



**FPS**

## Tuning Fork Level Switch

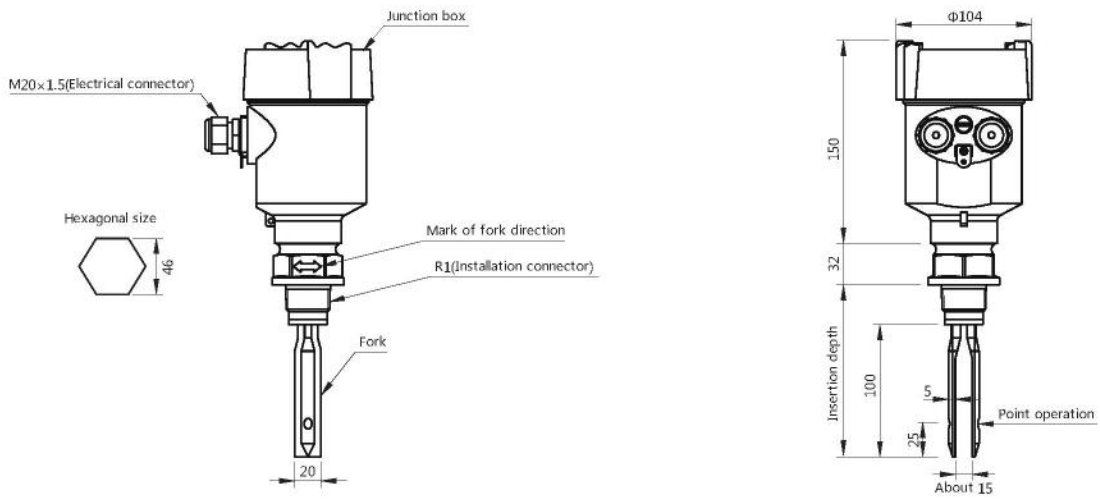
Tuning Fork Switch vibrates to tuning fork by piezoelectric crystal and inherent frequency of tuning fork. It can monitor continuously to the change of frequency. When the tuning fork switch is used for low alarm (or low position control), the medium in the vessel is discharged downward passing through 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 (about 1300Hz) to prevent disturbance of equipments' vibration, which could bring wrong switch operation. The length of tuning fork is a little short, thus make the length to the vessel/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 cannot 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 petrification, light industry and water treatment for controlling level and alarming automatically.

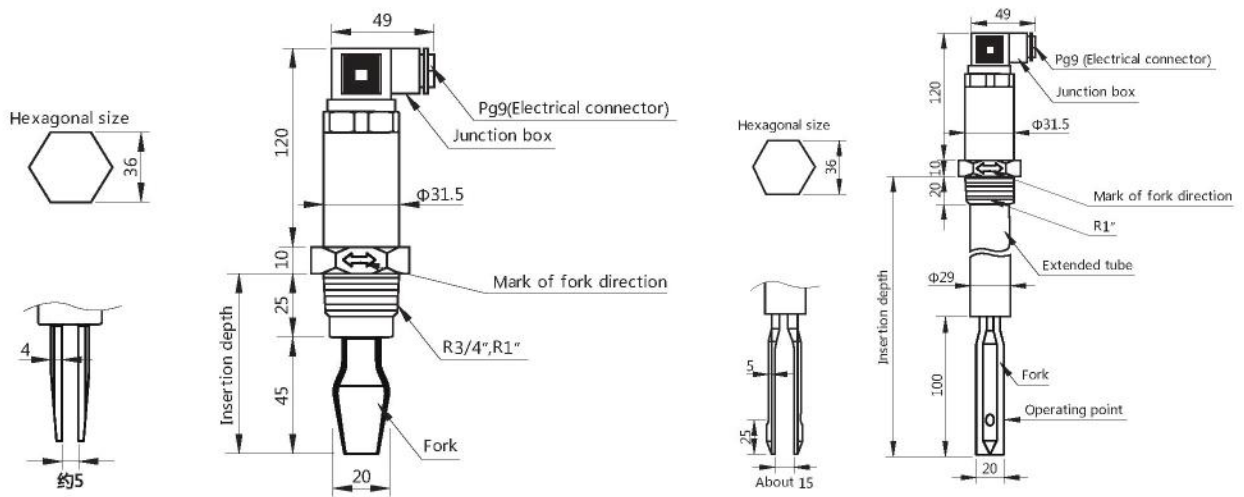
### Products series



## Industrial standard type



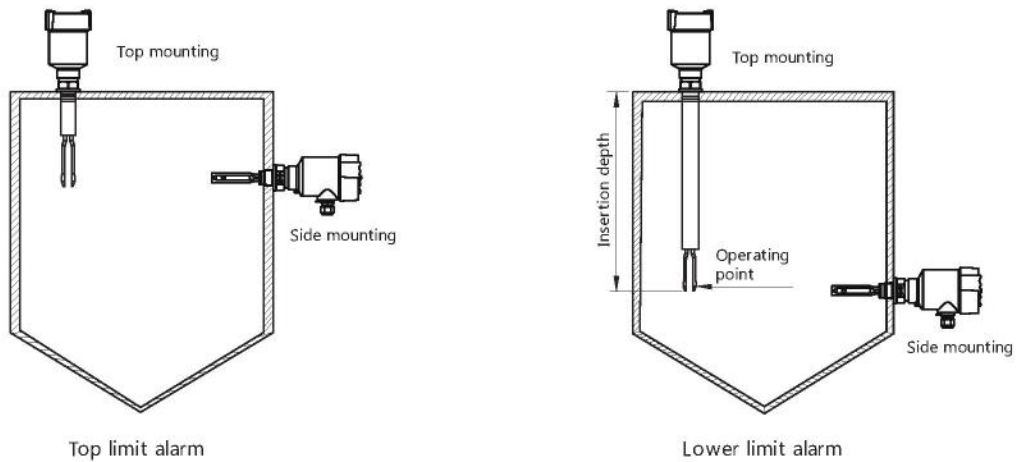
## Compact



a. Short fork refine type

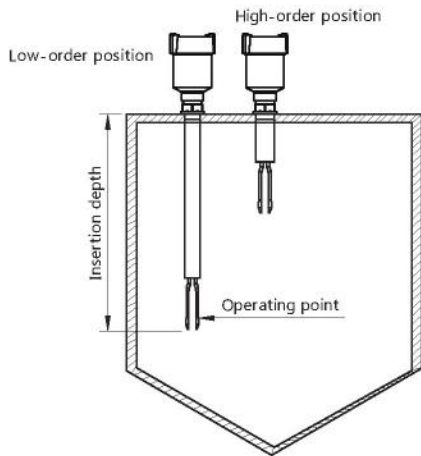
b. Long fork refine type

## Installation figure

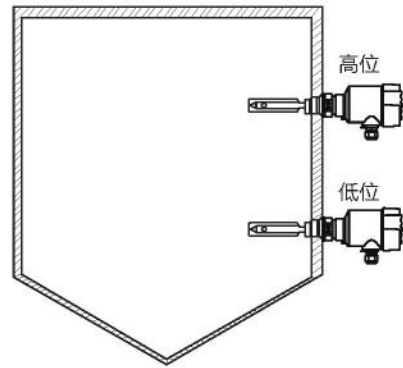


Top limit alarm

Lower limit alarm



Top-mounted auto control in top and lower limit



Side-mounted auto control of top and lower limit

## 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.

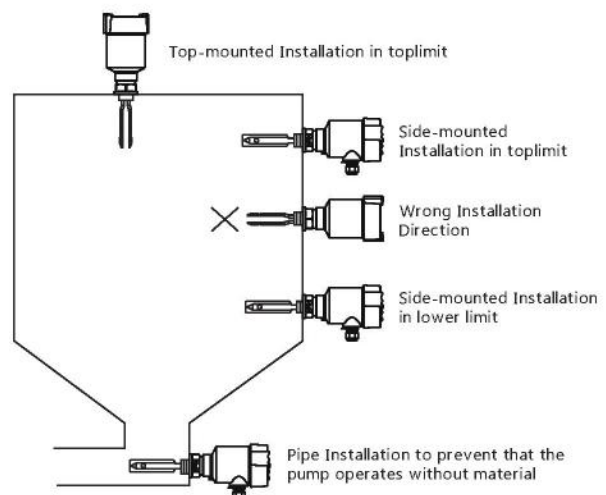
**No Regulation** : as the detection of tuning fork switch cannot be effected by parameter and density of measured liquid, it needs not to regulate in site for all any liquid. **No Maintenance**: As the detection of tuning fork switch is completed by electronic circuit and it has no moving components, 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

Tuning Fork Switch usually adopts the way of side-mounting installation (install in the side of vessel) and detect toplimit 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 Parameters

|                                     |                                                                           |
|-------------------------------------|---------------------------------------------------------------------------|
| Power Supply :                      | 220VAC/24VDC                                                              |
| Output Way :                        | SPDT Relay , DPDT , SPST or PNP/NPN                                       |
| Working Temperature :               | Fork body: -30~150°C ; Meters: -30~70°C                                   |
| Working pressure :                  | Small than 2MPa                                                           |
| Medium density :                    | Minimum is 0.6g/cm <sup>3</sup>                                           |
| Operation point :                   | Vertically insert in the water about 25mm                                 |
| Oscillation Starting Time :         | About 3mm                                                                 |
| Response time :                     | About 1 seconds                                                           |
| Output :                            | one set of relay, contact point output (AC 220V/3A, DC 30V/3A)            |
| Hysteresis settings :               | About 3mm                                                                 |
| Delay :                             | 1~50S                                                                     |
| Power Consumption :                 | Small than 1W                                                             |
| Process connection specifications : | all kinds of standard screw, flange and hygiene chuck could be customized |
| Electrical connector :              | M20×1.5 (Electriccoated cable: 6-8mm)                                     |
| Material to contact liquid :        | SUS304 , SUS316L , SS Coated Teflon etc.                                  |

## Selection Tables

### Tuning fork level switch

|                |                                                                                                                                                |              |          |                        |                   |              |                   |                            |                 |  |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------|------------------------|-------------------|--------------|-------------------|----------------------------|-----------------|--|
|                | D : 24VDC ; A : 220VAC ; X : Universal power supply                                                                                            |              |          |                        |                   |              |                   |                            |                 |  |
|                | 0 : NO ; 1 : 0~50S delay                                                                                                                       |              |          |                        |                   |              |                   |                            |                 |  |
|                | 4 : SUS304 ; 6 : SUS316 ; F : Stainless Steel Coated with Teflon                                                                               |              |          |                        |                   |              |                   |                            |                 |  |
|                | E : Ex-proof ; Z : Non-explosion-proof                                                                                                         |              |          |                        |                   |              |                   |                            |                 |  |
|                | C : Normal Industrial Temperature within 90°C ;<br>T : High Temperature within 150°C                                                           |              |          |                        |                   |              |                   |                            |                 |  |
|                | 1 : Hirschmann ; 2 : Standard junction box ; 3 : Output cable                                                                                  |              |          |                        |                   |              |                   |                            |                 |  |
|                | 1 : Standard Refined type ; 2 : Standard fork type ;<br>3 : Rod vibration type                                                                 |              |          |                        |                   |              |                   |                            |                 |  |
|                | S : Thread Installation(thread specification)<br>F : Flange iInstallation(flange specification)<br>K : Chuck Installation(chuck specification) |              |          |                        |                   |              |                   |                            |                 |  |
|                | xxx : Insertion depth (mm)                                                                                                                     |              |          |                        |                   |              |                   |                            |                 |  |
| Product Series | Power supply                                                                                                                                   | delay or not | Material | Explosion proof or not | Temperature range | Junction box | Structure of fork | Installation specification | Insertion depth |  |
| FPS            | -□                                                                                                                                             | □            | □        | □                      | □                 | -□           | -□                | □()                        | -□□□            |  |

## Example of model selection

### Example 1

Model : **FPS-D04ZC-1S ( R1" ) -200**

Instruction: power supply 20VDC, no need not delay, material SUS304, without explosion-proof, standard refined type, process contact thread specification: R1", fork insert depth is 200mm.

### Example 2

Model : **FPS-A16EC-2F ( DN50 PN1.0MPa RF )**

Instruction: power supply 220VAC, delay 0-50S, material SUS316L, explosion-proof grade EXDLLCT6, industrial normal temperature  $\leq 90^{\circ}\text{C}$ , process contact flange specification DN50PN1.OFF, 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 toplimit 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.

