YW04-B

76-81GHz Continuous frequency modulation radar water level gauge Product manual

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1.Feature

The main advantages of radar level gauge series are as follows:

- Millimeter wave RF chip enables more compact RF architecture, higher signal-to-noise ratio and smaller blind area.
- 5GHz working bandwidth enables the product to have higher measurement resolution and accuracy.
- The narrowest antenna beam angle is 6 °, the interference in the installation environment has less impact on the instrument, and the installation is more convenient.
- Integrated lens design, compact size.
- Display control and water level gauge adopt separate design, which can be customized.
- Low power consumption operation, service life more than 3 years.
- Bluetooth debugging of mobile phones is supported to facilitate the maintenance work of field personnel.

2.Technical specifications

Table 2-1 Technical Specifications Of Radar Water Level Gauge

Transmission frequency	76GHz~81GHz
measuring range	65m
measurement accurac	±1mm
beam angle	6°
Power supply range	18-28 VDC
Output	4-20mA
operation temperature	-30~75℃
Shell material	PP/stainless steel/cast aluminum
Antenna type	lens antenna
Recommended cables	0.5mm²
protection grade	IP68
Installation method	Bracket/Thread

3.Dimension

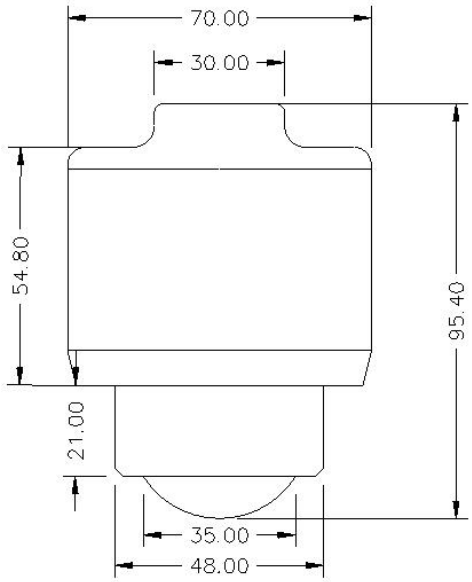


Figure 3-1 Schematic diagram of a 1.5-inch water level gauge

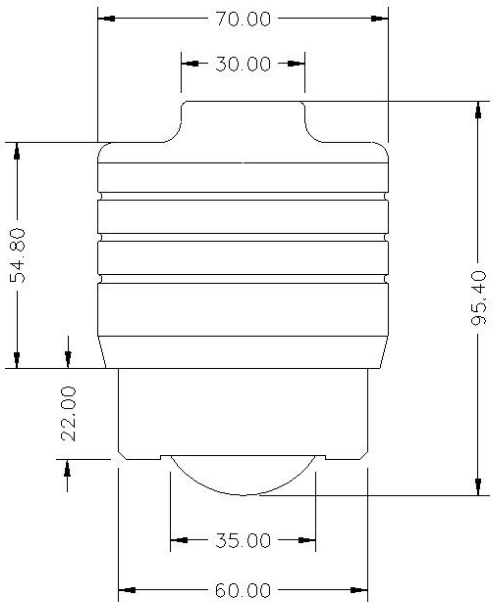
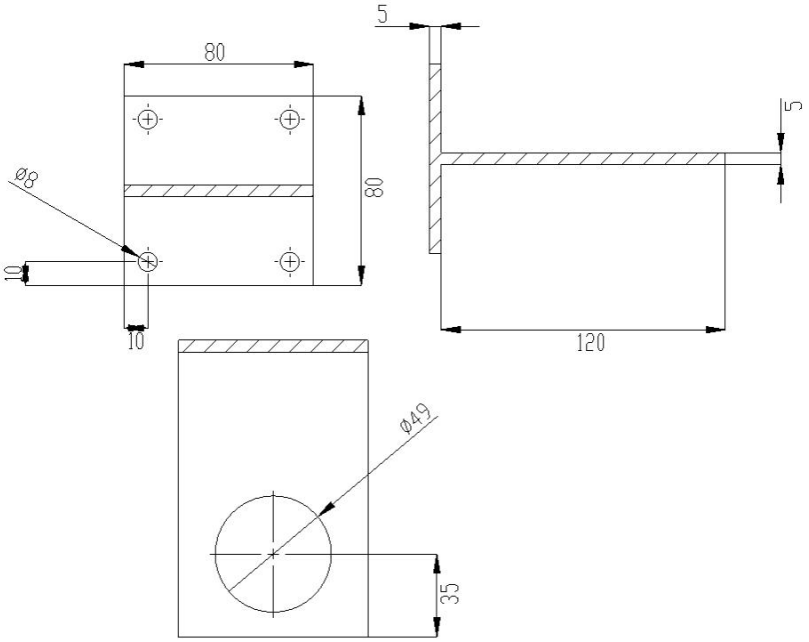
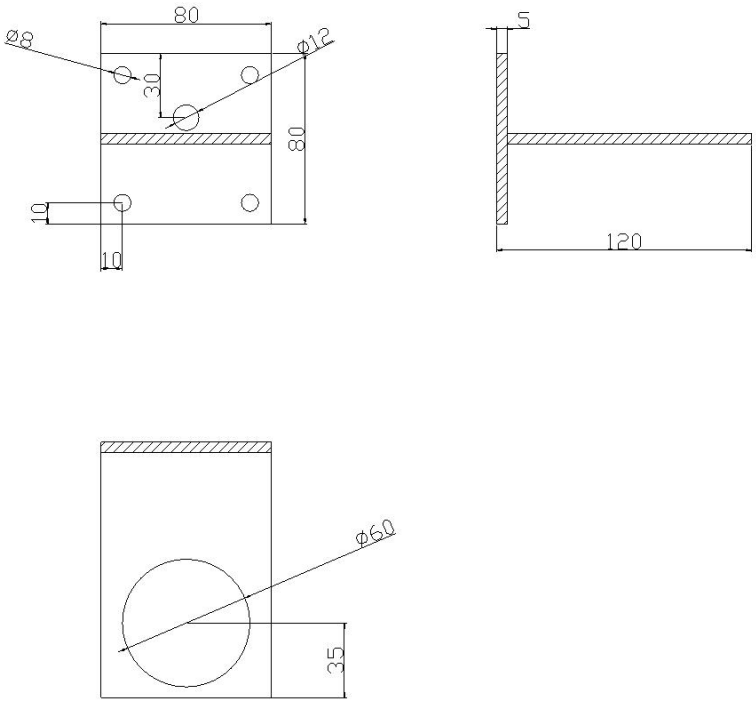


Figure 3-2 Schematic diagram of a 2-inch water level gauge



3-3 Figure 1.5 inch T-shaped bracket schematic diagram



3-4 Figure 2-inch T-shaped bracket schematic diagram

4. Installation

Two points to pay attention to during installation: (1) Ensure that the instrument is perpendicular to the water surface; (2) Avoid emitting beams that illuminate interfering objects and generate false echoes. Please refer to the following points for typical operating conditions.

Ensure that the water level gauge is installed perpendicular to the water surface, and tilting will weaken the signal amplitude and affect normal ranging.

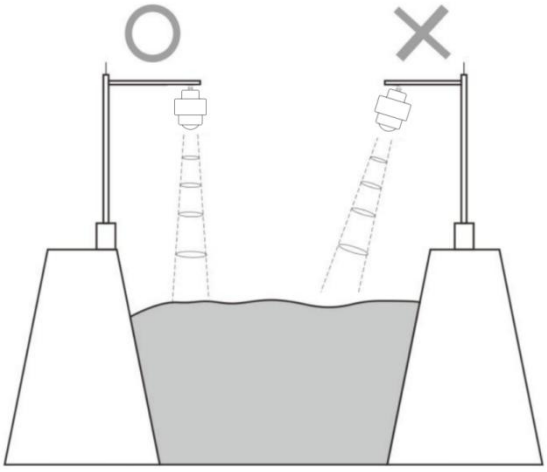


Figure 4-1 Schematic diagram of instrument installation location

- Ensure that there are no interfering objects within the beam range, such as the riverbank.

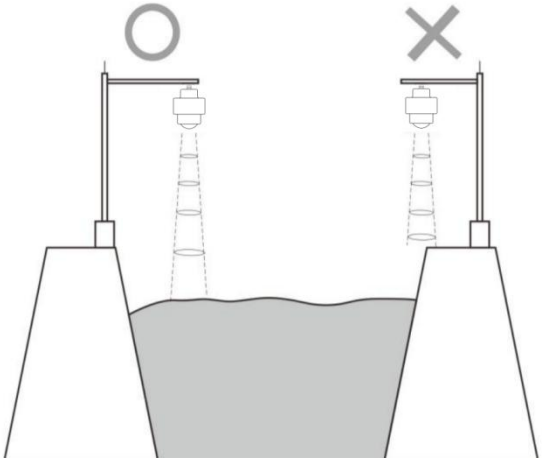


Figure 4-2 Schematic diagram of instrument installation location

- The instrument installation should be at least 20cm away from the side wall, and the underground pipeline network should be installed as close as possible to the center of the well, otherwise the well wall may generate interference signals that affect measurement judgment.

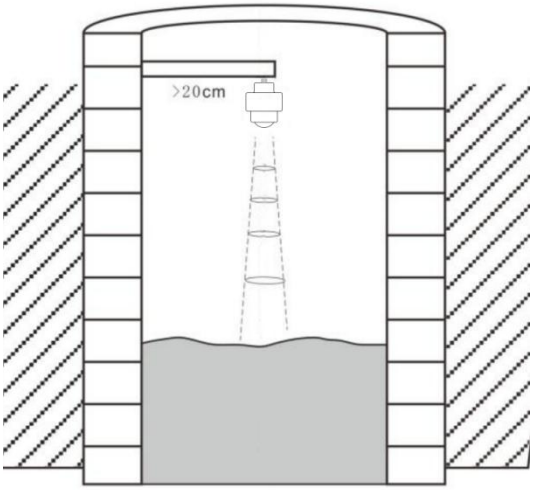


Figure 4-3 Installation at least 20cm away from the container wall

5. Links

Figure 5-1 Product Wiring Diagram

Figure 5-2 Schematic diagram of upper computer connection

Firstly, connect the device correctly according to the above interface definition, and note that the power supply range of the device is 18-28V

Step 2, connect the device to the computer using a HART to USB modulator

Step 3: Connect the 24V power supply, turn on the upper computer, and perform equipment debugging

6. Water level gauge operation

6.1 Bluetooth app operating instructions

Firstly, users need to install the provided app software.

(Android end) can install packages through sales personnel

(iOS side) can be searched and downloaded through the app store


1:38
5G
搜索
万物互联-雷达物位计
广岳 刘
年龄
类别
开发者
iOS端
跳过 3s
雷达液位计
雷达物位计
菜单
基本设置
LHB-864B2D0A
LHB-3CB5F501
低位设定
高位设定
量程设定
盲区设定
阻尼时间
介质类型
容器类型
EDIFIER BLE
Today
游戏
App
搜索

6.1.1 【Search Interface】

Figure 6-1 Bluetooth search interface

After downloading the app, open it for the first time and click on the top right corner box. The interface displays all the devices under the current user. Clicking on the name can successfully connect and operate the device information. Bluetooth name [RFstar xxxx]

6.1.2 【Curve interface】

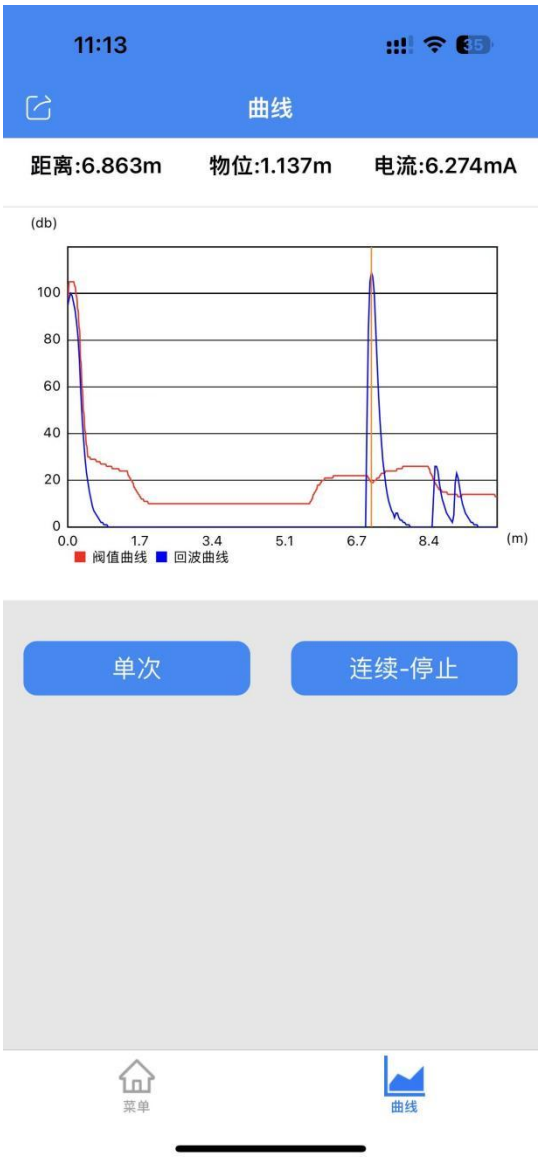


Figure 6-2 Curve Interface

Display the current real-time value, curve (click once), single refresh data (click continuously), real-time refresh data

6.1.3 【Device menu interface】

Figure 6-3 Menu Interface

6.1.3.1 【Low setting】

The distance from the front end of the water level gauge to the bottom of the water level, and the low setting must be less than the range.

Range: 0.1-15, unit: m; Default value: 15

6.1.3.2 【Range setting】

When processing the algorithm, echoes outside the range will be ignored. Setting the range reasonably can avoid multiple reflection interference and possible interference signals outside the range.

Value range: 0.1-15, unit: m; Default value: 15

The blind zone setting and range setting jointly determine the selection area for the internal echo algorithm of the instrument. When processing the algorithm, echoes within the blind area will be ignored, and this option can be used to avoid interference signals at the near end.

6.1.3.3 【Damping time】

In order to improve the stability of the measured output value, a larger damping time can be set to achieve stable measurement values.

6.1.3.4 【Media Type】

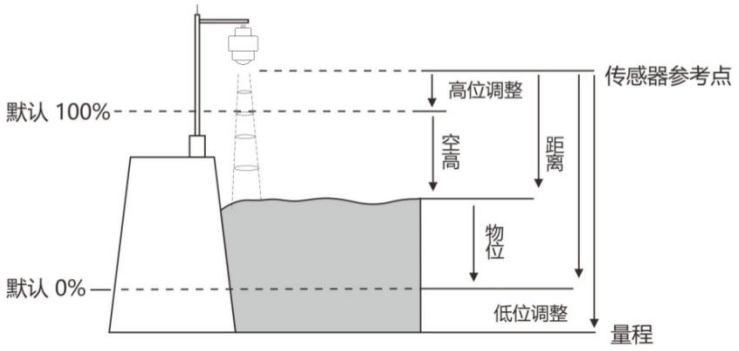
For solid and liquid applications, rich adaptive algorithms are integrated, and customers can make corresponding configurations based on the actual measurement objects on site.

6.1.3.5 **【container type】**

Built in multiple modes to adapt to on-site applications with different feeding and discharging rates.

7. Low adjustment

7.1.1【 Low adjustment 】 refers to the low adjustment point, as defined in the following figure.



Parameter	**Low adjustment**
Parameter range (m)	**0.1~Range**
Default value (m)	**65**
Associated Configuration	**If the set low adjustment<high adjustment+0.1, then low adjustment=(high adjustment+0.1);**
Special matters	**The low adjustment point is independent of the range and only affects the calculation of the material level**
Special matters	**The low adjustment point is independent of the range and only affects the calculation of the material level**

7.1.2【High level adjustment】refers to the high level adjustment point, as shown in the figure

Parameter	**High level adjustment**
Parameter range(m)	0~(low adjustment -0.1)
Default value (m)	0
Associated Configuration	If the set high adjustment>(low adjustment -0.1), then high adjustment=(low adjustment -0.1)

Special matters	**High level adjustment is not related to blind spot setting, but only affects the calculation of air height**

7.1.3【Range setting】

In order to obtain the correct measurement results, it is necessary to set the range range of the instrument, and the specific meaning is shown in the table below.

Parameter	**range**
Parameter range（m）	1~65
Default value (m)	15
Associated Configuration	If the range is set to<(blind zone+0.1m), the range is automatically set to (blind zone+0.1m).
Option Meaning	When processing the algorithm, echoes outside the range will be ignored. Setting the range reasonably can avoid multiple reflections and possible interference signals outside the range
Special matters	This range does not refer to the remote measurement limit of the instrument, but is only used to limit the algorithm area. Please refer to the technical specifications section for instrument measurement limits.

Note: The blind spot and range determine the specific range of algorithm application, and can be reasonably set to avoid interference and false echoes, achieving fast and stable measurement.

7.1.4【Blind spot adjustment】

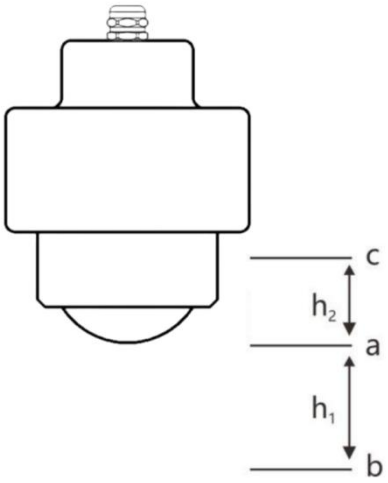
Please refer to the table below for specific meanings

Parameter	**blind area**
Parameter range（m）	0~（range-0.1）
Default value（m）	0
Associated Configuration	If the blind zone set is>(range -0.1), then the blind zone=(range -0.1).
Option Meaning	When processing the algorithm, echoes within the blind area will be ignored, and this option can be used to avoid interference signals at the near end.

Special matters/特别事项	This blind spot does not refer to the near end measurement limit of the instrument, but is only used to limit the algorithm area. Please refer to the technical specifications section for instrument measurement limits.

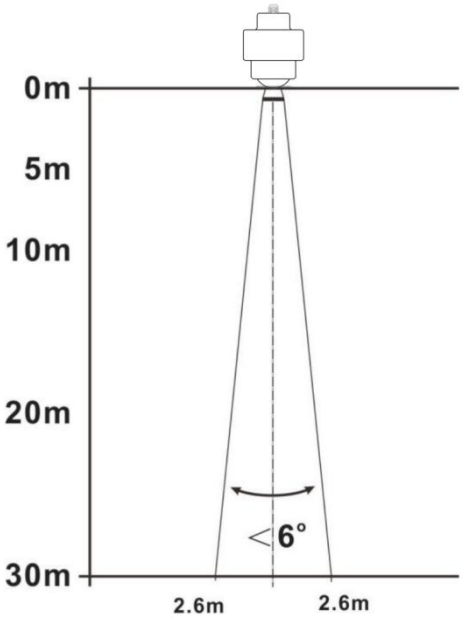
7.1.5【Distance offset】

【Distance offset】Used to correct the reference point of the sensor. The default reference point of the instrument is adjusted at the factory to the position shown at point a in the figure below. If you want to adjust the reference point down to point b, enter h1 in Settings.



8. Glossary

beam angle：The beam width bounded by 3dB lower than the maximum value. The beam angle is 6 °, as shown in the figure.



Schematic diagram of the radar beam space geometry of the instrument

range resolution：Distance resolution refers to how far apart two objects are from each other, and the level radar can distinguish between two objects rather than one object and measure their respective distances. If the distance between two objects is less than the distance resolution of the level radar, then the radar can only measure one distance value, which is not equal to the distance value of any one of the objects, but rather the combination of the distance values of the two objects. The frequency modulation bandwidth of the product is B=5GHz, and the minimum distance resolution is equal to the speed of light/working bandwidth/2 ≈ 3cm.

measurement accuracy：If there is only one object and it has moved a small distance, can the level radar recognize distance changes. The indicator for distinguishing the distance traveled by a single object is called accuracy. The intermediate frequency signal is analyzed using its own algorithm, with a measurement accuracy of 0.5mm.

Blind spots：(1) Refers to the measurement limit of the near end of the instrument, which cannot be measured by the instrument within the blind zone

Echo：The reflected signal received by the radar.

Emission cone：Extension of antenna beam angle.

False echo：Any echo that is not generated by the desired target. Generally speaking, false echoes are generated by obstacles in the container.

Multiple echo：Multiple reflection echoes that occur at the target echo distance may be 2 or 3 times.

Range：(1) Refers to the farthest measurement limit of the instrument (2) Special, refers to the artificially set farthest distance beyond which the instrument does not consider when processing data.

Repeatability：The degree of deviation in multiple measurements of the same variable under the same circumstances.

Threshold curve：A curve that changes over time serves as a threshold, and echoes exceeding it are considered valid.