



上海思派电子科技有限公司

SHANGHAI SPES ELECTRONIC TECHNOLOGY CO.,LTD.

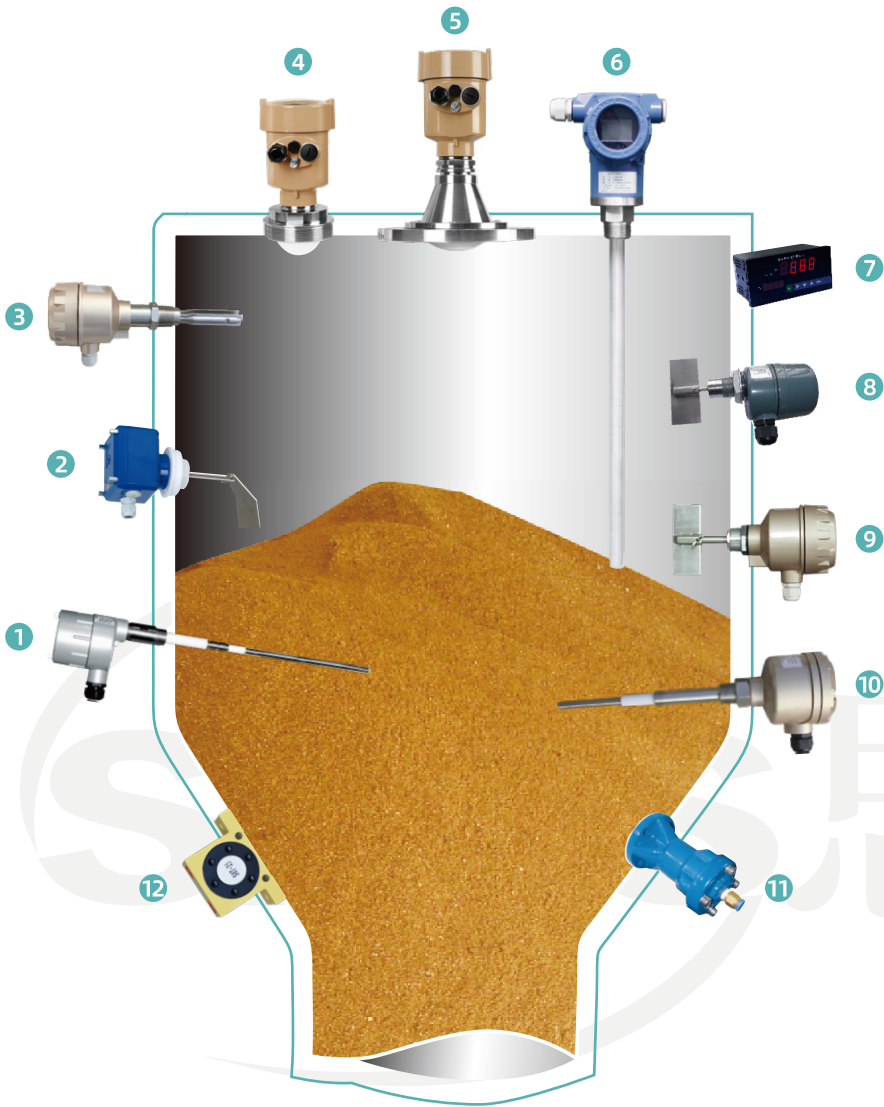
Selection Catalogue of Capacitance / RF Admittance Level Sensor



ISO9001:2015 CE



MATERIAL LOCATION



- 1. RF Admittance Level Switch
- 2. Rotary Paddle Level Switch
- 3. Tuning Fork Level Switch
- 4. Radar Level Meter
- 5. Radar Level Meter
- 6. RF Admittance Level Gauge
- 7. Intelligent Digital Displayer
- 8. Small Rotary Paddle Level Switch
- 9. Rotary Paddle Level Switch
- 10. Capacitance Level Switch
- 11. Pneumatic Hammer
- 12. Pneumatic Vibrator

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COMPANY INTRODUCTION



Shanghai SPES Electronic Technology Co., Ltd.

(<https://www.spes.com.cn>) was founded in January, 2003 with a registered fund of 10.1 million Yuan, which is a professional high-tech private company specializing in R&D, production, and sales of various level meters. At the very beginning of establishment, SPES has gathered a group of professionals and managerial personnel, and brought together many senior engineers. Their R&D experience of automation instruments guaranteed the quality and excellent performances of products.

SPES has won international certificates such as ISO, CE, and SIL, as well as anti-explosion and metrology certificates, specializing in the production of level switches, RF admittance sensors, capacitance sensors, radar level meters, magnetic level indicators, float switches, and temperature/pressure/differential pressure instruments. Our comprehensive product portfolio caters to diverse industrial applications across chemical processing, pharmaceuticals, new energy, grain & oils, environmental power, feed production, cement, plastics, and construction machinery sectors. Widely distributed across domestic and global markets, we serve as a trusted supplier to Fortune 500 companies including SANY Heavy Industry, CNPC, and CSSC, having earned the distinction of "Outstanding Supplier" from our clients.

SPES has established offices and branch subsidiaries in multiple locations, including Guangzhou and Chengdu, and has actively participated in international exhibitions such as the Hannover Messe in Germany. Adhering to the principles of innovation, pragmatism, and professionalism, Shanghai SPES maintains an open global vision and a keen industry insight, delivering cutting-edge technology, high-quality products, and efficient services to both domestic and international clients.

COMPANY SCENES



Head Office



Laser Welding



CNC Machine



Testing Room



Pressure Automatic Calibration Aging Workshop



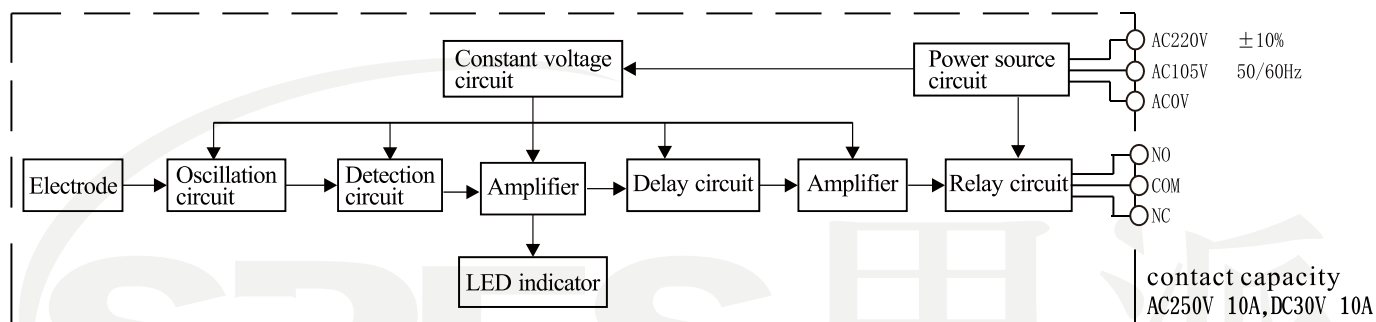
Certificates



CAPACITANCE LEVEL SWITCH

Working Principle

The probe (induction pole) of the level switch and the container wall (earth ground) are used as the two polar plates of the capacitor. As the medium between the two plates changes, the capacitance changes accordingly. The special analyzing and processing unit of the level switch detects the range of changes. When the change is up to the set value of the switch, it is converted into switch signal output for control. In this way, it further reflects the height of the measured medium or the liquid level.



Technical Specification

- **Power Supply:** 220VAC/110VAC, 24VAC/24VDC
- **Contact Capacity:** 250VAC/10A, DC30V/10A, SPDT
- **Power:** 4.5W
- **Time Delay:** Adjustable 0~10s
- **Working Temperature:** -25°C~70°C
- **Protection Grade:** IP65
- **Medium Temperature:** Standard Type: -25°C~80°C High-temperature Type: max 200°C Ultrahigh Temperature Type: max 1000°C

Features

- ▲ Stable measurement of adhesive media;
- ▲ Applicable to both conductive and non-conductive media;
- ▲ Convenient for detecting strong corrosive liquids;
- ▲ Strong mechanical properties without movable parts;
- ▲ Easy installation with simple adjustment.

Application

Liquid: Various kinds of solvents, fuels, water, pure water and etc.

Interface: Water-oil interface, water and sediments in water, foam, washing water and etc.

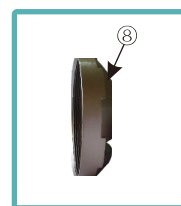
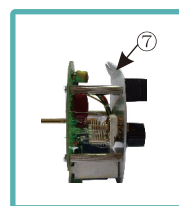
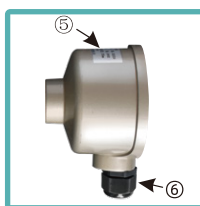
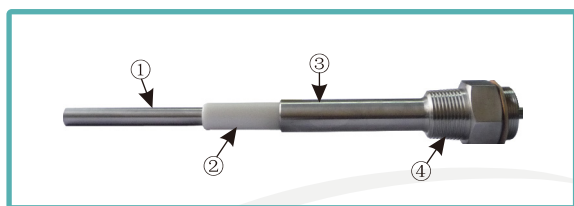
Particles: Feed, medicine, plastic particles and etc.

Mixed Liquid: Plant effluent, sewage, domestic sewage, water and etc.

Powder: Dust, mud with sand, wheat flour, sugar, rice flour, lime powder, cement and etc.

Lump: Coal, stone, ore and etc.

Structure Diagram



① Induction Pole: SUS304/SUS316L

② Insulator: UPE/PTFE

③ Earth Ground: SUS304/SUS316L

④ Screw Connection: SUS304/SUS316L (Standard: 1" PT)

⑤ Junction Box: Aluminum alloy coated with paint

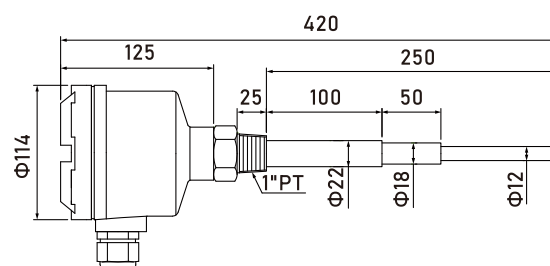
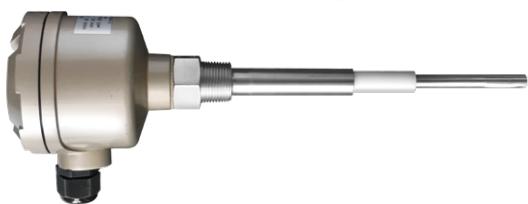
⑥ Outlet Interface: G3/4"

⑦ Circuit Board

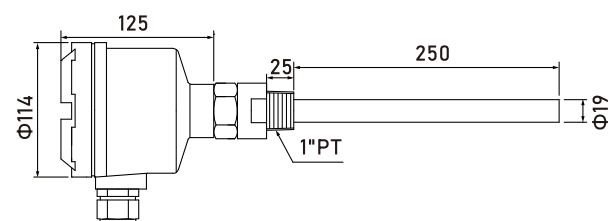
⑧ Junction Box Cover: Aluminum alloy coated with paint

Model

| SE-10 |

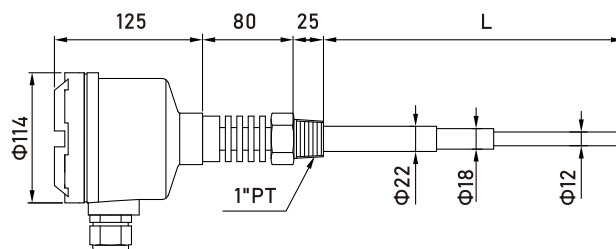
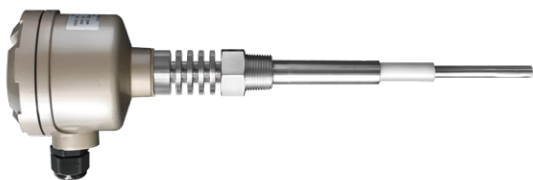


SE-11

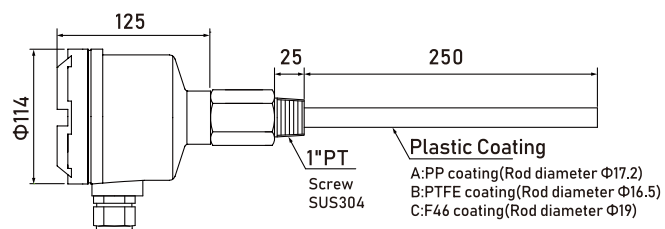


Model

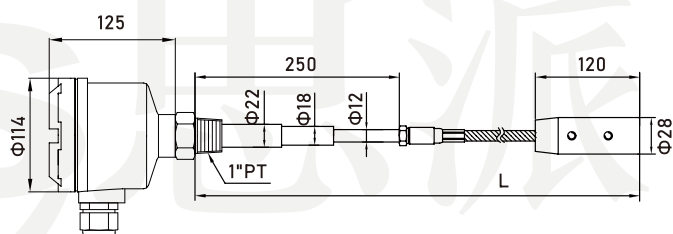
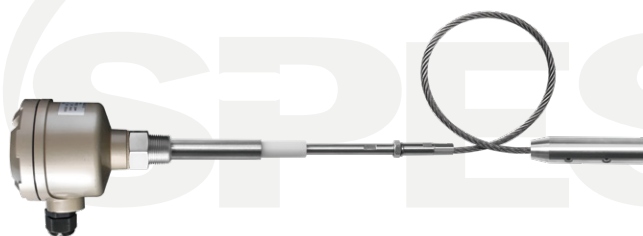
| SE-12 |



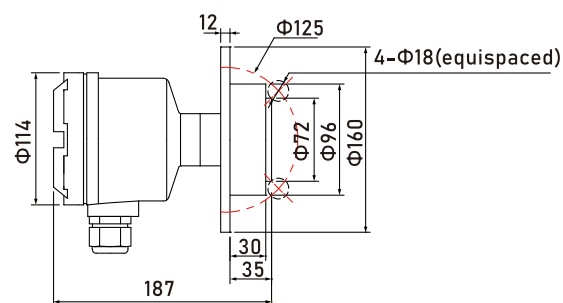
| SE-13 |



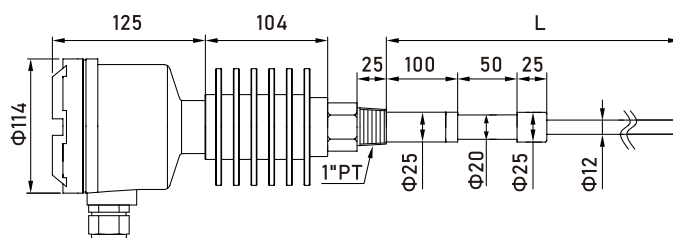
| SE-20 |



| SE-30 |



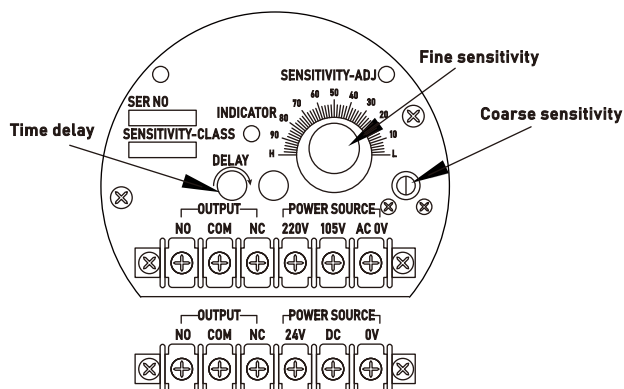
| SE-40 |



Capacitance SE

Sensitivity Adjustment

Connection Diagram



Selection Guide

SE- -

Coated Material

A: PP B: PTFE C: F46 X: Others

Total Length

Unit: mm

Power Supply

A: 220VAC/110VAC B: 24VAC/24VDC

Connection Method

F: Flange S: Screw C: Chuck

X: Others(Note for detailed specification)

Probe Type (For Type 11 and Type 13, selection is required.)

10. Rod type(standard is 250mm)

13. Rod type anti probe covered with plastic

20. Wire type

22. High temperature wire type(Max 200°C)

40. Special high temperature type

11. Coated rod type

12. High temperature rod type(Max 200°C)

21. Coated wire type

30. Flat type(only for flange connection)

50. Specially customized probe

RF ADMITTANCE LEVEL SWITCH L-2000D

Working Principle

RF Admittance Level Controller is developed based on the introduced RF technology. It is an anti-adhesion, more reliable and more applicable level controller, which is anti-adhesion and more reliable with wide application. With high frequency radio waves applied to the probe, the conductance value formed together by the probe, the admittance wall and the measured materials changes accordingly when the position of the material changes. Once the electric circuit detects this change, the analyzing and processing unit of the instrument makes constant analysis to recognize the change of the surrounding environment (material level), and then converts this change into related output signals for long-distance control or alarm. The unique electric circuit design based on the equipotential principle enables the measured circuit to eliminate any impact on detection by the material adhering on the probe, thus correctly reflecting the actual material level rather than the accumulated materials that adhere on the probe.



Technical Specification

- **Power Supply:** 220VAC/110VAC/24VAC/24VDC
- **Power:** 3W
- **Relay Output:** 5A/240VAC, DPDT
- **Sensitivity:** 0.3pf-750pf
- **Probe Material:** SUS304/SUS316L, Teflon
- **Environmental Temperature:** -40°C~80°C
- **Time Delay:** Adjustable 0~30s
- **Working Temperature:** -40°C~250°C(Ultra-high Temperature up to 1000°C)
- **Electrical Interface:** 3/4"NPT

Features

- ▲ **Wide Application:** Application for the detection on flying ash, particles, powders, liquids, and adhesive, conductive or non-conductive materials.
- ▲ **Anti-adhesion:** Unique electric circuit design to enable the measuring circuit to neglect the accumulated materials on the probe and conduct automatic readjustment.
- ▲ **Separate Probe:** Separable probe and controller without cable connection to facilitate disassembly, and installation without influence on the work site.
- ▲ **Powerful Function:** Huge output contact capacity with an indicator to show the work status and 0 to 30 seconds time delay to eliminate the influences from the medium's fluctuation.
- ▲ **Power-off Protection:** Normally open or normally close(which can be switched on site).

Selection Guide

L-2000D-□□□-□-□□□

Explosion-proof

No explosion proof unless Ex is selected

Temperature

N: 125°C T: 250°C H: Special high temperature

Probe Length

Self-selected by customer, 450mm for standard length, max 2.5m for rod probe type, max 20m for cable probe length.

Anti-adhesive Pole Length of the Probe

Self-selected by customer, 110mm for standard length, it should jut out at least 50mm from adhesive materials in tank container wall.

Probe Type

A1. Standard rod type

A2. Ultra-shot rod type

A3. High temperature rod type

A4. Covered rod type

A5. Covered rod type (probe only)

B1. Steel cable

B2. Coated cable type

C1. Special high temperature

D1. Flat Type

X. Specially customized

Power Supply

A: 220VAC

B: 110VAC

C: 24VAC

D: 24VDC

E: Special

Connection Method

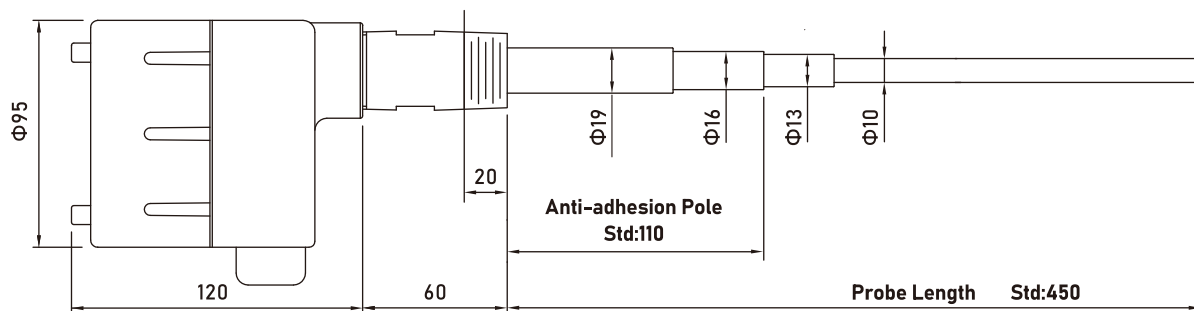
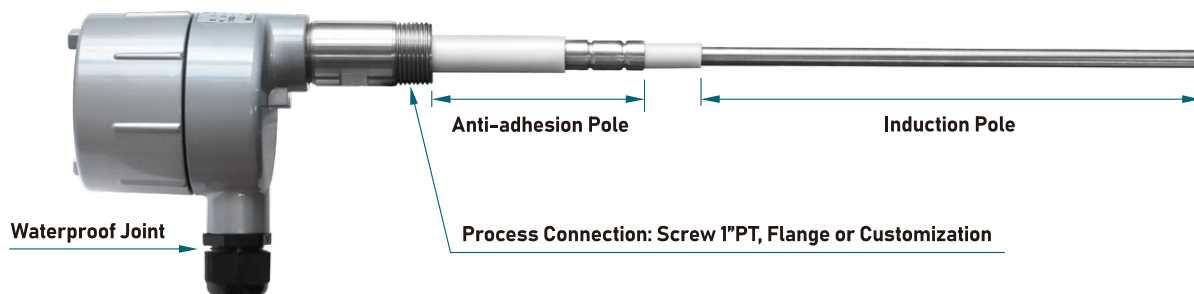
F: Flange

S: Screw

C: Chuck

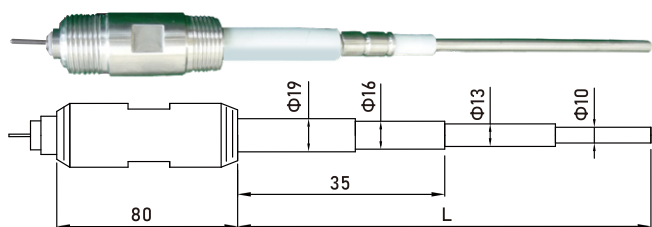
X: Others(Note for detailed specification)

Standard Rod Type Probe A1



Probe Model

Ultra-short Probe A2

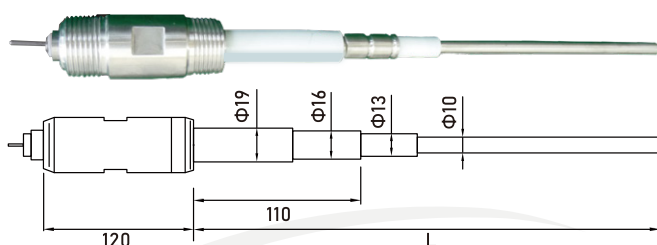


The part of the probe into the tank is very short, suitable for small hoppers, tanks and other places with limited space by top mounting or side mounting.

Maximum Working Temperature: 150°C

Probe Material: SUS304/316L, PTFE

High Temperature Rod Probe A3

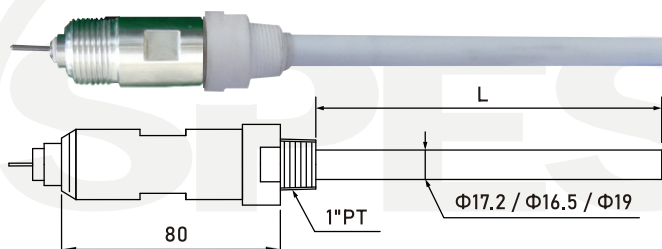


This kind of probe applies in deep or thick containers, hoppers or heat insulating layers to detect the low material level by top mounting or side mounting.

Maximum Working Temperature: 250°C

Probe Material: SUS304/316L, PTFE

Covered Rod Type A4

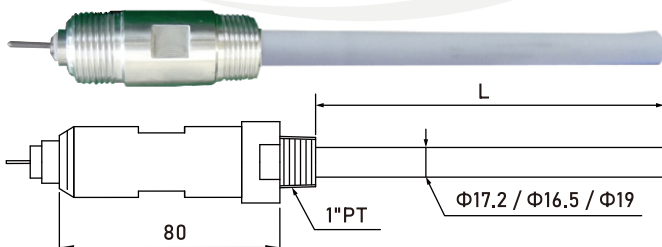


This probe is suitable for various containers and is corrosion-resistant.

Maximum Working Temperature: 80°C/200°C

Probe Material: Covered PP, PTFE, Other

Covered Rod Type (Probe only) A5

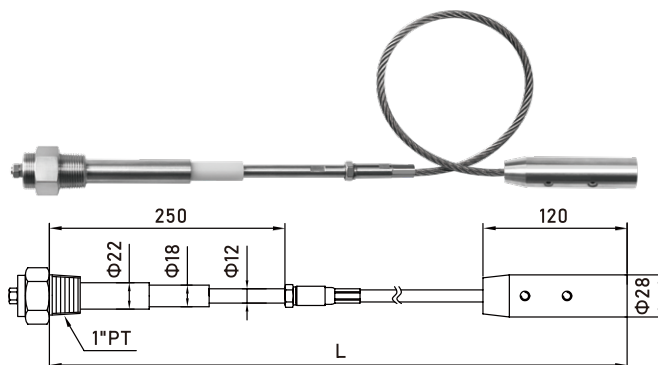


This probe is suitable for various containers and is corrosion-resistant. It is recommended for measuring solids.

Maximum Working Temperature: 80°C/200°C

Probe Material: Covered PP, PTFE, Other

Standard Cable Probe B1



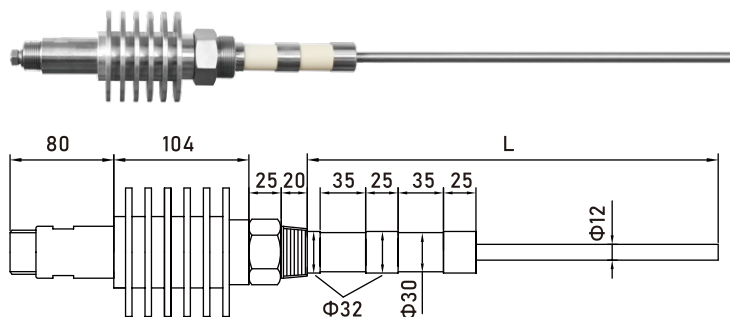
The part of the probe into the tank is very long, suitable for tall hoppers and containers by top mounting.

Maximum Working Temperature: 250°C

Probe Material: SUS304/316L, PTFE

Probe Model

Special High Temperature Probe C1

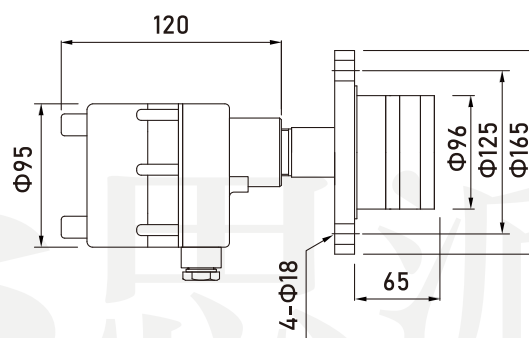
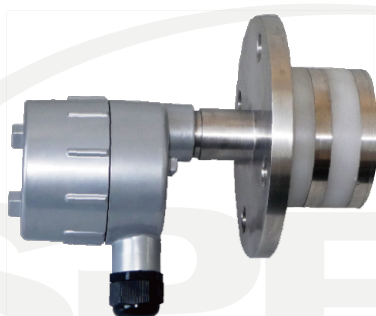


This kind of probe applies in various high temperature hoppers by top mounting or side mounting.

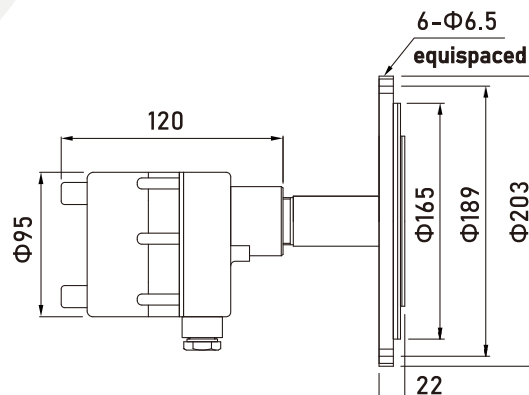
Maximum Temperature for Customization: up to 1000°C

Probe Material: SUS304/316L, ceramics

Flat Probe D1-a



Flat Probe D1-b



This kind of probe can be installed on the container to keep the probe in line with the container wall, which minimizes the internal part of the probe extending into the container, chute and conveying machinery.

Max Working Temperature: 250°C

Probe Material: SUS304/316L

It is used to detect gravels, granular materials, coal briquette and other materials in the chute, and is especially desirable in case of material flow or places where probes are easy to break off or bend. It is commonly applied to detect chute block, such as the coal blockage detection of the coal dropping pipe of power plants.

RF ADMITTANCE LEVEL SWITCH SRF-88

Working Principle

RF admittance level controller is used to detect whether there are materials in the container or not by phase shift technology. The quartz crystal vibrator in the electronic unit generates a high-frequency sine wave, one of which is sent directly to the detection pole, and the other is sent to the anti-adhesion protection pole through a voltage follower. When the pole hits the material, there is change in the resistance (including capacitance and impedance) of the signal, causing a change in the phase of the high-frequency signal on the pole. After processing, the output circuit is driven to issue an alarm signal. When the material is adhered to the probe, a capacitor is formed between the protective sleeve and the container wall, so that the high-frequency signal applied to the protective sleeve causes the capacitor to become saturated, and the potential of the material around the protective sleeve is equal to the electric potential on the protective sleeve and is equal to the electric potential on the detection pole. As a result, the high frequency signal on the detection pole cannot pass through the adhesive layer into the container wall.

| Model A | | Model B |

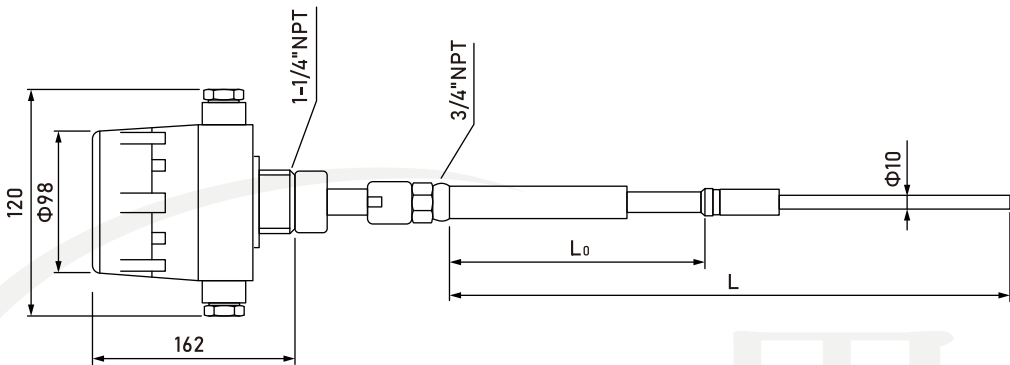
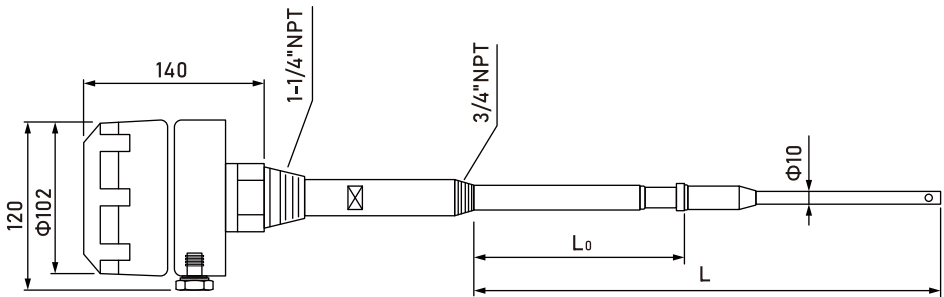


Technical Specification

- **Power Supply:** 220VAC $\pm 15\%$ 50Hz, 24VDC $\pm 5\%$
- **Power:** 4W
- **Output:** DPDT, 5A (resistive), 220VAC
- **Environmental Temperature:** -40°C ~ 70°C (middle and low sensitivity settings); -20°C ~ 50°C (high sensitivity settings)
- **Sensitivity:** 0.5pf-500pf
- **Time Delay:** 0-30 sec adjustable

Features

- ▲ Double installation interface 3/4" or 1-1/4"NPT;
- ▲ Manual calibration in two steps;
- ▲ Adjustable sensitivity analog;
- ▲ Wave soldering electronic circuit;
- ▲ Max working temperature up to 120°C ;
- ▲ Separate type for high temperature and great vibration conditions with working temperature up to 230°C ;
- ▲ Max cable length up to 14m.



SRF-88-□□□□□□

Cable Type Electrode Assembly

- 0: electrode assembly without cable
- 1: the length of the designated cable type electrode,unit is mm

Connection Method

- A: 3/4" stainless steel and 1-1/4" aluminum alloy NPT joint
- N: 1-1/4" NPT aluminum alloy joint (standard joint)

Supply Voltage

- 1: 220VAC 2: 24VDC

Shell Class

- G: Standard Type X: Flameproof Type

Probe Type

- 0: Standard 2: Food Grade 4: Ultrashot 5: Heavy Type 8: Flat

Electronic Circuit

- 0: Standard(2pf)
- A: High-sensitivity(1pf)
- L: Cable Type Electronic Components

Note: Cable Type is used only for probe of Model 0,4 and 5

RF ADMITTANCE LEVEL SENSOR L-2631H

Working Principle

Based on the principle of admittance, the probe inside the container and the container wall form the two-pole plates of the capacitor, while the air between the probe and the container wall, and the insulating layer of the probe constitute the dielectric material. When the material in the container rises, part of the air in the dielectric material of the capacitor is replaced by the material because various kinds of materials (dielectric constant >1) have dielectric constant different from that of air (dielectric constant $=1$). Therefore, the capacity and the total resistance of the capacitor also change, which is measured by the circuit and then converted into a linear 4~20mA current signal output through the amplifier to continuously track, measure, convert and output the current signal.

Technical Specification

- **Power Supply:** 24VDC
- **Measuring Range:** 0.3m~30m
- **Output Signal:** two-wire 4~20mA
- **Power:** 3W
- **Linear Precision:** $\pm 0.5\%$
- **Temperature Linearity:** $\pm 0.0015\%/1^{\circ}\text{C}$
- **Working Temperature:** $-30^{\circ}\text{C}\sim 60^{\circ}\text{C}$
- **Shell Standard:** Cast aluminum, IP65
- **Electrical Interface:** M20 $\times$ 1.5

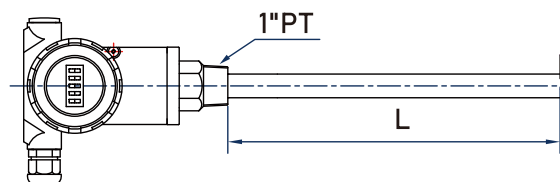
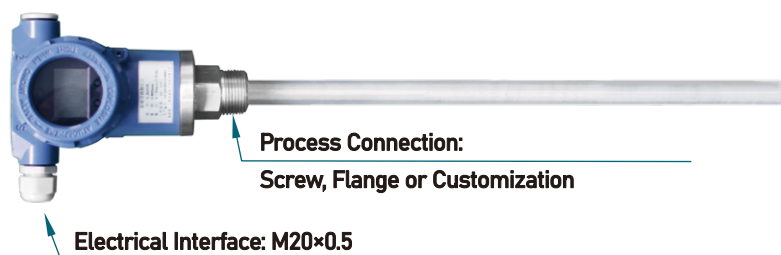
Features

- ▲ **Wide Application:** Application for the measurement of various conductive and non-conductive materials.
- ▲ **Anti-adhesion:** Professional anti-adhesion circuit to eliminate false signals produced by medium adhesion.
- ▲ **Detachable Probe:** No cable connection between the probe and the controller for disassembling, replacing and repairing the controller without influence on charging and discharging of the material.
- ▲ **High and Low Temperature Resistant Probe:** Applicable for $-30^{\circ}\text{C}\sim 260^{\circ}\text{C}$ working environment.
- ▲ **SMT Circuit:** SMT Circuit for improved anti-vibration feature and stable and reliable parameters.
- ▲ **Intelligent Diagnosis:** Automatic detection to identify whether the working status is normal or not after power on.

Probe Model

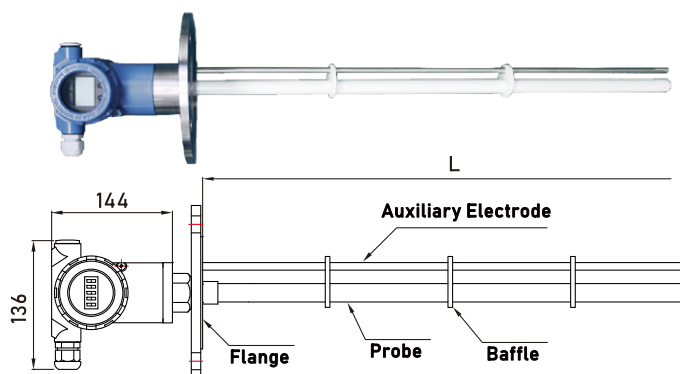
L-2631H Rod Type (screw connection)

$-10\sim 80^{\circ}\text{C}$



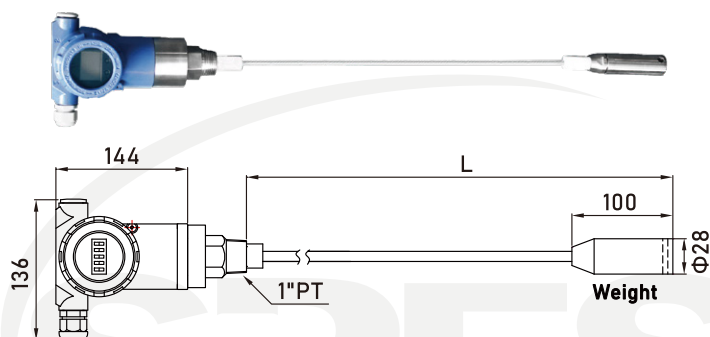
Probe Model

Double Rod Probe A2



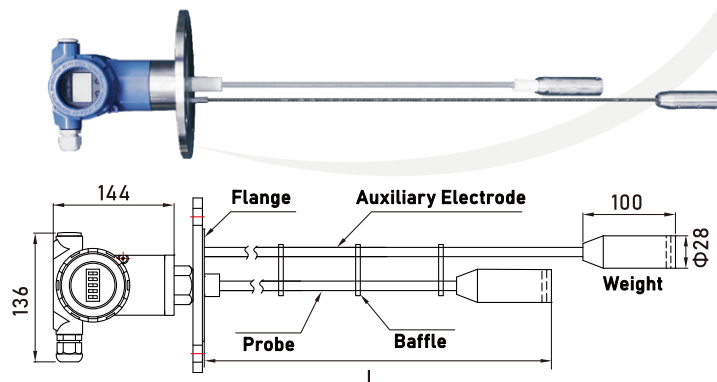
Applicable for various containers to measure liquids not corrosive to SUS316L stainless steel.

Standard Single Cable Probe B1



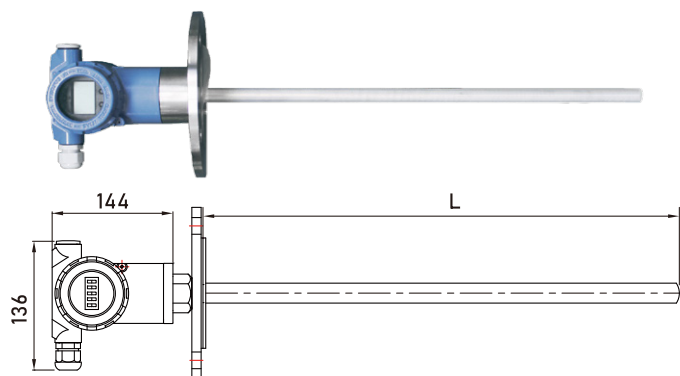
Applicable to measure the level of various liquids and solid materials in metal containers. The probe is Teflon coated and anti-corrosive. It is suggested for applications with a length of more than 3 meters. If there is stirring, it is suggested to fix the probe at the bottom.

Standard Double Cable Probe B1



Applicable to measure the level of various liquids and solid materials in metal containers. The probe is Teflon coated and anti-corrosive. It is suggested for applications with a length of more than 3 meters. If there is stirring, it is suggested to fix the probe at the bottom.

Anti-corrosive Single Rod Probe D2



Applicable for various containers. The probe is Teflon coated and anti-corrosive. It is suggested to measure conductive liquids.

Selection Guide

L-2631H—□□—□□□

Explosion-proof

No explosion proof unless Ex is selected

Temperature

N: 125°C T: 250°C H: Special High Temperature

Probe Length

Self-selected by customer, max 2.5m for rod probe type, max 30m for cable probe length.

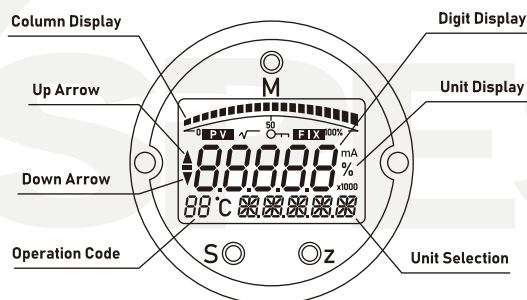
Probe Type

A1. Single Rod A2. Double Rod B1. Single Cable B2. Double Cable
C1. Special high Temperature D1. Coated with PP D2. Coated with PTFE
X. Special Customization

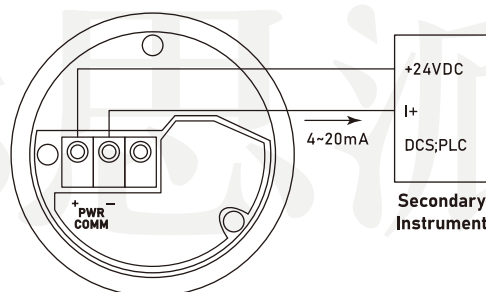
Connection Method

F: Flange S: Screw C: Chuck X: Others(Note for detailed specification)

Typical Wiring Diagram



Display Frame



When the instrument is installed correctly on the equipment and the signal circuit is connected as shown in the diagram, the zero (low) position and full (high) position of the instrument must be calibrated according to the zero (low) position and full (high) position of the actual condition of material, so as to conduct normal measurement (the material calibrated and measured must be the same material).

1. When the probe is in contact with the material, it is in zero position and zero (4mA) calibration can be performed. When it is in normal display, press button M and S and keep it for more than 3 seconds; enter "calibrating zero position" screen, the lower left corner shows the operation code "9", while "number display" is 0 in zero position; press button S, the up arrow is flashing, then press button M to finish zero position calibration; meanwhile, the operation code in the lower left corner automatically enters "10" (that's the full position calibration screen). At this time, there is no flash in the upper left corner. When the actual material is in full position, the second step of full position calibration can be performed as follows.

2. Full position (20mA) calibration: when the actual material is in full position, the lower left corner shows the operation code "10", while "number display" is the value in full position; press button S, the up arrow is flashing, press button M to finish full position calibration; meanwhile, the operation code in the lower left corner automatically enters "0" (display screen). About 10 seconds later, the operation code in the lower left corner automatically disappears, the meter enters the normal measurement display screen, and the display number is the current measured number.

In the real-time normal display status (master variable display status), press button S to change the display settings; press button S, the display switches between "master variable" — "percentage" — "output current", and the lower right corner shows the operation code "30".

When "master variable" is displayed, release button S immediately and press button S quickly at the same time, then only "master variable" displays.

When "percentage" is displayed, release button S, then the display switches between "master variable" and "percentage".

When "output current" is displayed, release button S, then the display switches between "master variable" and "output current".

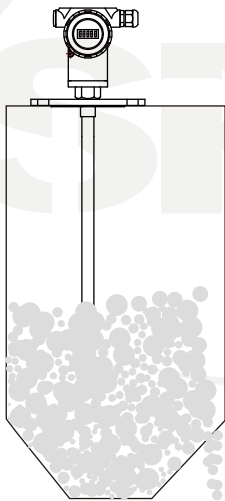
RF ADMITTANCE LEVEL SENSOR L-2631H

Installation Guide

In order to make the instrument work more reliably, the controller must be installed correctly. The following diagrams help to identify whether the installation is correct.

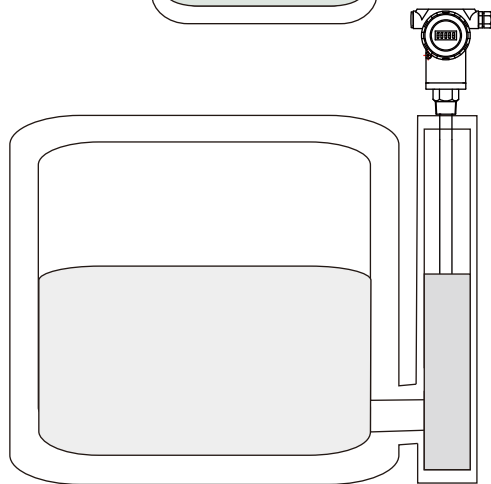
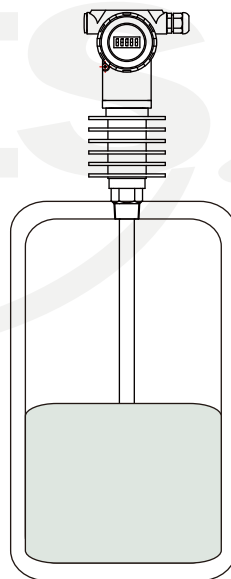
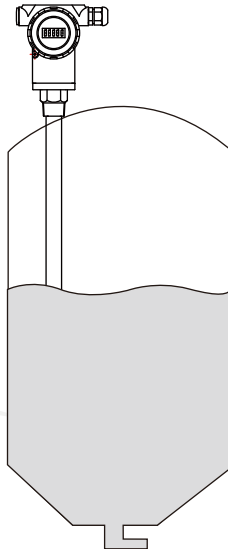
Containers for Food and Pharmaceutical Industries

Rod type and cable type are available for fully insulated measuring electrode, and the measurements are not affected by the medium density, temperature, over-pressure, foam, dielectric constant and adhesion.



Plastics and Particles

It is applied to measure the powder or particles in chemical industry. As mediums are different or often replaced, the level measurement requires that the result is not affected by the change of the medium's characteristics, powder and medium accumulated at the corners.



Containers for Storage

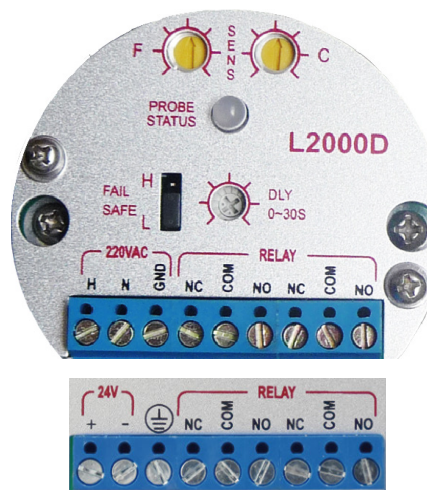
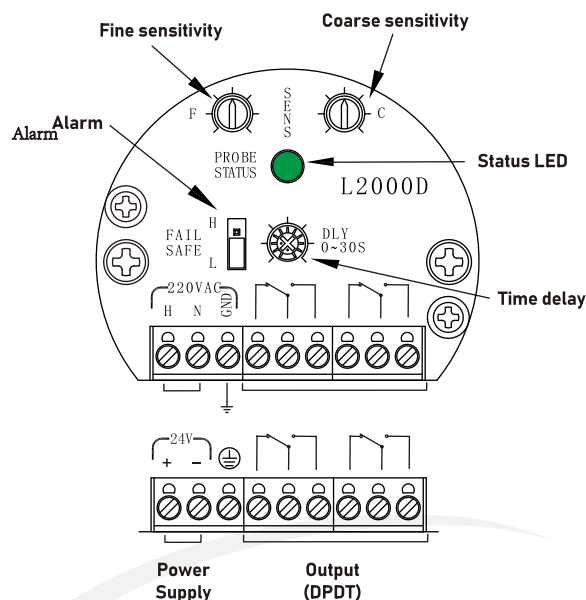
The instrument can be used to measure material level in containers. The sensor can be adjusted without material and then put into work. If both the adhesion and dielectric constant of the measured medium are small, the coaxial valve type can be selected, which can also meet the requirement of high accuracy. Measurements are not affected by the medium density, temperature, over-pressure, foam, dielectric constant and adhesion.

Measuring Pipe or By-pass

The measurement is not affected by the connection used in measuring pipe, by-pass pipe and the side of the pipe, the opening for the mixed medium or the corrosion in the pipe, so that the space of the container can be fully utilized to improve the measurement accuracy.

RF ADMITTANCE LEVEL SWITCH L-2000D

Operation Instruction

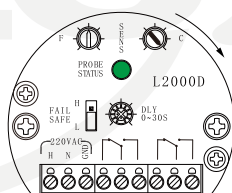


Simple Adjustment

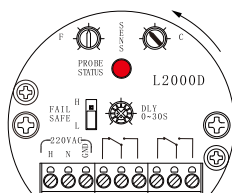
After power on, adjust the buttons according to the following steps when there are no materials (when the red light is on, there are materials; when the green light is on, there are still materials left).

Note:

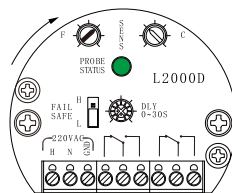
1. The instrument has been adjusted in the factory. Do not make random adjustment to the coarse sensitivity button C.
2. If there is any discrepancy with the site requirement, the fine sensitivity button F can be separately adjusted: counterclockwise to the left for decreased sensitivity while clockwise to the right for increased sensitivity, and empty for red light.
3. If the coarse sensitivity button C is disordered, follow the steps below to re-adjust.



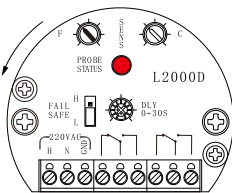
1. Keep F in center, adjust C clockwise to the end, then the light turns green.



2. Still keep F in center, adjust C counter-clockwise until the light turns red from green.



3. Do not adjust C, adjust F clockwise until the light turns green from red.

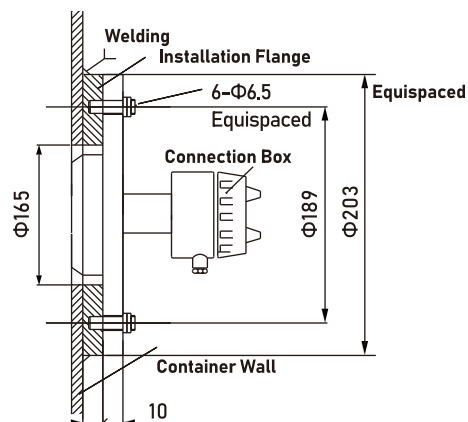
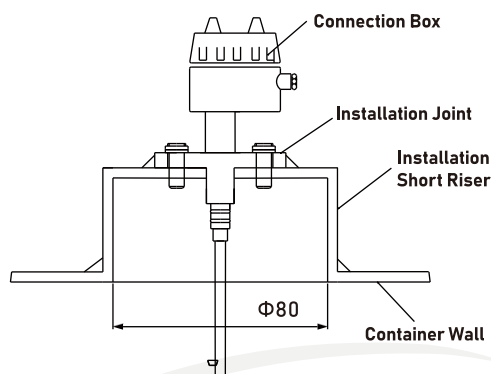


4. Do not adjust C, adjust F counter-clockwise until the light turns red from green, then adjust F counter-clockwise 0.2 grid to 2 grids (according to material characteristics).

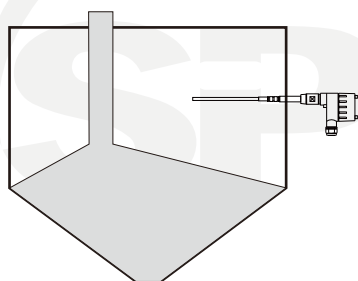
RF ADMITTANCE LEVEL SWITCH L-2000D, SRF-88

Installation Guide

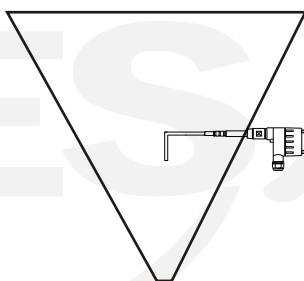
In order to make the instrument work more reliably, the controller must be installed correctly. The following diagrams help to identify whether the installation is correct.



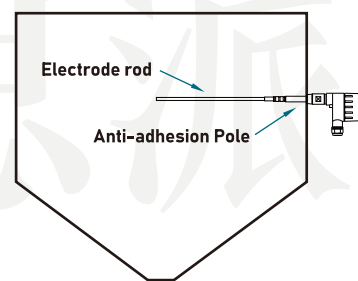
The probe can be horizontally or vertically installed by a 1"NPT screw or flange.



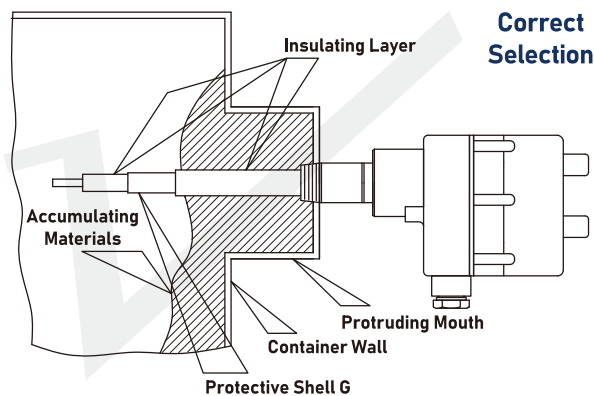
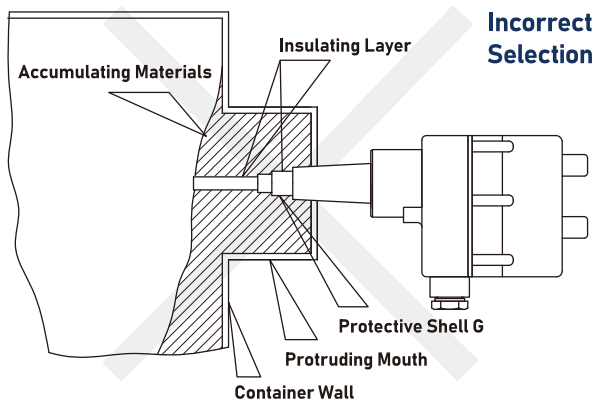
Please be careful not to install it under the material flow.



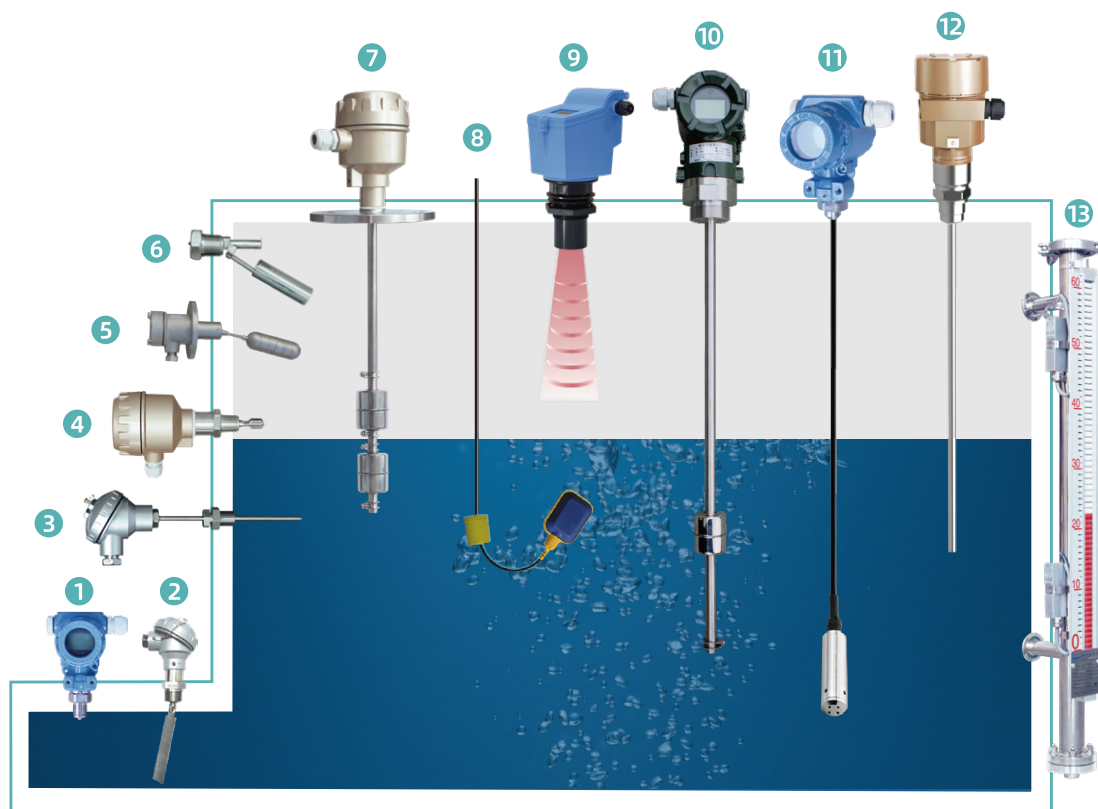
Please overlap here or it may cause false alarm.



Please do not keep the protective electrode in the riser.



When the instrument is used to detect conductive or non-conductive liquids, pulp, powder and particles, it is best to be installed horizontally. When vertical installation is required, the length of the probe should be kept at least 12". When the instrument is installed horizontally, the protective shell G of the probe must be plugged into the container wall at 2".



- | | |
|-------------------------------------|--|
| 1. Pressure Transmitter | 8. Cable Float Level Switch |
| 2. Flow Switch | 9. Ultrasonic Level Gauge |
| 3. Temperature Transmitter | 10. Magnetostrictive Liquid Level Gauge |
| 4. Tuning Fork Level Switch | 11. Immersion Static Pressure Liquid Level Gauge |
| 5. Side-mounting Float Level Switch | 12. Guided Wave Radar Level Gauge |
| 6. Float Level Switch | 13. Magnetic Level Gauge |
| 7. Multi-point Float Level Switch | |



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