



VRPWRD80 Series Intelligent Radar Level Transmitters

(Working Frequency 80GHz)



DANDONG VIRTUE RIVER TECHNOLOGY CO., LTD

<http://www.v-river.com>

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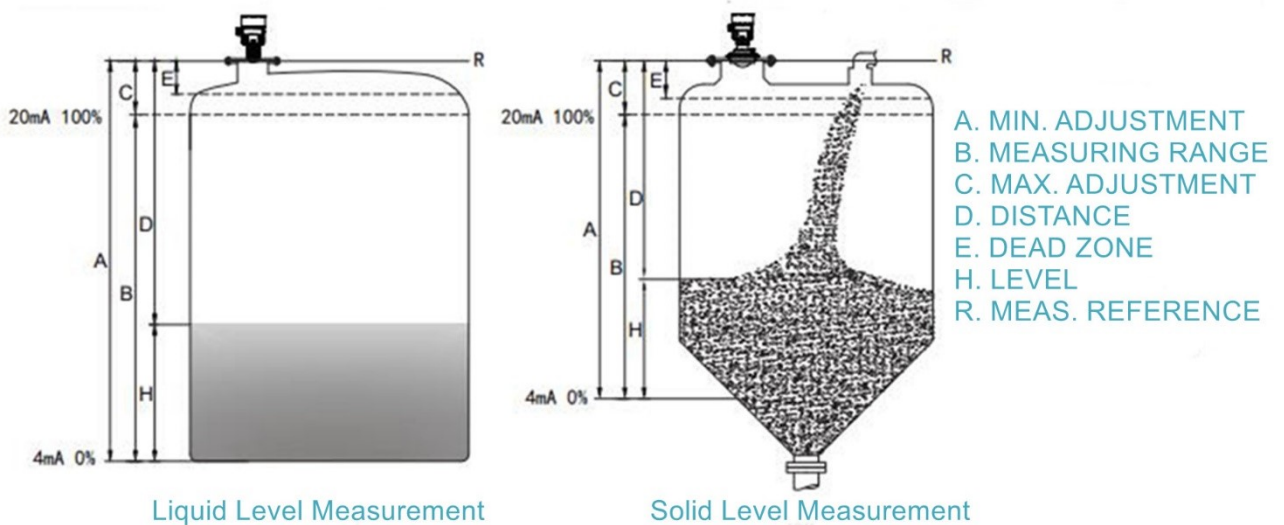
1. Product Overview

1.1. Brief Introduction

VRPWRD80 series radar level transmitters are intelligent non-contact level measuring instruments with their working frequency of 80GHz, which output 4 - 20 mA analog signals. Their maximum measuring range is 120 meters. The antenna has been further optimized, and the new fast microprocessor can perform higher-speed signal analysis and processing, so that the instrument can be used for level measurement of other very complex conditions, such as different kinds of process storage tanks, reactors (reaction kettle) and solid silos, etc.

1.2. Working Principle

The radar level meter transmits a continuous radar wave signal from its antenna. This signal is a frequency modulated continuous wave, referred to as FMCW. There is a frequency difference between the continuous wave emitted from the radar level transmitter's antenna and the echo returned from the top surface of a measured medium. The difference is proportional to the distance between the reference plane of the antenna and the top surface of the medium. After the electronic components receive the echoes, the signals of the echoes undergo the special processing such as Fourier transform (FT), the unique high-precision algorithms are used during the processing, so that the instrument can accurately measure the level of the medium.



Note: When using a radar level transmitter, make sure that the highest level cannot enter the dead zone marked with E in this schematic diagram

Figure 1

1.3. Features:


The working frequency of VRPWRD80 series radar level transmitters is 80GHz. Their features are follows:

- ◆ Non-contact measurement, no wear, no contamination;
- ◆ The antenna size is small, and easy to be installed;
- ◆ Shorter wavelength, better reflection on inclined solid surfaces;
- ◆ The upper dead zone is smaller, and they are more suitable even for the level measurement in small storage tanks;

- ◆ The beam angle is small and the energy is concentrated, which not only enhances the echo capability, but also helps to avoid interference from a possible obstacle;
- ◆ Almost unaffected by corrosive vapors and foam;
- ◆ Almost unaffected by changes of water vapor, temperature, and pressure in the atmosphere;
- ◆ The instrument in severe dust environment can also accurately read the real echoes from the actual level;
- ◆ Having high signal-to-noise ratio, can keep better performance even under fluctuating conditions;
- ◆ 80GHz frequency radar level transmitter is the best choice for measuring solid level and low dielectric constant liquid level. Be suitable for the level measurements of those measured mediums which dielectric constants are respectively ≥ 1.8 .

2. Product Introduction

 <p>VRPWRD81</p>	<p>Features: Anti-corrosion integrated lens antenna, small upper dead zone, high precision, and easier installation;</p> <p>Applications: Level measurement of various liquids in different kinds of tanks or containers in chemical, metallurgical, food processing, waste water and other industries. (For example: hydrochloric acid, nitric acid, sulfuric acid, lye, etc.).</p> <p>Measuring range: 10m/20m/35m</p> <p>Accuracy: $\pm 1\text{mm}$</p> <p>Process connection: thread, flange</p> <p>Process temperature: $-40 - +150^{\circ}\text{C}$</p> <p>Process pressure: $-0.1 - +4.0\text{MPa}$</p> <p>Operating frequency: 80GHz</p> <p>Signal output: 4 - 20mA/HART protocol (24 V DC), two-wire/ four-wires 4 - 20mA/HART protocol (220 V AC, four wires) RS485/MODBUS (6 - 30 V DC)</p> <p>BlueTeeth setting: Optional</p> <p>Explosion-proof grade: Ex ia IIC T6 Ga; Ex d IIC T6 Gb</p> <p>Enclosure protection grade: IP68 (aluminum housing), IP67 (plastic housing)</p>
 <p>VRPWRD82</p>	<p>Features: composite flange type anti-corrosion lens antenna, small beam angle, strong focusing ability, high precision.</p> <p>Applications: Level measurement of various liquids in different kinds of tanks or containers in chemical, metallurgical, food processing, waste water and other industries. (For example: hydrochloric acid, nitric acid, sulfuric acid, lye, etc.).</p> <p>Measuring range: 10m/20m/35m</p> <p>Accuracy: $\pm 1\text{mm}$</p> <p>Process connection: Composite Flange</p> <p>Process temperature: $-40 - +200^{\circ}\text{C}$</p> <p>Process pressure: $-0.1 - +4.0\text{MPa}$</p> <p>Operating frequency: 80GHz</p> <p>Signal output: 4 - 20mA/HART protocol (24 V DC), two-wire/ four-wires 4 - 20mA/HART protocol (220 V AC, four wires) RS485/MODBUS (6 - 30 V DC)</p>

	<p>BlueTeeth setting: Optional</p> <p>Explosion-proof grade: Ex ia IIC T6 Ga; Ex d IIC T6 Gb</p> <p>Enclosure protection grade: IP68 (aluminum housing), IP67 (plastic housing)</p>
 <p>VRPWRD83</p>	<p>Features: Lens antenna with air purging, equipped with a flange with a universal joint, small beam angle, high sensitivity, the function of air purging is optional on request.</p> <p>Application: Solid level measurement of different storage tanks or containers in cement, steel, electric power, coal, building materials and other industries (for example: powder, rocks, and gravels).</p> <p>Measuring range: 35m/85m/120m</p> <p>Accuracy: $\pm 1\text{mm}$</p> <p>Process connection: thread, flange with a universal joint</p> <p>Process temperature: $-40 - +250^{\circ}\text{C}$</p> <p>Process pressure: atmospheric</p> <p>Operating frequency: 80GHz</p> <p>Signal output: 4 - 20mA/HART protocol (24 V DC), two-wire/ four-wires 4 - 20mA/HART protocol (220 V AC, four wires) RS485/MODBUS (6 - 30 V DC)</p> <p>BlueTeeth setting: Optional</p> <p>Explosion-proof grade: Ex ia IIC T6 Ga; Ex d IIC T6 Gb</p> <p>Enclosure protection grade: IP68 (aluminum housing), IP67 (plastic housing)</p>

3. Installation

When installing a radar level transmitter, please pay attention to the following items to ensure that the instrument can be installed correctly.

A. Please reserve enough space for installation.

B. Please avoid a place with strong vibration.

3.1. Mounting position

- ◆ The installation position of the instrument should be selected as far as possible at 1/6 or 1/4 of the diameter of the storage tank.
- ◆ If the diameter of the storage tank is small, the minimum installation distance is $\geq 200\text{mm}$.



Figure 2

- ◆ When the container is a conical bottom, flat-top tank, the instrument should be installed in the middle of the tank top so as to measure to the medium level close to the tank bottom. Please refer to figure 3 at right.
- ◆ When there is a stirring mixer in the tank which paddles interfere with the radar level measurement, if these stirring paddles cannot be avoided, it is necessary to use the function of the false echo storage of the instrument to eliminate the interference signals from the false wave. Please refer to the figure 4 below.

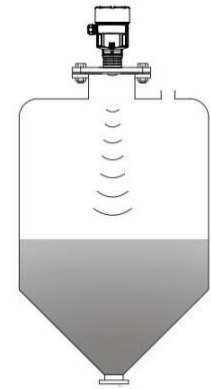


Figure 3

3.2. Typical Wrong Installation

- ◆ The instrument cannot be installed above the feed inlet. And please note that sunshade and rainproof measures should be taken to it when it is installed outdoor. Please refer to the figure 5 below at left.
- ◆ The meter cannot be installed in the middle of the curved tank top. If so, the instrument's operation will be affected by the multiple echoes, because the curved tank roof can concentrate these multiple echoes, and enhance them which will also be reflected to the instrument and become false signals. Their amplitudes may be stronger than the true echo signals' amplitude. Please refer to the figure 6 below at right.

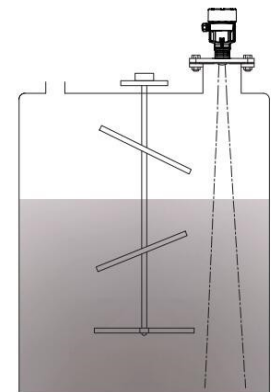


Figure 4

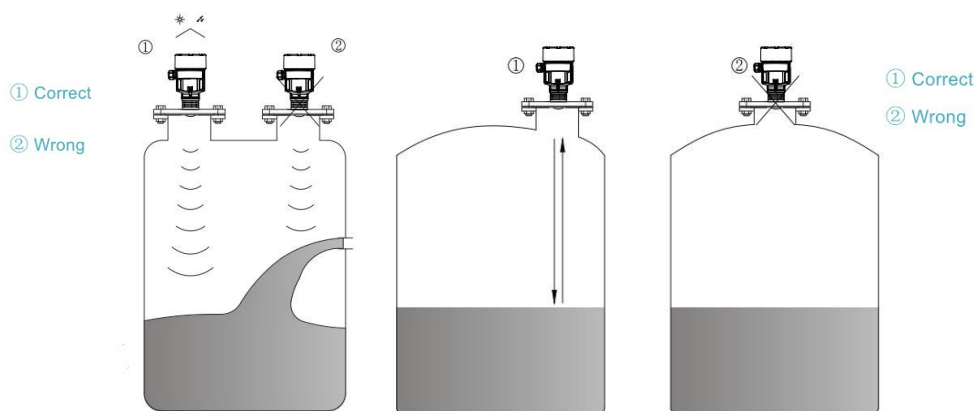
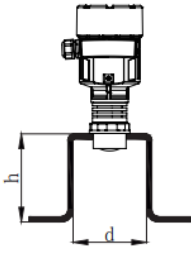
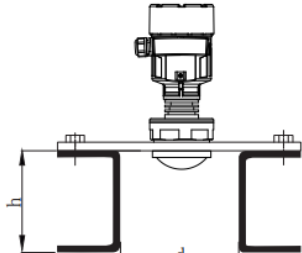


Figure 5

Figure 6

3.3. Mounting in a Nozzle

- ◆ It is strongly recommended that the height of a short pipe (mounting nozzle) for a radar level transmitter's on-site installation in a tank or a container is less than or equal to 150mm, which has been proven by rich practices being a very reasonable installation method.
- ◆ If the length of the mounting nozzle is longer than the recommended value, please refer to Figure 7 below. For the mounting nozzles with the longest lengths, the pipe sizes should be smaller than the size shown in Figure 7 corresponding to the lengths, and the end surface must be smooth, and there should be no any protrusions such as burrs. When it is necessary, use the "false echo storage" function to eliminate the reflected signals created at the end surface of the mounting nozzle to obtain better measurement results.

Φ45mm lens antenna		Φ75mm lens antenna	
 <p>Figure 7 - 1</p>		 <p>Figure 7 - 2</p>	
Diameter of the mounting nozzle d (mm)	Length of the mounting nozzle h (mm)	Diameter of the mounting nozzle d (mm)	Length of the mounting nozzle h (mm)
50 (2")	≤200	80 (3")	≤400
80 (3")	≤300	100 (4")	≤500
100 (4")	≤400		
150 (6")	≤500	150 (6")	≤600

3.4. Reference Datum Plane

The figure 7-3 below illustrates the positions of the reference datum plane to different propagators.

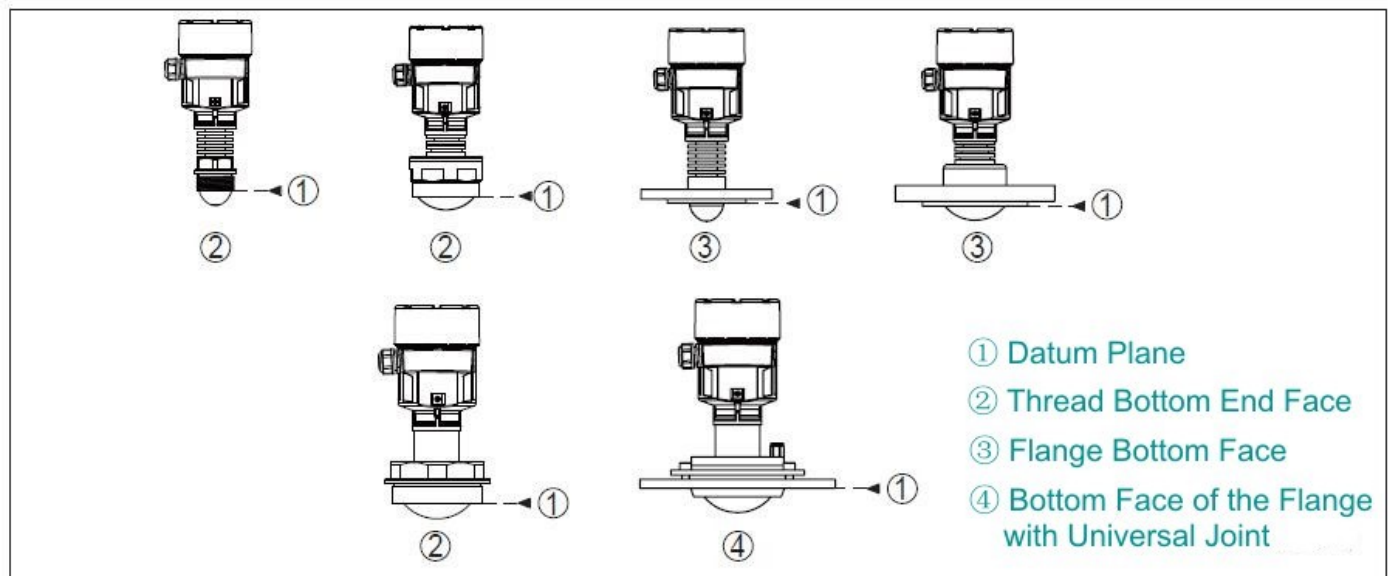


Figure 7-3

3.5. Emission (Beam) Bngle

The emission (beam) angle of the radar level transmitter depends on the antenna size.

The measurement conditions are ideal if the emitted signals can reach the top surface of the measured medium perpendicularly without any obstacle within the zone of the beam angle (emission zone) and they can be reflected.

VRPWRD81

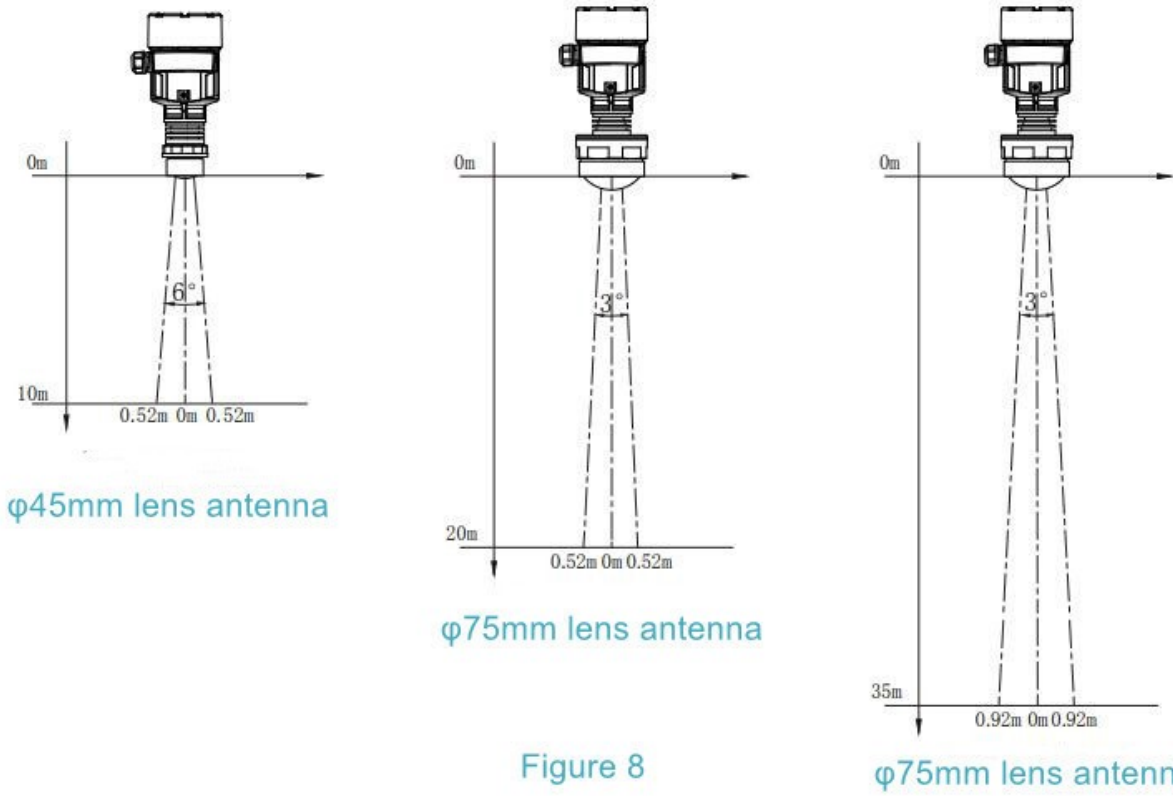


Figure 8

VRPWRD82

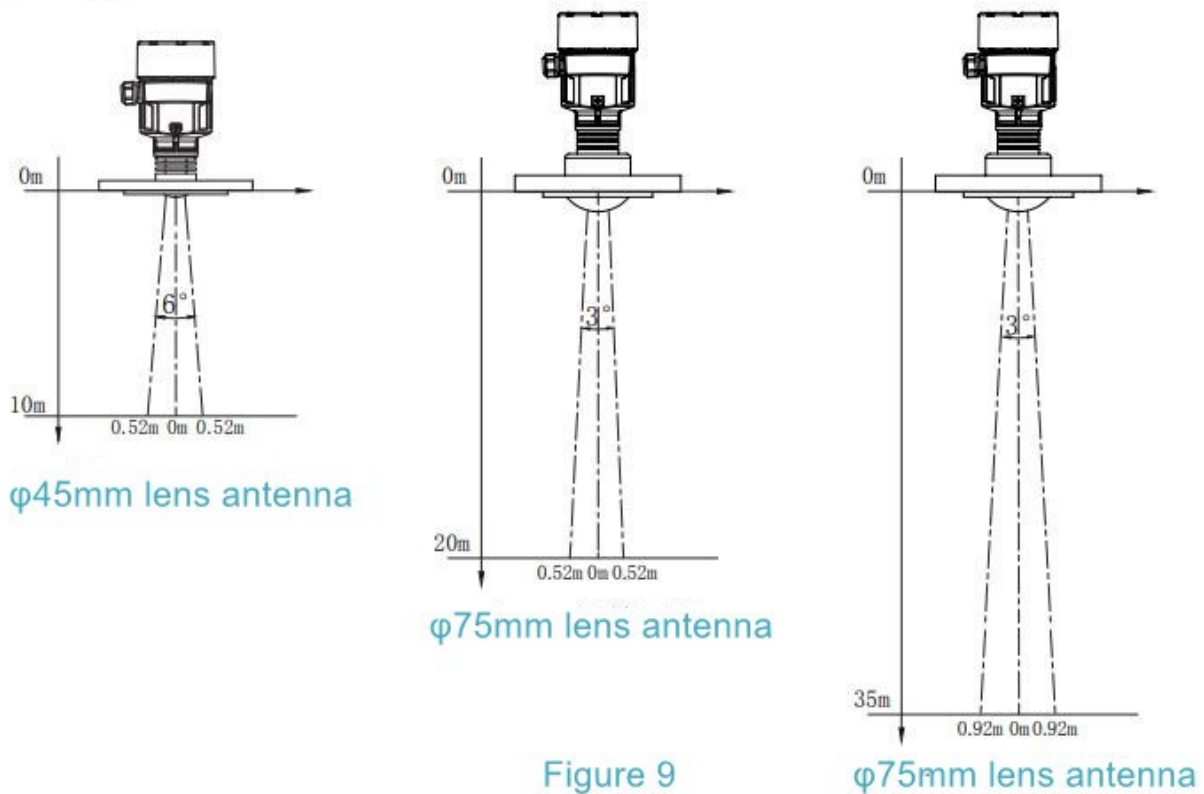
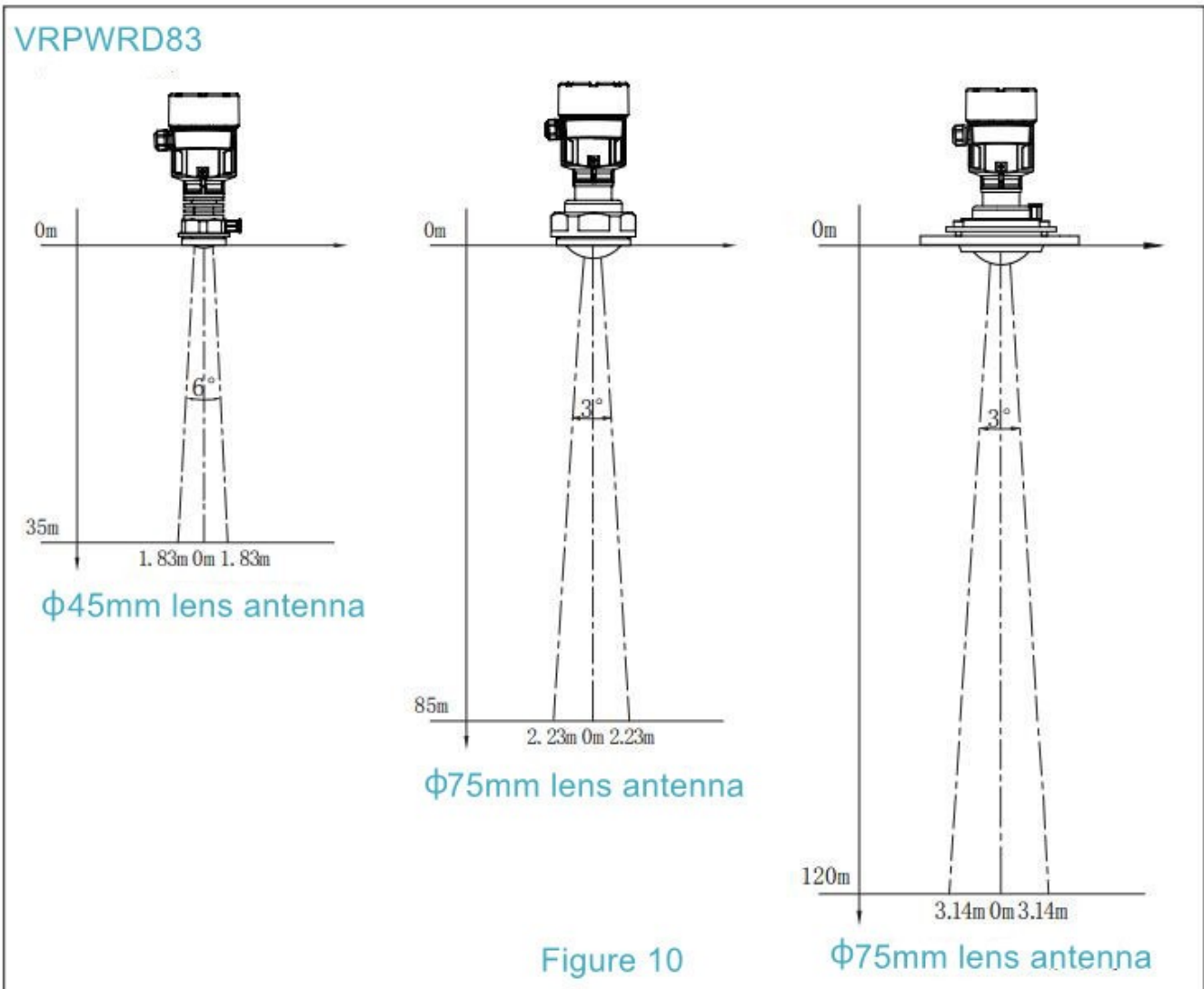


Figure 9



4. Electrical Wiring

4.1. Voltage of Power Supply

For radar level transmitters with 4 - 20mA/HART, two-wire, power supply 24V DC

The power supply and the output current signals share a two-core shielded cable. For the intrinsically safe type, a safety barrier must be added between the power supply and the instrument.

For radar level transmitters with 4 - 20mA/HART, four-wire, power supply 24V DC.

The power supply and current signals are separated, use two two-core shielded cables or one four-core shielded cable.

4.2. Cable Size

Cable outer diameter: 6mm - 9mm (the cable entry to the housing is M20×1.5);

3.5mm - 8.7mm (the cable entry to the housing is ½" NPT)

Wiring generally uses shielded cables.

4 - 20mA/HART, two-wire power supply cable can use two-core cable;

4 - 20mA/HART, four-wire power supply cable can use four-core cable

4.3. Cable Shielding and Grounding

Ideally, the shielded wire should be grounded at both ends. However, please be noted that there will be ground compensation current passing through.

When both ends are grounded, a capacitor with ground potential can be connected to one of the grounded ends (for example, in the switch cabinet). Such as 1 μF ; 1500V. Use low-value resistance as low as possible to be grounded. (Note: when the meter is used in an explosion-proof area, due to the potential output, it is absolute not to have both ends to be grounded.)

4.4. Wiring Methods

4.4.1. Wiring for Intrinsically Safe Type Single Chamber Instrument. 24V DC Power Supply, 4 – 20mA Output

Wiring for two-wire single chamber instrument

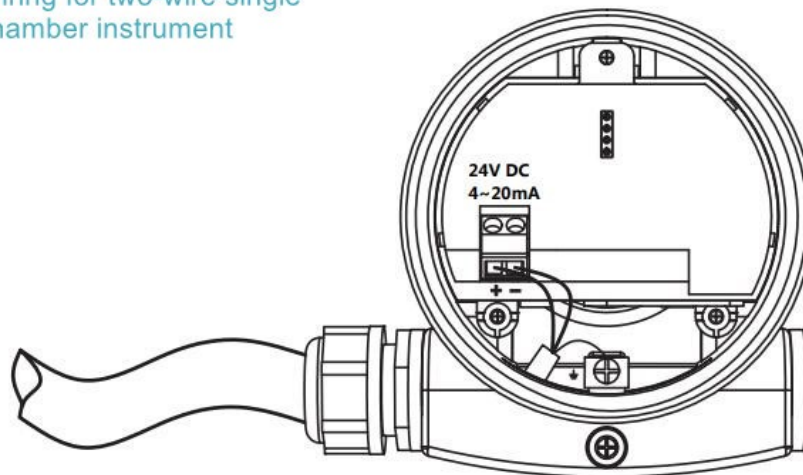


Figure 11

Wiring for explosion-proof instrument:

The explosion-proof type of this family products is intrinsically safe. The explosion-proof mark is “Ex ia IIC T6 Ga”, these products are suitable for continuous level measurement of flammable medium which explosion-proof category is for those below Ex ia IIC T6 Ga.

The product must be powered by a safety barrier. The safety barrier is the related equipment of this product, and the explosion-proof type is intrinsically safe. Explosion-proof mark is “[Exia Ga] IIC”, the power supply voltage 24V DC, the short-circuit current is 100mA, the working current is 4 - 20 mA.

All cables should be shielded, the maximum length from the instrument to the safety barrier is 500m. $U_i=30\text{VDC}$, $I_i=100\text{mA}$, $P_i=0.75\text{W}$, $C_i=0\mu\text{F}$, $L_i=0\text{mH}$. The radar level transmitter must be grounded when being installed. Other associated equipment that has not been tested for explosion protection shall not be used.

The distribution parameters of the connecting cable between the safety barrier and the radar level transmitter should meet:

$$U_o \leq U_i \quad I_o \leq I_i \quad P_o \leq P_i \quad C_o \geq C_c + C_i \quad L_o \geq L_c + L_i$$

Note: U_o : the maximum output voltage of the safety barrier

I_o : the maximum output current of the safety barrier

C_o : Maximum external capacitance of safety barrier

L_o : Maximum external inductance of safety barrier

C_c : The maximum allowable distributed capacitance of the connecting cable

L_c : The maximum allowable distributed inductance of the connecting cable

C_i : The maximum internal capacitance of the radar level transmitter

L_i : The maximum internal inductance of the radar level transmitter

Wiring diagram of the radar with intrinsically safe explosion-proof is shown as follows:

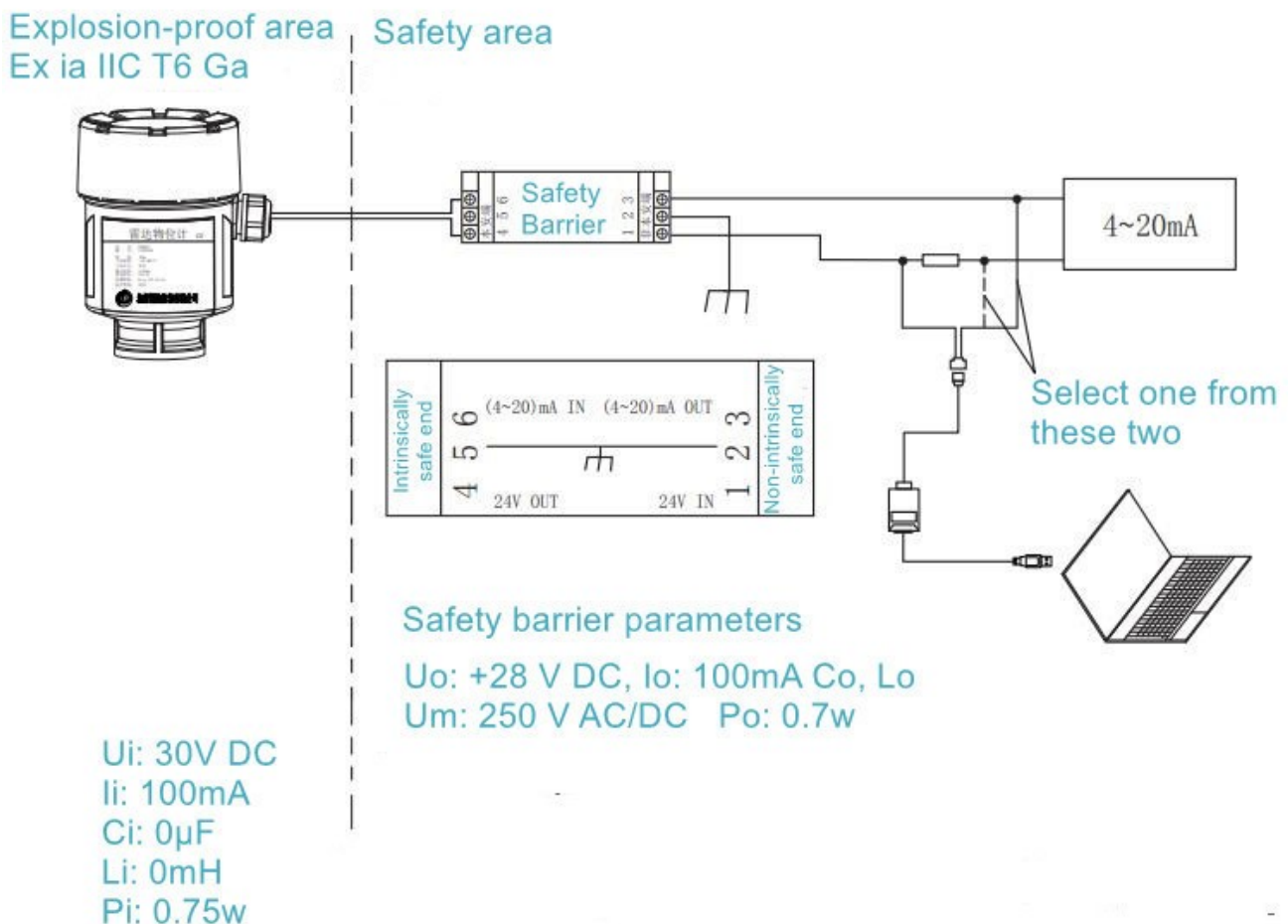


Figure 12

Precautions on the explosion-proof:

It is not allowed to replace any component in the instrument or its structure, so as not to affect the explosion-proof performance

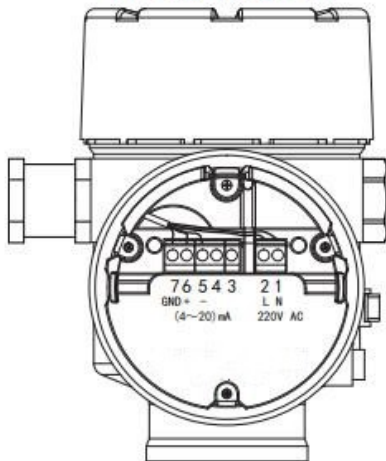
When this product is used in zone "0", the power transformer supplying power to the safety barrier must comply with the requirements of item 8.1 in Standard GB3836.4-2010 or the requirements of other equivalent standards.

The installation and wiring of the safety barrier shall be carried out in accordance with its instruction manual, and the safety barrier shall obtain an explosion-proof certificate.

When this product is used in zone 0, the safety measures should be taken to prevent any ignition

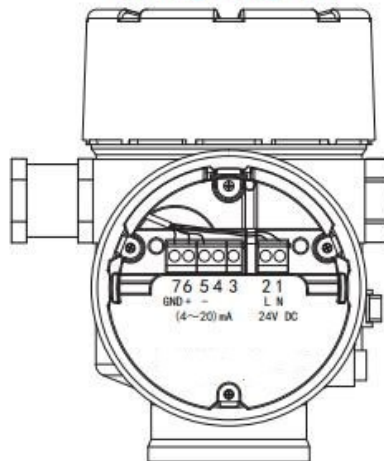
hazard due to shock or friction!

220V four wires wiring diagram



Note: The terminals 5 & 6 should be short-connected when the output is not 4 - 20mA

24 V four wires wiring diagram



Note: The terminals 5 & 6 should be short-connected when the output is not 4 - 20mA

24 V two wires wiring diagram

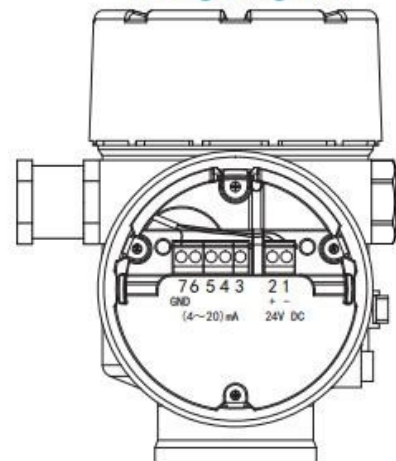


Figure 13

4.4.2. Wiring Method for Double Chamber Housing Instrument with Flame-proof

When the radar level transmitter is a flameproof explosionproof instrument. The explosion proof sign is “Ex d IICT6 Gb”. It means that the instrument can be used for the level measurement of the explosive medium which is under the explosion proof grade of “Ex d IICT6 Gb”.

Wiring diagram for flameproof double chambers two-wire instrument

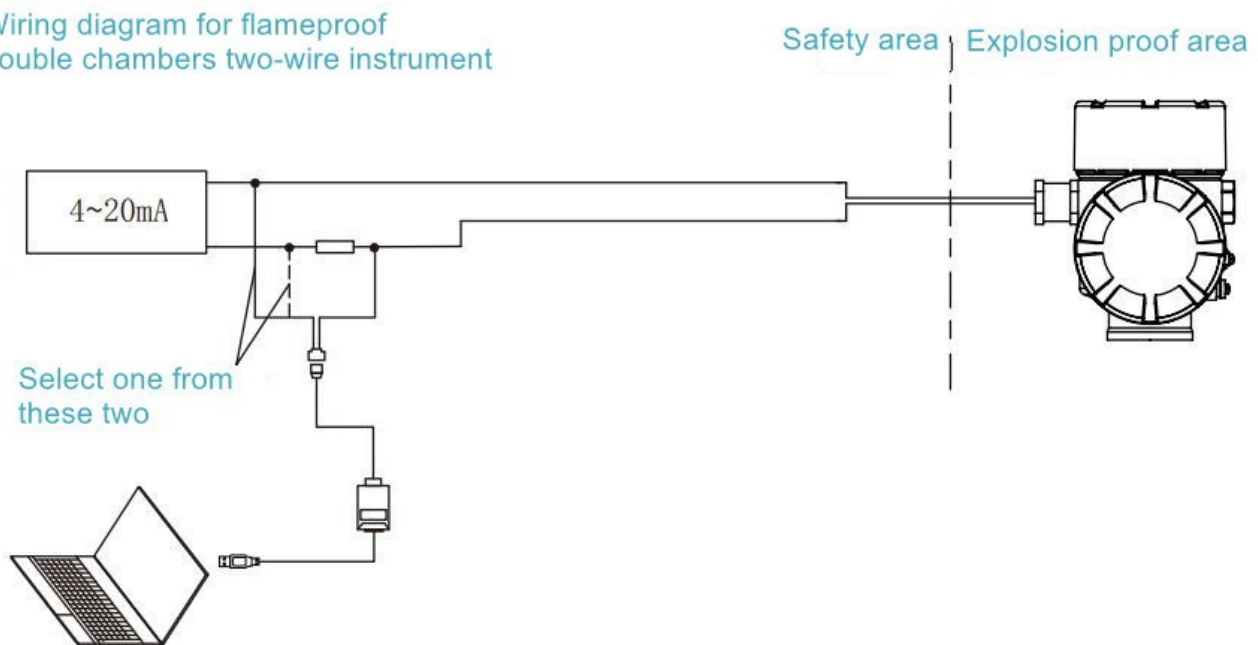


Figure 14

Wiring diagram for flameproof double chambers four-wire instrument

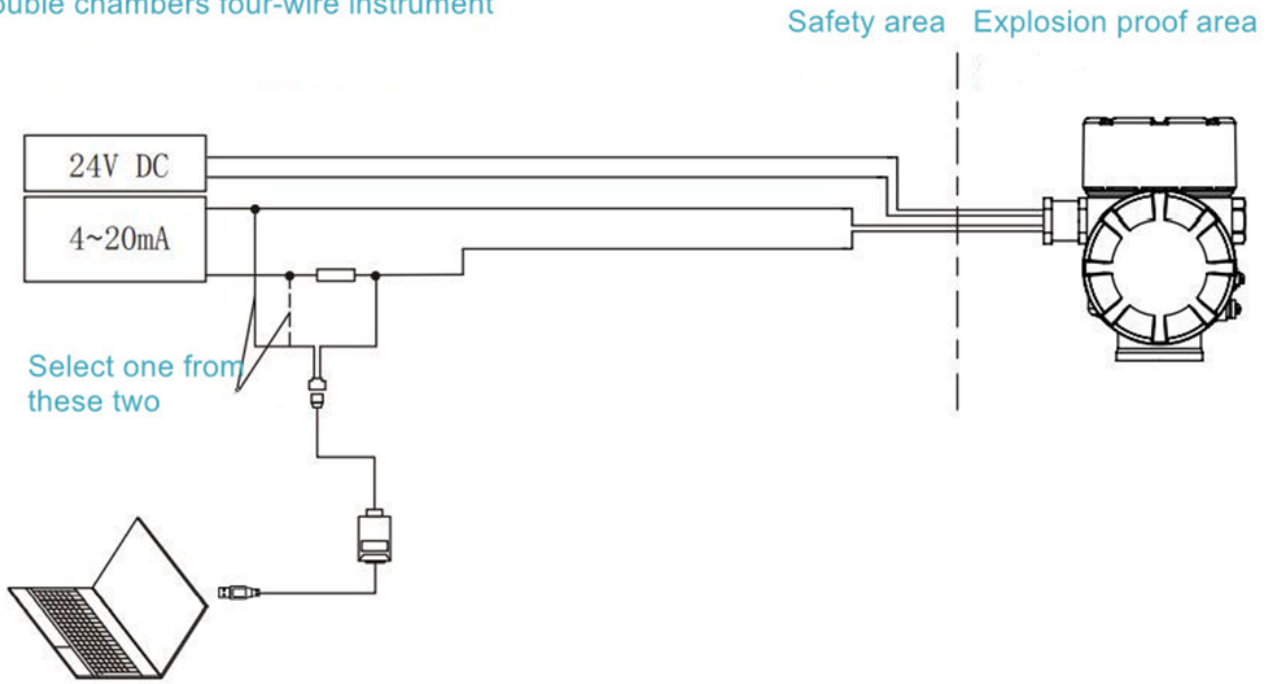
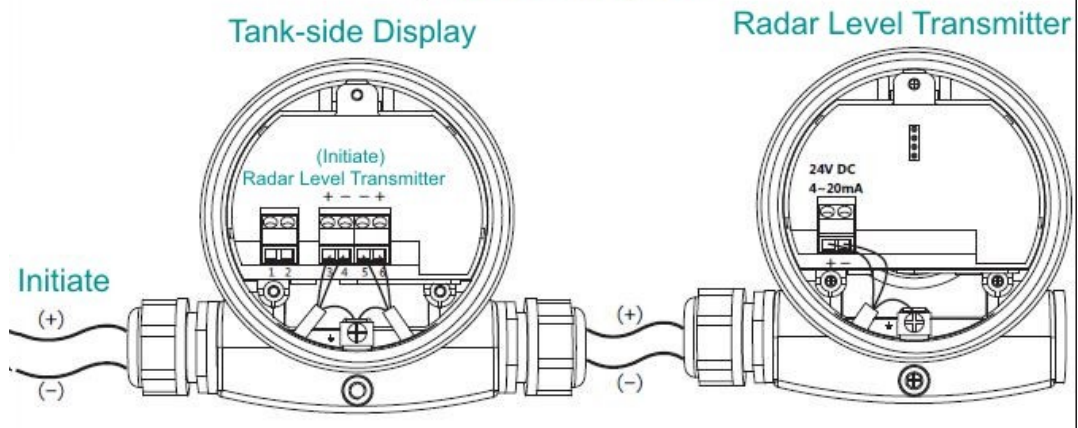


Figure 15

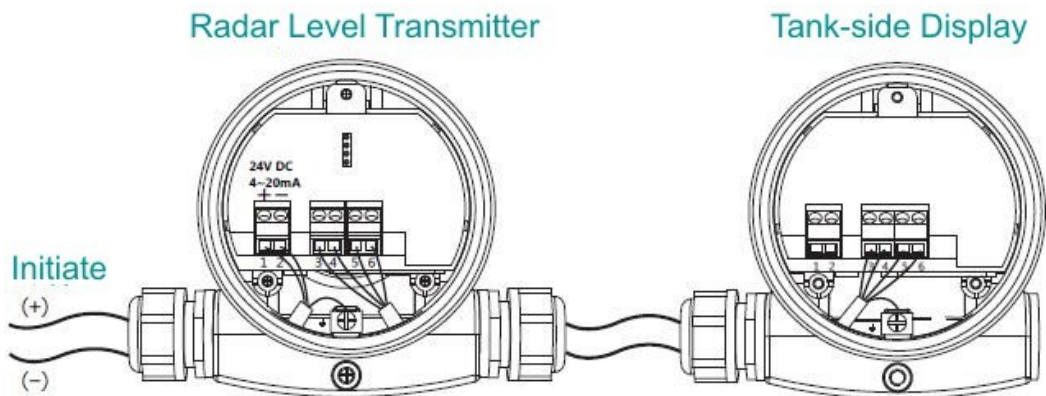
4.4.3. Wiring Mode of the Tank-side Display

4.4.3.1. Electric Current Wiring Diagram

Additional Figure 1



4.4.3.2. I²C Wiring Diagram



Additional Figure 2

4.5. Safety Guidance

All electrical connection work must be carried out under the condition of power failure, please follow the instructions in the instrument manual!

- ◆ Follow local electrical installation regulations.
- ◆ Follow local health and safety regulations for personnel. All work on the electrical components of the meter must be done by properly trained professionals.
- ◆ Please check the meter's nameplate to ensure that the supplied product specifications meet your requirements. Please make sure that the power supply voltage is consistent with the requirements on the instrument nameplate.

4.6. Protection Grade

VRPWRD80 series radar level transmitters fully meet the requirements of protection grade IP67, please ensure the waterproofness of the cable gland. As shown in figure 16 on the right:

How to make sure your installation meets IP67 requirements:

- ◆ Make sure the sealing head is not damaged
- ◆ Make sure the cable is not damaged
- ◆ Make sure that the cable used is compatible with the electrical connection code. Before entering the electrical connection, bend the cable downwards to ensure that water cannot flow along the cable into the housing at any time, see the place marked with “①”
- ◆ Please tighten the cable gland, see the place marked with “②”
- ◆ Please tighten the other unused electrical connection with a blind plug, see the place marked with “③” .

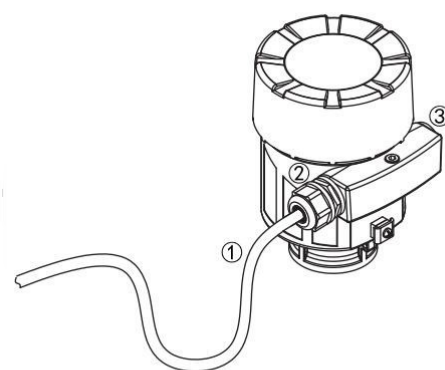


Figure 16

5. Technical Specifications

General Data

Model		VRPWRD81	VRPWRD82	VRPWRD83
Process connection		Thread G11/2"A	Composite flange	Thread G2"A
		Thread G3"A		Thread G31/2" A
		Thread G31/2"A		Flange with universal joint
Weight (Depends on the process connection)	Φ45mm lens antenna	1.5Kg	4Kg	2Kg
	Φ75mm lens antenna	2.5Kg	5.5Kg	4Kg
Antenna material		PTFE	PTFE	PTFE

Process temperature	-40°C - +150°C	-40°C - +200°C	-40°C - +250°C
Process pressure (Depends on process connection/material/antenna size)	-0.1 - +2.0 MPa (S.S steel thread G3/4")	-0.1 – +4.0MPa φ45mm lens antenna	ATM
	-0.1 - +4.0 MPa (S.S steel thread G11/2")		
	-0.1 - +2.0 MPa (S.S steel thread G31/2")	-0.1 – +2.0MPa φ75mm lens antenna	
	-0.1 - +0.3 MPa (Plastic thread G11/2" or G3" A)		

Power supply	Two-wire	Standard	16 – 26 V DC	
		Intrinsically safe	21.6 – 26.4 V DC	
		Consumption	Max. 0.54W	
		Ripple allowed	< 100Hz	U _{ss} < 1V
	100 – 100k Hz		U _{ss} < 10mV	
	Four-wire	Standard	24 (1±10%) V DC	220 (1±10%) V AC
		Consumption	Max. 0.54W	Max.2W

Cable and cable entry	Cable entry	One cable entry, M20×1.5 (Cable outer diameter is 5 -9 mm)	
	Plug	One bland plug, M20×1.5	
Output	Output signal	4 – 20mA/HART	RS485/MODBUS
	Resolution	1.6μA	
	Fault alarm	20.5mA; 22mA; 3.9mA	
	Dumping time	0 – 100s adjustable	
Enclosure	Housing material	Aluminum/ Plastic (ABS)	
	Housing seals	Viton	
	Top window	PC	
	Grounding terminal	Stainless steel	

Characteristic parameters

Model	VRPWRD81			VRPWRD82			VRPWRD83		
Measuring range (m)	10	20	30	10	20	35	35	85	120
Accuracy	± 1mm			± 1mm			± 1mm		
Upper dead zone	φ45mm lens antenna 0.05m			0.05m			0.10m		

	φ75mm lens antenna	0.1m	0.1m	0.15m	0.2m
General data	Microwave frequency	77 – 81GHz			
	Communication	HART or MODBUS			
	Measuring interval	About 1s (Depends on setting)			
	Adjusting time	About 1s (Depends on setting)			
	Anti-vibration	Mechanical vibration 10m/s ² , 10 – 150 Hz			
	Repeatability	±1mm			
	Resolution	1mm			
	Relative humidity	< 95%			

6. Calibration

6.1. Calibration with the Programmer

6.1.1. The Function of Each Button

Refer to figure 17 at right. The instrument can be set through the 4 buttons on the programming module. The language of the setting menu is selectable. After setting, the programmer functions as a display, and the measured value can be read out very clearly through the top glass window.

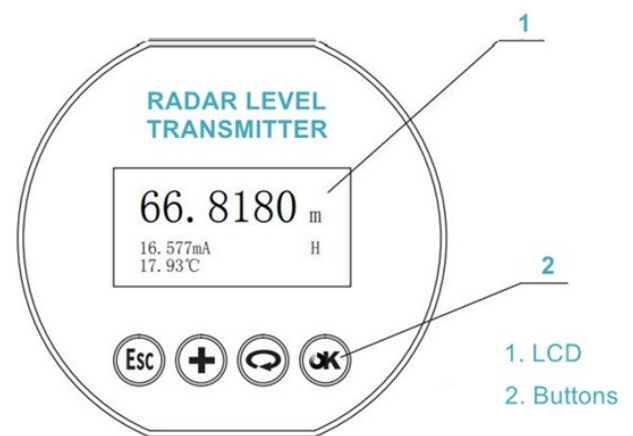






Figure 17

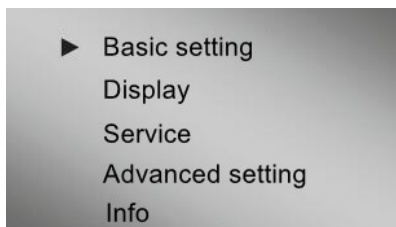
The functions of the buttons:

Button Hereinafter referred to as "Button ESC"		Exit the programming state or return to the previous menu Switch between the value displayed page and echo curve page (when at the home page)
Button Hereinafter referred to as "Button +"		Toggle menu items Change cursor position Modify the parameter value, 0~9 infinite loop Switch between curve display mode and home page display mode
Button Hereinafter referred to as "Button SELECTION"		Toggle menu item Change cursor position
Button Hereinafter referred to as "Button OK"		enter programming state Confirm programming item Confirm parameter modification

6.1.2. Setting Steps

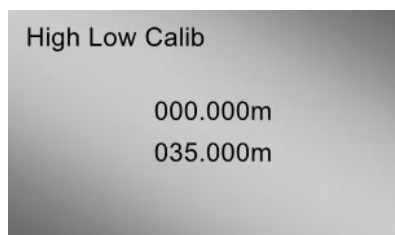
6.1.2.1. Enter the Main Menu

In the running state, press Button OK to display the programming main menu, there is a triangular cursor on the left side of the main menu, press Button SELECTION to change the position of the triangular cursor downwards, press Button + to change the position of the triangular cursor upwards, press Button OK to enter the menu pointed by the cursor, and press Button ESC to exit the current menu. The displayed page is shown as follows:



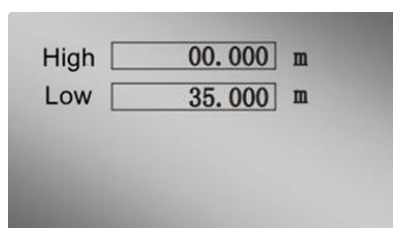
6.1.2.2. Setting Measuring Range

Enter the "Basic Settings" menu, the programmer will directly display the first submenu "High Low Calib". The displayed page is as follows:

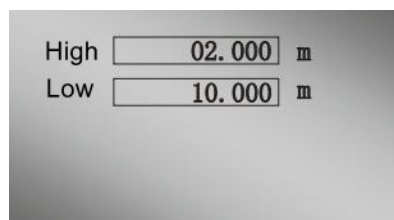


Examples:

- i. In general, if the distance from the zero point of the instrument to the bottom of the tank is 35m, the position "Low" should be set to "35.000m"; the position "High" should be set to "00.000m". The displayed page is shown as follows:



- ii. In special cases, the production process on-site needs to set the highest output below the zero point of the instrument. For example, the 10m tank process requires that the tank should be considered as full when the filled material level is up to 2m below the zero point of the instrument to prevent dangerous overfilling. "High" should be set to 02.000m. The displayed page is shown as follows:

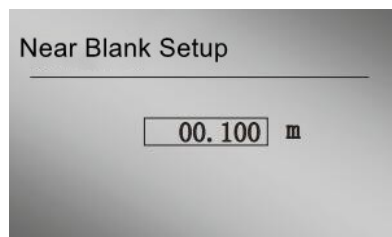


After the high-level (Max.) adjustment setting is completed, continue to cycle the submenu until the item "measurement range" is displayed. Note that this range is not the output range of the meter, but the maximum range of the reflected echo processed by the meter (set value: range setting \geq low-level adjustment).

Example: Assuming that the customer's tank is 10m high, all the levels in this range are required to participate in the measurement output. Therefore, the output range is 10m. If the "measurement range" is set as 9m, the "low (Min.) position" is set to 10m, and the "Max. adjustment" is set to 0m. The output range of the meter has not changed, but the medium level within zone from the bottom to the point of 1m cannot be involved in the measurement, and when the tank is empty, the meter cannot find the signal at the bottom of the tank, which makes the instrument prone to produce data jumps.

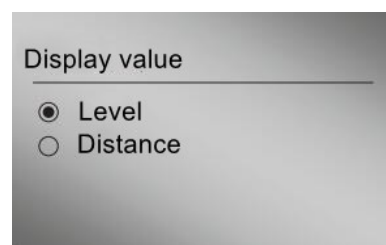
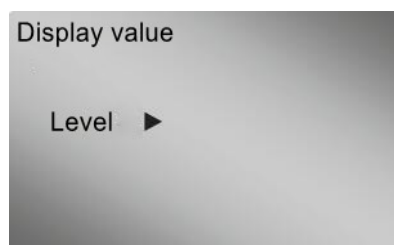
6.1.2.3. Setting Near Blank

When there is a fixed obstacle near the distance sensor surface interfering with the measurement, and the maximum material height will not reach the obstacle, it can be used for the near blank setting function to avoid the measurement errors. Press button OK to enter the near blank setting editing interface, select Button + or Button SELECTION to set the parameters, and press Button OK to confirm what you have done. Please refer to the figure below:



6.1.2.4. Setting the Displayed Values

After entering the "Display" menu, the first submenu is "Display value". After setting the options, the programmer will display the corresponding content. The factory default value is generally the medium level, that is, the height of the level is displayed on the screen when the programmer does not enter any menu. Please refer to the two figures below:



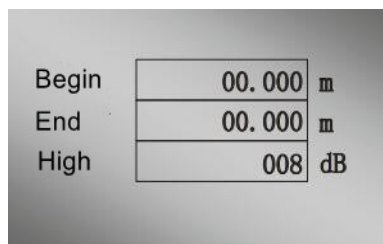
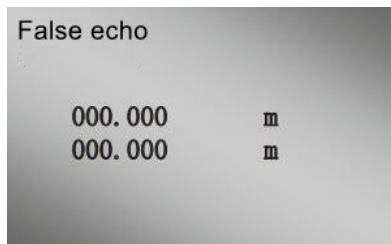
Explanation on what are displayed on the screen:

- Distance: the distance from the zero point of the instrument to the top surface of the measured medium.
- Level: it is the value which is equal to the value of "Min. Adjustment" minus the value of "the distance", the difference of the two mentioned values.

6.1.2.5. The Function of the False Echo Storage

The false echo storage function can eliminate the influence of the interference waves on the real signals under certain circumstances. Enter the "Service" menu, the first submenu is "False Echo", click Button OK to enter the setting interface on which four options are displayed there.

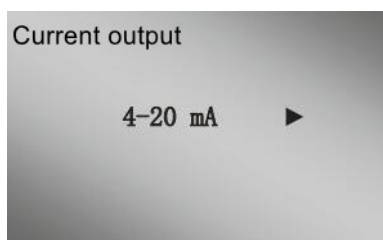
The displays on the pages are shown as the follows:



6.1.2.6. Selecting Current Output

After the "false echo" setting is completed, press Button SELECTION cycle to display "current output".

The display on the page is shown as the follows:



Current output: You can choose the output direction of the current when the instrument is working. The factory default setting is 4-20mA, and the output current is proportional to the level value; after 20-4mA is selected, the output current is inversely proportional to the level change, that is, the output current is proportional to the distance value.



VRPWRD81 RADAR



VRPWRD81 RADAR



VRPWRD82 RADAR



VRPWRD82 RADAR



VRPWRD82 RADAR



VRPWRD82 RADAR

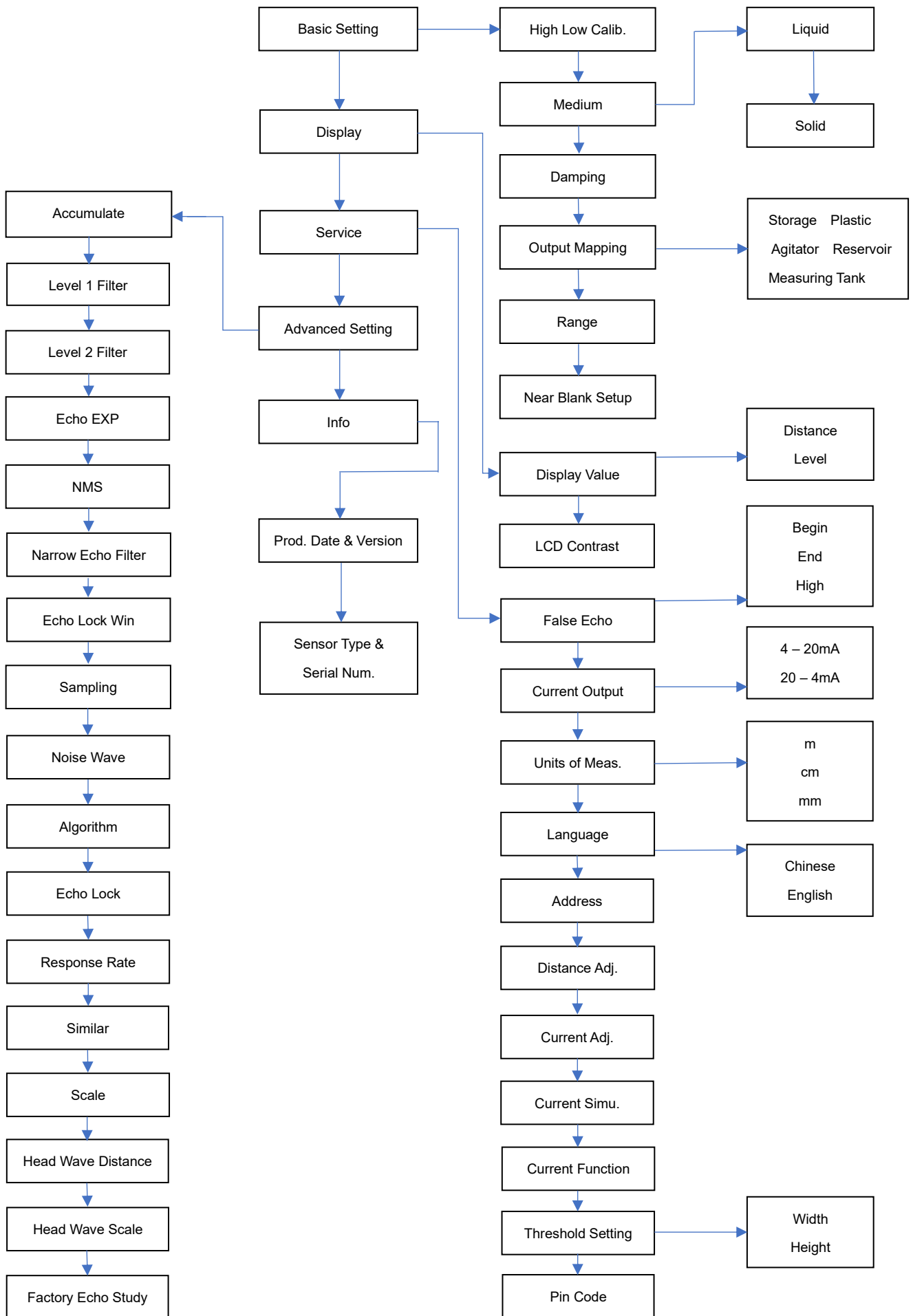


VRPWRD83 RADAR



VRPWRD83 RADAR

Annexed table



6.2. Calibration with PC software

6.2.1. Calibration through a PC with a HART modem

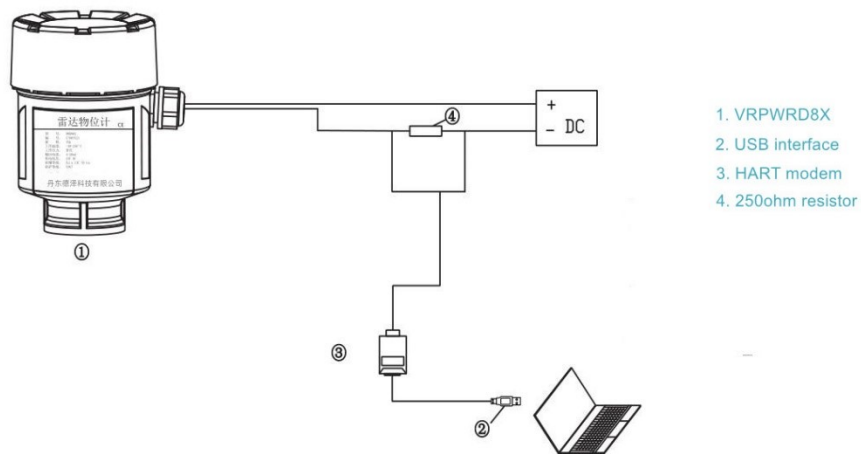


Figure 18

6.3. Calibration with a HART hand held communicator

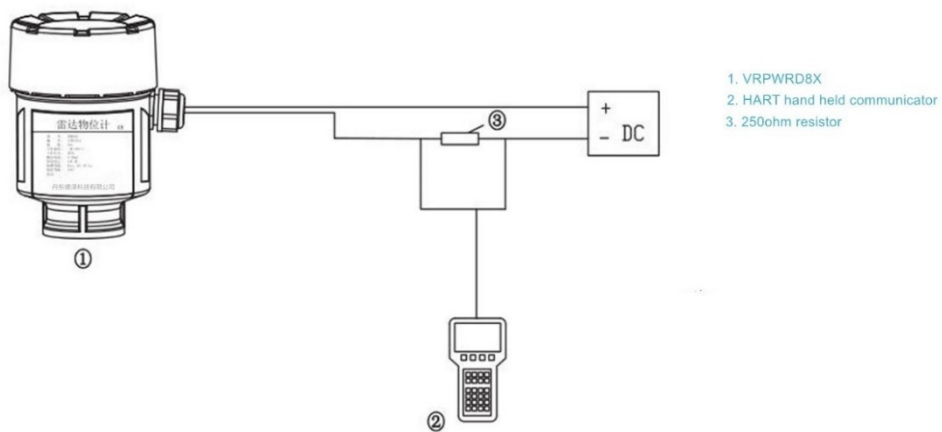
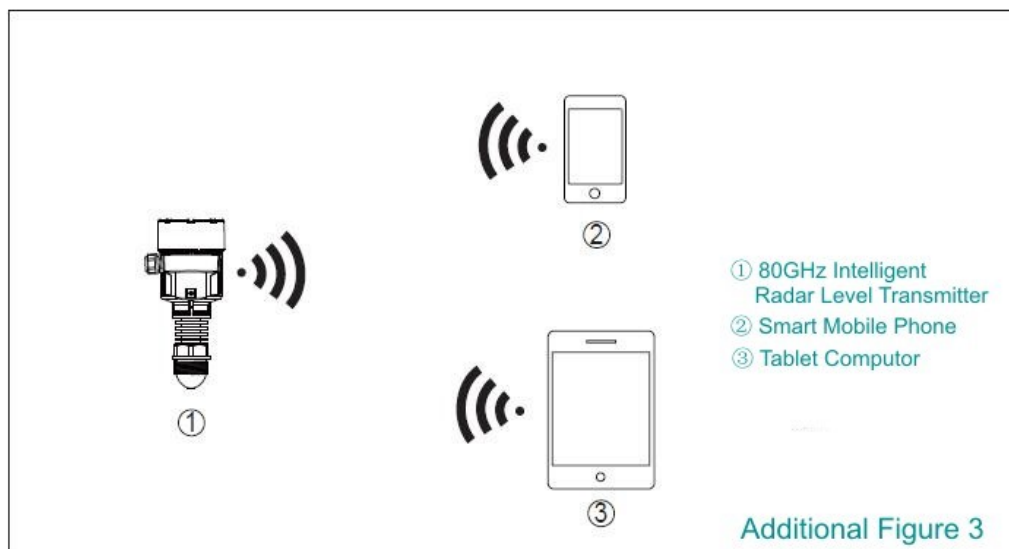


Figure 19

6.4. Setting with BlueTeeth

80GHz series radar level transmitters can be set via BlueTeeth. Please refer to the additional figure 3 below.



7. Structural Dimensions of VRPWRD80 series (unit mm)

Dimensions of housing (material: aluminum)

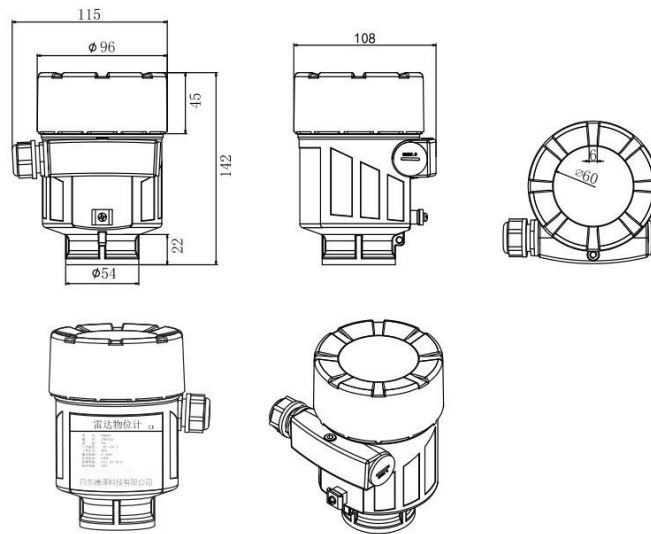
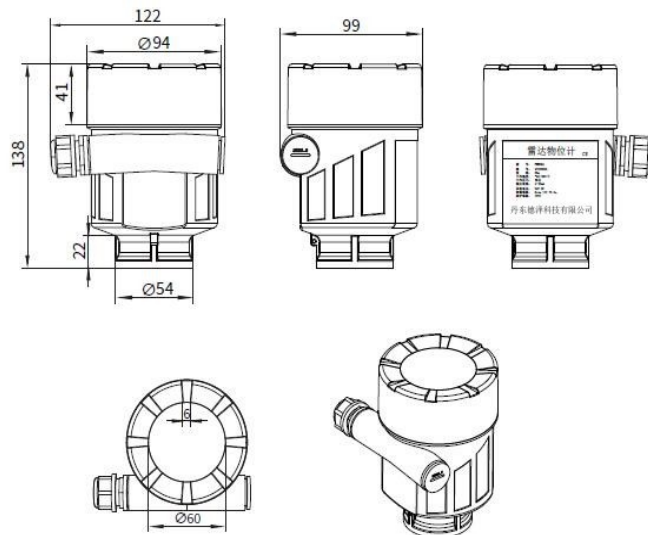


Figure 20

Dimensions of housing (material: plastic ABS)



Additional Figure 4

VRPWRD81

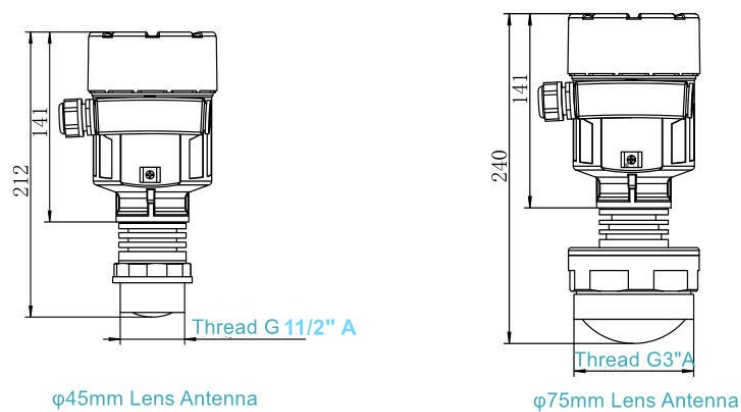
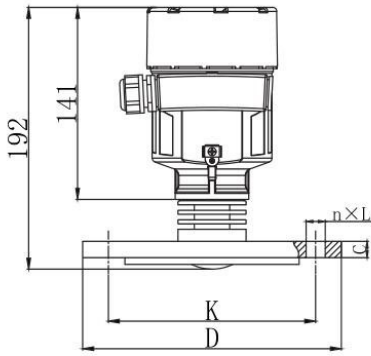


Figure 21

VRPWRD82

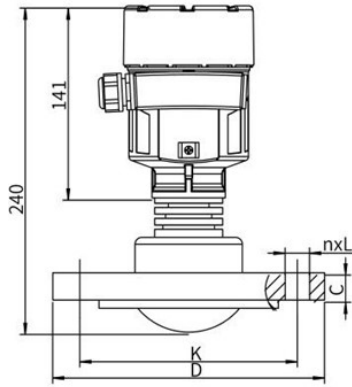


φ45mm Lens Antenna

Figure22-1

Flange Specification Selection Table (GB/T9119-2000) Unit: mm			
Item number	1	2	3
Nominal size	DN50	DN80	DN100
Outer diameter	φ165	φ200	φ220
Centers' distance K	125	160	180
Hole's number n	4	8	8
Bolt hole diameter L	18	18	18
Thickness of the flange C	12	12	12

VRPWRD82

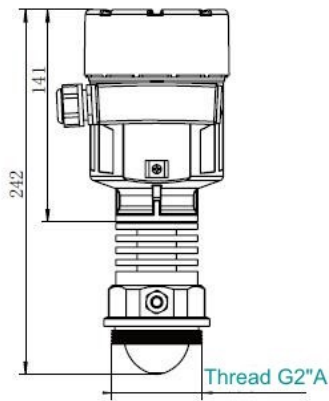


φ75mm Lens Antenna

Figure 22-2

Flange Specification Selection Table (GB/T9119-2000) Unit: mm				
Item number	1	2	3	4
Nominal size	DN80	DN100	DN125	DN150
Outer diameter	φ200	φ220	φ250	φ285
Centers' distance K	160	180	210	240
Hole's number n	8	8	8	8
Bolt hole diameter L	18	18	18	22
Thickness of the flange C	14	14	14	14

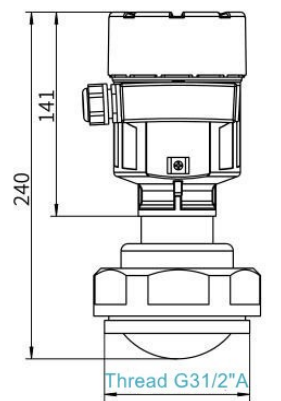
VRPWRD81



φ45mm Lens Antenna

Figure 23-1

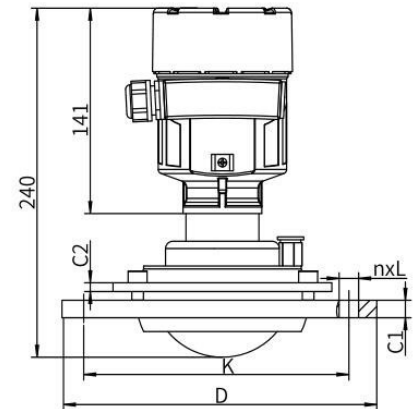
VRPWRD83



φ75mm Lens Antenna

Figure 23-2

VRPWRD83



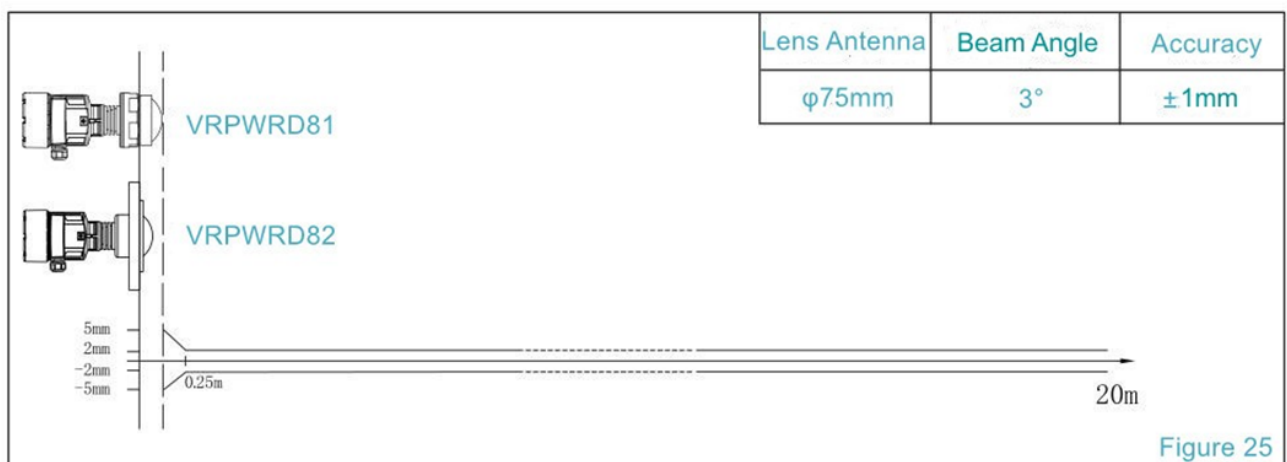
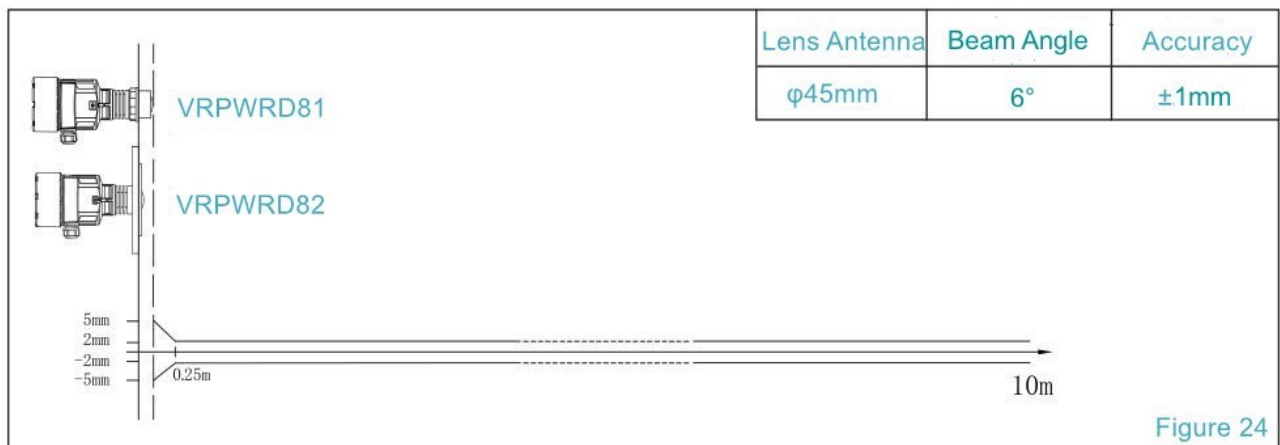
φ75mm Lens Antenna

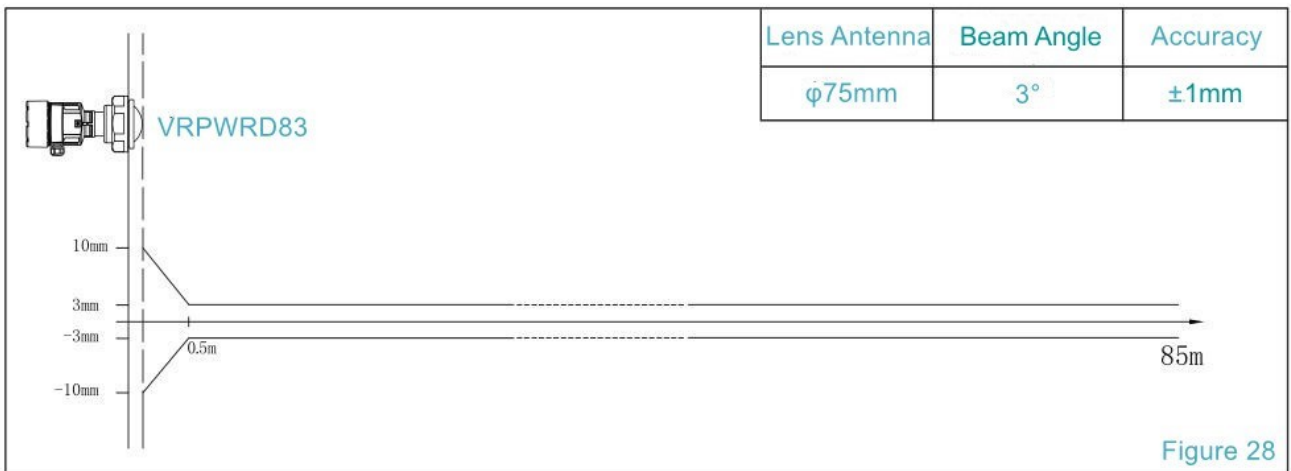
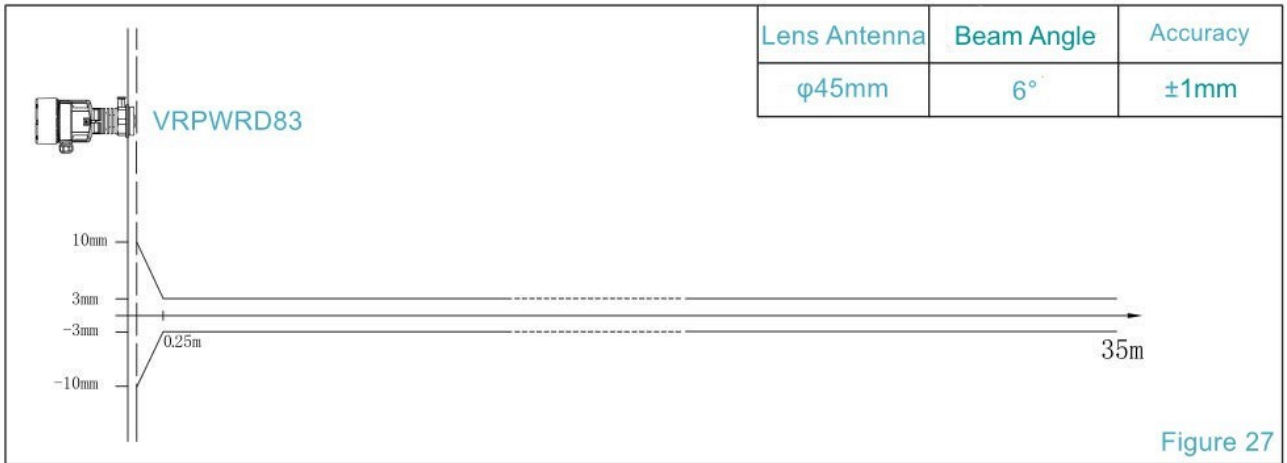
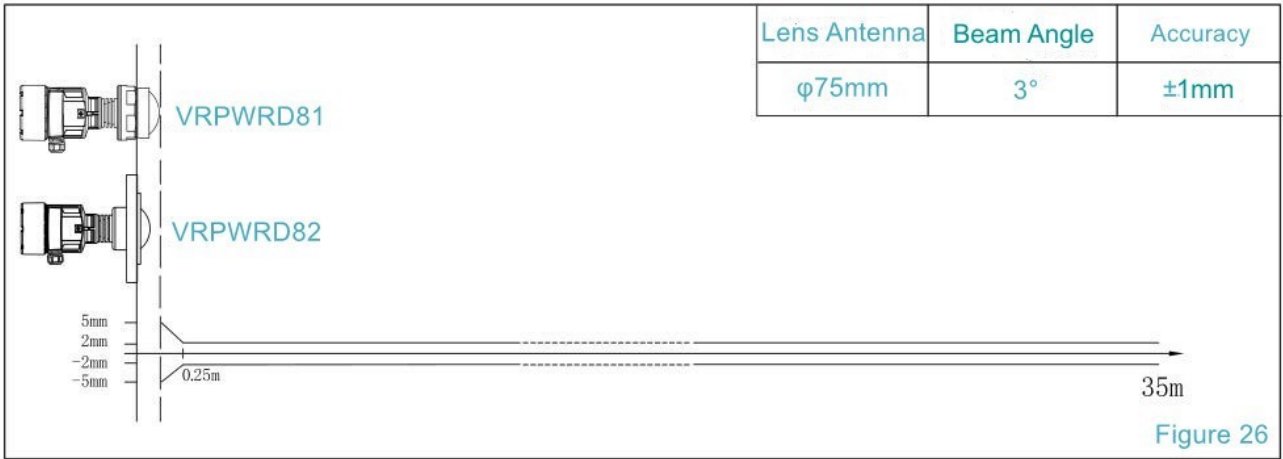
Figure 23-3

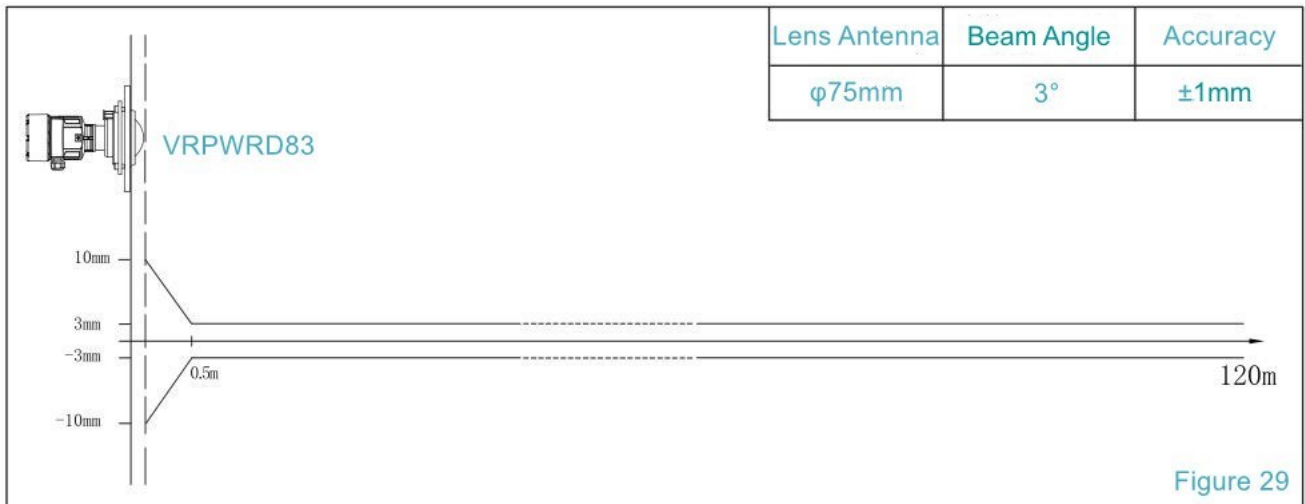
Universal Joint Flange Specification Selection Table (GB/T9119-2000) Unit: mm

Item number	1	2	3	4
Nominal size	DN100	DN125	DN150	DN200
Outer diameter	φ220	φ250	φ285	φ340
Centers' distance K	180	210	240	295
Hole's number n	8	8	8	12
Bolt hole diameter L	18	18	22	22
Thickness of the flange C1	10	10	10	10
Thickness of the plate of the universal joint C2	6	6	6	6

8. Linearity Graphs







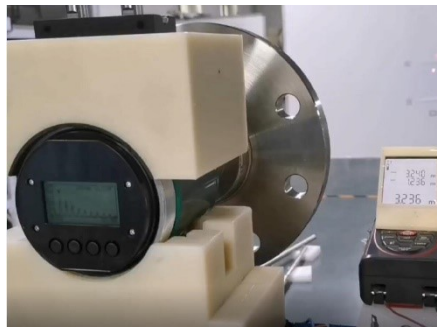
9. Transport and Storage

In addition to the regulations of the standard JB/T 9329, the transportation and storage conditions of the level meter should also meet the following requirements:

- A. The instrument should be treated in strict accordance with the characteristics of the product and the requirements of the manual during transportation.
- B. The instrument be stored in a dry and ventilated room with a relative humidity of not more than 80% at the ambient temperature range of -20°C - +60°C. Do not store it with any corrosive substance. Any the instrument that has been stored for a long time should be tested before it is sold and used.



Being Assembled



Being Calibrated



Being Packaged



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