

Smart Position Transmitter SPTM-5V SERIES

PRODUCT MANUAL



VERSION 1.01

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1. Introduction

1.1 General Information for the users

Thank you for purchasing Young Tech Co., Ltd products. Each product has been fully inspected after its production to offer you the highest quality and reliable performance. Please read the product manual carefully prior to installing and commission the product.

- For the safety, it is important to follow the instructions in the manual. Young Tech Co., Ltd will not be responsible for any damages caused by user's negligence.
- The manual should be provided to the end-user.
- Any modifications or repairs to the product may only be performed if expressed in this manual.
- The manual can be altered or revised without any prior notice. Any changes in product's specification, design, and/or any components may not be printed immediately but until the following revision of the manual.
- The manual should not be duplicated or reproduced for any purpose without prior approval from Young Tech Co., Ltd, Gimpo-si, South Korea.

1.2 Manufacturer Warranty

- For the safety, it is important to follow the instructions in the manual. Manufacturer will not be responsible for any damages caused by user's negligence.
- Manufacturer will not be responsible for any damages or accidents as a result of any alteration or modification of the product and its parts. If any alteration or modifications are necessary, please contact Young Tech Co., Ltd directly.
- Manufacturer warrants the product from the date of original purchase of the product for one (1) year, except as otherwise stated.
- Manufacturer warranty will not cover products that have been subjected to abuse, accidents, alterations, modifications, tampering, negligence, misuse, faulty installation, lack of reasonable care, repair or service in any way that is not contemplated in the documentation for the product, or if the model or serial number has been altered, tampered with, defaced or removed; damages that occurs in shipment, due to act of God, failure due to power surge, or cosmetic damage. Improper or incorrectly performed maintenance will void this limited warranty.
- For detailed warranty information, please contact Young Tech Co., Ltd – South Korea.

1.3 Explosion Proof Warning

Please ensure the unit is being used and installed within the explosion proof certified environment.

- SPTM-5V series explosion proof grades are **Ex ia IIC T6**.
- Certified ambient temperature is -20°C ~ 60°C. The product should be used in certified



ambient temperature. If the field is not explosion proof area and does not require explosion proof, the product can be used in temperature range of $-40^{\circ}\text{C} \sim 85^{\circ}\text{C}$. LCD operation temperature range is $-30^{\circ}\text{C} \sim 85^{\circ}\text{C}$.

- Barrier must be installed with below specification
 $U_i = 28\text{V}$, $I_i = 47\text{mA}$, $P_i = 437\text{mW}$, $L_i = 0.3\mu\text{H}$, $C_i = 56.5\text{nF}$
- The product must be grounded according to explosion proof procedure.

2. Product Description

2.1 General

SPTM-5V series is 2 wire type transmitter with in-built micro-processor which transmits DC 4~20mA signal according to changes in valve or damper position.

2.2 Main Features and Functions

- Designed to be **Ex ia IIC T6** explosion proof grades.
- Economical price and long product life time.
- Very easy and simple calibration.
- LCD displays current output signal.

2.3 Label Description

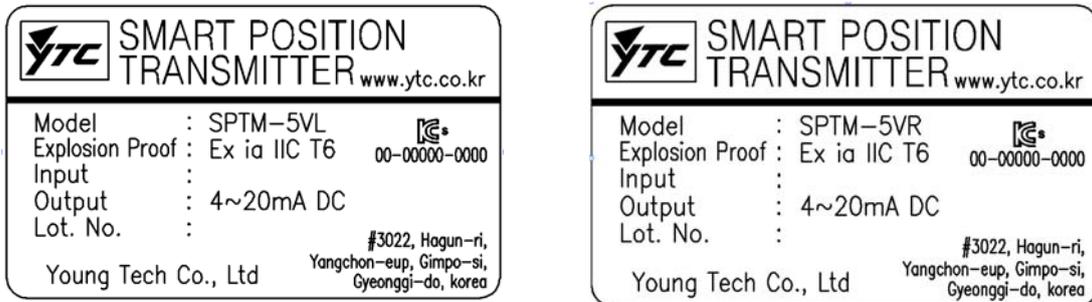


Fig. 1: SPTM-5V Body Label

- | | |
|---------------------|--|
| A. Model Number: | Indicates model number. |
| B. Explosion Proof: | Indicates certified explosion proof grade. |
| C. Input: | Indicates input rotation angle |
| D. Output: | Indicates output signal range |
| E. Lot No.: | Indicates unique lot number |

** SPTM-5V series' KCs certification conforms Ministry of Employment and Labor announcement article No. 2010-36.

2.4 Product Number

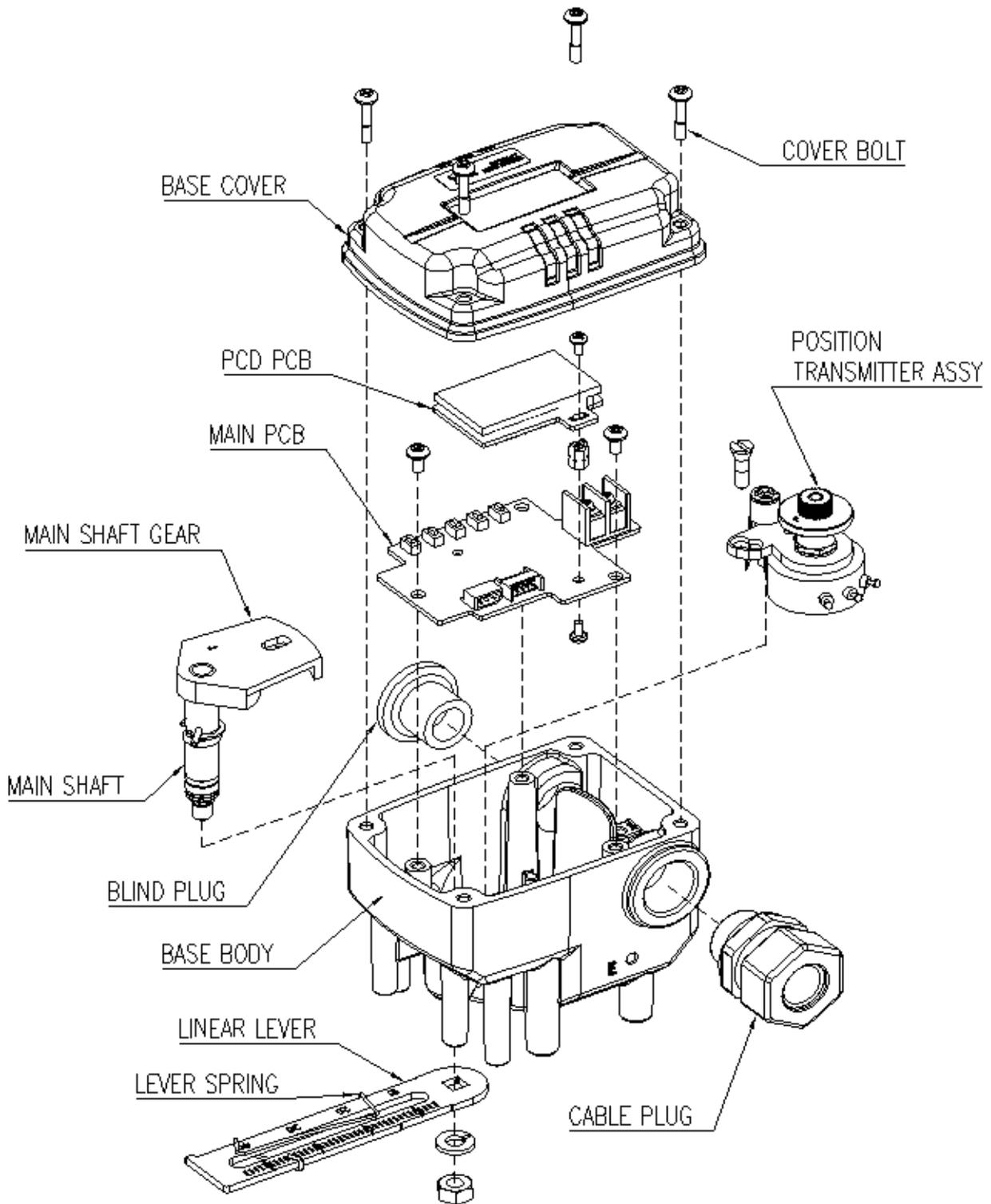
SPTM-5V **1** **2** **3** **4**

1	Motion Type	L	Linear	
		R	Rotary	
2	Explosion Proof	i	Ex ia IIC T6 <KC>	
3	Connection Type	L	1	10 ~ 40 mm
			2	20 ~ 70 mm
			3	50 ~ 100 mm
			4	100 ~ 150 mm
		R	1	Standard Lever Type
			2	NAMUR Type
4	Option	1	With LCD	

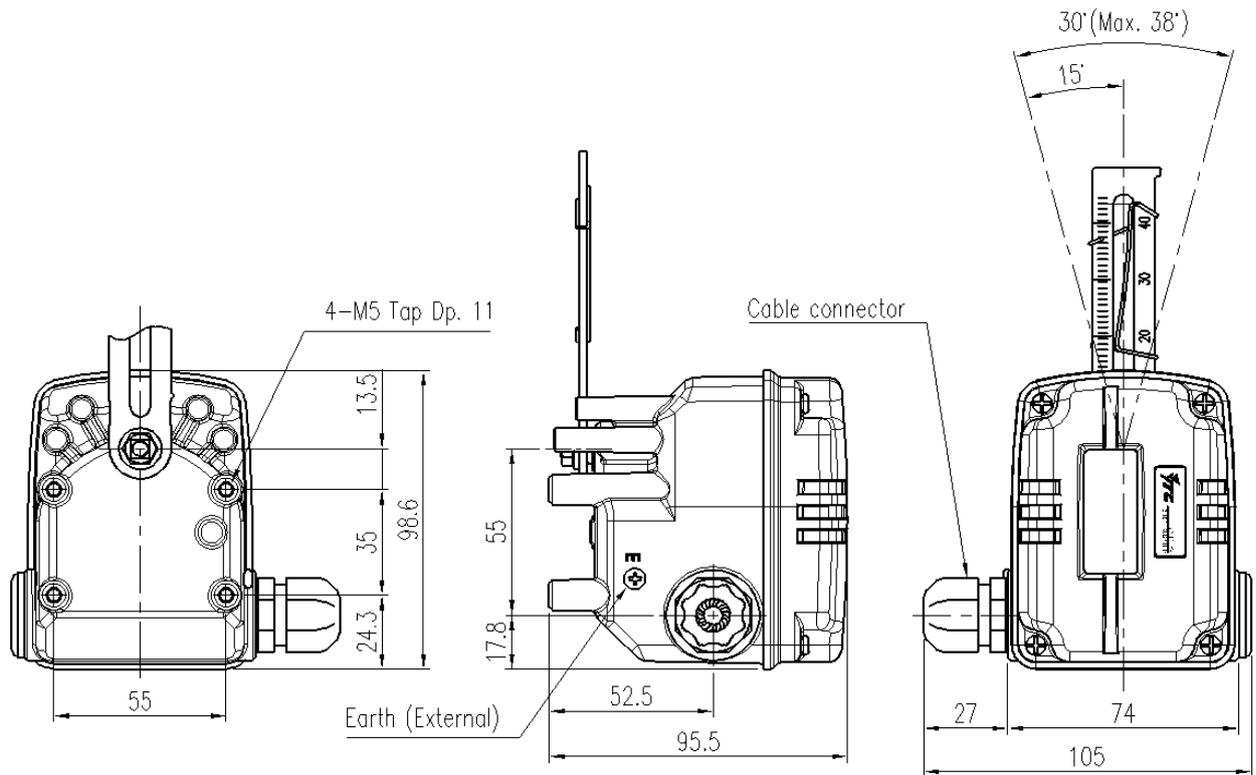
2.5 Product Specification

Model	SPTM-5VL	SPTM-5VR
Input Type	2 Wire	
Input Signal	0 ~ 30 degrees	0 ~ 90 degrees
Output Signal	4 ~ 20mA DC	
Load Resistance	Max.600 Ω / 28V DC	
Supply Voltage	9 ~ 28V DC	
Noise Range	50mV p.p.	
Conduit Entry	PF 1/2 (G 1/2)	
Enclosure	IP 67	
Explosion Proof	Ex ia IIC T6 (KCs)	
Ambient Temp.	Operating: -40°C ~ 85°C Explosion Proof: -20°C ~ 60°C LCD Operating: -30 ~ 85°C	
Linearity	± 1% F.S.	
Hysteresis	0.2% F.S	
Sensitivity	± 0.2% F.S.	
Material	Aluminum Diecasting	
Weight	0.6 kg	

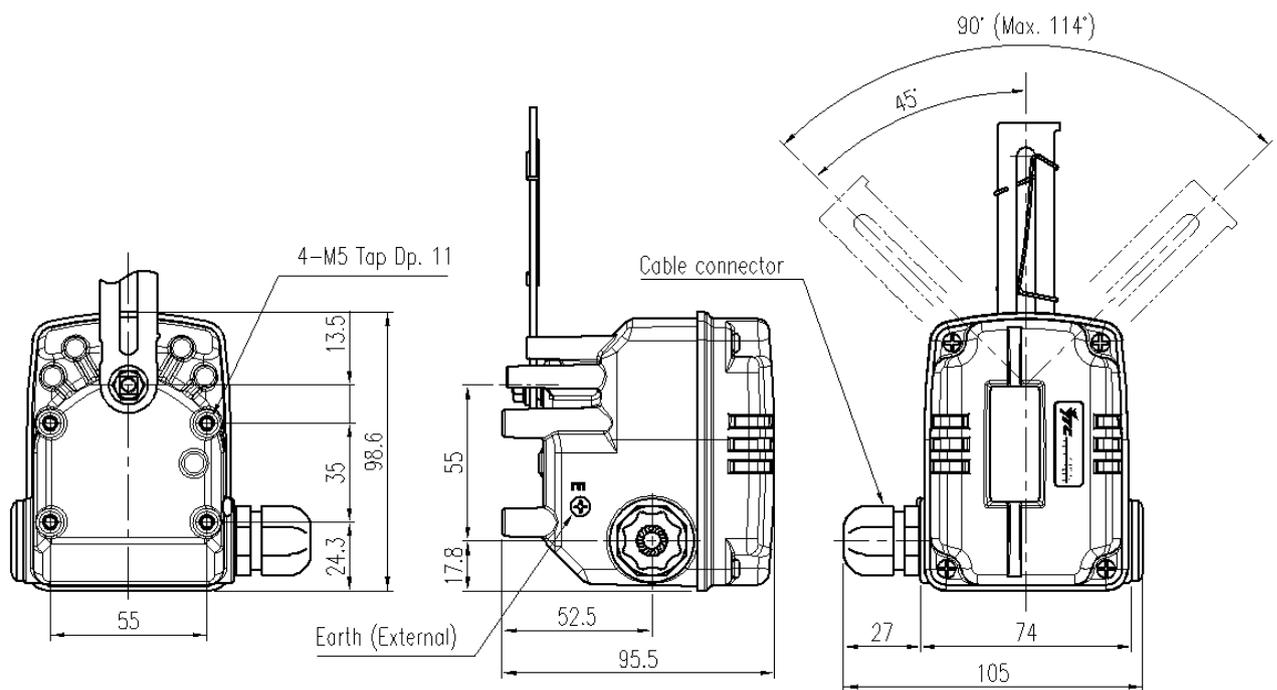
2.6 Parts and Assembly



2.7 Dimension – SPTM-5VL



2.8 Dimension – SPTM-5VR



3. Installation

3.1 Safety

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



- Check unit's specification and ensure to use as specified.
- Follow other explosion proof procedures and safety precautions.
- Use bypass valve or other supportive equipment to avoid entire system "shut down".
- Make sure all input and supply pressure to valve, actuator, and other related devices must be turned off.

3.2 SPTM-5VL Installation

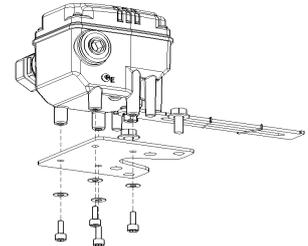
1. Proper bracket must be made in order to adapt SPTM-5V on the actuator yoke.

Please consider following important points when a bracket is being designed.



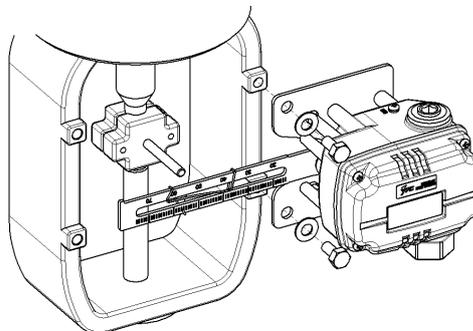
- SPTM-5V feedback lever must be parallel to the ground at 50% of the valve stroke.
- Feedback lever connection with the pin of the actuator clamp should be installed in such a way that the valve stroke length coincides with the corresponding figure of "mm marked on the feedback lever. Improper setting may cause poor linearity.

2. Assemble the SPTM-5V with the bracket made in previous step by fastening the bolts. Please refer to the backside of the SPTM-5V for size of the bolts. The standard bolt size is M8 x 1.25P.



3. Attach SPTM-5V with the bracket to the actuator yoke – **DO NOT TIGHTEN COMPLETELY.**

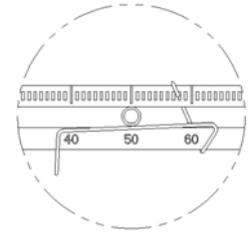
4. Connect SPTM-5V's feedback lever to the actuator clamp. The hole gap on the feedback lever is 6.5mm. The connection pins outer diameter should be less than 6.3mm.



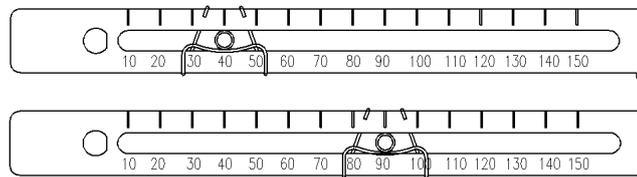
5. Connect supply pressure to the actuator temporarily. Supply enough supply pressure to the actuator in order to position the actuator clamp at 50% of the total valve stroke.

6. Insert connection pin into the feedback lever. The pin should be inserted when the actuator clamp is at 50% of the total valve stroke.

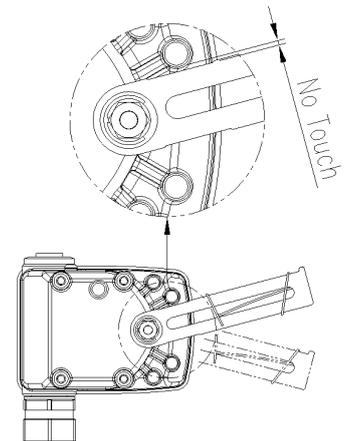
7. Check if the feedback lever is parallel to the ground at 50% of the valve stroke. If it is not parallel, adjust the bracket or feedback link bar to make parallel. Improper installation may cause poor linearity.



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

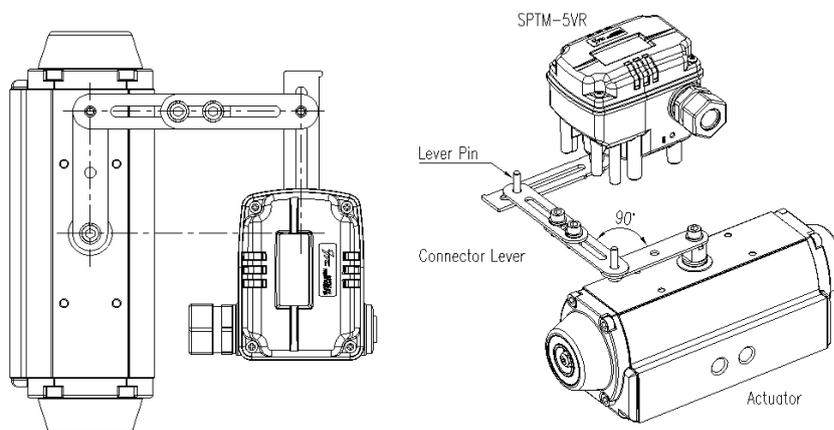


9. After installing the SPTM-5v, operate the valve from 0% to 100% stroke by using direct air to the actuator. On both 0% and 100%, the feedback lever should not touch the lever stopper, which is located on the backside of SPTM-5V. If the feedback lever touches the stopper, SPTM-5V should be installed further away from the yoke.



3.3 SPTM-5VR Installation

1. Please refer to SPTM-5VL installation section for important note for bracket design.
2. There are two types of the lever – standard and NAMUR type.



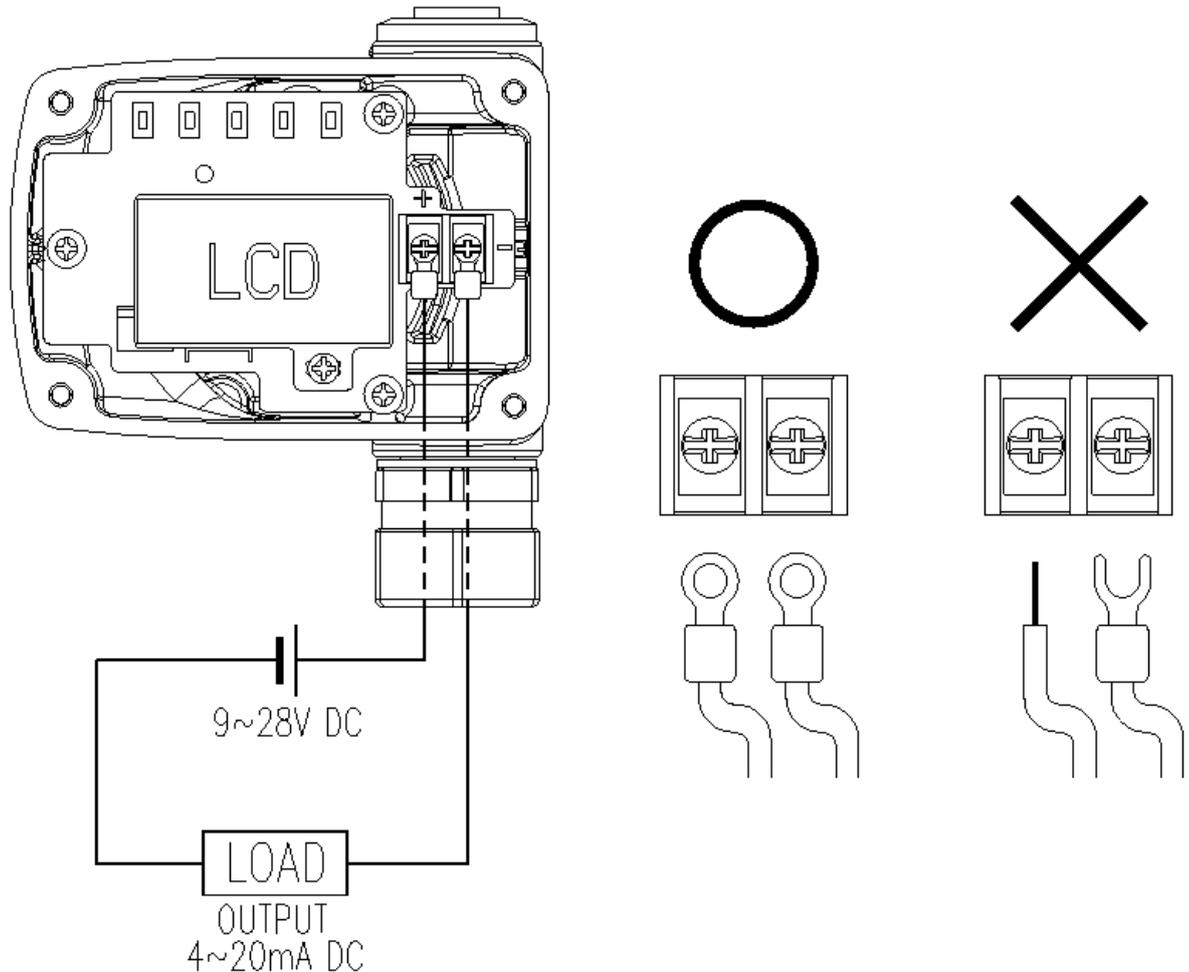
4. Connection – Power

4.1 Safety

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

- When installing in hazardous and explosive gas area, conduit tube or pressure-proof packing union must be used.
- Please use ring-type lug to protect against vibration or any other external impact.
- Please use twisted cable with conductor section are 1.25mm^2 and that is suitable for 600V (complying to the conductor table of NEC Article 310.) The outer diameter of the cable should be between 6.35 ~ 10mm. Use shield wire to protect against electro-magnetic field and noise.
- Please do not install the cable near high noise equipments, such as high-capacity transformer or motor.

4.2



5. Adjustment

5.1 Setting Point Switch

SPTM-5V series can be calibrated in 2 or 5 points setting.

a) 2 Point Setting:

By setting minimum and maximum points <0% and 100% of valve stroke>, in-b

b) 5 Point Setting

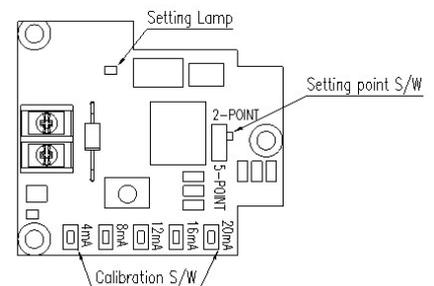
By setting 5 points <0%, 25%, 50%, 75%, and 100%> the outputs can be set accordingly.

5.2 Adjustment - Calibration

a) Input 4mA signal to the positioner to move the valve stroke to the 4mA position.

b) After the valve reaches at the 4mA position, press "4mA button for 3-4 seconds. The lamp will be lighted, and this indicates that 4mA output feedback position has been calibrated.

c) Please repeat above step for 8mA, 12mA, 16mA, and 20mA for 5 point setting. For 2 point setting, repeat above step for 20mA only.

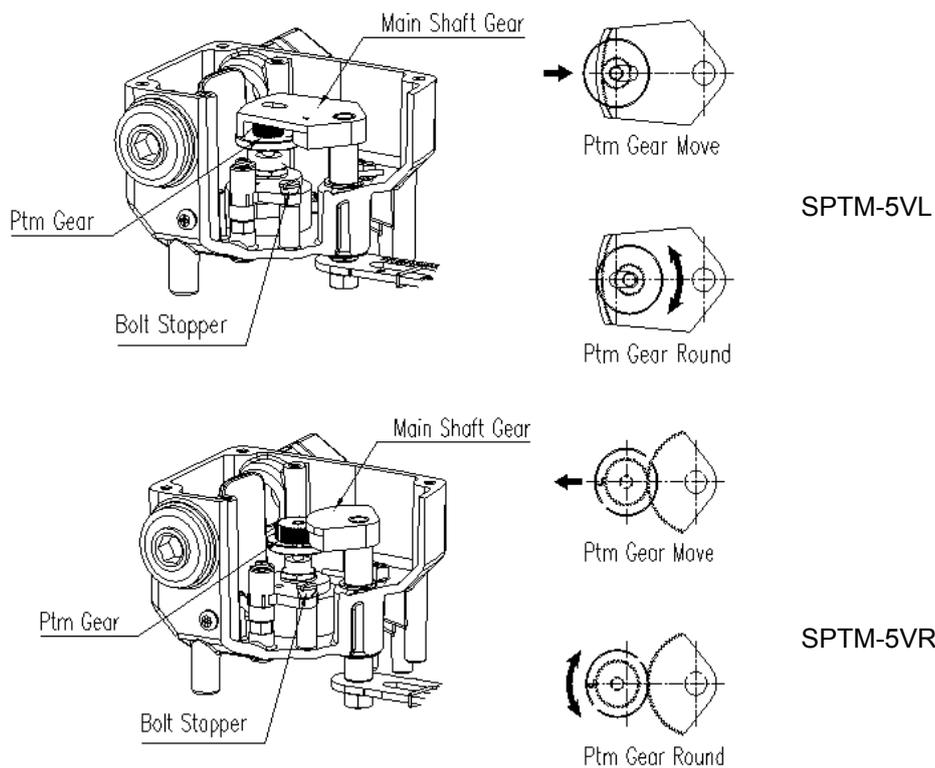


5.3 Adjustment – Potentiometer

Potentiometer is designed to output 12mA signal when the feedback lever is at 50% position. In case of dislocation of the potentiometer, please follow below procedure to re-set the potentiometer.

- Power must be turned off before adjusting potentiometer.
- Please be cautious when adjusting potentiometer.
- Please make sure that there is no remaining circuit on the PCB.
- Please do not use excessive force when disconnecting potentiometer from the PCB.

1. Locate the potentiometer under the PCB. Disconnect from the PCB. Please do not use excessive force.
2. Unfasten lock screw which locks the potentiometer gear and take out potentiometer body from the lag-gear.
3. Fix the feedback lever at 50% position and measure resistance level by connecting two probes out of three inlets.
4. Rotate pinion gear until resistance vale is about 5KΩ.
5. After setting the resistance value, rotate stopper to the normal position an fasten the lock screw.
6. Reconnect potentiometer to the PCB and reinstall PCB onto SPTM-5V body.



6. Troubleshooting

1) SPTM-5V shows no output signal.

- A. Check actual input signal to SPTM-5V.
- B. Check power connection and + / - poles.

2) Input signal value to the positioner and output signal value from SPTM-5V differs dramatically.

- A. Check input signal value and supply voltage. Insufficient voltage can affect input signal value.
- B. Check the installation of the positioner. If the positioner is installed improperly, please refer to the positioner's manual and re-install the positioner.
- C. Set the positioner's zero and span. Inaccurate zero and span setting can lower the accuracy and linearity.
- D. Check the installation of the position transmitter. If SPTM-5V is installed improperly, then refer to the manual and re-install.

3) Sudden changes in SPTM-5V's output signal value.

- A. Please make sure that SPTM-5V's lever is placed at 50% point. If not, SPTM-5V needs to be re-installed and adjusted to be placed at the 50% point.
- B. Adjust the potentiometer. Potentiometer's load resistance is 10KΩ, and it should be ready at the 50% point.

Manufacturer:**Young Tech Co., Ltd**

#3022, Hagun-ri, Yangchon-myeon

Kimpo-si, Kyeonggi-do, 415-843

South Korea

Tel: +82-31-986-8545

Fax: +82-31-986-2683

Email: ytic@ytic.co.kr

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