



# **Ω OMEGA™** **User's Guide**



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## **LTUR Series Tuning Fork Level Switch**



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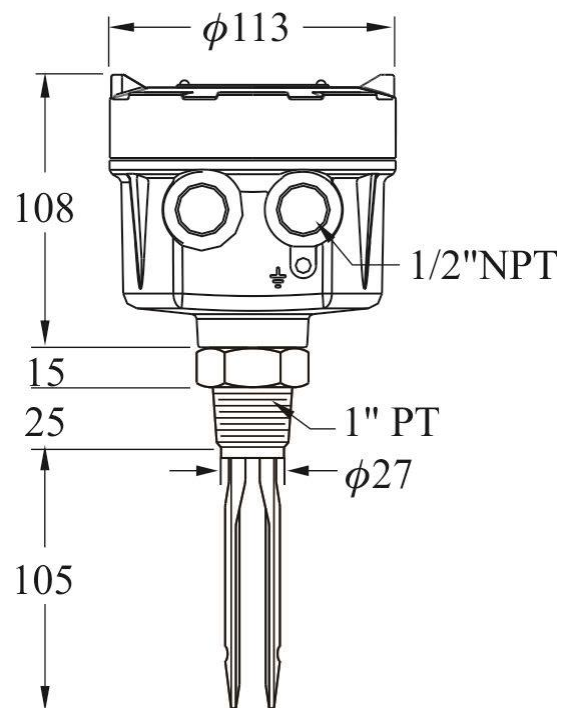
# 1. Introduction

The tuning fork level switch is a mechanical resonant device which excited by piezoelectric (PZT) elements. When the measured medium comes into contact with the tuning fork, it will change the feedback resonant frequency due to the damping resonances between the exciting PZT and receiving PZT. By detecting the frequency and appropriately tuning the sensitivity of tuning fork level switch on measured material, such device can easily operate for monitoring the alarm level of measured material.

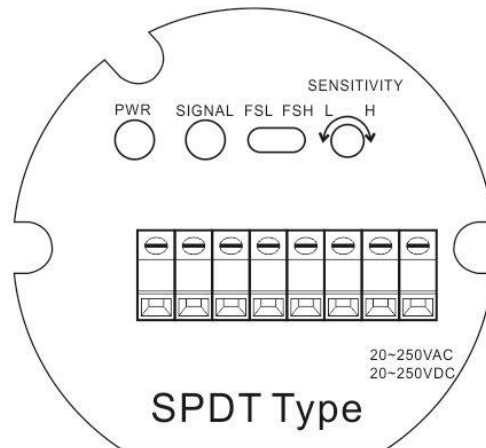
# 2. Feature

1. Providing a universal power supply for operating in voltage range of 20 to 250 (Vac / Vdc).
2. No calibration or complex setting procedure are needed, robust, free of maintenance.
3. High / Low fail safe modes provide user the safety monitoring and real time communication.
4. Equipped with Remote Self-Testing function (RST) to diagnostic the hardware connection with peripherals

### 3. Dimensions



## 4. Terminals Arrangement



Relay output type(SPDT)

SSR(MOSFET) output type

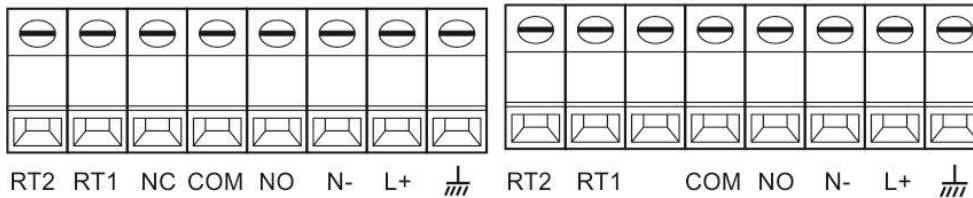


Fig-1. SPDT contact output model

### Terminal Description:

- L+, N-: Power Supply
- NC, COM, No: Relay Output
- RT1, RT2: Remote-Test
- $\perp$  : Ground Connection
- COM, NO: PNP/NPN Output

### Description of terminal functions:

- L+, N-: Power Supply
- NC, COM, No: Relay Output
- RT1, RT2: Remote-Test
- $\perp$  : Ground Connection
- COM, NO: SSR(MOSFET) Output

## 5. Output Description

1. Make sure provide power supply (L+/N-) in range of 20 to 250 (Vac or Vdc,50/60Hz) and output relay (Relay or PNP/NPN before wiring. Detail please see Fig-1.
2. RT1 and RT2 are the testing points that easy user to verify the situation. When the RT1 and RT2 are in electric short, it means the measured material is in contact with the tuning fork level switch. The Relay or PNP/NPN should be activated. In examining the tuning fork level switch, user will finds it keep excitation.
3. Set OUTPUT MODE to FSH , Please refer to Fig 2 and 3:

### ***Relay contact output:***

- a. When vibrating fork is not contacted with media or the bin is empty,Signal is switched on. Relay N.O and COM are connected.
- b. When vibrating fork is contacted with media, Signal is not switched on. Relay N.C and COM are connected.

### ***PNP/NPN contact output:***

- a. When vibrating fork is not contacted with media or the bin is empty, Signal is switched on. Ourput transistor is connected and output functions.
- b. When vibrating fork is contacted with media, Signal is not switched on. MOSFET transistor is not connected and output doesn't function.

4. Adjust OUTPUT MODE to FSL. (Please refer to Fig. 2, 3)

### ***Relay contact output:***

- a. When vibrating fork is not contacted with media or the bin is empty, Signal is not switched on. Relay N.C and COM are connected.
- b. When vibrating fork is contacted with media, Signal is switched on. Relay N.O and COM are connected.

### ***PNP/NPN contact output:***

- a. When vibrating fork is not contacted with media or the bin is empty, Signal is not switched on. Output transistor is not connected and output doesn't function.
- b. When vibrating fork is contacted with media, Signal is switched on. Output transistor is connected and output functions.

## 6. Panel Function

- PWR: Power Supply (Green Light)
- SIGNAL: Output Indication (Red Light)
- FSH: Power on. The signal LED is on and the relay acts.  
While the tuning fork level switch contacts with measured material, the signal LED is off and the relay is in not act.
- FSL: Power on. The signal LED is off and the relay is in not act.  
While the tuning fork level switch contacts with measured material, the signal LED is on and the relay is in act.
- SENSITIVITY L: Low Sensitivity
- SENSITIVITY H: High Sensitivity

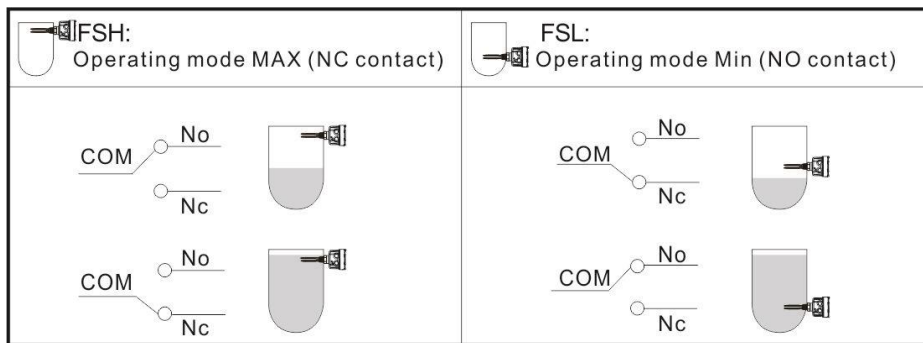


Fig-2. Diagram of Relay contact output

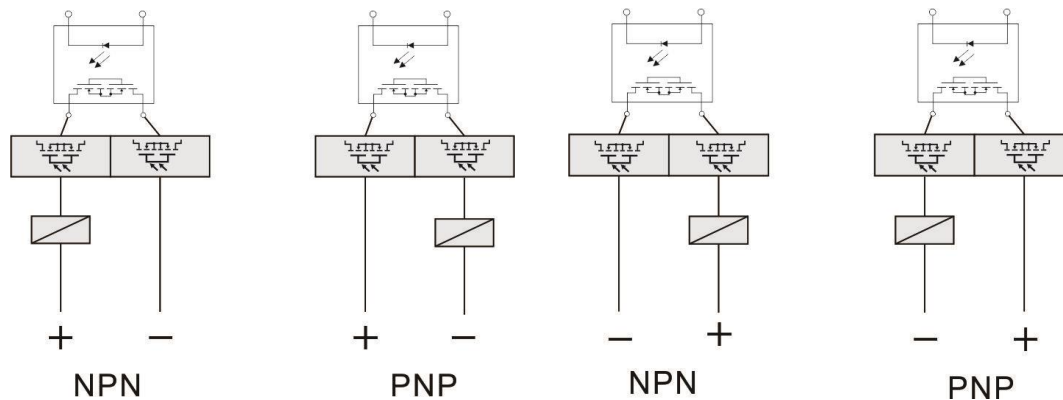


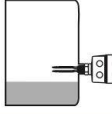
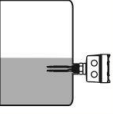
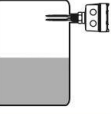
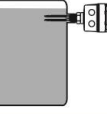








Fig-3. Diagram of PNP/NPN transistor output

### Sensitivity Adjustment/Calibration:

Sensitivity knob located on the right side of the PCB board. It approximately allows 22 turns for sensitivity adjustment. For higher sensitivity need, user please turn the knob clockwise toward H and counterclockwise toward L for lower sensitivity. Factory default is set in high. The physical contact point is located at 15mm from the tip of the fork and it will slightly moving upward or downward along the axis of fork while the sensitivity is changed. For example, the point will move downward for L sensitivity and vice versa. The total range of the physical contact point can be adjusted around 60mm.



## 7. Output Mode

	FSL		FSH	
Level				
Contact Form				
Indication				
Status	Fail	Normal	Normal	Fail

### ***FSH (FAIL-SAFE HIGH) PROTECTION:***

On the OUTPUT MODE, select Fail-Safe High Mode (FSH) and install the tuning fork switch at the high position.

#### **Relay Output:**

Normal Status: NO & COM contact of the relay are conducted and the Signal Lamp lights up when tuning fork level switch doesn't sense any materials.

Failure: NC & COM contact of the relay are conducted and the Signal Lamp is out when tuning fork level switch senses the material or when there is power breakdown.

#### **PNP/NPN Output:**

Normal Status: Output is conducted and the Signal Lamp lights up when tuning fork level switch doesn't sense any materials.

Failure: Output is not conducted and the Signal Lamp is out when tuning fork level switch senses the material or when there is power breakdown.

### ***FSL (FAIL-SAFE LOW) PROTECTION:***

On the OUTPUT MODE, select Fail-Safe Low Mode (FSL) and install the tuning fork switch at the low position.

#### **Relay Output:**

Normal Status: NO & COM contact of the relay are conducted and the Signal Lamp lights up when tuning fork level switch senses the materials.

Failure: NC & COM contact of the relay are conducted and the Signal Lamp is out when tuning fork level switch does not sense the material or when there is power breakdown.

#### **PNP/NPN Output:**

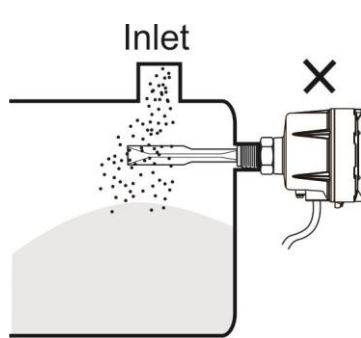
Normal Status: Output is conducted and the Signal Lamp lights up when tuning fork level switch senses materials.

Failure: Output is not conducted and the Signal Lamp is out when tuning fork level switch does not sense the material or when there is power breakdown.

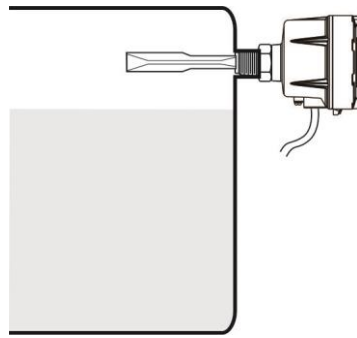
## 8. Installation For Tuning Fork

### Horizontal Installation:

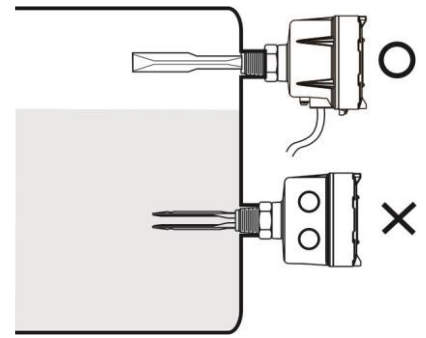
1. Can be applied in viscosity, powder, and liquid. Do not install near substance inlet. ( Figure 1)
2. Conduit faces downward at installation. ( Figure 2)
3. To be installed with the surface of two fork blades facing each other horizontally. ( Figure 3)



( Figure 1)



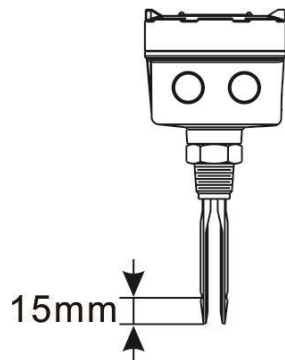
( Figure 2)



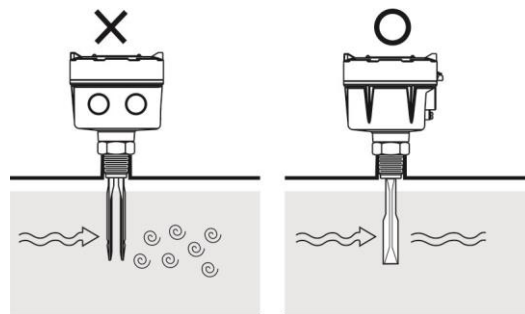
( Figure 3)

### Vertical Installation:

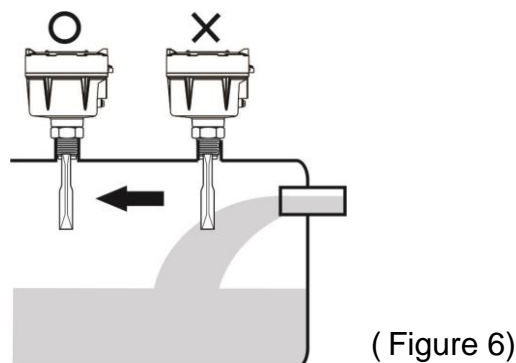
1. With high sensitivity, switching point is distanced 15mm away from the tip of fork. ( Figure 4)
2. Opening of the two fork blades is to be as the flow direction. ( Figure 5)
3. Do not install near substance inlet. ( Figure 6)



( Figure 4)



( Figure 5)



( Figure 6)

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The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

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