

# Tuning Fork level switch

## User Manual





## ➤ First. Introduction

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This product is based on liquid point level switch vibration short fork technology. It is a compact switch with durable stainless steel body and a fork can be used for a variety of liquid applications. An "economic level switch through the threaded mounting pipe or tank, or by health fittings installed in the food industry facilities directly applicable to all power load switch or PNP output, used as a programmable logic controller (PLC) direct interface provided to prevent overflow certification applies only to a safe area.

## ➤ Second, product characteristics

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- 1.Run a real impact by free flow, turbulence, bubbles, foam, vibration, solids content, coating, liquid properties and product changes
- 2.does not require calibration and installation procedures required minimum
- 3.polarity insensitive and short circuit protection
- 4.The use of industry-standard plug / socket connector
- 5.No moving parts or gaps truly maintenance-free
- 6.electronic components, self-test, and status monitoring -LED display status information and good information
- 7.facilitate magnetic test point for functional testing
- 8.The compact design of the compact and light weight
- 9."fast low" the fork design for the replacement of a viscous liquid having a response time
10. The sanitary fittings.

## ➤ Third, the measurement principle

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This product is a tuning fork design principles using liquid level switch. Piezoelectric crystal to the natural frequency of the tuning fork vibration of a tuning fork. For the change in frequency can be continuously monitored. When the product is used as a low alarm, the liquid in the vessel drains down past the fork, causing the natural frequency changes, this change is detected by the electronics, thereby switching the output state. When used in high alarm, the liquid in the container rises in contact with the fork again the output switches.

Selecting the natural frequency of the tuning fork (about 1300Hz), a device to prevent the interference of vibration, which may cause false switching operation, the length of the tuning fork so that the length of the shorter pipe extends into the container or the shortest, due to the design of the product with short fork technology, can be used in virtually all liquid applications. Numerous studies have been designed to make the fork to the highest operating frequency, so that the product is suitable for all liquids, including coating liquids (avoid bridging of forks), aerated liquids and slurries.

## ➤ Fourth, application examples

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## Prevent overflow

In charge will spill over human and environmental harm caused by full, resulting in loss of production and increased cleaning costs, change device is a limit switch, readily available for overflow signal.

## Pump Protection

Short Fork wet side of the insertion length of the shortest, and can be easily installed at any angle in the pipe or vessel, thus reducing installation costs. With the fork projecting only 2 inches (50mm) (depending on the connection type), the device can even be installed on small diameter pipes, direct load switch by selecting the option of electronic components, equipment, ideal for reliable pump control, and the available to prevent the pump running dry.

## High and low level alarm

The product is room to store all kinds of the highest and lowest level of detection of different liquids storage; the ideal choice. Ruggedized device can run continuously at temperatures up to 302 ° F (150 °C) environment and operating pressure up to 1450psig (100barg), making it especially suitable for high-level alarm. Customary practice is to install a separate high-level alarm switch, so that in case of failure to provide additional standby switch.

## Leak Detection

Flanges, gaskets, seals, a corrosive liquids under adverse conditions, they are likely to leak. Most users of the site tanks and container is mounted on the base plate or in the protective body in order to prevent liquid leakage. The product can be quickly and accurately detect any leakage, so the cost can be significantly reduced.

## Pump Control

Many parts have a batch process and elevated storage tanks, usually need to control the pump to reach the level set point. These tanks are usually fabricated with materials thinner, and therefore can not withstand heavy instrument.

## Health Applications

Due to the highly polished surface finish provides a tuning fork (Ra) better than 0.8um, the product meets the basic design of the standard diet and pharmaceutical applications with the most stringent requirements. Better than stainless steel, the product has sufficient durability, can withstand routine steam cleaning at temperatures up to 302 °F (150 °C) when the (cleaning in place CIP).



- 安装简便
- 节约成本
- 高度一体化
- LED显示
- 小型音叉
- 降低成本
- 防止错误开关



- 304 不锈  
钢外壳
- 防护等级  
IP66/67



- 重量轻
- 316不锈钢
- 3/4" 螺纹  
连接型



- 防止错误  
开关
- 经济节约  
可靠
- 维护量最  
低
- 人工测试  
设施



- 卫生安装  
主要配件
- 卫生表面  
光洁度
- 2" Tri-clamp  
接头



## ➤ Fifth.Application and Installation Best Practices

### Application Considerations

1. Make sure the liquid is at a predetermined temperature and pressure within the scope (see Technical Specifications)
2. Check whether the viscosity of the liquid in the recommended range of 0.2 to 10000cp.
3. Examples of products with a higher viscosity include: chocolate syrup, ketchup, peanut butter and bitumen. Switch can still detect these products but it will be a long time emissions.
4. Check the liquid density is greater than 37.5 lbs / ft<sup>3</sup> (600kg / m<sup>3</sup>).
5. Examples of products with lower densities include: acetone, pentane and hexane.
6. Check whether the risk of product aggregation fork exist.
7. avoid excessive drying and coating products cause aggregation situation.
8. Ensure no risk of bridging the tuning fork.
9. can cause bridging of forks examples include: thick pulp and asphalt.



10. Check whether the solids content of the liquid.
11. If the product coating and drying conditions caused by excessive aggregation.
12. As a guide, the liquid's largest solid particle diameter 0.2 "(5mm).
13. In dealing with the particle diameter is larger than 0.2 "(5mm) requires special consideration may consult factory.
14. Foam

## ➤ Six recommended installation

1. Always install in the normal "open (on)" status.
2. For high level, at (Dry) opens.
3. For low level, wet (Wet) opens.
4. Always be sure to use the machine magnetic pilot during commissioning of the system for debugging.
5. Ensure sufficient space for installation and electrical connections (see size chart).
6. Avoid making it easy to install the equipment in contact with the liquid in the tank filling point into the tank location.
7. Avoid large amounts of liquid spilled on the tuning fork.
8. Make sure the fork is not, or interfere with any internal parts in contact with the tank wall objects.
9. Make sur

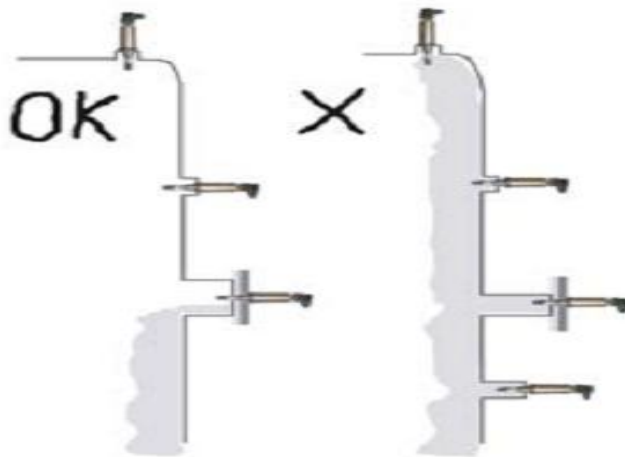


图1 储罐壁上聚积物合格 (OK) 以及不合格的实例

## ➤ Seven. technical specifications

### Physical Characteristics

2. Measuring principle Vibrating Fork
3. Applications are available for most liquids including coating liquids, aerated liquids and slurries

### Mechanical properties



4. Process Material 316L stainless steel (1.4404); for Tri-Clamp connector fittings, artificial polished surface finish better than 0.8um. 1 "BSPP (G1) non-asbestos gasket material BS7531 X grade carbon fiber with rubber adhesive.
5. Case Material housing shell: 304 stainless steel, with a polyester plate; LED display window: Flame retardant Polyamide (Pa12) UL94 V2; plugs, polyamide glass plug; Sealing: NBR 122 "(50mm)
6. Install 3/4 "BSPT (R) or NPT; 1" BSPT (R) or BSPP (G) thread, or 2 "(51mm) Tri-clamp sanitary fittings
7. Dimensions See "Dimensions"
8. Product proof grade IP66 / 67, in line with standard EN60529

#### Performance

9. Hysteresis (water)  $\pm 0.039$  "( $\pm 1$ mm) Ratings
10. Switching Point (water) distance fork ends (vertical) distance / distance tuning fork edge (horizontal) distance: 0.5 "(13mm) (This value will vary with different liquid densities)

#### Features

11. The final rating depends on the maximum operating pressure tank connection
12. See Figure 2 threaded connections
13. Health connector 435psig (30barg)
14. See Figure 3 Temperature
15. The liquid density minimum 37.5 lbs / ft<sup>3</sup> (600kg / m<sup>3</sup>)
16. The liquid viscosity in the range of 0.2 to 10000cp (cps)
17. The solids content of the coating liquid and particles due to recommend a maximum diameter of 0.2 "(5mm) for coated products, to avoid overlapping tuning fork
18. The switching delay from 0.3 to 30 seconds
19. CIP (cleaning in place) cleaning can withstand temperatures of up steam cleaning routine 302 °F (150 °C)

#### Features

20. The switch mode by selecting the DIP switch, the user can choose
21. The cable connection via four plug provided - standard DIN43650. Maximum wire size: 15AWG. Four-way directional device (90/180/270/360 degrees)
22. The maximum wire size 0.06 inches (1.5mm<sup>2</sup>)
23. The cable sealing device provided PG9- cable diameter from 0.24 to 0.31 "(6 to 8mm)

#### Dimensions

24. The switch housing shell made of durable stainless steel with a polyamide material of the LED display window of the four-way switch with plug connectors, standard DIN43650, supporting the supply of four-way directional device and the cable sealing device
25. The electronic component connection 15V-28V DC power supply for the product standard two-wire cable connected in series with the load and achieve direct load switch. Output acts as a simple single-pole, single-throw (SPST) switch, with the emergence of the liquid is changed. The most options, you can use 24V DC solid state PNP output, as a programmable logic controller (PLC) direct interface. Simultaneously with relay output current capacity, up to 5A.
26. The tank connection and fork material is 316 stainless steel wetted parts, tuning fork length or shorter can extend the length of the half.
27. The thread connecting thread: 3/4 "NPT or BSPT (R), 1" BSPP (R) or BSPP (G); Material: 316L stainless steel; accessories: very particular about the health establishments, mainly to provide supporting installation kit, and 1 "BSPP a or industry standard 2" (51mm) Tri-Clamp connectors supporting the use of connectors. Tri-Clamp connector with wet side of the manual polishing, and surface roughness (Ra) better than 0.8um, in line with the basic design criteria of the most stringent hygiene requirements

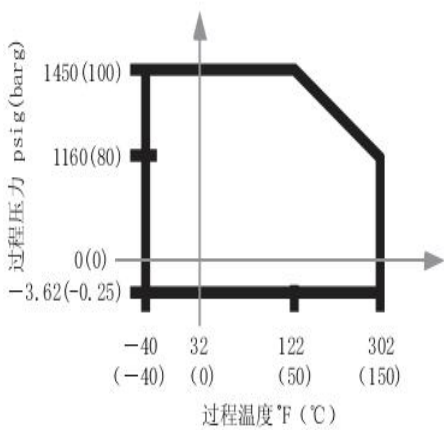


图2 过程压力

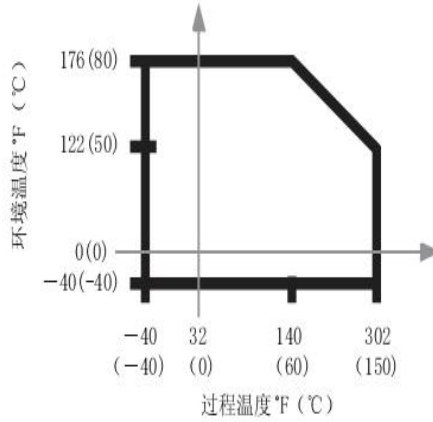
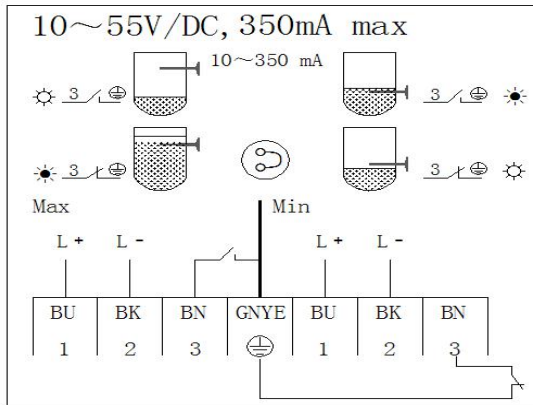


图3 温度

## ➤ Eight, electrical connection diagram

### Relay wire connection



### PNP wire connection

