Ziasiot

Instructions

Tuning fork level switch

YC300

CE attestation

Please read this instruction manual carefully before installation

www.ziasiot.com
400-821-0137
info@ziasiot.com

Product Description

The tuning fork level switch is a new type of level switch. The tuning fork vibrates by crystal excitation. When the tuning fork is immersed in the material, the vibration frequency changes. This frequency rate change is detected by the electronic circuit and outputs a switch quantity.
The tuning fork of the sensor vibrates at its inherent frequency. When the tuning fork comes into contact with the liquid or other materials, its inherent vibration frequency decreases, and the energy is consumed in the friction between the material particles, forcing the amplitude to sharply decline and stop vibrating. The change in frequency activates the liquid level on and off, generating an on-off signal. The "tuning fork type level switch" can be used in situations where the float ball level switch cannot be used due to structural, turbulent, churning, bubble, vibration and other reasons. As the tuning fork level switch has no moving parts, it requires no maintenance or adjustment and is an upgraded version of the float level switch.

Product Features

- Strong adaptability: Different electrical parameters and densities of the measured liquid level have no impact on the measurement. Harsh conditions such as structure, agitation, turbulence, bubbles, vibration, medium viscosity, high temperature and high pressure have no effect on the detection either.
- Maintenance-free: As the detection process of the tuning fork limit switch is completed by an electronic circuit and has no moving parts, it does not require maintenance once installed and put into operation.
- No calibration required: As the detection of the tuning fork limit switch is not affected by the electrical parameters and density of the measured medium, no on-site calibration is needed regardless of the liquid level/material level being measured.

Working principle

Based on whether the material has resistance to the tuning fork during vibration, it can detect whether the material level has reached or exceeded a certain height and issue a on-off signal. This principle does not require large-scale mechanical movement, has a small driving power, does not need calibration, and can be started quickly and at a low cost. It has a simple structure, no mechanical moving parts, no maintenance, no wear, a long operating life, and is sensitive and reliable.

Application field

Tuning fork level switches are widely used in industries such as petrochemical, light industry, food, and water treatment to provide upper and lower limit alarm and control for the level. The specific application scenarios are as follows:

In the chemical industry, tuning fork level switches are mainly used to measure the height of chemical liquids, for liquid level control and alarm. In addition, it can also be used to measure the flow rate of the medium in pipelines. Petroleum industry: It is used to measure the height changes of the media inside storage tanks for oil, natural gas, etc., and can also be used to detect the flow in pipelines, providing precise control means for petroleum production and storage.

Food industry: It is applied to liquid level monitoring in containers such as tanks, troughs and barrels in the food industry, such as beverage manufacturing, juice production, milk processing, etc.

Papermaking industry: Mainly used for measuring liquid levels and pulp levels, etc.

In the sewage treatment industry, tuning fork level switches are used to monitor the liquid level in sewage tanks or sedimentation tanks. When the liquid level reaches a certain height, the switch will send a signal to trigger control actions such as drainage, maintaining the normal operation of the system.

Drinking water supply system: In the water tank or water tower, the tuning fork level switch monitors the water level. When the water level is too low, it triggers the water pump to start, ensuring the normal water demand of residents. Pharmaceutical industry: It can be applied to liquid level monitoring of pharmaceutical equipment, such as filters, reactors, metering tanks, etc.

Product series

1 YC300 Standard thread type

2 YC300 Standard flange type

3 YC300C Standard thread small fork type

4 YC300 Standard clamp type

5 YC300B Threaded large tuning fork

6 YC300 Threaded extended type

7 YC300 High-temperature thread type

8 YC300 High-temperature flange type

9 YC300 Ptfe anti-corrosion type

10 YC300 Split tuning fork

11 YC300 All-stainless steel type

12 YC301Standard aviation type

13 YC301 Aviation high-temperature type

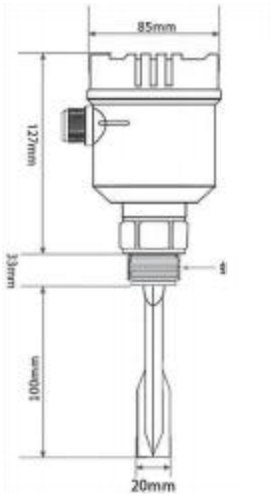
14 YC301B Standard Hirschmann type

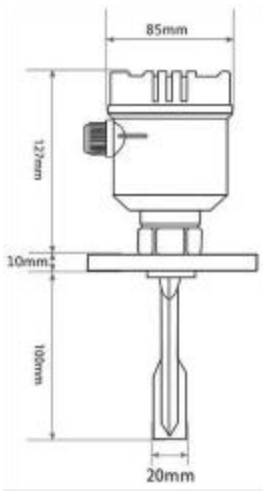
15 YC301B Hesman high-temperature type

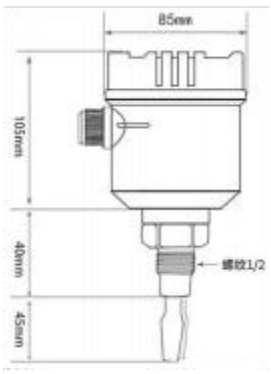
16 YC301BS Hirschmann 45mm small fork model

17 YC301S 45mm small fork type for aviation

External dimensions drawing (for reference)



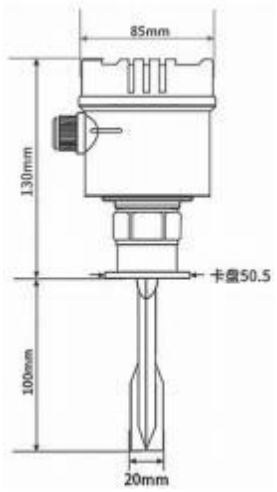




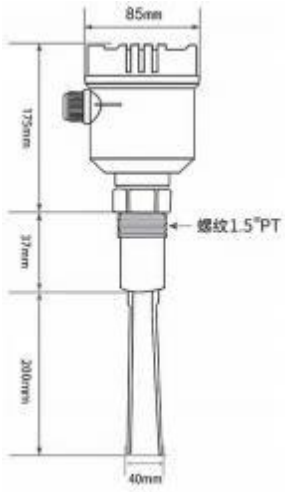
1 YC300 Standard thread type

2 YC300 Standard flange type

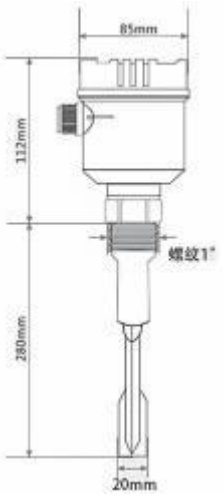
3 YC300C Standard thread small fork type



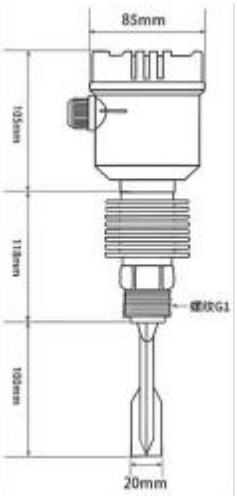
4 YC300 Standard clamp type



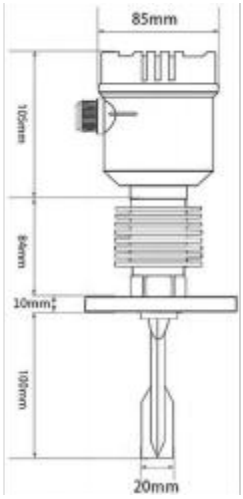
5 YC300B Threaded large tuning fork



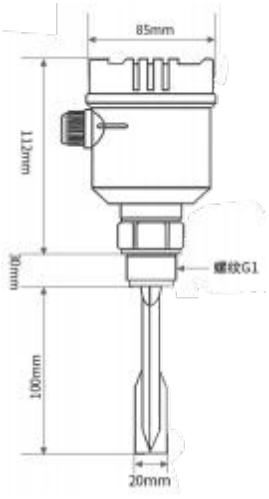
6 YC300 Threaded extended type



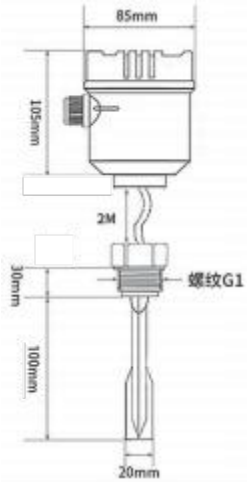
7 YC300 High-temperature thread type



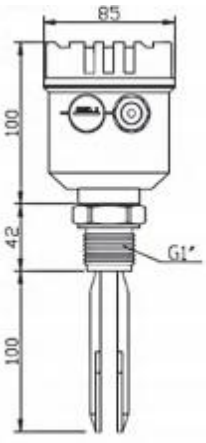
8 YC300 High-temperature flange type



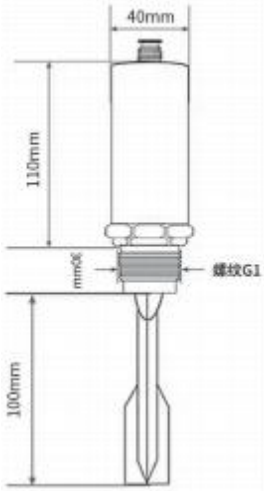
9 YC300 Ptfe anti-corrosion type



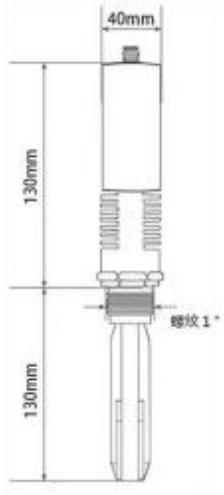
10 YC300 Split tuning fork



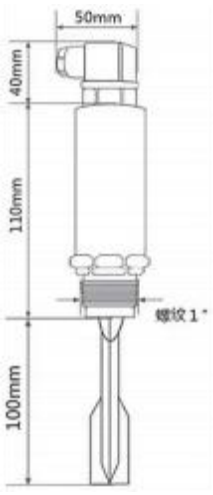
11 YC300 All-stainless steel type



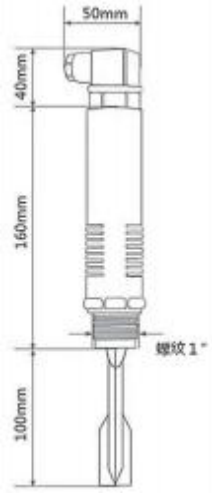
12 YC301Standard aviation type



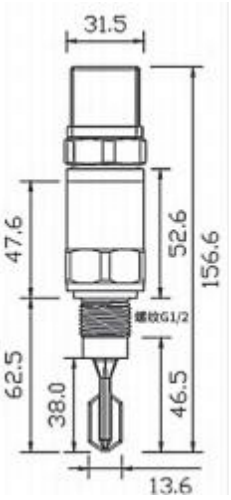
13 YC301 Aviation high-temperature type



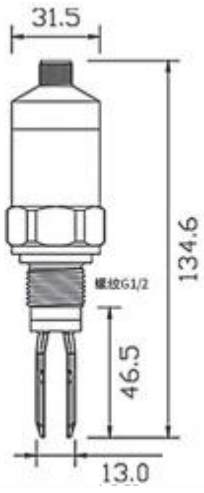
14 YC301B Standard Hirschmann type



15 YC301B Hesman high-temperature type



16 YC301BS Hirschmann 45mm small fork model



17 YC301S 45mm small fork type for aviation

Technical parameters

Power supply voltage	20…60VDC 20…250VDC 50/60Hz
Switching time	It takes about 2 seconds when covered by a medium and about 3 seconds when there is no medium
Ambient temperature	-40…+70℃
Storage temperature	-40…+85℃
Medium temperature	-40…+150℃
Operating pressure	-1…+40bar
Tested material	Powder and granules =10mm, density >0.1g/cm ^{3}; Liquid, viscosity = 10,000 mm ^{2} /s, density >0.7g/cm^3

Connection method	G1-1/2"G1"
Electrical interface	M12×P1.0 connector
Shell material	Aluminum alloy/stainless steel
Fork body material	Stainless steel S304/ Stainless steel S316
Output mode	Relay output, negative AC250V/4A,DC60V/4A Collector open circuit (NPN) output, negative 400mA Collector open circuit (PNP) output, negative 400mA
Power consumption	When powered by DC, the maximum power is 3W; when powered by AC, the maximum power is 15W

Installation diagram (for reference)

1. Correct installation method

A. Top-mounted, with the probe pointing vertically downward, it can be installed at any position on the top (away from the feed port).

B. Install horizontally, with the probe tilted downward by 15 to 20 degrees to reduce the impact of materials and the occurrence of material adhesion.

C. Horizontally installed, the probe is inclined downward by 15-20 degrees. There is a baffle above the material level switch [approximately 10 "(250mm) in length and 8" (200mm) in width], which can prevent improper accumulation of materials around the material level switch and reduce the impact of materials on the material level switch.

D. Installed in the discharge hopper, the maximum distance between the bottom end of the screw thread of the material level switch and the bucket wall does not exceed 2.4 "(60mm), which can prevent false alarms caused by improper accumulation of materials.

2. Incorrect installation:

A. Horizontally installed below the filling wall or the feed inlet;

B. Incorrect installation Angle (The surface of the probe is subjected to high load pressure during feeding and discharging.

And it is prone to malfunction;

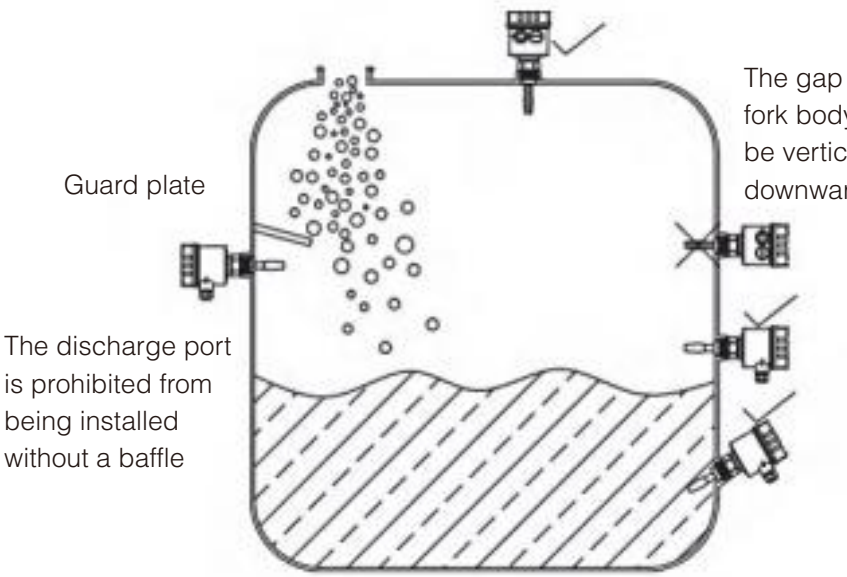
If the distance between the bottom end of the screw thread of the material level switch and the barrel wall exceeds 2.4 "(60mm), the material level switch will not work properly.

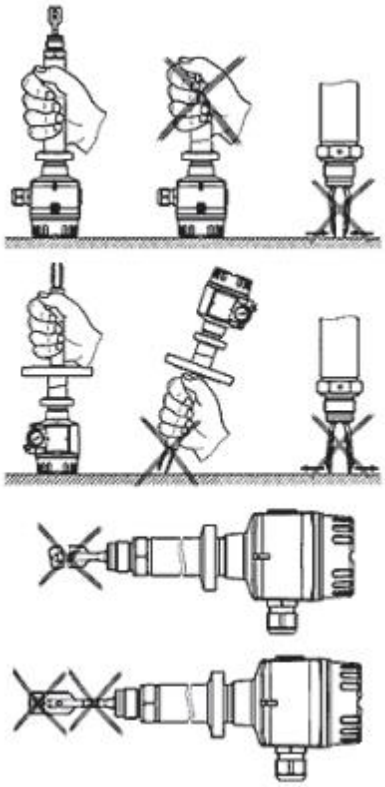
Notes:

When installing tuning forks, please try to avoid positions with obvious vibrations to prevent misoperation. If it is unavoidable, please re-check at the installation position or restore the factory Settings. Allowed: Hold the insulation pipe, extension pipe, flange or thread.

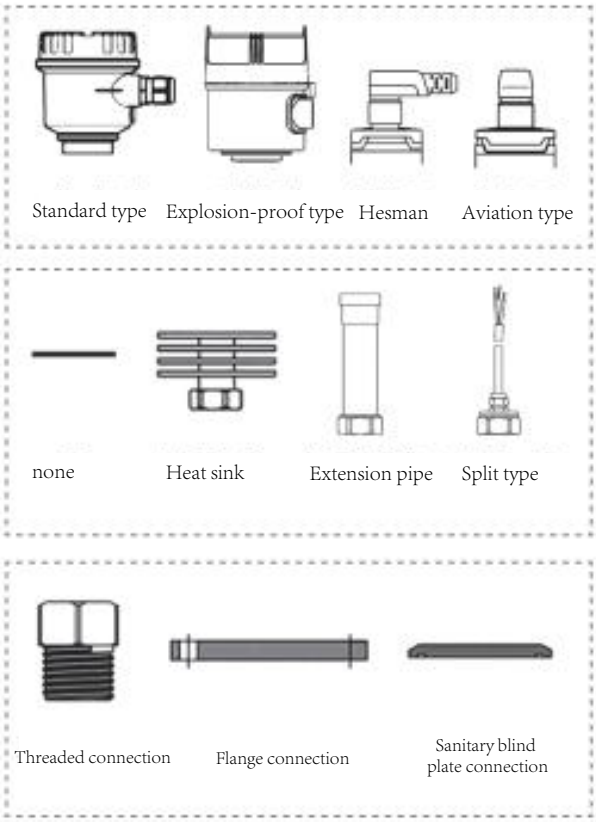
Prohibit: Damaging the vibrating rod, bending the vibrating rod, stretching the vibrating rod, shortening the vibrating rod, lengthening the vibrating rod, and the vibrating rod coming into contact with hard objects.

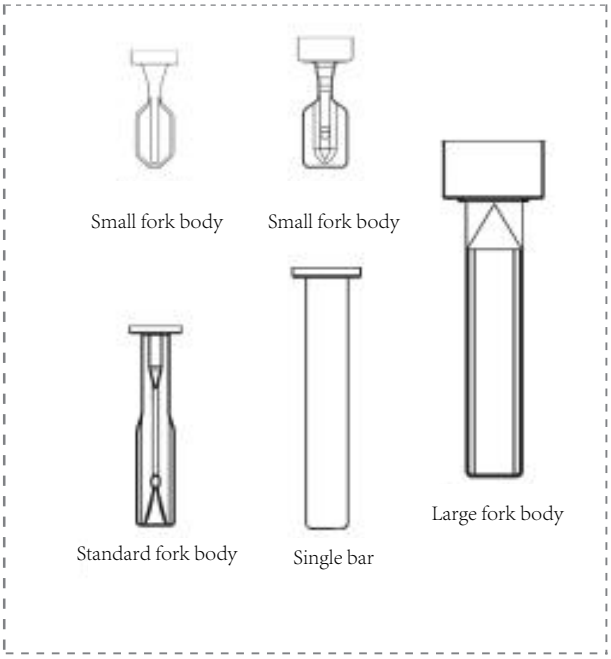
Seal with raw tape and tighten the hexagonal bolts with a wrench. Do not tighten by rotating the casing





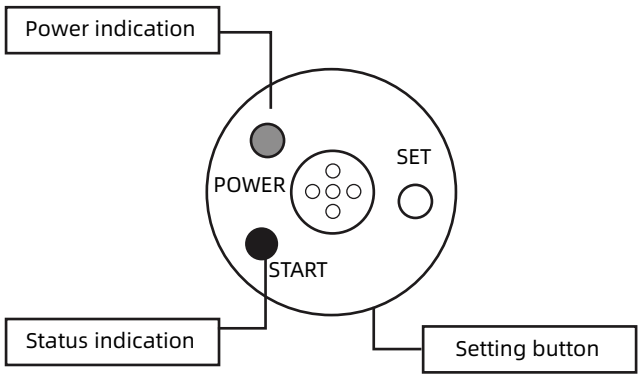
Installation diagram (for reference)

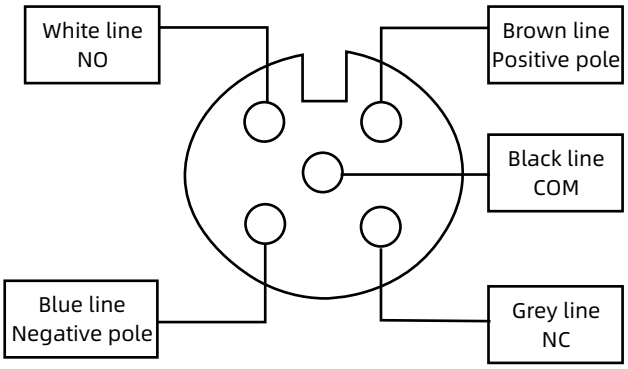




Output mode

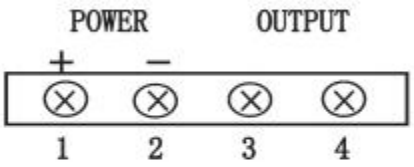
- Aviation joint





• Hesman

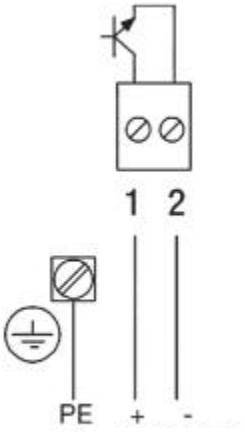
Electrical wiring diagram



1: It is the positive power supply
2: It is the negative of the power supply
3: For output
4: They are collinear

• 8/16mA

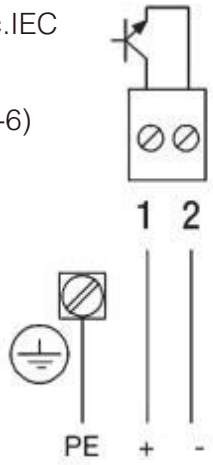
Power supply voltage :12.5... 36VDC+0%
Signal output :8mAor16mA



Power supply voltage

• NAMUR

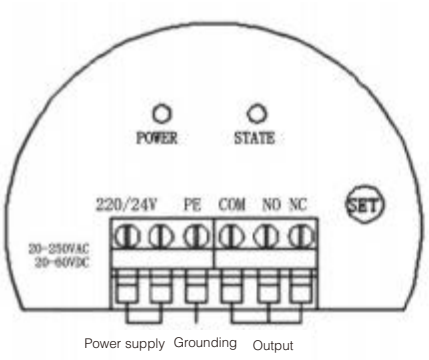
Supply voltage :ca.7... 9VDC
intrinsically safe type (spec.IEC 60947-5-6)<1mAor
>2,2mA(spec.IEC 60947-5-6)

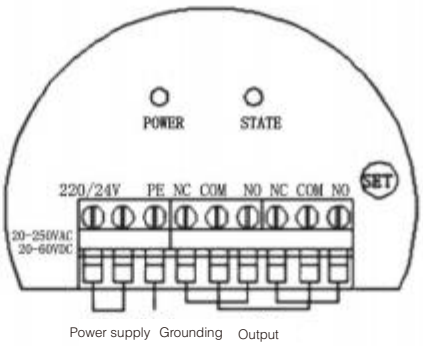


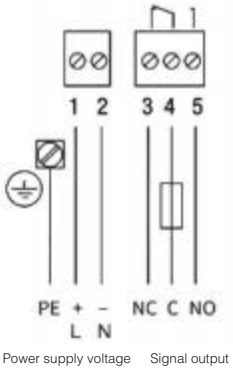
Power supply voltage

Wiring and function introduction

- A Electronic plug-in







Supply voltage: 20-250VAC, 19-72VDC

Signal output: relay DPDT

POWER: The power supply is green, and it switches to red when outputting.

Dial: The left dial is used to switch the normal operating mode of the relay, and the right dial is used to convert the sensitivity.

SET: Self-checking function, overcomes the vibration absorption phenomenon that occurs after installation on the bucket wall, prevents noise interference, and avoids misoperation.

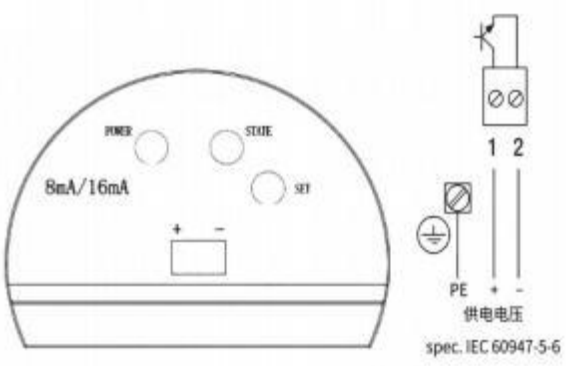
Conduct functional tests when the instrument is powered on. When the tuning fork is not in contact with the material, hold down the SET key. Release the key when the red and green indicator lights alternate. Wait until the instrument light stops flashing

The post-mortem self-check was successful.

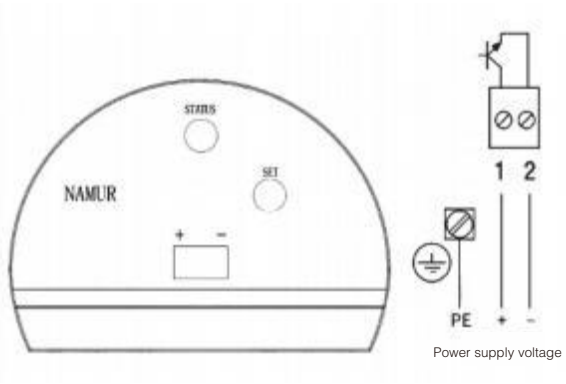
The sensitivity is set to the highest at the factory and is suitable for places where the material to be tested is relatively stable. If the surface fluctuation of the material to be tested is large, the sensitivity needs to be reduced to prevent it from happening

False alarm situations. When installing the tuning fork, please try to avoid positions with obvious vibration to prevent incorrect operation of the tuning fork. If it is unavoidable, please re-check at the installation position.

- B Electronic plug-in



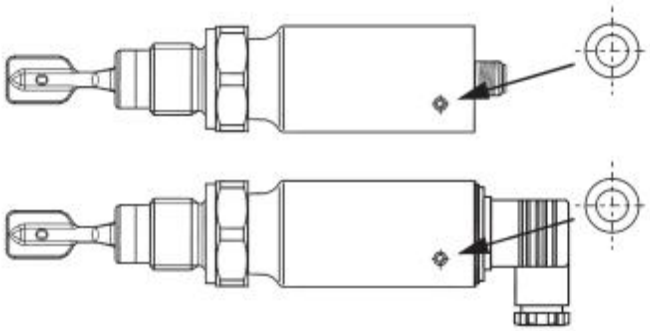
• C Electronic plug-in



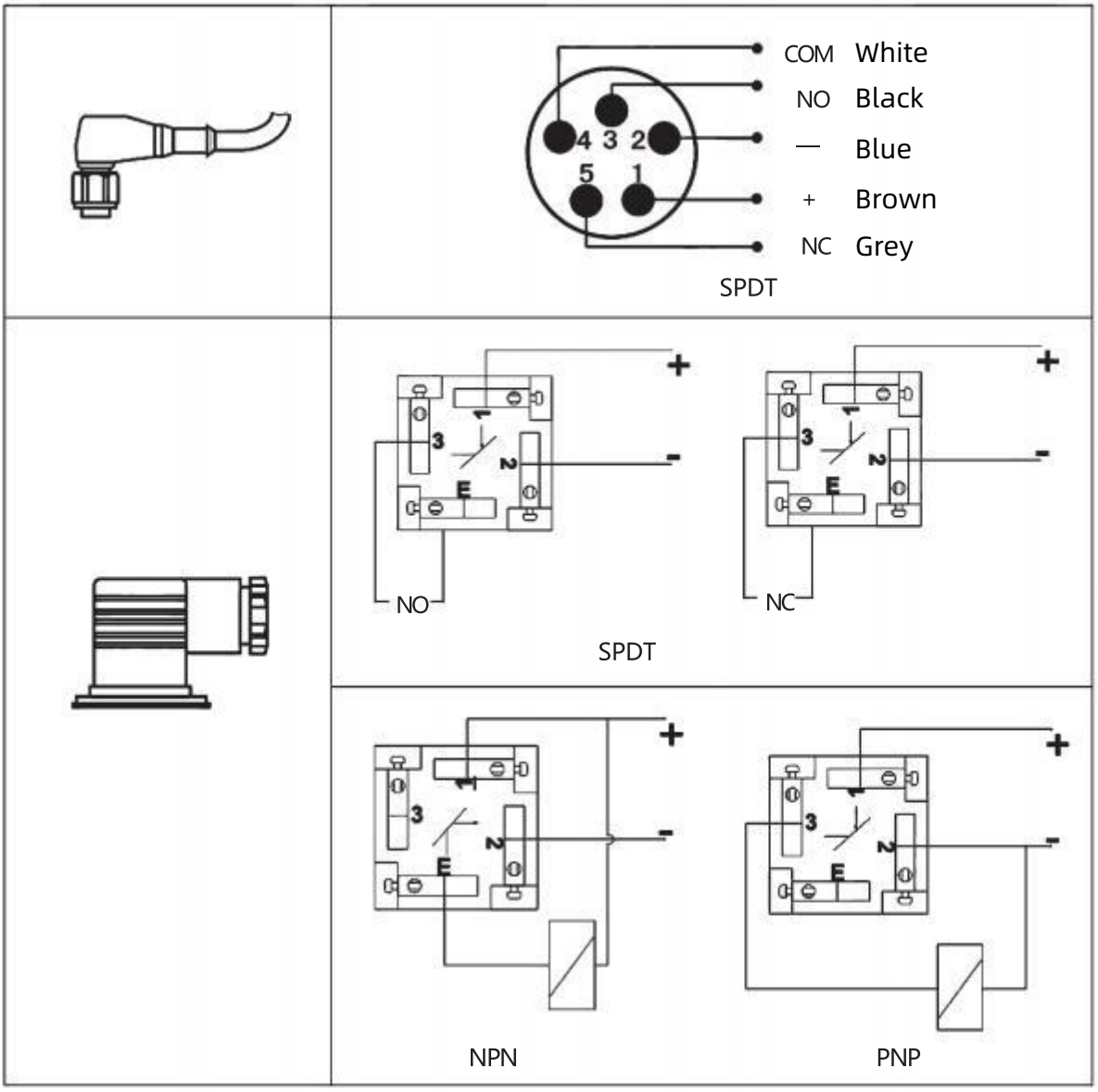
Power supply voltage

Supply voltage: 12.5-30V DC
Signal output: 8mA or 16mA
POWER: The power indicator is green, and STATE: It switches to red when outputting.
SET: Self-checking function, overcomes the vibration absorption phenomenon that occurs after installation on the bucket wall, prevents noise interference, and avoids misoperation. Conduct functional tests when the instrument is powered on. When the tuning fork is not in contact with the material, hold down the SET key. Release the key when the red and green indicator lights alternate. The self-check is successful after the instrument light stops flashing. The sensitivity is set to the highest at the factory and is suitable for places where the material to be tested is relatively stable. If the surface fluctuation of the material to be tested is large, the sensitivity needs to be reduced to prevent false alarms. When installing the tuning fork, please try to avoid positions with obvious vibration to prevent incorrect operation of the tuning fork. If it is unavoidable, please re-check at the installation position.

• A Panel



Supply voltage: 10-55VDC
Signal output: relay DPDT/NPN/PNP
Green light: Power indicator light
Red light: Converts to red light when outputting
Self-check function: Overcome the vibration absorption phenomenon that occurs after installation on the bucket wall, prevent noise interference, and avoid misoperation. The sensitivity is set to the highest at the factory and is suitable for places where the material to be tested is relatively stable. If the surface fluctuation of the material to be tested is large, the sensitivity needs to be reduced to prevent false alarms. When installing the tuning fork, please try to avoid positions with obvious vibration to prevent incorrect operation of the tuning fork. If it is unavoidable, please re-check at the installation position. Conduct functional tests during the operation of the instrument. Place the test magnet at the marked position on the housing and keep it for at least 3 seconds. When the test magnet is placed on the marking of the shell for more than 3 seconds, remove the magnet when the red and green indicator lights flash alternately. The self-check is successful after the instrument light stops flashing. The test magnet is a standard supply



Selection example

Example: ZP-YC300-S1NXL4Y114300, standard threaded tuning fork, G1" threaded installation (standard), temperature -20~80℃, dual power supply, aluminum alloy junction box, stainless steel SUS304 fork body material, integrated, standard fork body (100mm), single-pole switch, four-wire system, range 300mm.

Selection table

Model	Product name
ZP-YC( )	Tuning fork level switch

Code	Tuning fork structure form
300	Standard threaded tuning fork
300B	Standard large tuning fork
300C	Standard small tuning fork
301	Standard aviation tuning fork
301B	Standard Hirschmann tuning fork
301BS	Mini Hirschmann tuning fork
301S	Mini aviation tuning fork

Code	Process connection
S0	G1/2" threaded installation
S1	G1" Threaded Installation (Standard)
S2	1"NPT thread installation
S2	G1-1/2" threaded installation
F5	DN25 flange connection
F6	DN50 flange connection
T	Clamp connection
Y	Customizable

Code	Temperature range
N	-20~80℃
T	-20~170℃
H	Within 250 ℃

Code	Power supply
A	220VAC
D	24VDC
X	Dual power supply
Y	Customizable

Code	Junction box
L	Aluminum alloy
H	Hirschmann connector
A	Aviation plug
4	Stainless steel SUS304
6	Stainless steel SUS316

Code	Fork body material
4	Stainless steel SUS304
6	Stainless steel SUS316L
F	Stainless steel coated with PTFE

Code	External structure
Y	Integrated type
F	Split type

	Code	Fork structure		
	1	Standard fork type (100mm)		
	2	Large fork type (170mm)		
	3	Mini fork type (45mm)		
		Code	Switch form	
		1	Single-pole switch	
		2	Double-pole switch	
			Code	Wiring method
			2	Two-wire 8V/ NAMUR
			3	Two-wire 24V intrinsically safe signal (8/16mA)
			4	Four-wire system
			5	PNP output
			6	NPN output
				Code / Range of measurement
				xxxx / mm (Choose the range according to your own needs)