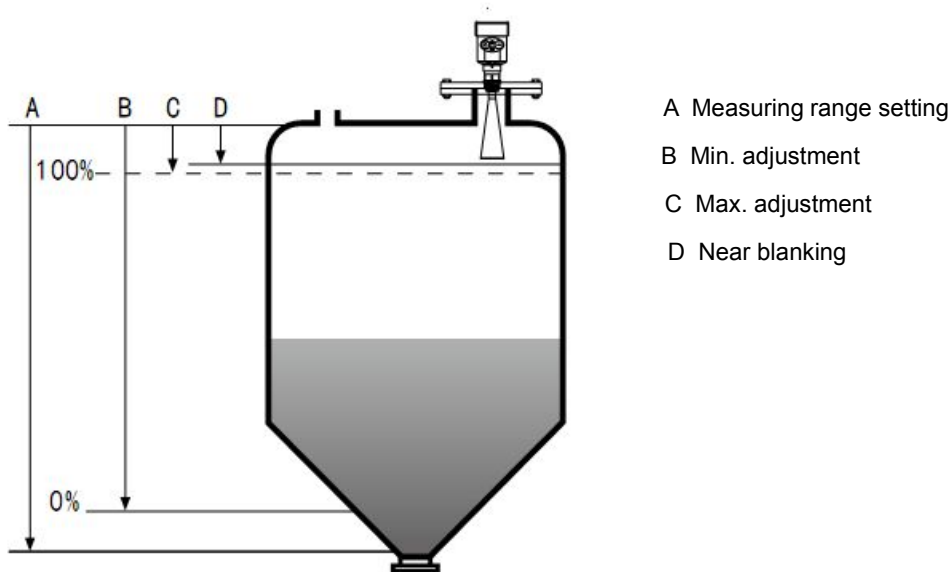


DCRD1000A2 high frequency 26GHz radar level transmitter

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

DCRD1000A2

Technical Parameter



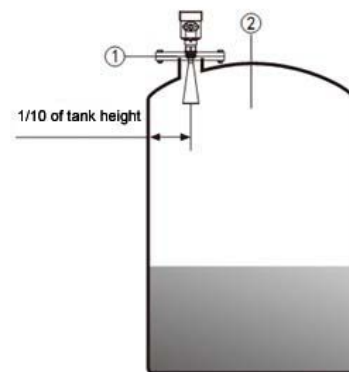
Application	Temperature resistance, withstand pressure, slightly corrosive liquid, sewage, petroleum, river channel, heavy steam conditions, etc.
Measuring range	30 meter
Process connection	Screw, Flange
Medium Temperature	-40~250°C
Process pressure	-0.1~4.0MPa
Precision	± 3mm
Frequency range	26GHz
Anti-explosion/safety 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.

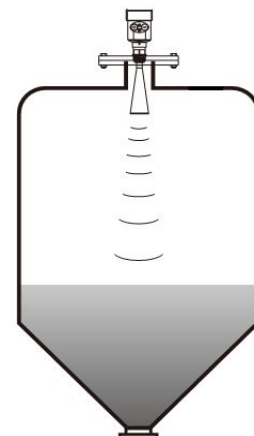
Note: The minimum distance from the tank wall shall be tenth of the tank height.



Note: ① datum plane

② vessel center or axis of symmetry

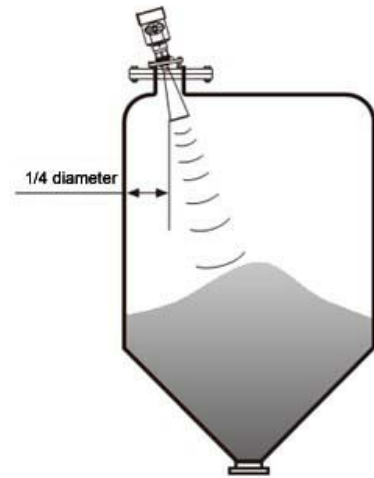
For conical tank top plane, it can be installed on the middle of the tank top to ensure the measurement of the conical bottom.



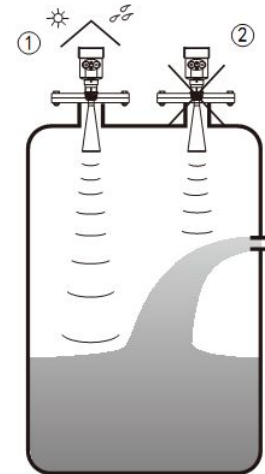
When there's the material pile, the antenna need to perpendicularly alignment to the material surface.

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.

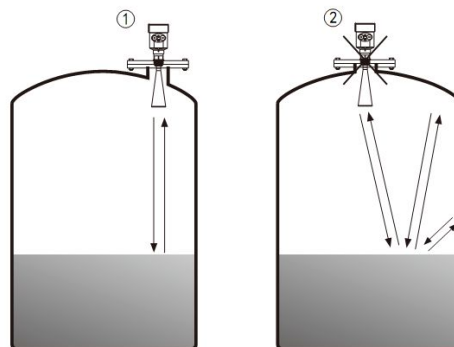
(Due to the inclination of the solid surface it will cause the echo decay, or even the signal loss problem)



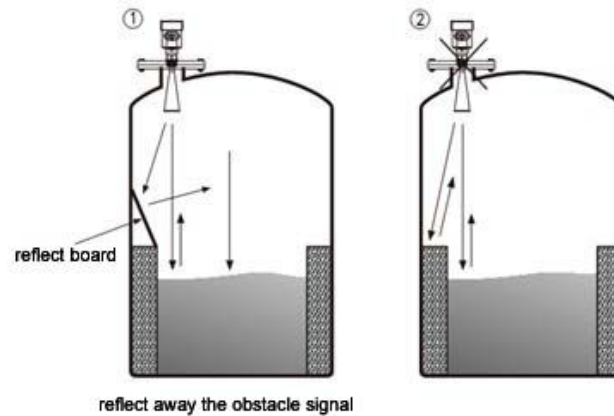
Radar cannot be installed above the tapered tank into the mouth;
In outdoor installation, sunshade and rainproof measures should be taken.



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.



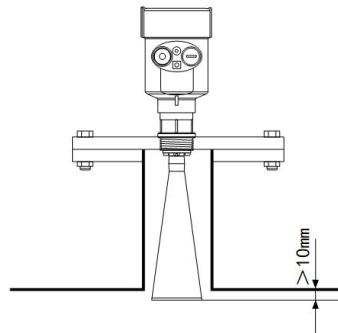
When the tank obstacles affect the measurement, the reflect board must be installed for proper measurement.



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

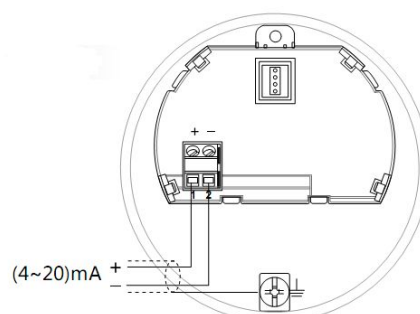
(4~20) mA/HART (two-wire) Power supply and output current signals share a two-core shielded cable. Specific supply voltage ranges see technical data. For intrinsically safe power supply, guard grating should be added between supply power and the instrument.

(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.

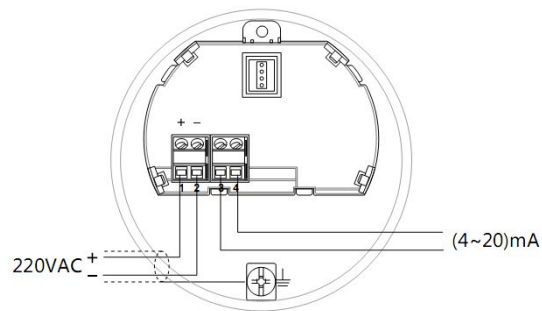
RS485/Modbus The supply voltage and Modbus signal line respectively use a shield cable. Specific supply voltage ranges see technical data.

Connection type

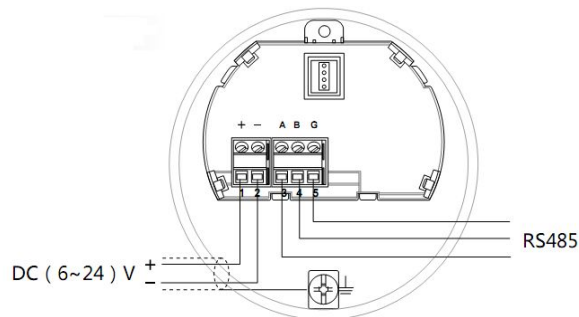
24V two-wire wiring diagram:



220V four-wire wiring diagram:



24V RS485/Modbus wiring diagram:



Safety guidance

Please comply with local electrical installation regulations requirements!

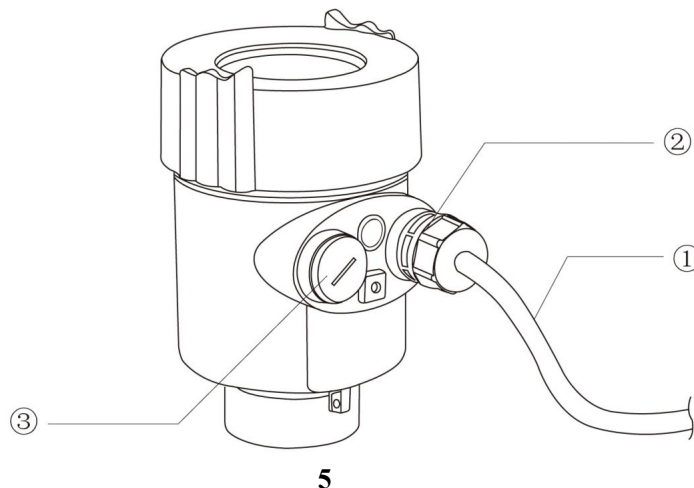
Please abide by local health and safety personnel procedures requirements.

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

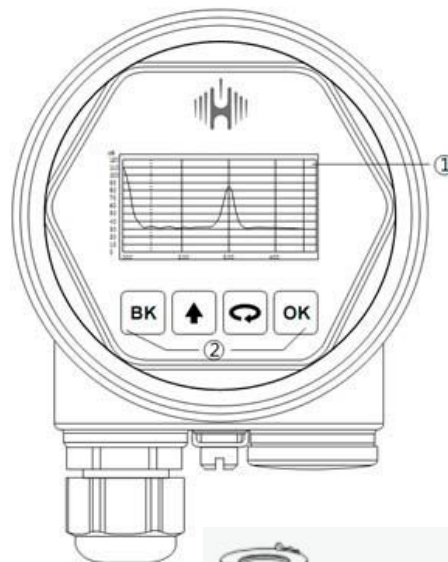
Display/ keypad

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

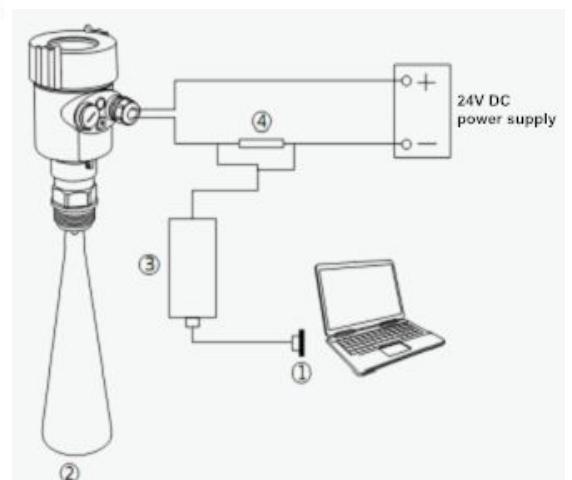
- ① LCD display
- ② Keypad



Upper computer debugging

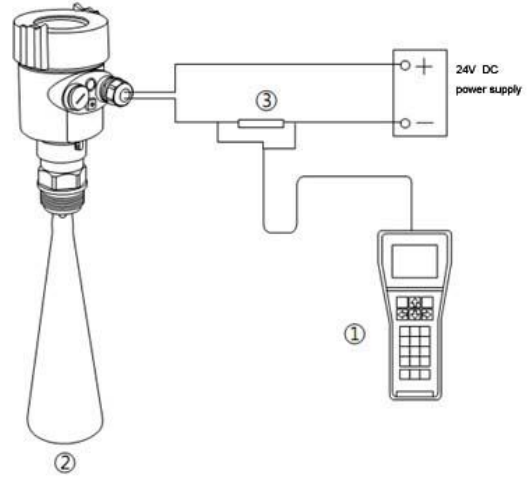
Connected with the upper computer via HART

- ① RS232 interface / or USB interface
- ② Radar Level Transmitter
- ③ HART adapter
- ④ 250Ω resistor



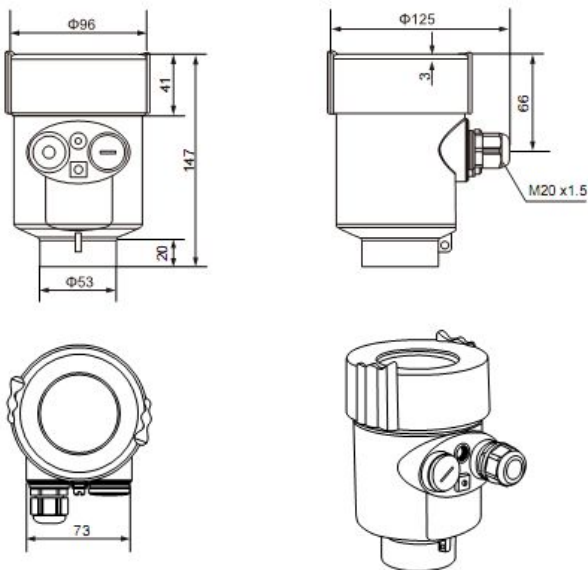
HART handheld programmer programming

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



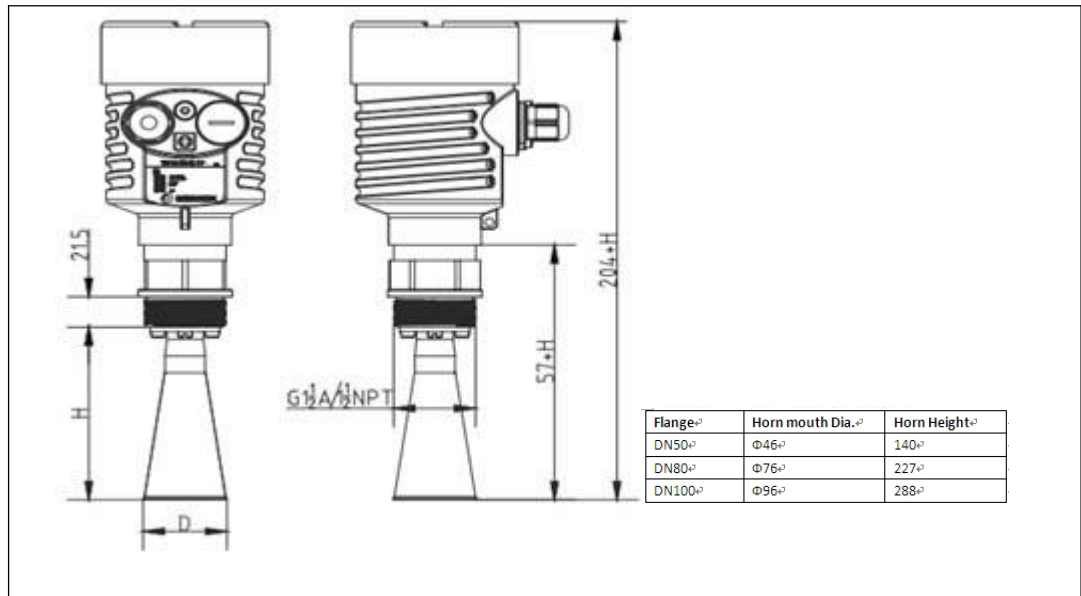
6. DCRD1000A Series Dimension unit: mm

Housing

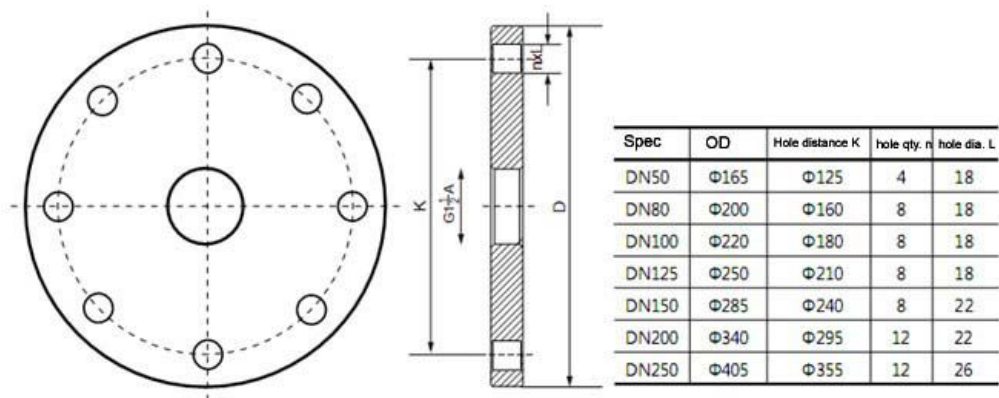


External dimension

DCRD1000A2



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

Two-wire

Intrinsically Safe (21.6 ~ 26.4) V DC

Power consumption max 22.5mA/ 1W

Allowable ripple wave

- <100Hz

U_{ss} <1V

-(100 ~ 100K) Hz U_{ss} <10mV

Cable parameters

Cable entry plug M20x1.5 cable entry
 Amphenol connector cross-section 1.0mm²

Output parameters

The output signal (4 ~ 20) mA
 HART communication protocol
 Resolution 1.6u A
 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

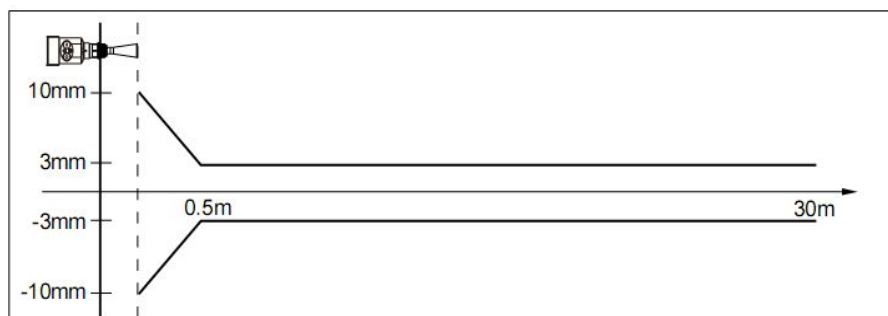
Shock-proof

Mechanical vibration 10m/ s², (10~150) Hz

8. Instrument linear

DCRD1000A2

Launching angle	depends on antenna size
- Φ 46mm	18°
- Φ 76mm	12°
- Φ 96mm	8°
Precision	see below



9. Model selection table

DCRD1000A2

Anti-explosion

P Standard (non-Ex)

I Intrinsically Safe (Exia IIC T6 Ga)

Process connection / Material

G Screw thread G1½ A / stainless steel 304

N Screw 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

B Horn antenna Φ46mm / stainless steel 304

C Horn antenna Φ76mm / stainless steel 304

D Horn antenna Φ96mm / stainless steel 304

Y Special custom

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

4 (4 ~ 20) mA / (~ 220) V AC / four-wire

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