

User Manual R1.0
Santacary Technology Co., Ltd.
MHK-OZ1 Low level Ozone Gas Detector



INTRODUCTION

Santacary MHK-OZ1 is an ultrasensitive Ozone gas detector with 0.001 ppm (=1 PPP) resolution for monitoring low level ozone (O₃) in the air. It has been designed to notify of the presence of low level O₃ gas. MHK-OZ1 has a wide range of applications in industrial, business, home or R&D and other fields.

It is important to measure low-concentration ozone accurately. The California Ambient Air Quality Standard (CAAQS) for outdoor ozone is 0.09 ppm for a 1-hour average, and 0.07 ppm for an 8-hour average. OSHA guidelines state that ozone in the workplace should never exceed 0.1 ppm over an 8-hour day. NIOSH outlines a recommended exposure limit of 0.1 PPM (0.2 mg/m³) and an immediately dangerous to life or health (IDLH) ozone level of 5 ppm or higher.

Please read this manual carefully before use. This operation manual will provide you with all the necessary information for the correct use of your MHK-OZ1 ozone gas detector.

FEATURES

- Portable O₃ gas detector
- Low level O₃ gas detector range: 0 ~ 1.000 PPM. Resolution: 0.001 PPM or 1.0 PPP
- Audible alarm
- Two points of instantaneous alarm
- Trend chart display showing the past readings for O₃
- With temperature and humidity measurement

Note:

- MHK-OZ1 should be used in a strong convection air environment.

UNIT DESCRIPTION

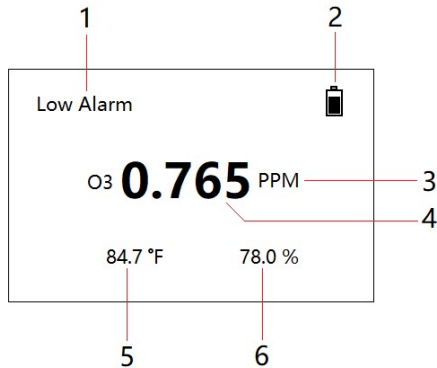
Device



1. TFT display
2. Power button
3. Select button
4. Enter button
5. Battery compartment cover
6. Air sampling port

DISPLAYS

Normal Display



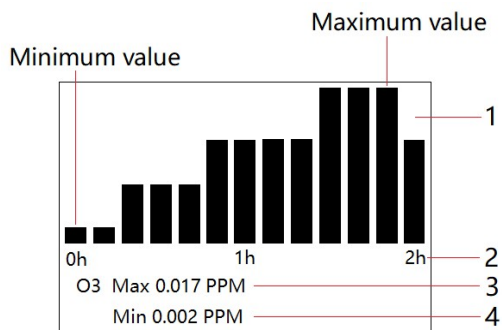
1. Alarm status (None/Low Alarm/High Alarm)
2. Battery gauge
3. O₃ concentration unit (PPM)
4. O₃ concentration (Resolution is 0.001 PPM)
5. Air temperature
6. % relative humidity

Trend Chart Display

MHK-OZ1 has a data log function that provides up to 2 hours history of O₃ concentration.

The trend chart displays the past readings for O₃. The time per division (indicates the chart's time per unit division) is 10 min / div. Trend chart contains a maximum of 13 recorded data at one time. The time span is 2 hours. After the chart is full the data is FIFO (first-in, first-out). Below is the example of Trend Chart Display.

1. Vertical bar of O₃ (The higher the bar, the greater the value)
2. Time scale (farther to the right, longer time in the past)
3. Maximum value on the chart of O₃ concentration
4. Minimum value on the chart of O₃ concentration



At the bottom of the chart, there are two numerical indicators: Max and Min. The Max and Min values will reflect the maximum and minimum values on the chart of O₃ concentration.

Log Display


The Log Display lists the 13 recorded data in the trend chart with time stamps.

| O3 PPM | |
|--------|-------|
| 0m | 0.002 |
| 10m | 0.002 |
| 20m | 0.007 |
| 30m | 0.007 |
| 40m | 0.007 |
| 50m | 0.012 |
| 1h | 0.012 |
| 70m | 0.012 |
| 80m | 0.012 |
| 90m | 0.017 |
| 100m | 0.017 |
| 110m | 0.017 |
| 2h | 0.012 |

1. O₃ unit
2. Time stamps in past (m--minute, h--hour)
3. O₃ concentration (PPM)

OPERATING INSTRUCTIONS


1. Turn on detector

When the detector is turned off, press Power button  to turn on the unit. When the unit is first turned on, it performs 10 seconds countdown for detector initial warm up, then enters normal display with current O₃ concentration (PPM), temperature (°C or °F), and humidity (%RH) readings displayed.


The detector starts taking measurements when power on and updates readings every 2 seconds. In the condition of operating environment change, it takes 90 seconds to respond for O₃, and 30 minutes for humidity.

Note:

Air Sampling Port: Always ensures that the detector vents are not blocked and open to the atmosphere.

3. Press Select button  shortly to switch Normal Display, Trend Chart Display and Log Display in loop.

4. Temperature Units Setup Menu

Press Power button  shortly to switch two temperature units: °F and °C in loop.

5. Calibration of Detector

This detector can implement calibration when needed. Below is the guideline.

- Calibrate the detector at least once every 180 days depending on

the use and sensor exposure to poisons and contaminants.

➤ Calibrate the detector if the ambient gas display varies at startup. By pressing the Enter button **ENTER** shortly, the detector enters into **Calibration Menu**. In this menu, there are four items by pressing the Enter button **ENTER** shortly to loop switching: “Fresh Air Calibration”, “Ozone Span Calibration 0.5 PPM”, “Factory Reset” and “Exit” as described in below table.

Calibration Menu

| Menu Items | Functional Description |
|--------------------------------|--|
| Fresh Air Calibration | The MHK-OZ1 will perform an automatic fresh air adjustment. If the fresh air adjustment is successful, the unit will proceed to Normal Display |
| Ozone Span Calibration 0.5 PPM | To implement the span calibration with 0.5 PPM Ozone gas. If the span calibration is successful, the unit will proceed to Normal Display |
| Factory Reset | To restore factory settings. One press to restore factory setting, free from the bother of mis-operation |
| Exit | Exit the Menu and proceed to Normal Display |

Procedures of Calibration


Step 1. To adjust the offset of sensor

Place the detector in clean atmosphere. Pressing the Enter button **ENTER** shortly, the detector enters into Calibration Menu. By pressing Select button **SELECT** shortly in the “Fresh Air Calibration” item to auto adjust the offset of ozone sensor.

Step 2. To do span calibration

Apply a 0.5 PPM calibration Ozone gas to the detector. Pressing the Enter button **ENTER** shortly, the detector enters into Calibration Menu. Continuously press the Enter button **ENTER** shortly to select “Ozone Span Calibration 0.5 PPM” item. Press Select button **SELECT** shortly to start span calibration. Or pressing Select button **SELECT** shortly in the “Exit” item to cancel calibration and return to Normal Display.

6. Turn off the Detector

When the measurement is completed, press Power button  for 2 seconds to turn off the detector.

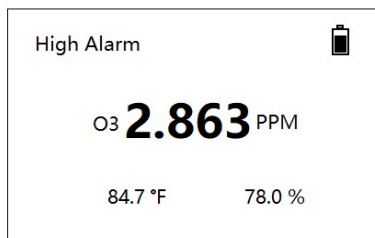
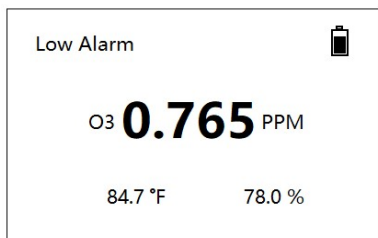
ALARM

Low Alarm and High Alarm


MHK-OZ1 has two alarm set points: High Alarm (O₃: 1.00 PPM) and Low Alarm (O₃: 0.500 PPM). These set points are factory set and cannot be changed. MHK-OZ1 is equipped with audio alarms to alert you when the ambient gas concentration exceeds one of the two alarm set points. When O₃ value exceeds the defined high alarm set point (1.000 PPM), the audio alarm will sound at 3 beeps/sec. When O₃ value exceeds the defined low alarm set point (0.500 PPM) but less than the defined high alarm set point (1.000 PPM), the audio alarm will sound at 2 beeps/sec.

Factory Alarm Set points

| Gas | Low | High |
|----------------|-----------|-----------|
| O ₃ | 0.500 PPM | 1.000 PPM |



BATTERIES REPLACEMENT

1. When the batteries power is low, the low voltage symbol  appears on the display. It indicates that the batteries need to be replaced. If they are not replaced in time, the accuracy of measurement will be affected.
2. Open the battery compartment cover and take out the batteries.
3. Install 3 new AA batteries correctly according to the diagram of positive and negative poles in the battery compartment.
4. If the detector is not used for a long time, please take out the batteries to prevent the batteries from leaking and damaging the detector.

MATERIALS SUPPLIED

- MHK-OZ1 Low level Ozone Gas Detector
- Carry case
- English User Manual

SPECIFICATIONS

O₃ Sensor Specification:

| | |
|---------------|------------------------|
| Sensor | Electrochemical sensor |
| Sample Method | Diffusion |

| | |
|-------------------|--------------------------|
| Measurement Range | 0~1.000 PPM |
| Resolution | 0.001 PPM / 1.0 PPP |
| Repeatability | <±5% of signal |
| Accuracy | ± 5%FS |
| Warm-up time | <3 mins |
| Response time | < 90 seconds (diffusion) |
| Recovery time | < 90 seconds (diffusion) |
| Service life | 2 years (in air) |

Temperature Specification

| | |
|--------------------|---|
| Temperature Range | -10.0~60.0°C (14~140°F) display |
| Display Resolution | 0.1°C (0.1°F) |
| Display Options | °C/°F switchable |
| Accuracy | ±0.5°C (±0.9°F) |
| Response Time | 5~30 seconds (device must equilibrate with environment) |

RH Specification

| | |
|--------------------|-----------------------------------|
| Measurement Range | 0.0~99.9%RH |
| Display Resolution | 1%RH |
| Accuracy | ±4.5%RH |
| Response Time | <8 seconds for 63% of step change |

General Specification

| | |
|--------------|--|
| Display | 2.2" TFT LCD |
| Operating | -10°C to 50°C (14°F to 122°F), 15~90% RH non-condensing |
| Storage | -10°C to 60°C (14°F to 140°F), <99% RH non-condensing |
| Power Supply | Three AA Alkaline Batteries |

| | |
|------------|---------------------------------------|
| Dimensions | 74x148x26.5mm (2.91x5.83x1.04") |
| Weight | 122 grams (4.3 oz.) without batteries |

Out of range of operating conditions will impact the accurate of O₃ measurement.

MAINTENANCE

To maintain the detector in good operating condition, perform the following basic maintenance as required.

1. Inspect the detector at regular intervals.
2. Clean the exterior with a soft damp cloth. Do not use solvents, soaps, or polishes.
3. Do not immerse the detector in liquids.
4. Keep away MHK-OZ1 from dust and particles and never touch exhaust or concentrated vapors, harsh chemicals or extremely high concentration levels, such as corrosive gases, organic gases. They may poison the sensor.
5. Long-term placement in high-concentration organic gas will cause the sensor zero point to drift and slow recovery.
6. It is forbidden to store and use MHK-OZ1 in high-concentration alkaline gas for a long time.

Troubleshooting

If a problem occurs, refer to the solutions provided in below table. If the problem persists, contact Santacary Technology Co., Ltd..

| Problem | Possible cause | Solution |
|-----------------------------|-----------------------------------|---|
| The detector can't power on | Batteries are not properly placed | Please check that the batteries are properly placed |
| | Damaged or | Contact Santacary |

| | | |
|--|---|---|
| | defective detector | Technology Co., Ltd. |
| The detector enters alarm immediately when activated | Sensor needs to stabilize | If the detector is not used for long time, the warm up time of O ₃ sensor needs more than 3 minutes. |
| Detector does not accurately measure O ₃ gas. | Detector is colder/hotter than O ₃ gas temperature | Allow the detector to attain ambient temperature before use |
| | Air vents are blocked | Make sure that the air vents are ventilated |

WARRANTY

The MHK-OZ1 is warranted to be free from defects in material and workmanship for a period of one year from the date of purchase. This warranty covers normal operation and does not cover misuse, abuse, alteration, neglect, improper maintenance. Proof of purchase is required for warranty. Warranty is void if the detector has been opened.

CONTACT US

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