FPS series Tuning fork level switch vibrates to tuning fork by piezoelectric crystal and inherent frequency of tuning fork. It can monitor continuously to the change of frequency. When the tuning fork switch is used for low alarm (or low position control), the medium in the vessel is discharged downward passing through the tuning fork. When it is lower than the specific location and change the inherent frequency, this change is detected by electronic component, the output state is shifted; when it is used for high alarm (or high position control), the medium in the vessel go upward and contact with tuning fork which can shift the output state. Choose the inherent frequency of tuning fork to prevent disturbance of equipped vibration, which could bring wrong switch operation. The length of tuning fork is a little short, thus make the length to the vessel or tube to be shortest. As design of the product adopts short tuning technology, it can actually be used in all liquid situation and good flow ability occasion. Plenty of researches make the tuning fork technology get the greatest operating efficiency which enable the product apply to any liquid, including coating liquid (eliminate tuning adhesion and joint), aerated liquid, serous fluid and good flow without adhesion of powder.

Tuning fork switch is also called “electric float”. Both occasion which using float liquid lever switch and which can not use float liquid level switch due to structure, turbulent flow, agitation, air bubble or vibration can use tuning fork level switch. As tuning fork switch has not moving parts, there is no need to maintain or regulate, it is the advanced product comparatively to float level switch. Tuning fork switch is widely used in the field of petrifaction, light industry and water treatment for controlling level and alarming automatically.

Product series

- Standard new image
- Short fork refined type
- Long fork refined type
Outline structure drawing of industrial standard type (reference)

Outline structure drawing of refined products

a. Short fork refined type

b. Long fork refined type
Installation drawing of industrial standard tuning fork switch for upper and lower limit alarm

Product features

Well-adapted capability: precise electrical component, double functions, almost can be applied to all liquids, different parameters and density of the measured liquid could not affect the measuring result. Mal-condition such as forming scaling, stirring, air bubble, vibration, medium viscosity, high temperature and high pressure also could not affect the measuring result.

No maintenance: as the detection of tuning fork switch is completed by electronic circuit and it has no moving components, so it is no need to maintain after installed and applied.

Typical applications

Tap water, minimal water, paper pulp, glue, dye, waste water, mud, acid and alkali liquor, liquid which can generate gas, beer, beer leaven, beverage, diesel oil and good flow solid powder etc.
Installation of FPS series Tuning fork level switch

Tuning fork switch usually adopts the way of side-mounting installation (install in the side of vessel) and detect top limit and lower limit of the medium height. If the vessel is not convenient to be mounted, try the top-mounted installation (install in the top of the vessel), and the position should be out of the place where could be crashed by material entered; it can also be installed on the pipe which can prevent that the pump operates without material. (As shown in the diagram)

Technical performance index

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>220VAC/24VDC</td>
</tr>
<tr>
<td>Output way</td>
<td>SPDT relay, DPDT, SPST or PNP/NPN</td>
</tr>
<tr>
<td>Working temperature</td>
<td>Fork body -30<del>150°C; meters -30</del>70°C</td>
</tr>
<tr>
<td>Working pressure</td>
<td>Smaller than 2MPa</td>
</tr>
<tr>
<td>Medium density</td>
<td>0.6g/cm³</td>
</tr>
<tr>
<td>Operation point</td>
<td>Vertically insert in the water about 25mm</td>
</tr>
<tr>
<td>Oscillation starting time</td>
<td>About 3S</td>
</tr>
<tr>
<td>Response time</td>
<td>About 1S</td>
</tr>
<tr>
<td>Contact rating</td>
<td>One set of relay, contact point output</td>
</tr>
<tr>
<td>Hysteresis settings</td>
<td>About 3mm</td>
</tr>
<tr>
<td>Delay</td>
<td>1~30s</td>
</tr>
<tr>
<td>Power consumption</td>
<td>Smaller than 1W</td>
</tr>
<tr>
<td>Process connection specifications</td>
<td>All kinds of standard screw, flange and hygiene chuck could be customized</td>
</tr>
<tr>
<td>Electrical connector</td>
<td>M20x1.5 (Outer diameter of sheath cable: 6~8mm)</td>
</tr>
<tr>
<td>Material to contact liquid</td>
<td>SUS304, SUS316L, stainless steel coated Teflon etc.</td>
</tr>
</tbody>
</table>

NOTE

Refined tuning fork level switch is suitable for the detection of most liquids. When the liquid viscosity is general and the fluidity is good, the use of tuning fork level switch is the most appropriate. Powder with good fluidity and solid particle with diameter less than 3mm can also be used with refined tuning fork level switch. When the material viscosity is too high, the particle diameter is more than 5mm, the temperature is more than 150°C, the pressure is more than 2MPa, the capsule has a strong vibration is not suitable for the use of this product. Sensors of the power cord and signal lines should be avoided laying, stranding, running together a threading pipe output driver perceptual load with other power (such as AC contacts, etc.) should be on both ends of the load and "surge suppressor" were at the scene when high power equipment, frequency conversion equipment, which should choose 24 VDC power supply.
Example of model selection

Example 1
Model: FPS-D04ZC11S(R1") -200  
Instruction: Power supply 20VDC, no delay required, material SUS304, without explosion-proof, standard refined type, process contact thread specification: R1", Fork insert depth is 200mm.

Example 2
Model: FPS-A16EC22F(DN50 PN1.0MPa RF)  
Instruction: Power supply 220VAC, delay 1~30S, material SUS316, explosion-proof grade ExdIICT6. Industrial normal temperature ≤90℃, process contact flange specification DN50PN1.0MPa RF, fork insert depth is standard length

Installation
Refined tuning fork switch usually adopts the way of side-mounting installation (install on the side of vessel) and detect top limit and lower limit of the medium height. If the vessel is not convenient to be mounted, try the top-mounted installation (install in the top of the vessel), and the position should be out of the place where could be crashed by material entered.

Model selection of all series tuning fork switch

<table>
<thead>
<tr>
<th>Product series</th>
<th>Power supply</th>
<th>Delay or not</th>
<th>Material</th>
<th>Process connection</th>
<th>Explosion proof or not</th>
<th>Temperature range</th>
<th>Junction box</th>
<th>Structure of fork</th>
<th>Insertion depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPS</td>
<td>-</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Tuning fork level switch

- 0: No; 1: 1~30s delay  
- D: 24VDC; A: 220VAC; X: Universal power supply; S: 8.2V  
- E: Explosion-proof; Z: Non-explosion-proof  
- E: Normal industrial temperature within 80℃; T: High temperature within 170℃  
- Flange/thread specification:
  - C: 3/4"(20A)  
  - D: 1"(25A)  
  - E: 1-1/2"(40A)  
  - F: 2"(50A)  
  - G: 2-1/2"(65A)  
  - H: 3"(80A)  
  - L: 5kg/cm²  
  - M: 10kg/cm²  
  - N: 150Lbs  
  - O: 300Lbs  
  - P: PT  
  - Q: PF  
  - R: NPT  
  - S: Special size  
  - U: PN0.6(6Bar)  
  - V: PN1.0(10Bar)  
  - W: PN1.6(16Bar)  
  - X: PN2.5(25Bar)  
  - Y: PN4.0(40Bar)  
  - Z: PN6.3(63Bar)  
  - S: Special size

Insertion depth unit: mm (Default short fork 63, long fork type 135, rod type 200mm)