



Tuning Fork Level Switch



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Tuning Fork Level Switch

The tuning fork level switch is a new type of level switch. It is suitable for almost all liquid media, and it is also suitable for measuring free-flowing medium-density solid powders or particles. Since the tuning fork level switch basically has no moving parts, the mechanical wear is relatively low, so there is no need for maintenance and adjustment, and it is simple and convenient to use.

In addition, the level switch adopts foreign new technology and original imported chips, which has the advantages of long service life, stable performance, safety and reliability, and strong adaptability (different electrical parameters and densities of the measured medium will not affect the measurement), No need to adjust (no matter what kind of medium is measured, no on-site adjustment is needed) and maintenance-free, etc., it is widely used in the process control of metallurgy, building materials, chemical industry, light industry, food and other industries.

Working Principle

The tuning fork level switch is designed and manufactured using the principle of tuning fork vibration. It is the sensor rod base of the tuning fork level switch. The tuning fork rod is driven by the piezoelectric crystal chip, and the vibration signal is received by another piezoelectric chip, so that the vibration signal can be circulated and the sensor rod can resonate. When the material is in contact with the sensor rod, the vibration signal gradually becomes smaller, until the resonance stops, the control circuit will output an electrical contact signal. Due to the natural principle that the sensitivity of the sensor rod gradually weakens from the front to the rear seat, when the material in the tank and the surroundings of the barrel accumulate upwards and touch the sensor rod base (rear) or discharge, no error signal will be generated. Simply put, the tuning fork produces mechanical vibration under the excitation of the piezoelectric crystal. This vibration has a certain frequency and amplitude. When the tuning fork is immersed in liquid or solid, the vibration frequency and amplitude of the tuning fork will change. This frequency change is detected by the electronic circuit and a switch value is output.

Design Features

- ⑦ It is suitable for measuring free-flowing medium-density solid powders or particles. It is also suitable for almost all liquid media. This series of tuning fork level switches can measure a variety of levels, with high/low fail-safe limit switches, overflow or dry running protection, pump control, display of whether there is flow in the pipeline, etc. function.
 - ⑦ It is not affected by foam, eddy current and gas, and is suitable for fixed-point alarm or control of the solid material level in various silos and the liquid level in various containers. A variety of models can be suitable for different occasions.
 - ⑦ Long service life, stable performance, safety and reliability.
 - ⑦ Strong adaptability--different electrical parameters and densities of the tested materials have no effect on the measurement. Scaling, agitation, turbulence, bubbles, vibration, medium viscosity, high temperature, high pressure and other harsh conditions have no effect on the detection.
- No adjustment required: It is not affected by the dielectric constant and density of the measured medium, so no on-site adjustment is required no matter what kind of liquid is measured.
- ⑦ Maintenance-free: The measurement process of the tuning fork switch is completed by an electronic circuit, there are no moving parts, and there is no need for on-site adjustment once it is installed and put into operation.

Product Category

Tuning fork level switches include small tuning forks, standard tuning forks, high temperature tuning forks and special customized tuning forks; among them, special customized tuning fork level switches can be customized according to site conditions (high temperature, extension, corrosion, etc.), and the color and type of the case it can also be customized!

Technical Parameters

● NYYCUK-B



Typical application: Can be used for most liquids, including coating liquids, aerated liquids and slurries

Fork body material: 316L

Fork length: 100mm(Can be customized according to requirements)

Power supply: 24VDC, 220VAC

Working temperature: Fork body -40~130℃

Instrument -40~80℃(customized)

Medium density: $\geq 0.7\text{g/cm}^3$ (liquid), $>0.1\text{g/cm}^3$ (solid)

Process pressure: $<2.0\text{MPa}$

Process connection: Thread, Flange (optional)

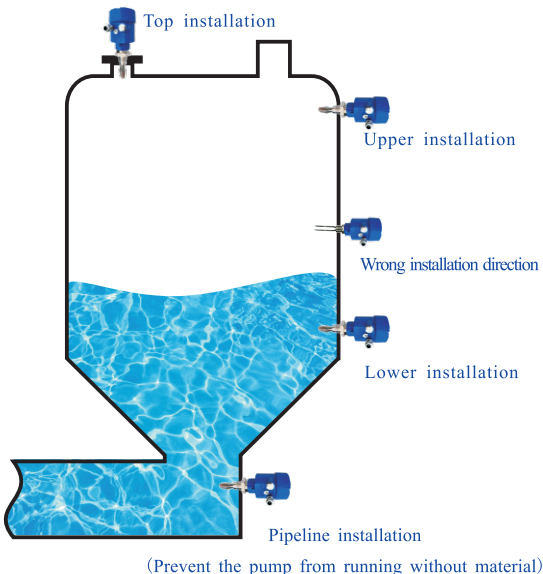
Protection level: IP67

Explosion-proof grade: Exd II BT4 (optional)

Signal output: SPDT relay output

Installation Requirements

- ◎ The instrument is generally installed vertically with the fork end downward, horizontally installed or with the fork end inclined downward (when the material has strong adhesion, it is recommended to install the fork end vertically downward).
- ◎ The instrument is not allowed to be mounted on the back, that is, the mounting method with the fork end upward.
- ◎ When the material is mixed with lumps or hard particles, it is recommended to adopt a vertical or inclined installation method.
- ◎ Before installing on the equipment, it is recommended to use a small amount of media sample to test the calibration sensitivity. For example: immerse the meter in a window containing a medium to test the reliability of the switch.
- ◎ The actual installation is generally divided into top installation (high-level monitoring of the medium), side wall installation (high or low-level monitoring of the medium), and pipeline installation (air flow monitoring of the material pump).



Precautions

1. Avoid the vibration of the forks due to material bonding.
2. In the case of scarring, leave enough space between the fork and the tank wall.
3. For the instrument used for liquid level monitoring, the detection point is determined according to the height required to monitor or control.
4. For low-viscosity liquids, the tuning fork head can be freely separated from the process medium and can be installed in any position shown in the figure above.
5. For high-viscosity liquids, the tuning fork head cannot be freely separated from the process medium. It is recommended that the fork end should be installed vertically.
6. For the instrument used for material level monitoring, for vertical cylindrical containers or similar containers, the installation position not only depends on the material level height that needs to be monitored or controlled, but also the angle of repose and feeding position of the material. When installed horizontally, the fork end should be located at one-third of the radius of the container from the inner wall of the container; the two fork strands should be in the same horizontal plane. When installed vertically on the top of the container, the distance between the installation center and the inner wall of the container should be selected at one-third of the radius of the container. The instrument installation position should try to avoid the direct impact or splash of the material flow to avoid wrong action and wear. If the impact or splash of the material cannot be avoided, a protective eaves can be installed above the instrument installation position. The effective width of the protective eaves should be greater than the fork end Width, its length should be greater than the size of the meter actually penetrated into the silo.

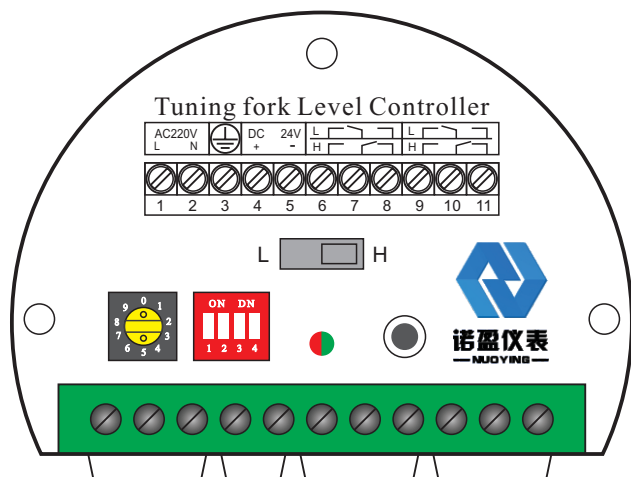
Warn! During installation and use, do not grasp the meter fork or knock the spring fork with your hands, so as to prevent the fork from being deformed by force and even damage the internal piezoelectric elements.

Electrical Connections

The wiring of the tuning fork level switch is shown in the figure. No. 1 and No. 2 of the meter terminal are AC220V AC power supply, No. 3 is earth, No. 4 and No. 5 are DC24V DC power supply), No. 6, 7, 8, 9 No., No. 10, and No. 11 are relay output terminals.

When the limit selection is in the L state:

Relays 6, 7, 9, 10 contacts are normally closed, 7, 8, 10, 11 contacts are normally open, and the red light is on, indicating that the tuning fork is in a state of vibration. When the material touches the plug, the plug stops vibrating, the green light is on, and the relay Turn over, the normally open contacts 7, 8, 10, 11 are closed, and the normally closed contacts 6, 7, 9, 10 are open, indicating that the tuning fork is in a stopped vibration state.



When the limit selection is in H state:

Relays 6, 7, 9, 10 contacts are normally open, 7, 8, 10, 11 contacts are normally closed, and the red light is on, indicating that the tuning fork is in a state of vibration. When the material touches the plug, the plug stops vibrating, the green light is on, and the relay Turn over, the normally open contacts 6, 7, 9, 10 are closed, and the normally closed contacts 7, 8, 10, and 11 are open, indicating that the tuning fork is in a stopped vibration state. Under normal circumstances, the state can be adjusted to the L end, to select the relay output terminal to achieve the upper and lower limit alarm. Sensitivity adjustment: Adjust according to the density of the medium, the lower the density, the higher the sensitivity should be adjusted. False alarms caused by strong on-site vibration can be solved by appropriately reducing the sensitivity.

When the status indicator is selected, connect the wires according to the instructions. After confirming that it is correct, turn on the power and lightly touch the end of the tuning fork with your hand to simulate the presence of materials. Repeat this several times to confirm that it is working properly before preparing to install it on site.

Note: Red light-tuning fork working status; Green light-SSR relay output status indication.

Application Field

- ◎ Water plant: water level detection of tap water and mineral water;
- ◎ Liquid that can generate gas
- ◎ Paper mill: pulp, glue, dye level;
- ◎ Beverage factory/brewery: beer, beer starter, beverage level;
- ◎ Chemical plant: Detect the liquid level of polyester, spandex, waste water, mud, acid, alkali, etc. ;
- ◎ Glass factory: check the level of quartz sand and cullet;
- ◎ Oil production plant: detect gasoline/oil production liquid level;
- ◎ Environmental protection: check the level of sewage and wastewater;
- ◎ Boiler factory: check the water level of the steam drum and the liquid level of other pressure vessels
- ◎ Liquid level control in other industries. . .

Storage And After-sales

Frequent maintenance and maintenance:

1. The instrument that is correctly installed in a good working environment generally does not require maintenance. However, when the measured material is likely to contaminate and adhere to the fork, it should be cleaned regularly to prevent the deposition of adhesions from causing abnormal operation of the tuning fork. Be careful not to knock or drop the fork body when cleaning, so as not to damage the vibration part of the tuning fork.
2. For instruments with Teflon treatment on the surface, do not wipe the surface of the instrument with wipes containing sharp impurities, so as not to damage the specially treated surface.

Storage and transportation:

1. Storage temperature: $-10^{\circ}\text{C} \sim +55^{\circ}\text{C}$.
2. Storage environment humidity: less than 90%.
3. The product should be protected from rain and strong vibration and collision during transportation. Be careful when handling, not upside down.

After-sales service:

This product should be used correctly according to the method specified in this instruction manual. The company ensures the work of after-sales service. The warranty period of this product is one year.





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