

Ultrasonic level gauge

Ultrasonic level gauges are specifically designed for continuous level measurement. The transducer (probe) of the ultrasonic level gauge emits high-frequency ultrasonic pulses. When it encounters the surface of the measured liquid level, the sound wave is reflected back, and some of the reflected echoes are received by the transducer (probe) and converted into electrical signals. The ultrasonic level gauge uses the time difference between the emission and reception of sound waves, as well as the propagation speed of sound waves, to calculate the liquid level height. The ultrasonic level gauge adopts non-contact measurement technology and can be stably and reliably applied to continuous level measurement in various open tanks, such as sewage, wastewater tanks, and hydrological and hydraulic measurement.

The USON series ultrasonic level gauge adopts microprocessor program control technology and intelligent signal processing technology, ensuring efficient and accurate measurement. Compared to similar products from other brands, this product has the following characteristics:

- There are three ranges to choose from: 5 meters, 10 meters, and 15 meters.
- Passed CE (standard and explosion-proof) and explosion-proof certification, with a high explosion-proof level (Ex d IIC T6 Gb).
- Equipped with temperature compensation, high accuracy, and strong adaptability.
- Equipped with RS-485 communication interface, it can switch between Chinese and English menus at will, making operation convenient.
- Adopting special echo processing methods to effectively avoid false echoes.
- The overall protection level of the machine is as high as IP66/IP67.
- PVDF material probes are suitable for corrosive liquids and environments.
- High cost-effectiveness and low maintenance costs.
- EMC design complies with the regulatory requirements of IEC61000-4 (GB/T17626.2) standards - EFT (group pulse A-level performance), ESD (electrostatic discharge A-level performance), and surge.

Uson-31 split type ultrasonic level gauge: The probe (transducer) and the host (transmitter) can be installed separately. Suitable for real-time monitoring of remote liquid level situations, it has the characteristics of high accuracy, long service life, stability and reliability, and convenient installation and maintenance.



Overview

Uson-31 The probe (transducer) and host (transmitter) of the split type ultrasonic level gauge can be installed separately. The protection level of the probe is as high as IP68, the protection level of the host is IP65, and it has passed explosion-proof certification. Suitable for real-time monitoring of remote liquid level situations, it has the characteristics of high accuracy, long service life, stability and reliability, and convenient installation and maintenance.

Working principle

The working principle of the Uson-11/21 ultrasonic level gauge is the same. The transducer (probe) of the Uson-31 split type ultrasonic level gauge emits high-frequency ultrasonic pulses. When it encounters the surface of the measured liquid level, the sound wave is reflected back, and some of the reflected echoes are received by the transducer (probe) and converted into electrical signals. The time T from ultrasonic emission to reception is proportional to the distance S from the transducer (probe) to the measured liquid level. The relationship between this distance value S , sound speed C , and transmission time T can be expressed by the formula: $S=C \times T/2$.

Product features

- There are three ranges to choose from: 5 meters, 10 meters, and 15 meters.
- Passed explosion-proof certification, with an explosion-proof level of: **Ex d IIC T6 Gb**.
- Equipped with temperature compensation function, high accuracy, and strong adaptability.
- Equipped with RS-485 communication interface for real-time monitoring, convenient and efficient.
- Adopting a special echo processing method to effectively avoid false echoes.
- The protection level of the probe is as high as IP68, and the protection level of the host is IP65.
- PVDF material sensors can be used in highly corrosive measurement situations.
- Suitable for use in harsh weather conditions, the transducer and transmitter can be installed separately.
- The Chinese and English menus can be switched freely, making it easy to operate.
- Non contact measurement ensures no wear during operation and minimizes maintenance costs.
- Anti strong interference, suitable for harsh industrial environments. The EMC design complies with the regulatory requirements of IEC61000-4 (GB/T17626.2) standards - EFT (group pulse A-level performance), ESD (electrostatic discharge A-level performance), and surge.

Typical application

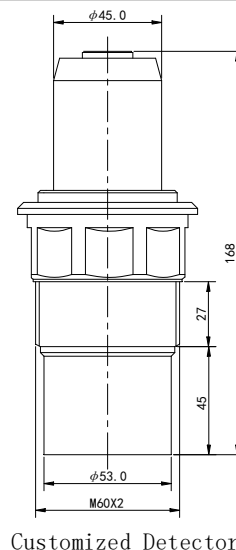
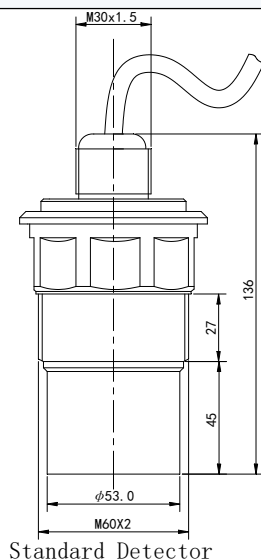
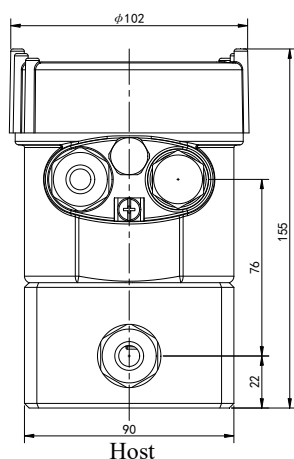
- **Uson-31** The split type ultrasonic level gauge is suitable for remote real-time monitoring of liquid levels in hazardous environments such as petroleum, chemical, environmental protection, metallurgy, and mining. It is particularly suitable for continuous liquid level measurement in sewage treatment plants, water plants, open storage tanks, rivers, lakes, and reservoirs.



Technical Data

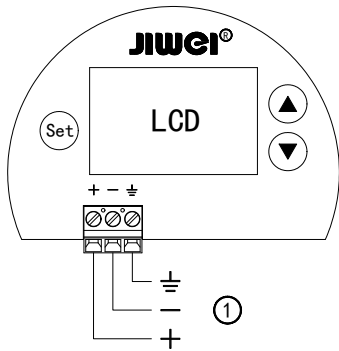
| | |
|--------------------------------|---|
| Measurement range | 5m、10m、15m |
| Material of transducer | ABS |
| | PVDF |
| Blind spot | ≤0.3m(5m/10m) |
| | ≤0.6m(15m) |
| Resolving power | ±0.5% |
| Beam angle | 6° (5m) |
| | 8° (10m) |
| | 10° (15m) |
| Error | ≤1% |
| Display | LCD Chinese and English LCD display |
| Keys | Three buttons |
| Input Rated Voltage | Four wire system (non explosion-proof type): 85~264V AC 50/60Hz 18~36V DC |
| | Four wire system (explosion-proof type): 85~240V AC 50/60Hz 18~36V DC |
| | two-wire system: 18~30V DC |
| Output form | two-wire system: 4~20mA |
| | four-wire system: 4~20mA |
| | Optional RS-485/Relay |
| Relay contact capacity | 4A 250V AC/30V DC |
| Ambient temperature | Detector: -20~+80°C |
| | Host: -20~+60°C |
| Process temperature | Detector: -20~+80°C |
| | Host: -20~+80°C |
| Process pressure | Ordinary pressure |
| Cable interface | M20×1.5 |
| Material of transmitter casing | Plastic ABS+aluminum alloy |
| Connecting cables | Standard configuration of 10 meters, other lengths can be customized |
| Process connection | screw thread |
| | flange |
| IP code | Probe: IP68 |
| | Host: IP65 |
| Explosion Proof | Ex d IIC T6 Gb |

Dimensional Drawing

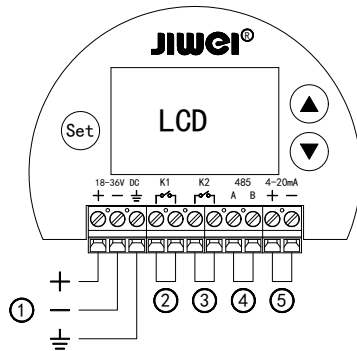


Wiring diagram

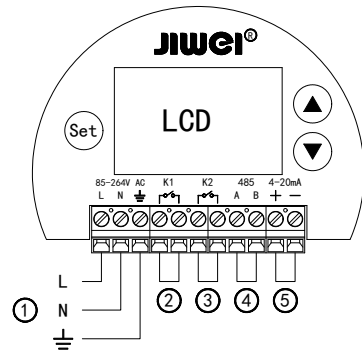
Two wire output mode



Four wire output mode (24V DC)



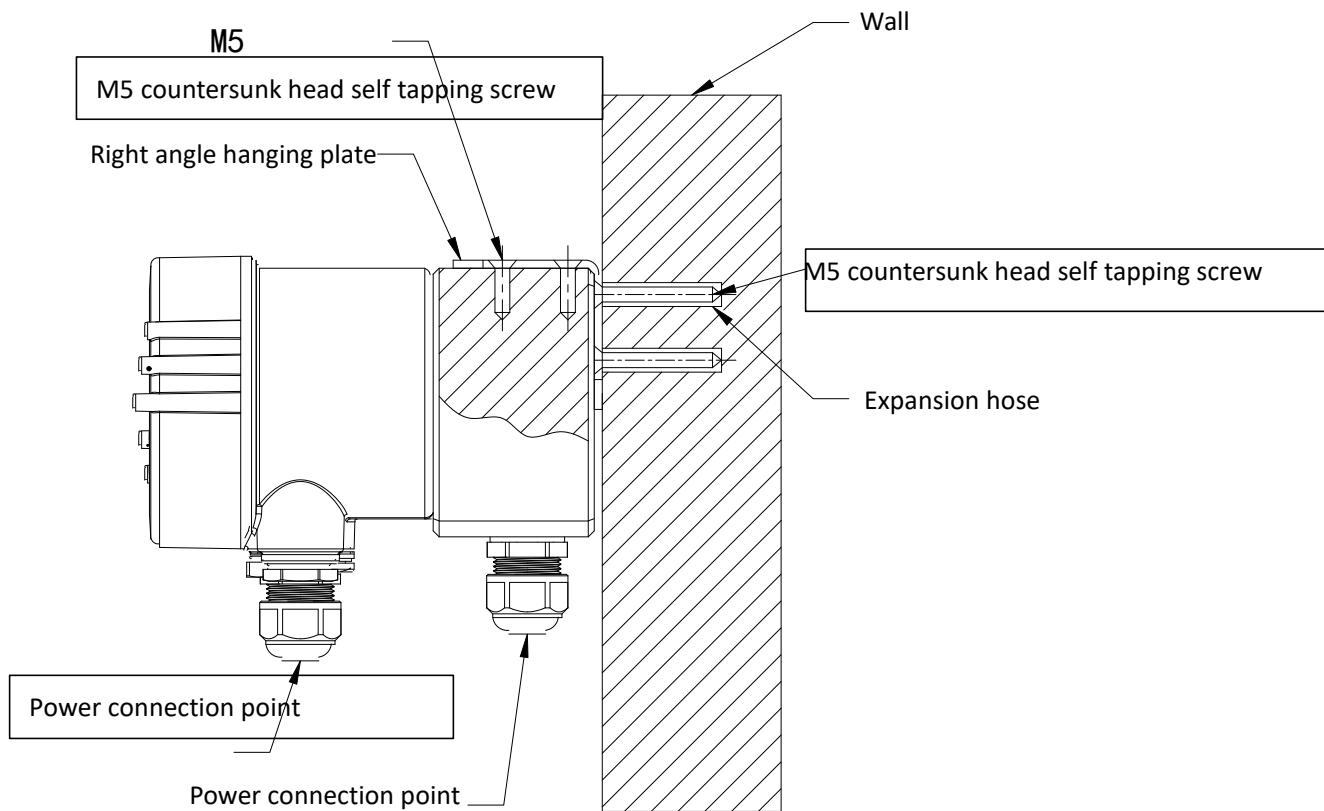
Four wire output mode (220V AC)



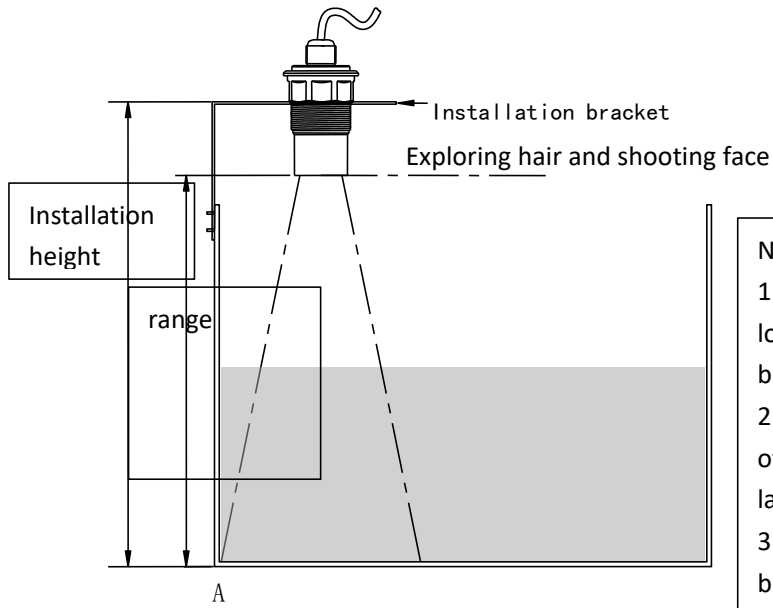
- ① Power input ② ③ Relay output SPST ④ RS-485 output ⑤ 4-20mA output

Installation diagram

Host installation diagram



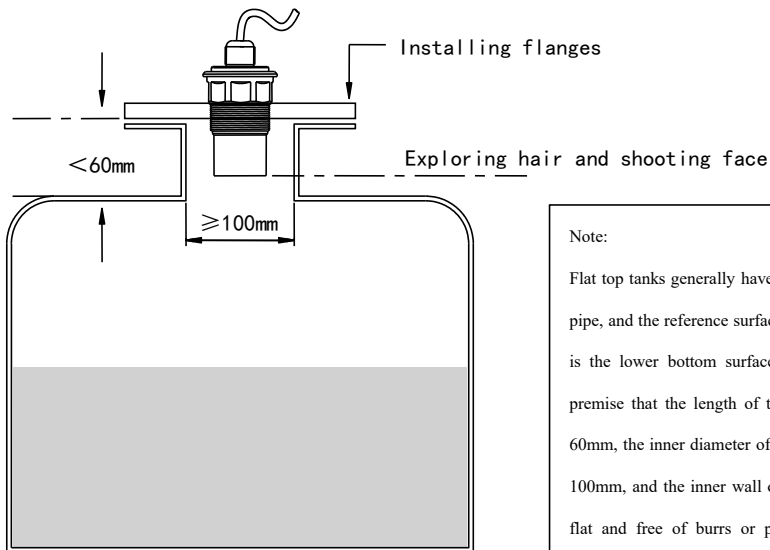
Probe groove installation diagram



Note:

1. Pay attention to the load-bearing capacity of the bracket during installation.
2. Do not exceed the boundary of point A when exploring the launch angle.
3. The installation height should be ensured to be within the range range.

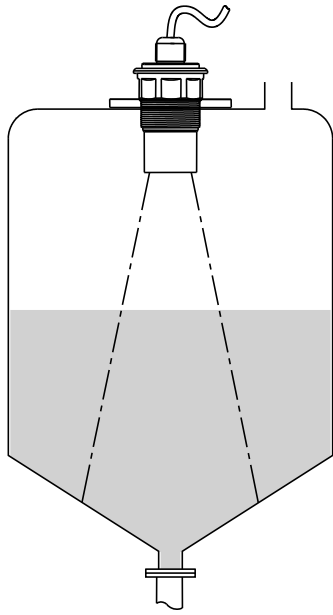
Installation diagram of probe flat top tank



Note:

Flat top tanks generally have a very short connecting pipe, and the reference surface of the connecting pipe is the lower bottom surface of the flange. On the premise that the length of the connecting pipe is $\leq 60\text{mm}$, the inner diameter of the connecting pipe is $\geq 100\text{mm}$, and the inner wall of the connecting pipe is flat and free of burrs or protrusions, the emitting surface after installation can be measured 30mm lower than the lower bottom surface of the flange.

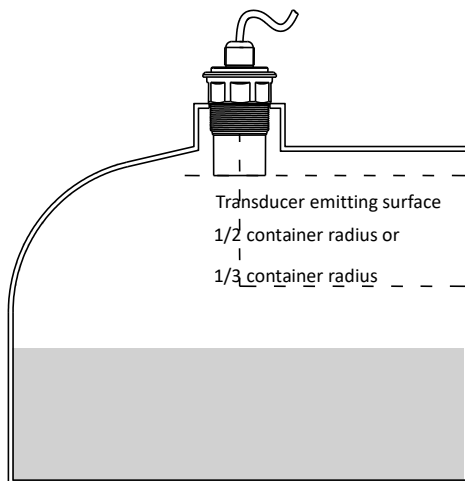
Installation diagram of probe conical tank



Note:

For conical containers with flat tank tops, the optimal installation position for the instrument is in the center of the top of the container, which ensures measurement to the bottom of the container.

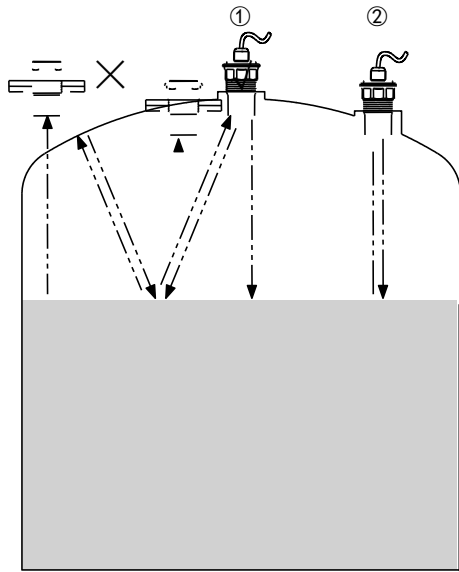
Probe Arched Tank Installation Diagram -1



Note:

For arched tanks, it is best not to install the instrument in the center of the tank top, but to install it at $1/2$ or $2/3$ of the radius of the tank top (under the premise of meeting a certain distance from the tank wall). For ultrasonic pulses, the arched tank top is like a convex lens. If the probe is installed at the focus of the convex lens, it will receive all false echoes. Therefore, it is advisable to avoid installing the probe in the center of the arched tank top as much as possible.

Probe Arched Tank Installation Diagram -2



Note:

1. Error: The instrument is installed on the top of the arched tank, which can cause multiple reflected echoes. It should be avoided as much as possible during installation.
2. Correct: Install at 1/2 or 2/3 of the radius of the tank top.

Ordering information

| | | | | | | | | |
|-------------------------|--|--|--|--|--|--|--|--|
| | Uson-31 | | | | | | | |
| License | N <input type="text"/> D <input type="text"/> (Ex d IIC T6 Gb) | | | | | | | |
| Range | A 5 B 10 C 15 ^① | | | | | | | |
| Process Connection | TB G 2" A TC M48×2 TD M60×2 TE M78×2 FA DN50 PN10 FB DN65 PN10 FC DN80 PN10 XX <input type="text"/> | | | | | | | |
| Probe type | A ABS P PVDF | | | | | | | |
| Work electric jade | A 85~264 V AC 50/60Hz D 18~30 V DC | | | | | | | |
| Output method | A <input type="text"/> 4~20mA B <input type="text"/> 4~20mA | | | | | | | |
| Optional output | O <input type="text"/> R RS-485 (<input type="text"/> B) K <input type="text"/> 2×SPDT (<input type="text"/> B) | | | | | | | |
| Connecting cable length | <input type="text"/> : ≤30 <input type="text"/> | | | | | | | |