Tel: 86-15158063876 E-mail: sales@supmea.com

Supmea

www.supmea.com

Radar level transmitter

Datasheet

SUP-RD902T

Add: 5th floor, Building 4,
Singapore-Hangzhou Science & Technology
Park, Hangzhou,China

Directory

1. Product Overview

This series of radar level meter adopted 26G high frequency radar sensor, the maximum measurement range can reach up to 20 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

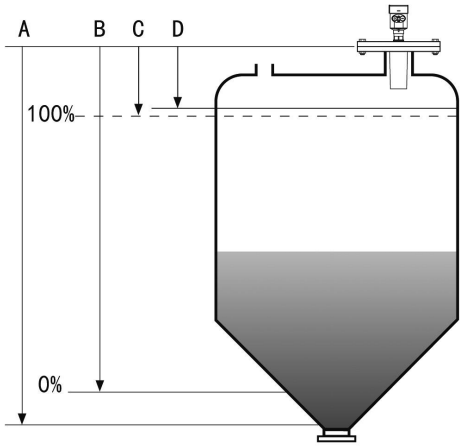
Radar level transmitter antenna microwave pulse is narrow, the downward transmission antenna. Microwave exposure to the medium surface is reflected back again by the antenna system receives, sends the signal to the electronic circuit automatically converted into level signals (because the microwave propagation 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).*

● 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.

2. Product Introduction

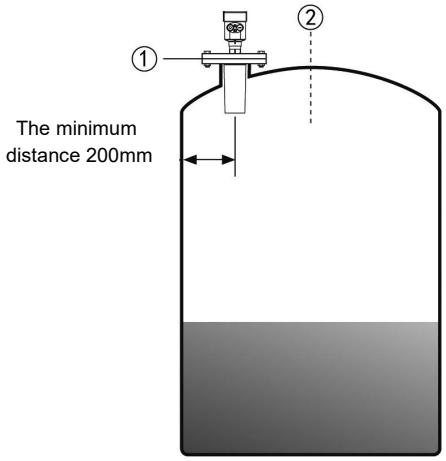
- **902T**

Application：Corrosive liquids, vapors,volatile liquid
Measuring Range：20 meters
Process Connection： Flange
Process Temperature： -40℃~130℃(Standard type)
-40℃~250℃(High temperature type)
Process Pressure：-0.1 ~ 2.0 MPa
Accuracy： ± 3mm
Protection Grade：IP67
Frequency Range： 26GHz
Display：LED, Programmable
Supply：2-wire（DC24V）/ 4-wire（DC24V /AC220V ）
Signal Output：4... 20mA / HART (2-wire / 4-wire)
RS485/ Modbus
Outer Covering：Aluminum / Plastic / Stainless steel
Explosion-proof Grade： ExiaⅡC T6 Ga /Exd ⅡC T6 Gb

3. The Installation Requirements

- **Installation guide:**

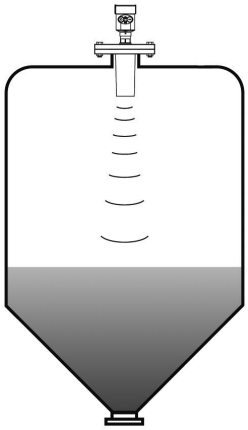
902T product used to measure corrosive liquids, vapors, volatile liquids and to prevent condensation during measurement.
It needs to install flange connection.



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

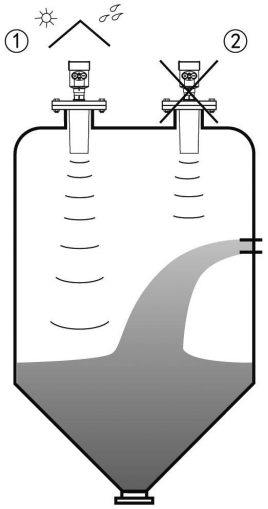
- For the top of the flat conical tank, meter can be installed in the middle of the tank top to the bottom of the cone to ensure measurement.



- **Typical installation errors：**

➢ Conical tank cannot be installed above the feed port.

Note: outdoor installation should adopt sunshade.



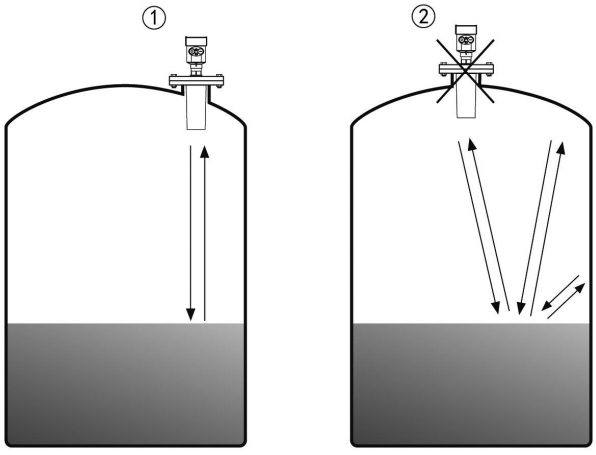
① Correct

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.

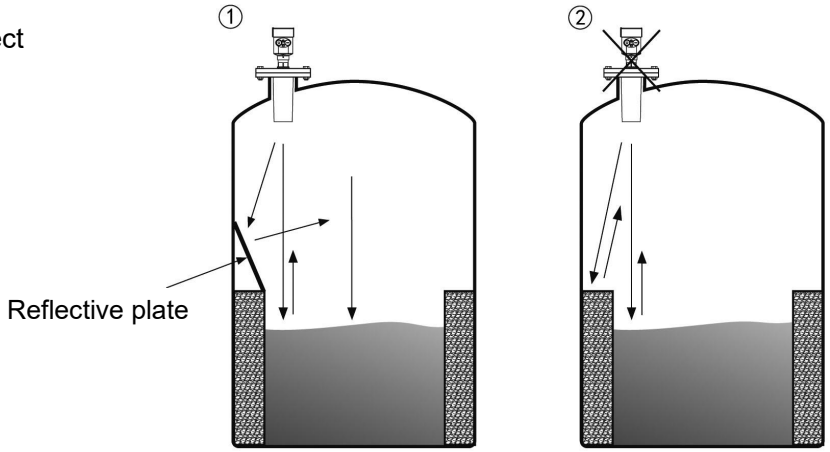
①Correct

②Error



➢ There are obstacles affecting measurement needed reflection plate.

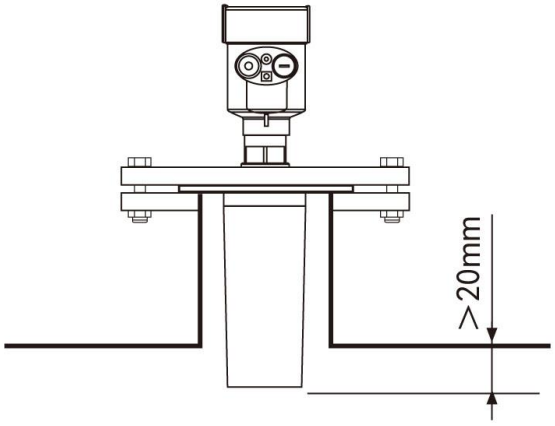
① Correct
② Error



The role of the reflecting plate is refracted away the obstacle signal.

- **Height of nozzle:**

Antenna extends into the tank at least 20mm distance.



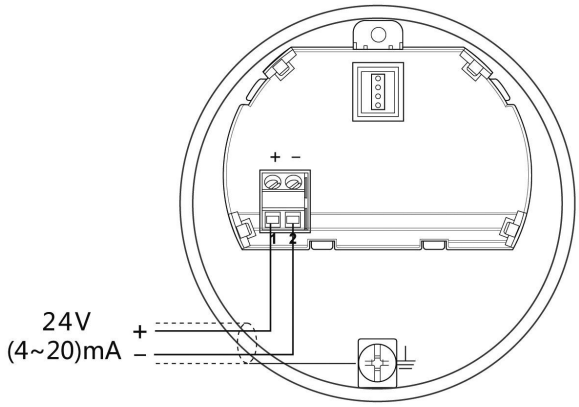
4. The Electrical Connection

- **The power supply voltage:**

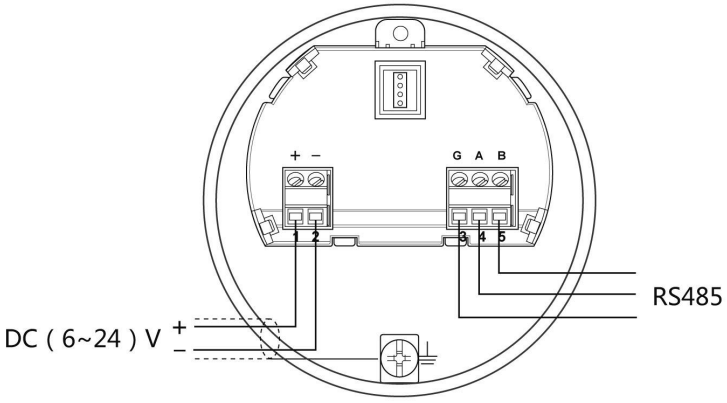
(4~20)mA/HART (Two wire system)	The power supply and the output current signal sharing a two core shield cable. The supply voltage range see technical data. For intrinsically safe type must be a safety barrier between the power supply and the instrument.
(4~20)mA/HART(Four wire system)	Separate power 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:



➢ 6~24V RS485/Modbus wiring diagram as follows:



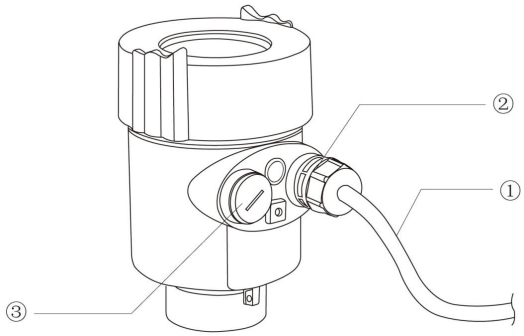
- **Safety instructions:**

➢ 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 the①
Tighten the cable seal head, see the②
Please electrical interface will not use blind plug tight, see the③

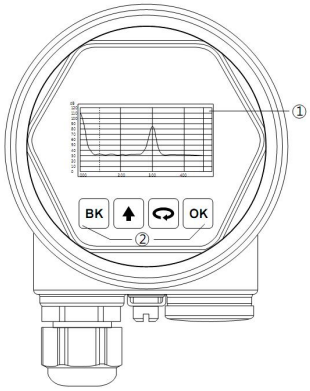
5. Instrument Commissioning

- **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

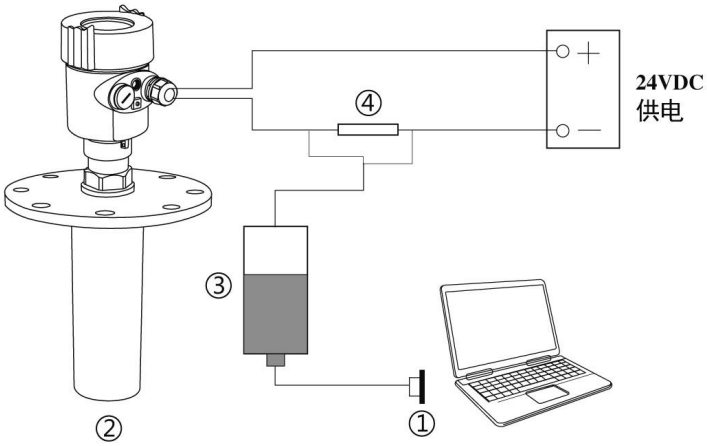


① Liquid crystal display(LCD)
② The key

- **PC debugging:**

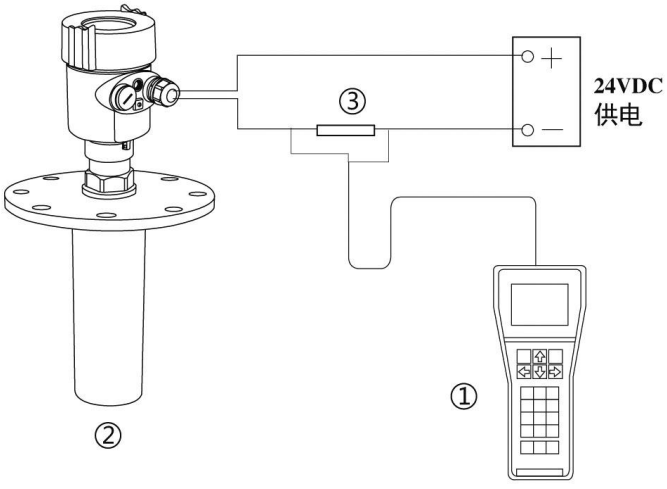
Connected to PC by HART

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



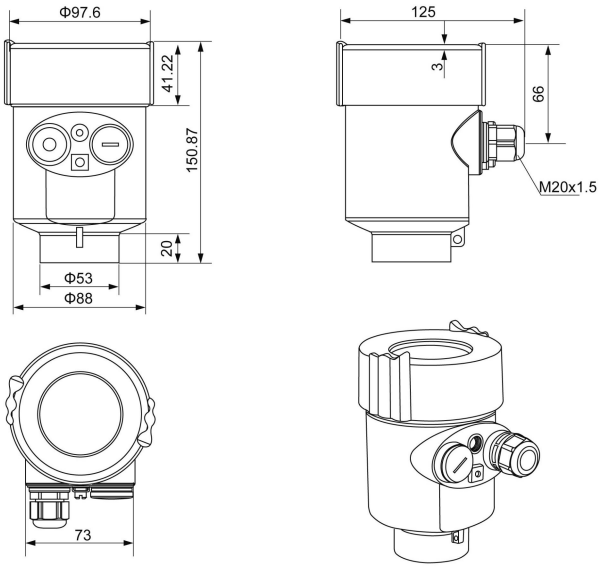
- **HART handheld programmer:**

① HART handheld programmer
② Radar level meter
③ 250 Ωresistor



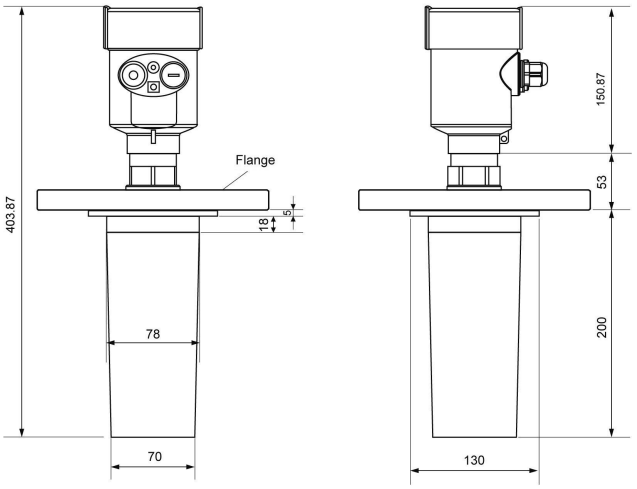
6. Structure Size (Unit: mm)

- **The outer shell**:



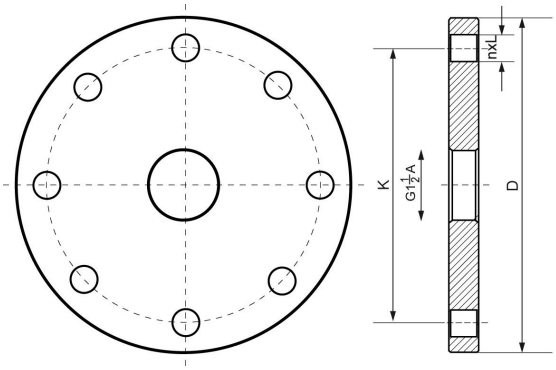
- **Appearance size:**

902T



Flange	The Bell Diameter D	Bell height H
DN80	Φ65	185
DN100	Φ65	185

- **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

7. Technical Parameters

Process Connection

Thread G1½″ A
Thread 1½″ NPT
Flange

Antenna Material

PVDF / PFA

The outer shell

The seal between the shell and the shell cover	Silicone rubber
Casing window	Polycarbonate
The ground terminal	Stainless steel

The power supply voltage

Two wire system

The standard type	(16 ~ 26) V DC
Intrinsically safe	(21.6 ~ 26.4) V DC
Power dissipation	max 22.5mA / 1W
Allowable ripple	
- <100Hz	Uss<lV
- (100～100K) Hz	Uss<l0mV

Flameproof

(22.8 ~ 26.4) V DC 2-wire system
(198 ~242)V AC 4-wire system / 110V AC 4-wire system

The cable parameters

Cable entrance / plug	1 M20xl.5 cable entrance
	1 blind plug
Terminal	Conductor cross section 2.5mm²

Output parameters

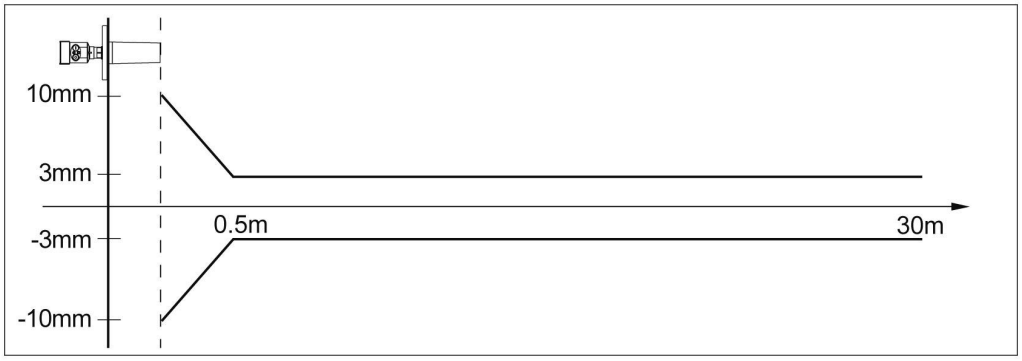
The output signal	(4 ~ 20) mA
Communication protocol	HART
Resolution	1.6 μA
Fault signal	Constant current output;
	20. 5mA

	22mA
	3.9mA
The integral time	(0 ~ 36) s, adjustable
Blind area	the ends of the antenna
The maximum distance measurement	20 meters
Microwave frequency	26GHz
Communication interface	HART communication protocol
The measurement interval	about 1 second (depending on the parameter settings)
Adjust the time	about 1 second (depending on the parameter settings)
Display resolution	1 mm
Working storage and transportation temperature	(-40～80) ℃
Process temperature (the temperature of the antenna part)	
(-40～130)℃ Standard type / (-40～230)℃ High temperature type	
Pressure	Max.4MPa
Seismic	Mechanical vibration l0m/s², (10 ~ 150) Hz

8. Meter Linearity

902T

Emission angle	Depending on the size of the antenna
-¢65mm	14°
Precision	See chart



9. Product Model Selection

- **902T**

License
P Standard (Non-explosion-proof)

Process Connection / Material
A Flange DN80 / Stainless Steel 304
B Flange DN100 / Stainless Steel 304
Y Special Custom

Antenna Type / Material
A Internal tapered rod antenna PVDF / 78mm
B Internal tapered rod antenna PFA / 78mm

Seal Up / Process Temperature
V Viton / (-40~130) ℃
P PFA / (-40~250) ℃

The Electronic Unit
3 (4~20) mA / 24V DC
4 (4~20) mA / 220V AC
5 RS485 / Modbus / 6~24V/ Four wire system

Outer Covering / Protection Grade
L Aluminum / Single chamber / IP67
H Aluminum / Double chamber / IP67
G Plastic / Single chamber / IP65
K Stainless steel / Single chamber / IP67

Cable Line
M M 20x1.5
N ½″ NPT

Field Display/The Programmer
A With
X Without

Ordering code

Radar Level Transmitter RD902T										Description
RD902T	-	-	-	-	-	-	-	-	-	
Measuring Medium		A								Liquid
		B								Solid Powder
Measurement Range			05							5m
			10							10m
			15							15m
			20							20m
			XX							Other
Antenna Type				KN						Horn Mouth H205mm×Φ76mm 304SS/PTFE
				KQ						Horn Mouth H205mm×Φ76mm 304SS/PFA
				KR						Horn Mouth H290mm×Φ96mm 304SS/PTFE
				KT						Horn Mouth H290mm×Φ96mm 304SS/PFA
				XX						Other
Output and Power Supply					A2					Two-wire 4-20mA+HART
					SC					4-20mA+HART，24VDC
					R2					RS485，24VDC
					XX					Other
Thread Type						FE				HG/T20592 PN10/25 DN80 304SS

	FK			HG/T20592 PN10/25 DN80 SS316L
	FF			HG/T20592 PN10/16 DN100 304SS
	FL			HG/T20592 PN10/16 DN100 SS316L
	XX			Other
High Temperature Resistance		TE		'-40-130℃
		TH		'-40-230℃
Electrical Interface, Housing Material, and Ingress Protection			WH	M20×1.5 Cable Gland, Aluminum Alloy, IP67
Explosion-Proof Option				00 None
				E4 CNEX Ex db ⅡC T6 Gb