



DATASHEET

L02 Series Sensor Module

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Product Description

1. General

The L02 series liquid level sensor breaks through the traditional installation method, and realizes the real non-contact measurement of the liquid level height, upper and lower limit alarms in the airtight container.

The sensor is installed directly below (bottom) of the container to detect the height of the liquid level. It can be installed on the outer wall of the container to detect whether there is liquid in the container at the monitoring point. There is no need to open a hole in the container, easy to install. It can accurately measure the level of various toxic substances, strong acids, strong alkalis and various pure liquids in high-temperature, high-pressure airtight containers.

2. Features

- Non-contact measurement of liquid level
- 2.8V~5V working voltage
- Real-time tracking of the whole range, no need to restart when refill the empty container.
- Easy to install and debug
- Multiple output interfaces
- Working temperature -15°C to +60°C
- Storage temperature -25°C to +80°C
- Resolution 1mm
- Anti static electricity design, in accordance with IEC61000-4-2 standard.

3. Advantages

High protection level

Strong anti-interference

Stable and reliable data output

Strong anti-static

High measurement accuracy

Intelligent algorithm to identify container material, adaptive blind zone

4. Applications

Real-time detection of liquid height in containers of dense materials such as steel, iron, glass, ceramics, and non-foamed plastics

Real-time detection of the liquid level height of pure single liquid or miscible mixed liquid without serious deposition

The shape of the measuring container is relatively regular, and the surface is relatively flat

Applied to smart water cups, smart beer barrels, LPG cylinder level and other smart liquid control systems etc.

Item	L023MUW	L023MTW	L023MGDW	L023MPNW	Unit	Remark
Operating voltage	2.8~5	2.8~5	2.8~5	2.8~5	V	DC
Standby current	1	1	1	1~8000	uA	
Average current	2.5~5	2.5~5	2.5~5	2.5~15	mA	(1)
Blind zone	Adaptive	Adaptive	Adaptive	Adaptive	mm	(2)
Height of liquid level	20~2000	20~2000	20~2000	20~2000	mm	(3)
Working cycle	1	Controlled	1	1	s	
Output interface	UART Autoe	UART Controlled	TTL Switch	PNP/NPN Switch		
Resolution			1		mm	
Response time			1		s	
Repeated measurement error	±1	±1	-	-	mm	(4)
Accuracy	±(5+S*0.5%)	±(5+S*0.5%)	-	-	mm	(4)
Beam pattern	3~12	3~12	3~12	3~12	°	(5)

Remarks:

(1)The lower the power supply, the lower the current. Operating current of 2.8V power supply for 1S duty cycle is 2.5mA.

(2)Under normal temperature, the blind zone of 1mm thickness plastic container is 15mm, 1mm thickness iron plate container is 40mm, a 2mm thickness steel container is 20mm. Blind zone is related to the material and thickness of the tested container.

(3)The data obtained from 2mm thickness steel material bottom plate container at room temperature, the container is $\Phi 160$ mm white PVC pipe.

(4)The data obtained from different container materials and thickness tests will be different.The data is obtained by testing a 2mm thick steel plate container at room temperature, and S represents the current liquid level.

(5)The lower the liquid level, the smaller the measurement angle. At room temperature, the water level is measured for a container with a $\Phi 110$ mm white PVC pipe and a 2mm thick bottom steel plate, the liquid level is below 1000mm.

2.Environment

Item	Minimum value	Typical value	Max value	Unit	Remark
Storage Temp	-25	25	80	°C	
Storage Humidity		65%	90%	RH	(1)
Operating Temp	-15	25	60	°C	
Operating Humidity		65%	80%	RH	(2)

Remark:

(1) Environment temperature is 0-39°C, max humidity is 90%(Non-condensation)

(2) Environment is 40-50°C, max humidity is the highest at current temperature in nature.

3.Electronics

Item	Minimum value	Typical value	Max value	Unit	Remark
Operating voltage	2.8	5	5.25	V	
Peak current			130	mA	DC5V
Input ripple			50	mV	peak to peak value
Input noise			100	mV	peak to peak value
ESD			$\pm 4K/\pm 8K$	V	(1)

Remark:The probe shell and output pin comply with the IEC61000-4-2 standard.

Sensor Selection Instruction

This series of sensors including four types according to the output format, user can choose the corresponding product model according to the actual use needs. These four output formats are optional before ordering, and the same sensor does not support two or more than two formats to output at the same time.

Series	Model No.	Output interface
L02 Series	DYP-L023MUW-V1.0	UART Auto output
	DYP-L023MTW-V1.0	UART controlled output
	DYP-L023MGDW-V1.0	TTL High, Low level output, no drive capability
	DYP-L023MPNW-V1.0	PNP NPN output, Load capacity up to 100mA

Reliable testing Instruction

No.	Description	Testing condition	sample QTY	remark
1	High temperature and humidity	65°C, 85%RH, Power ON@5V, 72hrs	3	
2	low temperature	-20°C, Power ON@5V,72hrs	3	
3	High temperature and humidity storage	80°C, 80%RH, storage, 72hrs	3	
4	Low temperature storage	-30°C, storage, 72hrs	3	
5	Vibration test	10-200Hz,15min,2.0G, XYZ three axes, each axis is 0.5 hours	3	
6	Drop test	120cm free fall, 5 times on wooden floor	3	

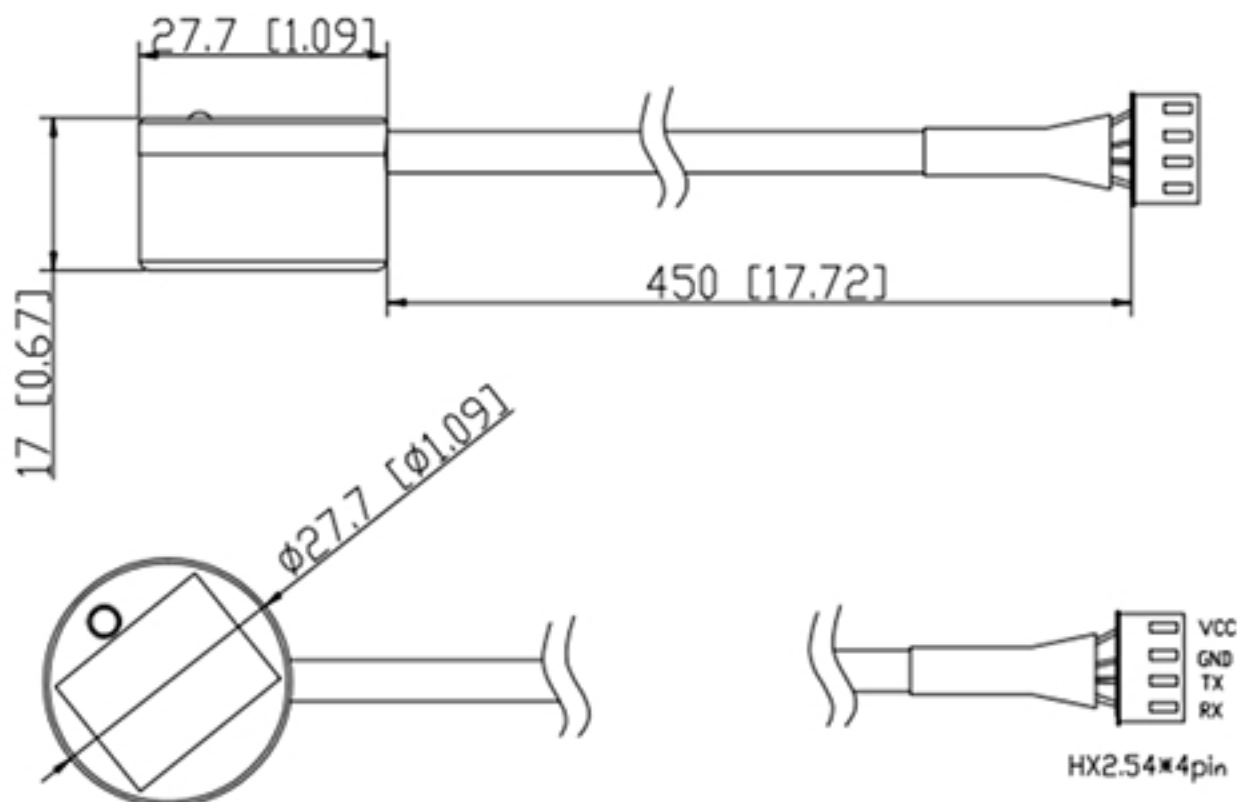
Note: After the test, the module is determined to be OK after the function test, and the performance degradation rate is $\leq 10\%$.

Notice

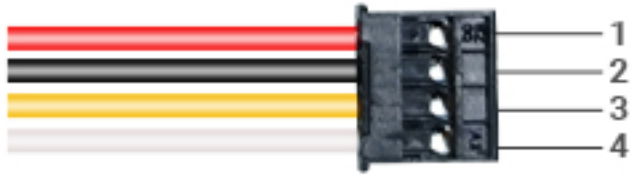
1. Containers of different materials such as steel, glass, iron, ceramics, non-foamed plastics and other dense materials at room temperature, have different detection blind zone and detectable limit heights.
2. Same material container at room temperature, different thickness of container with different blind zone and detection limit height.
3. The detected liquid height value is unstable when the detected liquid level exceeds measuring range of the sensor, or the liquid to be measured shakes or tilts.
4. Please pay attention to the evaluation of electromagnetic compatibility when designing. Unreasonable system design may cause malfunction of the module.
5. When the boundary application of the product limit parameter is involved, you can contact after sale service dept. to confirm the relevant precautions.
6. The company reserves the right to change this document and update the functions without prior notice.

Mechanics

1. Mechanical Dimensions (mm-inch)



2. Pin out



Pin No.	Mark	Description	Remark
①	VCC	Power Input	
②	GND	GND	
③	TX/H	Functional PIN	UART output/Positive TTL output/ PNP output
④	RX/L	Functional PIN	UART Output/Negative TTL output/ NPN output