

LSM-01 ultrasonic level meter User Manual



SUMÁRIO

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1. Overview

The two-wire ultrasonic level meter is a unit that draws on the best of others and draws on the advantages of various level meters at home and abroad. A universal level instrument with a fully digitalized and humanized design concept, with complete level measurement and control functions. Data transmission function and man-machine communication function. The main chip adopts imported industrial grade single-chip microcomputer, digital temperature compensation and wide voltage input voltage stabilization, etc... related special integrated circuits. It has strong anti-interference. This machine is a reinforced nylon waterproof case. Because it is a non-contact detection method, it is more hygienic than other instruments, and is more resistant to harsh environments such as humidity, dust, high temperature, and corrosive gas. It has the characteristics of high reliability, no pollution, stable performance, and low price. Therefore, it can be widely used in various fields related to the measurement and control of material level, material level and liquid level.

The new upgraded version adds the HART protocol communication support, which makes up for the shortcomings of the two-wire instrument without data output, and can directly communicate with HART field instruments.

2. Characteristics

2.1 Product features

- DC24V DC wide voltage work
- 4 ~ 20mA current output.
- HART Protocol.
- Friendly design.
- Military quality.
- Digital filtering and echo recognition
- Digital temperature compensation.
- ABS plastic.

2.2 Technical Parameters

Range: 5m

Dead zone: <0.3m

Error: 0.25% F.S

Display: four eight-segment 0.36-inch LED (optional LCD)

Minimum display resolution: 1 mm

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Keyboard: Three-patch button

Operating frequency: 20 ~ 350KHz (due to different specifications and models)

Optional power supply: 24VDC

Power Consumption: <1.5W

Output mode: 4 ~ 20mA RL > 600Ω

Instrument Material: ABS engineering plastics

Overall dimensions: 75mm × 132mm × G1 1/2

Installation interface: G1 1/2 pipe with large gong ring (diameter 47mm)

Electrical connection: PG7

Incoming cable: 1.5m (optional length)

Working environment: room temperature, atmospheric pressure

Protection class: IP65

3. Operation and parameter settings

3.1 Key functions

| | |
|-------|--|
| A key | Normal operation - Menu key: Enter the password input interface. |
| | Menu item interface - page key, return key: menu to scroll back to the previous level. Long press to exit to normal working condition. |
| | Input Status - Enter: Confirm the data entry and exit the menu. |
| B key | Menu item interface: Enter the menu or enter the state. |
| | Input Status - Shift Key: Moves the cursor to the right. |
| C Key | Menu item interface - Page up key: Press the key on the menu. |
| | Input interface - Addition keys: From 0 to 9, minus sign, the decimal point is so circled. |

3.2 Enter menu interface

In the normal measurement interface, press (A key) to display the password input, the default password is "0000". Press (A key) to confirm the input and enter the default menu interface.

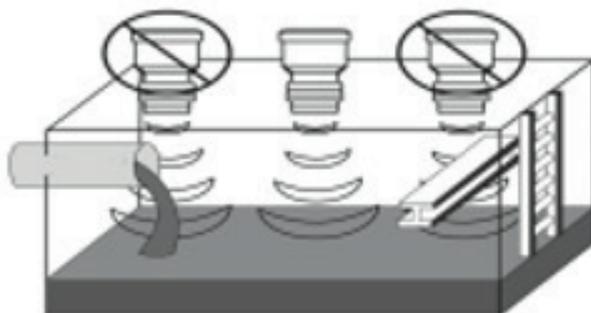
3.3 Menu function

| | | | |
|----------|------------------|----------------|--|
| Mounting | <u>Wrok mode</u> | Mount height | For setting mounting height. Set the distance from the end of probe to the liquid surface. Must be between 0 to range max. Note (see item 4.2). |
| | | Level Value | For setting level Value. Set the distance end of the liquid level. Must be between 0 to range max. Note (see item 4.2). |
| OUTPUT | Analog | FO | For setting output start point. Set value which corresponds to 4mA output current. Must be between 0 to range max. Factory default is 0. |
| | | FS | For setting output end point. Set value which corresponds to 20mA output current. Must be between 0 to range max. Factory default is max range. |
| | HART | <u>SI Addr</u> | Address protocol HART 000 |
| Display | Unit | | For selecting level unit. |
| | | | Level can be in: Inch (in) Foot (ft) Yard (yd) Millimeter (mm) Centimeter (cm) Meter (m) - is default |
| | Covert | | |
| | Contrast | | For setting the contrast level. Contrast control will become brighter when value approaches zero (0). Ranges from 0 to 9. Factory default is 0. |
| | Display delay | | For setting the delay of display. Set value of delay 100 to 900 milliseconds. Factory default is 900. |
| Probe | Filtering | Filter | For selecting filter applied in the probe reading. Filter can be in: Fast - is default Normal Stable None. |
| System | Language | | For selecting language. Language can be in: Chinese English - is default |

4. Installation

4.1 Installation of the probe

Probe simultaneously produce ultrasonic pulse and detection echo, ultrasonic pulse wave with a certain cone-shaped wave surface from the probe surface to spread out. There should be no obstructions in this area and away from the feed opening. The probe should be installed in a position where there is no obstruction between the emitter of the probe and the medium to be measured. See Figure 1.



The shape of the container should be considered when installing the probe. If the probe is installed incorrectly, a container of a certain shape will generate a secondary echo. These problems are mainly concentrated in the conical and spherical tank top. This special shape magnifies the emitted echoes to produce an erroneous reading. Choose the correct installation location to solve this problem. See Figure 2.

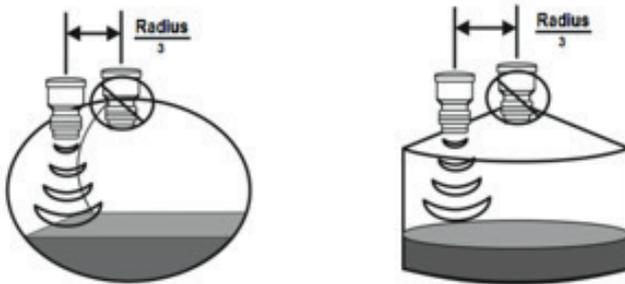


Fig. 2

The probe can be mounted with flange or standard G 1 1/2 thread (installation interface and object). Whether flanged or threaded, or with or without a cone, ensure that the bottom of the probe protrudes from the bottom of the process interface. Figure 3 illustrates the correct installation method.

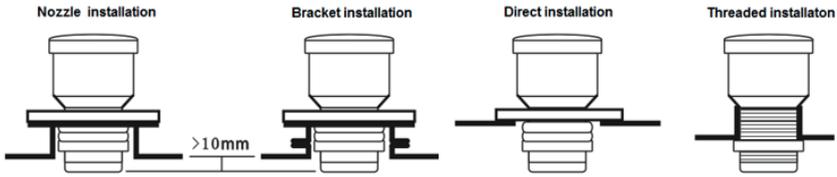


Fig. 3

The probe should be installed so that the acoustic path between the transmitter and the vessel wall is kept within the desired area as shown in Figure 4. If the installation distance is less than the distance specified in the ideal area, the probe should be installed in the “minimum space” area. If the distance from the side wall is still below the “minimum pitch” line, the transmitter may not be able to measure the level correctly. See Figure 4.

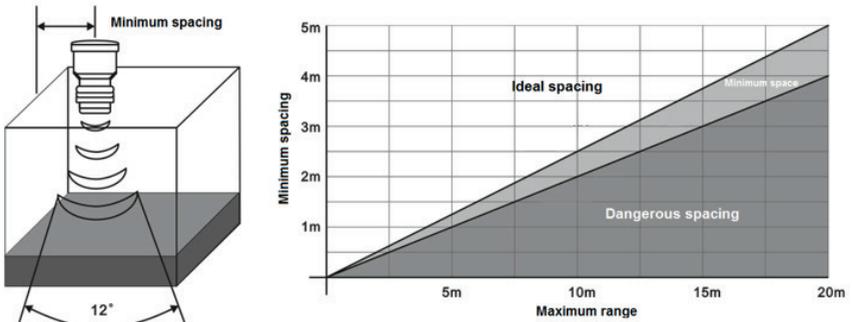


Fig. 4

In the solid material measurement, the probe should be installed at a distance from the wall of $\frac{1}{3}$ of the side wall to the center of the inlet. When the material is stacked, it will form a conical surface. The probe mounting positions shown in Figure 5 will give a reading of the average material level, which is the height of the material level when the material is level. This is true for the conical stacking or the concave stacking surface that occurs during unloading.

The average level measured for this installation is only valid for cylindrical containers and the feed opening is at the centerline of the container. In the case of containers of other shapes or where the inlet is not in the neutral position, the probe shall be installed in accordance with the requirements of the user and shall comply with the foregoing requirements.

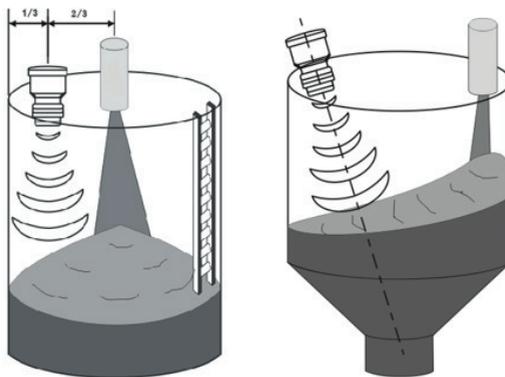


Fig. 5

The average level measured for this installation is only valid for cylindrical containers and the feed opening is at the centerline of the container. In the case of containers of other shapes or where the inlet is not in the neutral position, the probe shall be installed in accordance with the requirements of the user and shall comply with the foregoing requirements.

The surface is calm and no wave of liquid, ultrasonic measurement will get the best results. If the liquid surface debris, bubbles or large fluctuations, should be installed with a waveguide. The waveguide diameter should be greater than 120mm, and no joints. Figure 6

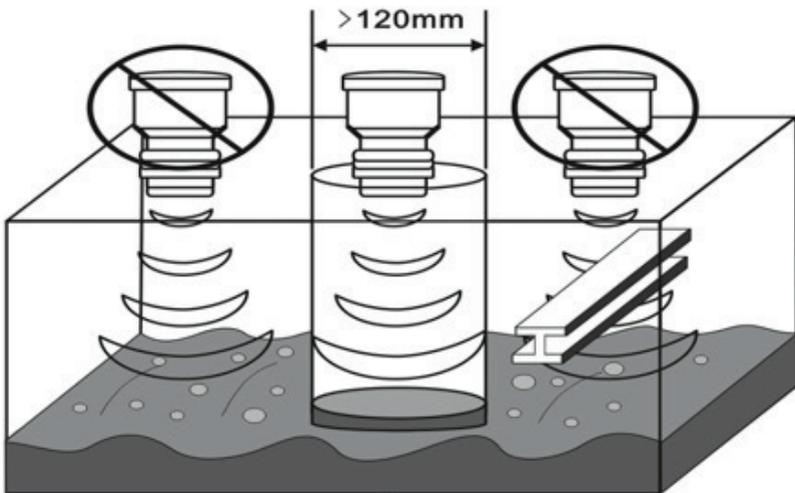


Fig. 6

4.2 Liquid and height Level Mode

This product has a level mode (measured high) and liquid level mode (measured difference), level mode is not used for any settings directly.

In the liquid level mode, A is the distance from the end of the probe to the liquid surface, D is the height of the liquid surface, $D = B$ (mounting position) - A, when using this function, the installation position (B) is the total height of the tank bottom to the level probe head, the level meter shows the level of the liquid level (D).

When using level mode for measured height, the level meter shows the distance from the end of the level gauge probe to the liquid level (A). See in figure7.

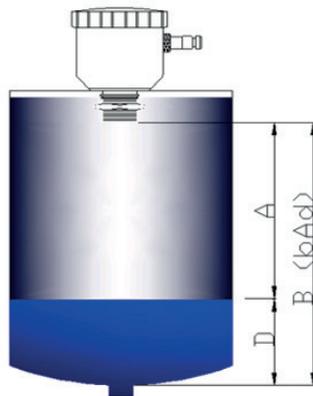


Fig. 7

4.3 Terminal description

The device must be switched on according the figure 8, using the recommended voltages and tolerances. The use of HART modem is optional. The current generated can reach 1 to 21mA outside normal operation.

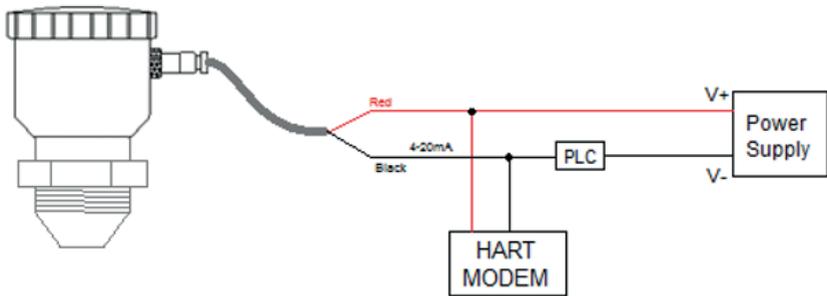


Fig. 8

4.4 Recommendations for use

It is recommended to use 24V greater than 2W DC power supply, if the use of switching power supply DC, the DC power supply must be connected to the ground. Please refer to the instruction manual or the fuselage label of the level meter to ensure the stability of the machine and the accuracy of analog output, please use the power for 15 minutes before normal operation. Tighten the rear cover to prevent water or dust. When working in the field, please take the sunshade above the level meter to avoid the direct sunlight and rain, should take lightning protection measures.

4.3 Terminal description

1, the sensor does not work

Difficulties:

After the power does not work, no display, the sensor no sound.....

Possible causes of the problem:

power is not connected, or positive and negative reverse.

working voltage is too low, level meter does not work or too high,

the instrument has been bad.

Difficulties to deal with:

Check the wiring, according to the manual cable.

Use 24V DC power supply, and contact the dealer.

2, the product is not displayed

Difficulties:

The sensor has a working sound, no display

Possible causes of the problem:

(1) Program OFF operation has been performed.

has received high voltage, display chip is damaged.

Difficulties to deal with:

Press B to open the display.

□ contact with the dealer.

3, the value does not change

Difficulties:

There is a display sound, but the number does not change with the distance change

Possible causes of the problem:

input voltage is too low, the ultrasonic level meter at the end of normal work.

ultrasonic level sensor sensor or power driver has been damaged.

Difficulties to deal with:

use 24V DC power supply.

contact with the dealer.

4, the value of bounce

Difficulties:

There is a display, a sound, the measured value of bounce or the value does not change with distance ...

Possible causes of the problem:

Level meter installation is too skewed.

pulse intensity is set improperly, resulting in Yu Zhen or diffraction.

There are more than two level instrument in the work, resulting in mutual interference.

electromagnetic interference in the working area too.

liquid surface with bubbles or debris.

Difficulties to deal with:

(1) Adjust the sensor axis perpendicular to the target plane.

1-3m within the general range, the emission pulse intensity of 2-5.

try to eliminate mutual interference. to identify the source of interference, screen open interference.

eliminate surface bubbles and debris.

5, show the blind zone or over range

Difficulties:

The sensor has sound, the display was blind or over-range range

Possible causes of the problem:

beyond the level gauge range. measuring surface from the probe too close.

improper use in high dust. High foam. High steam environment or operating temperature is too high or too low; pulse intensity is set properly.

Difficulties to deal with:

(1) Adjust the actual measuring range of the level meter to the working range of the level meter.

Adjust the application environment to the required range.

modify the intensity of emission pulse size, to show stability.

6, the error

Difficulties:

Sensor sound, the level of error displayed more than ten centimeters or more ...

Possible causes of the problem:

installation is not vertical, resulting in multiple reflections.

install too close to the tank wall, acoustic reflection halfway.

(3) Check whether the difference "Setting position" is set correctly.

Check the temperature indication is normal.

Difficulties to deal with:

(1) Adjust the mounting position repeatedly. □ Set the BD.00 value correctly.

If the temperature difference is large, adjust the "CB" value to the correct value.

7, the current output is not normal

Difficulties:

4-20mA output is not normal; high, low, beating

Possible causes of the problem:

load resistance is too large.

(2) Range "End of Range" is modified, and the output trimming parameter "Output Low End Trim" or "Output High End Trim" is modified.

power rectifier, filter is not good.

power is not enough time.

Difficulties to deal with:

reduce the load resistance

self-adjust the relevant parameters.

replace the larger DC power supply capacity.

Power on > 15 minutes preheating.



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