

FORK TYPE LEVEL SWITCH

[FDI - FLW - 507]

INTRODUCTION

Tuning fork level switch operated by using two piezoelectric elements built in on vibration tube. The first piezoelectric element triggered by a pulse signal that created from circuit to transport vibration energy out and the other piezoelectric element receives the vibration and transmits it to output electric signal. When the probe comes into contact with the fluid, it will cause the frequency change of output signal and the vibration will hold and send out the relay on at the same time. Tuning fork of the level switch provides reliable & maintenance-free for bulk solids. This device can withstand static electricity. & fiercely lateral loads.

It consists of a two-pronged fork which vibrates at its natural frequency. The frequency changes depending on the media in which it is immersed. When in air, the forks vibrate at their natural frequency and When liquid covers the forks, the frequency drops. Changes to the frequency are continuously monitored by the switch electronics, which then change the output state to operate an alarm, pump, or valve.

The fork sensors are tuned at a particular frequency according to the type of industry and are generally factory calibrated. The pitch of the tuning fork may vary as per the length of the fork tine.

FIDICON is a pioneer in the field of manufacturing Level Switch in India since 2002 years of designing, manufacturing, installation and service of the same. Fork Type Level Switch manufactured by FIDICON are user friendly and easy to install. It comes in many ranges and can be tailor made as per the requirements of customers.

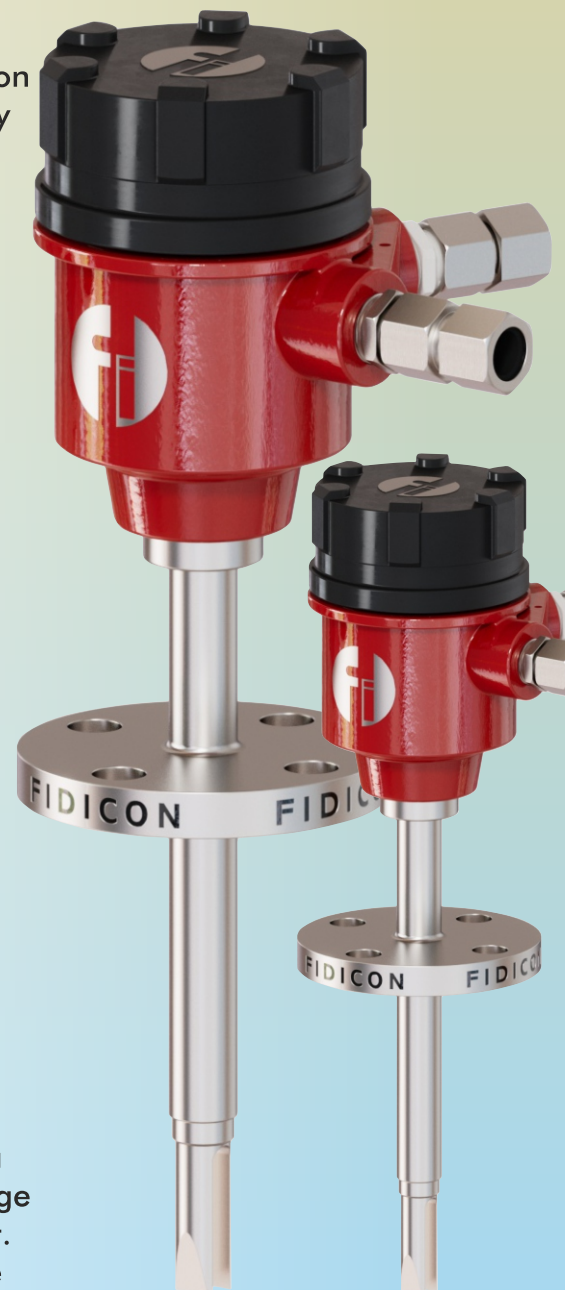
WORKING PRINCIPLE

The vibrating fork type level sensor works on the principle of tuning forks. There is a Piezo ceramic crystal located inside the fork assembly. On the application of voltage, the crystals oscillate at the natural frequency of the fork assembly. This frequency is continuously monitored by the internal electronic circuitry.

When the fork comes in contact with liquids/solid material, the frequency slightly changes, and this change in frequency is sensed by the electronic circuit which in turn send out a signal. This signal is processed to give out as a relay output either N.O or N.C. signal which in turn indicates Level signal either Low or High depends on application.

The working principle of vibrating fork level sensor is based on vibrating a tuning fork sensor continuously at its natural frequency and detecting the change of frequency and amplitude in the presence of application media. The monitoring process of given parameters depends upon type of application media.

The vibrating fork level sensor operates by constantly vibrating a tuning fork sensor at its natural frequency and sensing the change in frequency and amplitude when application media are present. The type of application medium determines how parameters are monitored.



WORKING PRINCIPLE

Amplitude of vibration:

The tuning fork level switch's oscillation dampens as the material level rises and comes into contact with the tines of the vibrating fork. The outputs are altered by the onboard electronics when the amplitude falls below a predetermined threshold.

Frequency of operation:

As the tuning fork level switch is covered with the liquid application media, the natural frequency of oscillation for the switch lowers. A tuning fork-type level switch's natural frequency is used as the threshold frequency, which is tuned to match that frequency.

OPERATION

Pressure applied by the piezoelectric stack on the diaphragm causes it to shear, which in turn drives the tuning fork's tines apart from each other. When the pressure is removed the fork tines return to their original position. The application of force when applied at the fork's Natural Frequency makes it oscillate at its maximum amplitude for a given power.

The natural frequency and amplitude measurement of a vibrating tuning fork serves as the foundation for the vibrating fork level switch's operation. Piezoelectric components are used to constantly vibrate a specifically formed tuning fork at its inherent frequency, and changes in amplitude in the presence of application media are monitored. The tines of the vibrating fork are forced apart from one another by the pressure given to the diaphragm, which returns to its original position when the pressure is released. The amplitude of oscillation of the vibrating fork level switch dampens or reduces when it is covered with the solid application media as the material level rises and comes into contact with the vibrating fork tines. The microprocessor detects the change in amplitude and decides whether to switch. The microprocessor notices the difference in amplitude, which results in a decision to switch. A vibrating fork-style level switch causes output adjustments when the amplitude falls below a predetermined threshold.

APPLICATION

- ✦ Overfill prevention
- ✦ Empty pipe detection
- ✦ Wireless applications
- ✦ Pump control or limit detection
- ✦ High- & Low-level Alarm & shutdown duties
- ✦ Fuel dispensing system
- ✦ Differential level control
- ✦ Wellhead automation (plunger lift, main line valve control, etc)
- ✦ Sump level control
- ✦ Storage tank level monitoring
- ✦ Spark protection in diesel fuel distribution
- ✦ Auxiliary generator fuel tanks
- ✦ Hydraulic and lubricating oil reservoirs



APPLICATION

In packaging machines- large production companies need quick automated packing equipment to fill packets with the right amount of material without failure or material loss. The increased need for industrial sites calls for level instruments with quick switching capabilities. For applications that prevent overfilling, the dependable vibrating fork switch is suitable. In the food, beverage, and pharmaceutical industries, point level liquid detection is used by fork level switch.

ADVANTAGES

- ✦ Installing vibrating level switches is simple.
- ✦ Without a medium, setup and commissioning are possible.
- ✦ Unaffected by installation location, pressure, temperature, foam, viscosity, and particle size, reliable point level measurement.

LIMITATION

- ✦ For excessively viscous fluid, vibrating fork level switches are not recommended.
- ✦ The forks get joined due to material build-up between them, which results in inaccurate level detection.

FEATURES

- ✦ Field-operatable in sensitivity adjustment to fit versatile density of material
- ✦ Maintenance free
- ✦ High/Low fail-safe modes.
- ✦ No mechanical moving parts or crevices
- ✦ Short fork technology for minimized protrusion
- ✦ Replaceable electronics cassettes with versatile switch outputs
- ✦ Intrinsically safe

RECOMMENDED DISPOSAL

- ✦ Give it back to us & we will take care of recycling & possible disposal.
- ✦ User can dis-assemble the product in multiple stage
- ✦ The above may be handed over (state pollution board), authorized re-cycler item-wise.





ENQUIRY SPECIFICATIONS:

- [1] Service Media Details.
- [2] Size/Connection
- [3] System Operating and Design Pressure.
- [4] System Operating and Design Temperature.
- [5] Material Specifications (Body, Internal)

RECOMMENDED SPARES

- [1] Gasket / as per customer need

OTHER RANGE OF PRODUCTS

- [1] Flame Arrester
- [2] Breather Valve
- [3] Level Indicators
- [4] Rotameters
- [5] Emergency Relief Valve
- [6] Gauge Hatch
- [7] Strainers
- [8] Pressure Reducing Valve
- [9] Safety Relief Valve
- [10] Flowmeters
- [11] Level Switches
- [12] Pressure Reducing Station
- [13] Level Gauge, etc.

Any Query?

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