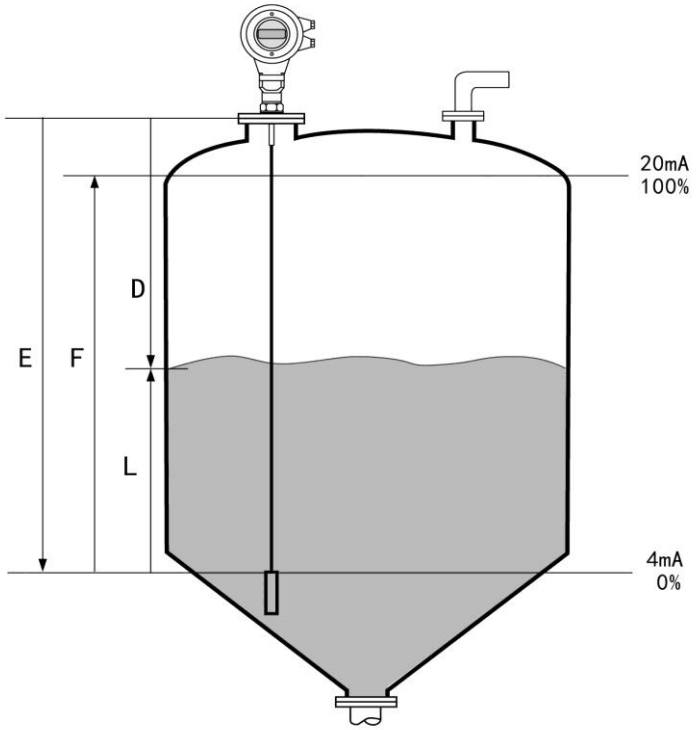
北京格莱普科技有限公司
BEIJING GALLOP TECHNOLOGY CO.,LTD.

Guided wave radar level transmitter manual

Product overview

1, the introduction

GRD80 guided wave radar is based on the principle of time travel is measuring instrument, radar wave running at the speed of light, running time can be transformed into material level signal by electronic parts. Probe a high-frequency pulse and or bar type probe transmission along the cable type, when the pulse in the material surface reflected by the receiver inside the instrument, and the distance signal is transformed into material level signal.



Reflection of the pulse signal along the cable type or bar type probe to the instrument electronic circuit part, microprocessor to signal processing, identify the microwave pulse produced by the echo in the material surface.Correct echo signal recognition by the pulse software complete, distance material on the surface of the distance D is proportional to the pulse travel time T:

D = C * T / 2,

Where C is the speed of light

E known due to empty cans of distance, the level of L as follows:

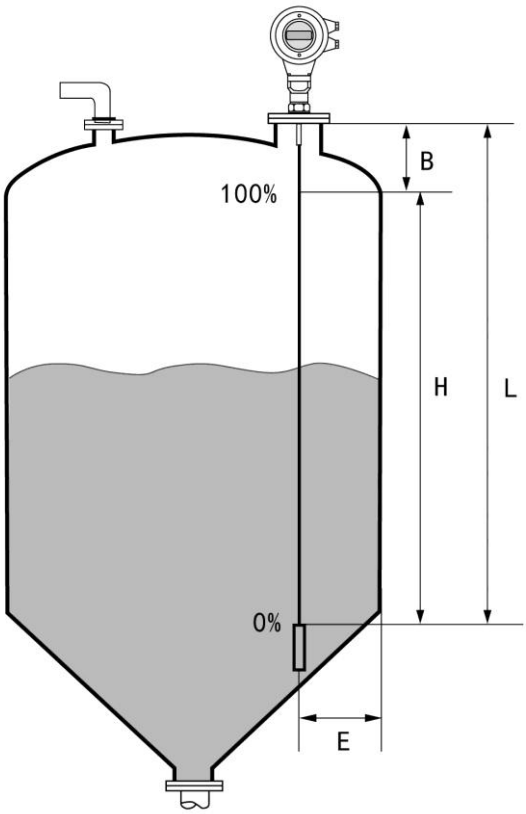
L = E – D

By entering empty cans height E (= zero), full tank height F (= full scale) and some applications to set parameters, application parameters will be automatically adapt instrument to measure the environment. Corresponding to 4 ~ 20 ma output.

Measuring range

Description

H - measuring range
L - empty cans
B - at the top of the blind area
The minimum distance E, probe into the tank wall
At the top of the blind area refers to the material the highest materials surface and minimum distance between the measuring reference point.
At the bottom of the blind area refers to the cable can't accurate measurement of the distance near the bottom.
At the top of the blind area and at the bottom of the blind area is limited between the measuring distance.



Note:
Only the material between the top blind area and at the bottom of the blind area, to guarantee the reliable tank level measurement.

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Product introduction

- **GRD801**

Applicable medium: liquid, solid powder
Should be used: liquid and solid powder measurement, complex process conditions
Explosion-proof certification: Exd IIC T6 Gb
Measuring range: 30 m, liquid solid 15 meters
Frequency rate: 500 MHZ to 1.8 GHz
Day line, the single line or single pole antenna
Measuring accuracy: + / - 3 mm
Process temperature (40 ~ 250 ℃)
Process pressure: 0.1 MPa ~ 4)
Signal output: (4 ~ 20 mA/HART
The scene shows: four LCD
Electricity source, two wire (DC24V)/four wire (DC24V/AC220V)
Process connections: thread/flange (optional)

GRD802

Applicable medium: liquid, especially the corrosive liquid
Should be: acid, alkali or other corrosive medium
Explosion-proof certification: Exd IIC T6 Gb
Measuring range: bar type 6 m/cable type 20 m
Frequency rate: 500 MHZ to 1.8 GHz
Day line, the four fluorine sealing rope type or bar type antenna
Accuracy: + / - 10 mm
Process temperature (40 ~ 150 ℃)
Process: 0.1 ~ 1.6 MPa pressure
Signal output: (4 ~ 20 mA/HART
The scene shows: four LCD
Electricity source, two wire (DC24V)/four wire (DC24V/AC220V)
Process connections: thread/flange (optional)

GRD803

Applicable medium: a small dielectric constant liquid and solid
Should be used: cement silo powder measurement;The fly ash powder measurement
Explosion-proof certification: Exd IIC T6 Gb
Measuring range: 30 m
Frequency rate: 500 MHZ to 1.8 GHz
Day line, double line antenna
Accuracy: + / - 5 mm
Process temperature (40 ~ 250 ℃)
Process pressure: 0.1 MPa ~ 4)
Signal output: (4 ~ 20 mA/HART
The scene shows: four LCD
Electricity source, two wire (DC24V)/four wire (DC24V/AC220V)
Process connections: thread/flange (optional)

GRD804

Applicable medium: liquid, especially the low dielectric constant, large fluctuation of the liquid
Should be used: deionized water, solid liquid such as water measurement
Explosion-proof certification: Exd IIC T6 Gb
Measuring range: 6 m
Frequency rate: 500 MHZ to 1.8 GHz
Day line, coaxial tube type antenna
Measuring accuracy: + / - 3 mm
Process temperature (40 ~ 250 ℃)
Process pressure: 0.1 MPa ~ 4)
Signal output: (4 ~ 20 mA/HART
The scene shows: four LCD
Electricity source, two wire (DC24V)/four wire (DC24V/AC220V)
Process connections: thread/flange (optional)

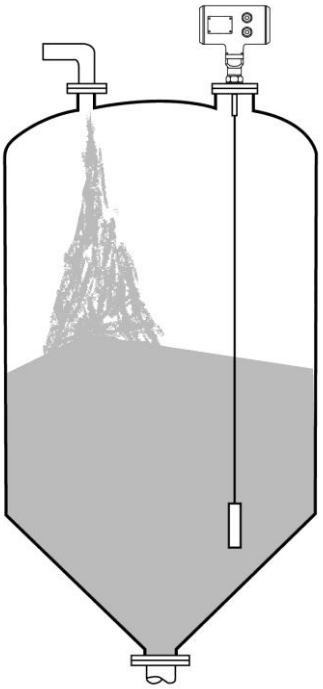
GRD805

Applicable medium: liquid, especially in the environment of high temperature and high pressure liquid
Should be used: sealed tank, liquid pressure measurement
Explosion-proof certification: Exd IIC T6 Gb
Measuring range: 6 m
Frequency rate: 500 MHZ to 1.8 GHz
Day line, the single pole or the line type
Accuracy: + / - 10 mm
Process temperature (40 ~ 400 ℃)
Process pressure: 0.1 MPa ~ 40)
Signal output: (4 ~ 20 mA/HART
The scene shows: four LCD
Electricity source, two wire (DC24V)/four wire (DC24V/AC220V)
Process connections: thread/flange (optional)

The installation guide

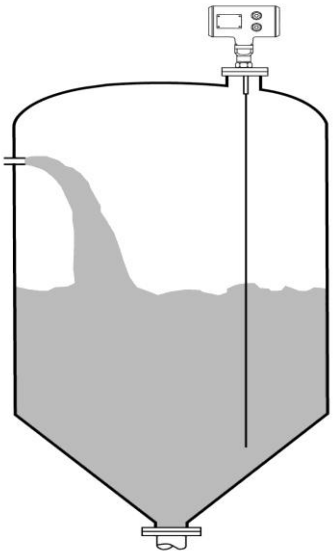
The following installation guide is suitable for the cable type and lever type measuring solid powder or liquid.

1, L installation position



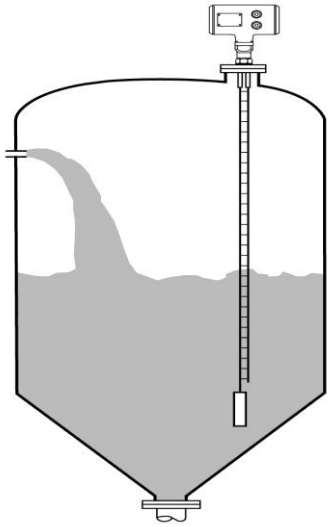
Ø as far as possible away from the discharge port and feed port.
Ø metal cans within the whole range don't touch the tank wall and the tank bottom.
Ø suggest installation at 1/4 or 1/6 of the diameter of the bunker, the minimum distance between the tank wall is 1/10 of the measurement range.
Ø cable type or bar type probe minimum distance 300 mm or more from the tank wall.
Ø probe at the bottom of the tank bottom acuity from 30 mm.
Ø probe from the tank obstacles minimum distance 200 mm or more.
Ø if the container is at the bottom of the cone type, you can install the center of the roof.

2. right picture lever the radar level meter installation drawing, it is mainly used for liquid level measurement



Points:
Ø can measure the dielectric constant of 1.8 or any medium.
Ø commonly used for measuring the viscosity of 500 CST or less and not easy to produce adhesive medium.
Ø bar type radar maximum range can reach 6 meters.
Ø with steam and foam has a strong penetrating power, measurement is not affected.
Ø bubble larger liquid measurement environment, should choose single lever guided wave radar level meter measuring.

3.Right for the cable type radar level meter installation drawing, it is mainly used for low dielectric constant liquid level and the low dielectric constant of lightweight solid powder material level measurement



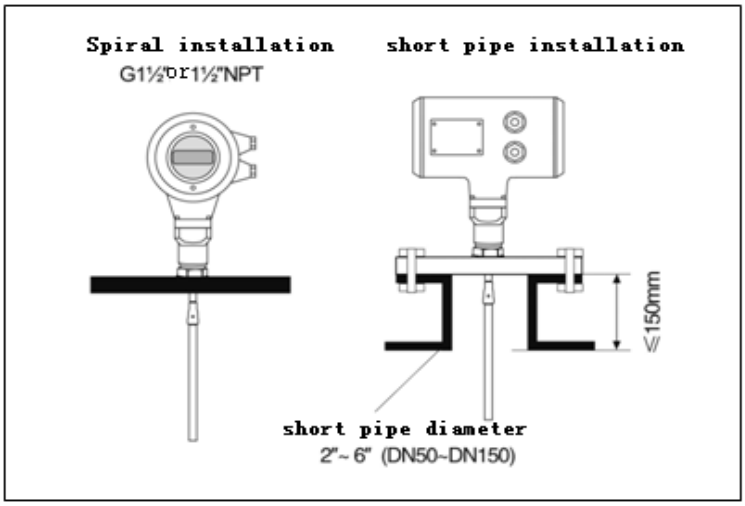
Points:

Ø liquid dielectric constant is small and lightweight solid powder can be used in a double rope type measuring method, in order to ensure accurate measurements.
Ø can measure the dielectric constant of 1.6 or any medium.
Ø commonly used for measuring the viscosity of 500 CST or less and not easy to produce adhesive medium.
Ø double cable type radar level meter maximum range can be up to 30 meters.

installation method

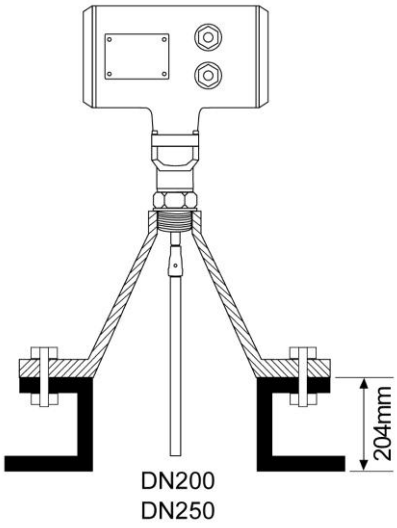
Ø reasonable installation can ensure the long-term reliable and precise measuring instrument

Guided wave radar level meter can be used threaded connections, thread length is not more than 15 mm, also can be used in short pipe installation.Install short tube diameter on the 2 "to 6", the short pipe installation height should be 100 mm or less (thread and the shorter the length of the spool, measurement, the more stable), if install short tube is longer, ideal short tube should be cut short, or at the bottom of the fixed rope type probe and choice of the insulation for support to avoid line type probe in contact with the short end of the tube.



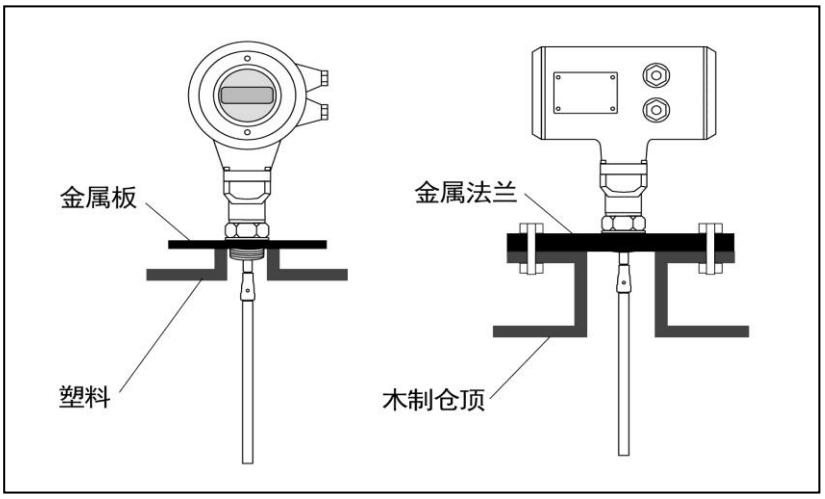
Ø DN200 or DN250 short pipe installation:

When need to install the guided wave radar in short pipe diameter greater than 200 mm, short tube wall produces echoes, in the case of low dielectric permittivity will cause measurement error.Therefore, for a diameter of 200 mm or 250 mm short tube, need to choose a special flange with the interface "speaker".



Ø install matters needing attention in the plastic tank:

Whether the cabling or lever, if want to guided wave radar working properly, process connections shall be the metal surface.When the guided wave radar is installed on the plastic tank, if the roof is also plastic, or other non conductive material, instrument need to match the metal flange, USES threaded connection, if need to match a piece of metal plate.



under the cable by tension:

When charging and discharging, medium for cable type probe will produce under tension, the tension size depends on the following factors:

1. The length of the cable
2. The density of the material
3. The diameter of the bunker
4. The diameter of the cable

The optimization of interference

Squared clutter echo suppression: the software can realize the interference echo suppression, so as to achieve ideal effect measurement.

Squared by-pass pipe and guided wave (only applicable to liquid) for medium viscosity is not more than 500 CST, can adopt by-pass pipe or guided wave tube to avoid interference.

The installation of low dielectric constant liquid

For the dielectric constant is greater than 1.3, 500 CST or less and not easy to produce the adhesive medium viscosity, can be guided wave radar is installed in the guided wave tube measurement, its characteristic is as follows:

Squared excellent reliability and high accuracy

Squared any medium can be used for the dielectric constant of 1.3 or more, has nothing to do with the medium electrical conductivity measurement

Squared tank obstacles and short tube size does not affect the measurement

corrosive medium measurement

If the corrosive medium, can choose lever or rope type probe sets of PTFE, PFA casing is measured

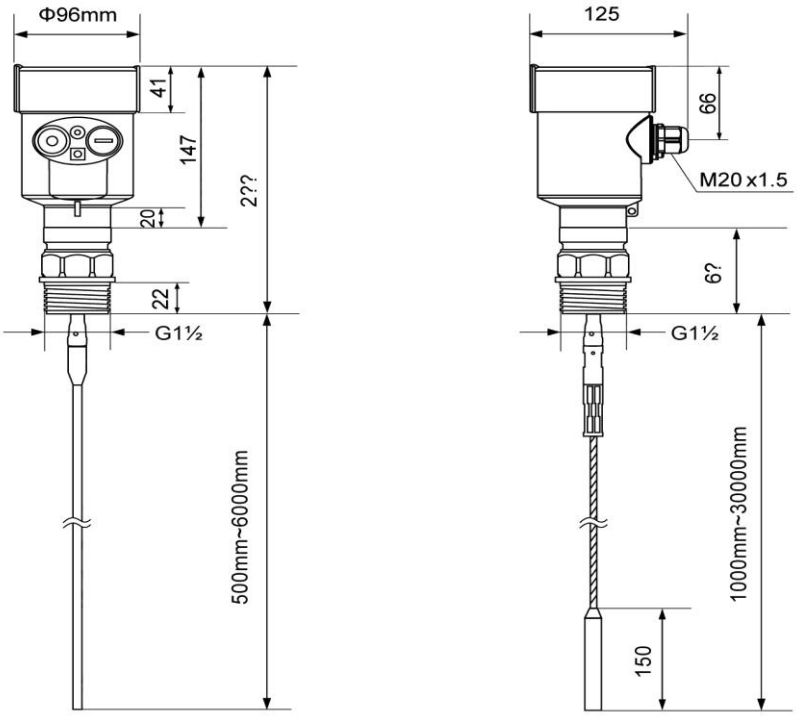
lie the tank and the installation of vertical tank

Squared rod probe is up to 6 meters, more than 6 meters for measuring distance of tank, can choose 4 mm cable type probe
Squared installation and fixed way, with the measurement of solid powder storehouse
Squared distance of tank wall distance is greater than or equal to 300 mm, must avoid the probe contact tank wall
Squared choosing probe length, pay attention to the bottom of the probe from the tank bottom is greater than 30 mm
More squared if tank obstacles or too close to the sensor probe, the measure can be installed guided wave tube

matters needing attention

Squared is installed on the guided wave radar guided wave tube lever is generally selected probe sensor, bar type probe when installation should be installed on the insulation concentric support, guarantee the bar type probe and guided wave tube concentric, otherwise will produce strong false echo.
Squared when measuring range more than bar type probe maximum measuring range of guided wave radar, should choose line type probe guided wave radar, the guided wave tube diameter should be greater than or equal to 6 "(6), otherwise will produce strong false echo.

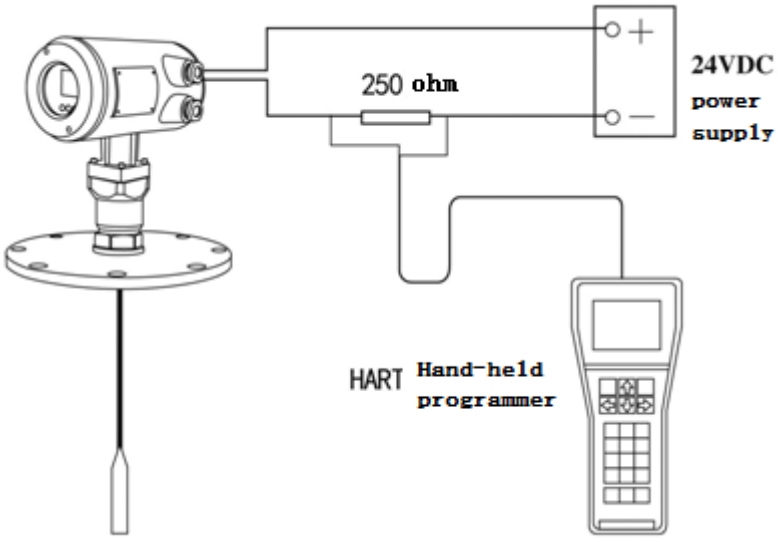
Size of instrument (unit :mm)



Programming and debugging

Guided wave radar system through debugging in three ways:

1. Through key debugging
2. Handheld programmer by HART
3. Handheld programmer can only be adjusted by HART radar level meter measuring range and 4 ~ 20 ma corresponding value.



Technical parameters

Basic parameters of the working frequency: 500 MHZ to 1.8 GHZ
Measuring range: cable type: 0 ~ 30 m.Rod: 0 ~ 6 m
Heavy after sex: plus or minus 1 mm
Resolution: 1 mm
Mining: echo sampling 55 / s
Response speed: < 0.2 S (according to the specific use of the case may be)
Output current signal: 4 ~ 20 ma
Fine degrees: + / - 3 mm
HART communication protocol communication interface
Process connection G1 1/2 level "A thread, flange (, DN80, DN100, 6, DN200, DN250
Process - 0.1 ~ 4 mpa pressure
24 VDC power source (+ / - 10%), ripple voltage: 1 VPP
Power consumption: 22.5 mA Max
Environmental conditions - 40 ℃ ~ + 70 ℃ temperature
Protection grade IP67
Explosion-proof grade Exd IIC T6 Gb
Two wire connection instrument power supply and signal output share a core shielded cable
Cable entry: 2 M20 * 1.5 (cable 5 ~ 9 mm diameter)

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