PCM112 High Frequency Radar Level Transmitter

Features

■ Almost free from corrosion and foam; Almost unaffected by changes in water vapor, temperature, and pressure in the atmosphere.

■In remote target detection and strong smoke and dust environments, it can detect smaller targets than microwave radar and achieve more accurate positioning, with higher resolution and stronger confidentiality.

■The small beam angle and concentrated energy enhance the echo capability while also helping to avoid interference.

■The measurement blind spot is smaller, and good results can also be achieved for small tank measurements.

■Using millimeter wave bands with higher frequencies than Ku band radar, resulting in high accuracy.

■The extremely narrow beam and penetration ability make it more adaptable to ultra complex working conditions without compromising measurement performance.

Applications

■Chemical industry
■Water level detection
■Coal silos, ash silos, oil tanks, cement powder tanks, etc
■Water storage tanks, acid-base storage tanks, slurry storage tanks, solid particles

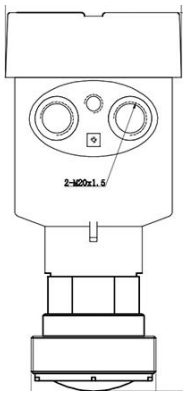
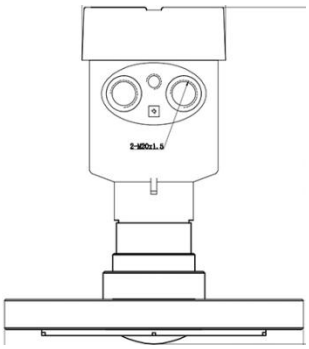
Product Overview:

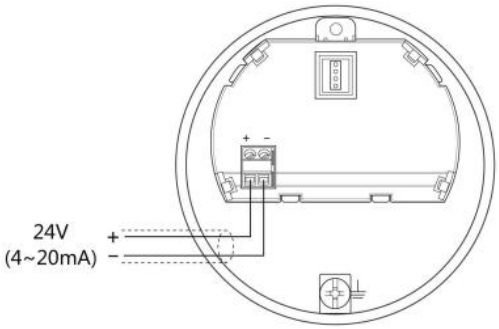
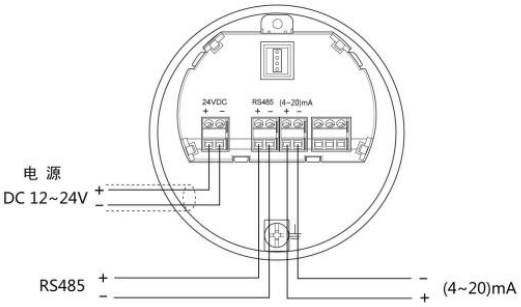
The radar level meter antenna emits extremely narrow microwave pulses (80GHz), which propagate at the speed of light in space. When it encounters the surface of the measured medium, some of its energy is reflected back and received by the same antenna. The time interval between transmitting and receiving pulses is proportional to the distance from the antenna to the surface of the measured medium. Due to the extremely high propagation speed of electromagnetic waves, it is difficult to confirm the time interval between the transmitting and receiving masons (in the nanosecond range). The high-frequency radar level meter uses a special demodulation technology to accurately identify the time interval between the transmitting and receiving masons, thereby further calculating the distance from the antenna to the surface of the measured object.

Principle: The radar level antenna emits narrow microwave pulses, which are transmitted downwards through the antenna. After the microwave comes into contact with the surface of the tested medium, it is reflected back and then received by the antenna system. The signal is transmitted to the electronic circuit and automatically converted into a level signal (because the microwave propagation speed is extremely fast, the electromagnetic wave reaches the target and is reflected back to the receiver, which takes almost an instant)The reference surface for measurement is the bottom surface of the thread or the sealing surface of the flange.

Parameters	
Pressure ranges	0.1～150m
Nominal pressure	（-0.1～2.5）MPa
Output	Two wire 4-20mA transmission output/Four wire 4-20mA transmission output/Six wire 4-20mA transmission output
Communication output	HART / RS485 Modbus
Process temp.	（-40～200）℃ Max（260～300）℃
Microwave frequency	80GHz
Antenna size	32mm lens antenna/44mm lens antenna/76mm lens antenna
Emission angle	8°/ 6°/ 3°
local display	Display, buttons/upper computer debugging/Hart handheld programmer
Power Supply	Two wire system (DC24V)/Four wire system (AC220V)/Six wire system (DC12-24V)
Housing	Cast aluminum/stainless steel/plastic
Process Connection	Thread/flange (optional)
Application	Measurement of liquid and solid powders under complex process conditions
Medium	Liquids, solid powders, corrosive liquids, vapors, volatile liquids, strong dust, Occasions prone to crystallization and condensation
Operating Temp.	-20~70 ℃ Note：The instrument can work normally at (-40~-20) ℃, but the screen will display abnormalities
Storage Temp.	（-40～80）℃
Relative humidity	＜95%
Tank pressure	Max.2.5MPa
shock-proof	Mechanical vibration 10m/s ², (10-150) Hz
Explosion Grade	Exd IIC T6 Gb / EXia IIC T6 Ga

External structure

Type	Structure diagram	Applicable media and applications
Type 1		Applicable medium: liquid Application: Suitable for measuring most liquid products, sanitary products, pharmaceuticals, and chemical raw materials
Type 2		Applicable medium: solid Application: Solid and solid powders such as material piles

Electrical Connection		
Connection method	Wiring diagram	Note
2 wire wiring diagram with 24V		The power supply and output current signal share a two core shielded cable, and the specific power supply voltage range can be found in the technical data.
4 wire wiring diagram with 220V		The power supply needs to be powered separately, and a four core shielded cable is used for the power supply and current signal (the current signal can be output simultaneously with the RS485 interface, and a six core shielded cable is required for simultaneous output).
Note: The RS485/Modbus protocol power supply needs to be powered separately, and the power supply and digital use a four core shielded cable (the current signal can be output simultaneously with the RS485 interface, and a six core shielded cable is required for simultaneous output).		

How to order

PCM112- 1 RT3 01 D3 I4 BD1 P1 T2 B1

Code	Flange material	Code	Flange material
B1	SS304	B4	PDVF
B2	SS316L	B5	PFA
B3	PTFE		

Code	Temperature resistance grade	Code	Temperature resistance grade
T1	(-40 ～260)℃	T4	(-20 ～100)℃
T2	(-40 ～200)℃	T5	(-40 ～80)℃
T3	(-40 ～130)℃		

Code	Nominal pressure	Code	Nominal pressure
P2	(-0.1～2.5)MPa	P4	(-0.1～0.3)MPa
P3	(-0.1～2)MPa	P5	Atmospheric pressure

Code	Antenna size	Code	Antenna	Code	Antenna size
BD1	32mm lens antenna	BD2	44mm lens anten	BD3	76mm lens antenna
BD4	110mm lens antenna				

Code	Installation	Code	Installation
I1	G1 1/2(thread installation)	I6	DN125(flange installation)
I2	NPT1 1/2(thread installation)	I7	DN80(Universal flange installation)
I3	DN50(flange installation)	I8	DN100(Universal flange installation)
I4	DN80(flange installation)	I9	DN125(Universal flange installation)
I5	DN100(flange installation)	IZ	others

Code	Communication output	Code	Communication output
D2	RS485 Modbus	D3	HART

Code	Transmission output	Code	Transmission output	Code	Transmission output
01	2-wire 4-20mA	08	4-wire 4-20mA	09	6-wire 4-20mA

Code	Measuring range	Code	Measuring range	Code	Measuring range
RT1	30m range	RT2	150m range		

Code	Measuring medium	Code	Measuring medium	Code	Measuring medium
1	Liquid	2	Solid	3	Solid powder

PCM112	High frequency radar level meter detailed in external structure

Example of selection: PCM112-1RT101D3I4BD2P2T2B1

The model is PCM112, measuring medium liquid, 30m range, default with display, 2-wire 4-20mA transmission output, Hart communication, default 24VDC power supply, DN80 (flange installation, material stainless steel 304), 44mm lens antenna, nominal pressure (-0.1~2.5) MPa, temperature resistance level (-40~200) ℃, flange material SS304, default IP67.

Installation

Provide instructions on the installation location and method of this product, and be sure to read this section during installation.

1 Installation guidance

1.1 Installed at 1/4 or 1/6 of the diameter. Note: The minimum distance from the tank wall should be 200mm (as shown in Figure 2). Note: ① Reference plane ② Center or installation position of the container.

1.2 The top plane of the conical tank can be installed in the middle of the tank top to ensure measurement to the conical bottom (as shown in Figure 3).

1.3 When there is a material pile, the antenna should be vertically aligned with the material surface. If the material surface is uneven and the stacking angle is large, a universal flange must be used to adjust the horn angle to align the horn with the material surface as much as possible (as shown in Figure 4). (Due to the problem of echo attenuation and even signal loss caused by tilted solid surfaces)

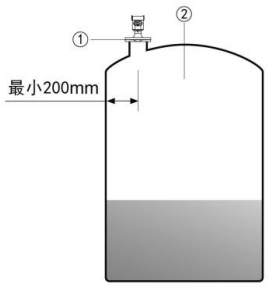


Figure 2

Figure 3

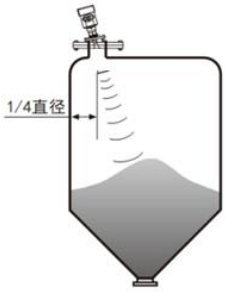


Figure 4

2 Installation errors

2.1 The conical tank cannot be installed above the feeding port (as shown in Figure 5). At the same time, it should be noted that shading and rainproof measures should be taken during outdoor installation.

2.2 Instruments cannot be installed in the middle of arched or circular tank tops. In addition to generating indirect echoes, it is also affected by multiple echoes. Multiple echoes may have a signal threshold greater than the true echo, as multiple echoes can be concentrated through the top and cannot be installed in the center position. (As shown in Figure 6).

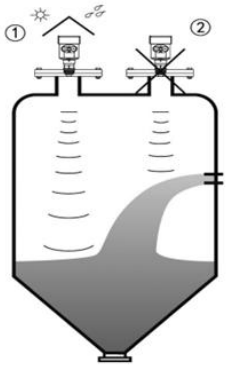


Figure 5

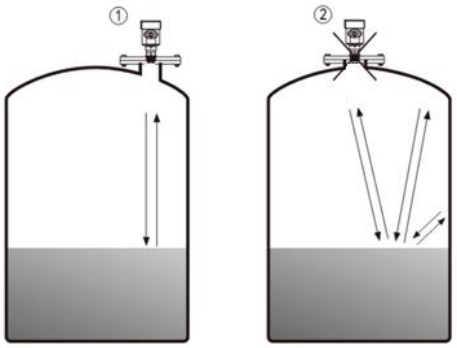


Figure 6

2.3 When there are obstacles in the tank that affect the measurement, a reflective plate needs to be installed to ensure normal measurement (as shown in Figure 7).

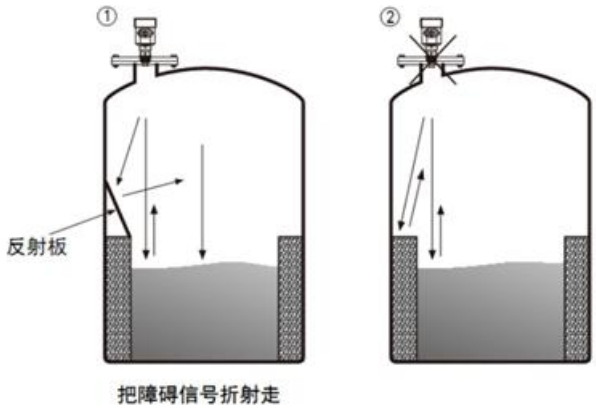


Figure 7

2.4 Moisture-proof treatment: For instruments installed on tanks that are mechanically cooled or heated in damp indoor environments, in order to prevent moisture, the cable gland should be tightened and the cable should be bent downwards at the inlet (as shown in Figure 8).

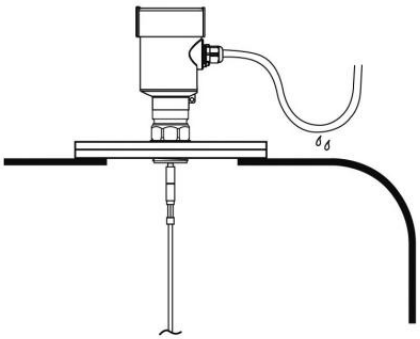


Figure 8

Wotian reserves the right to make changes to any product in this publication without notice. The information provided is believed to be accurate and reliable as of this printing.

Contact us

Nanjing Wotian Technology Co.,Ltd.

Website: www.wtsensor.com

Add: 5 Wenying Road, Binjiang Development Zone, Nanjing, 211161, China

E-mail: dr@wtsensor.com