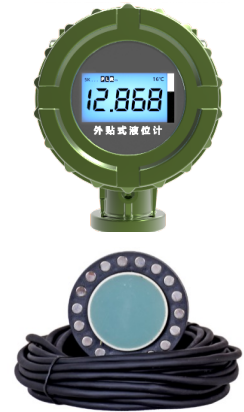


SUL814 External Ultrasonic Level Meter
OVERVIEW

SUL814 external ultrasonic liquid level meter adopts the principle of acoustic time distance measurement of ultrasonic echo. The mechanical wave from the radiation surface of the sensor passes through the pipe wall and passes through the liquid medium in the tank again. When the liquid level is reflected, the sound wave goes through one-way twice, which makes its simulation and digital signal processing technology different and more complex.

The installation of external mounted ultrasonic liquid level gauge is more convenient. The sensor with magnet is only needed to be attached to the appropriate position at the bottom of the tank surface to realize the liquid level detection in the tank. Its signal output is the same as that of the intrusive liquid level meter, such as the current loop 4-20mA, 0-20mA, analog voltage 0 / 1-5V, 0 / 1-10V; data communication RS232C, RS485 are very rich. It is convenient for users to select the corresponding output signal and interface with the upper equipment according to their PLC, digital instrument, computer, ferroelectric memory, etc. to enter the user's main system.


SPECIFICATION

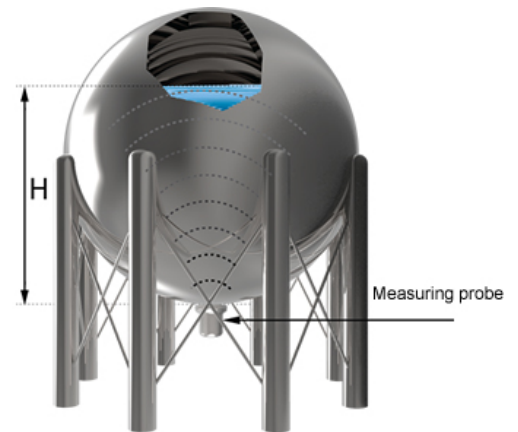
Detection range	1m, 3M, 5m, 10m, 20m, 30m, 50m(optional according to working conditions)
Display resolution	D = 1mm / 1cm (self setting)
Repeatability	1mm
Measurement error	±1%FS, ±2%FS, ±5%FS
Migration	±100m
Display mode	128x64 LCD
Blind zone	No blind spots or tiny blind spots. The blind spot has a certain relationship with the wall thickness, and the tiny blind spot is twice the wall thickness
Signal interface	(4~20) mA, HART (maximum load 500Ω), or RS485, IR, HART, Modbus or customized
Relay alarm output	AC 250V 5A, DC 30V 5A
Working power supply	DC 24V, AC 220V
Power consumption	< 1W
Temperature parameters	Probe range: -196°C~120°C (normal temperature type), 60°C~200°C (high temperature type) Instrument range: -20°C~70°C (normal temperature type), -40°C~70°C (low temperature type)
Working humidity	0%~95% RH
Medium requirements	clean liquid medium with constant sound velocity of water in accordance with the above recommended temperature range;
Medium viscosity	Dynamic viscosity < 10mpas; dynamic viscosity < 30mpas
Dynamic viscosity	10mpas ~ 30mpas will reduce the measuring range
Container parameters	Metal horizontal tank, straight tank wall thickness: 1 ~ 20 mm
Installation method	The sensor is directly attached to the tank wall, and there is no attachment inside and outside the tank wall. The instrument is connected by DN20 mm thread and installed in the box;
Host base hole diameter	M5
Electrical Interface	M20x1.5
Explosion-proof grade	ExdIICT6
Protection grade	instrument IP65, sensor IP68

WORKING PRINCIPLE

As shown in the figure, when measuring the liquid level, the sonar wave signal is emitted from the probe, and the echo signal is detected by the probe after being reflected back by the liquid surface. The echo signal is processed by a proprietary algorithm to calculate the time t , and the system calculates the liquid level height according to the formula.

$$H = v \times \left(\frac{t}{2} - \frac{t_g}{2} \right) \times \alpha$$

- H : Measured liquid level height
- t : the time it takes for a sonar wave to return from launch
- t_g : the transit time of the sonar wave in the tank wall
- v : the speed of the sonar wave propagating in the liquid
- α : Correction factor



APPLICATION

Measured container:

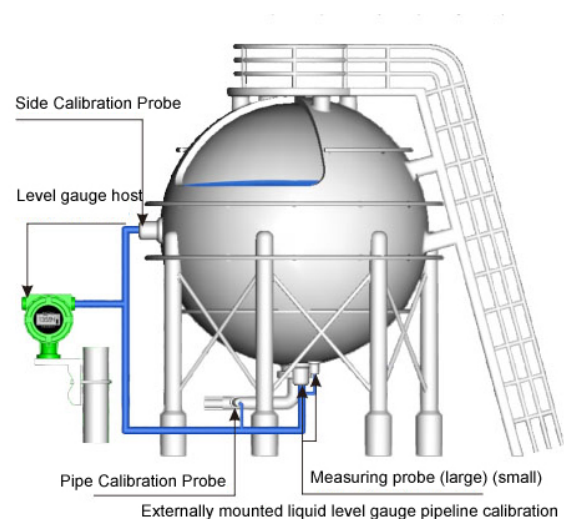
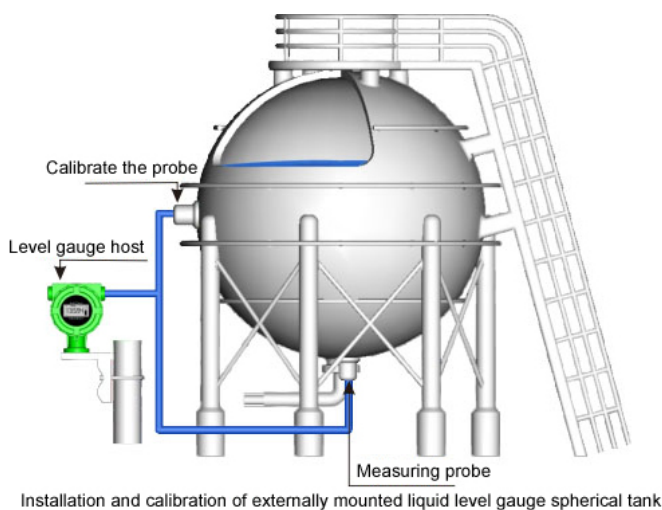
- spherical, vertical, horizontal and other shapes
- It is required to have a probe installation space of 200mm long, 200mm deep and 300mm high directly under the container
- There is no solid structure (transverse partition, leakage plate, column, stirring) and other barriers between the installation position of the measuring probe and the highest liquid level of the liquid
- The tank wall at the bottom of the container (where the measuring probe is installed) ≤ 100 mm
- The tank wall at the bottom of the container (where the measuring probe is installed) has no lining or gas interlayer
- The tank wall at the bottom of the container (where the measuring probe is installed) is made of hard materials, such as carbon steel, 16MnR, 304, 316, glass fiber reinforced plastic, hard rubber, etc.

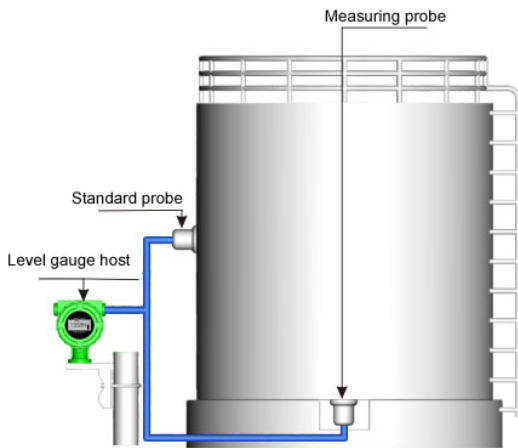
Measured liquid:

- The dynamic viscosity of the liquid medium to be measured is less than 50mPa s (cP)
- The liquid has no serious sedimentation, crystallization and self-aggregation
- The liquid can not suspend a large amount of solids and deposit a large amount of sediment, can not be an emulsion, and can not have a large number of air bubbles
- The liquid to be tested is preferably a single liquid or a compatible mixture. If it is two or more immiscible liquids, an obvious interface will be formed, so the instrument should be specially set.

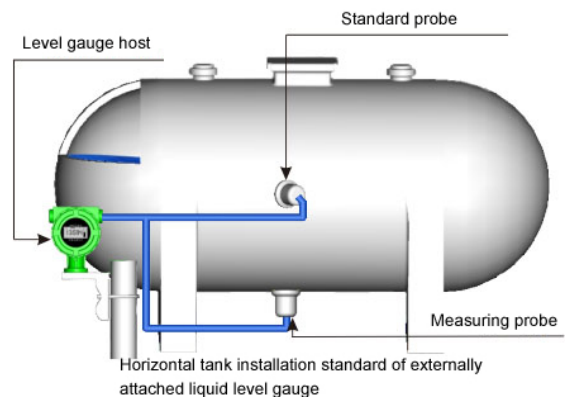
The temperature of the measured place:

The temperature of the tank wall at the bottom of the container (where the measuring probe is installed) determines the selection of the appropriate probe. The normal temperature probe is at (-196°C to 120°C) and the high temperature is at (60°C to 200°C).





Installation and calibration of externally mounted liquid level gauge vertical tank



ORDER GUIDE

FMU814	Externally posted liquid level (boundary) level gauge									
	CODE	type								
	L	level gauge								
	B	Boundary meter								
	CODE	Medium temperature								
	N	Normal temperature								
	H	High temperature								
	CODE	Tank type								
	S	Spherical tank								
	H	Horizontal tank								
	C	Code Tank Material								
	CODE	Tank material								
	F	Ferromagnetic								
	N	Non-ferromagnetic								
	CODE	Range								
	Xm	3~50 3m, 5m, 10m, 15m, 20m, 30m, 50m (Customized)								
	CODE	Blind spot								
	S	Very small blind spot (close to no blind spot)								
	N	Normal blind spot								
	CODE	Calibration mode (multiple choices)								
	D	Diameter calibration								
	T	Temperature calibration								
	P	Pipe Calibration								
	CODE	Signal output								
	N	Modbus.								
	F	Infrared								
	I	Hart								
	S	Single relay output								
FMU814	L	N	S	F	5M	S	D	N	Order example-	