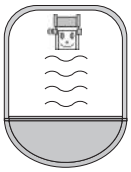
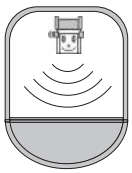
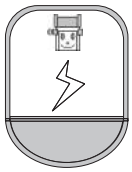
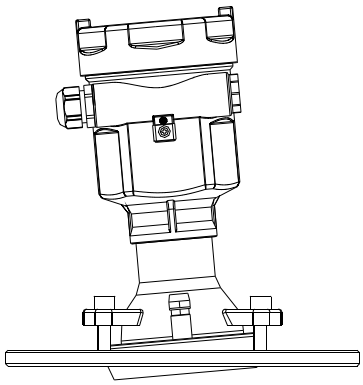
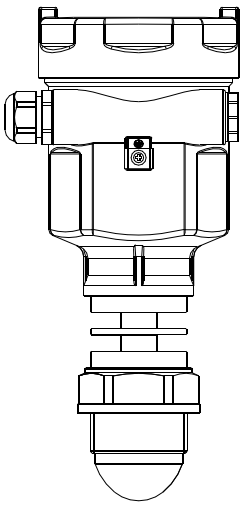
80G Radar Level Instrument











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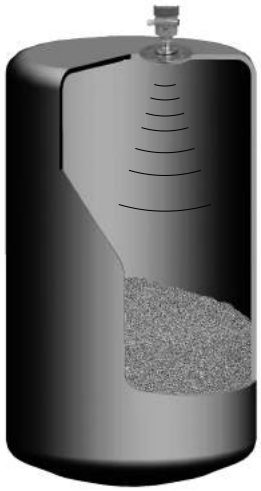
Contents

1. Principle of Measurement



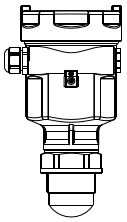
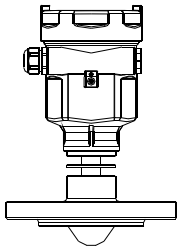
● Principle

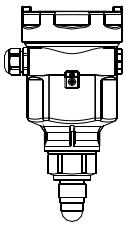
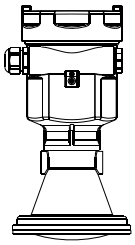
Frequency modulated continuous wave (FMCW) is adopted for radar level instrument (80G). The antenna transmits the high frequency and frequency modulated radar signal. The frequency of the radar signal linearly increases. The transmitted radar signal is reflected by dielectric to be measured and received by antenna. At the same time, the difference between the frequency of transmitted signal and that of the received signal is proportional to the measured distance. Therefore, the distance is calculated by the spectrum derived from the analog-to-digital conversion frequency difference and the fast Fourier transform (FFT).

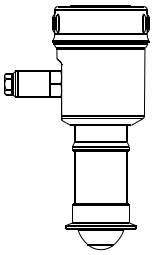
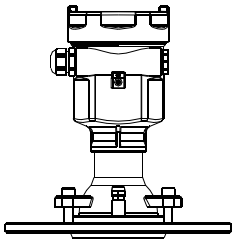
● Features

1. High frequency, small beam angle, and smaller unmeasurable zone which can help to measure the tanks with small diameter and can adapt to the connecting pipe on the tank;
2. Centralized energy and stronger anti-jamming capability which have significantly improved the measurement accuracy and reliability;
3. Small antenna size which facilitates the installation.

2. Brief description of instrument

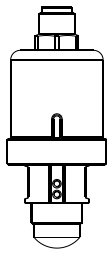
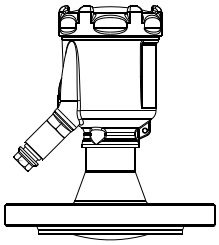
	GDRD81	GDRD82
		
Application:	Liquid Suitable for the strong corrosive liquids Vapour /Foam	Liquid Suitable for the strong corrosive liquids Vapour /Foam
Measurement range:	0～30m	0～30m
Measurement accuracy:	±2mm	±2mm
Process temperature:	(-40～110)℃ (-40～150)℃ (See page 6)	(-40～130)℃
Process pressure	(-0.1～0.1)MPa	(-0.1～4.0)MPa
Frequency:	80GHz	80GHz
Signal output:	(4～20)mA/HART RS485/MODBUS Protocol	(4～20)mA/HART RS485/MODBUS Protocol
Power supply:	2-Wire(DC24V) 4-Wire(DC10.8～26.4V)	2-Wire(DC24V) 4-Wire(DC10.8～26.4V)
Display/programming:	Optional	Optional
Housing:	A/B/D/G/H (See page 6)	A/B/D/G/H (See page 6)
Antenna material:	PP/FEP (See page 6)	316L+FEP (See page 6)
Installation form:	Thread (See page 6) GC/GD/GE/GF	Flange (See page 6) FA/FB/FC/FD/FE
Protection Level :	IP67	Ip67

	GDRD83	GDRD84
		
Application:	Liquid Suitable for the strong corrosive or Pressure resistance liquid	Liquid Vapour /Foam
Measurement range:	0～10m	0～30m
Measurement accuracy:	±2mm	±2mm
Process temperature:	(-40～110)℃	(-40～110)℃
Process pressure	(-0.1～0.5)MPa (Suitable for thestrong corrosive liquid) (-0.1～4.0)MPa(Pressure resistance liquid) (See page 6)	(-0.1～0.1)MPa
Frequency:	80GHz	80GHz
Signal output:	(4～20)mA/HART RS485/MODBUS Protocol	(4～20)mA/HART RS485/MODBUS Protocol
Power supply:	2-Wire(DC24V) 4-Wire(DC10.8～26.4V)	2-Wire(DC24V) 4-Wire(DC10.8～26.4V)
Display/programming:	Optional	Optional
Housing:	A/B/D/G/H (See page 6)	A/B/D/G/H (See page 6)
Antenna material:	FEP/316L+PTFE (See page 6)	PP (See page 6)
Installation form:	Thread (See page 6) GA/GB	Swivelling Holder (See page 6) -
Protection Level :	IP67	IP67

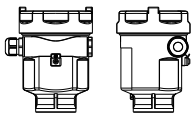
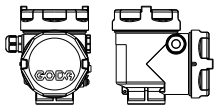
	GDRD85	GDRD87
		
Application:	Liquid Hygiene	Solid Storage vessel/process vessel or high dust occasion
Measurement range:	0～30m	0～120m
Measurement accuracy:	±2mm	±5mm
Process temperature:	(-40～130)℃	(-40～110)℃ (-40～130)℃ (-40～195)℃ (See page 6)
Process pressure	(-0.1～4.0)MPa	-
Frequency:	80GHz	80GHz
Signal output:	(4～20)mA/HART RS485/MODBUS Protocol	(4～20)mA/HART RS485/MODBUS Protocol
Power supply:	2-Wire(DC24V) 4-Wire(DC10.8～26.4V)	2-Wire(DC24V) 4-Wire(DC10.8～26.4V)
Display/programming:	Optional	Optional
Housing:	K (See page 6)	A/B/D/G/H ※1 (See page 6)
Antenna material:	PTFE (See page 6)	Aluminum substrate plastic +PP/316L+PP/316L+PEEK/ 316L+PEEK Heat sink (See page 6)
Installation form:	Chuck and Clamp (See page 6) -	Flange (See page 6) FC/FD/FE
Protection Level :	IP67	IP67

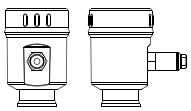
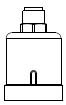
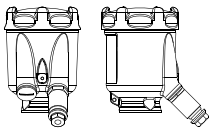
Note

1. Intrinsically safe + dust version instrument can only use A, G .

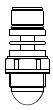
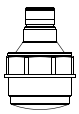
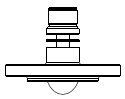
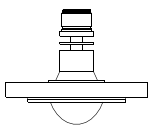
	GDRD88	GDRD89
		
Application:	Liquid	Marine
Measurement range:	0～30m	0～30m/0～70m
Measurement accuracy:	±2mm	±2mm/±5mm
Process temperature:	(-40～110)℃	(-40～110)℃
Process pressure	(-0.1～0.1)MPa	(-0.1～0.1)MPa
Frequency:	80GHz	80GHz
Signal output:	(4～20)mA/HART RS485/MODBUS Protocol	(4～20)mA/HART RS485/MODBUS Protocol
Power supply:	2-Wire(DC24V) 4-Wire(DC10.8～26.4V)	2-Wire(DC24V) 4-Wire(DC10.8～26.4V)
Display/programming:	None	Optional
Housing:	L (See page 6)	M (See page 6)
Antenna material:	PP (See page 6)	316L+PTFE (See page 6)
Installation form:	Swivelling Holder/Thread GD (See page 6)	Flange (See page 6) FB
Protection Level :	IP68	IP67

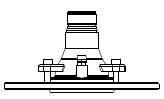
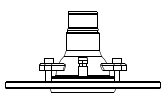
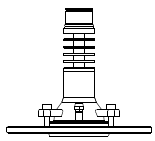
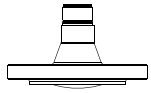
Housing

		
No.	A/ B /G	D/ H
Material	Aluminum Alloy/Plastic/Stainless Steel 316L	Aluminum ally/Stainless Steel 316L
Features	Single Lumen	2-Chamber

			
No.	K	L	M
Material	Stainless Steel 316L (Surface machining)	Pa66	Stainless Steel 316L
Features	Hygiene	-	Marine

Antenna

							
No.	GDRD81	GDRD81	GDRD81	GDRD82	GDRD82	GDRD83	GDRD83
Material	PP/FEP	FEP	PP/FEP	316L+FEP	316L+FEP	FEP	316L+PTFE
Specifications	Thread G1½A Thread1½NPT	Thread G1½A Thread1½NPT	Thread G3A Thread3NPT	DN50 DN80 DN100	DN80 DN100 DN125 DN150	Thread G¾A Thread¾NPT	Thread G¾A Thread¾NPT
Features	Anti-corrosion 110℃	Anti-corrosion 150℃	Anti-corrosion 110℃	Anti-corrosion High pressure	Anti-corrosion High pressure	Anti-corrosion	High pressure

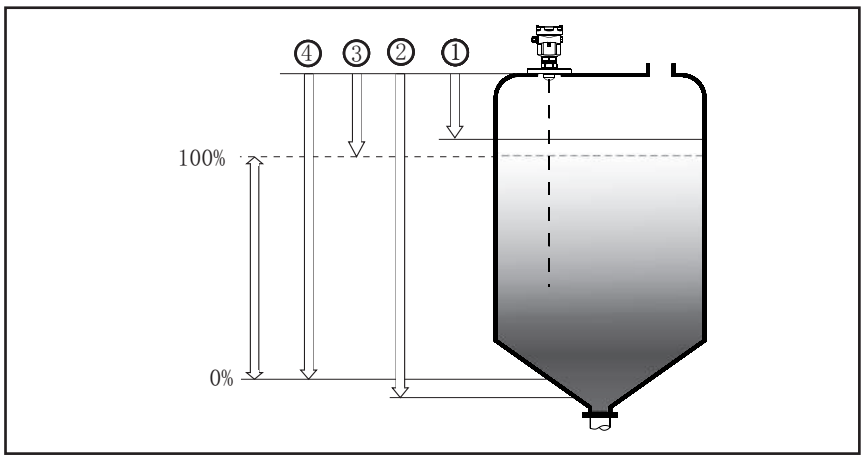
						
GDRD84	GDRD85	GDRD87	GDRD87	GDRD87	GDRD88	GDRD89
PP	PTFE	Aluminum Substrate Plastic +PP	316L+PP 316L+PEEK	316L+PEEK	PP	316L+PTFE
	DN50	DN100 DN125 DN150	DN100 DN125 DN150	DN100 DN125 DN150		DN80
-	Hygiene	Universal/purging 110℃	Universal/purging 130℃	Universal/purging 195℃	Anti-corrosion	Marine

3. Requirement of installation

Basic requirements

When the antenna transmits the microwave pulse, it has a certain transmitting angle. There shall be noobstacles in the area radiated by the transmitted microwave beam from the lower edge of the antenna to the dielectric surface to be measured. Therefore, it is necessary to avoid the facilities in the tank during installation, for example: human ladder, limit switch, heating equipment, supports, etc. If necessary, "Virtual Echo Learning" should be implemented. In addition, please note that the microwave beam should not intersect the charging material flow. During the installation of instrument, please also note that: the highest material level shall not enter the unmeasurable zone; the instrument shall be kept at a certain distance from the wall of tank; the installation of instrument should enable the transmitting direction of antenna to be perpendicular to the dielectric surface to be measured as much as possible. The instruments installed in the explosion-proof area shall be in compliance with the national installation regulations of explosion-proof dangerous area. The die-casting aluminum should be adopted for the housing of explosion-proof instrument. The explosion-proof instrument can be installed in the occasion that is required to be explosion-proof, and the instrument should be grounded.

Graphic illustration

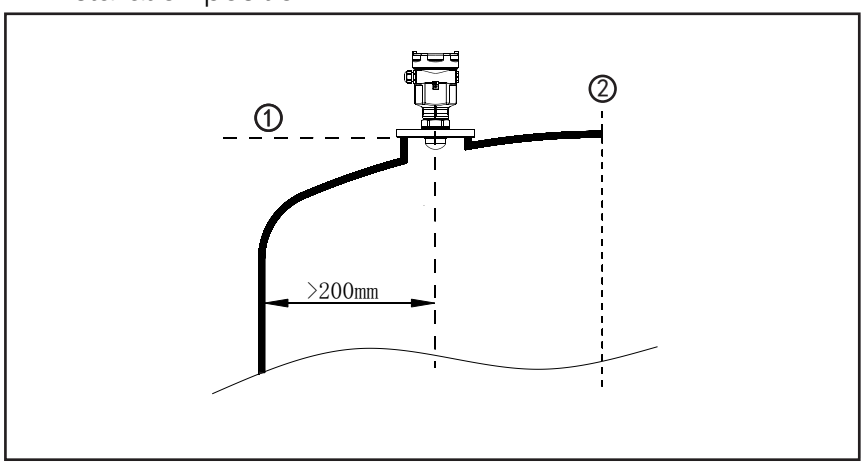


The reference plane for measurement is the sealing surface of threads or flanges.

1 Scope of unmeasurable zone
2 Setting of measurement range
3 Adjustment at high level
4 Adjustment at low level

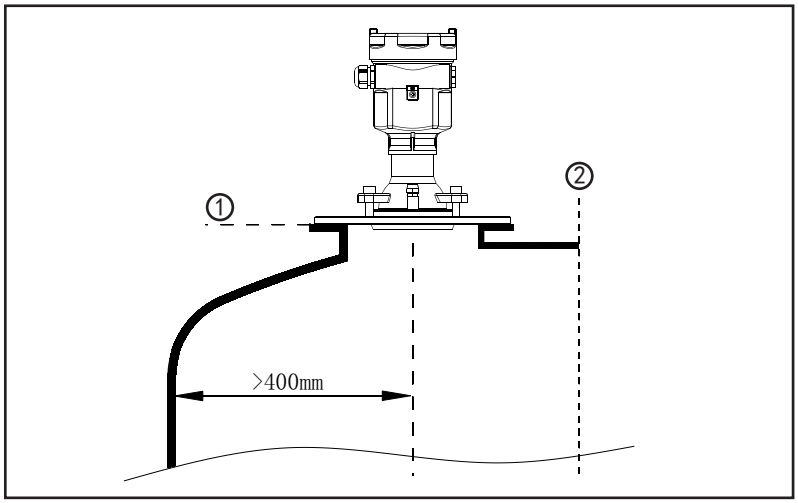
Note: when the radar level instrument is used, please make sure that the highest material level does not enter the unmeasurable zone (No. 1 area shown in the figure).

Installation position

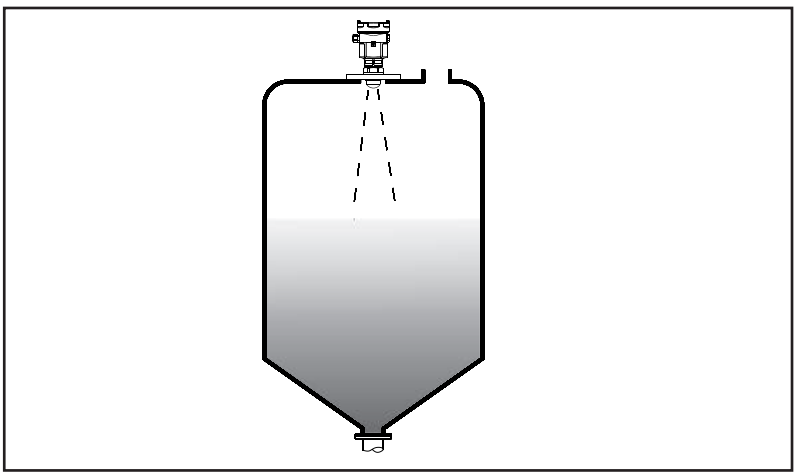


During the installation, please note that the instrument should be kept at a distance of 200mm at least from the vessel wall.

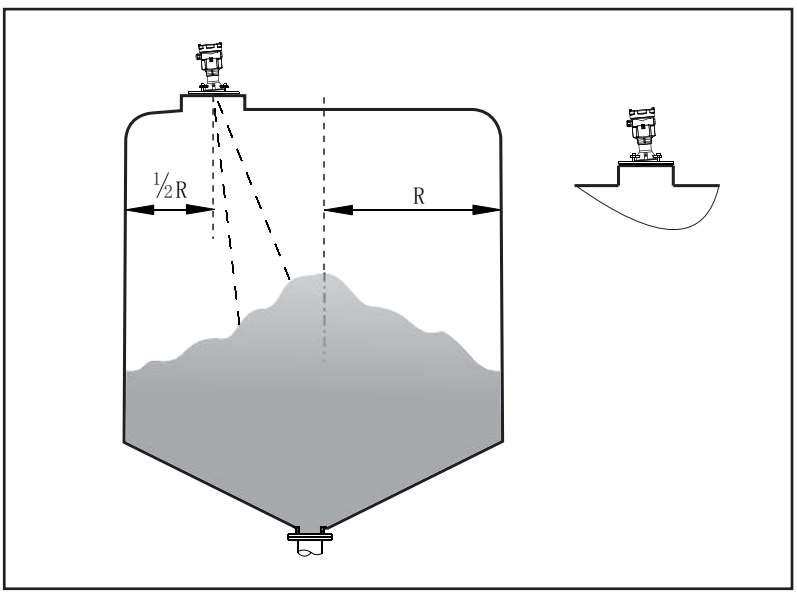
1 Reference plane
2 Center of the vessel or symmetry axis



1 Reference plane
2 Center of the vessel or symmetry axis

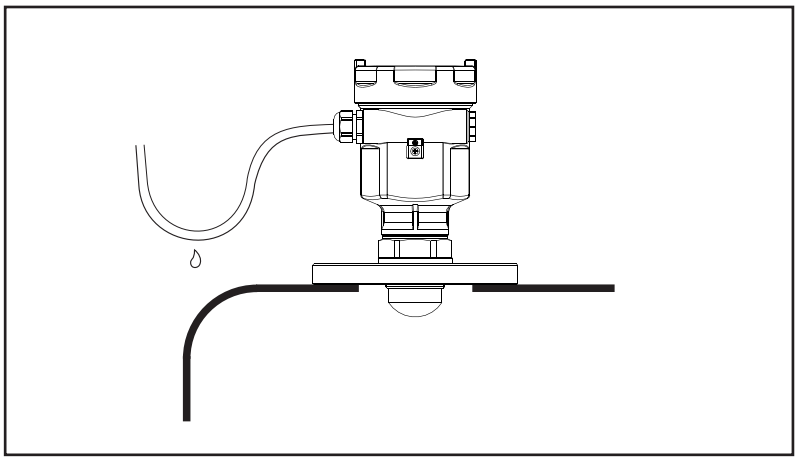


As for the conical vessel with flat tank top, the best installation position of instrument is the top center of the vessel, which ensures that the bottom of the container is measured.



Installation with gimbal installation

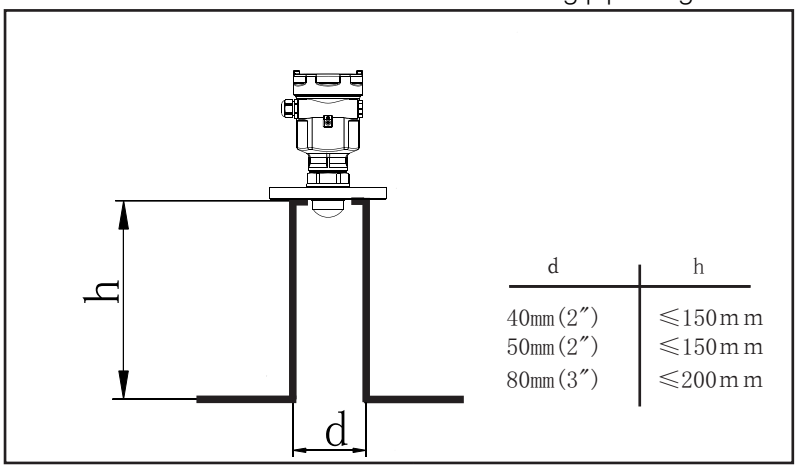
Moisture-proof



As for the instrument installed in outside or wet indoor environment and cooling or heating tanks, the cable gland should be tightened and the cable at the cable entry should be bend downward for preventing moisture. As shown in the figure:

Antenna extension

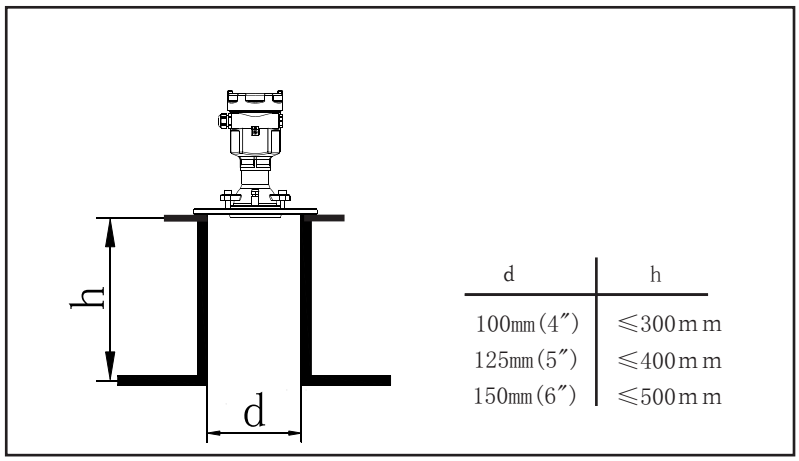
GDRD81～GDRD85、GDRD88、GDRD89 Connecting pipe diagram



d	h
40㎜(2″)	≤150mm
50㎜(2″)	≤150mm
80㎜(3″)	≤200mm

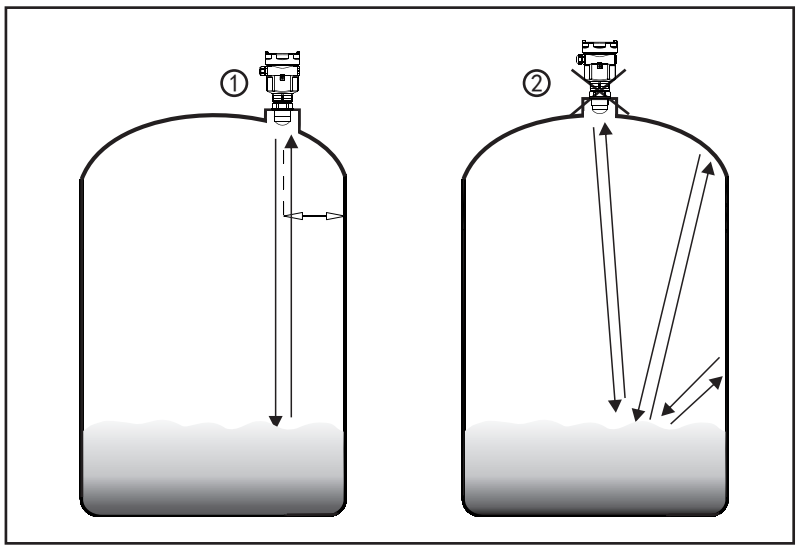
If the reflection property of the dielectric to be measured is good, the antenna extension can also be longer than the length of antenna. See the following table for the standard length of antenna extension. See the following table for the standard length in such case. The ends must be ground without the bulges, for example, burrs. If necessary, "virtual echo learning" function should be used. Eliminating the reflection on the ends of smaller connecting pipe also can achieve better measurement results.

GDRD87Connecting pipe diagram

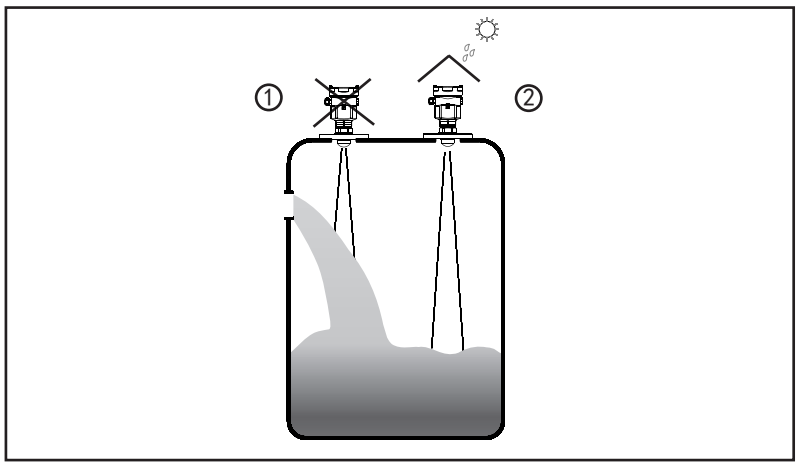


d	h
100㎜(4″)	≤300mm
125㎜(5″)	≤400mm
150㎜(6″)	≤500mm

- Rights and wrongs of installation position

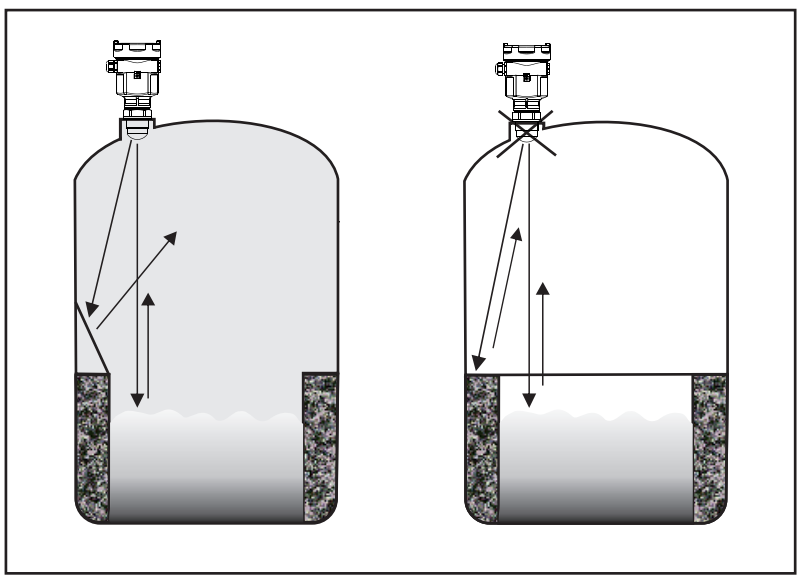


1. Correct
2. Error: Instruments are installed in the arched or round top of tank, which will result in multiple echoes. So it should be avoided as much as possible during the installation.



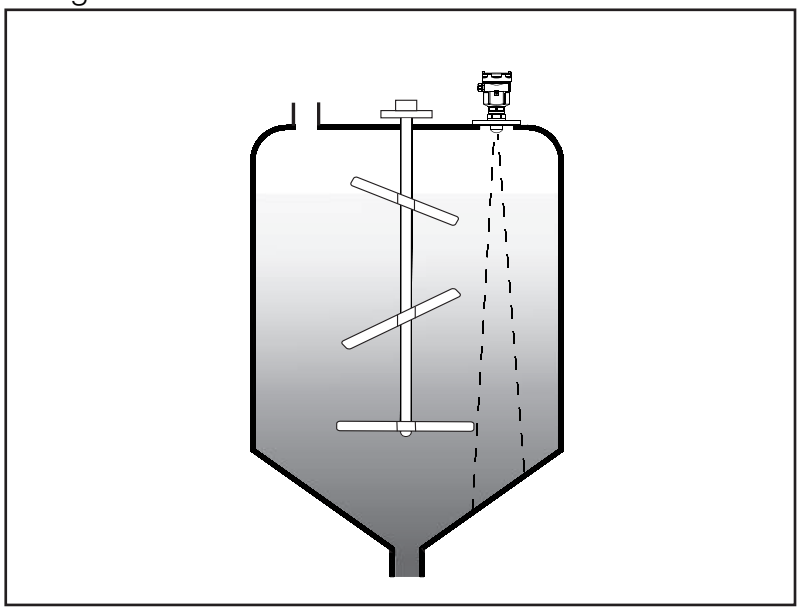
Error: instruments should not be installed above the charging material flow, in order to ensure that the dielectric surface is to be measured, rather than the charging material flow.
2 Correct
Note: sun-shading and rain-proof measures should be adopted for the outdoor installation.

- Installation of reflecting plate



If there are barriers in the tank, the reflecting plate can be installed to reflect the reflected wave of barriers out. If necessary, "virtual echo learning" can be implemented.

- Agitation



If there are agitation in the tank, the instruments should be installed as far away from agitators as possible. Once the installation is completed, the "virtual echo learning" should be carried out while agitators are running, to eliminate the influence of fraud echo generated by mixing blades. If foam or wave is generated due to the agitation, the waveguide installation method should be adopted.

4 Electrical connection

Supply voltage

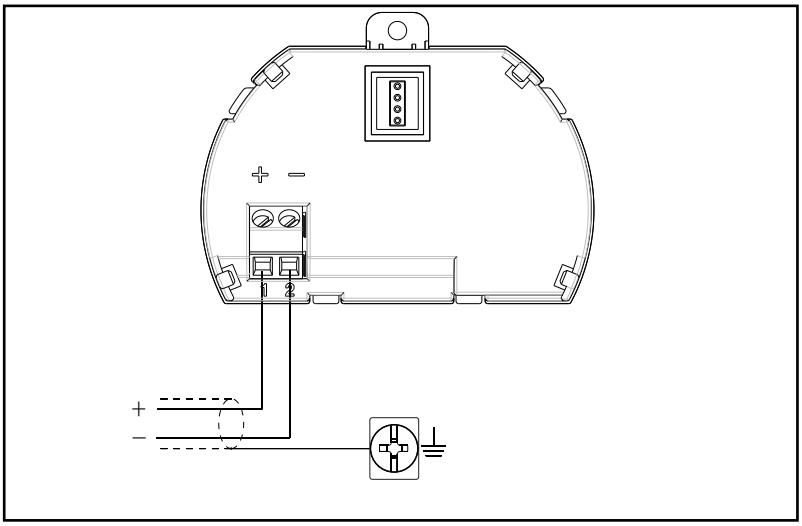
(4-20)mA/HART (2-Wire)	Power supply and the output current signal are carried by the same two-core cable.See the technical data for the detailed range of supply voltage. A safety barrier should be placed between the power supply and instrument for the intrinsically safe version. The grounding mode of current output can be adopted for the standard instrument, while the floating current output should be adopted for the explosion-proof instrument. Both of instrument and grounding terminals should be grounded well. Normally, the grounding terminals can be connected to the grounding point of tank or the nearby ground in case of plastic tank.

Installation of connecting cables

General introduction	The common two-core cable can be used as the power supply cable, and the outside diameter of the cable should be (5-9)mm to ensure the sealing of cable entry. In case of electromagnetic interference, it is recommended to use the shielded cable.
(4-20)mA/HART (2-Wire)	The common two-core cable can be used as the power supply cable.
(4-20)mA/HART/RS485 (4-Wire)	The cable with earth wire should be used as the power supply cable.
Shielding and wiring of cables	The two ends of the shielded cable should be grounded. The shielded cable must be directly connected to the grounding terminals inside of the sensor, while the outside grounding terminals on the housing must be grounded. In case of grounding current, the shielding side away from the instrument of the shielded cable must be grounded via a ceramic capacitor (for example: 1nF/1500V), in order for the blocking and bypassing of high frequency interference signal.

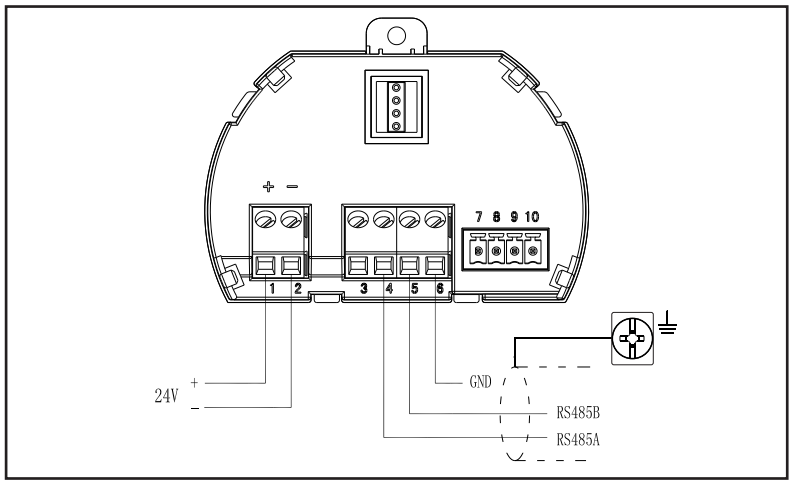
Wiring mode

2-Wire



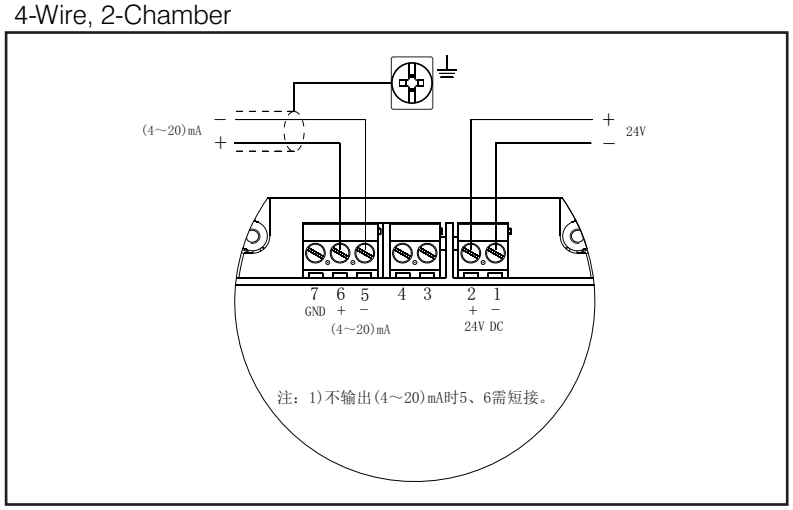
2-wire wiring used for HART (electronic unit B)

4-Wire



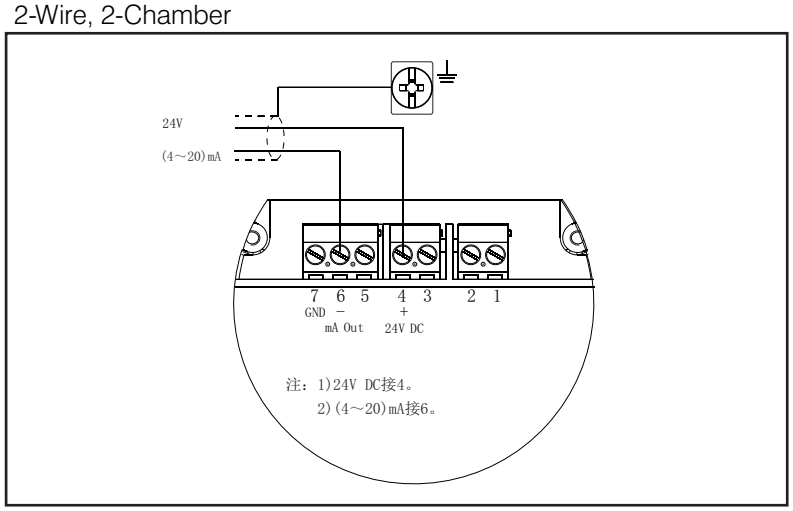
(10.8～26. 4)V DC power supply, RS485/MODBUS protocol output (electronic unit R)

4-Wire, 2-Chamber



24V DC power supply, (4-20)mA output (electronic unit C)

2-Wire, 2-Chamber



24V DC power supply, (4-20)mA output (electronic unit E)

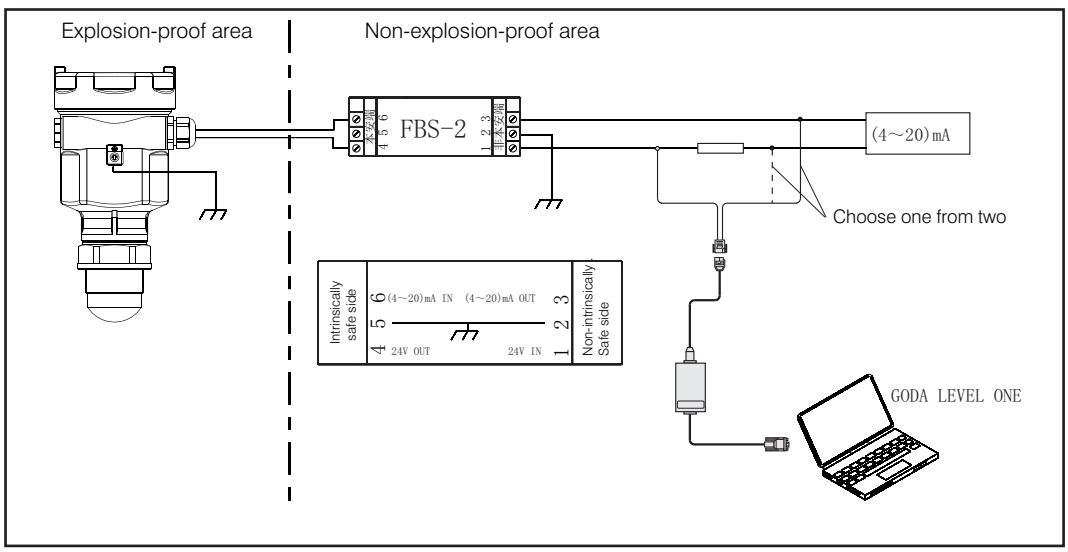
Explosion-proof connection

The explosion-proof types of the product include the intrinsically safe/ intrinsically safe + dust version/intrinsic safe+ flameproof approval. The working ambient temperature is (-40-65)℃. Under normal or fault conditions, the max temperature at any part of the surface should not exceed T3 (195℃), T4 (130℃), T5 (95℃) and T6 (80℃). Explosion-proof sign: Exia ⅡC T6 Ga/Exia D 20 T80℃/Ex d ia[ia Ga] ⅡC T6 Gb. The die-casting aluminum or 316L housing material is adopted for the intrinsically safe + dust version/ intrinsically safe +flameproof approval level instrument. The plastic, die-casting aluminum or 316L housing material is adopted for the intrinsically safe level instrument. The glue sealing structure is adopted for the electronic parts to ensure the sparks generated by the circuit fault will not be discharged. The product is applicable to the continuous level measurement for the media of inflammable gas/dust below the explosion-proof grades of Exia ⅡC T6 Ga/Exia D 20 T80℃/Ex d ia[ia Ga] ⅡC T6 Gb. When the explosion-proof instrument is used, safety barrier should be applied for its power supply. FBS-2 safety barrier is an associated equipment of this product, and its explosion-proof type is intrinsically safe. Explosion-proof sign: [Exia] ⅡC, with supply voltage of 24V DC±5%, short-circuit current of 130.5mA and working current of (4-20)mA. The shielded cable should be adopted for all cables. The max length from the instrument to safety barrier is 500m. Distributed capacity ≤0.1 μF/Km, distributed inductance ≤1mH/Km. During installation, instrument should be grounded. The associated equipment without the explosion-proof test should not be used.

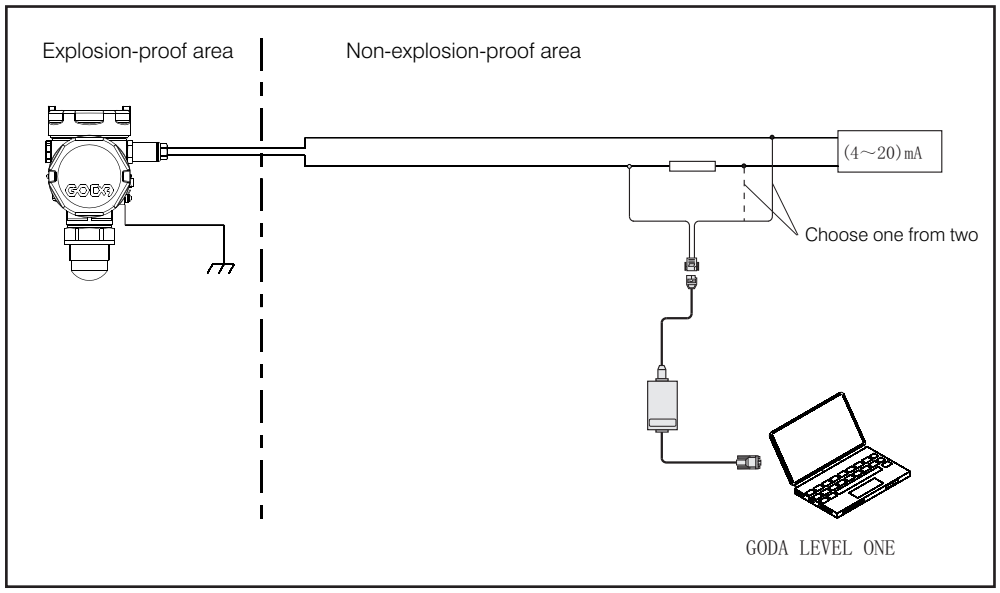
Explosion-proof sign of the product GDRD81～GDRD84:Ex ia ⅡC T6 Ga;Ex d ia[ia Ga] ⅡC T6 Gb.
Explosion-proof sign of GDRD87:Exia ⅡC T6 Ga;Ex d ia[ia Ga] ⅡC T6 Gb;Ex iaD 20 T80℃.
Explosion-proof sign of GDRD85, GDRD88 and GDRD89:Ex ia ⅡC T6 Ga.

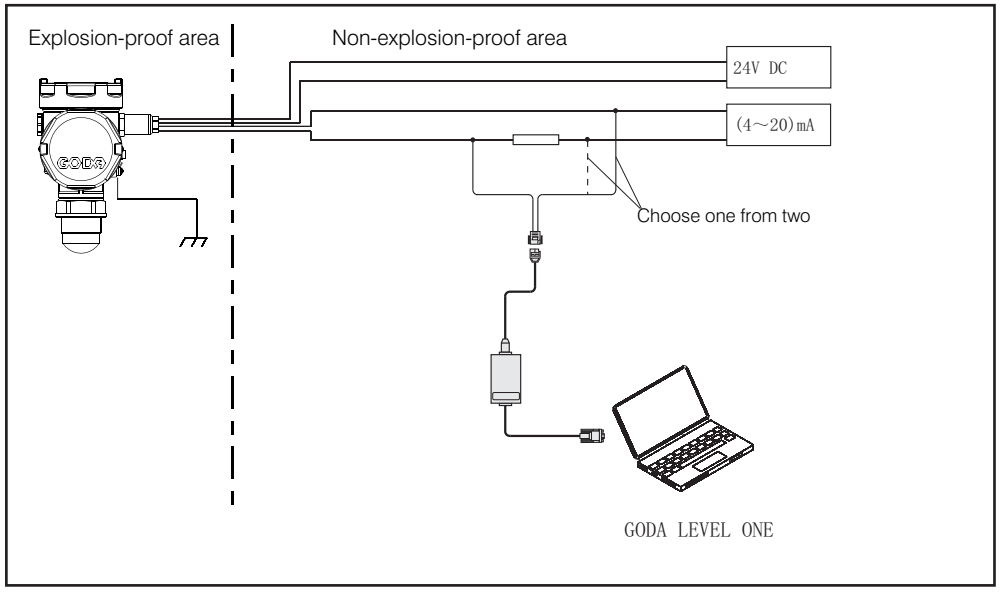
Parameters of FBS-2 safety barrier

(U_m)	(U_o)	(I_o)	(C_o)	(L_o)	(P_o)
250V VDC/AC	25.2 VDC	130.5mA	100nf	0.3mH	0.82W
	(U_i)	(I_i)	(C_i)	(L_i)	(P_i)
	26.4 VDC	166mA	0 μf	102 μH	1.096W



Wiring diagram of intrinsically safe/intrinsically safe + dust version





Explosion-proof wiring of intrinsically safe+ flameproof approval

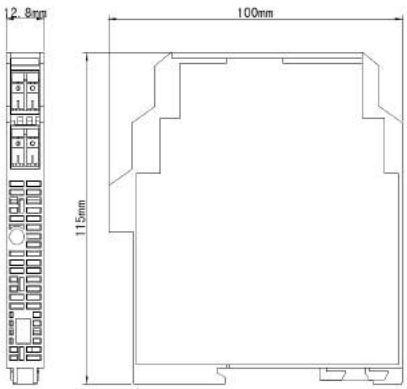
When RS485 intrinsically safe instrument is used, the communication input type isolated safety barrier should be used for power supply. NPEXA-C711 safety barrier is an associated equipment of this product, and its explosion-proof type is intrinsically safe.

External dimension of NPEXA-C711 communication input type isolated safety barrier

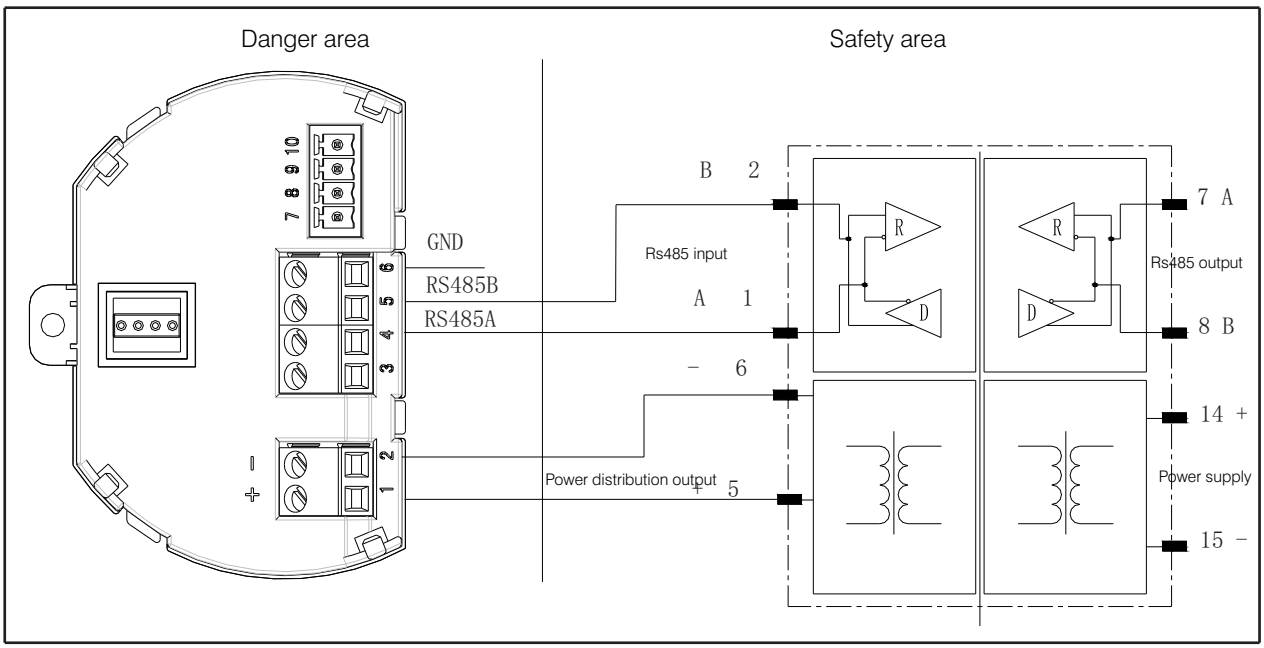
Port characteristics	Between No.1, No.2 terminals and GND	Between terminal 5 and terminal 6
Uo	6.5V	21V
Io	68mA	165mA
Po	111mW	866mW
Co	17.5 μF	0.13μF
Lo	5.4mA	0.91mA
Um	250V AC/DC	250V AC/DC

External dimension of NPEXA-C711 communication input type isolated safety barrier

WXHXD=12.8mmx100mmx115mm



Explosion-proof wiring of Rs485 intrinsically safe



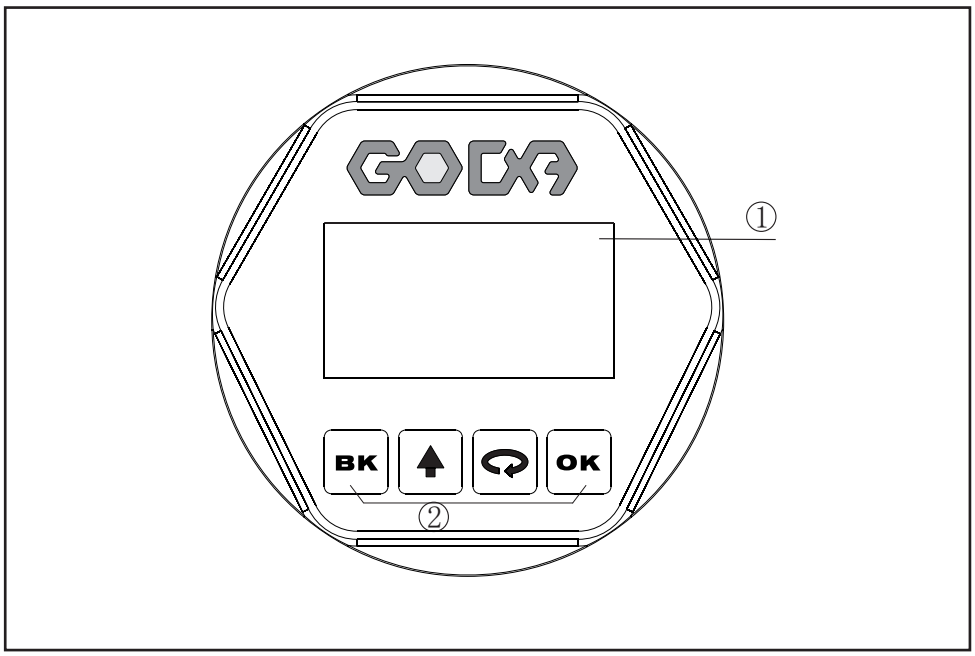
5 Instrument debugging

● Debugging method

There are four debugging methods for GDRD8X
1 Display/debugging module (View Point)
2 Host computer debugging software GODAware
3 HART hand-held programmer

ViewPoint is a pluggable display/debugging tool. The debugging can be done through operating with 4 buttons on ViewPoint. The language for the debugging menu is optional. After debugging, ViewPoint is only used for display in general, and the measurement value can be seen clearly through the glass window.

Display/debugging module



1. Liquid crystal display
2. Button

1. Liquid crystal display 2. Button

[**OK**]Button
–Enter programming mode;
–Confirm programming options;
–Confirm parameter modification.

[↻]Button
–Choose programming options;
–Choose the parameter bit to edit;
–Display of parameters.

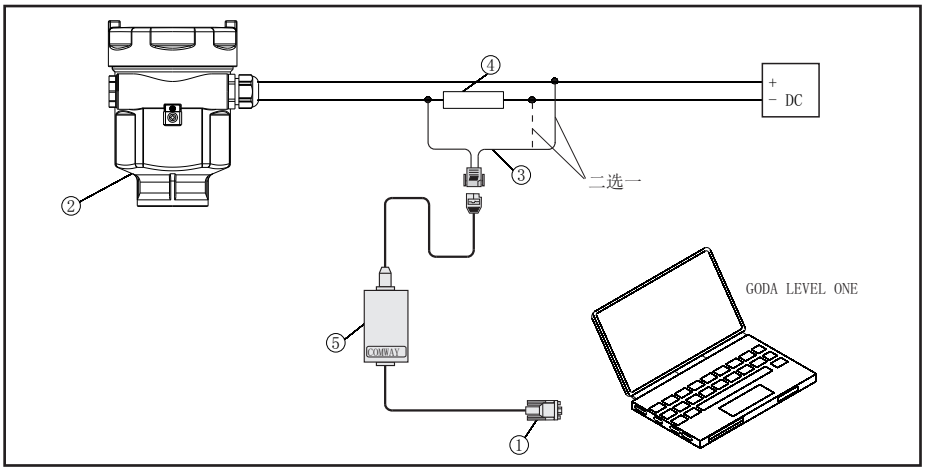
[▲]Button
–Modify parameter values;

[**BK**]Button
–Exit programming mode;
–Return to higher level menu.

Shortcut keys
[**BK**]displays the frequency spectrum

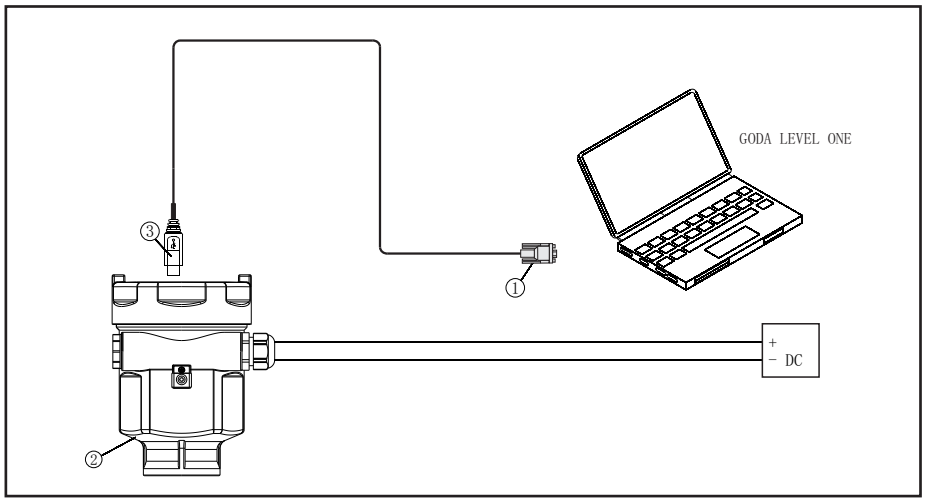
- Debugging of host computer

Connect to the host computer via HART



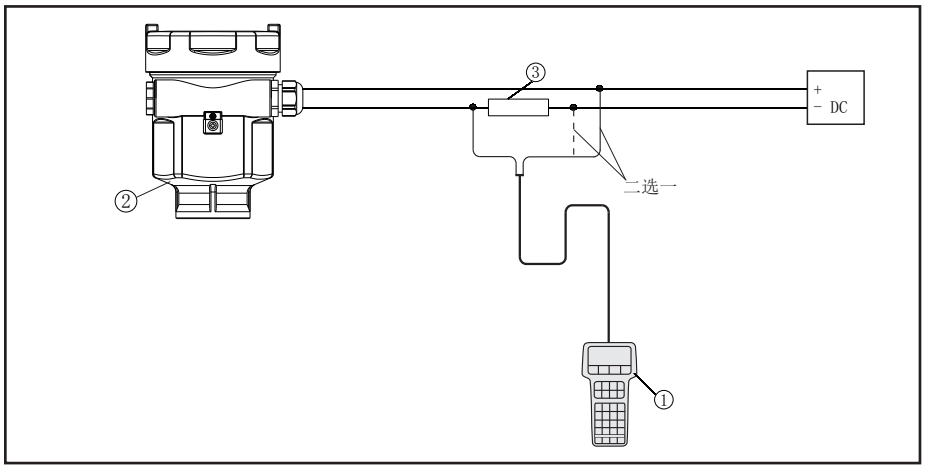
1 USB interface
2 GDRD8X
3 HART adapter used for COMWAY converter
4 250 Ω
5 COMWAY converter

Connect to the host computer via USB



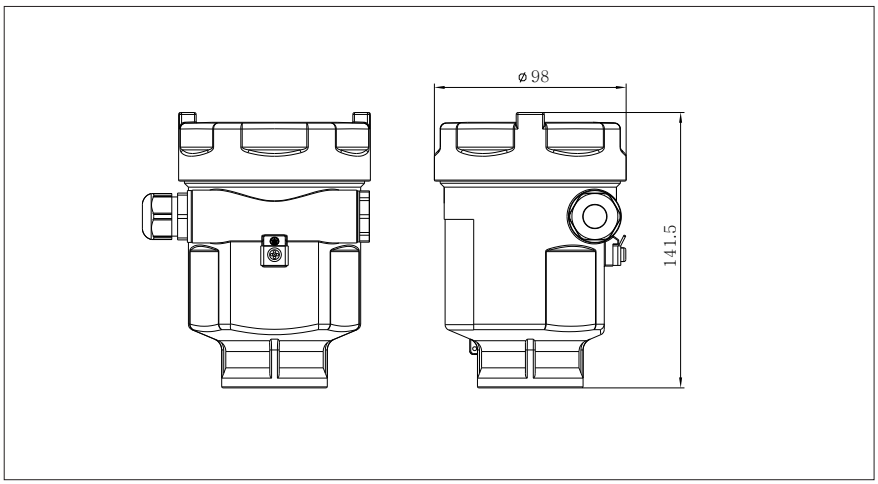
1 USB interface
2 GDRD8X
3 USB interface

HART hand-held programmer can be used for programming of GDRD8X

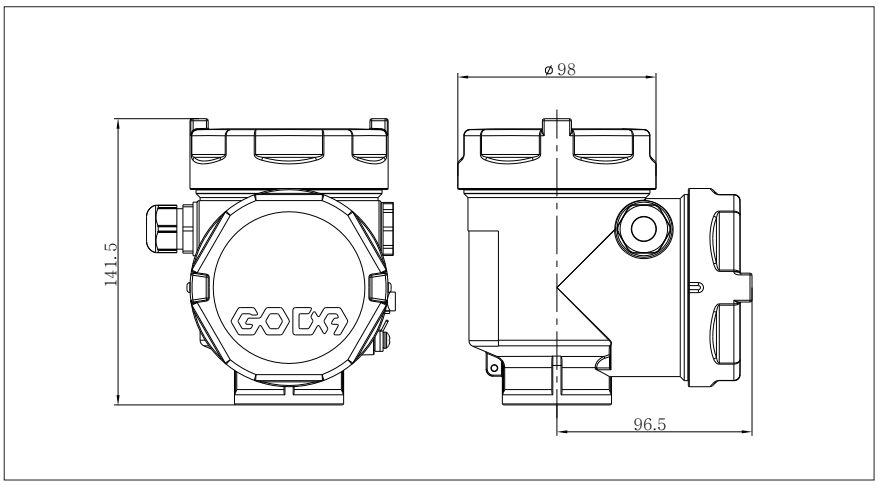


1 HART hand-held programmer
2 GDRD8X
3 250 Ω

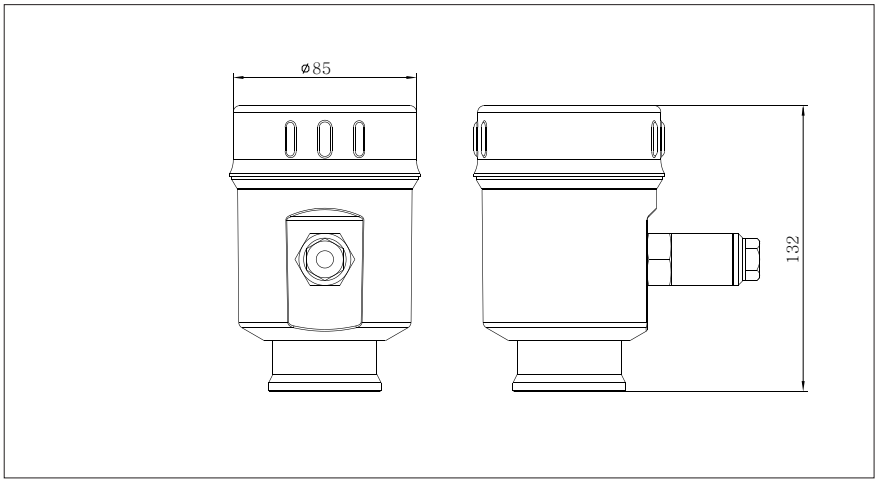
6 Structure size (unit: mm)



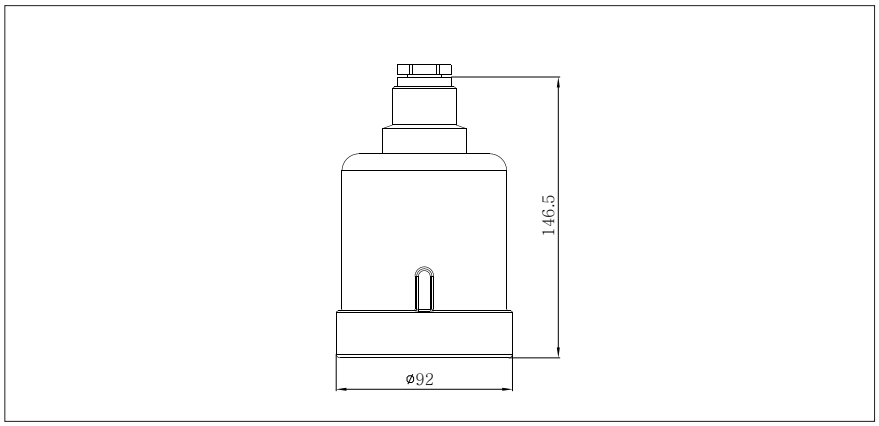
A/B/G type housing
Material:AL/PBT/316L



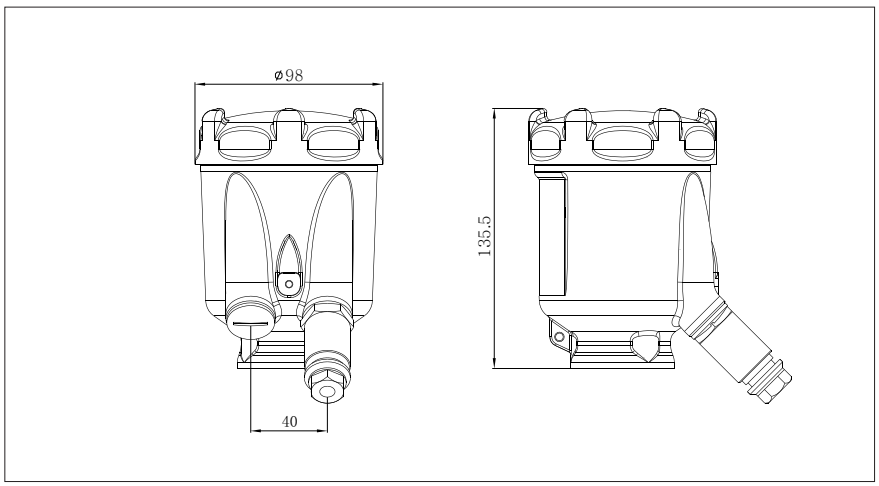
D/H type housing
Material:AL/316L



K type housing
Material: Stainless steel 316L (surface machining)

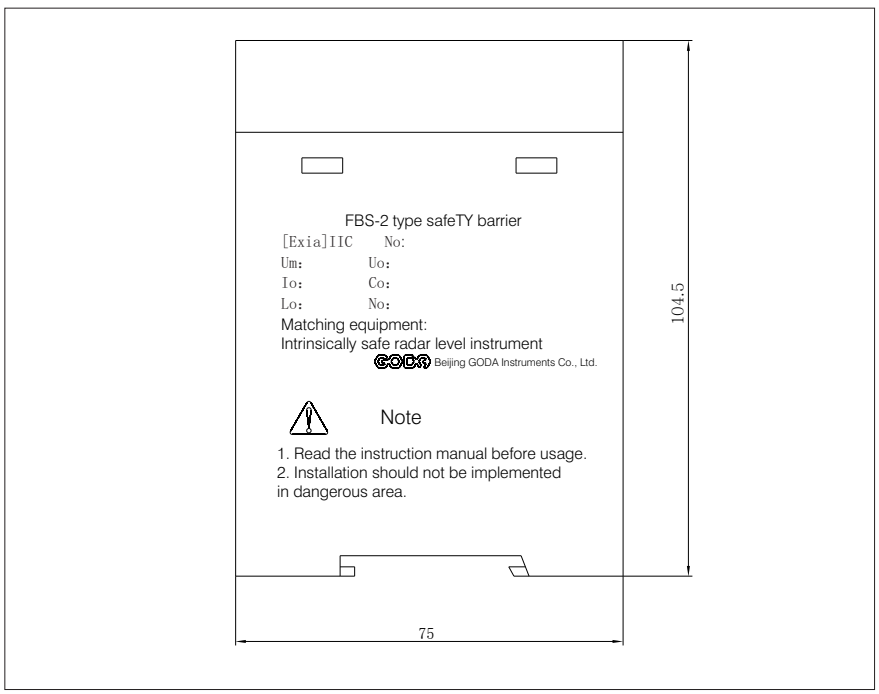


L type housing
Material:PBT

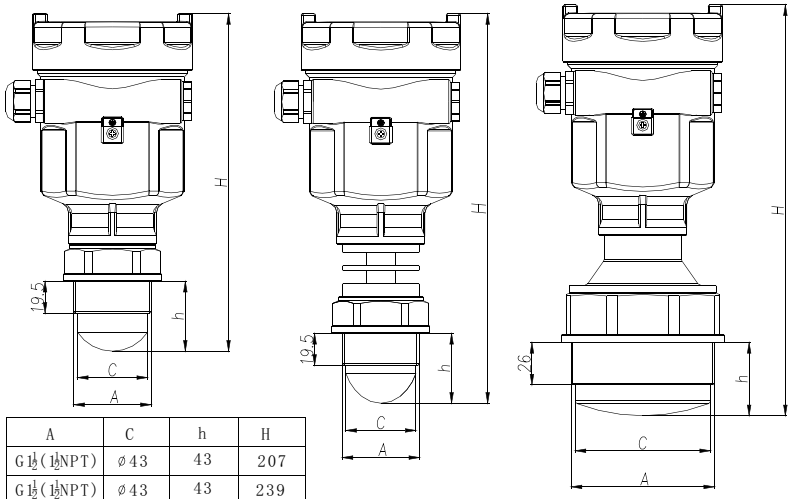


M type housing
Material: 316L

Safety barrier FBS-2

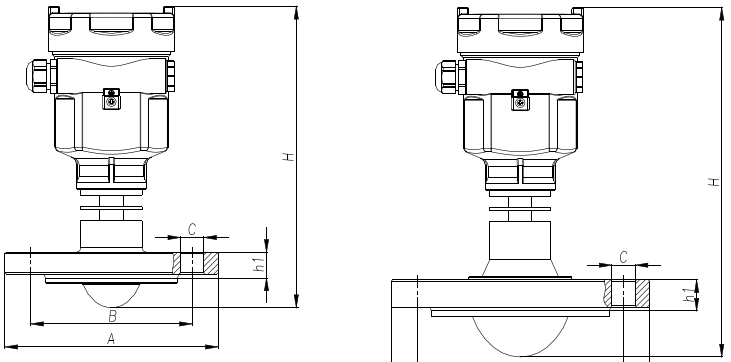


GDRD81



A	C	h	H
G1½(1½NPT)	ø43	43	207
G1½(1½NPT)	ø43	43	239
G3(3NPT)	ø83	45	252

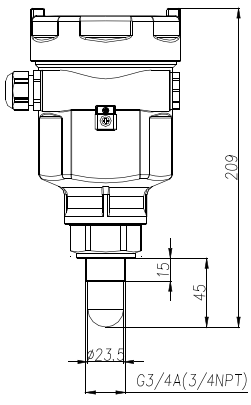
GDRD82



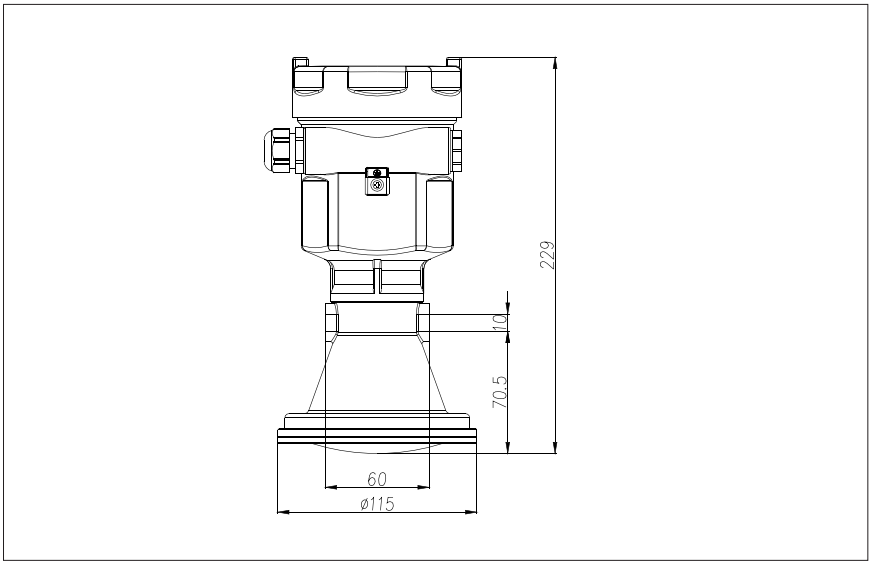
	A	B	C	H	h1
DN50 PN40	ø165	ø125	4-ø18	235	20
DN80 PN40	ø200	ø160	8-ø18	239	24
DN100 PN40	ø235	ø190	8-ø22	241	26

	A	B	C	H	h1
DN80 PN40	ø200	ø160	8-ø18	270	24
DN100 PN40	ø235	ø190	8-ø22	272	26
DN125 PN40	ø270	ø220	8-ø26	274	28
DN150 PN40	ø300	ø250	8-ø26	276	30

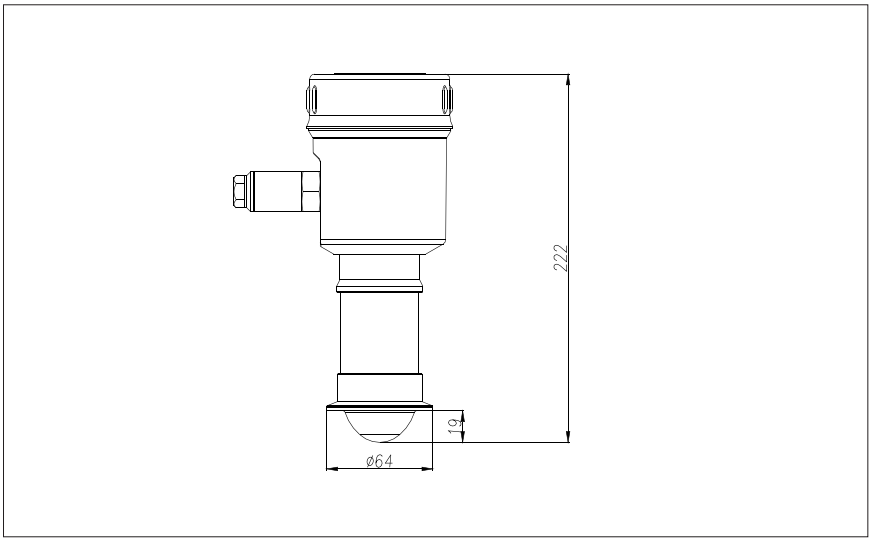
GDRD83



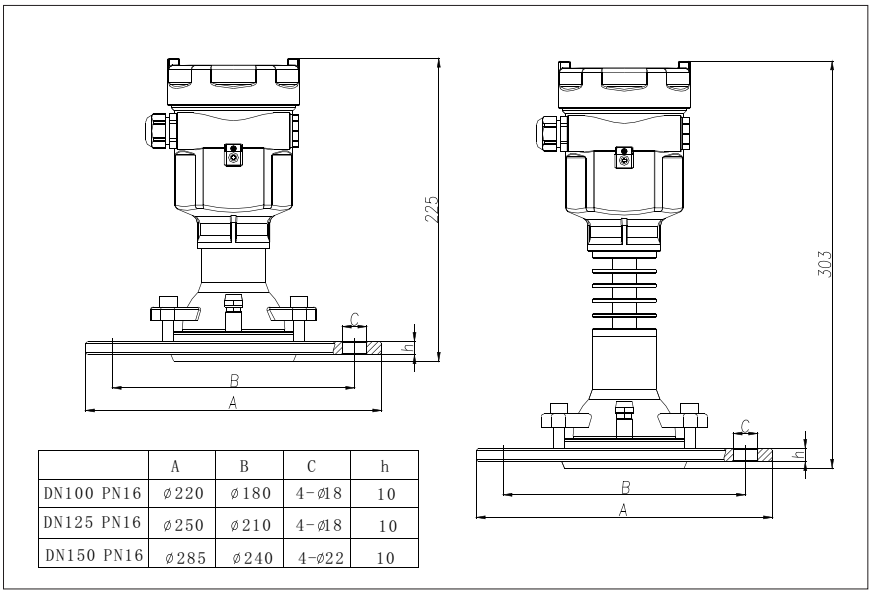
GDRD84



GDRD85

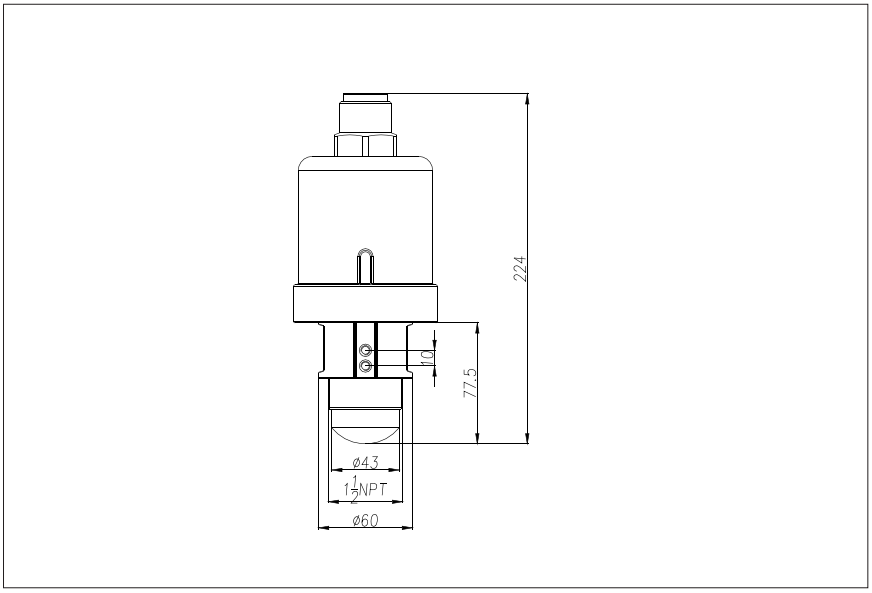


GDRD87

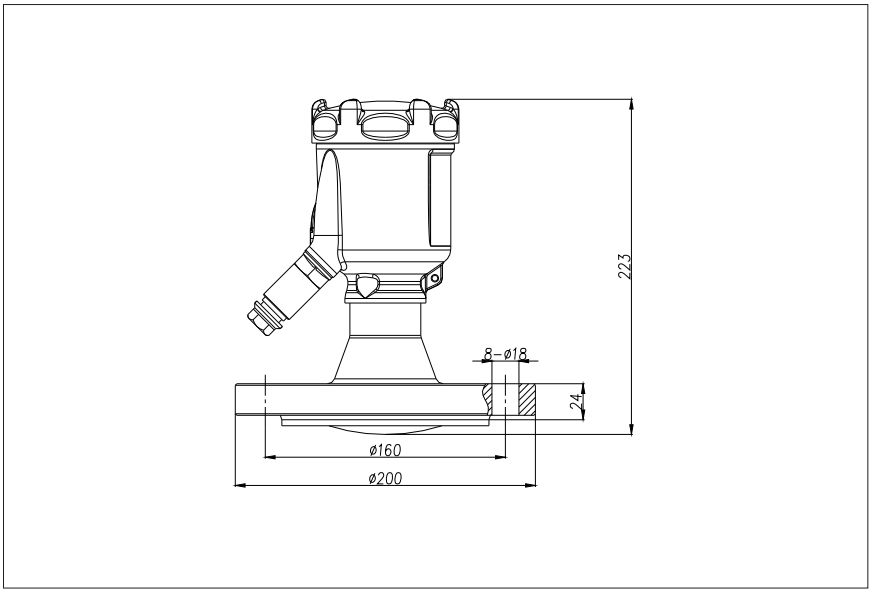


	A	B	C	h
DN100 PN16	ø220	ø180	4-ø18	10
DN125 PN16	ø250	ø210	4-ø18	10
DN150 PN16	ø285	ø240	4-ø22	10

GDRD88



GDRD89

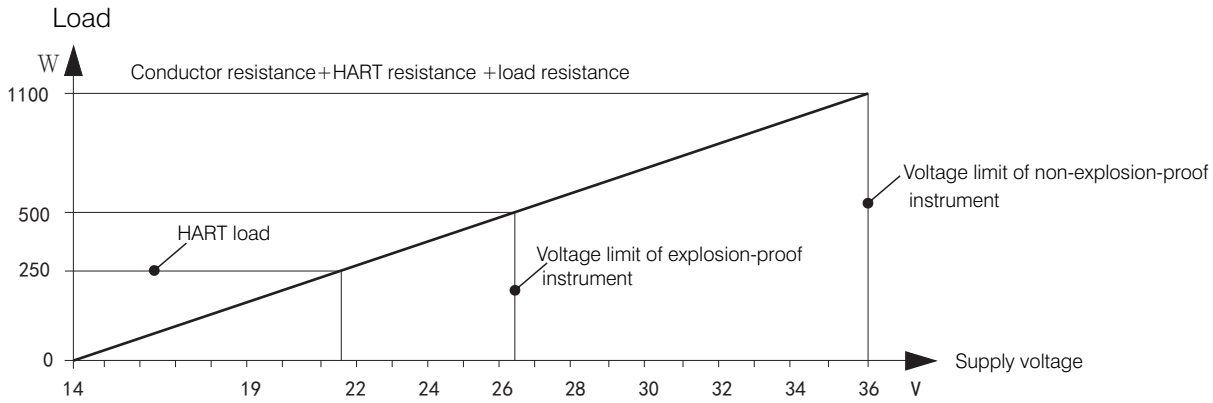


7 Technical parameters

● General data

	Housing	Aluminum, plastic and stainless steel 316L
	Sealing between the housing and housing cover	Silicone rubber
	Window on housing	Transparent PC
	Grounding terminal	Stainless steel
	Weight	
	–GDRD81	2.2Kg (depending on the antenna and housing)
	–GDRD82	8.0Kg (depending on the antenna and housing)
	–GDRD83	1.8Kg (depending on the antenna and housing)
	–GDRD84	2.7Kg (depending on the antenna and housing)
	–GDRD85	2.2Kg (depending on the antenna and housing)
	–GDRD87	8.8Kg (depending on the antenna and housing)
	–GDRD88	2.0Kg (depending on the antenna and housing)
	–GDRD89	12Kg (depending on the antenna and housing)
Supply voltage		
	Standard type	(20～28)V DC
2-Wire	Intrinsically safe/ intrinsically safe + dust version	24(1±10%)V DC
	Power consumption	max.22.5mA
	Ripples are allowed	
	－<100Hz	Uss<1V
	－(100～100K)Hz	Uss<100mV
4-Wire	Intrinsically safe/ intrinsically safe + dust version	(10.8～26.4)V DC
	Power consumption	max.12mA
4-Wire, 2-Chamber	Intrinsically safe/ +flameproof approval	24(1±10%)V DC
	Power consumption	max.1VA,1W
Cable parameters	Cable entry/plug	One M20x1.5 cable entry (cable with diameter of 5...9mm), and a M20x1.5 blind plug
	Spring collecting terminals	Used for conductor with cross section of 2.5mm^2
Output parameter	Output signal	(4-20)mA/HART/RS485/MODBUS protocol
	Resolution	0.3 μA
	Fault signal	Current output is unchanged; 20.5mA; 22mA; 3.9mA
	–2-wire load resistance	Refer to the following diagram
	Integral time	0-40s, adjustable

2-Wire load resistance figure



- Feature parameters

Unmeasurable area		Ends of antenna
Maximum measurement	-GDRD81	30m(liquid)
	-GDRD82	30m(liquid)
	-GDRD83	10m(liquid)
	-GDRD84	30m(liquid)
	-GDRD85	30m(liquid)
	-GDRD87	120m(solid)
	-GDRD88	30m(liquid)
	-GDRD89	70m(liquid)

Microwave frequency	77～81GHz
Measurement interval	About 1s (depending on the setting of parameters)
Adjust time[1)]	About 1s (depending on the setting of parameters)
Display resolution	1mm
Accuracy	See the accuracy figure
Temperature for storage and transport	(-40～55)℃
Relative humidity	<95%
Pressure	Max.4.0MPa
Vibration-proof	Mechanical shock 10m/s^2, (10-150)Hz

Operating temperature

Standard type (-40～80)℃

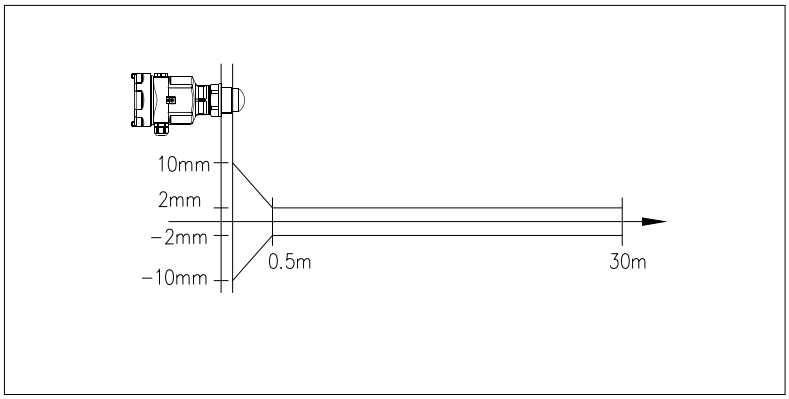
The explosion-proof types

Ambient temperature (℃)	Medium temperature (℃)	Group
-40～65	130～195	T3
	95～130	T4
	80～95	T5
	60～80	T6

1) Time required for giving the correct level after severe sudden change of level (max error of 10%).

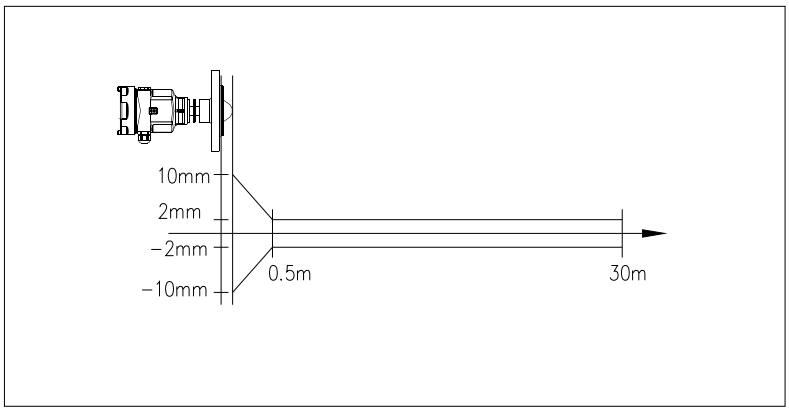
GDRD81	3dB	Transmitting angle
	-G1½A(1½NPT)	6°
	-G3A(3NPT)	3°

Accuracy Refer to the following diagram



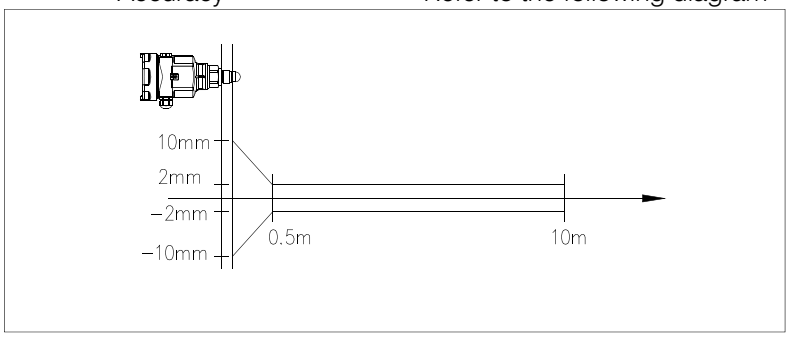
GDRD82	3dB	Transmitting angle
	-DN50	6°
	-DN80	3°

Accuracy Refer to the following diagram



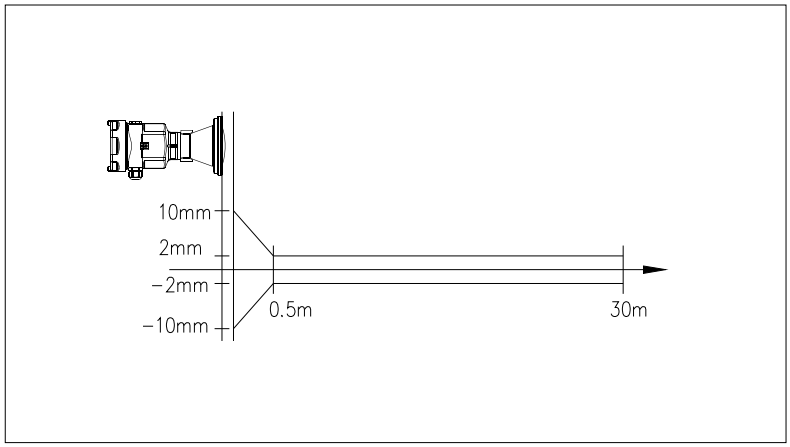
GDRD83 3dB Transmitting angle 6°

Accuracy Refer to the following diagram



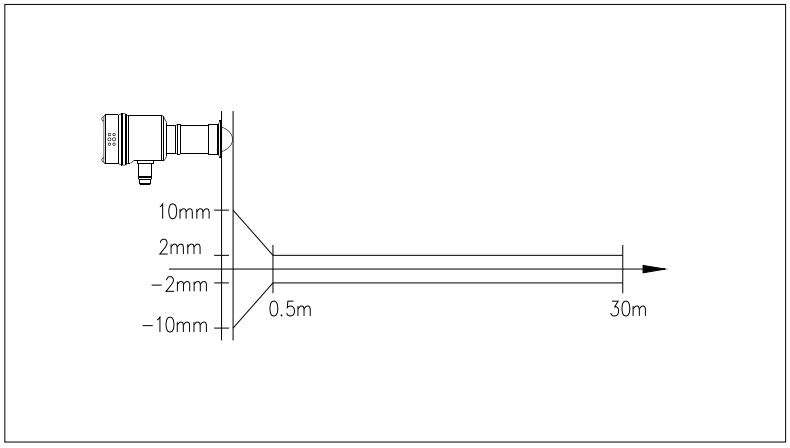
GDRD84 3dB Transmitting angle 3°

Accuracy Refer to the following diagram



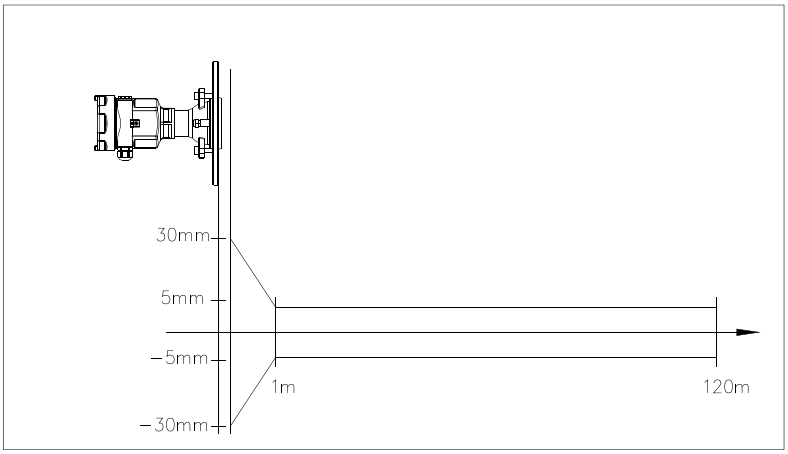
GDRD85 3dB Transmitting angle 6°

Accuracy Refer to the following diagram



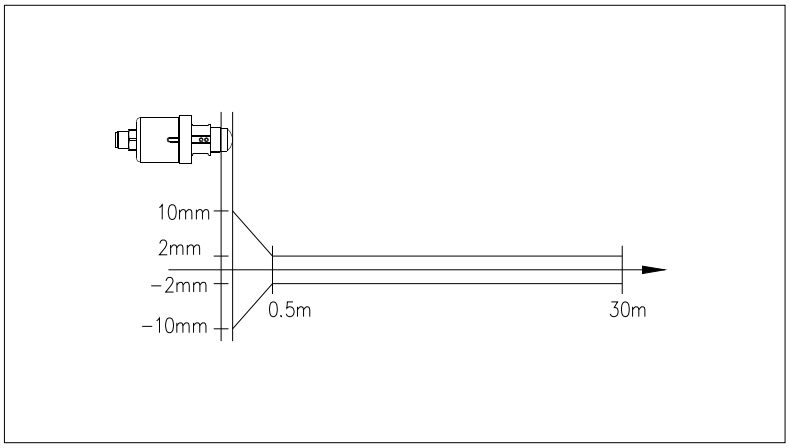
GDRD87 3dB Transmitting angle 4°

Accuracy Refer to the following diagram



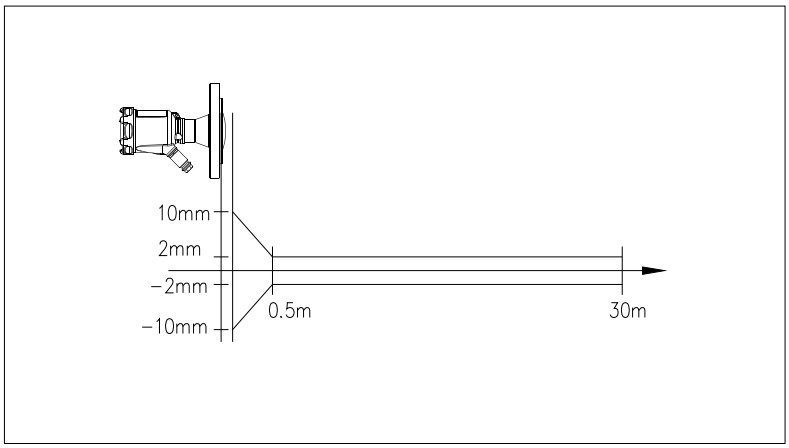
GDRD88 3dB Transmitting angle 6°

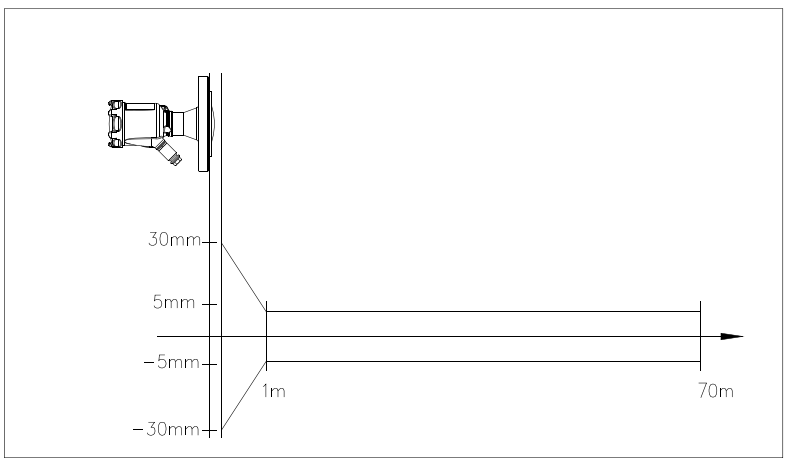
Accuracy Refer to the following diagram



GDRD89 3dB Transmitting angle 3°

Accuracy Refer to the following diagram





8. Product model naming

8.1 GDRD81 Product model naming

GDRD81- | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

1 — Approvals

P Standard (non-explosion-proof)
I Intrinsically safe (Ex ia ⅡC T6 Ga)
F Intrinsically safe + dust version (Ex ia D 20 T80℃)
G Intrinsically safe+ flameproof approval (Ex d ia[ia Ga] ⅡCT6 Gb)
※See Note 1

2 — Temperature

A (−40～110) ℃
B (−40～150) ℃

3 — Antenna Material

A PP
B FEP

4 — Thread specification

GC Thread G1½A
GD Thread 1½NPT
GE Thread G3A
GF Thread 3NPT

5 — Electronic building brick

B (4-20)mA/HART 2-Wire
C (4-20)mA/(22. 8～26. 4) VDC/HART 4-Wire(2-Chamber)
E (4-20)mA/(22. 8～26. 4) VDC/HART 2-Wire(2-Chamber)
R RS485/MODBUS Protocol
X Special customized (non-explosion-proof)
※See Note 1

6 — Housing/protection grade

B Plastic/IP66
A Aluminum/IP67
D Aluminum (2-Chamber)/IP67
G Stainless steel 316L/IP67
H Stainless steel (2-Chamber)316L/IP67
※See Note 1

7 — Incoming line of cable

M M20X1.5
N ½ NPT

8 — Display/programming

A Programmer
C Remote display
X None

Note
1.Intrinsically safe instrument (Ex ia ⅡC T6 Ga) can only use "B, R" electronic components; "A, B, G, K, L, M" housing;
Intrinsically safe + dust version instrument (Ex ia D 20 T80℃) can only use "B, R" electronic components; "A, G" housing;
Intrinsically safe + flameproof approval instrument Ex d ia[ia Ga] ⅡC T6 Gb) can only use “C, E" electronic components; "D, H" housing.
2.GDRD81 Process pressure (−0.1～0.1)MPa.

Warning:
1. "Avoid opening cover with power supply" .
2. As the nonmetallic part of the product's housing has potential electrostatic charge, it is prohibited to contact with liquid dielectric during installation and use, in order to avoid the ignition risk caused by friction and impact; please use wet cloth for cleaning.
3. The housing includes the materials of die-casting aluminum/plastic to avoid the ignition risk caused by impact or friction.

8.2 GDRD81 Product model naming

GDRD82- | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

1 — Approvals

P Standard (non-explosion-proof)
I Intrinsically safe (Ex ia ⅡC T6 Ga)
F Intrinsically safe + dust version (Ex ia D 20 T80℃)
G Intrinsically safe+ flameproof approval (Ex d ia[ia Ga] ⅡCT6 Gb)
※See Note 1

2 — Temperature

A (−40～130) ℃

3 — Antenna Diameter

A 50mm
B 80mm

4 — Flange Specification

FA Flange DN50 PN40 GB/T9119-2000 Stainless steel 316L
FB Flange Dn80 PN40 GB/T9119-2000 Stainless steel 316L
FC Flange DN100 PN40 GB/T9119-2000 Stainless steel 316L
FD Flange DN125 PN40 GB/T9119-2000 Stainless steel 316L
FE Flange DN150 PN40 GB/T9119-2000 Stainless steel 316L
X Nonstandard flange

5 — Electronic building brick

B (4-20)mA/HART 2-Wire
C (4-20)mA/(22. 8～26. 4) VDC/HART 4-Wire(2-Chamber)
E (4-20)mA/(22. 8～26. 4) VDC/HART 2-Wire(2-Chamber)
R RS485/MODBUS Protocol
X Special customized (non-explosion-proof)
※See Note 1

6 — Housing/protection grade

B Plastic/IP66
A Aluminum/IP67
D Aluminum (2-Chamber)/IP67
G Stainless steel 316L/IP67
H Stainless steel (2-Chamber)316L/IP67
※See Note 1

7 — Incoming line of cable

M M20X1.5
N ½ NPT

8 — Display/programming

A With Programmer
C With Remote display
X None

Note
1.Intrinsically safe instrument (Ex ia ⅡC T6 Ga) can only use "B, R" electronic components; "A, B, G, K, L, M" housing;
Intrinsically safe + dust version instrument (Ex ia D 20 T80℃) can only use "B, R" electronic components; "A, G" housing;
Intrinsically safe + flameproof approval instrument Ex d ia[ia Ga] ⅡC T6 Gb) can only use “C, E" electronic components; "D, H" housing.
2.GDRD82 Process pressure (−0.1～4.0)MPa.

Warning:
1. "Avoid opening cover with power supply" .
2. As the nonmetallic part of the product's housing has potential electrostatic charge, it is prohibited to contact with liquid dielectric during installation and use, in order to avoid the ignition risk caused by friction and impact; please use wet cloth for cleaning.
3. The housing includes the materials of die-casting aluminum/plastic to avoid the ignition risk caused by impact or friction.

8.3 GDRD83 Product model naming

GDRD83- | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

1 — Approvals

- P Standard (non-explosion-proof)
- I Intrinsically safe (Ex ia ⅡC T6 Ga)
- F Intrinsically safe + dust version (Ex ia D 20 T80℃)
- G Intrinsically safe+ flameproof approval (Ex d ia[ia Ga] ⅡCT6 Gb)

※See Note 1

2 — Process pressure

- A (−0.1～0.5) MPa
- B (−0.1～4.0) MPa

3 — Thread specification

- GA Thread G¾A
- GB Thread ¾NPT

4 — Electronic building brick

- B (4-20)mA/HART 2-Wire
- C (4-20)mA/(22. 8～26. 4) VDC/HART 4-Wire(2-Chamber)
- E (4-20)mA/(22. 8～26. 4) VDC/HART 2-Wire(2-Chamber)
- R RS485/MODBUS Protocol
- X Special customized (non-explosion-proof)

※See Note 1

5 — Housing/protection grade

- B Plastic/IP66
- A Aluminum/IP67
- D Aluminum (2-Chamber)/IP67
- G Stainless steel 316L/IP67
- H Stainless steel (2-Chamber)316L/IP67

※See Note 1

6 — Incoming line of cable

M	M20X1.5
N	½ NPT

7 — Display/programming

A	With Programmer
C	With Remote display
X	None

Note

1.Intrinsically safe instrument (Ex ia ⅡC T6 Ga) can only use "B, R" electronic components; "A, B, G, K, L, M" housing;

Intrinsically safe + dust version instrument (Ex ia D 20 T80℃) can only use "B, R" electronic components; "A, G" housing;

Intrinsically safe + flameproof approval instrument Ex d ia[ia Ga] ⅡC T6 Gb) can only use “C, E" electronic components; "D, H" housing.

2.GDRD83 Process Temperature (−40～110) ℃.

Warning:

1. "Avoid opening cover with power supply" .
2. As the nonmetallic part of the product's housing has potential electrostatic charge, it is prohibited to contact with liquid dielectric during installation and use, in order to avoid the ignition risk caused by friction and impact; please use wet cloth for cleaning.
3. The housing includes the materials of die-casting aluminum/plastic to avoid the ignition risk caused by impact or friction.

8.4 GDRD84 Product model naming

GDRD84- [1] [2] [3] [4] [5] [6]

[1] — Approvals

- P Standard (non-explosion-proof)
- I Intrinsically safe (Ex ia ⅡC T6 Ga)
- F Intrinsically safe + dust version (Ex ia D 20 T80℃)
- G Intrinsically safe+ flameproof approval (Ex d ia[ia Ga] ⅡCT6 Gb)

※See Note 1

[2] — Installation form

- D Swivelling Holder

[3] — Electronic building brick

- B (4-20)mA/HART 2-Wire
- C (4-20)mA/(22. 8～26. 4) VDC/HART 4-Wire(2-Chamber)
- E (4-20)mA/(22. 8～26. 4) VDC/HART 2-Wire(2-Chamber)
- R RS485/MODBUS Protocol
- X Special customized (non-explosion-proof)

※See Note 1

[4] — Housing/protection grade

- B Plastic/IP66
- A Aluminum/IP67
- D Aluminum (2-Chamber)/IP67
- G Stainless steel 316L/IP67
- H Stainless steel (2-Chamber)316L/IP67

※See Note 1

[5] — Incoming line of cable

- M M20X1.5
- N ½ NPT

[6] — Display/programming

- A With Programmer
- C With Remote display
- X None

Note

1.Intrinsically safe instrument (Ex ia ⅡC T6 Ga) can only use "B, R" electronic components; "A, B, G, K, L, M" housing;

Intrinsically safe + dust version instrument (Ex ia D 20 T80℃) can only use "B, R" electronic components; "A, G" housing;

Intrinsically safe + flameproof approval instrument Ex d ia[ia Ga] ⅡC T6 Gb) can only use “C, E" electronic components; "D, H" housing.

2.GDRD84 Process Temperature (−40～110) ℃, Process pressure (−0.1～0.1)MPa.

Warning:

1. "Avoid opening cover with power supply" .

2. As the nonmetallic part of the product's housing has potential electrostatic charge, it is prohibited to contact with liquid dielectric during installation and use, in order to avoid the ignition risk caused by friction and impact; please use wet cloth for cleaning.

3. The housing includes the materials of die-casting aluminum/plastic to avoid the ignition risk caused by impact or friction.

8.5 GDRD85 Product model naming

GDRD85- | 1 | 2 | 3 | 4 | 5 |

1 — Approvals

P Standard (non-explosion-proof)

I Intrinsically safe (Ex ia ⅡC T6 Ga)

※See Note 1

2 — Electronic building brick

B (4-20)mA/HART 2-Wire

R RS485/MODBUS Protocol

※See Note 1

3 — Housing/protection grade

K Stainless steel 316L (surface machining) /Ip67

※See Note 1

4 — Incoming line of cable

M M20X1.5

5 — Display/programming

A With Programmer

C With Remote display

X None

Note: GDRD85 is hygiene type instrument, only installed by DN50 chuck and clamp.

Note

1.Intrinsically safe instrument (Ex ia ⅡC T6 Ga) can only use "B, R" electronic components; "A, B, G, K, L, M" housing;

2.GDRD85 Process Temperature (−40～130) ℃, Process pressure (−0.1～4.0)MPa.

Warning:

1. "Avoid opening cover with power supply" .

2. As the nonmetallic part of the product's housing has potential electrostatic charge, it is prohibited to contact with liquid dielectric during installation and use, in order to avoid the ignition risk caused by friction and impact; please use wet cloth for cleaning.

3. The housing includes the materials of die-casting aluminum/plastic to avoid the ignition risk caused by impact or friction.

8.6 GDRD87 Product model naming

GDRD87- | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

1 — Approvals

P Standard (non-explosion-proof)
I Intrinsically safe (Ex ia ⅡC T6 Ga)
F Intrinsically safe + dust version (Ex ia D 20 T80℃)
G Intrinsically safe+ flameproof approval (Ex d ia[ia Ga] ⅡCT6 Gb)
※See Note 1

2 — Antenna material / Temperature

A Aluminum substrate plastic+PP (-40～110)℃
B Stainless steel 316L+PP (-40～110)℃
C Stainless steel 316L+PEEK (-40～130)℃
D Stainless steel 316L+PEEK with Heat sink (-40～195)℃

3 — Flange Specification

FC Flange DN100 PN16 GB/T9119-2000 Stainless steel 316L
FD Flange DN125 PN16 GB/T9119-2000 Stainless steel 316L
FE Flange DN150 PN16 GB/T9119-2000 Stainless steel 316L
X Nonstandard flange
※The flange thickness is all 10mm.

4 — Electronic building brick

B (4-20)mA/HART 2-Wire
C (4-20)mA/(22. 8～26. 4) VDC/HART 4-Wire(2-Chamber)
E (4-20)mA/(22. 8～26. 4) VDC/HART 2-Wire(2-Chamber)
R RS485/MODBUS Protocol
X Special customized (non-explosion-proof)
※See Note 1

5 — Housing/protection grade

B Plastic/IP66
A Aluminum/IP67
D Aluminum (2-Chamber)/IP67
G Stainless steel 316L/IP67
H Stainless steel (2-Chamber)316L/IP67
※See Note 1

6 — Incoming line of cable

M M20X1.5
N ½ NPT

7 — Display/programming

A With Programmer
C With Remote display
X None

Note
1.Intrinsically safe instrument (Ex ia ⅡC T6 Ga) can only use "B, R" electronic components; "A, B, G, K, L, M" housing;
Intrinsically safe + dust version instrument (Ex ia D 20 T80℃) can only use "B, R" electronic components; "A, G" housing;
Intrinsically safe + flameproof approval instrument Ex d ia[ia Ga] ⅡC T6 Gb) can only use “C, E" electronic components; "D, H" housing.
2.GDRD87 Process temperature is ordinary.

Warning:
1. "Avoid opening cover with power supply" .
2. As the nonmetallic part of the product's housing has potential electrostatic charge, it is prohibited to contact with liquid dielectric during installation and use, in order to avoid the ignition risk caused by friction and impact; please use wet cloth for cleaning.
3. The housing includes the materials of die-casting aluminum/plastic to avoid the ignition risk caused by impact or friction.

8.7 GDRD88 Product model naming

GDRD88- 1 2 3 4

1 — Approvals

P Standard (non-explosion-proof)

I Intrinsically safe (Ex ia ⅡC T6 Ga)

※See Note 1

2 — Electronic building brick

B (4-20)mA/HART 2-Wire

R RS485/MODBUS Protocol

※See Note 1

3 — Housing/protection grade

L Plastic/IP68

※See Note 1

5 — Display/programming

A No display

B Remote display

X None

Note: GDRD88 is full protection instrument and can be installed in the forms of hanger, thread 1NPT and thread 1½NPT.

Note

1.Intrinsically safe instrument (Ex ia ⅡC T6 Ga) can only use "B, R" electronic components; "A, B, G, K, L, M" housing;

2.GDRD88 Process Temperature (−40～110) ℃, Process pressure (−0.1～0.1)MPa.

Warning:

1. "Avoid opening cover with power supply" .

2. As the nonmetallic part of the product's housing has potential electrostatic charge, it is prohibited to contact with liquid dielectric during installation and use, in order to avoid the ignition risk caused by friction and impact; please use wet cloth for cleaning.

3. The housing includes the materials of die-casting aluminum/plastic to avoid the ignition risk caused by impact or friction.

8.8 GDRD89 Product model naming

GDRD89- | 1 | 2 | 3 | 4 | 5 | 6 |

1 — Approvals

P Standard (non-explosion-proof)

I Intrinsically safe (Ex ia ⅡC T6 Ga)

※See Note 1

2 — Range

A 30m

B 70m

3 — Electronic building brick

B (4-20)mA/HART 2-Wire

R RS485/MODBUS Protocol

※See Note 1

4 — Housing/protection grade

M Stainless steel 316L

※See Note 1

5 — Incoming line of cable

M M20X1.5

6 — Display/programming

A With display

X None

Note: GDRD89 is marine instrument and only installed by DN80 and PN40 flanges in GB/T9119-2000.

Note

1.Intrinsically safe instrument (Ex ia ⅡC T6 Ga) can only use "B, R" electronic components; "A, B, G, K, L, M" housing;

2.GDRD88 Process Temperature (−40～110) ℃, Process pressure (−0.1～0.1)MPa.

Warning:

1. "Avoid opening cover with power supply" .

2. As the nonmetallic part of the product's housing has potential electrostatic charge, it is prohibited to contact with liquid dielectric during installation and use, in order to avoid the ignition risk caused by friction and impact; please use wet cloth for cleaning.

3. The housing includes the materials of die-casting aluminum/plastic to avoid the ignition risk caused by impact or friction.

9 Application Questionnaire

Approvals

☐ Standard (non-explosion-proof)
☐ Intrinsically safe + dust version (Ex ia D 20 T80℃)
☐ intrinsically safe (Exia IIC T6 Ga)
☐ Intrinsically safe+ flameproof approval(Exdia [ia Ga] IIC T6 Gb)

Measured Medium

Name _____
Condition ☐ Liquid (☐ Volatile gas ☐Crystal ☐ Viscous) ☐ Solid（Form ☐Mass ☐Particle ☐Dust)
Temperature: Min._____℃ Norm._____℃ Max._____℃
Surface ☐ Flat ☐Turbulent ☐ Agitated Vorte
Dielectric Constant ☐ εr<3 ☐ εr>3

Atmosphere

Atmosphere ☐Form ☐Foam ☐ Dust ☐ Deposit ☐ Vapour
Atmosphere Pressure Min. _____ Norm. _____ Max. _____

Vessel

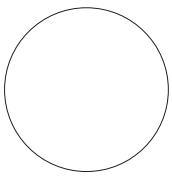
Shape of Top ☐ Flat ☐ Arch ☐ Conical ☐ Horizontal
Height _____ Diameter _____
Critical Information
Nozzle Length: _____ Nozzle Diameter: _____ Measurement Range: _____

Process Connection

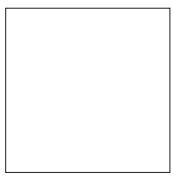
Thread（☐G¾A ☐¾NPT ☐ G1½A ☐ 1½NPT ☐ G3A ☐ 3NPT）
☐ Flange（DN= ） ☐ Swivelling Holder ☐Chuck and Clamp

Installation

Mode: ☐ Top ☐ Side
Filling Stream inlet position and installation position （Please specify in the diagram below）



Circular Vessel



Square Vessel

Power Supply

☐2-wire 24V DC ☐4-wire 24V DC

Communication

☐(4～20) mA/HART ☐RS485/MODBUS protocol

Display

☐ With Programmer
☐ With Display ☐None

Customer Information

Contact: _____
Company: _____
Address: _____
P. C.: _____ Tel: _____
Email: _____ Fax: _____

Please give brief explanation on the application of instrument:

Date: _____

10. Others

10.1 After-sale service information

Tel:010-89759332/89753941

E-mail: Service@godacn.com

Address: 2-4, Workshop No.2, Yard No. 10, Hongfu Pioneer Park, Changping District, Beijing

Federal Communications Commission (FCC) Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generate, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

RF exposure warning

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This equipment complies must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter.

Beijing GODA Instruments Co., Ltd.

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