

Instructions

80G FM radar bit meter



attestation

Please read this instruction manual carefully before installation



80G FM radar bit meter

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| Principle

The 80G radar bit meter adopts frequency modulation continuous wave (FMCW) technology. The antenna emits high-frequency FM radar signals, and the frequency of the radar signal increases linearly. The transmitted radar signal is received by the same antenna after being reflected by the measured medium. At the same time, the frequency difference between the transmitted signal frequency and the received signal frequency is proportional to the measured distance. The collected frequency difference signal obtains the frequency spectrum of the reflected echo by the fast Fourier transform (FFT), and thus calculates the distance of the target to be measured.

| Characteristic

For millimeter-wave radar, the measurement accuracy is up to $\pm 2\text{mm}$, and the minimum measurement blind area is 0.05m .

1. Smaller antenna size, to meet the more working conditions of the measurement.
2. Multiple lens antennas, smaller emission angle, more concentrated energy, stronger echo signal, under the same industrial and mining conditions, compared to the

Other radar products have higher reliability.

3. It is more penetrating, and can also be used normally with adhesion and condensation.
4. The dynamic signal range is larger and is more stable for measurements of low dielectric constant media.
5. A variety of measurement modes, and the radar response in the rapid measurement mode

RD80G Series Product introduction

RD80G01



Measurement medium: the liquid is without corrosion

Measuring range: 0.05m~10 / 20 / 30 / 60 / 100m

Process Connection: G1 ½ A / 1 ½ NPT thread / flange DN 40

Process temperature: -40~80°C

Process pressure: -0.1~0.3 MPa

Antenna dimensions: 32mm lens antenna

Antenna material: PTFE

accuracy: ±1mm

Level of protection: IP67

Center frequency: 123GHz

Emission angle: 3°

Power supply: second-line system / DC24V

Four-wire system / DC12~24V

Four-wire system / AC220V

Enclosure: aluminum / plastic / stainless steel

Signal output: second line / 4... The 20mA / HART protocol was used

Four-wire system 4...20mA/ RS485 Modbus

RD80G02



Measurement medium: no-corrosive liquid, slightly corrosive liquid

Measuring range: 0.1m~10 / 20 / 30 / 60 / 100m

Process Connection: flange DN80

Process temperature: -40~110°C

Process pressure: -0.1~1.6MPa

Antenna dimensions: 32mm lens antenna

Antenna material: PTFE

Accuracy: ± 1mm (range below 35m)
± 5mm (range from 35m-100m)

Level of protection: IP67

Center Frequency: 80GHz

Emission angle: 3°

Power supply: second-line system / DC24V

Four-wire system / DC12~24V
 Four-wire system / AC220V
 Enclosure: aluminum / stainless steel
 Signal output: second line / 4... The 20mA / HART
 protocol was used
 Four-wire system 4...20mA/ RS485
 Modbus

RD80G03



Measurement medium: strongly corrosive liquid,
 steam, foam
 Measuring range: 0.1m~10 / 20 / 30 / 60 / 100m
 Process Connection: flange D N 50
 Process temperature: -40~130°C
 Process pressure: -0.1~2.5MPa
 Antenna size: 34mm lens antenna (determined by
 flange size)
 Antenna material: PTFE
 Accuracy: $\pm 1\text{mm}$ (range below 35m)
 $\pm 5\text{mm}$ (range from 35m-100m)
 Level of protection: IP67
 Center Frequency: 80GHz
 Emission angle: 3°
 Power supply: second-line system / DC24V
 Four-wire system / DC12~24V
 Four-wire system / AC220V
 Enclosure: aluminum / stainless steel
 Signal output: second line / 4... The 20mA / HART
 protocol was used
 Four-wire system 4...20mA/ RS485
 Modbus

RD80G04

Measurement medium: strongly corrosive liquid,
 steam, foam
 Measuring range: 0.1m~10 / 20 / 30 / 60 / 100m
 Process Connection: flange DN 50
 Process temperature: -40~130°C
 Process pressure: -0.1~1.0MPa



Antenna dimensions: 76mm lens antenna
 Antenna material: PTFE
 accuracy: $\pm 1\text{mm}$
 Level of protection: IP67
 Center Frequency: 80GHz
 Emission angle: 3°
 Power supply: second-line system / DC24V
 Four-wire system / DC12~24V
 Four-wire system / AC220V
 Enclosure: aluminum / plastic / stainless steel
 Signal output: second line / 4... The 20mA / HART
 protocol was used
 Four-wire system 4...20mA/ RS485 Modbus

RD80G05



Measurement medium: strong corrosive liquid,
 steam, foam, high
 temperature and high
 pressure
 Measuring range: 0.1m~10 / 20 / 30 / 60 / 100m
 Process Connection: flange DN80
 Process temperature: $-40\sim 200^\circ\text{C}$
 Process pressure: $-0.1\sim 2.5\text{MPa}$
 Antenna size: 76mm lens antenna (customized to
 flange size)
 Antenna material: PTFE / integral fill
 accuracy: $\pm 1\text{mm}$
 Level of protection: IP67
 Center Frequency: 80GHz
 Emission angle: 3°
 Power supply: second-line system / DC24V
 Four-line / DC12~24V four-line /
 AC220V
 Enclosure: aluminum / plastic / stainless steel
 Signal output: second line / 4... The 20mA / HART
 protocol was used
 Four-wire system 4...20mA/ RS485
 Modbus

RD80G06



Measurement medium: solids, storage containers,
process containers, or strong dust
situations

Measuring range: 0.3m~10 / 20 / 30 / 60 / 100m

Process Connection: flange DN 100

Process temperature: -40~110°C

Process pressure: -0.1~0.3MPa

Antenna size: 76mm lens antenna + universal
purge (Or without a purge)

Antenna material: PTFE

accuracy:±5mm

Level of protection: IP67

Center Frequency: 80GHz

Emission angle: 3°

Power supply: second-line system / DC24V

Four-line / DC12~24V four-line /
AC220V

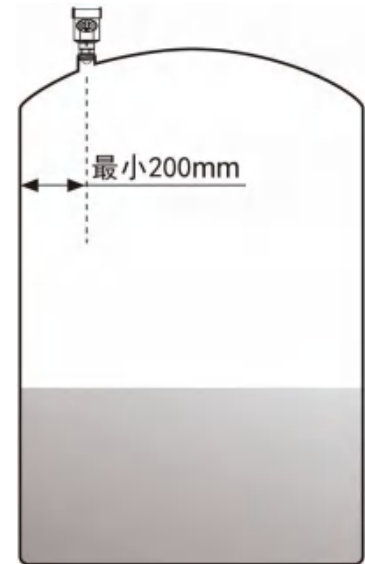
Enclosure: aluminum / plastic / stainless steel

Signal output: second line / 4... The 20mA / HART
protocol was used

Four-wire system 4...20mA/ RS485
Modbus

The RD80G installation requirements

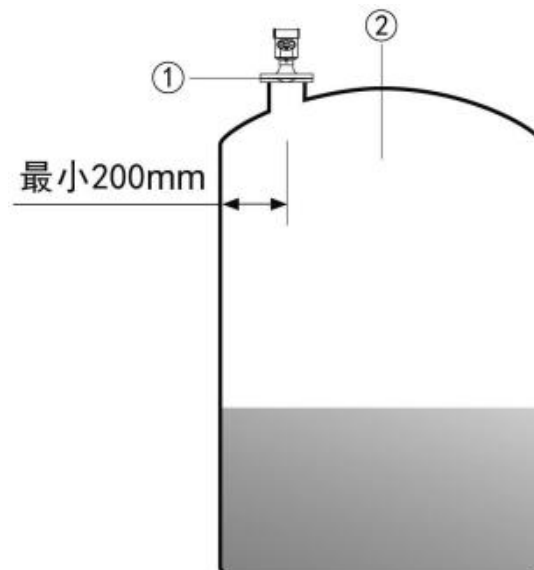
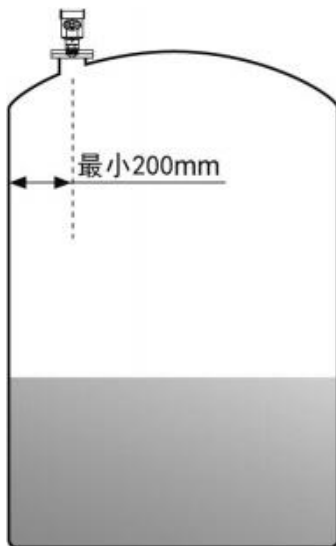
Installation mode 1: Threaded installation (for RD80G01)



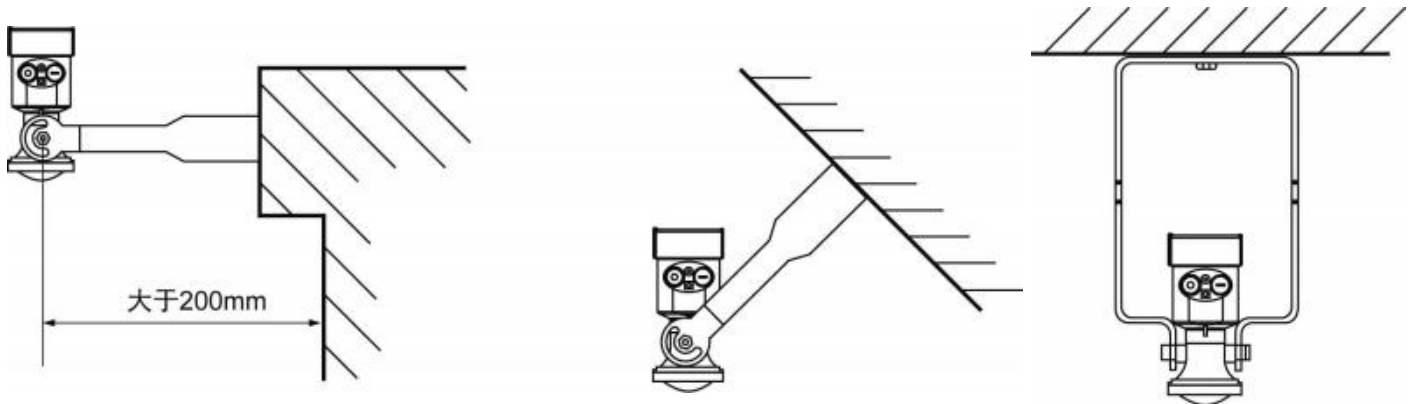
Installation method 2: flange installation

The minimum distance from the tank wall shall be 200mm.

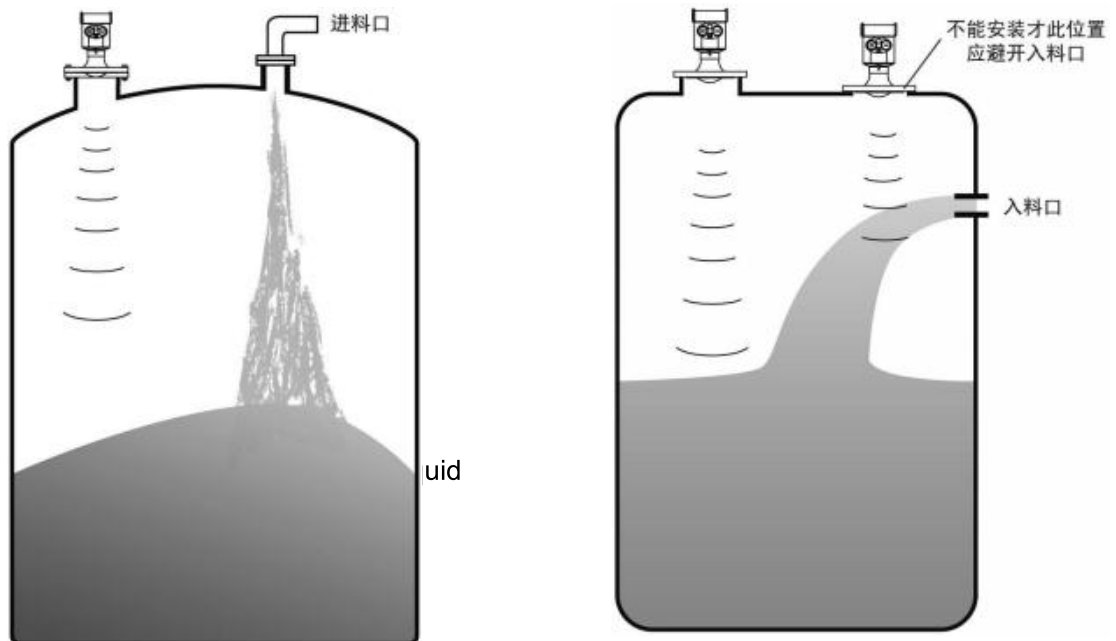
The ① datum ② container has a central or symmetry axis



Installation method 3: Lifting (selected according to the specific installation conditions)

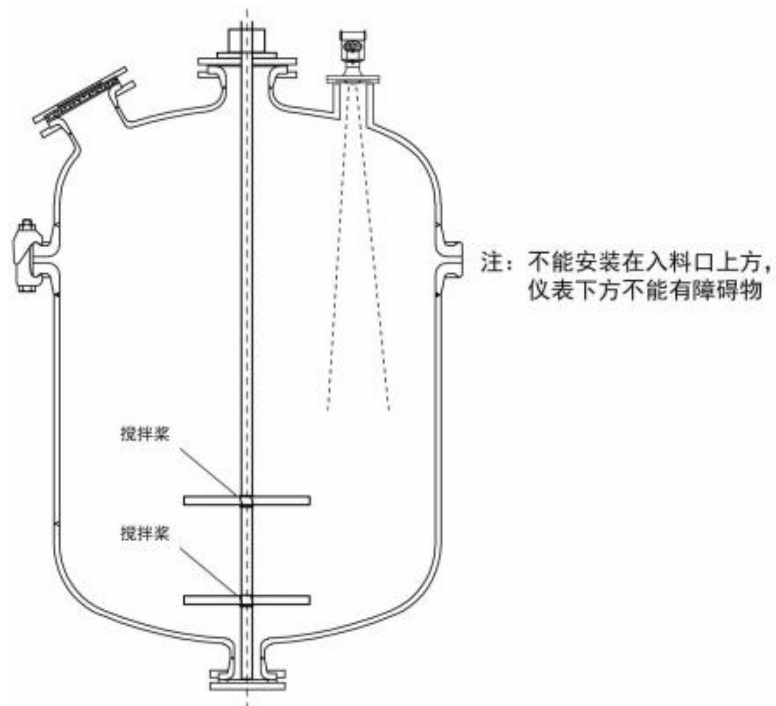


Installation requirements: Avoid installing instruments above the material inlet, and try to avoid various influences Signaling objects such as mixing paddle etc

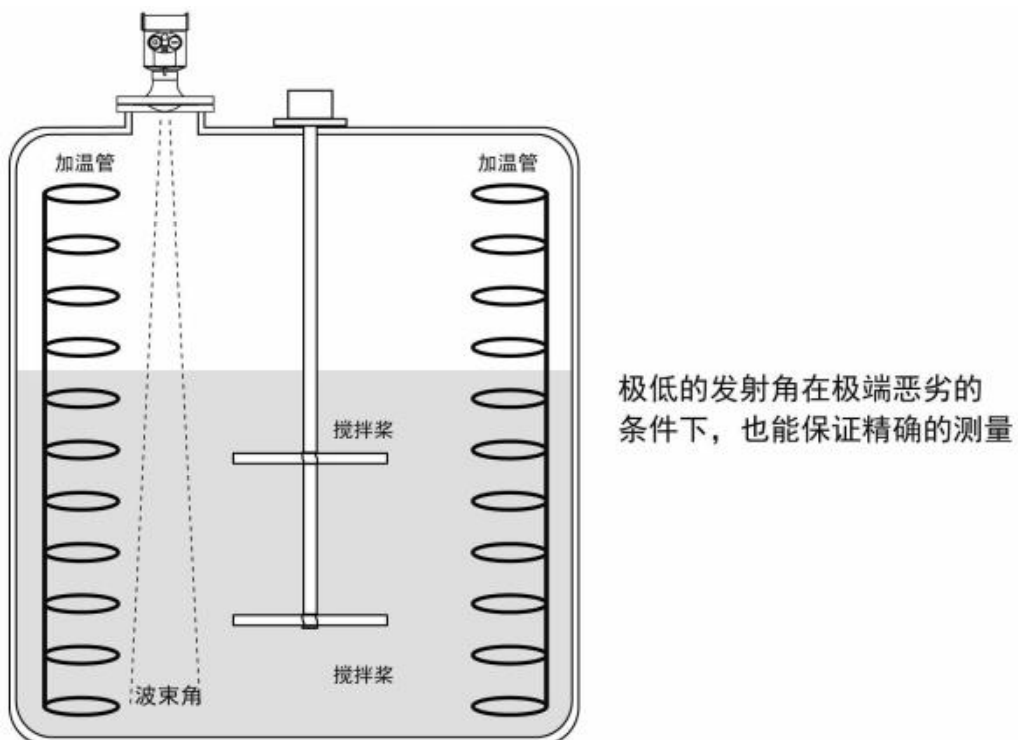


Do not install above feed opening

There must be no obstacles under the instrument



Under extremely complex working conditions, the instrument can work normally with the radar installation point and no obstacles in the radius of 20cm.

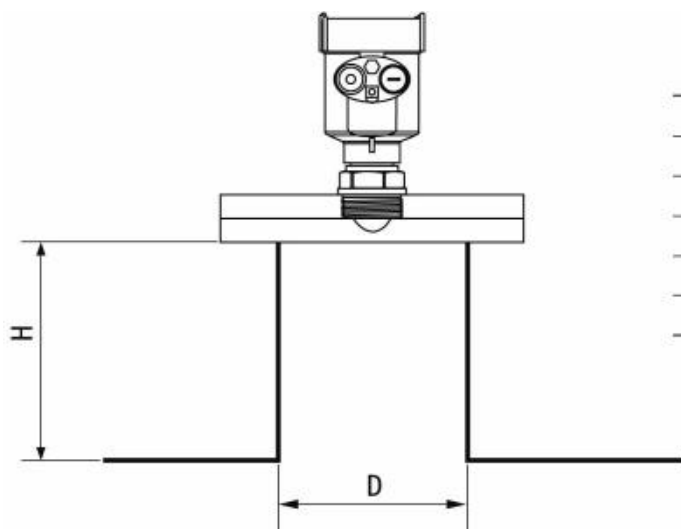


Installation takeover schematic diagram:

The maximum height of H max depends on the diameter D and the size of the launch angle of the product.

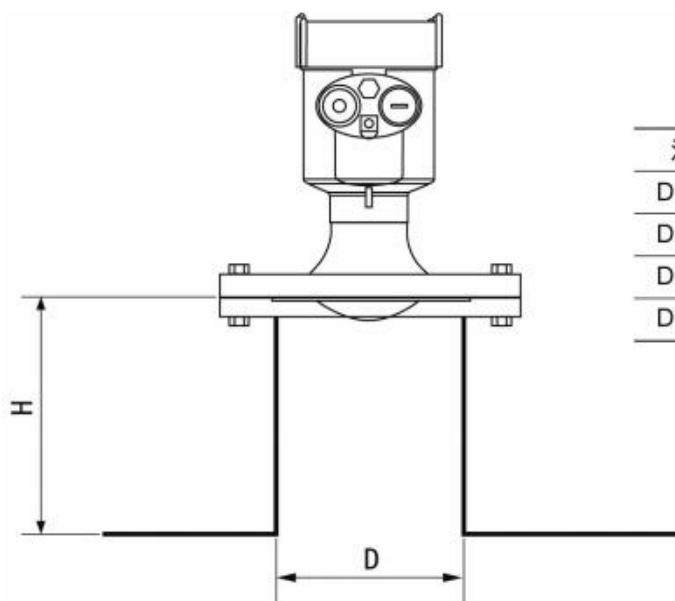
Too long the installation take-over will affect the radar performance.

RD80G01/02



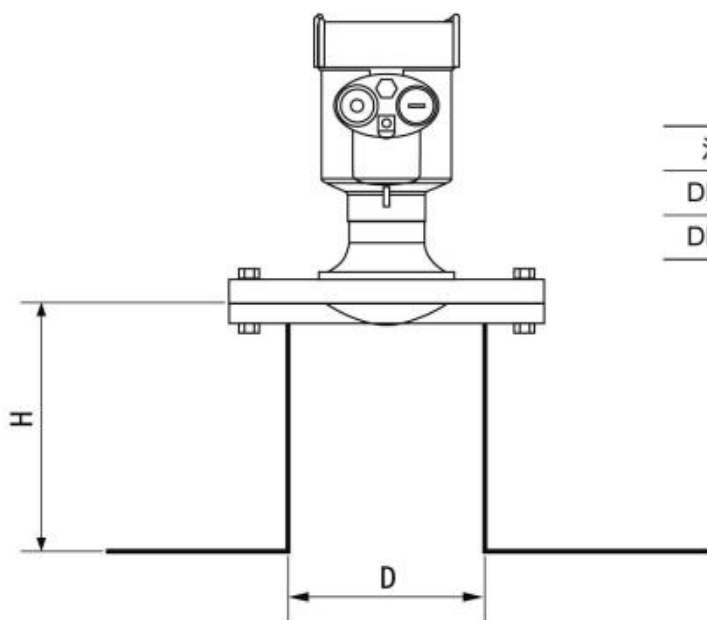
法兰	D	H max
DN65	65mm (2.5")	600mm
DN80	80mm (3")	800mm
DN100	100mm (4")	1000mm
DN125	125mm (5")	1200mm
DN150	150mm (6")	1400mm

RD80G03/RD80G04/RD80G05



法兰	D	H max
DN80	80mm (3")	1200mm
DN100	100mm (4")	1500mm
DN125	125mm (5")	2000mm
DN150	150mm (6")	2500mm

RD80G06



法兰	D	H max
DN125	125mm (5")	4000mm
DN150	150mm (6")	5000mm

RD80G electrical connection

(4~20) mA / HART (two-wire system) power supply and output current signal share a two-core shield cable. Refer to the technical data for the specific power supply voltage range.

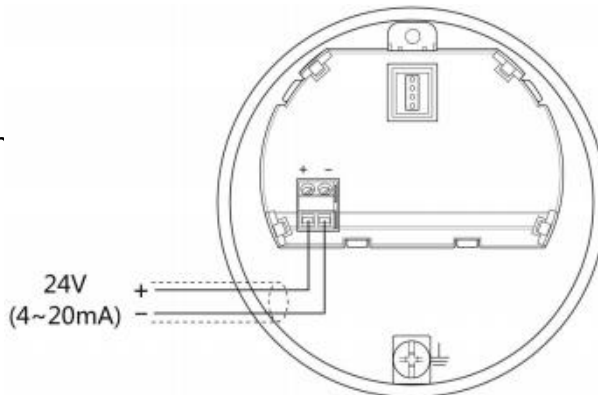
(4~20) mA (four-wire / six-wire) power supply needs to be supplied separately, power supply and current signal using a four-core shielding cable (current signal and RS485 interface can be output simultaneously, and output needs using a six-core shielding cable).

The RS485 / Modbus power supply shall be supplied separately, with a four-core shielded cable

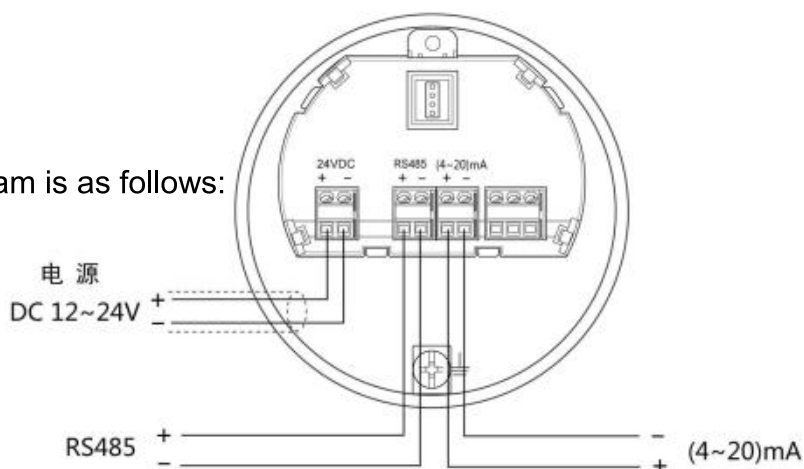
(The current signal and RS485 interface can be simultaneously output with a six-core shielded cable).

attended mode

The 24V 2-wire manufacturing wiring



The 12~24V four-wire wiring diagram is as follows:



Safety guidance

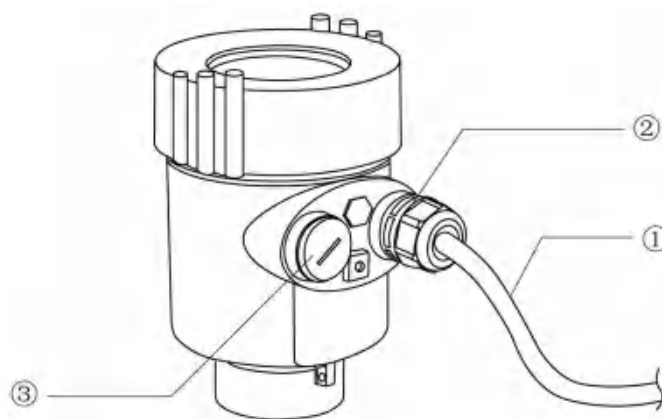
Please follow the local electrical installation regulations!

Please follow the local regulations for personnel health and safety. All operation of instrument electrical components must be done by properly trained professionals.

Please check the nameplate of the instrument to ensure that the product specifications meet your requirements. Ensure that the supply voltage is consistent with the requirements on the instrument nameplate.

levels of protection

This instrument fully meets the requirements of protection grade IP66 / 67, please ensure that the cable seal head is waterproof, as illustrated in following figure:



How to ensure t

Make sure that the sealing head is not damaged.

Make sure that the cable is not damaged.

Please ensure that the cables used comply with the electrical connection specification.

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

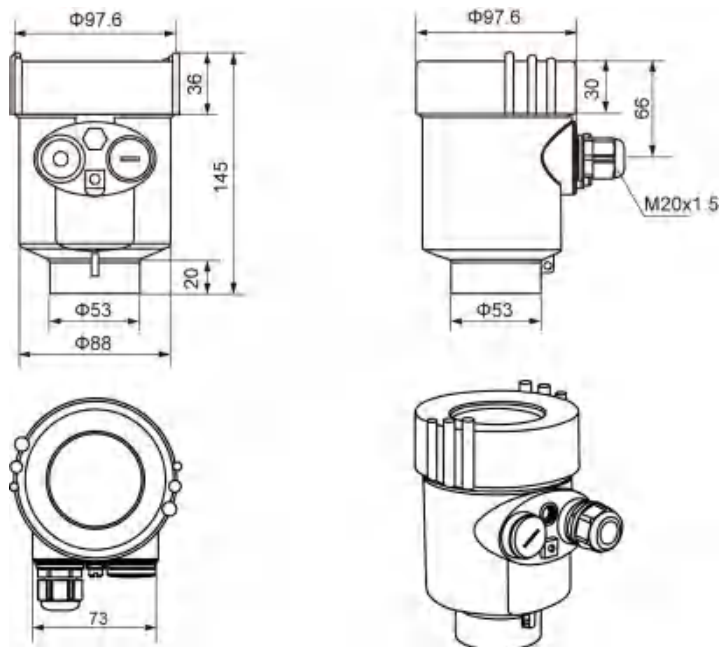
Tighten the cable seal head, see ②

Please blind the unused electrical interface, see ③

RD80G structure dimensions

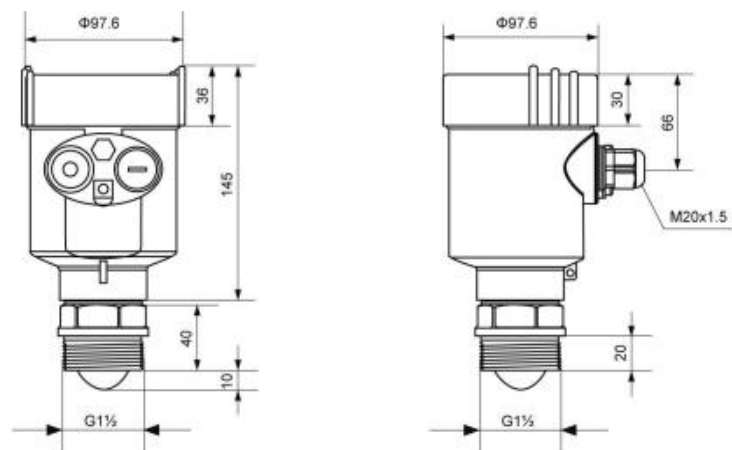
Case dimensions (in unit: mm)

Casting aluminum case

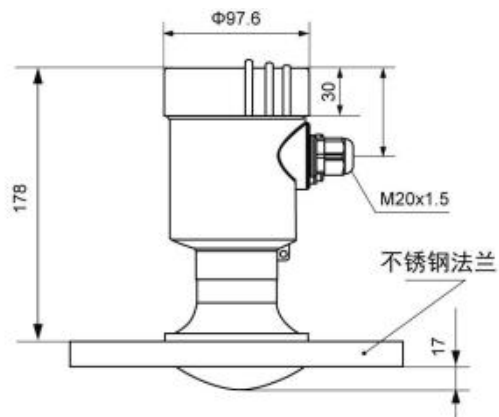
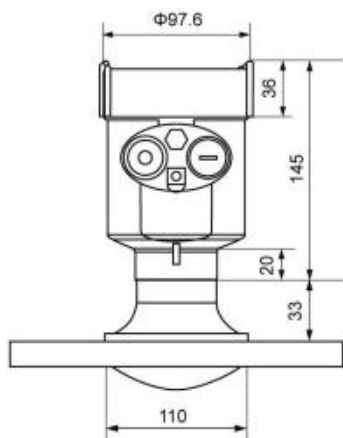
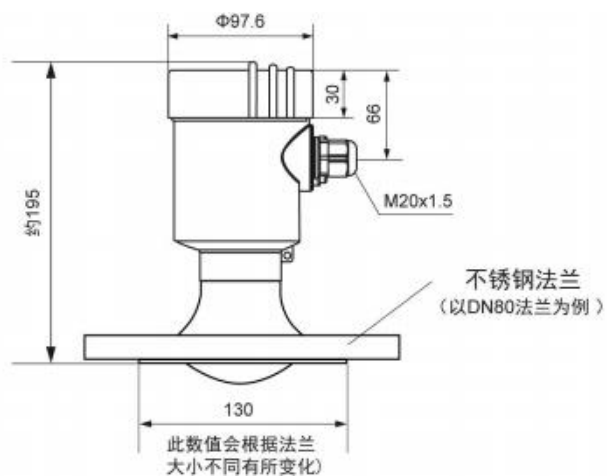
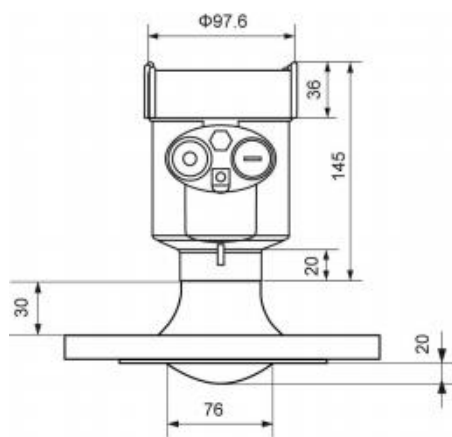
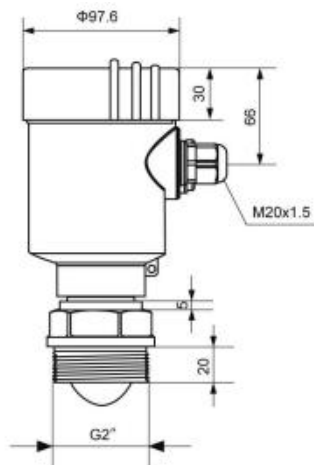
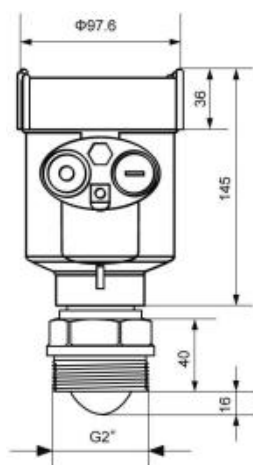


Product Size (in unit: mm)

RD80G01



RD80G02



RD80G technical parameters

general data

Process connection flange / material 304 stainless steel, PP
 Antenna profile, PTFE
 Case for cast aluminum / stainless steel
 Sealed FKM between the housing and the housing cover
 Shell window, transparent PC
 Ground terminal, stainless steel

service voltage

Two-line single cavity (4-20mA) standard (12-24) VDC intrinsically safe (12-24) VDC
 power dissipation max.22.5mA
 Allow ripple
 - <100Hz $U_{ss} < 1V$
 -(100~100K) Hz $U_{ss} < 10mV$

Two line two cavities (4-20mA) Ann + explosive isolation (18-25) VDC
 power dissipation max.22.5mA
 Four-wire single cavity (RS485) standard type (9-27) VDC
 power dissipation max.1.5W
 Intrinsically safe type 24 (1 ± 10%) V DC
 power dissipation max.12mA

Four-wire two cavity (4-20mA) Ben + 220V A C
 power dissipation max.18mA

Cable parameters

Cable inlet / plug: 1 M 20x1.5 Cable inlet cable diameter 5...9MM
 1 Blind Block of M20 I.5
 Terminal conductor cross-section is 2.5mm²

out parameter

Output signal (4~20) mA / HART
 RS 485/ Modbus

Resolution, 1mm m

Fault signal current output is unchanged; 20.5mA;22mA;3.9mA

Integral time (0~40) s, adjustable

Blind zone 0.1m/0.2m/0.3m

The maximum measurement distance is 150 m

Measurement interval of approximately 1 second (depending on the parameter settings)

Adjustment time is about 1 second (depending on the parameter settings)

Working storage and transportation temperature (-40~80) °C

Relative humidity is < 95%

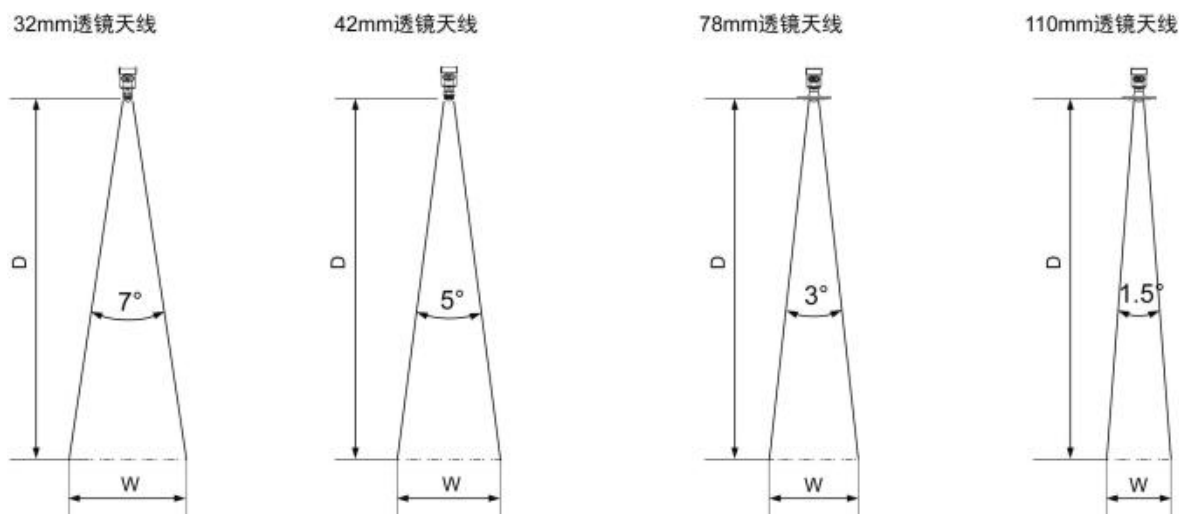
pressure Max.2.5MPa

Shock-resistant mechanical vibration 10 m/s^2 , (10~150) Hz

RD80G technical parameters

beam angle

The beam angle is the beam angle when the radar wave energy density reaches half its maximum value (3dB width). Microwaves emit a signal to the waves Outside of the beam range, and can be reflected by the distractors.



product model	01	02	03	07
Lens antenna diameter	Φ32mm antenna input resistance	Φ42mm antenna input resistance	Φ76mm antenna input resistance	Φ74.7mm Lens antenna band with a purge
beam angle	7°	6°	3°	3°

The larger the antenna size, the smaller the beam angle, the less interference echo is generated.

For more accurate measurements, avoid installing any internal devices (e. g., limit switch, temperature sensor, base, vacuum ring, heating coil, baffle, etc.) within the range of the signal beam.

