

Radar level meter

Committed to process automation solutions

Datasheet

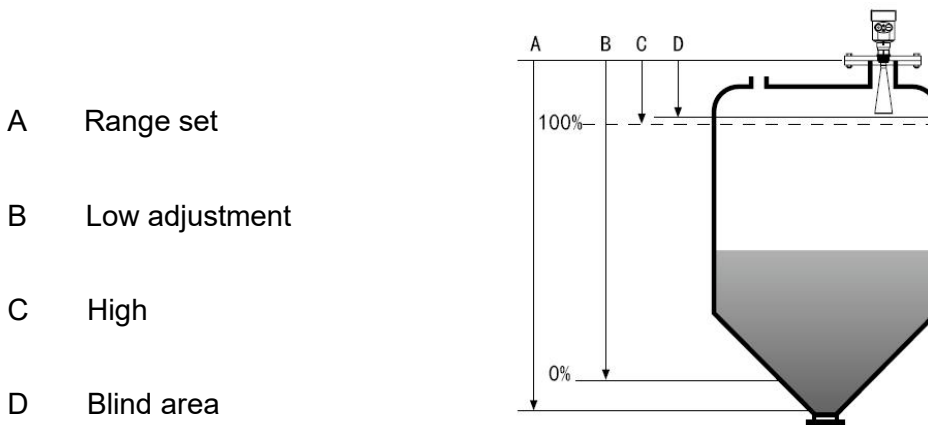


SUP-RD

This series of radar level meter adopted 26G high frequency radar sensor, the maximum measurement range can reach up to 60 meters. Antenna is optimized further processing, the new fast microprocessors have higher speed and efficiency can be done signal analysis, the instrumentation can be used for reactor, solid silo and very complex measurement environment.

Principle

Radar level transmitter antenna microwave pulse is narrow, the downward transmission antenna. Microwave exposure to the medium surface is reflected back again by the antenna system receives, sends the signal to the electronic circuit automatically converted into level signals (because the microwave propagation speed, electromagnetic wave to reach the target and the reflected back to the receiver this time is almost instantaneous).



Datum measurement: Screw thread bottom or the sealing surface of the flange.

Note: Make sure the radar level meter the highest level cannot enter the measuring blind area (Figure D shown below).

The characteristics of 26G radar level meter:

- Small antenna size, easy to install; Non-contact radar, no wear, no pollution.
- Almost no corrosion, bubble effect; almost not affected by water vapor in the atmosphere, the temperature and pressure changes.
- Serious dust environment on the high level meter work has little effect.
- A shorter wavelength, the reflection of solid surface inclination is better.
- Beam angle is small, the energy is concentrated, can enhance the ability of echo and to avoid interference.
- The measuring range is smaller, for a measurement will yield good results.
- High signal-to-noise ratio, the level fluctuation state can obtain better performance.
- High frequency, measurement of solid and low dielectric constant of the best choice.

Product Introduction

For liquid

SUP-RD901



Application: Slightly corrosive liquid

Measuring Range: 10 meters

Process Connection: Thread, flange

Medium Temperature: $-40^{\circ}\text{C} \sim 130^{\circ}\text{C}$

Process Pressure: $-0.1 \sim 0.3\text{MPa}$

Accuracy: $\pm 5\text{mm}$

Protection Grade: IP67

Frequency Range: 26GHz

Signal Output: 4... 20mA/HART (Two-wire / Four)

RS485/ Modbus

SUP-RD902T



Application: Slightly corrosive liquid, volatile liquid tank

Measuring Range: 20 meters

Process Connection: Flange

Medium Temperature: $-40^{\circ}\text{C} \sim 130^{\circ}\text{C}$ (Standard),
 $-40^{\circ}\text{C} \sim 250^{\circ}\text{C}$ (High temp type)

Process Pressure: $-0.1 \sim 2\text{MPa}$

Accuracy: $\pm 3\text{mm}$

Protection Grade: IP67

Frequency Range: 26GHz

Signal Output: 4... 20mA/HART (Two-wire / Four)

RS485/ Modbus

SUP-RD906



Application: Hygienic liquid storage tank, highly corrosive tank

Measuring Range: 20 meters

Process Connection: Flange

Medium Temperature: -40°C ~ 130°C (Standard),
-40°C ~ 200°C (High temp type)

Process Pressure: -0.1 ~ 4MPa

Accuracy: $\pm 3\text{mm}$

Protection Grade: IP67

Frequency Range: 26GHz

Signal Output: 4... 20mA/HART (Two-wire / Four)
RS485/ Modbus

SUP-RD908



Application: Rivers, lakes, shoals

Measuring Range: 30 meters

Process Connection: Thread, flange

Medium Temperature: -40°C ~ 100°C

Process Pressure: Natural pressure

Accuracy: $\pm 3\text{mm}$

Protection Grade: IP65/ IP67

Frequency Range: 26GHz

Signal Output: 4... 20mA/HART (Two-wire / Four)
RS485/ Modbus

SUP-RD909



Application: Rivers, lakes, shoals

Measuring Range: 70 meters

Process Connection: Thread, flange

Medium Temperature: -40°C ~ 100°C

Process Pressure: Natural pressure

Accuracy: $\pm 10\text{mm}$

Protection Grade: IP65/ IP67

Frequency Range: 26GHz

Signal Output: 4... 20mA/HART (Two-wire / Four)

RS485/ Modbus

For powder, granules, lumps

SUP-RD903



Application: powder, granules, lumps

Measuring Range:

DN80: granules 12 meters, lumps 12 meters;

DN100: powder 20 meters, granules 25 meters, lumps 25 meters;

DN125: powder 45 meters, granules 35 meters, lumps 40 meters;

Process Connection: Standard flange, universal flange

Medium Temperature: -40°C ~ 130°C (Standard),
-40°C ~ 200°C (High temp type)

Process Pressure: -0.1 ~ 4MPa (Standard flange),
-0.1 ~ 0.3MPa (Universal flange)

Accuracy: $\pm 15\text{mm}$

Protection Grade: IP65/ IP67

Frequency Range: 26GHz

Signal Output: 4... 20mA/HART (Two-wire / Four)

RS485/ Modbus

SUP-RD904



Application: powder, granules, lumps

Measuring Range:

196mm :powder 35 meters, granules 40 meters, lumps 40 meters;

246mm :powder 45 meters, granules 50 meters, lumps 50 meters;

Process Connection: Thread, universal flange

Medium Temperature: -40℃ ~ 130℃(Standard),
-40℃ ~ 200℃(High temp type)

Process Pressure: -0.1 ~ 0.3MPa

Accuracy: ± 15mm

Protection Grade: IP67

Frequency Range: 26GHz

Signal Output: 4... 20mA/HART (Two-wire / Four)
RS485/ Modbus

SUP-RD905



Application: powder, granules, lumps

Measuring Range:

DN80: granules 8 meters, lumps 8 meters;

DN100:powder 12 meters, granules 15 meters, lumps 15 meters;

DN125:powder 15 meters, granules 20 meters, lumps 20 meters;

Process Connection: Standard flange, universal flange

Medium Temperature: -40℃ ~ 130℃(Standard),
-40℃ ~ 200℃(High temp type)

Process Pressure: -0.1 ~ 4MPa(Standard flange),
-0.1 ~ 0.3MPa(Universal flange)

Accuracy: ± 15mm

Protection Grade: IP67

Frequency Range: 26GHz

Signal Output: 4... 20mA/HART (Two-wire / Four)
RS485/ Modbus

Installation Requirements

Installation guide:

Be installed in the diameter of the 1/4 or 1/6.

Note: The minimum distance from the tank wall should be 200mm.

Note: ① Datum

② The container center or axis of symmetry

- The top conical tank level, can be installed at the top of the tank is intermediate, can guarantee the measurement to the conical bottom.

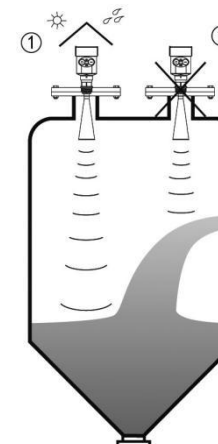
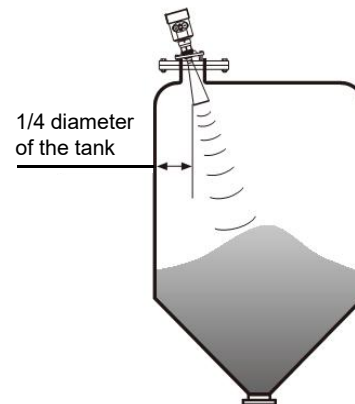
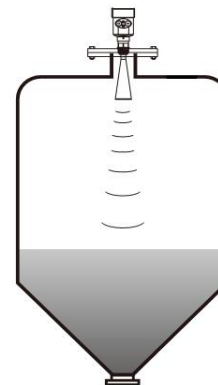
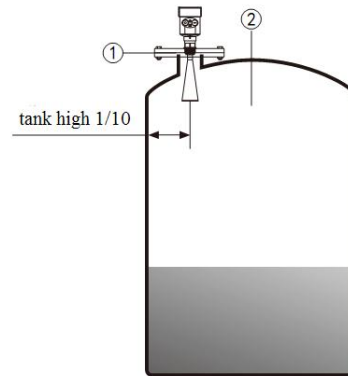
- A feed antenna to the vertical alignment surface. If the surface is rough, stack angle must be used to adjust the angle of cardan flange of the antenna to the alignment surface.

(Due to the solid surface tilt will cause the echo attenuation, even Loss of signal.)

■ Typical installation errors:

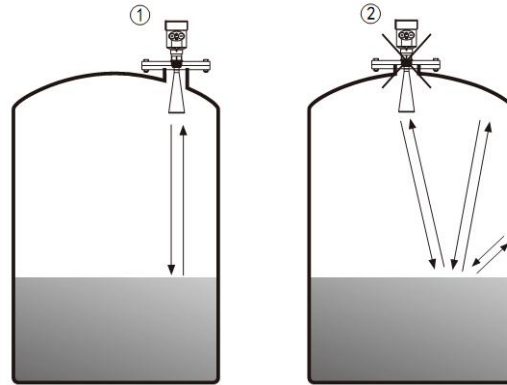
- Conical tank cannot be installed above the feed port.

Note: outdoor installation should adopt sunshade.



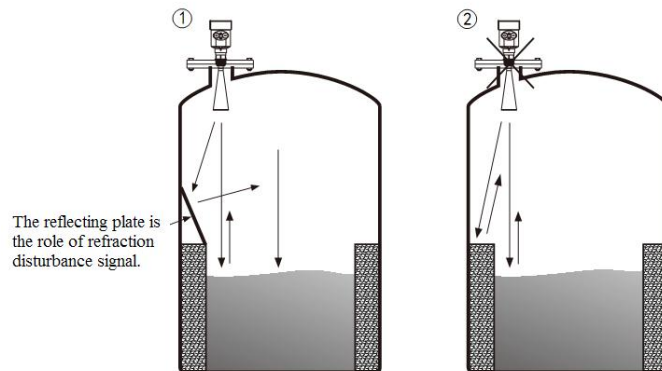
- The instrument cannot be installed in the arched or domed roof intermediate. In addition to produce indirect echo is also affected by the echoes. Multiple echo can be larger than the real value of signal echo, because through the top can concentrate multiple echo. So cannot be installed in a central location.

- ① Correct
- ② Error



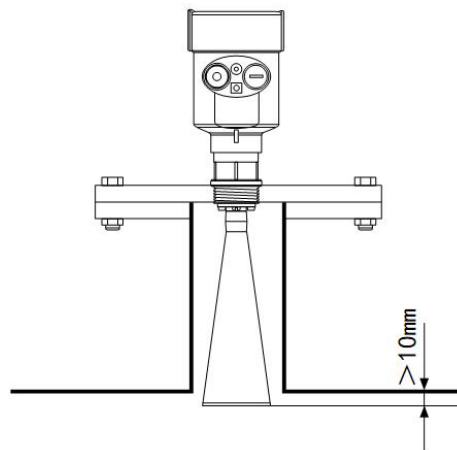
- There are obstacles affecting measurement needed reflection plate.

- ① Correct
- ② Error



■ Height of nozzle:

Antenna extends into the tank
at least 10mm distance.



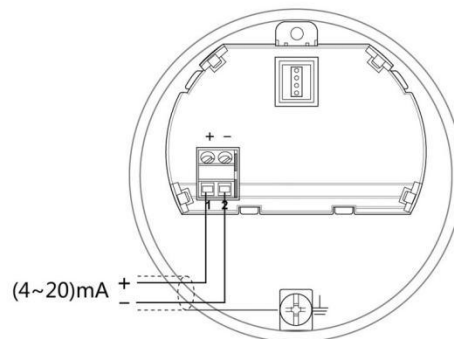
Electrical Connection

The power supply voltage:

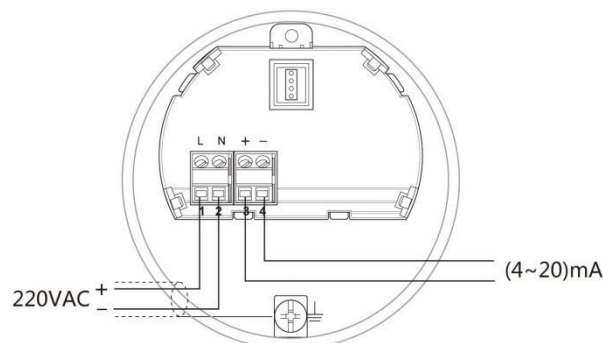
(4~20)mA/HART (Two wire system)	The power supply and the output current signal sharing a two core shield cable. The supply voltage range see technical data. For intrinsically safe type must be a safety barrier between the power supply and the instrument.
(4~20)mA/HART(Four wire system)	Separate power supply and the current signal, respectively using a two-core shielded cable. The supply voltage range see technical data.
RS485 / Modbus	Power supply and Modbus signal line separated respectively using a two-core shielded cable, the power supply voltage range see technical data.

■ Connection mode:

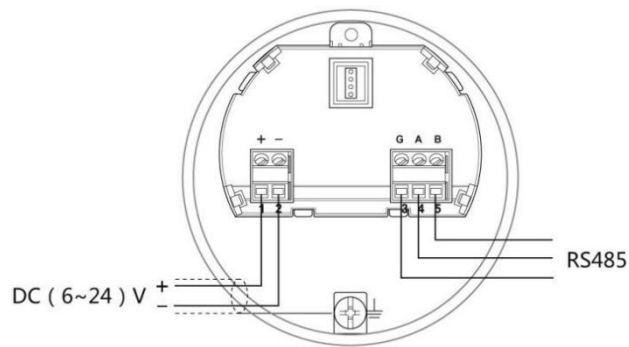
➤24V two wire wiring diagram as follows:



➤220V four wire connection is as below:



➤ 24V RS485/Modbus wiring diagram as follows:

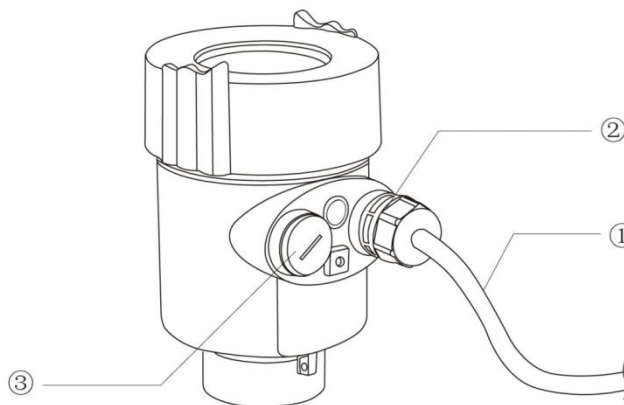


■ Safety instructions:

- Please observe the local electrical code requirements!
- Please comply with local requirements for personnel health and safety regulations.
- All electrical components of instrument operation must be completed by the formal training of professionals.
- Please check the instrument nameplate to provide product specifications meet your requirements. Please make sure that the power supply voltage and instrument nameplate on the requirements.

■ Protection grade:

This instrument meets the protection class IP66/67 requirements, please ensure the waterproof cable sealing head. The following diagram:



How to install to meet the requirements of IP67:

Please make sure that the sealing head is not damaged.

Please make sure that the cable is not damaged.

Please make sure that the cable for use with electrical connection specification.

Cable into the electrical interface before its curved downward, ensure that the water will not flow into

the shell, see the ①

Tighten the cable seal head, see the ②

Please electrical interface will not use blind plug tight, see the ③

Instrument Commissioning

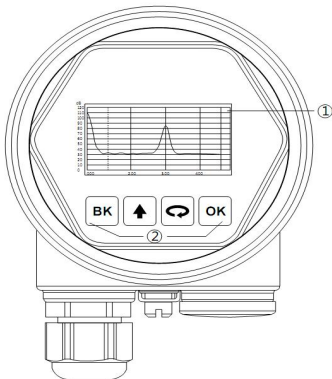
■ There are three kinds of debugging method:

- 1) Display / Keyboard
- 2) Host debugging
- 3) HART handheld programmer

■ Display / Keyboard:

Please debug the instrumentation by four buttons on the display screen. There are three debug menu languages optional. After debugging is generally used only for display, through the glass window can read measured value very clearly.

Display / Keyboard



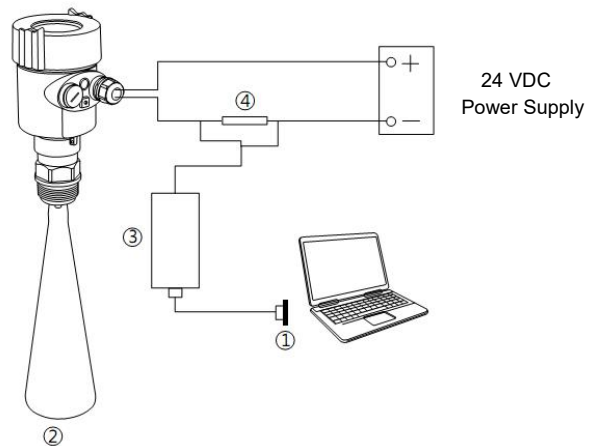
① Liquid crystal display(LCD)

② The key

■ PC debugging:

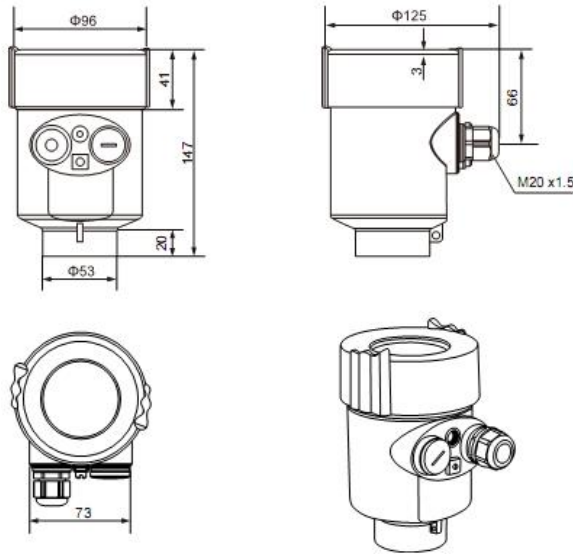
Connected to PC by HART

- ① RS232 interface or USB interface
- ② Radar level meter
- ③ HART adapter
- ④ 250 Ω resistor

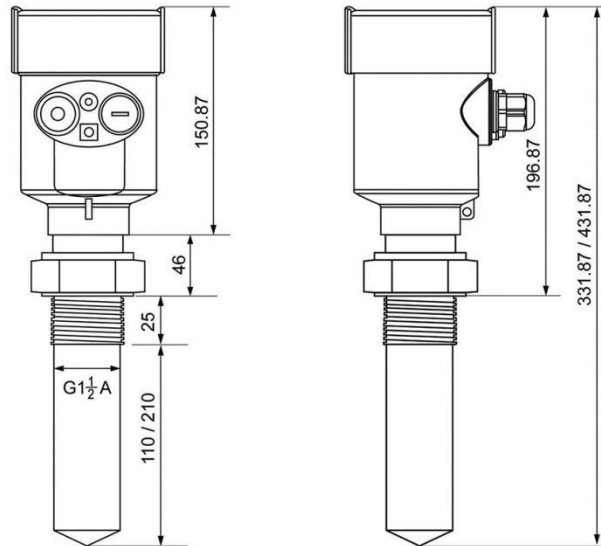


Structure Size

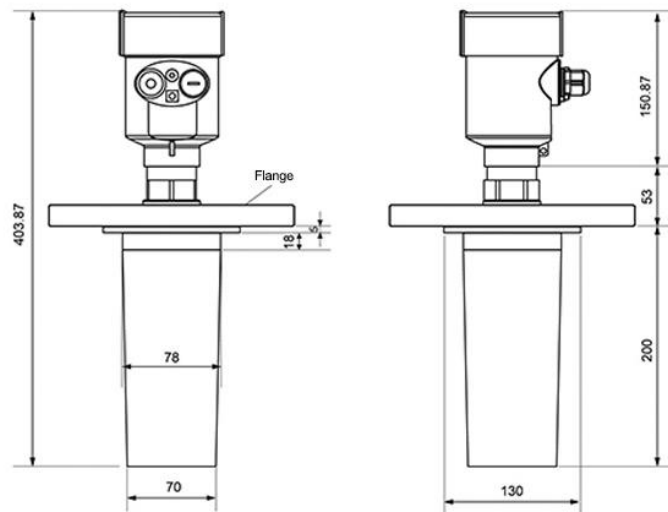
■ The outer shell:



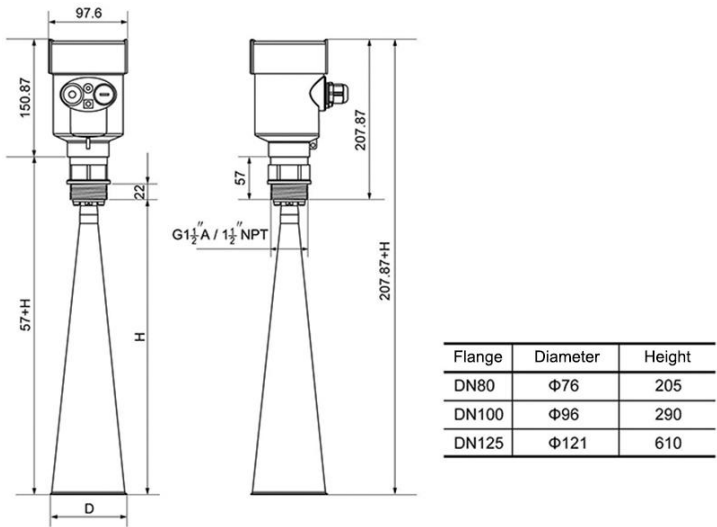
SUP-RD901



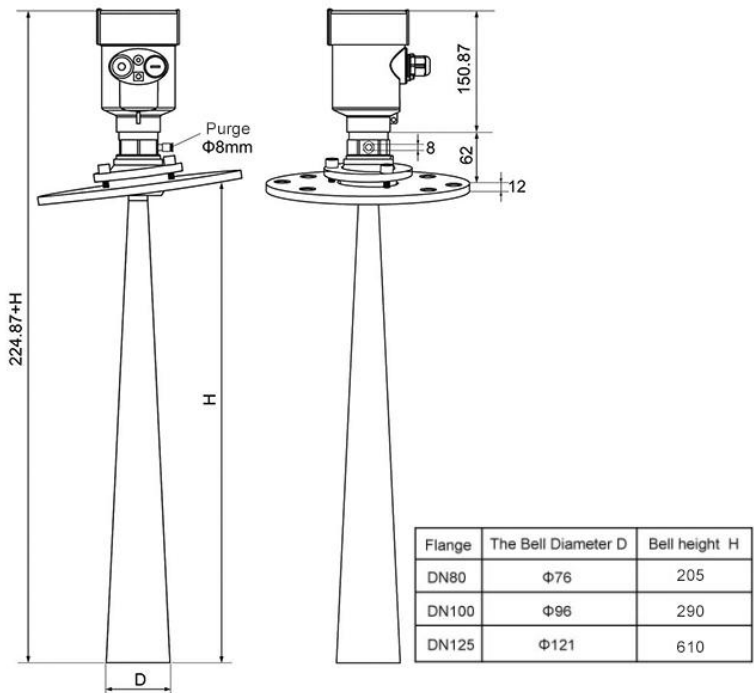
SUP-RD902T



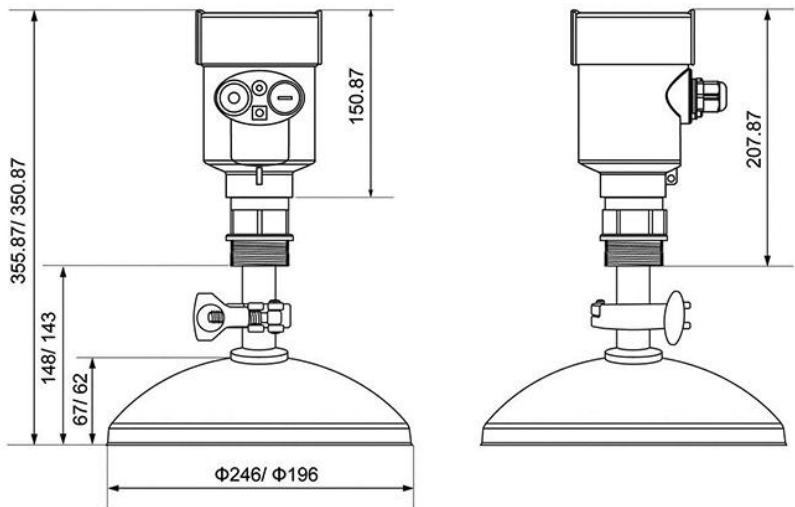
SUP-RD908/909



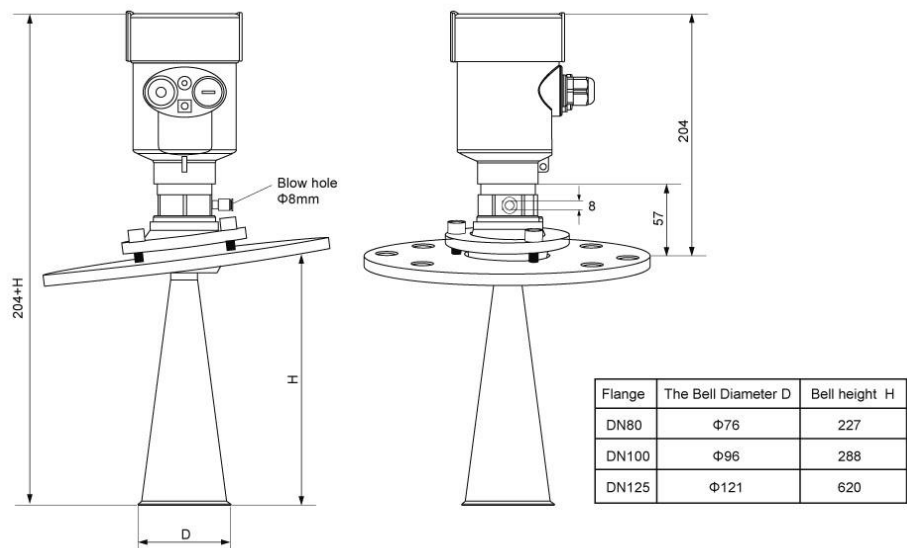
SUP-RD903



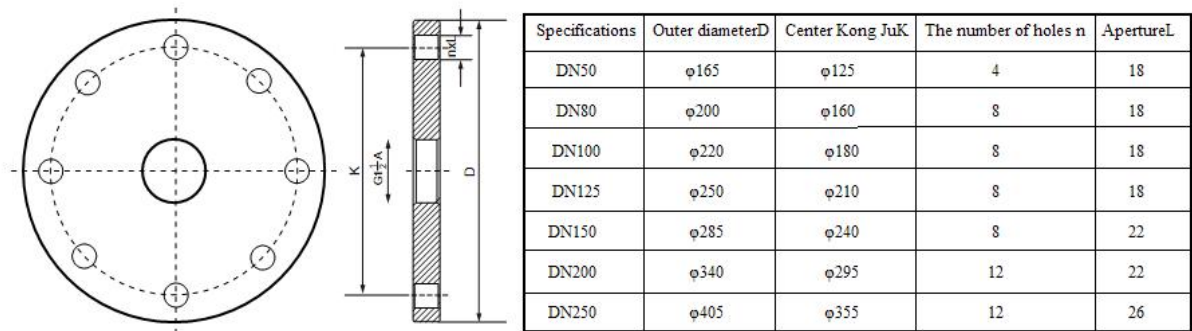
SUP-RD904



SUP-RD905



■ Flange type:



Technical Parameters

The outer shell

The seal between the shell and the shell cover
Casing window
The ground terminal

Silicone rubber
Polycarbonate
Stainless steel

The power supply voltage

Two wire system
The standard type
Intrinsically safe
Power dissipation
Allowable ripple

(16 ~ 26) V DC
(21.6 ~ 26.4) V DC
max 22.5mA / 1W

- <100Hz
- (100~100K) Hz

Uss<IV
Uss<10mV

The cable parameters

Cable entrance / plug	1 M20xl.5 cable entrance
Terminal	1 blind plug Conductor cross section 2.5mm ²

Output parameters

The output signal	(4 ~ 20) mA/RS485
Communication protocol	HART
Resolution	1.6 μ A
Fault signal	Constant current output; 20. 5mA 22mA 3.9mA
The integral time	(0 ~ 36) s, adjustable

Blind area	the ends of the antenna
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The maximum distance measurement	70 meters
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Microwave frequency	26GHz
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Communication interface	HART communication protocol
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The measurement interval	about 1 second (depending on the parameter settings)
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Adjust the time	about 1 second (depending on the parameter settings)
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Display resolution	1 mm
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Working storage and transportation temperature	(-40~100) °C
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Process temperature (the temperature of the antenna part)	(-40~250)°C
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Pressure	Max.4MPa
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Seismic	Mechanical vibration 10m/s ² , (10 ~ 150) Hz
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Meter Linearity

Emission angle

- \varnothing 76mm

- \varnothing 96mm

- \varnothing 121mm

Precision

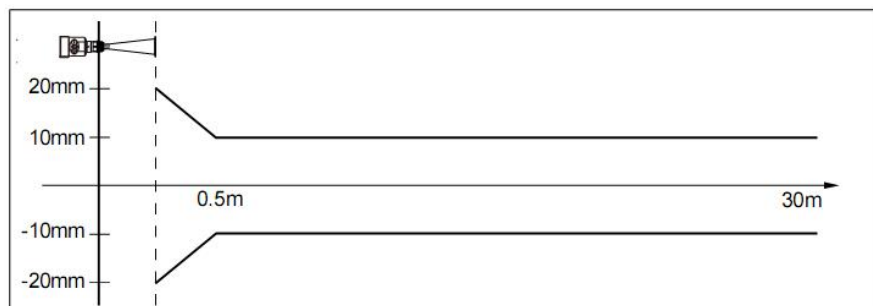
Depending on the size of the antenna

12°

8°

6°

See chart



Company: _____ Contact: _____
Address: _____ ZIP code: _____
The Telephone: _____ Fax: _____ Mobile phone: _____
Email: _____ Date: _____

Tank/Container Information

The Types of Tank:

☐ Tank ☐ Reaction Tank ☐ Separation Tank ☐ Marine Tank

The Tank Structure:

Material of Tank: _____ Pressure: _____

Tank size:

Tank Height: _____ m Diameter: _____

The top of the tank:

☐ Vault ☐ Flat ☐ Open ☐ Cone type

The bottom of the tank:

☐ Cone bottom ☐ Flat ☐ Slope bottom ☐ Arc bottom

Installation:

☐ Top installation ☐ Side installation
☐ The bypass pipe mount ☐ Guided wave pipe installation

Installation takes over the top of the tank (information) :

Height of take over: _____ mm Diameter of take over: _____ mm

Measurement of Medium

Media name: ☐ Liquid ☐ Solid ☐ Mixed Media

Medium temperature: _____ °C

Dielectric Constant:

Linked material: ☐ Yes ☐ No

Mixing: ☐ Yes ☐ No

Process Connection

Thread: ☐ G1'A ☐ 1%"NPT

Flange: ☐ Flange (DN=) ☐ Flange (ANSI=)

Power supply:

☐ 24VDC Two wire system ☐ 24VDC Four wire system ☐ 220V AC Four wire system

Output: ☐ 4-20mA ☐ HART

Display: ☐ Take the meter display program ☐ Without meter display program

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