Parameter Manual

S01 liquefied gas detector

Product model: DYP-S01-V1.0

Document version: V1.0

Confidentiality: Outbound

Table of content

1. Overview

Summary

The S01 liquefied gas detector is a sensor device that uses high-frequency ultrasonic detection technology to measure the height of the liquid gas substance without contact. S01 has high measurement accuracy, low power consumption, easy to use, external installation (without destroying the container structure), and WIFI networking equipment to realize network monitoring and management.
The S01 liquefied gas detector can adapt to a variety of liquefied gas tanks. When the liquid level in the liquefied gas tank changes, the current status is indicated by LED and voice prompts, and the information is sent to the remote platform through wireless technology. By analyzing the liquid level status information, the receiving end can determine the consumption status of the liquefied gas, the refueling situation, and the gas leakage alarm. The data is provided to the head of the household or the server for tracking, reminding, and maintenance.
S01 Liquefied Gas Detector is referred to as S01 hereinafter.

Product feature

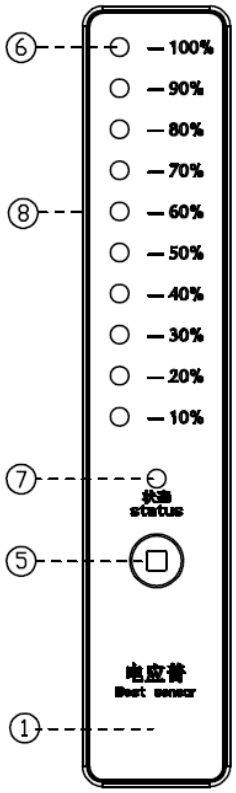
- Non-contact measurement, no need to change the shape of the container, no need to polish the surface paint of the container.
- Built-in powerful magnets, external fixed adhesive stickers, simple installation and firm fixing.
- High frequency ultrasonic detection, high solid penetration, suitable for various liquefied gas tanks.
- High-precision measurement output, built-in temperature sensor correction, millimeter-level measurement resolution.
- High stability measurement output, built-in anti-interference data processing model.
- Powered by 4 AAA batteries.
- 2.4G WIFI networking, support WIFI hotspot direct connection.
- Support MQTT protocol.
- Low power consumption management technology, sleep current: ≤15uA.
- Support Chinese voice broadcast.
- The mechanical buttons are easy to operate. 11 LEDs can indicate the current operating status and remaining air volume.

Scope of application

- Civil liquefied gas volume detection.
- Measurement of liquid gas filling in gas stations.
- Liquid level measurement in storage tank.

2. Appearance description

Schematic diagram of the appearance of the host



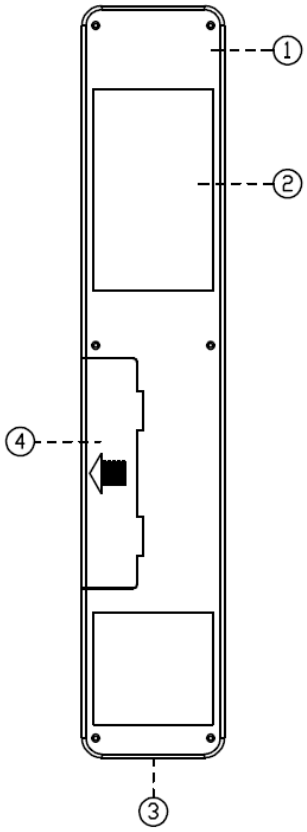


Figure 1 Front of S01 host Figure 2 Back of S01 host

① The main body is made of plastic material with built-in powerful magnets to provide convenient installation support for the tank with magnetic characteristics.
② The strong waterproof adhesive tape on the back can firmly stick the host to the surface of the tank without magnetic attraction, and fix it more firmly.
③ Probe interface, the connection sequence is: host <—> extension cord <—> probe, plug-in connection.
④ The battery compartment contains four AAA batteries for power supply.
⑤ The main key, click once to realize the measurement, wake-up and other functions, long press for 10 seconds to restore the factory settings.
⑥ 10 LED percentage indicators, showing the percentage of remaining gas (the default range is 1 meter, the percentage is calculated from the height of the liquid level and the range ratio).
⑦ LED status indicator, indicating the network status.
⑧ The sound hole of the horn, the voice state reminder, broadcast the measurement data.

Schematic diagram of probe appearance

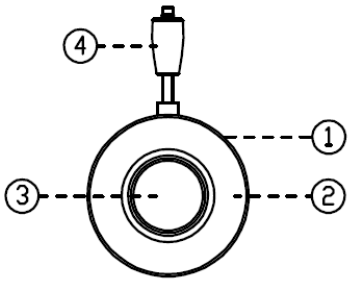


Figure 3 The front of the probe Figure 4 The back of the probe

① The probe is a plastic body shell with built-in powerful magnets to provide installation support.
② The strong waterproof adhesive tape can firmly stick the sensor to the surface of the container, strengthen the signal coupling, and fix it more firmly.
③ The surface of the ultrasonic transducer, the core sensor, is used for the mutual conversion of ultrasonic mechanical energy and electrical signals.
④ Probe signal connector, the connection sequence is: probe <—> extension cord <—> host, plug-in connection.

3. Use guidance

1. Man-machine operation

After S01 is powered on or press the main button, it will work once. After the measurement is completed, the liquid level will be announced by voice, and will also be broadcast when the measured temperature and battery power change; then the WIFI network will be started and the measurement data will be sent to the server. The LED lights simultaneously indicate the remaining gas percentage and the network status. 120 seconds of no operation will automatically enter the sleep mode to save power. Please refer to the detailed workflow
"DYP-RD-S0 Liquefied Gas Detector Work Flow Chart" document.

2. Mobile web access

The mobile phone and S01 can be directly connected through a WIFI hotspot, or through the same wireless router's local area network, using a browser to access the web page. For detailed operation methods, please refer to the document "S01 Liquefied Gas Detector Mobile Web Page Operation Guide".

3. Network communication protocol

S01 communicates wirelessly via WIFI. For detailed protocol format and connection method, please refer to "S01 LPG Detector MQTT Protocol Description", "S01 LPG Detector LAN Communication Protocol", "S01 Liquefied Gas Detector APP Development Docking Method" document.

4. Parameters

1. Basic parameters

Parameter	value	unit	Remarks
Working current (online)	≤90	mA	(1)
Working current (offline)	≤20	mA	(1)
Sleep current	≤15	uA	(1)
WIFI frequency band	2400 M～2483.5 M	Hz	2.4G
WIFI receiving sensitivity	802.11 b: -91 (11 Mbps) 802.11 g: -75 (54 Mbps) 802.11 n: -72(MCS7)	dbm	
Measuring range	35～1000	mm	(2)
measurement accuracy	≤10	mm	(2)
Resolution	1	mm	
Measuring angle	≈4	°	(3)
Measurable container thickness	1.0～5.0	mm	(4)
Power supply	Four AAA batteries, single battery specification 1.5V	-	
Battery life time	≥250	day	(5)

Remarks:

1) The more the battery power is, the lower the power consumption current is; when the battery power is lower than 4.3V, WIFI cannot wake up and connect to the Internet.
2) Normal temperature and humidity, 1 standard atmospheric pressure, and the measuring medium is propane liquefied gas (LPG); if testing other gas, please specify first when ordering.
3) The reference angle when the daily 15KG liquefied gas tank is full.
4) The measurement distance is determined by the material and thickness of the tank. When the thickness is greater than 5.0mm for special materials or testing, please specify when ordering.
5) The evaluation condition of standby time is: 800mAH Nanfu battery power supply; the number of times of reporting data per day is not more than 4 times, and the user does not operate the buttons.

2. Rated environmental conditions

project	Minimum	Typical value	Maximum	unit	Remarks
Storage temperature	-25	25	70	°C	
Storage humidity		65%	90%	RH	(1)
Operating temperature	-15	25	60	°C	
Working humidity		65%	80%	RH	(2)

Note:

1) When the ambient temperature is 0-39℃, the maximum humidity is 90% (non-condensing).
2) When the ambient temperature is 40-50℃, the highest humidity is the highest humidity (non-condensing) in nature at the current temperature.

3. Rated electrical conditions

Parameters	Specification			Unit	Remarks
	Minimum	Typical value	Maximum		
Operating voltage	4.3	6	6.8	V	
Peak current	300		450	mA	Peak to peak

Input ripple			200	mV	Peak to peak
Input noise			500	mV	Peak to peak
ESD			±4K/±8K	V	(1)

Note: (1) The shell and lead comply with the IEC61000-4-2 standard.

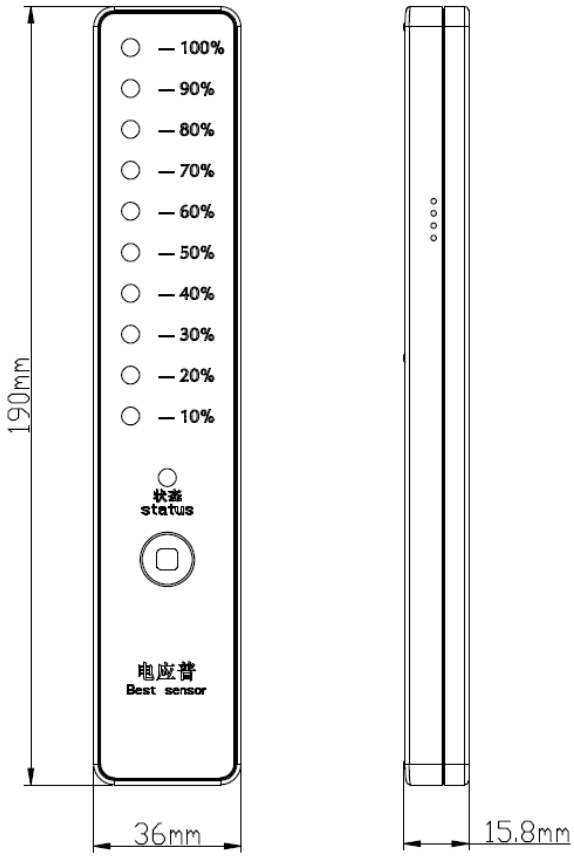
4. Reliability test conditions

Serial	Test items	Experimental condition	# of sample
1	High temperature and humidity work	60℃, 85%RH, Power ON@24V, 240hrs	3
2	Low temperature work	-15℃, Power ON@24V, 240hrs	3
3	High temperature and humidity storage	70℃, 90%RH, storage, 120hrs	3
4	Low temperature storage	-25℃，storage，120hrs	3
5	Vibration test	10-200Hz, 15min, 2G, XYZ 3 axis, each axis 0.5 hours	3
6	Drop test	1.2m free fall drop, 5 times at wood floor	3

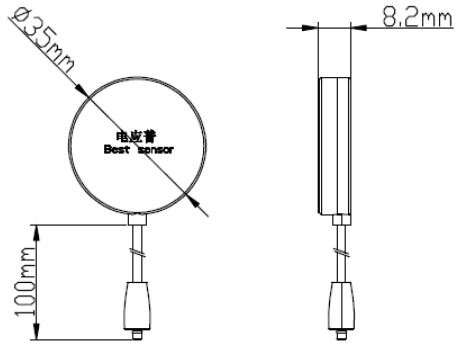
Note: After the test, the module is determined to be OK after the function test, and the performance degradation rate is ≤10%.

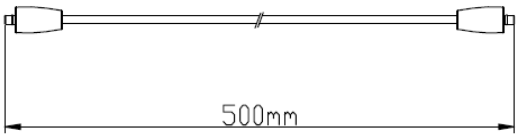
5. Dimensions

(1) Product main body size



(2) Sensor and connection size





5. Sensor selection instructions

Available product models for S01 are below:

Series	Model	Communication method	Remarks
1	DYP- S01 -V1.0	WiFi	

6. Precaution

1. The temperature range that can ensure the accuracy of liquefied gas detection is 0 to 35 degrees Celsius.
2. The default measuring medium of the product is liquefied petroleum gas (LPG for short), and the main component is propane.
3. When installing the S01 host and ultrasonic probe, you need to follow the installation instructions.
4. The battery life of the product is greatly affected by the frequency of user operations and networking.

7. Packing specifications

1. 1. The default is Denyong's conventional packaging method.
2. 2. Packaging materials can be customized according to customer IQC standards.
3. 3. The container transportation method needs to adopt the staggered consolidation method, and at the same time, the outer edge of the single stack needs to be wrapped with a reinforced gusset to provide sufficient support.

8. Version statement

The file version will be adjusted and updated with the product upgrade. Please consult the sales staff before using or understanding the product, or check the company website for the verification file version.