



# High Frequency Liquid Level Sensor

1、Name : UM0017-000

Model: FA02T01-UM0017Z

## 2、Product Overview

High Frequency Ultrasonic Sensor UM0017-000 is a non-contact detect device with high accuracy. This product is installed under the bottom of containers, so it can prevent the detected object from polluting. It features in high accuracy, high sensitivity, excellent directivity, stability and reliability, and it is waterproof. It has been widely used as a drinking water level meter.

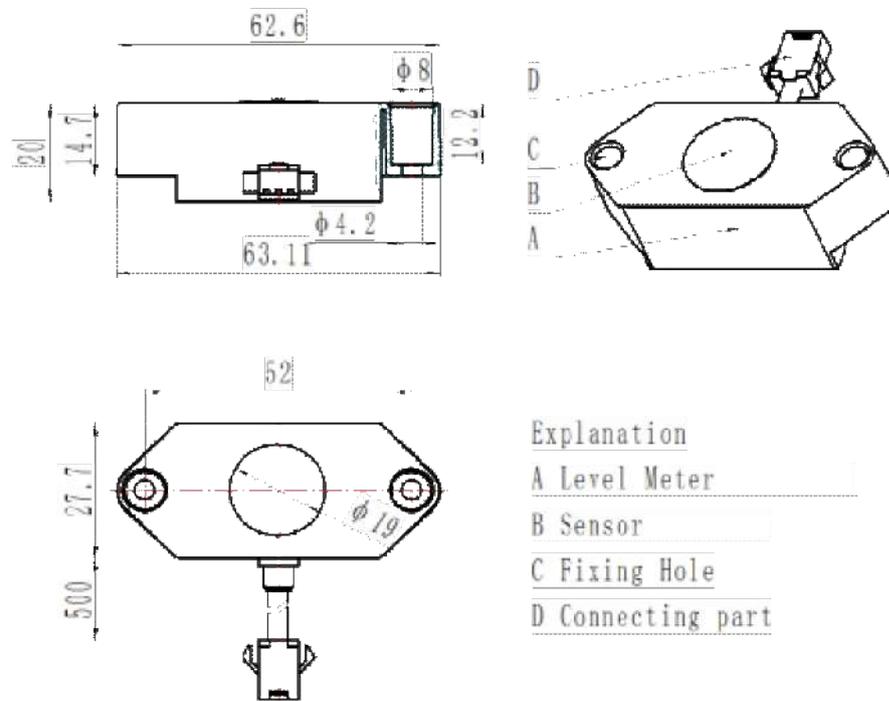
## 3、Application

- Detect level of normal temperature liquid
- Detect liquid level in the drinking fountain
- Detect liquid level in the storage container

## 4、Electric Property

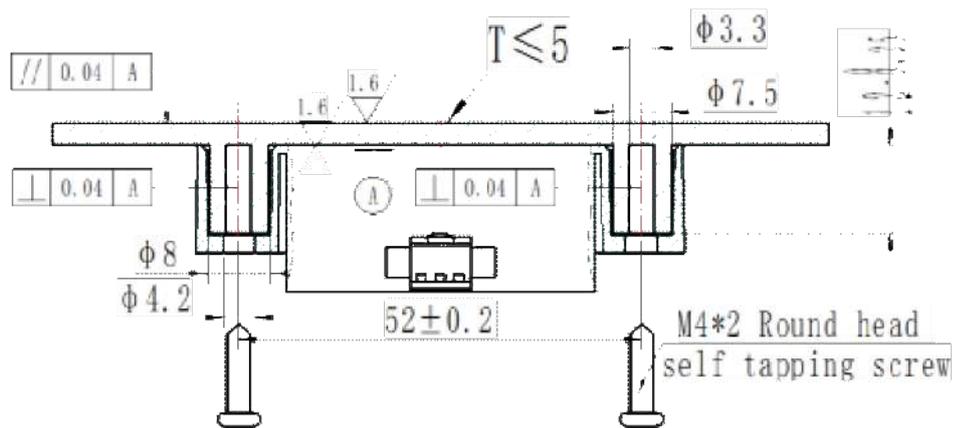
<b>Measure Mode</b>	
Measuring Principle	Application principle of ultrasonic
Typical Application	Detect liquid level of food grade: Drinking Fountain、coffee maker、beverage machine
<b>Specification</b>	
Detect Range	20~400mm
Frequency	1.38MHZ
Accuracy	±5mm 30℃
Response time	≤500ms
<b>Output</b>	USART Serial
Digital	Output digital value of sixteen bit binary code(Refer to 8、output protocols)
<b>Rated Operate Condition</b>	
Operation Temperature	+5~+50℃
Storage Temperature	-10~+60℃
<b>Power Supply</b>	
Power	DC 5±0.5V
Rated current	≤12mA
<b>Design</b>	
Material	ABS
<b>Installation Instructions</b>	
Screw torque	≤ 3.5Kg
Assembling safety distance (The distance between the sensor and the container wall	≥ 50mm
Material requirements of the tank	Material, Such as ABS、PP、PMMA, ect

### 5、Dimensions



Dimensions

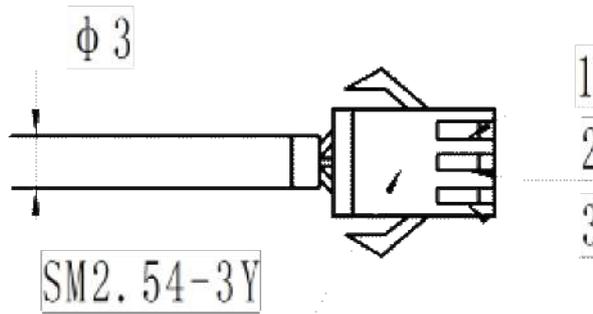
### 6、Installation drawing



Installation Drawing

### 7、Interface Control

Use lead output, there is a SM2.54-3Y pin on the lead. The name of the lead is shown as below:



Lead NO.	Lead Color	Function of pin	Remark
1	Red	VCC	DC 5V
2	Black	GND	Grounded
3	Brown	OUTPUT	USART Serial

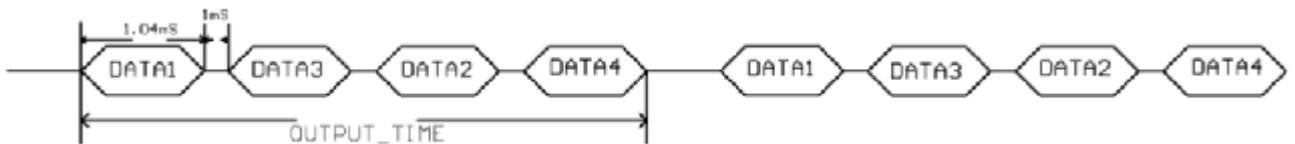
## 8、Output Protocols

The data of the sensor is consist of boot code 0xFF (DATA1) , distance signal (DATA2+DATA3) and LastFrame 0x00 (DATA4)

It transfers the low 8 bits data3 first, then transfers the high 8 bits data2.

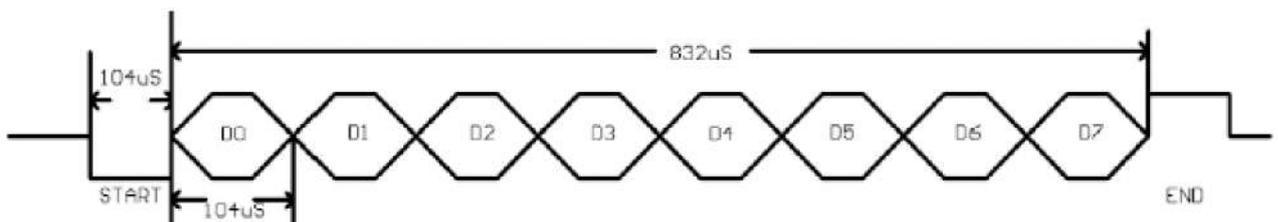
Shown as drawing 2:

Among which: DATA2 DATA3 is sixteen bit binary code: 0000 0000 0000 0000-0000 0001 1001 0000  
 Corresponding decimal value : 0mm-400mm



Drawing 2

The timing length of each data bit is 104us, i.e baud rate is 9600BPS. The data output form: low level start bit + eight digit bit + high level end bit (no parity). Shown as drawing 3



Drawing 3

Example:

The received data is: DATA1=1111 1111, DATA2=0000 0001, DATA3= 0001 0100, DATA4=0000 0000  
 Convert to decimal value, the distance value is : 276mm.



Remark:

1. Instruction:

Detective distance	0-20mm	20-400mm	400-500mm	>500mm
output value (hexadecimal)	0	14-190	190	FFFF

2.It shows "0" when the machine is started up and there is no water in.After filling water for a continuous time, if it still shows "0" or there is no value shows up.It can be caused by the failure of detector. The user should immediately be alarmed and take corresponding action, This product has no self-check function, the user can adjust it according to his request when designs his product.

3.This product calculates the distance based on the conditions of environment temperature 30 °C, relative humidity 50% , It can meet the accuracy to be ±5 mm in the full measurement range. As ultrasonic sensor is sensitive to temperature , in ording to guarantee the accuracy in temperature usage range , it has to add temperature compensation accordingly. Reference temperature compensation table as below.

temperature compensation table

Temperature (°C)	Coefficient
5	0.945
10	0.959
15	0.971
20	0.982
25	0.992
30	1
35	1.007
40	1.013
45	1.018
50	1.022
Eventually distance =Output Data * Coefficient	

9、 Publish History

Version	Date(MM/DD/YY)	DWN	Statement
A1.0	10/6/2012	陈伟健	Final compilation , amend on dimensions and installation instructions

**CUSTOMER APPROVAL:**

DATE: