

L-TEK P100

Portable Laser Methane

Operation Instruction



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Prologue

ATTENTION

Please note that the equipment must comply with the operating rules and methods specified in the manual. Please note that there are strict regulations for the installation, maintenance, and repair of this equipment. Any illegal operation may cause danger during use.

Crowcon reserves the right to optimise and improve the product without any prior notice.

The right to modify the content of this operation manual belongs to Crowcon, and no one is allowed to make modifications, deletions, or other actions without written authorisation from Crowcon.

Safety

WARNING

- If the equipment is repaired or modified without authorisation, it will not be able to restore its initial state, and its intrinsic safety explosion-proof structure may be damaged. Continuing to use the equipment at this time may cause danger. Therefore, please contact the after-sales service of Crowcon before repairing or modifying the equipment.
- Unauthorised disassembly of equipment is prohibited. This is related to the explosion-proof level and safety of the equipment. If there is a malfunction, please contact the after-sales service of Crowcon in time.

DANGER

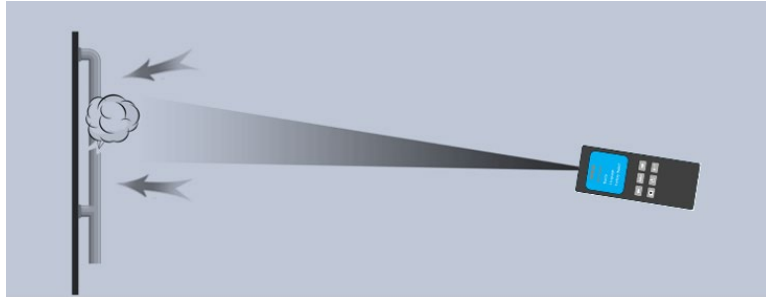
- Do not use this device in any unallowed explosive environment.
- The green laser of this product complies with the third level laser product standard, but please avoid direct observation or contact with human eyes!

ATEX/ IECEx SPECIFIC CONDITIONS OF USE:

- Do not open when an explosive atmosphere is present.
- The battery is not replaceable in hazardous areas.
- Do not charge the battery in hazardous locations.
- Maximum output voltage from charger shall not exceed 5.0V (Um).

1. Product Description

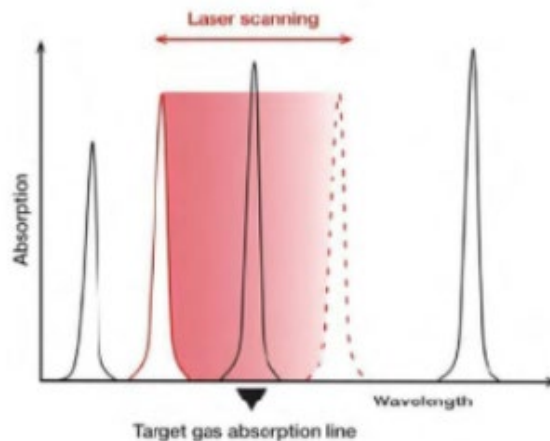
The L-TEK P100 uses TDLAS (Tunable Semiconductor Laser Absorption Spectroscopy) technology to quantitatively measure the methane gas concentration in the target area by absorbing the specific wavelength laser with methane gas, and quickly measure the methane gas concentration in the area. The product has the characteristics of precise selectivity, high sensitivity, high precision, low false alarm rate, strong anti-interference, and easy operation for methane gas monitoring. The L-TEK P100 can be carried by inspection personnel, providing great convenience for safety inspection work, and flexibly and dynamically detecting methane concentration in the inspection area.






2. Principle

Using tunable laser spectroscopy (TDLAS) technology, the portable laser methane gas detector L-TEK P100 uses the characteristic absorption principle of a specific wavelength laser when it irradiates a specific gas. With the calculation of CPU, we could get the value of ppm*m which is corresponding the concentration.

The device can accurately measure and analyse the characteristic gas without interference from other gas components. That is, the device can only perform test functions on methane, and does not react to other gases such as ethane, propane, water vapor and other gases.



3. Specifications

Model	L-TEK	
Basic Parameters	Measuring range	0~99999ppm.m
	Response Time	≤0.1s (adjustable)
	Measurement Distance	Standard: 20m Long distance: 50m
	Display	OLED
Basic Parameters	Dimensions	138mm x 49mm x 35mm
	Weight	320g
	Ingress protection	IP54
Certification	ATEX, IECEx	 II 2 G Ex ib op is IIB T4 Gb (-20 °C ≤ Ta ≤ +50 °C)  SGS23ATEX0156X  IECEx SGS23.0078X
Laser safety	Detecting laser	Class I
	Indicating laser	Class III R
Environment	Working temperature	-20°C~50°C
	Working Humidity	98%RH (No condensation)
Power	Power Voltage	3.5~5V
	Power consumption	<2W
	Battery life	6 hours
	Battery type	Lithium

4. Packing list

Item	Quantity
Portable Laser methane	1
Carry case	1
Carry strap	1
Charger	1
Manual	1

According to different product models, there may be changes in the accessories along with the box. Please refer to the actual situation. If you find any items damaged or missing, please contact Crowcon.

5. Transportation and storage

Transportation:

Avoid severe impact and shock.

Storage:

When the instrument is not in use, it is recommended to store it in a warehouse with a temperature range of 0-35°C, relative humidity below 98%, and no corrosive gas environment.

6. Product composition



6.1 Composition introduction

Device: Portable Laser Methane.

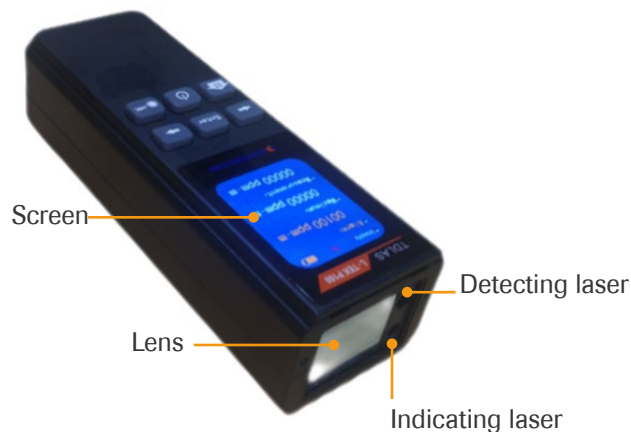
Carry case: To provide protection for storage and transportation. Instruments should be placed in the portable box when not in use.

Carry strap: Tied to the device for easy to carry.

Charger: Type-C 5V DC,1.0A

Manual: Operation instructions

6.2 Product appearance



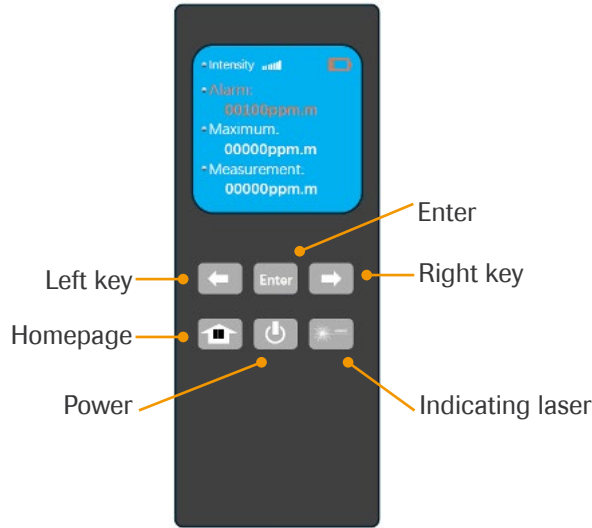
Screen: OLED display screen, displaying measured values.

Lens: After the laser is emitted and reflected back by the background reflector, it needs to be focused through a lens and reach the detector.

Indicating laser: Green visual laser helps user locate measurement direction and position.

Detecting laser: The detection light source cannot be observed by the naked eye, please do not cover it when using it.

7. Interface



- Power:** In the shutdown state, long press (5s) to turn on the device; When turned on, long press (5s) to turn off.
- Homepage:** When the instrument is turned on, click to return to the homepage.
- Indicating laser:** When the instrument is turned on, the indicator laser is green, click the key to switch the indicator laser.
- Left key:** Cursor switching and menu option switching.
- Right key:** Cursor switching and menu option switching.
- Enter:** In the homepage state, click to enter the menu; In the menu state, click on the confirm option.

8. Operation

8.1 Power on/off

Press and hold the power key for 5 seconds to enter the initialisation, the indicator laser green light flashes. Press and hold the power key for 5 seconds, the instrument will turn off.

8.2 Homepage

The home page displays the current measured integrated concentration and the maximum value of historical measured values. The upper left corner of the screen displays light intensity, indicating the strength of the laser reflected signal. The battery level is displayed in the upper right corner of the screen. You can return to the homepage by clicking the homepage key on any interface.



8.3 Menu

After clicking the Enter key on the homepage, enter the menu page, which includes alarm level setting, buzzer, language, and factory default. In menu page, move the cursor by using the ← and → keys to select the needed function.



8.4 Alarm level setting

Press Enter on the 'Alarm level' option. Double press the ← and → keys to move between the alarm level digits. Single press the ← and → key keys to set the desired number.



Set the concentration value for the alarm, and the device will sound an alarm when the measured concentration value exceeds the concentration threshold.

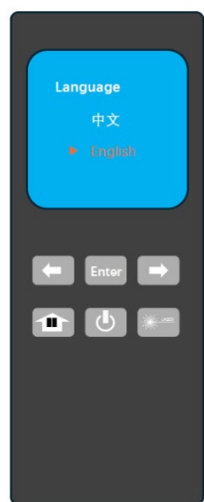
8.5 Buzzer Switch

After clicking the Enter button on the homepage, enter the menu page. On the menu page, move the cursor using the ← and → keys, move to the Buzzer function, and press using the ← and → keys, and press the Enter key.



8.6 Language selection

After clicking the Enter key on the homepage, enter the menu page. On the menu page, move the cursor by using the ← and → keys, move to the language mode setting, and press Enter to enter. Select Chinese or English and press Enter.



8.7 Factory default

After clicking the Enter key on the homepage, enter the menu page. On the menu page, using the ← and → keys to move the cursor to factory default and press the Enter key. Then select on or off and press the Enter key.



8.8 Start detection

When the instrument is turned on, point the indicating laser at the target being measured and the display will show the integrated concentration of methane in ppm m in the area being measured.

i ppm m is the unit used to describe gas concentration, which is the product of gas concentration and gas mass thickness. If the measured gas concentration is 100ppm and the gas mass thickness (distance of laser beam passing through the gas mass) is 0.5 meters, the reading is 50ppm m.



8.9 Detection instruction

1. The indicating laser is aimed above the target for detection, because methane gas is less dense than air and spreads upwards after leakage.
2. The indicating laser should be directed towards objects that are easily reflective, such as buildings, floors, and trees, in order for the instrument to receive stronger reflected laser signals.
3. At the same time of detection, observe the light intensity indicator bar returned at the top of the display, and if it is very weak, you need to change the angle or position for detection.
4. When detecting, control the speed of aiming and scanning. Try to maintain a constant speed, otherwise the drastic or sudden action change will cause distortion or false alarm of the instrument measurement.
5. If there is a dead angle in the target area that is not easy to be irradiated by the laser, change the orientation or repeat the above steps for the adjacent area.

8.10 Graph mode

From the home screen, key the button and the display will display the live readings as a graph. The alarm set point is displayed as a flat red line. To return to the home screen, press the home button.

8.11 Precautions for detection

Right way:

Select the angle with background reflection for measurement.

Methane is light in density so scan above the area to be detected too.

Scan the area in a “Z” shape, or scan the pipeline along an “S” shape route.

After detecting an alarm, it can be scanned several times to be sure.



Avoid:

Scanning too fast.

Areas such as wall corners that may form dual reflections.

Local occlusion areas with sudden changes in light intensity.

Strong reflective surfaces such as water, metal, glass, etc.

Strong electromagnetic or cross interference from similar equipment.

9. Charge

1. The instrument charging procedure is as follows:
2. Press and hold the power button to turn off the instrument.
3. Insert the Type-C plug into the device's power socket and connect to USB power source.
4. The screen shows “Recharging”
5. After being fully charged, the screen displays “Charged full”.
6. Disconnect the power supply of the charger.

i When the instrument is turned on, the battery icon in the upper right corner of the screen displays the charging status and battery level.
It is recommended to charge in the shutdown state to shorten the charging time.

10. Maintenance

In order to keep the instrument in good working condition, follow the instructions as follows:

- If necessary, clean the external surface of the instrument with a clean cloth.
- Clean the instrument screen with specialised screen cleaning paper to prevent dust accumulation.
- Before each test, make sure that the instrument is working properly.
- Keep the instrument fully charged after each use.

11. Repair

Return to the factory for repair.

This instrument is a precision optical instrument and requires professional instrument debugging during repair. Do not attempt to repair the instrument by yourself.

During the warranty period, the repairs are free of charge. Repairs will be charged for outside of the warranty period.

12. Warranty

Warranty period

The warranty period of this product is one year as standard. Additional years are available when ordering.

Repair method: Return to the factory for repair. This instrument is a precision optical instrument and requires professional instrument debugging during maintenance.

Warranty coverage:

During the warranty period, the instrument will be repaired free of charge. Man-made damage, unauthorised disassembly and assembly of the instrument and other reasons will not be warranted, and relevant costs will be charged for.

The instruments produced by the company have undergone strict quality testing before leaving the factory. If there is a failure, please contact Crowcon immediately. Do not try to repair the instrument by yourself.

Once the instrument is disassembled and assembled manually, it is easy to damage the protective structure of the product and reduce the protection level which voids the warranty.

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 **Halma**