

Technical Parameter

1. Power Supply/ Signal Output:
- 4-wire SPDT

20-250V AC, 19-60V DC
- 4-wire DPDT

20-250V AC, 19-72V DC
- 3-wire PNP/NPN

18-50V DC
- 2-wire NAMUR

8-8.2V DC
- 2-wire 8/16mA

12.5-30V DC
2. Process Temperature: Sensor -30 ~ 150°C (Higher temperature resistance can be customized), Transmitter -20 ~ 70°C.
3. Consumed Power: 1W
4. Working Pressure: ≤2MPa (Higher pressure can be customized)
5. Material Density: liquid≥0.7 g/cm³, solid≥0.1 g/cm³
6. Switching Time: The starting time is about 2 seconds, and the response time is about 1 second.



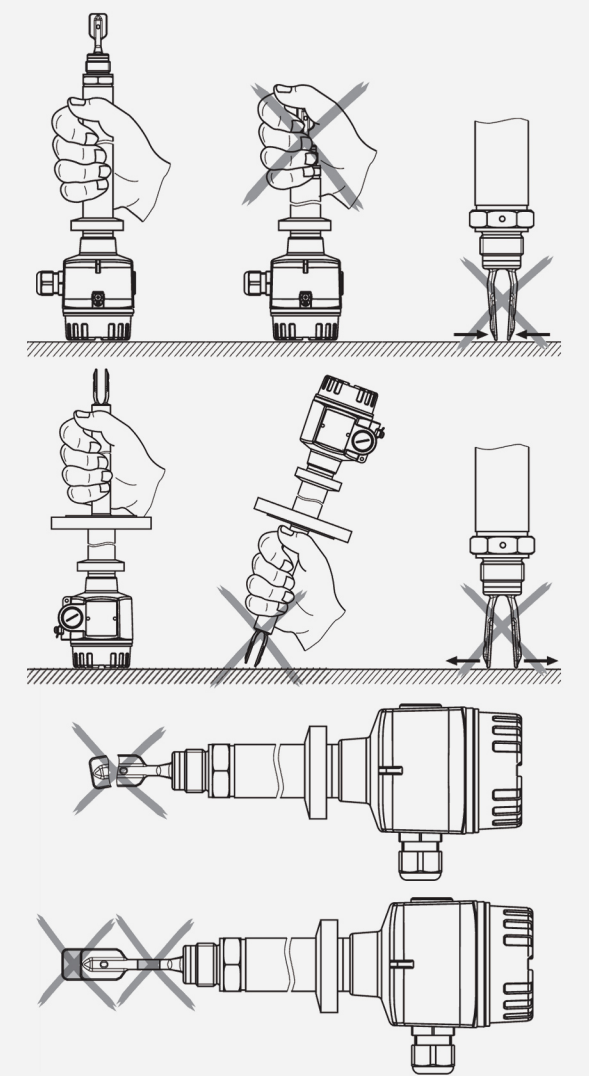
Tuning Fork Level Switch

Working Principle

Utilizing the piezoelectric crystal and the inherent frequency of the fork to drive and signal feedback to the fork rod, the fork rod produces resonance. When the material level contacts the fork rod, it sends back a frequency signal, and when the circuit detects the frequency drop of this signal, it converts it into an output of a contact signal. The damping effect produced by the measured object covering the fork rod causes the vibration frequency of the fork rod to decrease and outputs a switch signal. Therefore, there is no signal amplification circuit inside, which eliminates the problem of frequently adjusting sensitivity due to changes in material properties. When the fork switch is used for low alarm (or low-level control) purposes, the medium in the container flows through the fork. When it is lower than a specific position of the fork, it causes a change in the inherent frequency, which is detected by the electronic component, thereby switching the output status. When used for high-level alarm (or high-level control) purposes, the medium in the container rises and contacts the fork, causing a change in the inherent frequency and switching to the output status.

Features

- Can be used in safety systems with SIL2/SIL3 functional safety requirements
- Can be used in sterile applications in the life sciences industry
- No adjustment required: quick start, economical
- No mechanical moving parts: maintenance-free, no wear, long service life
- Functional safety: fork damage monitoring
- Integrated stainless steel housing (optional)
- Can reach IP68 protection level, ensuring that the equipment is always in a sealed state, even during high-intensity cleaning or immersion in water for several hours, the equipment will not be flooded



Matters Needing Attention

When installing the tuning fork, avoid the position with obvious vibration to prevent misoperation of the tuning fork. If this cannot be avoided, check the tuning fork again at the installation position or restore the factory Settings.

Allowed: Can clamp insulation pipe, extension pipe, flange or thread.

Do not: damage vibration rod, bending vibration rod, stretching vibration rod, cutting vibration rod, lengthening vibration rod, vibration rod contact with hard objects.

Use raw material belt to seal, use a wrench to twist the hex bolt, do not tighten through the shell rotation

Small Tuning Fork Switch

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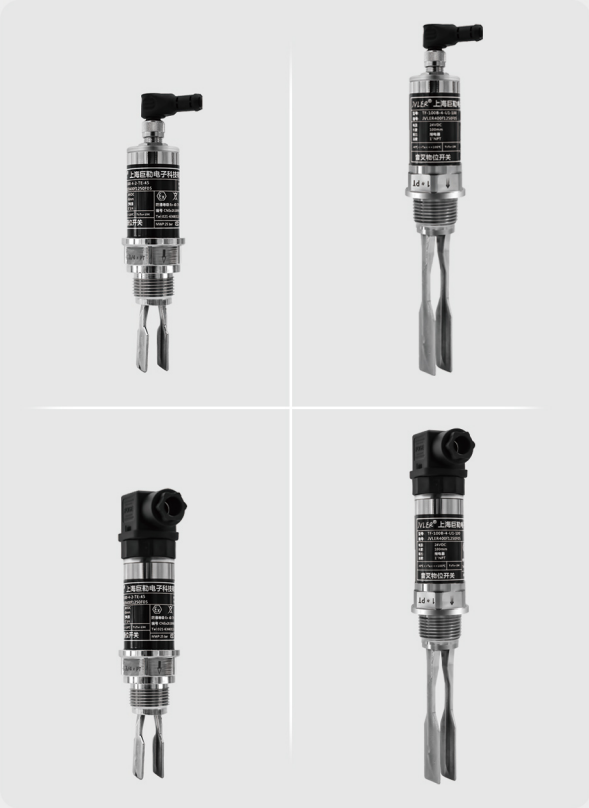
20-250V AC, 19-60V DC
- 4-wire DPDT

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7. Viscosity: 1~10000 cSt



Output Form

RELAY OUTPUT

Power Supply:

19..230V 50-60Hz +10% 18VA

19..55V (36V*) DC +10% 2W

Signal Output: Floating relay DPDT

AC max. 253V, 4A, 500VA at cos Phi = 1

DC max. 253V, 4A, 60W

max 10A

* fork (see pos.4 in price list)

PE + -

1 2

3 4 5

7 8 9

Signal Output

TRANSISTOR OUTPUT

Power Supply: 18 .. 50V DC +10% 1,5W

max4A

Signal Output: max. 0,4A

PLC, relay, contactor, bulb

PE + -

1 2 3

8/16mA

Power Supply: 12.5..36V DC +0%

Signal Output: 8mA or 16mA

PE + -

1 2

NAMUR

Power Supply: ca. 7..9 V DC

(spec. IEC 60947-5-6)

<1mA or > 2,2mA

(spec. IEC 60947-5-6)

PE + -

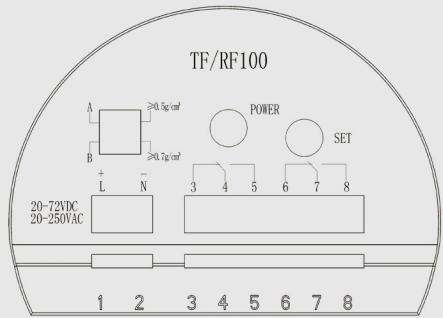
1 2

结构形式



Connection And Function

A

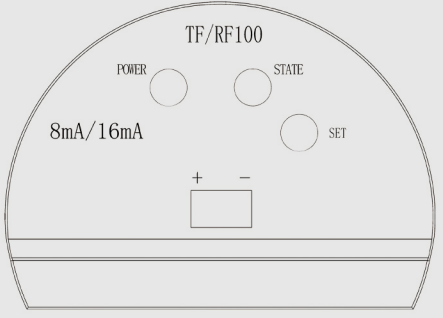


TF/RF100

20-72VDC
20-250VAC

1 2 3 4 5 6 7 8

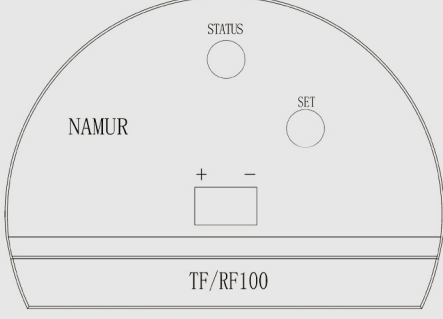
Power Supply: 20-250V AC, 19-72V DC
Signal Output: relay DPDT
POWER: The power supply is green, and the output changes to red.
Dip switch: The left dip switch is used to switch the normal operating mode of the relay, and the right dip switch is used to switch sensitivity.
SET: Self-check function, to overcome the phenomenon of vibration absorption after installation in the barrel wall, to prevent noise interference, and avoid misoperation.
Perform a functional test while the instrument is powered on. When the tuning fork is not in contact with the material, press and hold the SET button, and release the button when the red and green indicators flash alternately. After the instrument light does not flash, the self check is successful.
Sensitivity in factory setting is the highest, suitable for the stable place of the material to be measured. If there is significant fluctuation on the surface of the material to be tested, it is necessary to lower the sensitivity to prevent false alarms from occurring.
When installing the tuning fork, please try to avoid positions with obvious vibrations to prevent incorrect operation of the tuning fork. If this cannot be avoided, please retest at the installation position.



TF/RF100

8mA/16mA

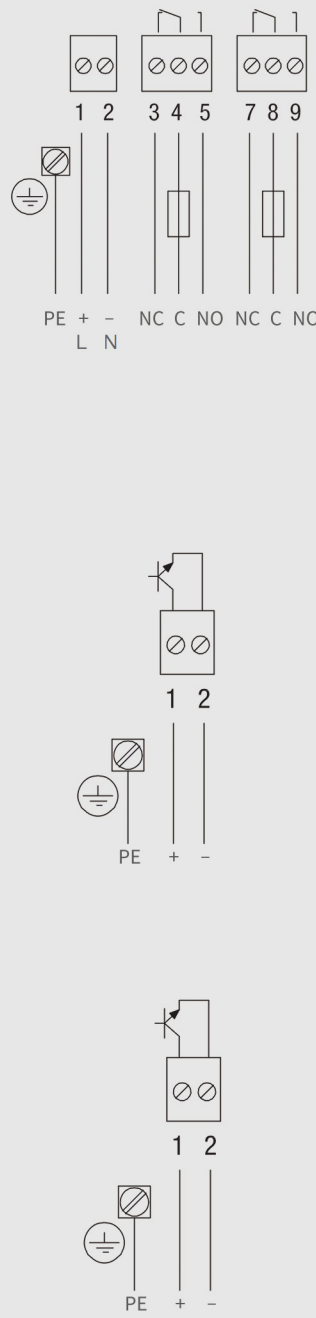
Power Supply: 12.5-30V DC
Signal Output: 8mA or 16mA
POWER: The power supply is green, and the output changes to red.
SET: The self-check function and operation are described above



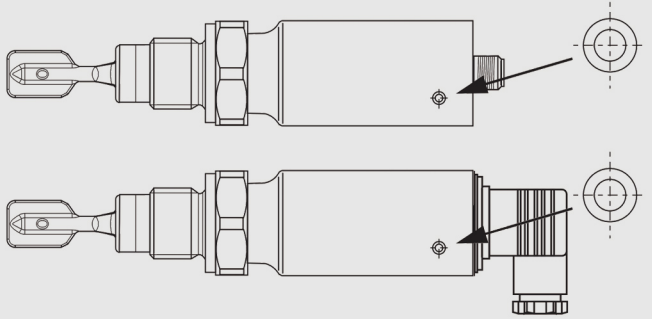
NAMUR

TF/RF100

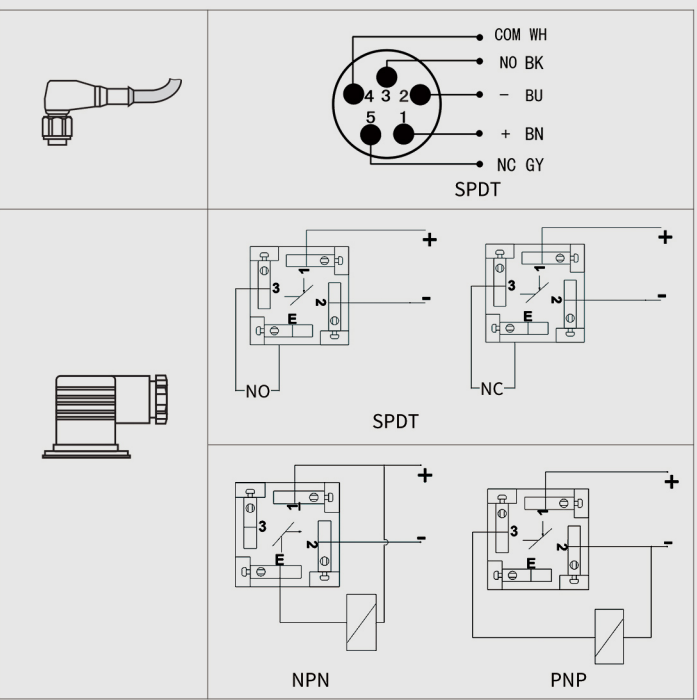
Power Supply: 8-8.2V DC
POWER: The power supply is green, and the output changes to red.
SET: The self-check function and operation are described above



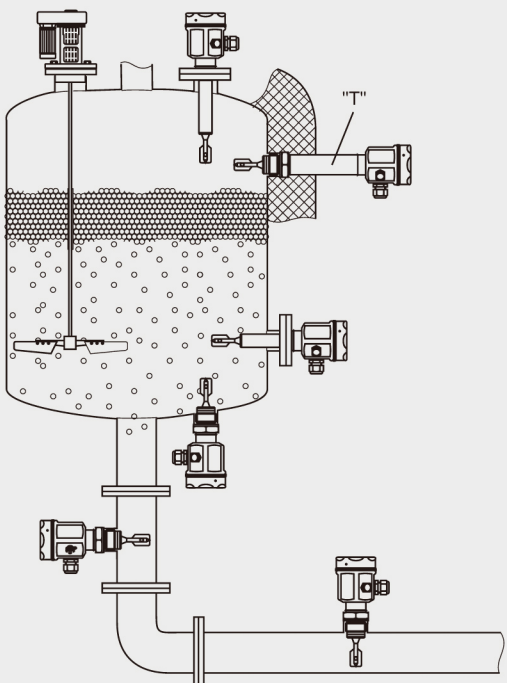
Compact Tuning Fork Switch



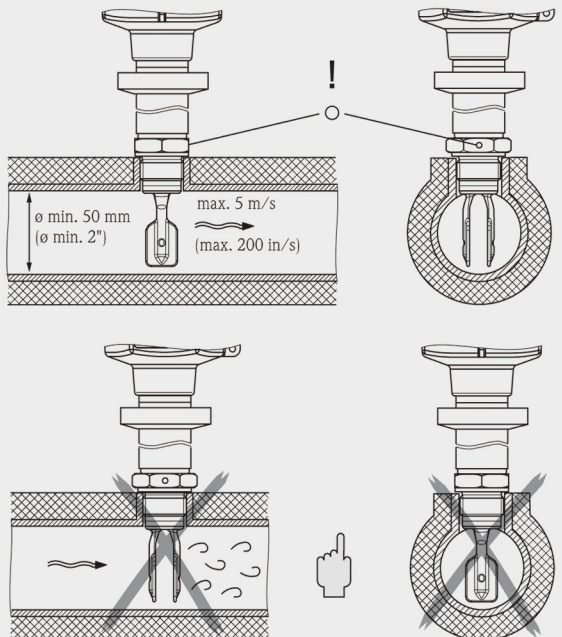
Power Supply: 10-55 V DC
Signal Output: relay DPDT/NPN/PNP
Green: indicates the power indicator
Red Light; Switch to red light on output
SET: The self-check function and operation are described above.
Perform functional testing during meter operation. Place the test magnet in the marked position on the housing and hold it for at least 3s. When the test magnet is placed on the shell mark for more than 3S, remove the magnet when the red and green indicator lights flash alternately, and the self-test is successful after the instrument light does not blink. The test magnet is a standard supply.



Installation And Precautions

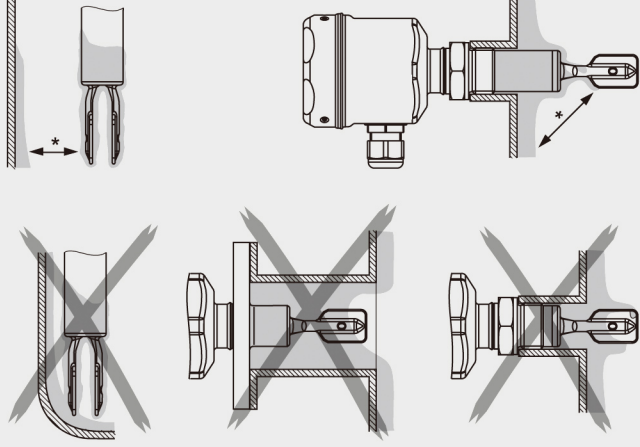


Liquid limit detection



Pipeline installation diagram

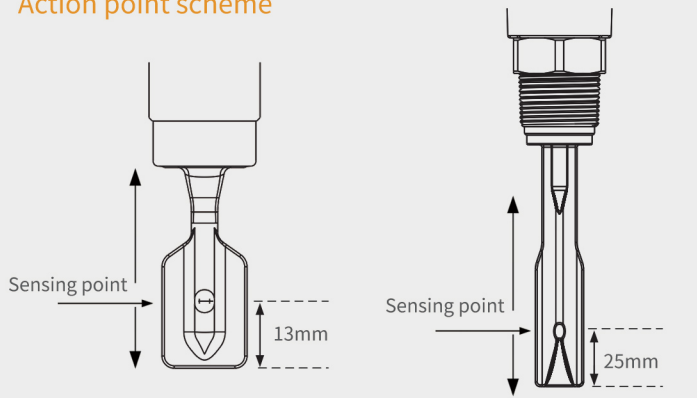
When there are external forces



Fork body pay attention to adhesion

- During installation, the switch can be installed at an Angle of 15-20 degrees horizontally downwards to reduce the impact of materials and the occurrence of hanging phenomenon.
- The installation should be far away from the inlet of the barrel tank to avoid material impact and false alarm. If unavoidable, a partition shall be installed between the feed port and the material level for protection.
- The cable inlet of the junction box must face down, and the fastening nut on the cable inlet of the power cable must be locked.
- When working in the tank, it is strictly prohibited to use vibrators to climb or hang any ropes or objects.

Action point scheme



The sensing location of the tuning fork is shown in the figure. When the object to be measured is water (specific gravity = 0.7g/cm3), the sensing point is located at the position of the groove of the tuning fork, about 13mm away from the top of the tuning fork, about 8mm when installed horizontally; If the specific gravity of the object to be measured is lower than 0.7g/cm3, the position of the sensing point will move upward; On the contrary, if the specific gravity of the object to be measured is higher than 0.7g/cm3, the position of the sensing point will move down, and the amplitude of displacement depends on the specific gravity.

Fault detection

Fault phenomenon	Cause analysis	Solution measure
non-action	unenergized	Check the power supply
	Signal line fault	Check signal line
	Electronic plug-in failure L1 and N are directly connected	Replace electronic plug-in always external load
	The liquid density is too low	Change the density setting on the electronic plug-in to > 0.5
	Fork body scaling	Cleaning fork
	The impedance of the connected relay is too high	Connect appropriate relays
	The suction current of the relay is too low	Connect a resistor in parallel to the relay
Incorrect switch	The contacts are welded together	Plus intermediate relay
	The low/high alarm loop is incorrectly set	Set the correct mode for the electronic plug-in
Accidental switch failure	Heavy foam, strong disturbance level, foam level	Install in the bypass pipe
	Extreme radio frequency interference	Use of shielded cable
	Violent vibration	With reduced vibration and increased damping, the fork rotates 90°
	Water in shell	Tighten the housing cover and cable plug
Abnormal switch	Output overload	Load reduction, (cable) tolerance
	Abnormal performance during power-on function test	The control time of blocking device after power-on failure is up to 45 seconds

※Safety knowledge

- Installation, commissioning, operation and maintenance must be carried out by qualified technicians
- Products must be used in strict accordance with the specifications of this operation manual