Reliant R902 26G Radar Level Meter Catalog
File Number: RII202003LM

R902-26GHz Radar Level Meter

BEST MEASUREMENT PERFORMANCE

- **Best measurement performance on liquid**
- **Optimum level measurement**
- **Reliable level measurement for the most complicate applications**
- **Excellent design to reduce installation cost and eliminate daily maintenance**

BEST FIT- FOR- APPLICATION

- **Wide range up to 30 meters**
- **Wide application of hygienic, cryogenic, high pressure and high temperature**
- **Wide variety of I/O and expansive communication protocols**

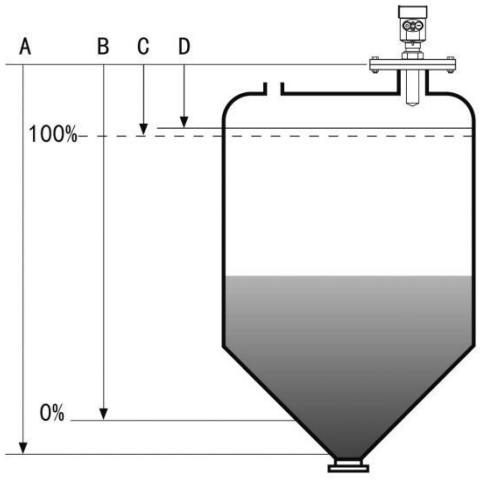
OVERVIEW

This series of radar level meter adopted 26G high frequency radar sensor, the maximum measurement range can reach up to 30 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).

A	Range set
B	Low adjustment
C	High
D	Blind area



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).

DESIGN & BENEFIT

- 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.
- Small beam angle, 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.

APPLICATION

Industries

- Chemicals
- Food & Beverages
- Machinery
- Minerals & Ming
- Oil & Gas
- Pharmaceuticals
- Power Plant
- Pulp & Paper
- Water
- Waste Water

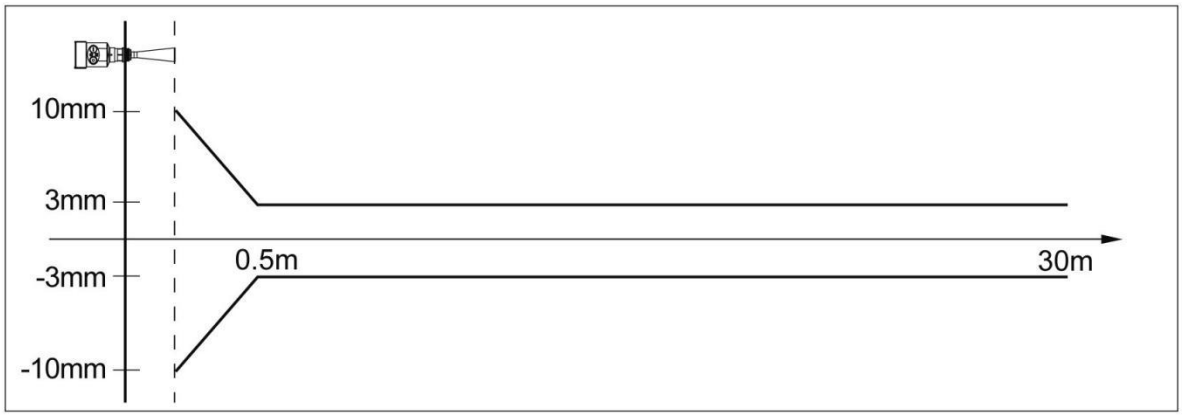
TECHNICAL PARAMETERS

Process Connection	Thread G1½″A/ Thread 1½″ NPT /Flange
Antenna Material	Stainless Steel / PTF
The outer shell	
The seal between the shell and the shell cover	Silicone rubber
Casing window	Polycarbonate
The ground terminal	Stainless steel
Power Supply	
2-wire system	Standard type (16 to 26) V DC Intrinsically safe (21.6 to 26.4) V DC Power dissipation max 22.5mA / 1W Allowable ripple <100Hz Uss<lV (100 to 100K) Hz Uss<l0mV
Flameproof	(22.8 to 26.4) V DC, 2-wire system (198 to242)VAC, 4-wire system/110VAC, 4-wire system
Cable parameters	
Cable entrance / plug	1-M20xl.5 cable entrance,1- blind plug
Terminal	Conductor cross section 2.5mm²
Output and Communication	
Output signal	(4 to 20) mA/RS485
Communication protocol	HART/ Modbus
Resolution	1.6μA
Fault signal	Constant current output; 20. 5mA 22mA 3.9mA
Integral time	(0 to 36) s, adjustable
Blind area	the ends of the antenna
Max. distance measurement	30 meters （Liquid type）

Accuracy	± 3mm
Enclosure	IP67
Ex-Grade	Exia Ⅱ C T6 Ga/ Exd Ⅱ C T6 Gb
Frequency	26GHz
Communication interface	HART communication protocol
Measurement interval	about 1 second (depending on the parameter settings)
Adjust the time	about 1 second (depend on the parameter settings)
Display resolution	1 mm
Storage and transportation temperature	(-40 to 100) ℃
Process Temperature	(-40 to 130)℃ / (-40 to 250)℃
Pressure	Max. 4.0MPa
Seismic	Mechanical vibration l0m/s², (10 to 150) Hz

LINEARITY

Emission angle	Depending on the size of the antenna
-¢46mm	18°
-¢76mm	12°
-¢96mm	8°
-¢121mm	6°
Precision	See chart



MODEL SELECTION

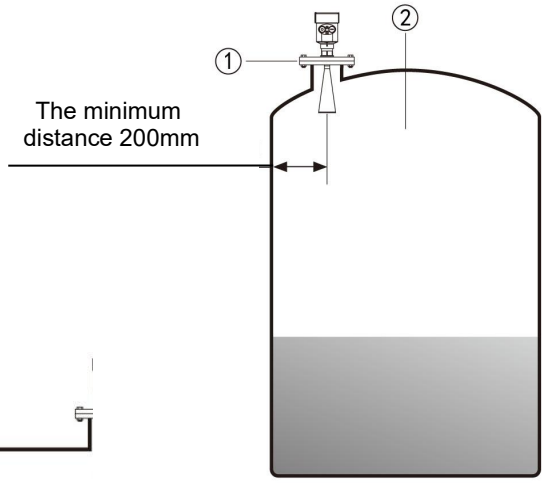
- **R902-**

Type		
	P	Standard (Non-explosion-proof)
	I	Intrinsically safe (Exia IIC T6 Ga)
	G	Flameproof (Exd IIC T6 Gb)
Process Connection / Material		
	G	Thread G1½″A / Stainless Steel 304
	N	Thread 1½″ NPT / Stainless Steel 304
	A	Flange DN50 / Stainless Steel 304
	B	Flange DN80 / Stainless Steel 304
	C	Flange DN100 / Stainless Steel 304
	Y	Special Custom
Antenna Type / Material		
	A	Horn Antenna Φ46mm / Stainless Steel 316L
	B	Horn Antenna Φ76mm / Stainless Steel 316L
	C	Horn Antenna Φ96mm / Stainless Steel 316L
	Y	Special Custom
Seal Up / Process Temperature		
	V	Viton / (-40to130) ℃
	K	Kalrez / (-40to250) ℃
	S	Custom for High temperature.
The Electronic Unit		
	3	(4to20)mA/ 24VDC / HART 2-wire system
	4	(4to20)mA/ 220VAC/ HART 4-wire system
	5	RS485 Modbus/ 6to24V/4-wire system
Outer Covering / Enclosure Grade		
	L	Aluminum/ Single chamber/ IP67
	H	Aluminum/ Double chamber/ IP67
	G	Plastic / Single chamber / IP65
	K	Stainless steel/ Single chamber/ IP67
Cable Entry		
	M	M 20x1.5
	N	½″ NPT
Field Display /The Programmer		
	A	With
	X	Without

INSTALLATION

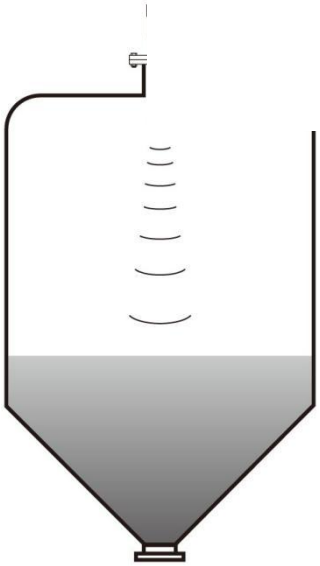
- **Installation guide:**

Be installed in the diameter of the 1/4 or 1/6.
Note: The minimum distance from the tank wall should be 200mm.



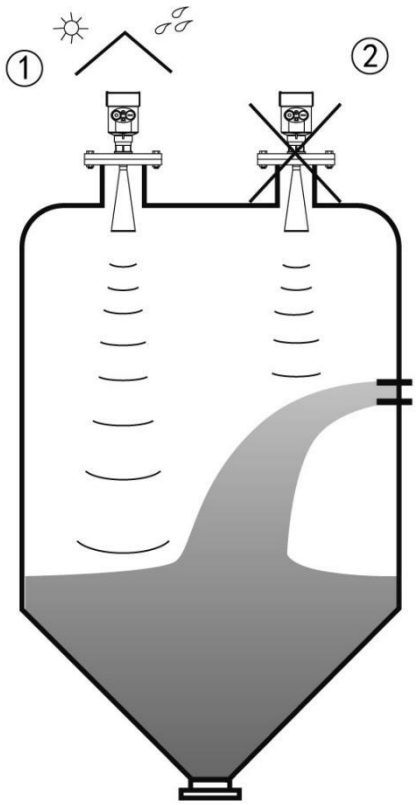
Note: ① datum
②The container center or axis of symmetry

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



- **Typical installation errors：**

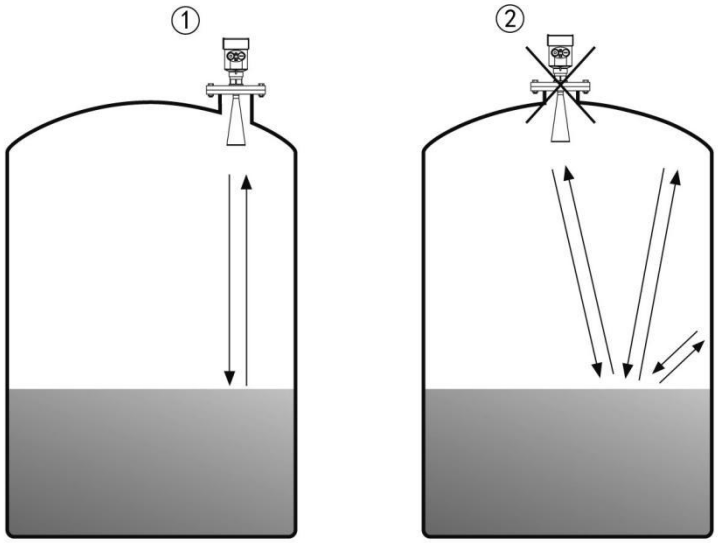
➢ Conical tank cannot be installed above the feed port.
Note: outdoor installation should adopt sunshade.



① Correct
② Error rainproof measures

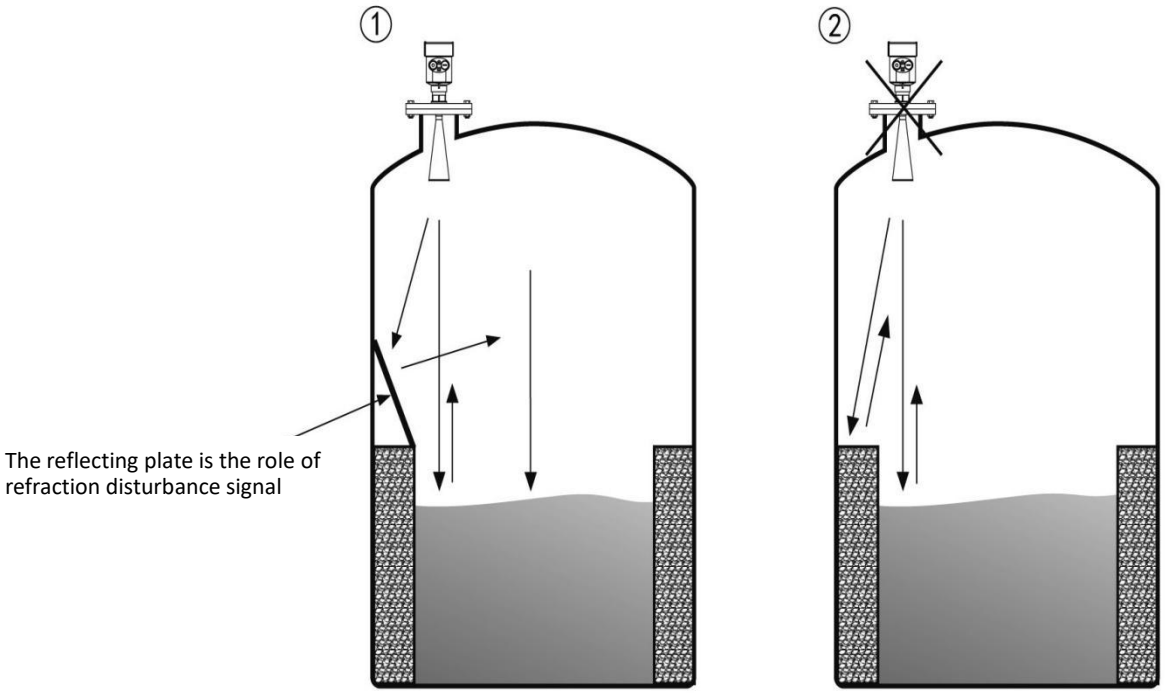
- The instrument cannot be installed in the arched or domed roof intermediate. In addition to produce indirect echo is also affected by the echoes. Multiple echo can be larger than the real value of signal echo, because through the top can concentrate multiple echo. So cannot be installed in a central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

① Correct
② Error



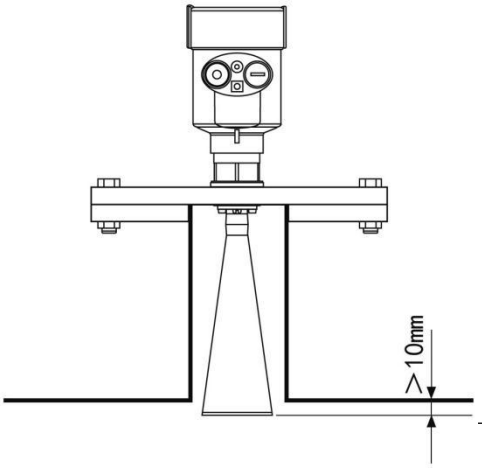
- There are obstacles affecting measurement needed reflection plate.

① Righr
② Error



- **Height of nozzle:**

Antenna extends into the tank at least 10mm.



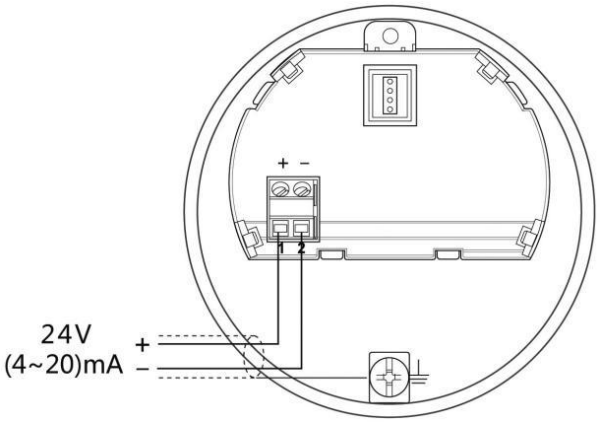
ELECTRICAL CONNECTION

- **The power supply voltage:**

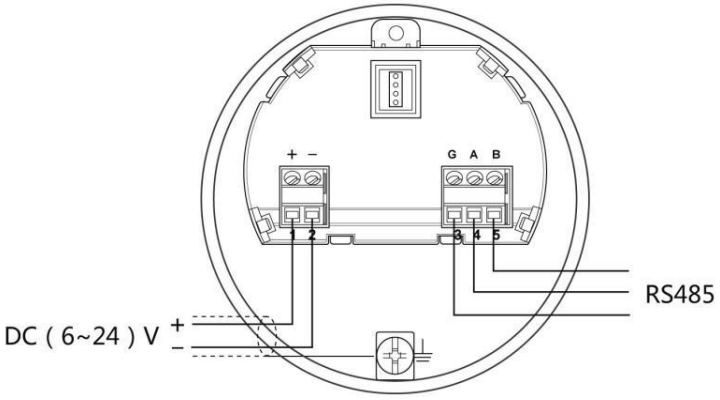
(4to20)mA/HART (2-wire system)	The power supply and a two core shield cable. The supply voltage range see technical data. For intrinsically safe type must be a safety barrier between the power supply and the instrument.
(4to20)mA/HART (4-wire system)	Separate power supply and the current signal, respectively 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 right:



➢ 6to24V RS485/Modbus wiring diagram as right:

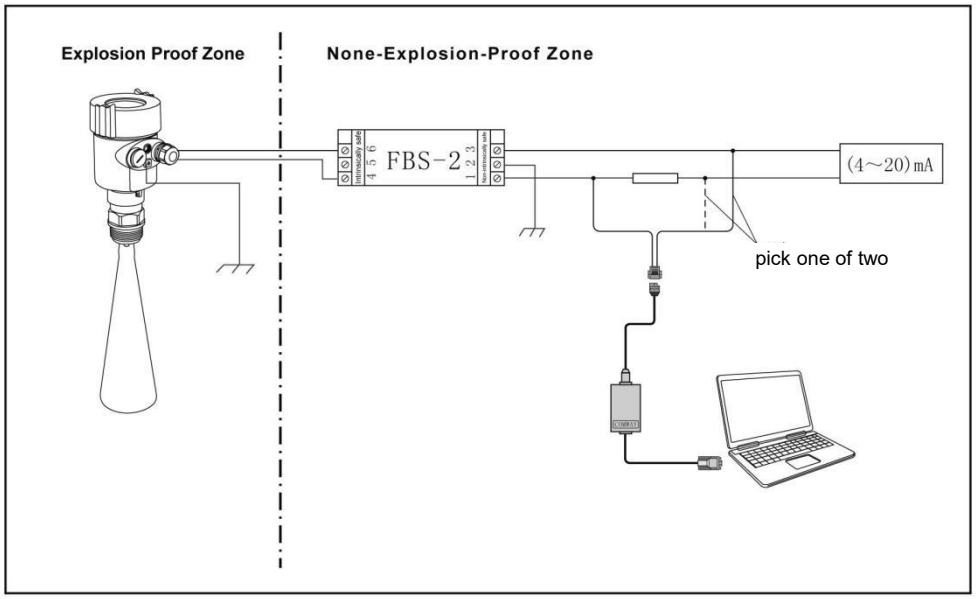


● Explosion Proof Connection

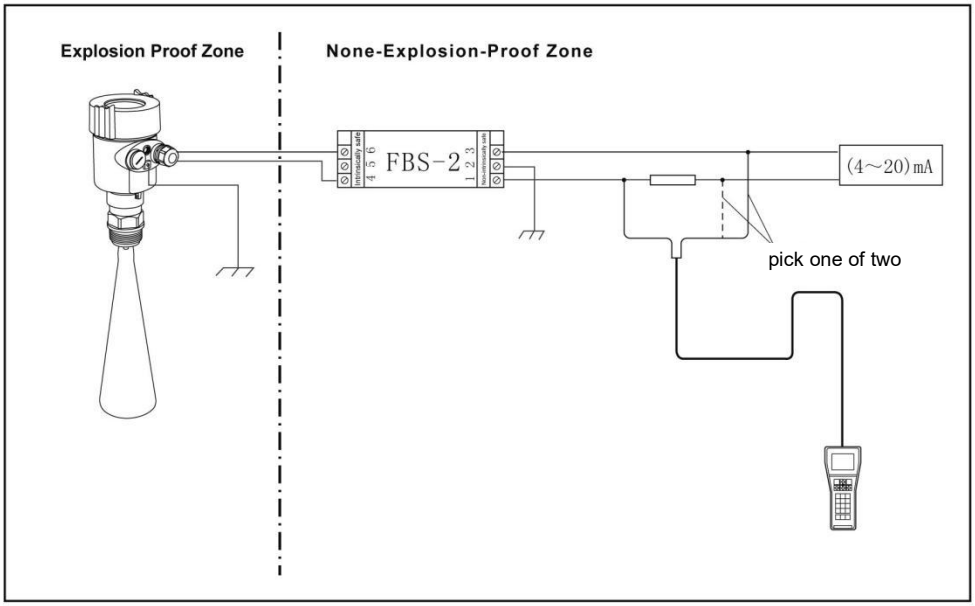
The intrinsic safety version sensors (Exia IIc T6) use Alu-die casting housing and filling Silicone rubber sealants internal structure aimed to prevent sparks resulted from circuit failure from leaking out. It is applicable for the continuous level measurement of flammable medium under Exia IIc T6.

A safety barrier FBS-2 must be used together with the intrinsic safety instrument. It is an associated device to this product for the power supply of this product. The main specification is intrinsic safety: Exia IIC, voltage of power supply: 24VDC±5%, short-circuit current: 135mA, operating current: 4 to 20mA.

All cables must be shielded. The max length is 500m for the cable from the barrier to the sensor. Stray capacitor ≤ 0.1 μ F/Km, stray inductance 1mH/Km. Instrument must be connected to the ground potential. Any unapproved associated device is not allowed to be used.



Adjustment with Software



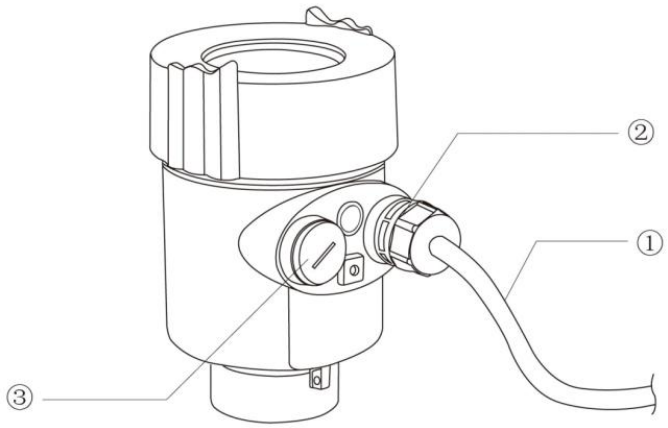
Adjustment with HART Handheld Programmer

- **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.

- **Enclosure grade:**

This instrument meets the enclosure 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 the①
Tighten the cable seal head, see the②
Please electrical interface will not use blind plug tight, see the③

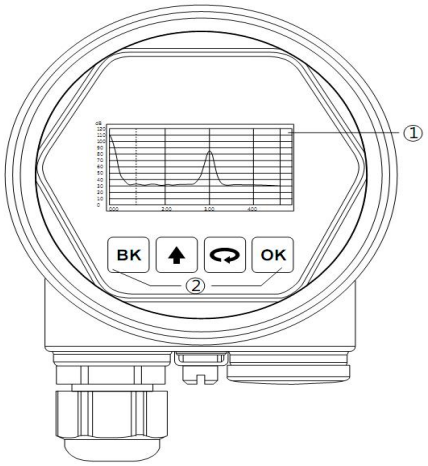
INSTRUMENT COMMISSIONING

- **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



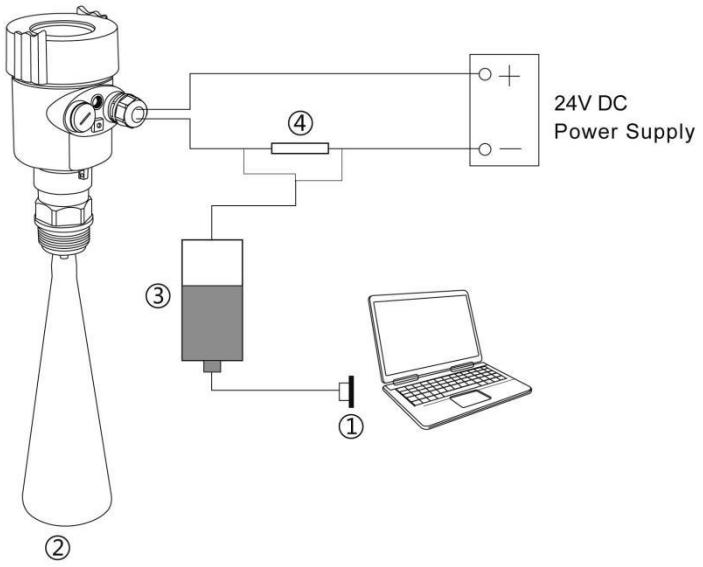
① Liquid crystal display(LCD)

② The key

- **PC debugging:**

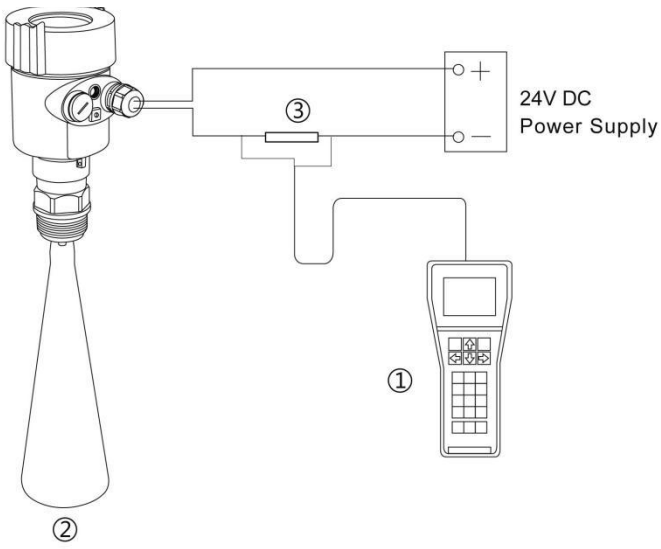
Connected to PC by HART

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



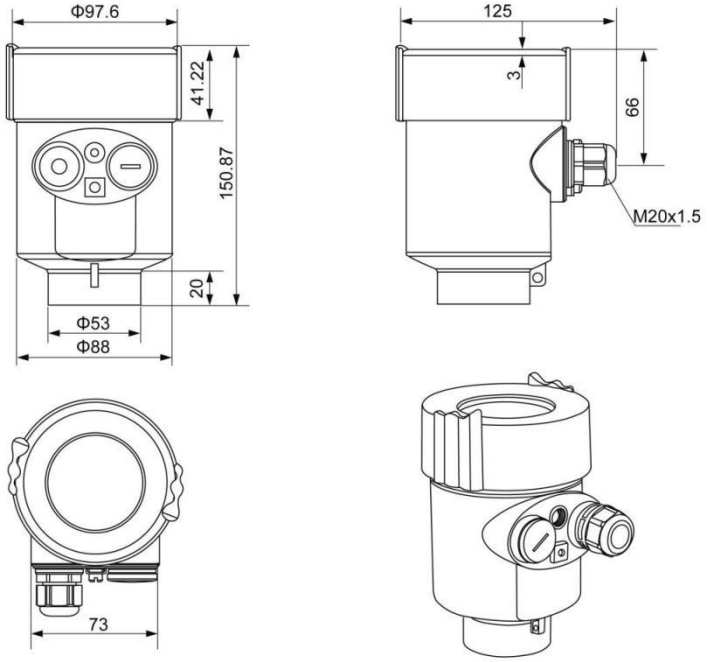
- **HART handheld programmer:**

① HART handheld programmer
② Radar level meter
③ 250 Ω resistor

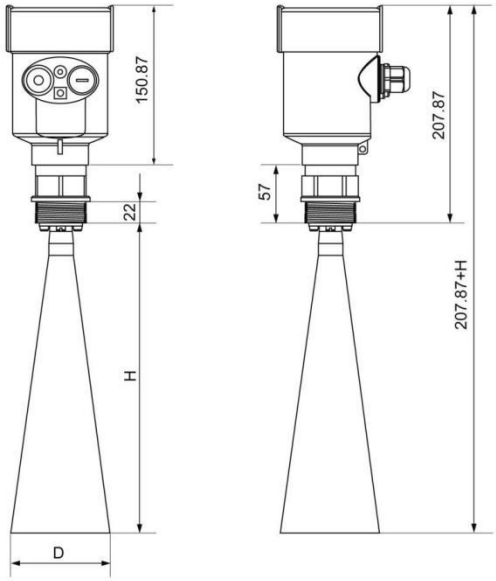


STRUCTURE SIZE (Unit: mm)

- **The outer shell**:

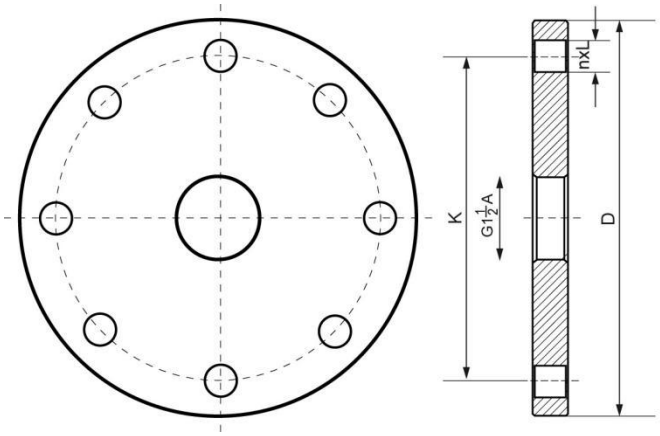


- **Dimension:**



Flange	Trumpet diameter D	Trumpet height H
DN50	Φ46	140
DN80	Φ76	205
DN100	Φ96	290

Flange type:



Flange Selection Tables				
Specification	Outer diameter D	Hole center distance K	Number of Holes n	Hole diameter L
DN50	Φ165	Φ125	4	18
DN80	Φ200	Φ160	8	18
DN100	Φ220	Φ180	8	18
DN125	Φ250	Φ210	8	18
DN150	Φ285	Φ240	8	22
DN200	Φ340	Φ295	12	22
DN250	Φ405	Φ355	12	26

Архангельск (8182)63-90-72
Астана (7172)727-132
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Брянск (4832)59-03-52
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