

External Liquid Level Gauge



SK Electronic

1 Principle of Operation

External liquid level sensor with sonar ranging principle, using the temperature integrate sensor to process the sonar signal. The sensor is pasted in the outer wall of the tank. Using the patented algorithm to calculate the height of the liquid in the tank and output to a remote control system (eg. DCS) through (4-20)mA, HART, RS-485, Modbus.

According to the figure right, the time is taken for the signal to be transmitted and then received from the liquid surface. Signals from the transducer are fed into the processor and then processed by patented algorithm to calculate the height of the liquid according to the formula:

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

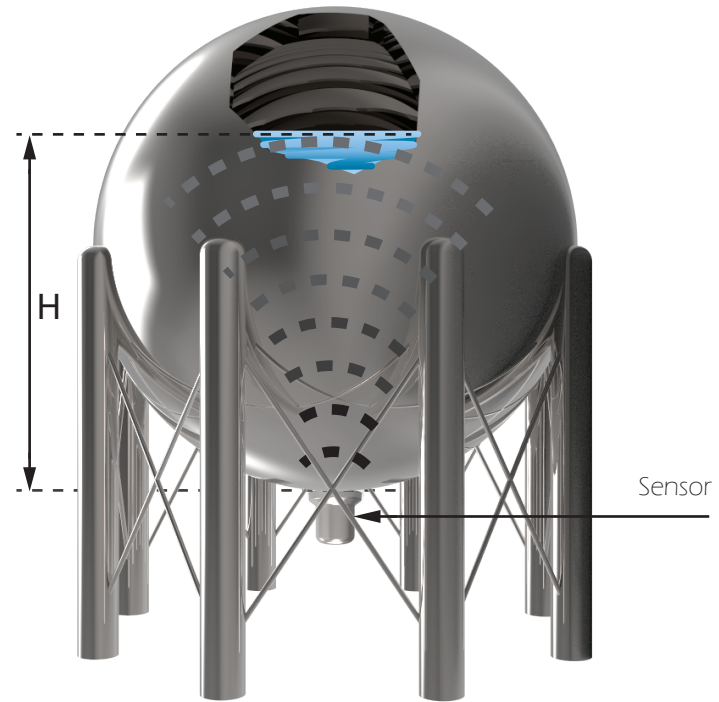
H: height of the liquid

v: velocity of sound in the liquid

t: time between transmitted and received signal

t_g : propagation time in the tank wall

α : liquid compensation factor



Working Principle

2 Applications

- LPG tanks
- liquid ammonia tanks
- liquid chlorine tanks
- liquid propene tanks
- liquid propane tanks
- Fuel tanks
- Acids/solvents tanks
- Concentrated sulfuric acid(98%) tanks
- Nitric acid tanks
- Hydrofluoric acid tanks
- Hydrochloric acid tanks



Processor & Sensor

3 Features

- Truly non-invasive sensing technique
- Sensors bonded to outside of tank base
- Fits tanks of most shapes and sizes
- Output to telemetry system – various options
- CNEX approved for hazardous areas (Both processor and sensor)
- Temperature integrated sensors

4 Benefits

- Low cost, reliable & accurate tank gauging
- Not affected by pressure
- Easy installation - no tank break-in
- Simple retrofit to existing tanks
- No down-time during installation
- No moving parts – no maintenance

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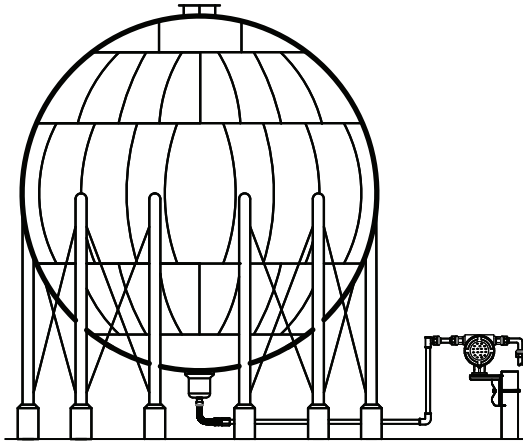
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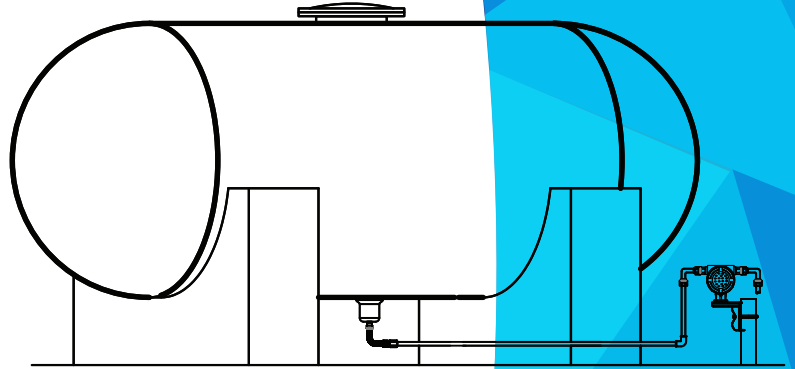
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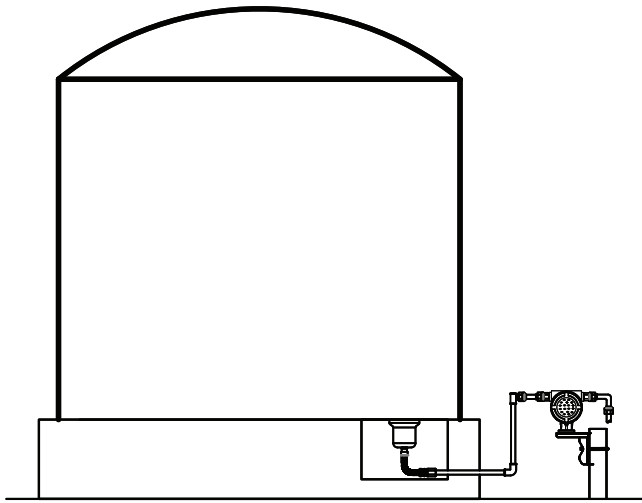
Web(English): <http://www.sklevelsensor.com> Web(Chinese): <http://www.sx-sk.com>



Spherical tank installation guide



Horizontal tank installation guide



Vertical tank installation guide

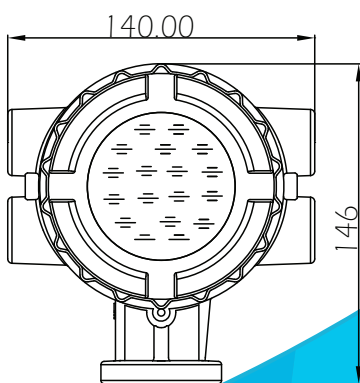
6 Technical Specification

Power	Two wire / DC 24V
Measure Range	3m, 5m, 10m 15m, 20m
Precision	10 mm
Display Resolution:	1 mm
Output	(4~20)mA, Hart, Max Load 500Ω
Communication	RS485, Hart, Modbus
Alarm Relay Output	AC 250V 5A / DC 30V 5A
Processor Temperature	-20°C ~+70°C
Sensor Temperature	-50°C ~+100°C
Hazardous Area Approval	ExdIICT6
Protection Rating	IP67
Display	128 x 64 LCD
Electrical Connector	G1/2 or M20 x 1.5
Max Sensor Length	30 m
Weight	2 KG
Dead Zone	5% of range (Max)

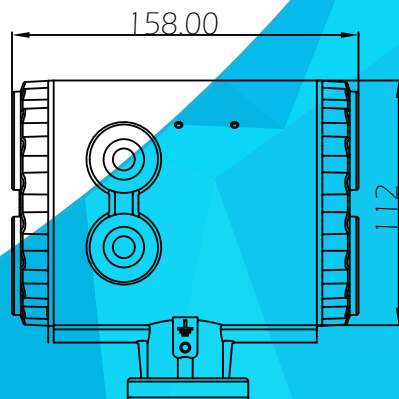
7 Electric Connection

24V	DC 24V Power input & 4~20 mA Signal output
MEA	Measure Sensor
485	RS485 and Modbus Communication
Relay	Alarm Relay Output

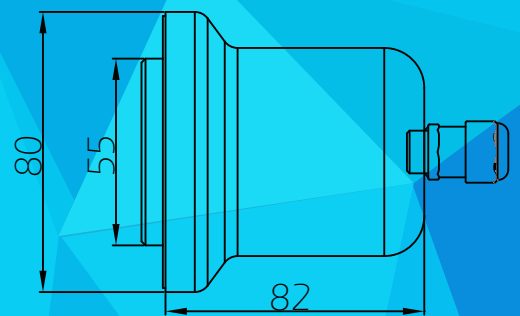
8 Dimension(unit: mm)



Processor Front View



Processor Side View



Sensor Side View