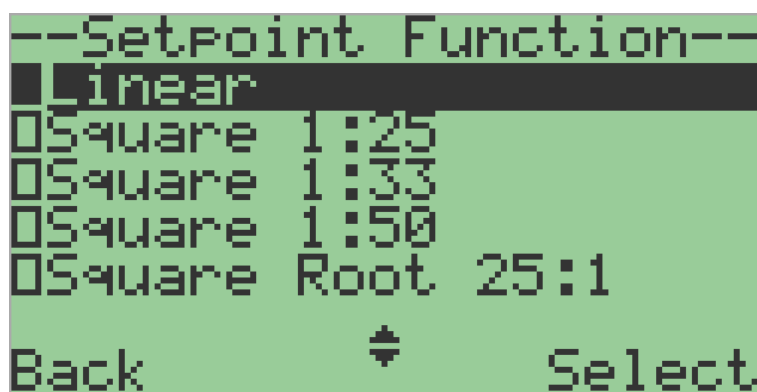
### Set point Function

Applicable for Posidapt – *Modern, Expert, Super, Ultra and IPST*

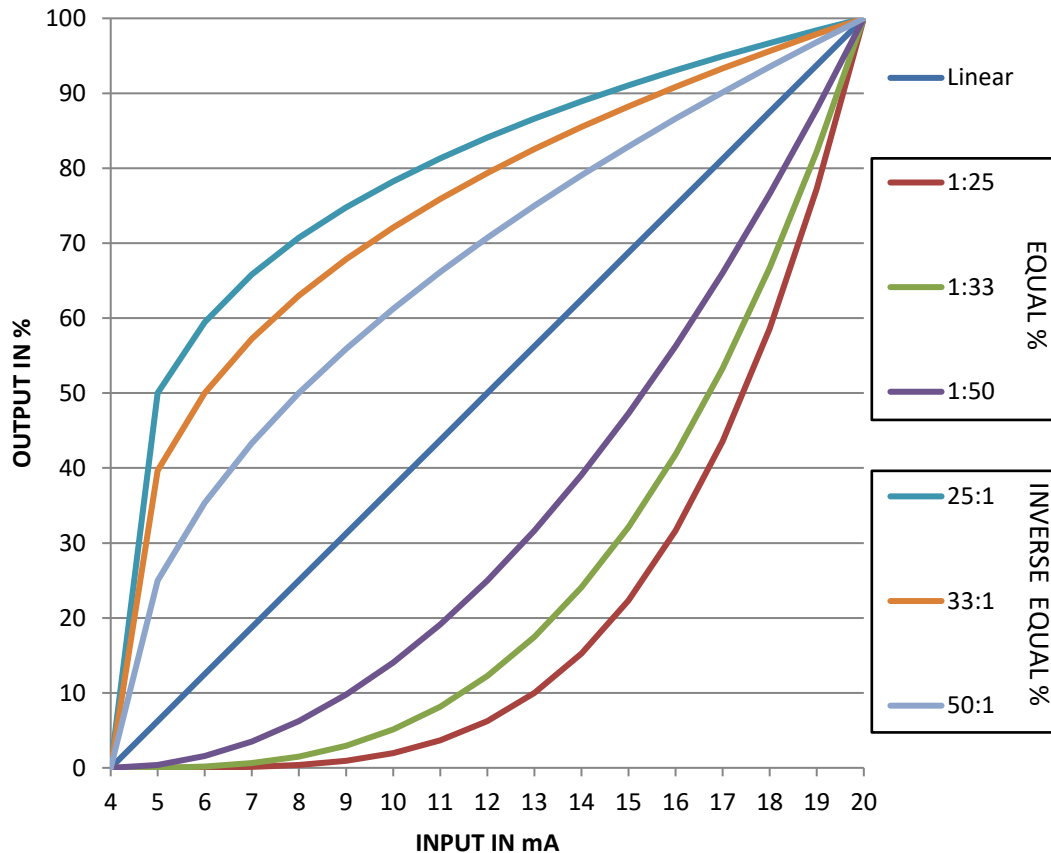


This parameter is used to linearize nonlinear valve characteristics. There are seven pre-defined &four user defined characteristics.

Sr. no.	Valve characteristics	Values
1	Linear - <i>Factory default</i>	Linear
2	Square	01:25
3	Square	01:33
4	Square	01:50
5	Square root	25:01:00
6	Square root	33:01:00
7	Square root	50:01:00
8	User set 5 points digital input	5 point digital
9	User set 21 points digital input	21 point digital



## SETPOINT FUNCTION



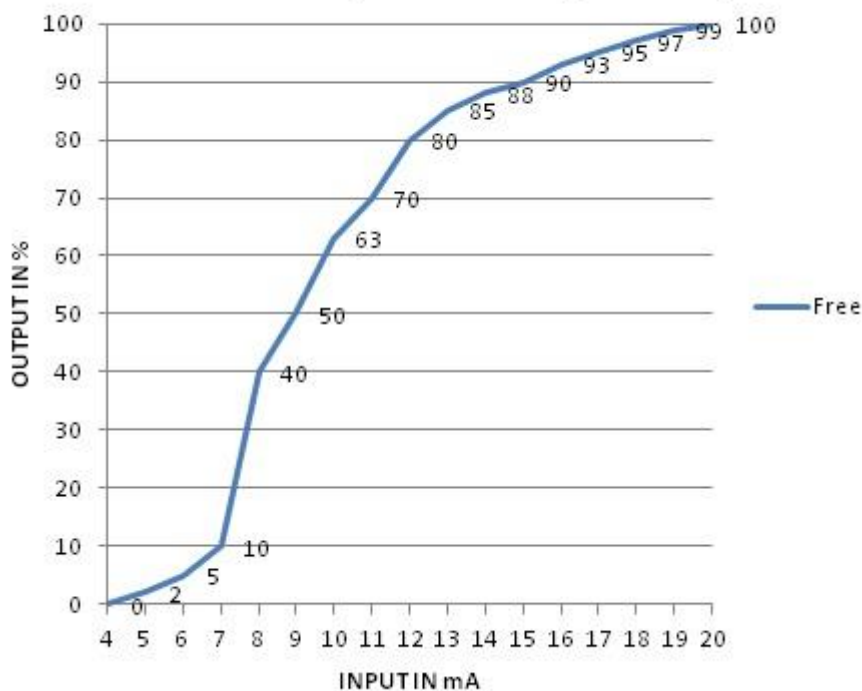
- User set point characteristics

These parameters are used to assign each set point interpolation point a flow metric in units of 5.0%. The set point interpolation points from a polygonal curve with 20 linear segments, which models the valve characteristic. The difference between digital and mechanical set point is, digital set point are set through keypad or DTM, whereas mechanical set point are set by physical moving the actuator to desired position.

Only rising characteristic is allowed where two user points must differ by 0.5%.

1	User defined set point 1
2	User defined set point 2
3	User defined set point 3
4	User defined set point 4
5	User defined set point 5
6	User defined set point 6
7	User defined set point 7
8	User defined set point 8
9	User defined set point 9
10	User defined set point 10
11	User defined set point 11
12	User defined set point 12
13	User defined set point 13
14	User defined set point 14
15	User defined set point 15
16	User defined set point 16
17	User defined set point 17
18	User defined set point 18
19	User defined set point 19
20	User defined set point 20
21	User defined set point 21

### User set 21 points digital input



### 8.3.4. Diagnostics and Setup

#### **Alarm Function**

#### **Pneumatic Leakage**

Applicable for Posidapt –*Super and Ultra*

This parameter is used to determine possible pneumatic leakages. Depending on the direction, changes in the position and the internal manipulated variable used for it are continuously recorded and filtered for this purpose. The filter result is used to form an indicator, which allows drawing a conclusion about a possible leakage.

The current value is displayed in the “Pneumatic leak” in Values and Counters under Counter Thresholds and Trends. The device triggers a fault message if the current value exceeds one of the three configurable limit thresholds.

#### **Threshold Limit 1**

Use this sub-parameter to set the factor for the formation of limit threshold 1.

- Off - Factory default

This parameter value does not trigger any message or alarm.

- Custom

The threshold 1 fault message is displayed when the limit threshold 1 is exceeded. The value can be set from 0.1 to 20.0%.

#### **Threshold Limit 2**

Use this sub-parameter to set the factor for the formation of limit threshold 2.

- Off - Factory default

This parameter value does not trigger any message or alarm.

- Custom

The threshold 2 fault message is displayed when the limit threshold 2 is exceeded. The value can be set from 0.1 to 20.0%.

#### **Threshold Limit 3**

Use this sub-parameter to set the factor for the formation of limit threshold 3.

- Off - Factory default

This parameter value does not trigger any message or alarm.

- Custom

The threshold 3 fault message is displayed when the limit threshold 3 is exceeded. The value can be set from 0.1 to 20.0%.

### **Zero Set point Shift**

Applicable for Posidapt –*Super and Ultra*

This parameter monitors whether the value of the lower end stop (close) has changed with respect to its value at the time of calibration.

Ensure that the sub-parameter "Close" in "Tight shut-off" parameter is set to "Custom".

The current value is displayed in the "Zero set point shift" in Values and Counters under Counter Thresholds and Trends. The device triggers a fault message if the current value exceeds one of the three configurable limit thresholds.

### **Threshold Limit 1**

Use this sub-parameter to set the factor for the formation of limit threshold 1.

- Off - Factory default

This parameter value does not trigger any message or alarm.

- Custom

The threshold 1 fault message is displayed when the limit threshold 1 is exceeded. The value can be set from 0.1 to 20.0%.

### **Threshold Limit 2**

Use this sub-parameter to set the factor for the formation of limit threshold 2.

- Off - Factory default

This parameter value does not trigger any message or alarm.

- Custom

The threshold 2 fault message is displayed when the limit threshold 2 is exceeded. The value can be set from 0.1 to 20.0%.

### **Threshold Limit 3**

Use this sub-parameter to set the factor for the formation of limit threshold 3.

- Off - Factory default

This parameter value does not trigger any message or alarm.

- Custom



The threshold 3 fault message is displayed when the limit threshold 3 is exceeded. The value can be set from 0.1 to 20.0%.

### ***End Set point Shift***

Applicable for Posidapt –*Super and Ultra*

This parameter monitors whether the value of the upper end stop (open) has changed with respect to its value at the time of calibration.

Ensure that the sub-parameter "Open" in "Tight shut-off" parameter is set to "Custom".

The current value is displayed in the "End set point shift" in Values and Counters under Counter Thresholds and Trends. The device triggers a fault message if the current value exceeds one of the three configurable limit thresholds.

### **Threshold Limit 1**

Use this sub-parameter to set the factor for the formation of limit threshold 1.

- Off - Factory default

This parameter value does not trigger any message or alarm.

- Custom

The threshold 1 fault message is displayed when the limit threshold 1 is exceeded. The value can be set from 0.1 to 20.0%.

### **Threshold Limit 2**

Use this sub-parameter to set the factor for the formation of limit threshold 2.

- Off - Factory default

This parameter value does not trigger any message or alarm.

- Custom

The threshold 2 fault message is displayed when the limit threshold 2 is exceeded. The value can be set from 0.1 to 20.0%.

### **Threshold Limit 3**

Use this sub-parameter to set the factor for the formation of limit threshold 3.

- Off - Factory default

This parameter value does not trigger any message or alarm.

- Custom

The threshold 3 fault message is displayed when the limit threshold 3 is exceeded. The value can be set from 0.1 to 20.0%.

### ***Dead-band Monitoring***

Applicable for Posidapt –Super and Ultra

This parameter is used to determine the basic control accuracy of the valve.

The current dead-band value is displayed in the “Dead-band” in Values and Counters under Counter Thresholds and Trends. The device triggers a fault message if the value exceeds one of the three configurable limit thresholds.

### **Threshold Limit 1**

Use this sub-parameter to set the factor for the formation of limit threshold 1.

- Off - Factory default

This parameter value does not trigger any message or alarm.

- Custom

The threshold 1 fault message is displayed when the limit threshold 1 is exceeded. The value can be set from 0.1 to 20.0%.

### **Threshold Limit 2**

Use this sub-parameter to set the factor for the formation of limit threshold 2.

- Off - Factory default

This parameter value does not trigger any message or alarm.

- Custom

The threshold 2 fault message is displayed when the limit threshold 2 is exceeded. The value can be set from 0.1 to 20.0%.

### **Threshold Limit 3**

Use this sub-parameter to set the factor for the formation of limit threshold 3.

- Off - Factory default

This parameter value does not trigger any message or alarm.

- Custom

The threshold 3 fault message is displayed when the limit threshold 3 is exceeded. The value can be set from 0.1 to 20.0%.

### ***Deviation of Set point***

Applicable for Posidapt – Ultra

This parameter is used for dynamic monitoring of the control valve response. The actual position course is compared with the expected position course for this purpose. This comparison helps in drawing a conclusion about the correct operational response of the control valve.

### **Monitoring Time for Regulating Set point**

This parameter is used to define the attenuation effect.

The current value is displayed in the "Control valve deviation" in Values and Counters under Counter Thresholds and Trends. The device triggers a fault message if the current value exceeds one of the three configurable limit thresholds.

- Auto - Factory default

This sub-parameter is set to "Auto" if the device is auto calibrated. The time constant is determined from the calibration process by actuating times open & close or value defined in the velocity parameter.

- Custom

If the time constant is inadequate, it can be change manually using this parameter. The unit is in seconds. The value can be set from 1 to 400 seconds

### **Threshold Limit 1**

This parameter defines the magnitude of the permissible deviation from the expected position.

- Off

This parameter value does not trigger any message or alarm.

- Custom

The threshold 1 fault message is displayed when the limit threshold 1 is exceeded. The value can be set from 0.1 to 100.0%

### **Threshold Limit 2**

This parameter defines the magnitude of the permissible deviation from the expected position.

- Off

This parameter value does not trigger any message or alarm.

- Custom

The threshold 2 fault message is displayed when the limit threshold 2 is exceeded. The value can be set from 0.1 to 100.0%

### **Threshold Limit 3**

This parameter defines the magnitude of the permissible deviation from the expected position.

- Off

This parameter value does not trigger any message or alarm.

- Custom

The threshold 3 fault message is displayed when the limit threshold 3 is exceeded. The value can be set from 0.1 to 100.0%.

### ***De-jamming Friction***

Applicable for Posidapt – Ultra

This parameter is used to continuously monitor the current static friction of the final controlling element. The device detects the slip-stick effects that may occur. Reverse changes in the valve position, the so-called slip jumps, let the device close at too large static friction. If slip jumps are detected, the filtered step height is saved as a de-jamming value. If slip jumps no longer exist, the value is reduced slowly.

The current value is displayed in the "De-jamming friction" in Values and Counters under Counter Thresholds and Trends. The device triggers a fault message if the current value exceeds one of the three configurable limit thresholds.

### **Threshold Limit 1**

Use this sub-parameter to set the factor for the formation of limit threshold 1.

- Off - Factory default

This parameter value does not trigger any message or alarm.

- Custom

The threshold 1 fault message is displayed when the limit threshold 1 is exceeded. The value can be set from 0.1 to 20.0%.

### **Threshold Limit 2**

Use this sub-parameter to set the factor for the formation of limit threshold 2.

- Off - Factory default

This parameter value does not trigger any message or alarm.

- Custom

The threshold 2 fault message is displayed when the limit threshold 2 is exceeded. The value can be set from 0.1 to 20.0%.

### **Threshold Limit 3**

Use this sub-parameter to set the factor for the formation of limit threshold 3.

- Off - Factory default

This parameter value does not trigger any message or alarm.

- Custom

The threshold 3 fault message is displayed when the limit threshold 3 is exceeded. The value can be set from 0.1 to 20.0%.

### ***Steady State Load***

Applicable for Posidapt –Super and Ultra

This parameter is used for steady state load measurement, which is especially significant for single-acting actuators since you can use it estimate the actuator spring force and spring condition.

The calculation is based on the pneumatic pressure measurement that is carried out whenever the valve is in a steady state. The current value is compare with the value recorded during calibration.

If the spring is broken, Stable State Load decreases noticeably.

### **Threshold Limit 1**

This parameter defines the magnitude of the permissible pressure difference from the recorded value.

- Off

This parameter value does not trigger any message or alarm.

- Custom

The threshold 1 fault message is displayed when the limit threshold 1 is exceeded. The value can be set from 0.0 to 10.0 bars.

### **Threshold Limit 2**

This parameter defines the magnitude of the permissible pressure difference from the recorded value.

- Off

This parameter value does not trigger any message or alarm.

- Custom

The threshold 2 fault message is displayed when the limit threshold 2 is exceeded. The value can be set from 0.0 to 10.0 bars.

### **Threshold Limit 3**

This parameter defines the magnitude of the permissible pressure difference from the recorded value.

- Off

This parameter value does not trigger any message or alarm.

- Custom

The threshold 3 fault message is displayed when the limit threshold 3 is exceeded. The value can be set from 0.0 to 10.0 bars.

### ***Lower Temperature Monitoring***

Applicable for Posidapt –Super and Ultra

This parameter is used to continuously monitor the minimum temperature recorded inside the enclosure. The current temperature in the enclosure is recorded by a sensor on the main circuit board.

The minimum temperature recorded is displayed in the “Minimum temperature recorded” diagnostics parameter. The device triggers a fault message if the current value undershoots one of the three configurable limit thresholds.

### **Threshold Limit 1**

This parameter is used to set the temperature threshold 1. The device triggers a fault message if the current temperature inside the enclosure undershoots threshold 1.

- Off

This parameter value does not trigger any message or alarm.

- Custom

This sub-parameter value is used to monitor the lower limit temperature. Set the threshold in a range from "- 60.0 °C" to "130.0 °C" or "- 76.0 °F" to "266.0 °F".

### **Threshold Limit 2**

This parameter is used to set the temperature threshold 2. The device triggers a fault message if the current temperature inside the enclosure undershoots threshold 2.

- Off

This parameter value does not trigger any message or alarm.

- Custom

This sub-parameter value is used to monitor the lower limit temperature. Set the threshold in a range from "- 60.0 °C" to "130.0 °C" or "- 76.0 °F" to "266.0 °F".

### **Threshold Limit 3**

This parameter is used to set the temperature threshold 3. The device triggers a fault message if the current temperature inside the enclosure undershoots threshold 3.

- Off

This parameter value does not trigger any message or alarm.

- Custom

This sub-parameter value is used to monitor the lower limit temperature. Set the threshold in a range from "- 60.0 °C" to "130.0 °C" or "- 76.0 °F" to "266.0 °F".



### **Higher Temperature Monitoring**

Applicable for Posidapt –Super and Ultra

This parameter is used to continuously monitor the maximum temperature recorded inside the enclosure. The current temperature in the enclosure is recorded by a sensor on the main circuit board.

The maximum temperature recorded is displayed in the “Maximum temperature recorded” diagnostics parameter. The device triggers a fault message if the current value exceeds one of the three configurable limit thresholds.

#### **Threshold Limit 1**

This parameter is used to set the temperature threshold 1. The device triggers a fault message if the current temperature inside the enclosure exceeds threshold 1.

- Off

This parameter value does not trigger any message or alarm.

- Custom

This sub-parameter value is used to monitor the upper limit temperature. Set the threshold in a range from "- 60.0 °C" to "130.0 °C" or "- 76.0 °F" to "266.0 °F".

#### **Threshold Limit 2**

This parameter is used to set the temperature threshold 2. The device triggers a fault message if the current temperature inside the enclosure exceeds threshold 2.

- Off

This parameter value does not trigger any message or alarm.

- Custom

This sub-parameter value is used to monitor the upper limit temperature. Set the threshold in a range from "- 60.0 °C" to "130.0 °C" or "- 76.0 °F" to "266.0 °F".

#### **Threshold Limit 3**

This parameter is used to set the temperature threshold 3. The device triggers a fault message if the current temperature inside the enclosure exceeds threshold 3.

- Off

This parameter value does not trigger any message or alarm.

- Custom

This sub-parameter value is used to monitor the upper limit temperature. Set the threshold in a range from "- 60.0 °C" to "130.0 °C" or "- 76.0 °F" to "266.0 °F".

### ***Low Pressure Monitoring***

Applicable for Posidapt –Super and Ultra

This parameter is used to continuously monitor the minimum value of supply pressure recorded. The current inlet pressure is recorded by a pressure sensor on the main circuit board.

The minimum recorded value is displayed in the "Minimum pressure recorded" diagnostics parameter. The device triggers a fault message if the current value undershoots one of the three configurable limit thresholds.

#### **Threshold Limit 1**

This parameter is used to set the pressure threshold 1. The device triggers a fault message if the current inlet pressure undershoots threshold 1.

- Off

This parameter value does not trigger any message or alarm.

- Custom

This sub-parameter value is used to monitor the lower limit pressure. Set the threshold in a range from "0.0" to "10.0" bar.

#### **Threshold Limit 2**

This parameter is used to set the pressure threshold 2. The device triggers a fault message if the current inlet pressure undershoots threshold 2.

- Off

This parameter value does not trigger any message or alarm.

- Custom

This sub-parameter value is used to monitor the lower limit pressure. Set the threshold in a range from "0.0" to "10.0" bar.

### **Threshold Limit 3**

This parameter is used to set the pressure threshold 3. The device triggers a fault message if the current inlet pressure undershoots threshold 3.

- Off

This parameter value does not trigger any message or alarm.

- Custom

This sub-parameter value is used to monitor the lower limit pressure. Set the threshold in a range from "0.0" to "10.0" bar.

### ***High Pressure Monitoring***

Applicable for Posidapt –Super and Ultra

This parameter is used to continuously monitor the maximum value of supply pressure recorded. The current inlet pressure is recorded by a pressure sensor on the main circuit board.

The maximum recorded value is displayed in the "Maximum pressure recorded" diagnostics parameter. The device triggers a fault message if the current value overshoots one of the three configurable limit thresholds.

### **Threshold Limit 1**

This parameter is used to set the pressure threshold 1. The device triggers a fault message if the current inlet pressure overshoots threshold 1.

- Off

This parameter value does not trigger any message or alarm.

- Custom

This sub-parameter value is used to monitor the higher limit pressure. Set the threshold in a range from "0.0" to "10.0" bar.

### **Threshold Limit 2**

This parameter is used to set the pressure threshold 2. The device triggers a fault message if the current inlet pressure overshoots threshold 2.

- Off

This parameter value does not trigger any message or alarm.

- Custom

This sub-parameter value is used to monitor the higher limit pressure. Set the threshold in a range from "0.0" to "10.0" bar.

### **Threshold Limit 3**

This parameter is used to set the pressure threshold 3. The device triggers a fault message if the current inlet pressure overshoots threshold 3.

- Off

This parameter value does not trigger any message or alarm.

- Custom

This sub-parameter value is used to monitor the higher limit pressure. Set the threshold in a range from "0.0" to "10.0" bar.

### ***Load for Opening***

Applicable for Posidapt –Super and Ultra

This parameter is used to determine minimum pressure required to open the valve from full close position.

The actual value (auto calibration) is displayed in the "Load for Opening" in Values and Counters under Counter Thresholds and Trends.

### **Threshold Limit 1**

This parameter is used to set threshold 1 for the deviation in Load for Opening of current value from the reference value.

- Off

This parameter value does not trigger any message or alarm.

- Custom

This parameter is used to set the threshold 1 in bar.

The device triggers a fault message if the difference between the current value and the reference value exceeds threshold 1. The value can be set from 0.0 to 10.0 bars.

### Threshold Limit 2

This parameter is used to set threshold 2 for the deviation in Load for Opening of current value from the reference value.

- Off

This parameter value does not trigger any message or alarm.

- Custom

This parameter is used to set the threshold 2 in bars.

The device triggers a fault message if the difference between the current value and the reference value exceeds threshold 2. The value can be set from 0.0 to 10.0 bars.

### Threshold Limit 3

This parameter is used to set threshold 3 for the deviation in Load for Opening of current value from the reference value.

- Off

This parameter value does not trigger any message or alarm.

- Custom

This parameter is used to set the threshold 3 in bars.

The device triggers a fault message if the difference between the current value and the reference value exceeds threshold 3. The value can be set from 0.0 to 10.0 bars.

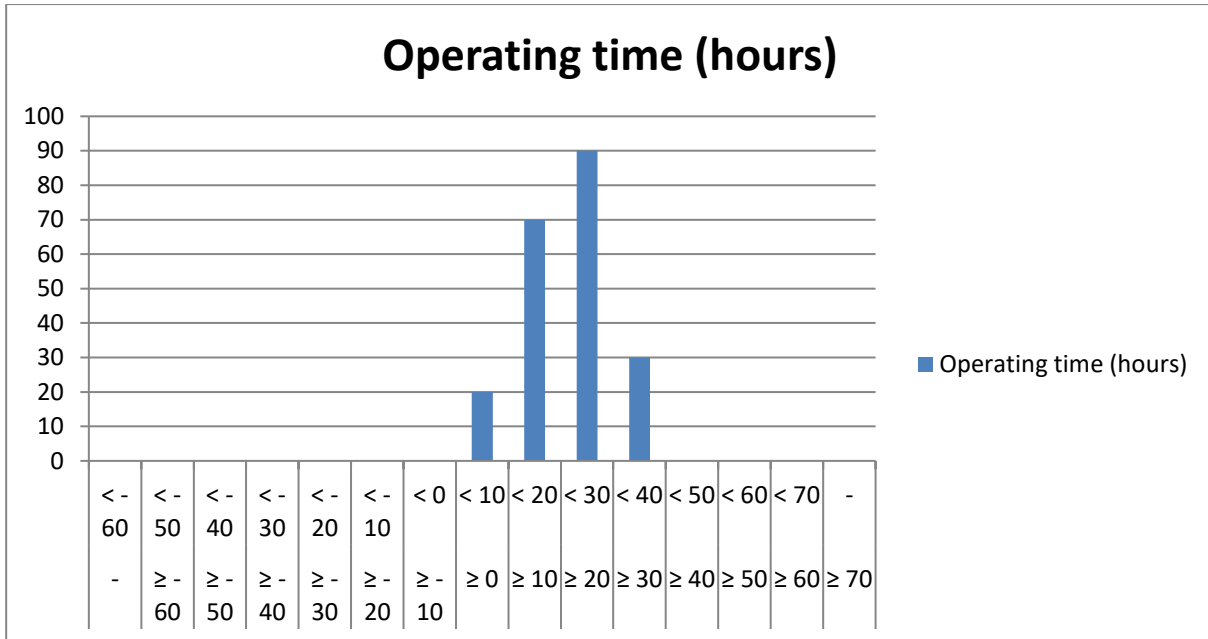
### Valve Position Statistics

Applicable for Posidapt –Super and Ultra

### Hours in Temperature Ranges

This value displays the statistics about the duration of operation in different temperatures range. The number of the operating hours is recorded in the corresponding temperature range. The following are the temperature range.

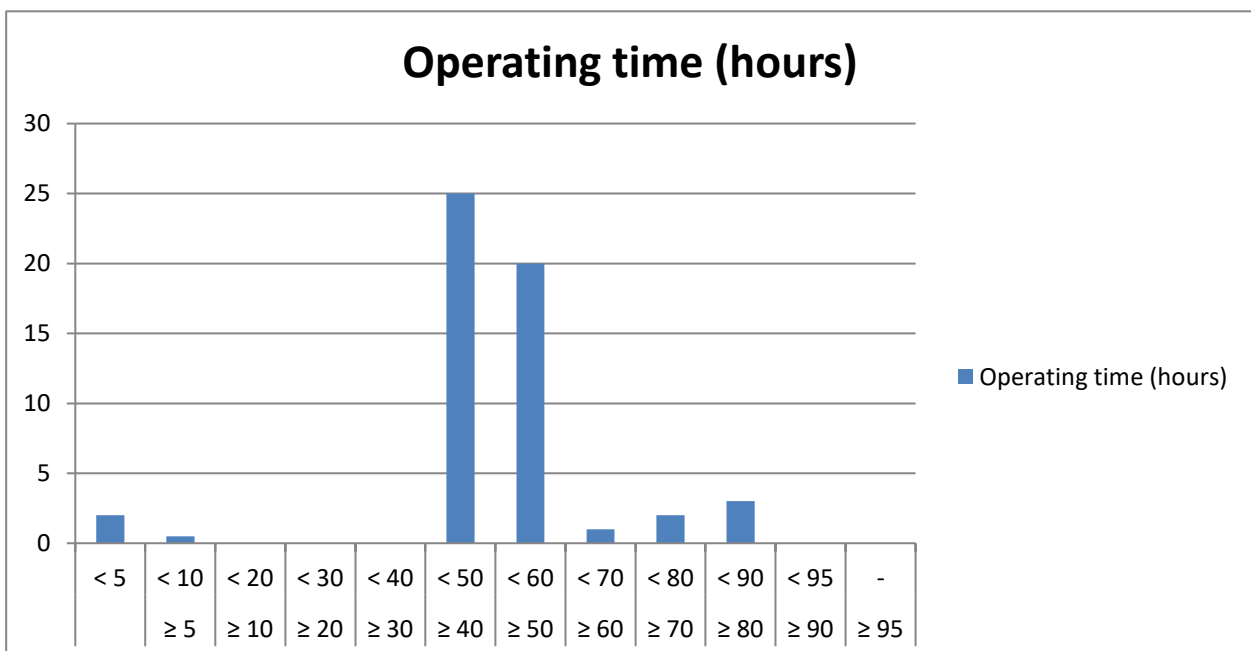
Temperature range (°C)	-	≥ -60	≥ -50	≥ -40	≥ -30	≥ -20	≥ -10	≥ 0	≥ 10	≥ 20	≥ 30	≥ 40	≥ 50	≥ 60	≥ 70
	< -60	< -50	< -40	< -30	< -20	< -10	< 0	< 10	< 20	< 30	< 40	< 50	< 60	< 70	-
Operating time (hours)	0	0	0	0	0	0	0	20	70	90	30	0	0	0	0



### Hours in actuating ranges

This value displays the statistics about the duration for which the valve operated in a particular actuating range. The average of the measure position is recorded in the corresponding working range. The following are the actuating range.

Working range (%)	≥ 5	≥ 10	≥ 20	≥ 30	≥ 40	≥ 50	≥ 60	≥ 70	≥ 80	≥ 90	≥ 95	
	< 5	< 10	< 20	< 30	< 40	< 50	< 60	< 70	< 80	< 90	< 95	-
Operating time (hours)	2	0.5	0	0	0	25	20	1	2	3	0	0



### 8.3.5. Diagnostics

#### Counter Threshold

##### *Monitoring Number of Strokes*

Applicable for Posidapt –Super and Ultra

This parameter is used to monitor the entire path covered by the final controlling element continuously.

The current value is displayed in the “Number of strokes” diagnostics parameter. The device triggers a fault message if the current value exceeds one of the three configurable limit thresholds.

#### Threshold Limit 1

Use this sub-parameter to set the limit threshold 1.

- Off

This parameter value does not trigger any message or alarm.

- Custom

The threshold 1 fault message is displayed when the limit threshold 1 is exceeded. The value can be set up to 100000000.

#### Threshold Limit 2

Use this sub-parameter to set the limit threshold 2.

- Off

This parameter value does not trigger any message or alarm.

- Custom

The threshold 2 fault message is displayed when the limit threshold 2 is exceeded. The value can be set up to 100000000.

#### Threshold Limit 3

Use this sub-parameter to set the limit threshold 3.

- Off

This parameter value does not trigger any message or alarm.

- Custom

The threshold 3 fault message is displayed when the limit threshold 3 is exceeded. The value can be set up to 100000000.

### ***Monitoring number of direction change***

Applicable for Posidapt –Super and Ultra

This parameter is used to continuously monitor the number of changes of direction of the actuator caused in the dead zone.

The current value is displayed in the “Number of change in direction” diagnostics parameter. The device triggers a fault message if the current value exceeds one of the three configurable limit thresholds.

### **Threshold Limit 1**

Use this sub-parameter to set the limit threshold 1.

- Off

This parameter value does not trigger any message or alarm.

- Custom

The threshold 1 fault message is displayed when the limit threshold 1 is exceeded. The value can be set up to 100000000.

### **Threshold Limit 2**

Use this sub-parameter to set the limit threshold 2.

- Off

This parameter value does not trigger any message or alarm.

- Custom

The threshold 2 fault message is displayed when the limit threshold 2 is exceeded. The value can be set up to 100000000.



### **Threshold Limit 3**

Use this sub-parameter to set the limit threshold 3.

- Off

This parameter value does not trigger any message or alarm.

- Custom

The threshold 3 fault message is displayed when the limit threshold 3 is exceeded. The value can be set up to 100000000.

### ***Monitoring of Average Value***

Applicable for Posidapt –Super and Ultra

This parameter is used to calculate and monitor the position average.

During the test, the position and reference average values are always compared at the end of a time interval. The device triggers a fault message if the current value exceeds one of the three configurable limit thresholds.

The current value is displayed in the “Position Average” diagnostics parameter.

### **Monitoring Time**

This parameter is used to set the time interval to calculate the position average.

- Value

The value can be set from 1 to 30

- Unit of value

The unit can be set as minute, day, month or year.

A position average over the time interval set in unit of value is determined and compared with the reference average at the expiry of the time interval. The test is then restarted.

### **Reference value**

Select this parameter to set reference value with which position average over the time interval is compared. The value can be set from 0.0 to 100.0%.

### **Threshold Limit 1**

This parameter is used to set threshold 1 for the maximum deviation of the current position average from the reference average.

- Off

This parameter value does not trigger any message or alarm.

- Custom

This parameter is used to set the threshold 1 in percent. The device triggers a fault message if the difference between the position average and the reference average exceeds threshold 1. The value can be set from 0.1 to 100.0%.

#### **Threshold Limit 2**

This parameter is used to set threshold 2 for the maximum deviation of the current position average from the reference average.

- Off

This parameter value does not trigger any message or alarm.

- Custom

This parameter is used to set the threshold 2 in percent. The device triggers a fault message if the difference between the position average and the reference average exceeds threshold 2. The value can be set from 0.1 to 100.0%.

#### **Threshold Limit 3**

This parameter is used to set threshold 3 for the maximum deviation of the current position average from the reference average.

- Off

This parameter value does not trigger any message or alarm.

- Custom

This parameter is used to set the threshold 3 in percent. The device triggers a fault message if the difference between the position average and the reference average exceeds threshold 3. The value can be set from 0.1 to 100.0%.

### **Counter Trends**

#### ***Average Set point Change***

This parameter is used to calculate and monitor the set point change average.

- Off

This parameter value does not trigger any message or alarm.

- Custom

The device triggers a fault message if set point change average value exceeds set threshold value. The value can be set up to 100000000.

### ***Average Direction Change***

This parameter is used to calculate and monitor the average direction change.

- Off

This parameter value does not trigger any message or alarm.

- Custom

The device triggers a fault message if average direction change value exceeds set threshold value. The value can be set up to 100000000.

### ***Average Direction Change in Steady State***

This parameter is used to calculate and monitor the average direction change in steady state.

- Off

This parameter value does not trigger any message or alarm.

- Custom

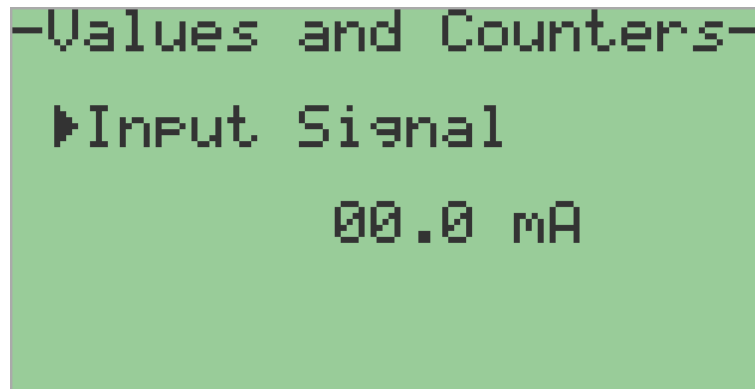
The device triggers a fault message if average direction change steady state value exceeds set threshold value. The value can be set up to 100000000.

## Values and Counter

### *Input Signal*

Applicable for Posidapt – Modern, Expert, Super, Ultra and IPST

This value displays the set point current (input loop current / input signal).

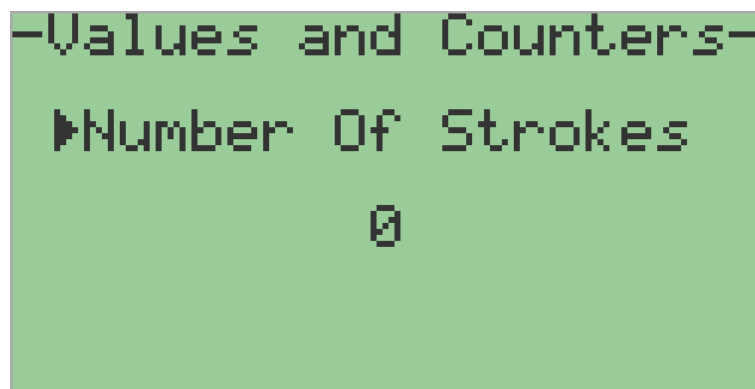


```
-Values and Counters-  
▶Input Signal  
    00.0 mA
```

### *Number of Strokes*

Applicable for Posidapt – Modern, Expert, Super, Ultra and IPST

The movements of the actuator in operation are summed up and are displayed in this value as the stroke number.

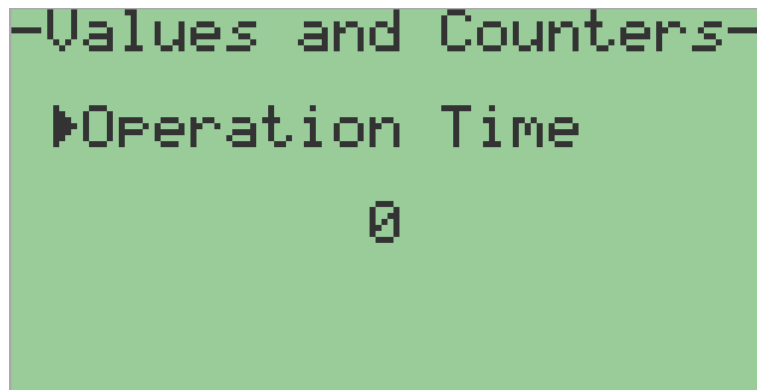


```
-Values and Counters-  
▶Number Of Strokes  
    0
```

### **Operation Time**

Applicable for Posidapt – Modern, Expert, Super, Ultra and IPST

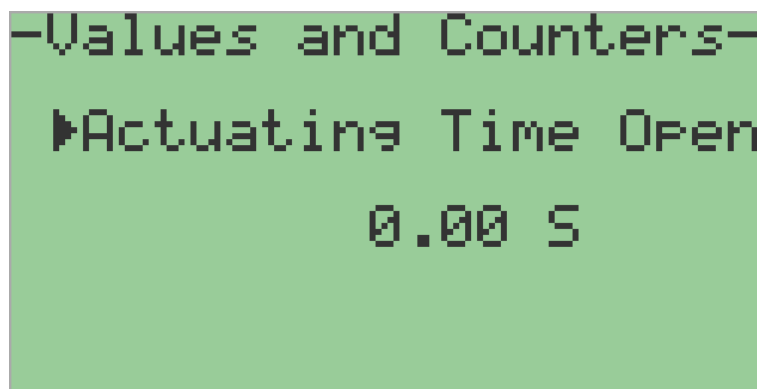
The on-time meter is incremented every hour as soon as electric auxiliary power is supplied to the device. This value displays number of operational hours of device.



### **Actuating Time Open**

Applicable for Posidapt – Modern, Expert, Super, Ultra and IPST

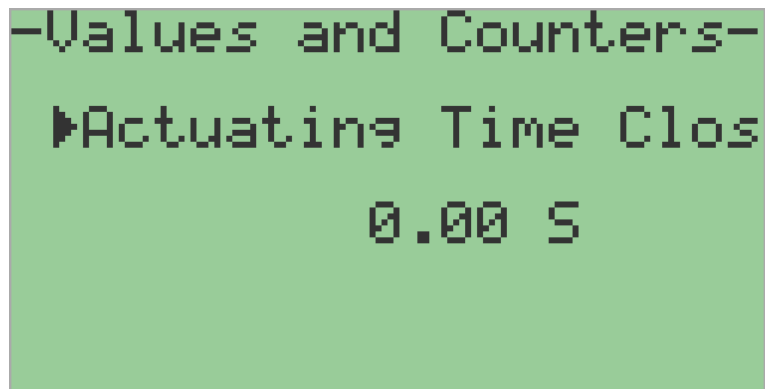
This value displays the actuating time required for open (up direction) determined during auto calibration process. The unit is seconds.



### **Actuating Time Close**

Applicable for Posidapt – Modern, Expert, Super, Ultra and IPST

This value displays the actuating time required for close (down direction) determined during auto calibration process. The unit is seconds.

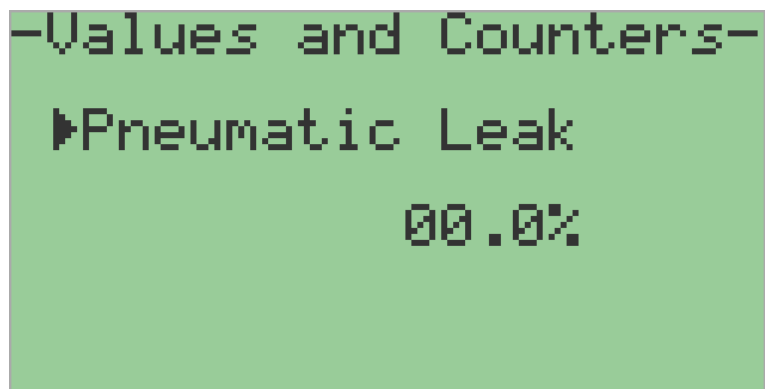


```
-Values and Counters-  
▶Actuating Time Clos  
0.00 S
```

### **Pneumatic Leak**

Applicable for Posidapt – Super and Ultra

This value displays the pneumatic leakage present in the device / system.



```
-Values and Counters-  
▶Pneumatic Leak  
00.0%
```

### ***Control Valve Deviation***

Applicable for Posidapt – Super and Ultra

This value displays information about the determined deviation from the actual model response. The actual position course is compared with the expected position course for this purpose. This comparison helps in drawing a conclusion about the correct operational response of the control valve.

```
-Values and Counters-  
▶Ctrl Valve Deviate  
00.0%
```

### ***De-jamming Friction***

Applicable for Posidapt – Super and Ultra

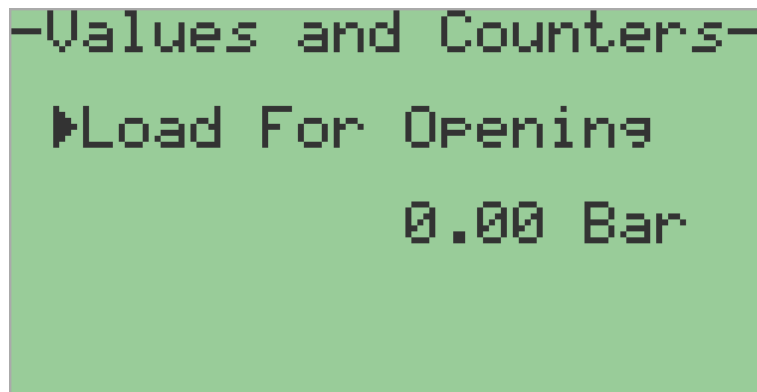
This value displays the step height based on the static friction.

```
-Values and Counters-  
▶De-Jamming Friction  
00.0%
```

### **Load for Opening**

Applicable for Posidapt – Super and Ultra

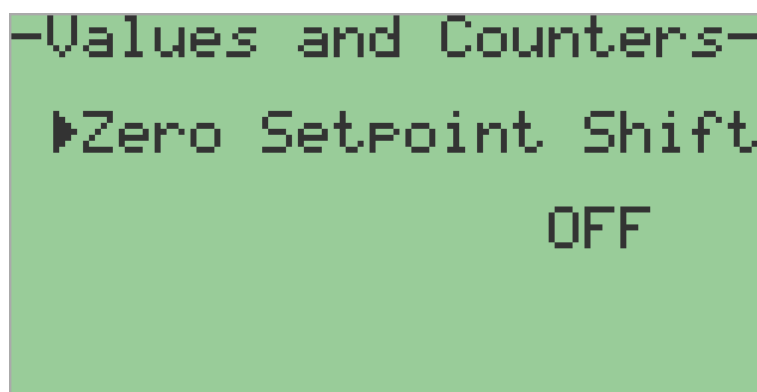
This value displays minimum pressure required to open the valve from full close position. Value is automatically determined during auto calibration process.



### **Zero Set point Shift**

Applicable for Posidapt – Super and Ultra

This value displays the current displacement of the lower hard end stops (close) with respect calibration value. The sub-parameter "Close" in "Tight shut-off" parameter is set to "Custom" to determine this value; else "Off" is displayed.





### ***Span Set point Shift***

Applicable for Posidapt – Super and Ultra

This value displays the current displacement of the upper hard end stops (open) with respect calibration value. The sub-parameter "Open" in "Tight shut-off" parameter is set to "Custom" to determine this value; else "Off" is displayed.

```
-Values and Counters-  
▶Span Setpoint Shift  
OFF
```

### ***Position Average***

Applicable for Posidapt – Modern, Expert, Super and Ultra

This value displays the calculated average position.

```
-Values and Counters-  
▶Position Average  
00.0%
```

### ***Fdbk Sensor Limit 1***

Applicable for Posidapt – Modern, Expert, Super, Ultra and IPST

Display feedback sensor value determined during auto calibration process in deg.

```
-Values and Counters-  
▶Fdbk Sensor Limit 1  
    00.0 deg
```

### ***Fdbk Sensor Limit 2***

Applicable for Posidapt – Modern, Expert, Super, Ultra and IPST

Display feedback sensor value determined during auto calibration process in deg.

```
-Values and Counters-  
▶Fdbk Sensor Limit 2  
    00.0 deg
```

### ***Fdbk Sensor***

Applicable for Posidapt – Modern, Expert, Super, Ultra and IPST

Display feedback sensor current value in deg.

```
-Values and Counters-  
▶Fdbk Sensor  
      00.0 deg
```

### ***Servo Limit 1***

Applicable for Posidapt – Modern, Expert, Super, Ultra and IPST

Display spool feedback sensor value determine during auto calibration process.

```
-Values and Counters-  
▶Servo Limit 1  
      000
```

### ***Servo Limit 2***

Applicable for Posidapt – Modern, Expert, Super, Ultra and IPST

Display spool feedback sensor value determine during auto calibration process.

```
-Values and Counters-  
▶Servo Limit 2  
      000
```

### ***Servo Feedback***

Applicable for Posidapt – Modern, Expert, Super, Ultra and IPST

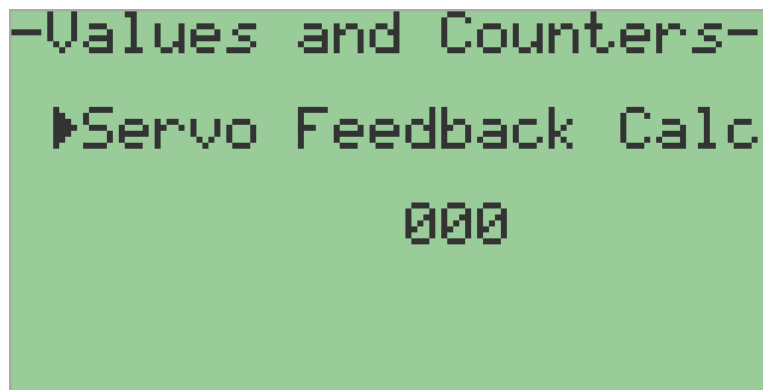
Display spool feedback sensor value determine during auto calibration process.

```
-Values and Counters-  
▶Servo Feedback  
      2700
```

### ***Servo Feedback Calculated***

Applicable for Posidapt – Modern, Expert, Super, Ultra and IPST

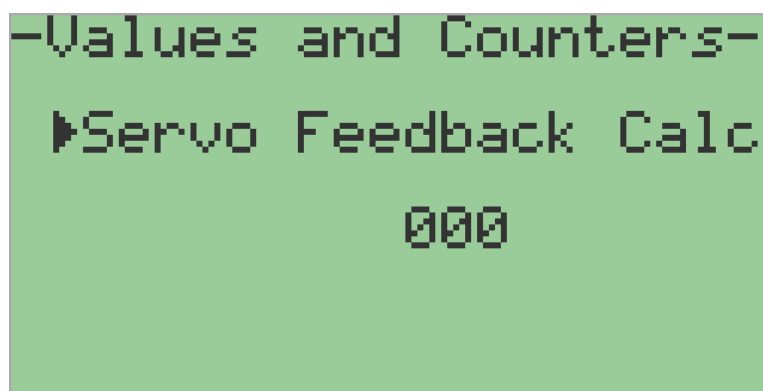
Display spool feedback sensor value determine during auto calibration process.



### ***Dead band***

Applicable for Posidapt – Modern, Expert, Super and Ultra

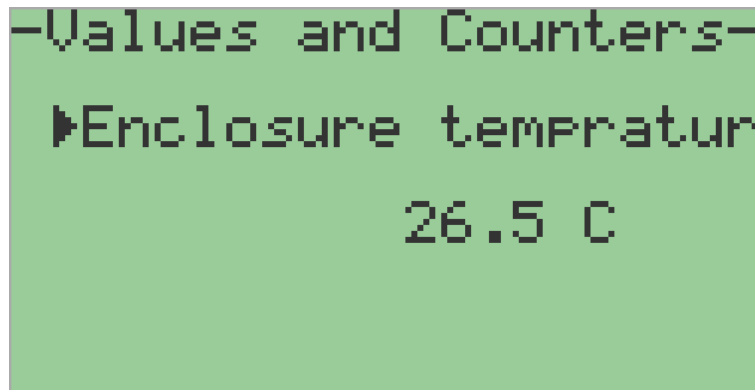
This value displays the dead-band of the controller. The value adapted from the parameter "Dead-band". It is either manually set or automatically determined during calibration process.



### ***Enclosure Temperature***

Applicable for Posidapt – Modern, Expert, Super, Ultra and IPST

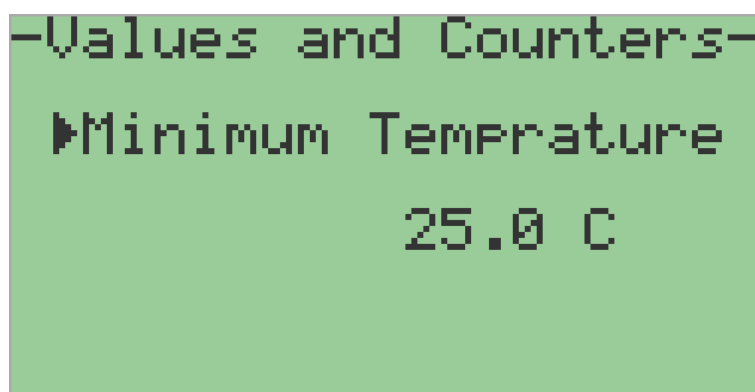
This value displays the current temperature inside the enclosure.



### ***Minimum Temperature***

Applicable for Posidapt – Modern, Expert, Super, Ultra and IPST

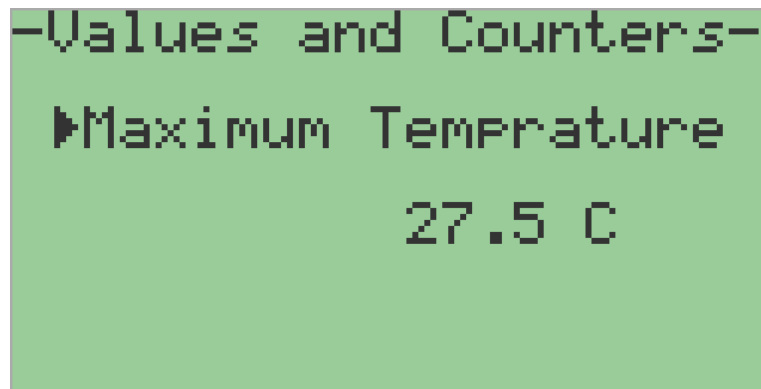
This value displays the minimum temperature inside the enclosure, recorded during continuous monitoring.



### ***Maximum Temperature***

Applicable for Posidapt – Modern, Expert, Super, Ultra and IPST

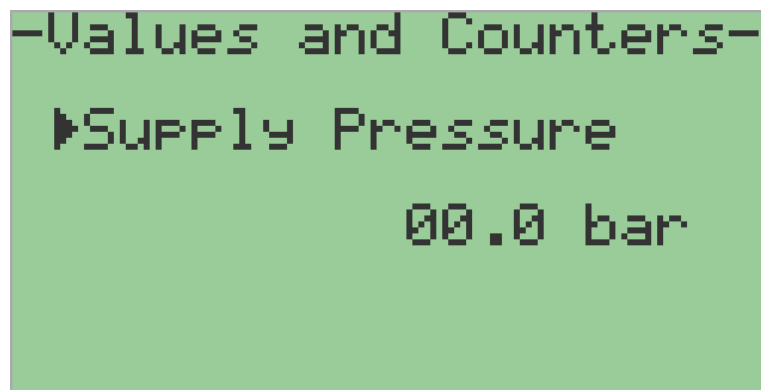
This value displays the maximum temperature inside the enclosure, recorded during continuous monitoring.



### ***Supply Pressure***

Applicable for Posidapt – Super and Ultra

This value displays the current supply (inlet) pressure to the device.



### ***Maximum Pressure***

Applicable for Posidapt – Super and Ultra

This value displays the maximum supply (inlet) pressure to the device, recorded during continuous monitoring.

```
-Values and Counters-  
▶Maximum Pressure  
      00.0 bar
```

#### ***Minimum Pressure***

Applicable for Posidapt – Super and Ultra

This value displays the minimum supply (inlet) pressure to the device, recorded during continuous monitoring.

```
-Values and Counters-  
▶Minimum Pressure  
      00.0 bar
```

#### ***Number of Fault Messages***

Applicable for Posidapt – Super and Ultra

This value displays the total number of fault message occurred during the operation.



```
-Values and Counters-  
▶Num Of Fault Mse  
000
```

#### ***Number of Times Alarm 1 Triggered***

Applicable for Posidapt – Super and Ultra

This value displays the total number of time alarm 1 is actuated during the operation. The value can reset to zero.

```
-Values and Counters-  
▶Num Of Times  
Alarm-1 Triggered  
000
```

#### ***Number of Times Alarm 2 Triggered***

Applicable for Posidapt – Super and Ultra

This value displays the total number of time alarm 2 is actuated during the operation. The value can reset to zero.

-Values and Counters-

▶ Num Of Times  
Alarm-2 Triggered  
000

## 8.4. Parameter Overview – DTM

### 8.4.1. Device Information

#### About Device

##### *Hart Tag*

Applicable for Posidapt – Expert, Super, Ultra and IPST

This text tag can be used freely and helps to identify devices according to their function/application. It can have up to 8 random ASCII characters. It is recommended that a clear designation is given for each field device in the system.

##### *Hart Long Tag*

Applicable for Posidapt – Expert, Super, Ultra and IPST

This text tag can be used freely and helps to identify devices according to their function/application. It can have up to 32 random ASCII characters Applicable with HART 7

##### *Installation Date*

Applicable for Posidapt – Expert, Super, Ultra and IPST

Enter a date when the device is installed.

- (Factory flash date) – Factory default

##### *Polling Address*

Applicable for Posidapt – Expert, Super, Ultra and IPST

Modify polling address of device

##### *Order Number*

Applicable for Posidapt – Expert, Super, Ultra and IPST

Order number of the field device corresponds to the as-delivered state of the device. This is reference number of the order.

- (Reference SO number) – Factory default

##### *Device Type Code*

Applicable for Posidapt – Expert, Super, Ultra and IPST

Identification code for the device type.

##### *Description*

Applicable for Posidapt – Expert, Super, Ultra and IPST

This text description can be used freely and helps to identify devices according to their function/application. It can have up to 32 random ASCII characters. It is recommended that a clear designation is given for each field device in the system.

### ***Message***

Applicable for Posidapt – Expert, Super, Ultra and IPST

This text description can be used freely and helps to identify devices according to their function/application. It can have up to 32 random ASCII characters. It is free text field; there is no recommendation for this field.

### ***Device Type***

Applicable for Posidapt – Expert, Super, Ultra and IPST

Type of connected device / Model of the device.

- Expert
- Super
- Ultra
- IPST

### ***Hart Revision***

Applicable for Posidapt – Expert, Super, Ultra and IPST

Device HART Version

### ***Software Revision***

Applicable for Posidapt – Expert, Super, Ultra and IPST

This field indicates the firmware revision of the device.

### ***Hardware Revision***

Applicable for Posidapt – Expert, Super, Ultra and IPST

This field indicates the hardware (electronics) revision of the device

### ***Device Serial Number***

Applicable for Posidapt – Expert, Super, Ultra and IPST

Uniquely identifies the device.

- (Serial Number) – Factory default

### **Actuator**

#### ***Manufacturer***

Applicable for Posidapt – Expert, Super, Ultra and IPST

This field can be used freely and helps to identify the manufacturer of the actuator. It can have up to 32 random ASCII characters.

### ***Model***

Applicable for Posidapt – Expert, Super, Ultra and IPST

This field can be used freely and helps to identify the model number of the actuator. It can have up to 32 random ASCII characters.

### ***Type***

Applicable for Posidapt – Expert, Super, Ultra and IPST

This field can be used freely and helps to identify the type of the actuator. It can have up to 32 random ASCII characters.

## **Valve**

### ***Manufacturer***

Applicable for Posidapt – Expert, Super, Ultra and IPST

This field can be used freely and helps to identify the manufacturer of the valve. It can have up to 32 random ASCII characters.

### ***Model***

Applicable for Posidapt – Expert, Super, Ultra and IPST

This field can be used freely and helps to identify the model number of the valve. It can have up to 32 random ASCII characters.

### ***Type***

Applicable for Posidapt – Expert, Super, Ultra and IPST

This field can be used freely and helps to identify the type of the valve. It can have up to 32 random ASCII characters.

### ***Media***

Applicable for Posidapt – Expert, Super, Ultra and IPST

This field can be freely used to specify the media for the valve type.

## **Control Accessories**

### ***Limit Switch***

Applicable for Posidapt – Expert, Super, Ultra and IPST

This field can be used freely used to enter the description of the limit switch mounted. It can be used to enter model, manufacturer, rating, etc.

### ***Positioner Transmitter***

Applicable for Posidapt – Expert, Super, Ultra and IPST

Model number of position transmitter, it will be displayed only if connected.

### ***Digital I/O Module***

Applicable for Posidapt – Expert, Super, Ultra and IPST

Model number of digital I/O module, it will be displayed only if connected.

### ***Solenoid Valve***

Applicable for Posidapt – Expert, Super, Ultra and IPST

This field can be used freely used to enter the description of the solenoid valve mounted. It can be used to enter model, manufacturer, rating, etc.

### ***Volume Booster / Quick Exhaust valve***

Applicable for Posidapt – Expert, Super, Ultra and IPST

This field can be used to enter the description of the volume booster or quick exhaust valve connected. Select one of the following.

- None
- No external device
- Volume Booster Type 1
- Volume booster size up to 1/2"
- Volume Booster Type 2
- Volume booster size above 1/2" up to 1"
- Volume Booster Type 3
- Volume booster size above 1"
  
- Quick Exhaust Valve 1
- Quick exhaust valve size up to 1/2"
- Quick Exhaust Valve 2
- Quick exhaust valve size above 1/2" up to 1"
- Quick Exhaust Valve 3

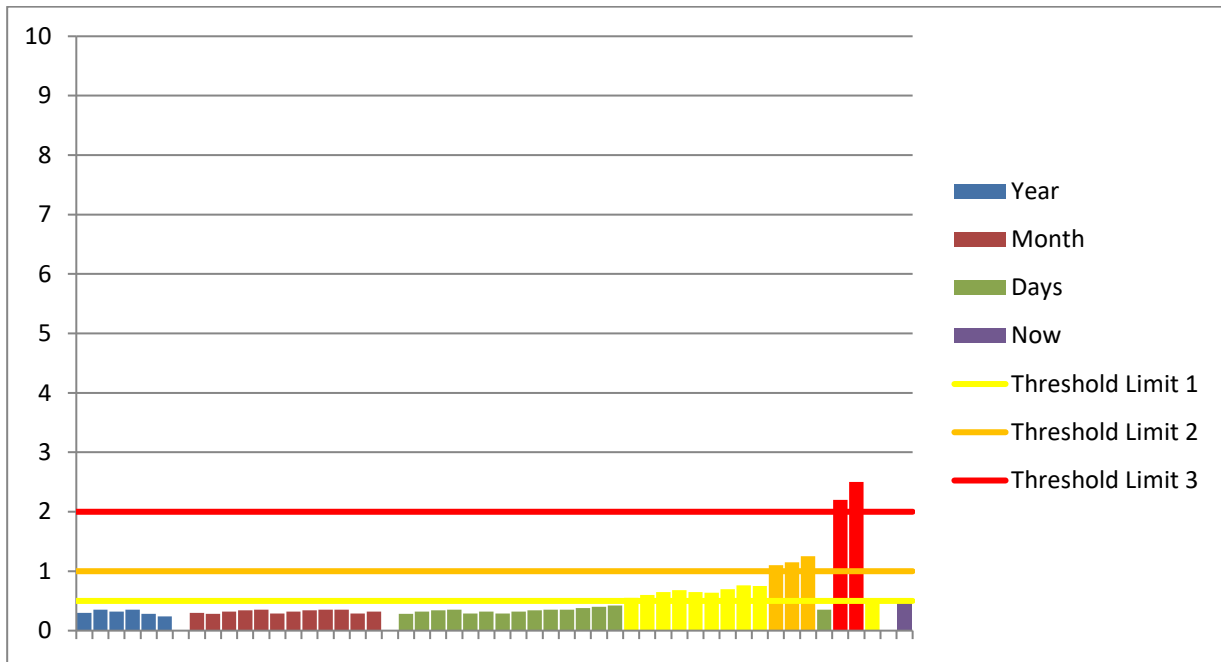
- Quick exhaust valve size above 1"
- Combination of Volume Booster and Quick Exhaust Valve Type 1
- Volume booster and quick exhaust valve size up to 1/2"
- Combination of Volume Booster and Quick Exhaust Valve Type 2
- Volume booster and quick exhaust valve size above 1/2" up to 1"
- Combination of Volume booster and Quick Exhaust Valve Type 3
- Volume booster and quick exhaust valve size above 1"

### 8.4.2. Online Statistics

#### *Average Dead band monitoring*

Applicable for Posidapt – Super and Ultra

This parameter record daily average dead-band in percentage for past 24 hours, 30 days, 12 month and corresponding years. This Average dead band value can be read from DTM or DD.



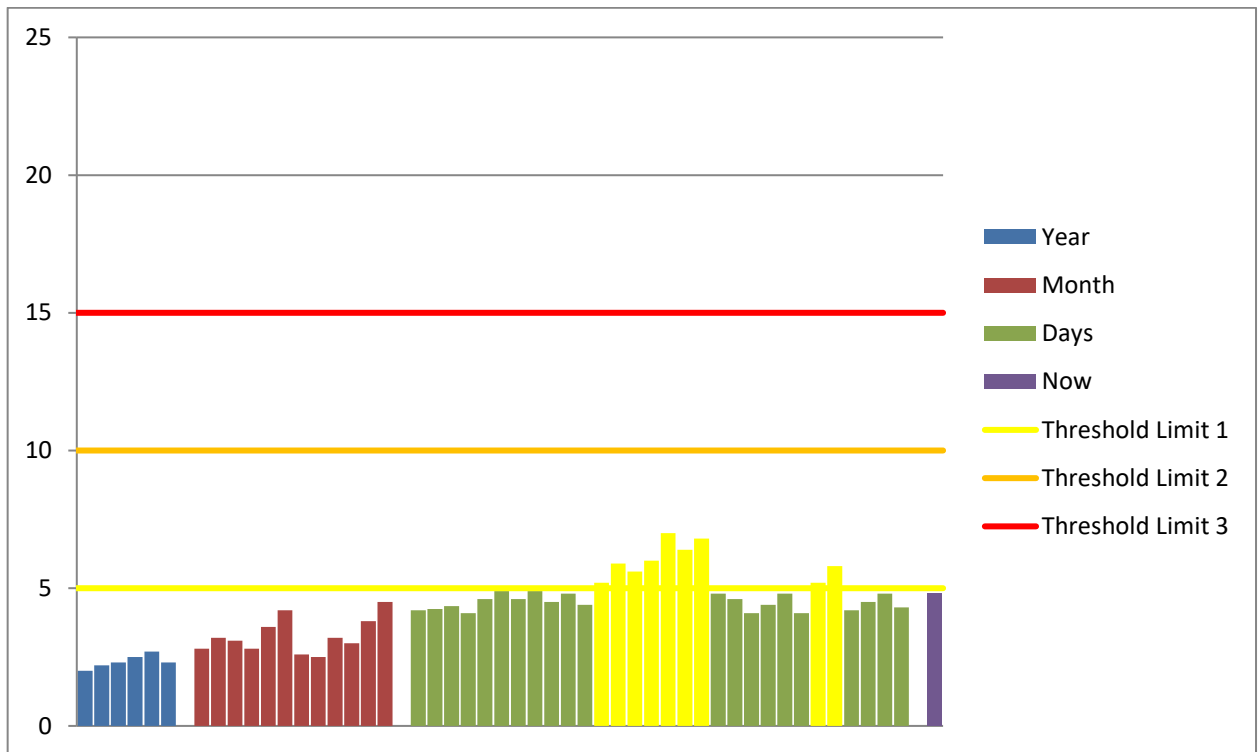
Average Dead-band Past 24 Hours	0.48
Average Dead-band 30 days	0.66
Average Dead-band 12 months	0.32
Average Dead-band Years	0.3



### Average Deviation of Set point

Applicable for Posidapt – Super and Ultra

Average set point is updated whenever the set point changes and the valve are expected to move accordingly. Updating continues throughout the valve movement and is switched back to Steady State when both set point and valve position have reached a steady state. Record daily average deviation in percentage for past 24 hours, 30 days, 12 month and corresponding years.



Average Deviation Past 24 Hours	4.83
Average Deviation 30 days	4.94
Average Deviation 12 months	3.23
Average Deviation Years	2.35

### 8.4.3. Valve Offline Test

#### ***Step Response Test***

- Step response test provides information about the friction of the valve and the actuator.
- It provides dead time (time required for the valve to respond to the given change of set point), response time for it to reach 63% and 86% of the specified step change.
- It also detects overshoots, if any.
- The result can be compared over the course of time for detailed analysis.

#### ***Dynamic Loop Test***

- Dynamic loop test provides information on dynamic dead band of the valve assembly.
- The valve will be open or close with the change in the input set point.

#### ***Valve Characteristic Test***

- Valve characteristic test is a method which identifies various parameters and operating conditions of the valve assembly.
- It analyses the static and dynamic condition of the valve.
- This data can be compared over the course of time to analyse maintenance or repair requirements.

#### ***Dead-band Test***

- Dead band test identifies how accurately the valve can achieve the desired set point.
- This test can give a fair conclusion on stiction and sensitivity of the assembly.

## 9. Alert and Error Message

### 9.1. Possible Error/Alert/Troubleshooting

Sr.No.	Message displayed.	Error Description.	Trouble shooting.
1	CRITICAL ERROR	NV memory error.	Contact manufacturer
2	SPOOL SENSOR FAILED	Mechanical spool error	Need to check pneumatic pressure and if the pressure is OK then need to check internal circuit. Contact manufacturer.
3	HARDWARE SENSOR FAILED	feedback sensor related error	Need to check pneumatic pressure and if the pressure is OK then need to check internal circuit. Contact manufacturer.
4	CRC ERROR	NV memory error.	NV memory error. Contact manufacturer
5	DEVICE NOT CALIBRATED	Device not calibrated	Calibration not done. Need to calibrate.
6	DEVICE INACTIVE	Device in Manual mode	Manual mode. To go to auto mode long press mode key.
7	INSUFFICIENT SUPPLY PRESSURE	Air Pressure related error	Adjust pneumatic pressure
8	OVER SUPPLY PRESSURE	Air Pressure related error	Adjust pneumatic pressure
9	POSITION OUT RANGE	Device not calibrated. Feedback sensor related error.	Calibration error. Need to Recalibrate. If problem persists contact manufacturer
10	FAIL SAFE ACTIVE	Input signal 4-20 mA not available.	Input signal not available
11	DEVIATION ERROR	Error in 4-20 mA input signal/pressure/sensor feedback	Calibration error. Need to Recalibrate. If problem persists contact manufacturer
12	DEADBAND OUT RANGE	Device calibration related error.	Calibration error, Need to recalibrate. If problem persists check linkage between positioned and actuator.
13	TEMPERATURE OUT RANGE	Ambient temperature is not within operational temperature range.	If ambient temperature is out of the operation range of -20° to 85° then place the device in the given temperature range, If the temperature is within the said range, then ambient sensor problem.
15	PRESSURE OUT RANGE	Pneumatic pressure related error	Adjust pneumatic pressure