

## Vibrating Fork Point Level Switch for Liquids – VFSL



### 1. Operation

The electronically stimulated fork vibrates at its mechanically resonance frequency of approx.330 Hz. If the liquid media covers the fork, the damping of the vibration is detected electronically and a corresponding signal output is actuated. The vibration of the fork has self-cleaning properties. The light deposit on the container wall does not affect the operation of switch.

Switch is available in two constructions

- 1) Two part system as sensing fork probe and controller
- 2) Integral system with built in controller

#### 1.1. Applications

All types of liquids, Plastic industry, powder, granular etc. Light free flowing power etc.

### 2. Installation

The switch has screwed mounting, which can be side mounted on the container wall at the desired level of the material to be controlled. The fork tines should be horizontally or pointed slightly downward. It can be also mounted from tank top.

#### 2.1 Precautions during Installation –

- The tines should not be bent or position distorted.
- During filling operation, the material should not fall directly onto the tines. Otherwise protection shield should be provided over the tines.
- During installation of probe with screwed mounting, turn the hexagonal mounting nut of the probe and not the housing.
- For side mounting location the tines position should be such that the material can flow freely through them.
- The knife-edges of the tines should face the ground plane in horizontal mounting position.
- The tines should extend far enough into the vessel so that they are free to vibrate despite the build-up on the vessel wall.
- The extended probe should be mounted in such a way that it does not extend further than necessary in the vessel.
- Turbulence during pneumatic conveying can cause operational problems and can be avoided by shielding the tines by windscreen.
- For remote mounting of the electronics switching unit/ controller, the probe connection cable gland of the Cast Aluminum housing of the Switching unit should point towards ground plane.

## 2.2 Calibration of Switch

Vibrating fork switch with Integral Controller is provided with DIP switch. Its functions are explained as below

DIP Switch Details:

SW1 - S/L : NA - should be OFF

SW2 - FSS : Fail Safe Switch+

SW3 - OND : On time delay settings

SW4 - OFD/CAL: Off delay settings and calibration.

***VFSL Two part system is provided with push switch for fail safe high and low selection and not required to be calibrated***

Normally all the switches are calibrated at factory and need not required to be calibrated. However if required follow the procedure below.

For liquid application, before calibration make sure that instrument is in OFF condition. Dip the fork blades in liquid up to approximately 30 percent of blades only. Switch on 4<sup>th</sup> DIP switch. Then power on instrument, red led start blink for five times. While calibration fork blades should be dip 30 percent. Don't move while calibration, it should be fix. After 5 blinks of led, make 4<sup>th</sup> switch in OFF condition.

Now calibration is complete and check the functioning of instrument.

## 2.3 Delay Setting

### 2.3.1 ON Delay

Make on 3<sup>rd</sup> dip switch, then red led start blink. Count blink for no. of seconds we need to set the delay. If no. of counts finish then make OFF the 3<sup>rd</sup> dip switch. This set for on delay of 3 sec.

After that check the operation. If we set 3 seconds delay then when medium touch the calibration point level then after 3 seconds, relay will change its contacts.

### 2.3.2 OFF Delay

Make on 4<sup>th</sup> dip switch, then red led start blink. Count blink for no. of seconds we need to set the delay. If no. of counts finish then make OFF the 4<sup>th</sup> dip switch. This set off delay.

After that check the operation. If we set 3 seconds delay then when medium away from the calibration point level then after 3 seconds, relay will change its contacts.

### 2.3.3 Fail Safe Selection

When 2<sup>nd</sup> switch is in off condition it is fail safe low mode and when it is on, then it is in fail safe high mode.

### 3. Termination and Wiring

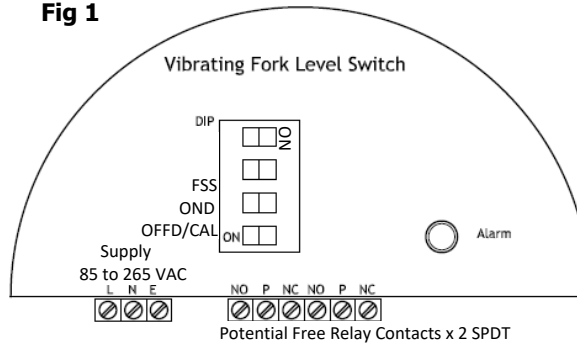
Refer the connection diagram for the electrical connection. Appropriate mains voltage should be connected to the terminals of the instruments as specified. The connectors are suitable for 1.5 sq.mm cable cross section.

#### VFSL Integral (Supply – 85 to 265 VAC)

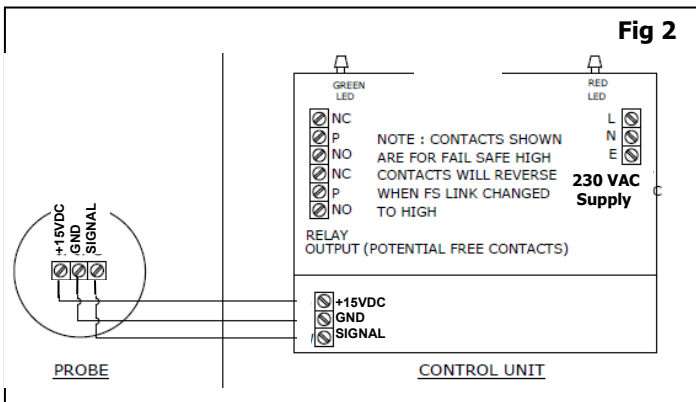
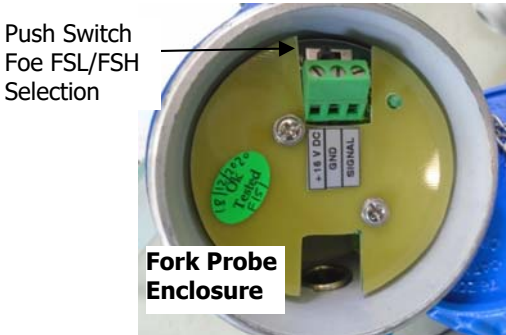
#### VFSL Integral (Supply – 24VDC)



Fig 1



#### VFSL Two Part (Supply – 110 or 230 VAC)



Controller VFSL Two Part Integral (Supply – 24VDC)

In case of two part system, install the fork probe on vessel, connect wires/ cable between fork probe and controller, refer fig 2 .

## 4. Maintenance

If the material has built up tendency, over a period of time, tines should be cleaned whenever need occurs. Ensure that the cable glands and the housing lid are sealed to prevent ingress of moisture.

## 5. Trouble Shooting

SL	Problem	Cause	Solution
1.	Switch not working	<ol style="list-style-type: none"> <li>1. Loose connection or disconnected power supply connection</li> <li>2. Incorrect power supply</li> <li>3. Wrong probe connections in case of two part system</li> <li>4. Forks are not vibrating due to bend</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and tighten connection</li> <li>2. Check and connect correct power supply. Ensure correct polarity for 24 VDC supply</li> <li>3. Check and make correct connection of fork probe and controller.</li> <li>4. Check and install the fork probe properly. Ensure forks are not bent. Else contact service dept.</li> </ol>