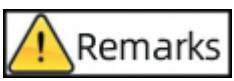
Handheld Laser Methane Gas Leak Detector

User Manual

Safety tips

Welcome to use S350MS handheld laser methane telemeometer. Before use and maintenance, please read this manual carefully and save this telemeometer together with the manual, hereinafter referred to as the telemeometer.

To ensure the safety of the telemetry and use, the following three signs are used on the instruction manual and telemetry to indicate the type of safety warning. Please follow these important contents.

	If the sign is ignored and incorrect operation is performed, it may cause serious accident or threat to life.
	Failure or product damage due to ignored identification and incorrect operation.
	It ers the possibility of missing useful or additional information if the logo is ignored.

catalogue

1. Must be read before use

1.1 User notice

Before using this product, please read this manual carefully. This manual covers all the important information and data in the product operation, and the users must strictly comply with its regulations to ensure the normal operation of the telemetry device. At the same time, the relevant information can help users to use the product correctly, and obtain accurate analysis results.

This manual details all information about the proper use of the telemetry. It provides an accurate reference for technicians who have received professional training or have relevant knowledge of instrument operation control. Before operating the instrument, ensure that the safety information and warning information mentioned in this manual are properly understood and apply them to practical operation. Due to various reasons, it is impossible to describe each manual in detail. If users need to know further about relevant information or solve problems not involved in this manual, please contact our after-sales department.

1.2 Quality assurance and disclaimer clause

You choose Henan Zhongan Electronic Detection Technology Co., LTD., which is equal to choose high-quality products. During the warranty period of all products, the instrument is free of maintenance; outside the warranty period, the corresponding device replacement fee shall be charged. If you encounter any problems during your use, please contact us and we will serve you in a timely manner. The whole instrument is guaranteed for one year.

After the warranty period or within the warranty period, they are uninsured maintenance, without free warranty service, our company reserves the right to charge any on-site maintenance fees. These faults include, but are not limited to:

1) Due to improper use (internal water, corrosion, fire, strong power string, etc.);

2) Force majeure (damage caused by earthquake, lightning strike, flood, etc.);

3) Change within the product without permission;

4) Not used according to the user manual and training regulations, causing product damage.

1.3 Safety precautions

Before using this instrument, make sure you have read and understood the safety precautions described below.

1.3.1 Precautions for the safe operation of the instrument

warn:

1. lease be sure to use in the corresponding environmental conditions.

2. When the instrument is working, do not aim the instrument laser at the eyes of people or animals, and do not look directly at the lens. The instrument laser may cause damage to the vision.

3. Do not charge the battery in places where explosive gas may exist.

1.3.2 Other safety precautions 

1, the instrument belongs to the optical precision equipment, do not try to disassemble or modify the instrument, if the instrument can not work properly or failure, please contact us;

2. If the instrument is accidentally dropped to the ground, or the instrument shell is damaged, please stop operating the instrument immediately, turn off the power supply of the instrument while confirming the safety of the environment, and contact us.

1.4 To avoid the failure

To maximize malfailure, read the following carefully. Instruments must

be operated, used and maintained in strict accordance with its labels, warnings and instructions.

1.4.1 Avoid the problems caused by condensation 

Taking the instrument from high to low temperature, or from low to high temperature, may cause condensation (water droplets) in the shell and interior of the instrument. To avoid this situation, let the instrument gradually adjust to the ambient temperature before use. If the condensation is produced inside the instrument, please immediately turn off the power of the instrument until the condensation is completely disappeared.

1.4.2 Precautions for using instruments when it rains 

The instrument can prevent the vertically falling water droplets from entering the instrument, but when the tilt angle of the instrument exceeds 15 degrees, the vertically falling water droplets may enter the instrument and cause damage to the instrument. Use the instrument when it rains, please take the corresponding rain prevention measures.

1.4.3 Notes for long-term storage 

1) The storage temperature of the telemetry instrument is (0~50) ℃, and the humidity is below 90%. If you fail to use the instrument for a long time, place the instrument in a cool and dry environment.

2) Do not keep the telemetry device in a violently shaken place.

1.4.4 Notes for normal use 

1) When using the telemetry instrument, do not squeeze the telemetry instrument hard or make it fall. If the LCD screen and window piece by strong mechanical impact, may be broken.

2. Product overview

2.1 Product function

The handheld laser gas telemetry instrument is composed of optoptic system, signal processing system, display and alarm system and housing components. It is mainly used to measure the concentration of methane or methane-containing gas (natural gas, gas or similar gas) at a long distance.

The telemetry device emits a beam of infrared laser to the detection point, which can quickly measure the air mass concentration between the detection point and the telemetry device. For ease of observation, the telemetry also emits a visible green laser to the detection point. The telemetry instrument can detect the methane concentration value of the checked position in real time and accurately, and display it. After exceeding the alarm value, conduct sound and light alarm, so that personnel can make subsequent disposal.

2.2 Detection principle

The measurement principle of this telemetry instrument makes full use of the absorption characteristics of methane gas for a specific wavelength. When the light beam is detected with methane molecules, part of the light beam will be absorbed by the methane molecule, and the methane gas mass concentration distributed between the target point and the telemetry instrument can be known by measuring the absorption rate.

2.3 Applicable occasions

This telemetry instrument is widely used in the gas transmission and distribution industry, and the applicable occasions include:

1) Gas pipe network patrol inspection;
2) Natural gas outdoor riser inspection;
3) Do not conduct indoor inspection of households;
4) Natural gas storage tank inspection;
5) Long-distance detection of dangerous gas leakage area;
6) Test the areas that are not easy to reach.

3. Product implementation standards

GB / T 3836.1-2021 The Explosive Environment-Part 1: General Requirements for Equipment
GB / T 3836.4-2021 Explosive Environment-Part 4: Equipment protected by an intrinsically safe "i"

4. technical parameter

Detection range: (0～50000) ppm·m (default, customizable)

Detection distance: (0-15) m, (0-20) m, or (0-30) m

Minimum detection limit: 5ppm · m

Accuracy: ±10%FS

Response time: 0.5s
Continuous working time: 8h
Power supply mode: lithium battery
Display mode: 1.47-inch LCD
Alarm volume: 70dB (at 1 m)
Explosion-proof certificate number: CCRI 25.2220X

Explosion-proof mark: Ex ia ⅡC T4 Ga/Ex ia ⅢC T_{200}130℃ Da

Protection level: IP68

Ambient temperature: (-20~50) ℃

Ambient humidity: (10~93)% RH, no condensation
Battery voltage: DC 3.7V
Battery capacity: 3400 mAh
Product size: 122 * 32 * 32mm
Product net weight: 220g

5. Key definition and operation instructions

5.1 Keys

There is a button below the product screen: the power button

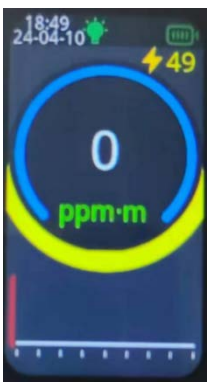
Long press the power button, start the instrument, wait for the equipment to warm up, the system will automatically enter the working mode and display the main interface. When stopping the detection, long press the power button to shut down the instrument.

In working mode, short press the power button to turn the indicator laser on or off.

Swipe down the screen to enter the function menu to set parameters and view history.

5.2 Main display interface

After the equipment is started and self-checked, it will automatically enter the main display interface, and the equipment can work normally. The main contents of the display include: concentration value, curve concentration value, return signal intensity value, battery power and time and date, as shown in Figure 1.



graph 1

1) Detection of light intensity indication: the intensity of the laser signal received by the instrument as reflected by the measured target. When the reflected signal is not received, the signal lattice is displayed as 0, and the detection value is not of practical significance. When receiving the

reflected signal, the signal grid shows the corresponding signal intensity.
2) Battery power indication: battery power display.

6. Operating instructions

6.1 Laser is on and off

In the main interface mode, short press the power button to turn the indicator laser on or off. After opening, the icon light in Figure 1 is on, and the device emits an indicator laser, and the device enters the detection mode. After closing, the icon light in the upper left corner goes off and the laser is off. Long press the power button to shut down, and the instrument enters the shutdown state.

6.2 Start of testing

For detection, the laser will be directed at the measured target, and the display will display the integral concentration of methane in the measured area. When the methane concentration is detected exceeding the set alarm value, the instrument will sound an alarm as shown in Figure 2.

graph 2

Remarks The ppmm is the unit of the integral concentration, representing the product of the methane concentration and width. Where ppm is the gas concentration unit, namely "one in a million", indicating the concentration of methane; m is the length unit "m", indicating the width of

the measured gas mass.

Example: At 5 meters from the measured target, if the concentration of the methane leakage gas mass is 500ppm and the width is 1 m, the integral concentration of the methane leakage gas mass is 500ppm 1 m = 500 ppmm, and the instrument shows 500 ppmm.

6.3 Alarm

When the methane concentration value exceeds the set alarm value.

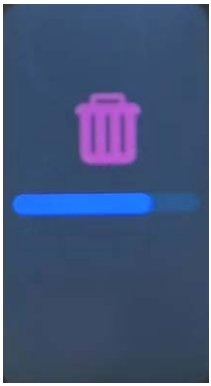
6.4 Menu

Under the main interface, slide your finger down to enter the menu interface, as shown in Figure 3. Click the finger button to enter the corresponding menu. Sthe finger up to the main interface.

graph 3

6.4.1 Alarm record

Click the "Alarm Record" menu with your finger to enter the interface shown in Figure 4. In this interface, you can see the historical alarm time, the alarm display value, etc., and swipe left to turn the page. After viewing, swipe up to return to the main menu interface. Swipe your finger down to enter the record delete interface, click "Yes" to delete the record as shown in the figure, and click "No" to return.



graph 4

6.4.2 Alarm setting

Click on the finger to enter the "alarm setting" menu, and you can enter the interface shown in Figure 5.

graph 5

The default alarm value is 500ppm, press "+" or "-" key to increase or reduce the alarm value.

After setting the alarm value, click the "" icon to save it. Click the "" icon to return to the menu interface.

6.4.3 Function Settings

Click the "Function Settings" menu with your finger to enter the interface shown in Figure 6.

Click "Time setting", select to confirm after completion, and enter the date setting as shown in Figure 7. The fingers slides up and down to adjust the time and date. Click the "" icon to save. Click the "" icon to return to the menu interface.

Click "Language Settings", confirm after the selection, and enter the language Settings as shown in Figure 8. You can switch the language of the device to Chinese or English, and directly click the circle behind the language to change it to "". Select Finish, click the "" symbol in the upper left corner of the screen, or swipe the screen up to return to the menu interface.

graph 6

graph 7

graph 8

6.4.4 Exit the menu

Click the "" symbol in the upper left corner of the menu interface to exit the menu, and the system returns to the main display interface.

6.5 Equipment charging

When the battery level is too low, the device should be charged with the own charger or the 5V / 2A standard charger with the output specification. It shows that it is charging, as shown in Figure 9.

graph 9

6.6 Notes for use

6.6.1 Prevent the machine from falling from the height or receiving severe vibration.

6.6.2 In the presence of high concentration gas, this machine may not be used normally.

6.6.3 Please operate and use the instructions, otherwise it may cause inaccurate test results or damage the machine.

6.6.4 This product shall not be stored or used in an environment containing corrosive gases (such as high concentration of chlorine gas, etc.), and shall not be used or stored in other harsh environments (including too high and too low temperature, high humidity, electromagnetic field and strong sunlight).

6.6.5 If after long-term use, the machine surface has dirt, please gently wipe with a clean soft cloth dipped in water, instead of using corrosive solvent and hard objects to wipe the machine surface, otherwise the machine surface may cause scratch or damage.

6.6.6 Please remove the lithium batteries and sensors of the discarded portable gas detector and send them to the designated place or return to our company. Do not throw them into the garbage can at will.

6.6.7 Contact us for any application or use failure beyond this specification.

6.7 Explosion-proof precautions

6.7.1 Explosion-proof mark refers to the identification used to describe the explosion-proof grade, temperature group, explosion-proof form and the applicable area of the explosion-proof electrical equipment.

6.7.2 In the corresponding national standards, there are clear regulations on the electrical design selection, installation or use of the explosion danger places, and the installation or use units shall strictly abide by these regulations to ensure the explosion-proof safety of the electrical equipment in the explosion danger places.

6.7.3 The battery pack cannot be removed or replaced in an explosive gas environment, nor can it be charged. In the explosive gas environment can not use without explosion-proof certification of peripheral plug equipment, also can not replace the sensor.

6.7.4 Products with explosion-proof certificate are not allowed to replace or change the components or structures that affect the explosion-proof performance.

7. detection skills

7.1 General Guidelines

1) Because the density of methane gas is smaller than that of air, it will spread upward after leakage. Therefore, it is better to point the indicated laser at 10~20 cm above the measured target.

2) When testing, please observe the return light intensity indicator bar on the display screen. If the number of return intensity bars is very small, the signal of the reflected laser received by the instrument is very weak, and the angle or position should be replaced for detection.

3) During the detection, the indicating laser should be exposed to the buildings, pipes, walls, ground, soil, trees and other objects that are easy to be reflected, so that the instrument can receive a stronger reflected laser signal.

4) Detection, master the aiming and control of the scanning speed, intense or sudden action will cause the false instrument measurement or false alarm.

5) When the test target has a detection dead corner of the test target that may not be irradiated, please change the orientation for detection, or approximate detection of the adjacent area of the test target.

7.2 Detection for different occasions

1) When testing the buried pipeline, the leakage gas is often not escaping from the leakage directly above the leakage point, but slowly diffused in the soil, escaping from the loose soil or cement cracks. Therefore, the soil should be loose and cement cracks, kiln wellhead and other key scanning.

2) When testing the ground pipe, use the pipe itself or the adjacent object as the reflector as far as possible to scan the valve, flange and other places prone to leakage.

3) When testing residents' homes, it is not necessary to enter the house within the detection range, but only necessary to scan the kitchen glass downstairs.

4) When detecting the smaller leakage point, you should stand in the leeward place, repeatedly detect it about 3 meters away from the measured target, and pay attention to the change of the display value.

5) When measuring the target of highly reflective background, false positives may be generated. Please pay special attention to observe whether the light intensity indicator bar of the display panel is too high. At this time, adjust the measurement Angle to avoid the false alarm caused by strong reflection.

6) The distance of the instrument in the actual detection is related to the field environment, reflector, reflection Angle and other factors. Generally speaking, the farther the detection distance, the weaker the intensity of the laser signal received by the instrument, and the detection accuracy also decreases. Therefore, when a gas leakage indication is found at a long distance, the instrument should be moved closer to the measured target for careful detection to obtain more accurate detection results.

7.3 How to determine the leakage range

During detection, to determine the leakage range, follow the following steps.

1) Scan the instrument in the direction of the wind.

2) Where the highest concentration is taken as the cut-off point.

3) Change the orientation and rescan the leakage area.

4) If there is still a leak after the change of position, then the defined position is correct.

5) If there is no leakage display after changing the direction, the leakage gas may be affected by the wind direction, please change the other direction scan.

7.4 General factors affecting the detection accuracy

1) Some objects or materials reflect the laser too strongly or the absorption of the laser is too strong, which is easy to make the instrument show the wrong detection value. Such as: glass, lens, mirror, etc.

2) Because the gas diffuses faster when the temperature is very high or the wind is large, when the leakage is less, the leakage gas cannot be concentrated, and the detection value may have a large deviation.

3) The telemetry has no reaction to other combustible gases such as ethane and propane; the back target of non-transparent occlusion cannot be measured.

8. Common faults and their solution countermeasures

question	probable cause	resolvent
The instrument cannot be operated	The power switch is not turned on	■ Power on the instrument
	Battery power is insufficient	■ charges the battery
The battery power was quickly exhausted	The battery is not used for a long time after full charging, resulting	■ Replacement New Battery

	in a decrease in the battery capacity	
	Over the battery life	■ Replacement New Battery
The battery cannot be charged	Poor charger and charging contact	■ Firmly insert the charger into the charging port ■ Firmly insert the power cable of the charger into the charger and the power socket
	Over the battery life	■ Replacement New Battery
The alarm was too small	The outlet hole was blocked	■ Gently wipe with a special clean wipe cloth or a clean soft cloth

9. Equipment maintenance

To keep the instrument in good condition, perform routine maintenance as described below.

organism	Please clean and wipe the body with a clean soft cloth or other special cloth
	Warning: Do not use alcohol, benzene, thinner, gaseous organic solvent or water cleaning instrument to avoid damage to the instrument
	Note: Do not wipe the lens with hands or other unclean cloth to avoid lens scratches
	When the telemetry device is not in use, please put it in the password box to avoid damage to the lens

display screen	Please wipe the display gently using a special clean wipe cloth or a clean soft cloth
	Note: Do not wipe the display with hands or unclean cloth to avoid scratches on the display. Do not wipe the display screen hard to avoid causing damage to the display screen