



## LEVEL | RADAR



### APPLICATION

The radar sensors of the SRL series are used for non-contact level measurement of liquids and solids. Even under high pressure and extreme temperature, they can measure various media. Radar sensors can be used for simple measurements or for measuring corrosive media. They are also suitable for applications with high hygiene requirements. These sensors can measure light and heavy solid materials with absolute reliability, even if the dust and noise are strong, they are not affected by adhesions or condensate.

### MEASURING PRINCIPLE

The measuring instrument emits short radar pulses in the direction of the medium through the antenna system. The signal waves are reflected by the surface of the medium, and they are then re-received by the antenna system. The measuring instrument can calculate the level by using the running time required by the radar pulse and the input container height.



### ADVANTAGE

Non-contact radar technology has the characteristics of extremely high measurement accuracy. The measurement process will not be affected by the volatility of the medium, nor will it be affected by continuous process conditions such as temperature, pressure or severe dust generation. The adjustment process is very simple, there is no need to fill and empty the container, which saves time.

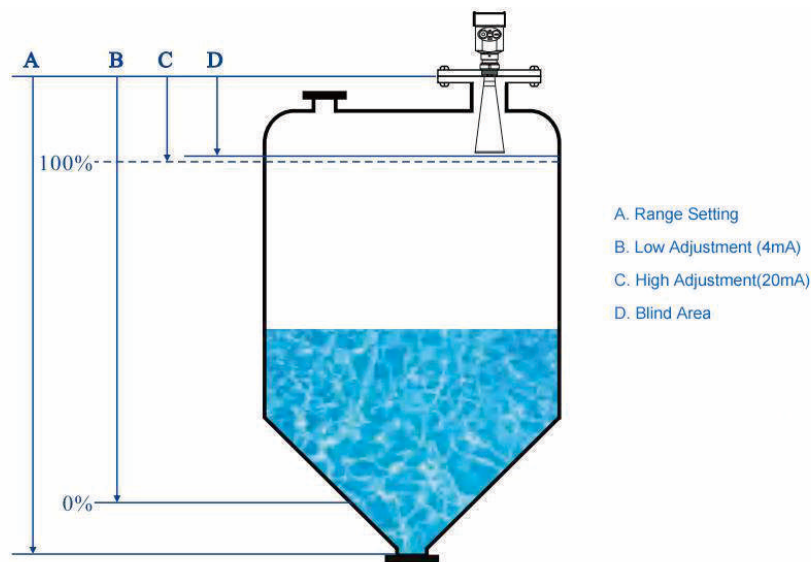
## SRL600 SERIES HIGH FREQUENCY RADAR LEVEL METER

### OVERVIEW

The radar level sensor SRL600 series of sensors is a 26GHz high frequency radar-type level measuring instrument, measuring a maximum distance of up to 80 meters. The antenna is further optimized, and the new fast microprocessor can perform high speed signal analysis and processing, so that the instrument can be used in some complex measurement conditions such as reactors and solid silos.

### WORKING PRINCIPLE

The radar level antenna emits narrow microwave pulses, which are transmitted downward through the antenna. After the pulse touches the surface of the measured medium, it is reflected back and received by the antenna system again. The signal is transmitted to the electronic circuit part and automatically converted into a level signal (because the pulse travels very fast, the electromagnetic wave reaches the target and returns to the receiver after reflection - The time it takes to go back and forth is almost instantaneous).



Measuring reference surface: thread bottom or flange sealing surface.

Note: When using radar level timing, it is necessary to ensure that the highest material level cannot enter the measurement blind area (the area shown in D in the figure).

### DESIGN FEATURE

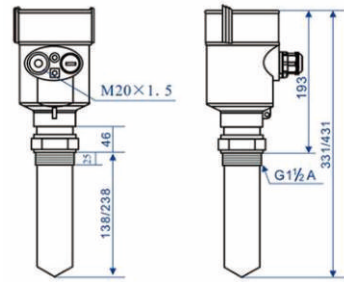
- ◎ The antenna is small in size and easy to install; the non-contact radar is free of wear and pollution.
- ◎ Almost not affected by corrosion and foam; almost not affected by changes in atmospheric water vapor, temperature and pressure.
- ◎ Severe dust environment has little effect on the work of high-frequency level gauge.
- ◎ The shorter wavelengths have better reflections on inclined solid surfaces.
- ◎ The beam angle is small and the energy is concentrated, which enhances the echo capability and helps avoid interference.
- ◎ The measurement dead zone is smaller, and good results can also be obtained for small tank measurements.
- ◎ High signal-to-noise ratio, even better performance under fluctuating conditions.
- ◎ High frequency is the best choice for measuring solid and low dielectric constant media.

## TYPES & SPECIFICATION



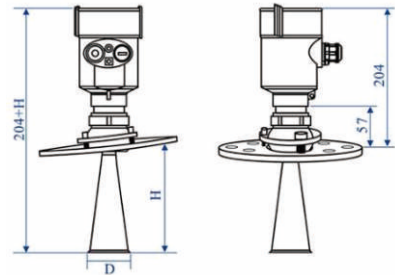
**SRL601**

Application: various **corrosive liquids**  
 Measuring range: 10 meters  
 Process connection: thread, flange  
 Medium temperature: -40~130°C  
 Process pressure: -0.1~0.3MPa  
 Accuracy: ±5mm  
 Protection level: IP67  
 Frequency range: 26GHz  
 Explosion-proof grade: Exia IICT6 Ga/ Exdia IC T6Gb  
 Signal output: 4.20mA/HART (two-wire/four-wire) , RS485/Mod bus



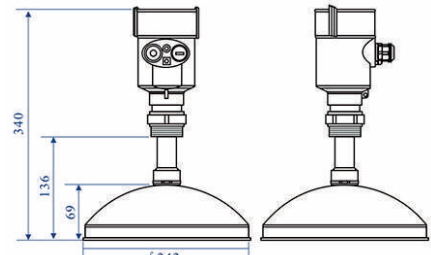
**SRL602**

Application: **solid particles, powder**  
 Measuring range: liquid 30 meters/solid block 20 meters/solid powder 15 meters  
 Process connection: thread, flange  
 Medium temperature: -40~ 250°C  
 Process pressure: -0.1~4.0MPa (flat flange)-0.1~0.1MPa (universal flange)  
 Accuracy: ±10mm  
 Protection level: IP67  
 Frequency range: 26GHz  
 Explosion-proof grade: Exia IICT6 Ga/Exdia IC T6Gb  
 Signal output: 4. 0mA/HART (two-wire/four-wire), RS485/Mod bus



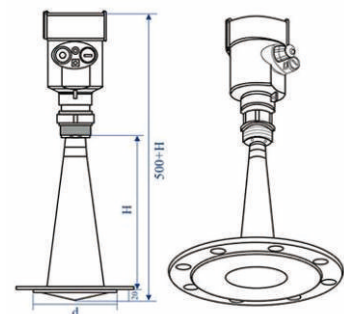
**SRL606**

Application: **solid material, strong dust, easy to crystallize and dew**  
 Measuring range: 80 meters  
 Process connection: universal flange  
 Medium temperature: -40~250°C  
 Process pressure: -0.1~0.1MPa  
 Accuracy: ±15mm  
 Protection level: IP67  
 Frequency range: 26GHz  
 Explosion-proof grade: Exia IIC T6 Ga/Exdia IICT6 Gb  
 Signal output: 4.20mA/HART (two-wire/four-wire, ), RS485/Mod bus



**SRL603**

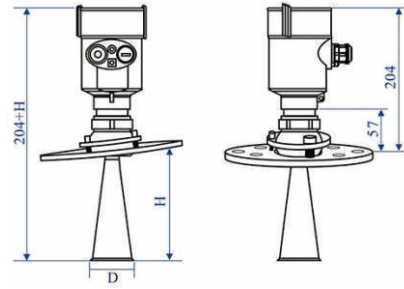
Application: **Hygienic liquid storage container, highly corrosive container**  
 Measuring range: 20 meters  
 Process connection: flange  
 Process temperature: -40 ~ 200°C  
 Process pressure: -0.1 ~ 0.3MPa / -0.1 ~ 2.5MPa (PTFE integrally filled antenna)  
 Accuracy: ±3mm  
 Frequency range: 26GHz  
 Explosion-proof grade: Exia II C T6 Ga/ Ex d IIC T6 Gb  
 Protection level: IP67  
 Signal output: 4-20mA/HART (two-wire/four-wire), RS485/Modbus





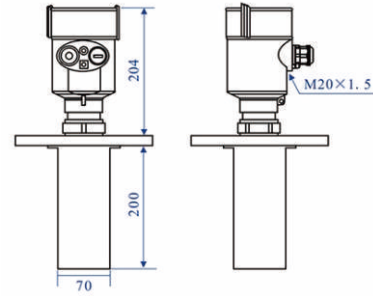
**SRL602S**

Application: **temperature, pressure, slightly corrosive liquid**  
 Measuring range: 30 meters  
 Process connection: thread, flange  
 Medium temperature: -40~ 250°C  
 Process pressure: -0.1~4.0MPa  
 Accuracy: ±3mm  
 Protection level: IP67  
 Frequency range: 26GHz  
 Explosion-proof grade: Exia IIC T6 Ga/Exd ia IC T6Gb  
 Signal output: 4-20mA/HART (two-wire/four-wire), RS485/Mod bus



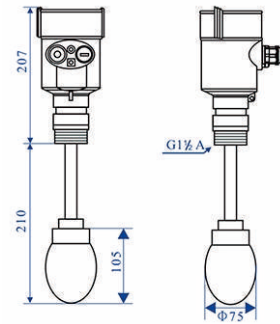
**SRL609**

Measuring range: 20 meters  
 Applications: **Strong corrosion, large water vapor, easy to condense and other working environments**  
 Process connection: flange  
 Medium temperature: -40~250°C  
 Process pressure: normal pressure  
 Measurement accuracy: ±3mm  
 Frequency range: 26GHz  
 Protection level: IP67  
 Explosion-proof grade: Exib II C T6 Gb  
 Signal output: 4-20ma/HART (2-wire/4-wire), RS485/Modbus



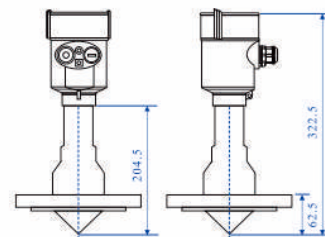
**SRL608**

Application: **corrosive liquid, steam, volatile liquid**  
 Measuring range: 15 meters  
 Process connection: flange  
 Medium temperature: -40 ~ 230°C  
 Process pressure: -0.1 ~ 2.0MPa  
 Accuracy: ±3mm  
 Frequency range: 26GHz  
 Explosion-proof grade: Exia II C T6 Ga/ Ex d IIC T6 Gb  
 Protection level: IP67  
 Power supply: Two-wire system (DC24V)/four-wire system (DC24V/AC220V)  
 Signal output: 4-20mA/HART (two-wire/four-wire), RS485/Modbus



**SRL607**

Applications: **easy to crystallize, dew, corrosive liquid, powder**  
 Antenna material: PTFE/316L (optional)  
 Measuring range: 40 meters  
 Measurement accuracy: soil 3mm  
 Power supply: 24VDC (two-wire, four-wire)  
 Medium temperature: -40~260°C  
 Process pressure: -0. 1~2. 0MPa.  
 Process connection: flange (optional)  
 Protection level: IP67  
 Explosion-proof grade: Exia IIC T6 (optional)  
 Signal output: 4... 20mA/HART/ RS485/Modbus...



## INSTALLATION REQUIREMENTS

©The radar level gauge is installed at 1/4 or 1/6 of the tank diameter.

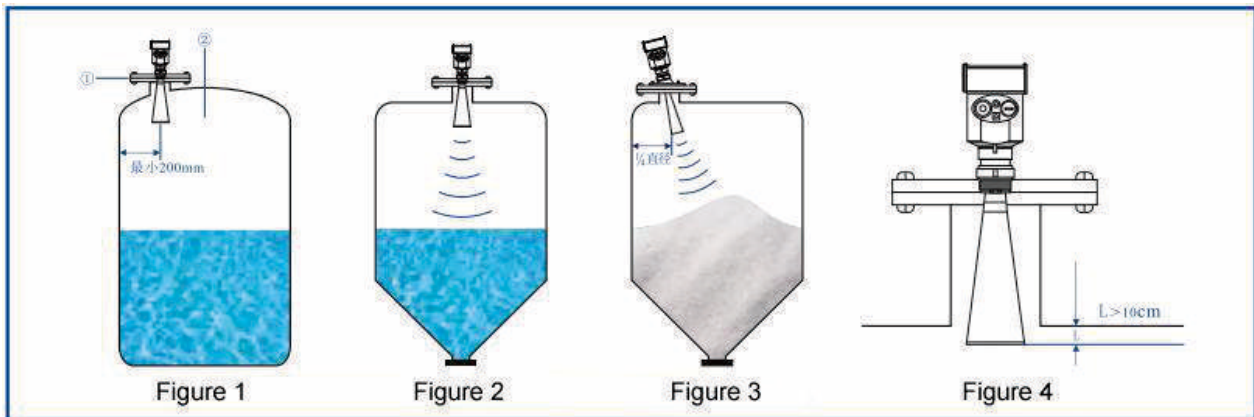
Note: The minimum distance from the tank wall should be ≥200mm. As shown in figure 1: ① reference plane, ② center of container or axis of symmetry.

©The top surface of the conical tank can be installed in the middle of the top of the tank to ensure that the bottom of the cone is measured, as shown in Figure 2.

©When there is a pile, the antenna should be vertically aligned with the material surface. If the material surface is not flat and the pile angle is large, you must use a universal flange to adjust the horn angle so that the horn is aligned with the material surface.

as much as possible, as shown in Figure 3.

© Takeover height requirements: must ensure that the antenna extends into the tank at least a distance of 10mm, as shown in Figure 4.



## ELECTRONIC CONNECTION

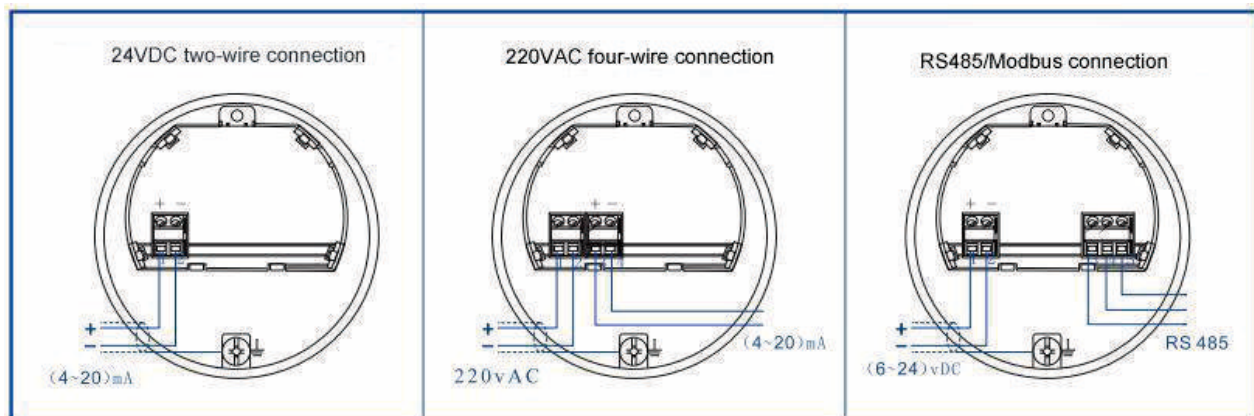
### © Supply voltage

(4~20)mA/HART (two-wire system) - The power supply and output current signal share a two-core shielded cable. Refer to the technical data for the specific supply voltage range. For intrinsically safe models, a safety barrier must be added between the power supply and the instrument.

(4~20)mA/HART (four-wire system) - The power supply and the current signal are separated, and each uses a two-core shielded wire. Refer to the technical data for the specific supply voltage range.

RS485/Modbus - The power supply and Modbus signals are separated, and each uses a two-core shielded wire. Refer to the technical data for the specific supply voltage range.

### © Wiring Connection



## PROTECTION LEVEL

This instrument fully meets the requirements of protection class IP66/67. As shown in Figure 5:

- ⊙ How to ensure that the installation meets the requirements of IP67:
- ⊙ Please make sure the sealing head is not damaged.
- ⊙ Please make sure the cable is not damaged.
- ⊙ Please make sure that the cables used meet the requirements of electrical connection specifications. Before entering electrical interface, bend the cable downward to ensure that water does not flow into the housing, see ①
- ⊙ Please tighten the cable gland, see ②
- ⊙ Please plug the unused electrical interface with a blind plug, see ③

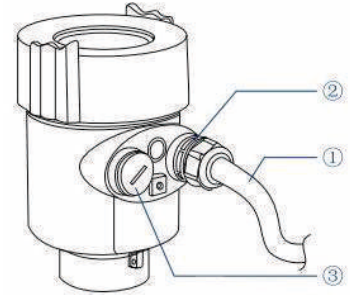


Figure 5

## INSTRUMENT COMMISSIONING

The instrument has three debugging methods, as follows:

- ⊙ Method one: display/button

Debug the instrument through the 4 buttons on the display screen. (Figure 6)

- ① LCD display; ② button.

- ⊙ Method 2: Commissioning on computer

Connected to the upper computer through HART (as shown in Figure 7) ① RS232 interface or USB interface; ② radar level gauge; ③ HART adapter; ④ 250 Ω resistance.

- ⊙ Method 3: HART handheld programmer programming

HART handheld programmer (see Figure 8) ① RS232 interface or USB interface; ② radar level gauge; ③ 250Ω resistance

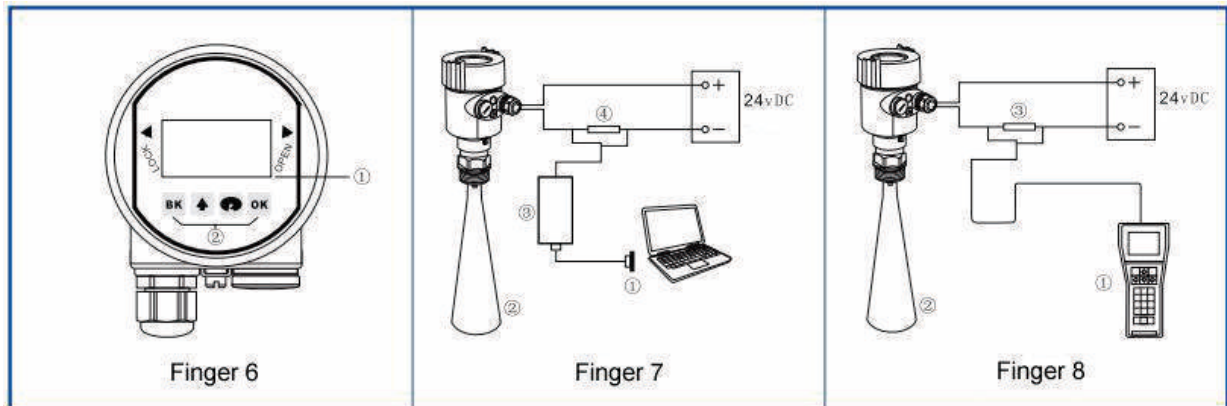


Figure 6

Figure 7

Figure 8

## APPLICATION

⊙ Power plant: coal pile, raw coal bunker, fuel bunker, storage tank, exhaust gas purification tank, bunker pump, steam drum, storage, oil tank, etc.;

⊙ Oilfield: crude oil storage tank, product oil storage tank, three-phase separator, settling tank, sewage tank, oil-water interface, drilling mud tank, etc.;

⊙ Chemical: crude oil distillation tower, raw material silo, intermediate silo, reaction tank, ammonia water tank, solid silo, separator, asphalt storage tank, etc.;

⊙ Metallurgy: blast furnace, ore silo, ore crusher, raw material silo, auxiliary silo, alumina powder silo, electrolytic cell buffer tank, etc.;

⊙ Water conservancy: water channels, reservoirs, farmland irrigation, river water level monitoring, mountain flood warning, urban waterlogging, etc.;

- ©Cement: stone silo, raw silo, cement silo, pulverized coal silo, slag storage silo, commercial concrete, etc.;
- ©Food: Juice factory, milk factory, raw sugar storage tank, tomato sauce storage tank, beer factory storage tank etc.;
- ©Pharmaceutical: Chinese medicine storage tank, separator, fermentation tank, etc.;
- ©Water treatment: storage tank, sewage tank, water treatment tank, sedimentation tank, deep well, drinking water network, etc.
- ©Papermaking: raw material warehouse, storage tower, drying drum, chemical material storage warehouse, etc.;
- ©Other: quarry, coal mine, environmental protection, shipbuilding and other industries.

