

YW04-SC Series Handheld Radar Level Meter User Manual



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I. Overview

This product features a modular circuit design, constructed with military-grade multilayer PCB boards that offer a tightly integrated hardware structure and rational layout.

II. Product Features

- ★ Backup and Restoration Settings Parameters
 - ★ Bilingual Menu (Chinese & English)
 - ★ Features digital filtering and echo recognition capabilities
- Supports data acquisition using MiniSD cards

III. Main Technical Parameters

Display Resolution: 1 mm

Display: 3-inch LCD

Keyboard: 18-bit surface-mount touch key

Power consumption: Operating mode <1 W; Sleep mode <0.03 W

External DC power supply: DC 5V 1A

Output Method: USB-UART (Other outputs available upon request)

Protection rating: Main unit IP55, Sensor IP68

Sensor: Material – ABS; Standard lead length – 10 m (other lengths available upon request)

External dimensions: (Main unit) 210 mm × 100 mm × 35 mm;
(Sensor) 135 mm × M60, G2

IV. Menu Operations and Parameter Settings

4.1 Key Functions

Before commencing measurements, simply complete the installation as required and configure the basic parameters; then power on the device for normal measurement. The 18-key keyboard inputs feature basic functions as shown in Table 1.



Table 1

	Return to Menu	Key Entry Password Input		Power On/Off Key	Go to the previous level
	Move Left Button	cursor left		symbol	incoming symbol
	Right Move Key	cursor right		'0 '	'0' Input Key
	Save	Confirm and save to menu		Select Up or Down	Up and Down selection menu

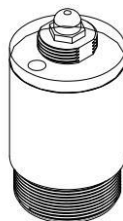
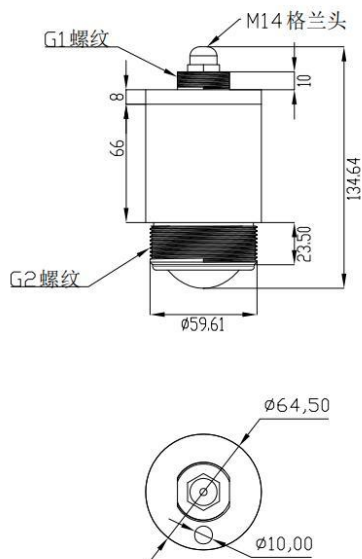
V. Installation of Instruments

5.1 Installation by Conventional Methods

The level gauge is equipped with a fixed screw ring, which should be pre-drilled into the installation position or bracket mounting hole. After adjusting the probe installation angle, simply tighten the screw ring.

The level gauge has two different installation interfaces, each requiring specific range specifications and blind zone requirements.

5.2 Instrument Dimensions



VI. Menu List

6.1 Routine Settings Menu List for Radar Level Gauges

(For detailed menu listings, see Appendix 4)

Main Menu	second-level menu	Three-Level Menu	explain
Probe Settings	Zero Point Setting	mounting height	The distance from the probe base to the water bottom, in meters
		Display Correction	The default is 0; no configuration required
		Linear Correction	The default is 1; no configuration required
	Zero Point Resection Settings	Zero-point resection	The default is 0; no configuration required
DA	Regular Sampling	(unit S)	Data Collection Interval
	Lower Limit Alarm Collection		
	Upper Limit Alarm Collection		
	Language Settings	language	Chinese, English

System Settings	Time Settings	Date Settings	Date and Time Settings
		Time Settings	
	Display Settings	contrast ratio	Screen Clarity Settings
		Backlight Delay	Screen Display Time
	Power Settings	Automatic shutdown at low voltage	Prohibit modification
	data management	Recovery Parameters	factory data reset
		Clear Memory	Clear instrument record data
	change password	User Password	Edit with caution

6.2 Common Menu Settings for Radar Level Gauges

6.2.1 Installation Height Settings

- ① Under the measurement  display interface, press the button to enter your password; the default password is '00000'.
- ② From  the main menu interface, select the first option (Probe Settings) and check it.
- ③ According  to the probe entry settings, the first item is installation height and is selected.
- ④  Depending on the installation height, the second row displays the original installation height value. The default is '000000'.
- ⑤ Enter data using   the numeric keypad or.
- ⑥ Confirm  the settings and exit.
- ⑦ Return  three times and select whether to save.
- ⑧ Confirm  to save and enter the display interface.

VII Installation Methods and Usage Precautions

Configuration: Standard components include the host unit (with built-in battery), sensor probe, and instrument panel (optional).

7.1 Probe Installation

7.1.1 The probe simultaneously generates radar pulse waves and detection echoes; the radar pulse waves propagate from the probe surface along a defined conical wavefront. This region must be free of obstructions and located away from the feed inlet. The probe should be installed at a position where no obstacles exist between its emission surface and the measured medium. See Figure 1.

7.1.2 The shape of the container must be considered during probe installation. Incorrect installation may cause secondary echoes in containers of specific shapes, particularly those with conical or spherical tops. These configurations can refocus and amplify transmitted echoes, leading to erroneous readings. Proper installation positioning resolves this issue; see Figure 2.

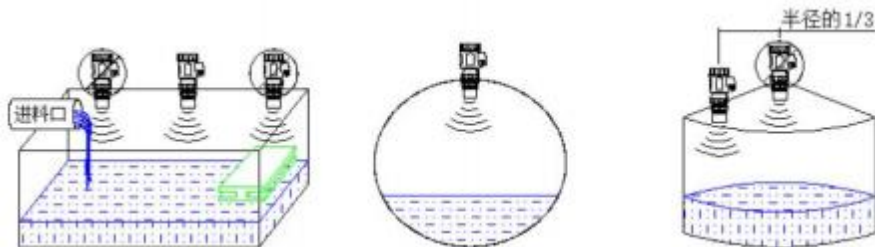


Figure 2

7.1.3 The probe may be installed using either a flange or standard M60×2 threads (the installation interface shall conform to the actual specifications). Regardless of whether flange or threaded installation is employed, and irrespective of whether a taper sleeve is selected, the bottom of the probe must protrude beyond the bottom of the installation interface. Figure 3 illustrates the correct installation method.

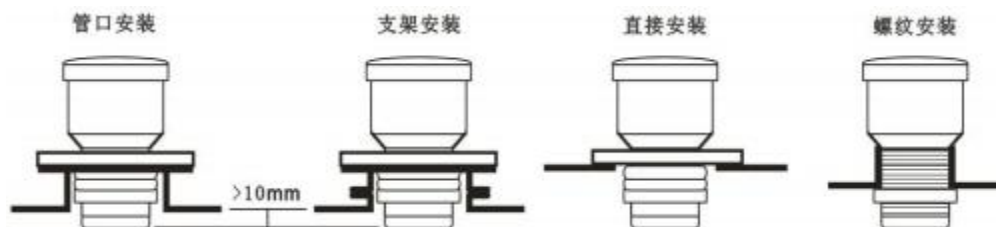


Figure 3

7.1.4 Probe installation shall ensure that the acoustic wave path emitted by the probe remains within the ideal zone defined relative to the container wall as shown in Figure 4. For the measurement range corresponding to the distance between the probe and the container wall as depicted in Figure 4, if this distance falls below the threshold specified for the ideal zone, the probe must be installed within the "minimum clearance" zone. If the installation distance from the side wall remains below the "minimum clearance" line, the transmitter may fail to measure the level accurately. See Figure 4.

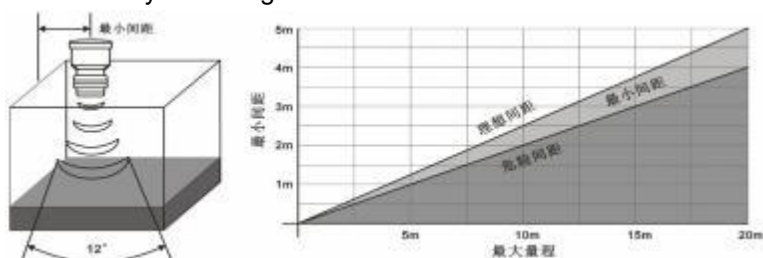


Figure 4

7.1.5 In solid material measurement, the probe should be typically installed at a distance of one-third of the container wall length from the side wall to the central feed opening. When material accumulates, a conical surface is formed. The probe installation positions shown in Figures 5 and 6 provide an average level reading, which corresponds to the level height under conditions of uniform material accumulation. This principle applies equally to conical accumulations as well as concave accumulation surfaces resulting from discharge operations.

The measured average level height obtained with this installation method is valid only for cylindrical containers with the feed inlet located at the centerline. For containers of other shapes or when the feed inlet is not centrally positioned, probe installation must comply with user specifications and meet the aforementioned requirements.

7.1.6 Radar measurements yield optimal results for liquids with a smooth, undisturbed surface. If the liquid surface contains debris, bubbles, or significant fluctuations, a guided wave tube should be installed. The diameter of the guided wave tube must exceed 120 mm and it shall have no joints. See Figure 7.

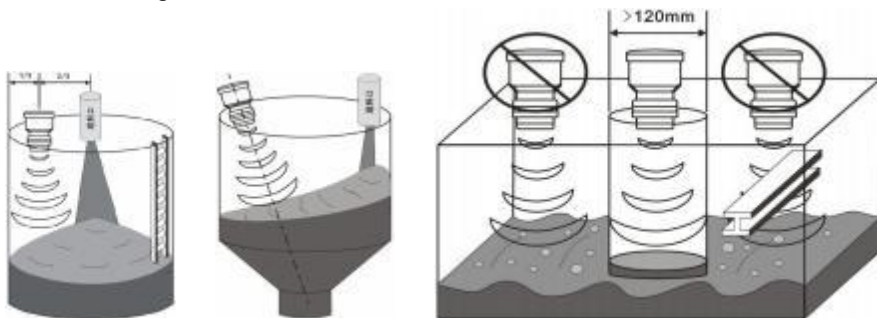


Figure 5: Solid material Figure 6: Conical discharge device Figure 7 Liquid material

7.2 Working Mode

This product features two modes: Level Mode (for measuring air height) and Liquid Level Mode (for measuring differential values). The Level Mode requires no configuration and can be used directly. The differences between the Liquid Level Mode and the Level Mode are illustrated in Figure 8.

7.2.1 Liquid Level Mode

Installation position (B) represents the total height from the tank bottom to the probe end face of the level transmitter; A denotes the distance from the probe end face to the liquid surface; and D is the liquid level height, calculated as $D = B - A$. When this function is used, the level transmitter displays the liquid level height (D).



Figure8

7.2.2 During the Position Mode

Installation position (B) = 0: When this function is used, the level sensor displays the value as the distance from the probe surface to the liquid level.Distance (A).

7.3 Working Environment and Filtering

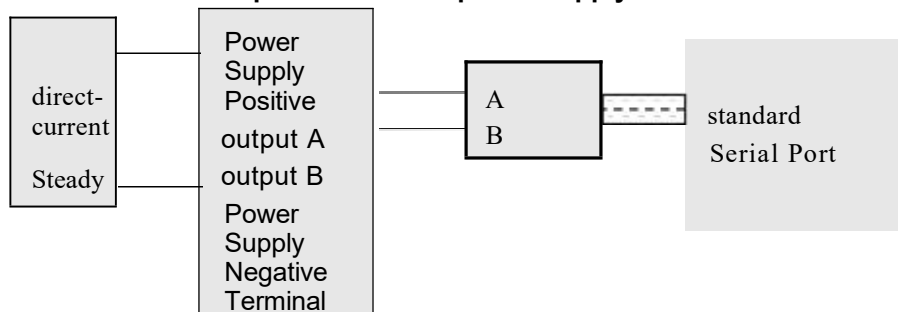
The device defaults to enabling dynamic filtering, which effectively removes fixed obstructions such as mixing components, tank walls, and crossbars that cannot be avoided. However, this function may not be reliable in completely sealed confined spaces or environments prone to secondary echoes. If the displayed value consistently shows erroneous values approximately twice the actual value, change the "Working Environment" setting to "Sealed".

7.4 Power Supply: It is recommended to use a DC regulated power supply with a voltage of 5 V and output power greater than 5 W. When using a switching power supply for DC power, the negative terminal must be connected to ground. Refer to the

instruction manual or the serial number on the level sensor's housing label for installation wiring. To ensure stable operation and accurate analog output, run the device for at least 15 minutes before normal use. Tighten the rear cover to prevent water ingress or dust accumulation. During outdoor operation, install a sunshade above the level sensor to protect it from direct sunlight and rain, and implement lightning protection measures.

VIII Control Schematic Diagram

8.1 Schematic diagram of serial port output connected to a PC
External Power Supply: This device uses a 485-232 power cable for power supply.
External Power Supply: This device uses a 485-232 power cable for power supply.
485-232
External Power Supply: This device uses a 485-232 power cable for power supply.



IX Common Complex Phenomena and Management Strategies

order number	Complex Issue	Possible causes of the problematic issue	Methods for resolving difficult issues
1	Does not function properly when powered on. No display	The operating voltage is too low; the instrument does not function. Alternatively, the voltage is too high; the instrument is damaged.	Use the instrument's dedicated DC power supply and contact the dealer.
2	Measure the number Changes with varying distance	① The input operating voltage is too low, causing the instrument to malfunction. ② The instrument's sensor or power driver is damaged.	① Use a dedicated DC power supply. ② Contact the distributor.
3	The display shows that the measured values fluctuate or do not vary with distance...	① The instrument is installed at an excessive angle. ② Improper pulse intensity settings result in excessive residual vibration or diffraction. ③ More than two instruments are operating simultaneously, causing mutual interference. ④ The electromagnetic interference in the operational zone is excessively high.	① Adjust the sensor axis to be perpendicular to the target plane. ② Adjust the pulse amplitude of emission signals. ③ Implement measures to eliminate mutual interference. ④ Identify the source of interference and mitigate it.
4	The level error is too large	① The installation is not vertical, causing multiple reflections. ② If installed too close to the tank wall, sound waves may be reflected en route. ③ Check whether the draft depth setting	① Adjust the installation position repeatedly. ② Set the draft depth value correctly. ③ If there is a large temperature

		is correct. ④ Verify that the temperature reading is normal.	difference, adjust the temperature correction menu to the correct value.
5	The serial port cannot communicate.	① The serial ports A and B are connected in reverse. ② The serial port configuration parameters do not match those of the host.	① Any changes to wiring or parameter resets must match those on the host computer.