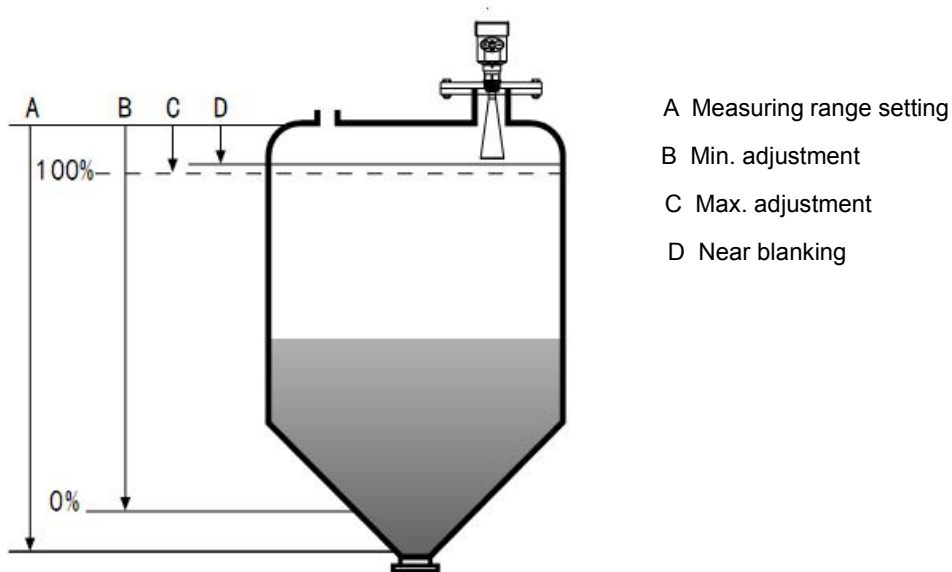


DCRD1000A6 high frequency 26GHz radar level transmitter

1. Working Principle

Radar level antenna emits narrow microwave pulses that transmitted down by the antenna. The microwave comes into contact with the measured medium surface then reflected back and receiving by the antenna system. The signal is transmitted to electronic circuit and partly convert to level signals (as the microwave featured with high propagation speed, it's almost instantaneous for the electromagnetic waves to reach the target and return to the receiver)



Note: When applying the radar level transmitter, make sure that the highest material level cannot reach the measurement blind spot (the territory that indicate as D)

Features of 26GHz Radar Level Transmitter

- Small antenna size, easy to install; non-contact radar, no wear, no pollution.
- Almost free from corrosion, foam impact; hardly affected by the change of the temperature, pressure and water vapor in the atmosphere.
- Severe dust environment is not likely to affect the work of the high-frequency level transmitter.
- Shorter wavelength can achieve better reflection for the inclined solid surface.
- The small field angle and energy concentration, enhanced echo capabilities, and beneficial to avoid interference.
- Minimized measuring blind spot can gain better result of small tank measurement.
- High SNR, even in the case of fluctuations can result in better performance.
- High frequency, the best choice to measure solids and low dielectric media.

2. Technical Parameter

DCRD1000A6 Technical Parameter



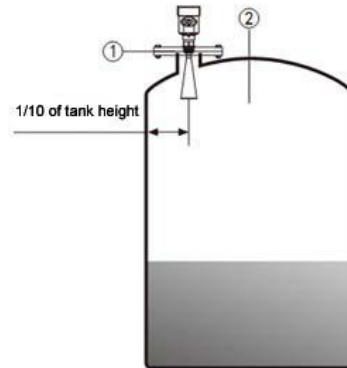
Application	Liquid, slurry, condensation, corrosive liquids.
Measuring range	20 meter
Process connection	Screw thread, Flange(optional)
Medium Temperature	-40~150°C
Process pressure	Atmospheric
Precision	± 3mm
Frequency range	26GHz
Anti-explosion/safety grade	Exia IIC T6 Ga/IP67
Signal output	4~20mA/HART(Two-wire/ Four) RS485/Mod bus

3. Installation Requirements

Installation Guideline

Installed in a quarter or sixth of the diameter.

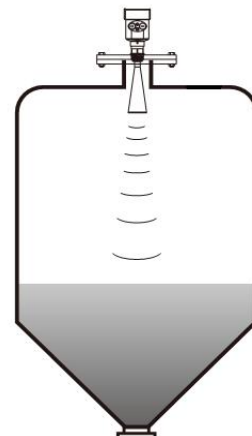
Note: The minimum distance from the tank wall shall be tenth of the tank height.



Note: ① datum plane

② vessel center or axis of symmetry

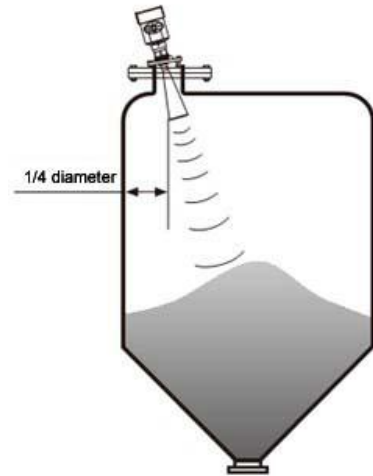
For conical tank top plane, it can be installed on the middle of the tank top to ensure the measurement of the conical bottom.



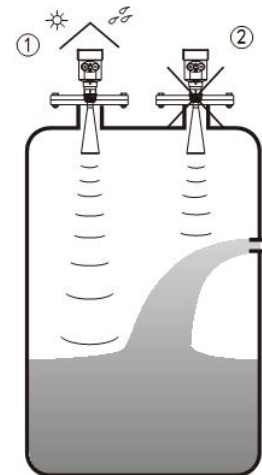
When there's the material pile, the antenna need to perpendicularly alignment to the material surface.

If the material is uneven, and the heap angle is large then the universal flange is needed to adjust the horn angle to aim the charge level.

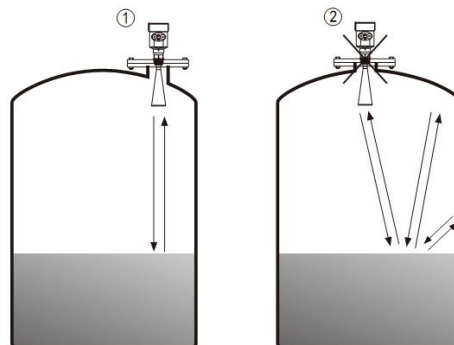
(Due to the inclination of the solid surface it will cause the echo decay, or even the signal loss problem)



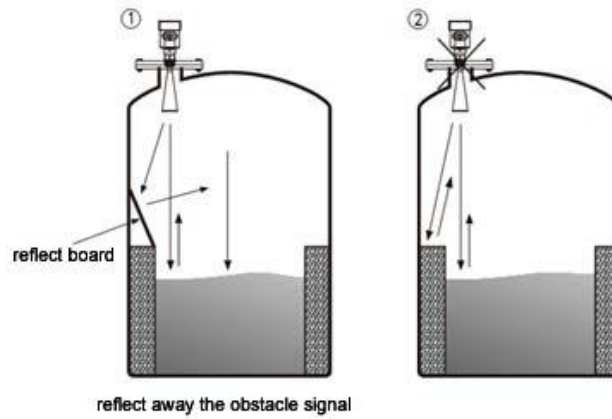
Radar cannot be installed above the tapered tank into the mouth; In outdoor installation, sunshade and rainproof measures should be taken.



Instrument cannot be installed in the middle of the arch or round tank top. It will be affected by multiple echo. The multiple echoes may be larger than the true echo signal threshold, because the top can be concentrated by multiple echoes. It cannot be installed in a central position.



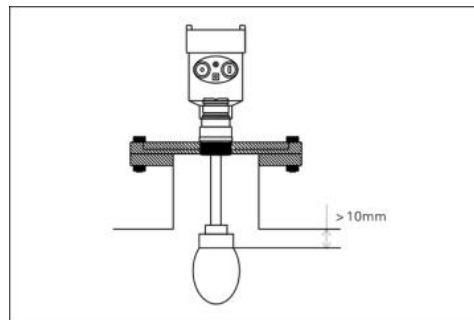
When the tank obstacles affect the measurement, the reflect board must be installed for proper measurement.



①right

②wrong

The pipe joint height requirements: it must ensure that the antenna extends into the tank for at least 10mm.



4. Electrical connection

Supply voltage

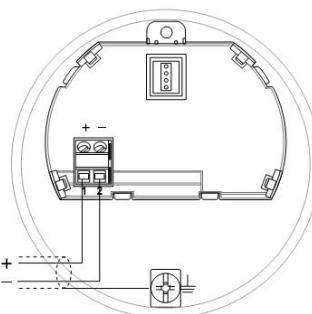
(4~20) mA/HART (two-wire) Power supply and output current signals share a two-core shielded cable. Specific supply voltage ranges see technical data. For intrinsically safe power supply, guard grating should be added between supply power and the instrument.

(4~20) mA/HART (four-wire) Power supply and current signal is separated by individually using a cable. Specific supply voltage ranges see technical data.

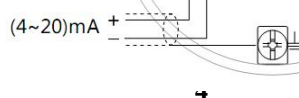
RS485/Modbus The supply voltage and Modbus signal line respectively use a shield cable. Specific supply voltage ranges see technical data.

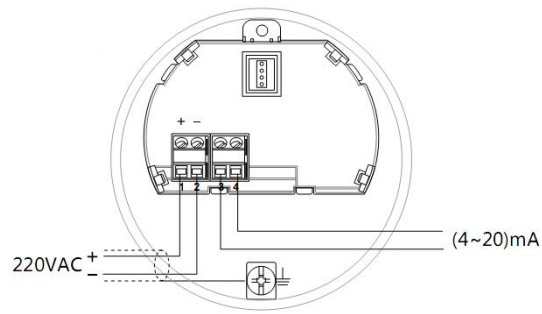
Connection type

24V two-wire wiring diagram:

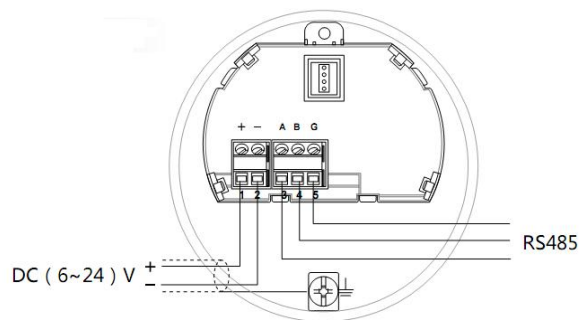


220V four-wire wiring diagram:





24V RS485/Modbus wiring diagram:



Safety guidance

Please comply with local electrical installation regulations requirements!

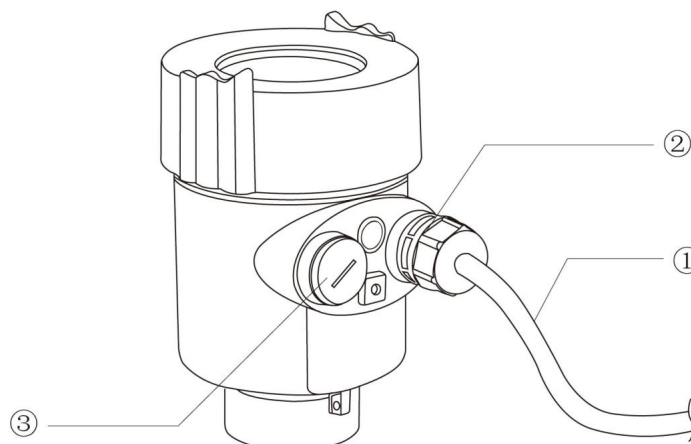
Please abide by local health and safety personnel procedures requirements.

All operations on the instrument electrical components must be done by properly trained professionals.

Please check the meter nameplate to ensure that product specifications meet your requirements. Make sure that the supply voltage fit the meter nameplate requirement.

Protection grade

The instruments fully meet the requirements of protection class IP66/67; make sure the cable sealing head waterproofness. As shown below:



How to ensure that the installation meets IP67 requirements:

Make sure the seal head is not damaged.

Make sure that the cable is not damaged.

Make sure the used cable is in line with the electrical connection specifications.

Before access the electrical interface, the cable will bend down, to ensure that water does not flow into the housing, see ①

Please tighten the cable sealing head, see ②

Keep unused electrical interface stopped up with blind block, see ③

5. Instrument Debug

Three debugging method:

Display/ keypad

Upper computer debugging

HART handheld programmer

Display/ keypad

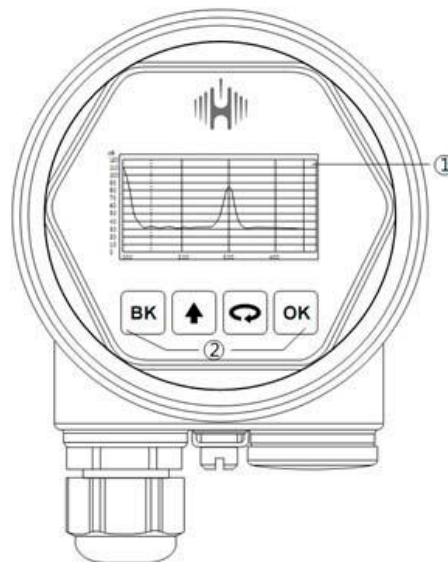
To debug by the four keys on the LCD of the instrument.

Debug menu language is optional. After debugging, it generally used for display. It's quite clear to read off the measured values (See instrument keypad setup instructions)

Display/Keypad

① LCD display

② Keypad



Upper computer debugging

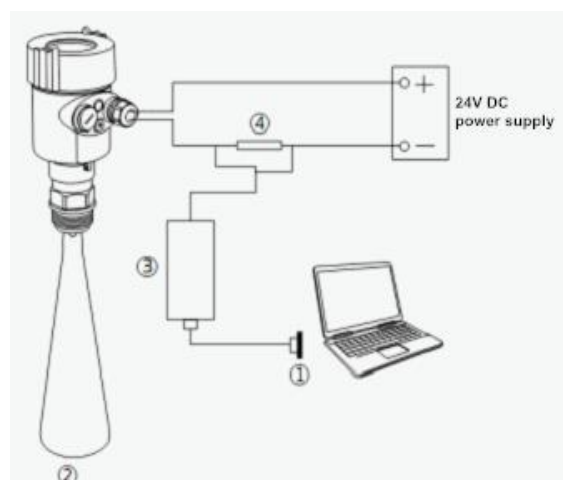
Connected with the upper computer via HART

① RS232 interface / or USB interface

② Radar Level Transmitter

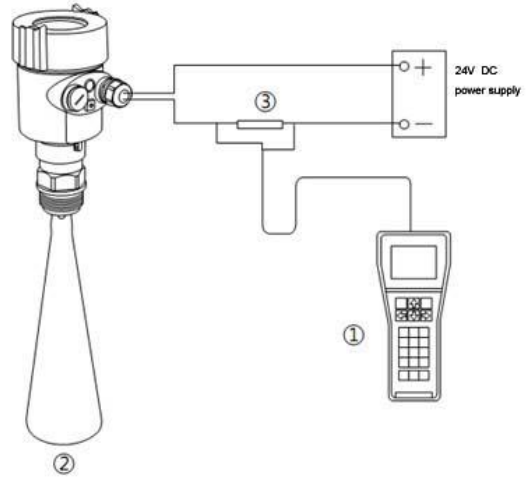
③ HART adapter

④ 250Ω resistor



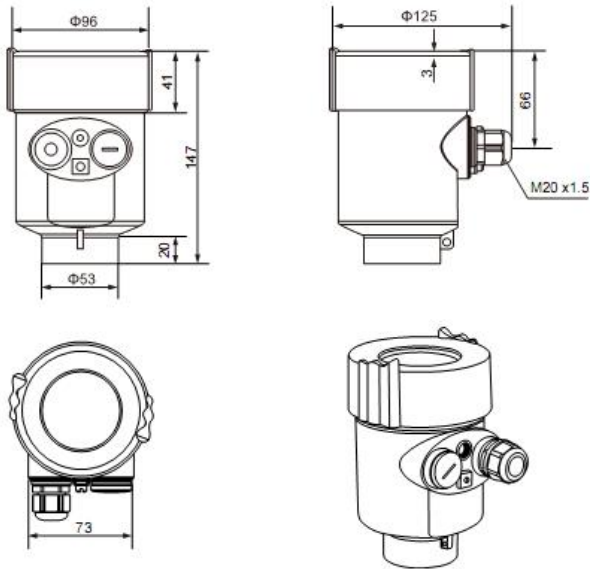
HART handheld programmer programming

- ① HART handheld programmer
- ② Radar Level Transmitter
- ③ 250Ω resistor



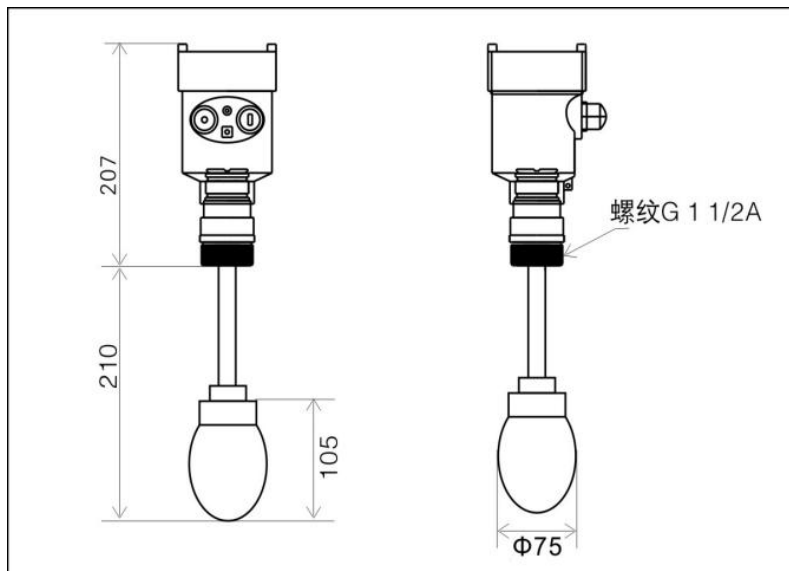
6. Structure size unit: mm

Housing

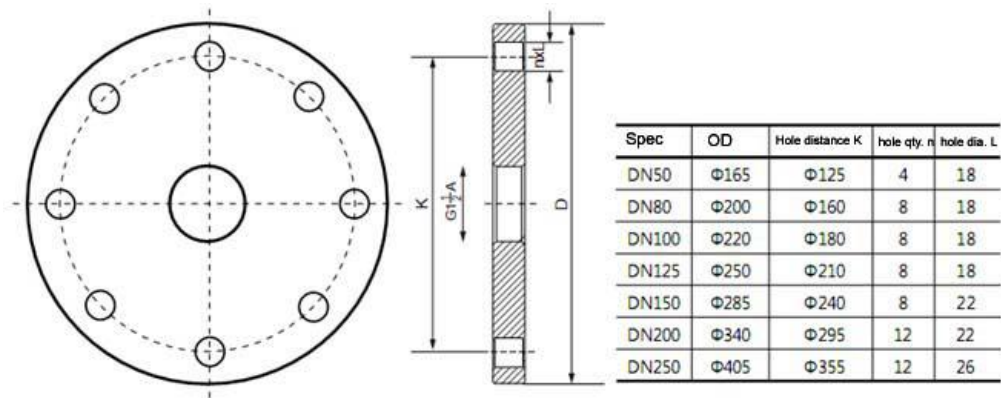


External dimension

DCRD1000A6



Flange Model Selection



7. Technical Parameters

Housing

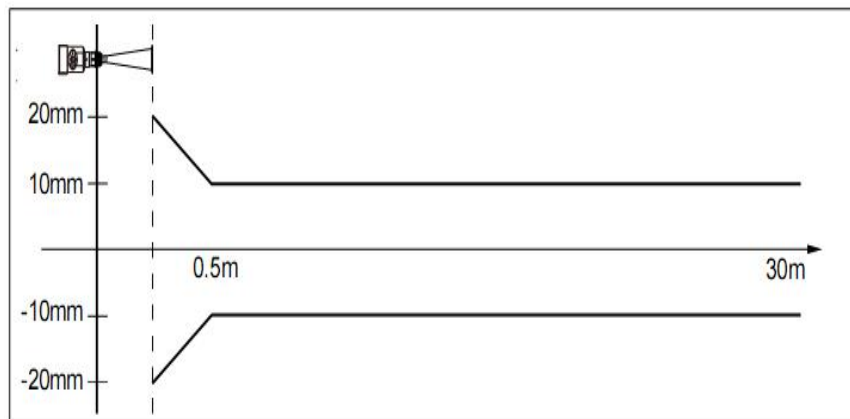
Seal between the housing and the housing cover	Silicone rubber
Shell window	Polycarbonate
Ground terminal	Stainless steel
Supply voltage	Standard type (16 ~ 26) V DC Intrinsically Safe (21.6 ~ 26.4) V DC Power consumption max 22.5mA/1W Allowable ripple wave
Two-wire	- <100Hz U _{ss} <1V - (100 ~ 100K) Hz U _{ss} <10mV
Cable parameters	Cable entry plug M20x1.5 cable entry Amphenol connector cross-section 1.0mm ²
Output parameters	The output signal (4 ~ 20) mA HART communication protocol Resolution 1.6μA Fault signal current output unchanged; 20.5mA 22mA; 3.9mA Integration time (0 ~ 50) s, adjustable
Blind area	Antenna end
The maximum measuring distance	30 m
Microwave frequencies	26GHz
Communication interface	HART protocol
Measurement interval	About one second (Depending on the parameter settings)

Adjustment time	About one second (Depending on the parameter settings)
Display resolution	1mm
Working storage and transport temperature	(-40 ~ 100) ° C
Process temperature (temperature of the antenna part)	(-40 ~ 250) ° C
Pressure	Max. 4MPa
Shock-proof	Mechanical vibration 10m/ s ² , (10~150) Hz

8. Instrument linear

DCRD1000A6

Launching angle	depend on antenna size
-Φ 76mm	12°
-Φ 96mm	8°
-Φ 121mm	6°
Precision	see below



9. Model selection table

DCRD1000A6

Anti-explosion

- P Standard (non-Ex)
- I Intrinsically Safe (Exia IIC T6 Ga)

Screw thread Process connection / Material

- G Screw thread G1 1/2"/SS 304
- N Screw thread 1 1/2"NPT/SS 304

Flange Process connection / Material

- B Flange DN80/ PTFE
- C Flange DN100/PTFE
- B Flange DN80/SS 304
- C Flange DN100/SS 304
- D Flange DN125/SS 304

- E Flange DN150/SS 304
- M Flange DN80/universal joint (SS) 304
- K Flange DN100/universal joint (SS) 304
- T Flange DN125/universal joint (SS) 304
- Z Flange DN150/universal joint (SS) 304

Antenna Type/ Material

- B Water droplets antenna/SS 304+PTFE
- C Water droplets antenna/ PTFE

Seal/ process temperature

- V Viton / (- 40 ~ 150) °C
- K Kalrez / (- 40 ~ 250) °C

Electronics unit

- 2 (4 ~ 20) mA / (24) V DC / two-wire
- 3 (4 ~ 20) mA / (~ 24) V DC / HART two-wire system
- 4 (4 ~ 20) mA / (~ 220) V AC / four-wire system
- 5 RS485/Mod bus

Housing / Safety grade

- L Aluminum / IP67
- G Stainless steel 304 / IP67

Cable entry

- M M20xl. 5
- N 1/2 NPT

Live display/ programming

- A With
- X Without

Special custom

- Y Special custom