

Ozone Systems

Installation & Operation Manual

CMT925 • CMT930

Gaseous Ozone Sensor



ClearWater Tech, LLC.

Integrated Ozone Systems

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INTRODUCTION

This Installation and Operation Manual is written to assist in the installation, operation and maintenance of systems manufactured by ClearWater Tech, LLC. This equipment has been designed using the most modern materials and technology available.

Please read this manual carefully and in its entirety before proceeding with any installation, operation, or maintenance procedure associated with this equipment. Failure to follow these instructions could result in personal injury, damage to the equipment, or reduced product performance.

In an ongoing effort to improve reliability and operating efficiency, ClearWater Tech may find it necessary to make changes to its products. Therefore, the information contained in this manual may not conform in every respect to earlier versions of ClearWater Tech systems found in the field. If you have any questions, please contact your ClearWater Tech dealer or the ClearWater Tech service department

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THEORY OF OPERATION

The CMT925 and CMT930 are designed with a solid state semiconductor ozone sensor head which uses an Indium Tin Oxide layer for ozone detection. The Indium Tin Oxide layer's resistance changes based on exposed ozone concentration.

Ozone, as an oxidizer, will rapidly cover the Indium Tin Oxide layer with an oxide, insulating it from the ambient air and eliminating the sensor's ability to sense ozone. For this reason the sensor head is continuously heated to approximately 400° F.

Eliminating oxide buildup on the sensor head is essential in the response of the sensor head. In addition to heating the sensor head continuously, the CMT925 and CMT930 implement a very unique process to “clean” the sensor heads and make sure they are free of oxide buildup.

GUIDELINES ON HOW TO MEASURE OZONE

The following information is presented to help users operate their CMT925 and CMT930 CWT Gaseous Ozone Sensor in the most effective and efficient manner.

General

Sensor Placement - When placing the ozone sensor it is important to remember that ozone is heavier than air and as such it will tend to sink. Keep this in mind when choosing where to place the sensor. Pick a location that will most likely be in the presence of ozone if there is an ozone leak if used for leak detection.

Volatility of Ozone - Ozone is an oxidizer and highly reactive. It will react with objects and surfaces.

Ozone Smell – Remember that a person’s ability to detect ozone is effected by many factors, and the level of ozone that a person can detect varies greatly from person to person, therefore smelling ozone is not an accurate measurement of ozone level.

Permanent Sensor Placement

The CWT Gaseous Ozone Sensor has been designed to measure the concentration of ozone in the ambient air. **The sensor must not be placed directly in an ozone stream.**

For indoor local area monitoring, attach the sensor to an inert fixture such as a metal post or rack with the inlet facing generally toward the center of the room.

For leak detection, mount the unit near the ozone equipment.

Ensure that the sensor is protected from water splashes, dust, vibration, excessive heat or cold, high concentrations of ozone and excessive swings in humidity. **See the “Appendix A – Specifications” section.**

False Readings

The CWT Gaseous Ozone Sensor has been designed to respond selectively to ozone, however other oxidizing gases such as chlorine and nitrogen dioxide can generate false readings if they are at high concentrations. High concentrations of hydrocarbon gases such as vapors of alcohol, oils and solvents can reduce and mask the concentration of ozone.

Ozone will react with and decompose on organic substances.

Calibration

The sensor head is calibrated at the factory.

The CWT Gaseous Ozone Sensor has been designed so that it does not normally require re-calibration for the life of the sensor head.

The CWT Gaseous Ozone Sensor comes with built in diagnostics which will alert the user if the sensor is not operating correctly.

Environmental conditions such as dust, high humidity, vibration, chemicals, heat or cold, as well as high concentrations of ozone may degrade the sensor performance and shorten the sensor life. Please ask your local dealer, or contact ClearWater Tech at sales@cwtozone.com about your application if you are in doubt.

INSTALLATION PROCEDURES

Unpacking

Compare the ozone system equipment received to the packing list provided. Before beginning any installation procedures, thoroughly inspect all components for damage. If damage is noticed, promptly notify the freight carrier and request an on-site inspection. Inspect all packing materials for small parts before discarding.

Ozone Sensor Components

The following components are supplied with the CWT Gaseous Ozone Sensor:

- User guide
- 2 Velcro Squares
- Strain Relief (1/4 inch)
- Power supply (CMT930 only, 90-240 VAC 50-60 Hz Input, 12V DC Output, 12W)

Please check that all these components have been supplied and contact your dealer, or ClearWater Tech or email at: sales@cwtozone.com if any of the components are missing.

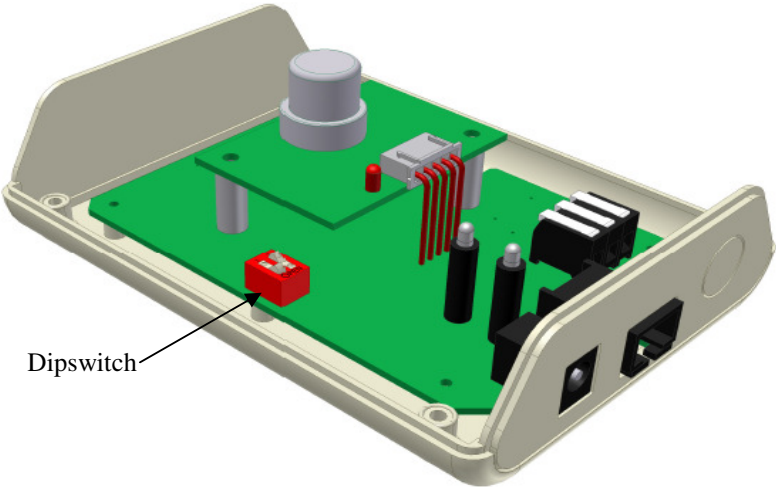
Installation Instructions

Step 1: Insure alarm dipswitches are set correctly. The sensor will ship from the factory set to provide a 0.1ppm high-limit set point. If a different set point is desired, remove the cover by unscrewing the screws on the back, and set the dipswitch to configure the unit to the desired set point (See Figure 1).

Step 2: Mount the unit as close to where you desire the ozone concentration to be monitored as possible. If the unit is to be used as a safety device with ozone equipment, place it as close to the ozone equipment as possible. Mount the unit with the sensor pointed toward the center of the room and as far away from any chemical storage areas as possible.

Alarm Dipswitch

Figure 1



	Position 1	Position 2	Alarm Set Point
	Closed	Closed	0.05 ppm Ozone
	Open	Closed	0.08 ppm Ozone
	Closed	Open	0.10 ppm Ozone
	Open	Open	0.15 ppm Ozone

Step 3: Plug in the power supply (if so required) to the jack next to the RJ45 receptacle.

Step 4: Insert a CAT5 cable with RJ45 connector (if so required) to the sensor, and wire up according to the pinout described in figure 2, making sure to observe the maximum allowable currents and voltages.

ECO systems from ClearWater Tech are provided with a CAT5 cable which can be directly connected to the CMT925 or CMT 930

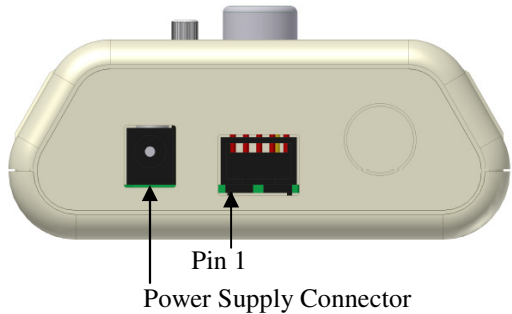
The CAT5 cable connection allows access to two independent low power solid state relays. These relays will open when the ozone level is above the set point, allowing the ozone sensor to be interfaced with other control circuitry.

These relays have a maximum voltage of 50V and a maximum current rating of 150mA. **WARNING – Failure to insure currents and voltages are below the maximum value can result in damage to the sensor.**

RJ45 Pinout

Figure 2

1. +12VDC
2. Not Used
3. GND
4. Relay-2 (volt-free)
5. Relay-2 (volt-free)
6. Relay-1 (volt-free)
7. Relay-1 (volt-free)
8. GND



Step 5: If using the power relay, remove the knockout plug and install the strain relief provided with the sensor. Wire up to the power relay according to the pinout described below in figure 3 below, making sure to observe the maximum allowable current and voltages.

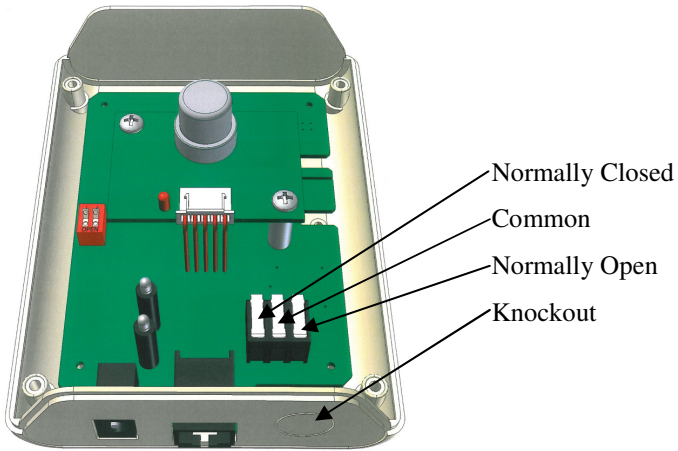
The power relay has a much higher switching capacity than the solid state relays on the RJ45 connector. For example, this relay can be used to switch the power to an ozone generator, or some sort of alarm light or buzzer. Common, normally closed and normally open terminals are provided.

Installation Procedures

The power relay has a maximum voltage rating of 250V and a maximum current rating of 10A. **WARNING – Failure to insure currents and voltages are below the maximum value can result in damage to the sensor.**

Power Relay Pinout

Figure 3



OPERATING INSTRUCTIONS

NOTE: Upon initial start-up (power applied to the Gaseous Ozone Sensor), the sensor will go into a 2 minute cleaning cycle. If the sensor has been unplugged for longer than 7 days it may not be as sensitive to ozone. It can take the sensor head from 24 to 48 hours to completely remove the built up oxidation that accumulates when the sensor head is unpowered.

When the ozone level is below the set point:

- Relay-1 – Closed
- Relay 2 – Closed
- Power Relay – Closed
- Green LED – On Solid
- Red LED – Off

When the ozone level is above the set point:

- Relay-1 – Open
- Relay 2 – Open
- Power Relay – Open
- Green LED – On Solid
- Red LED – On Flashing

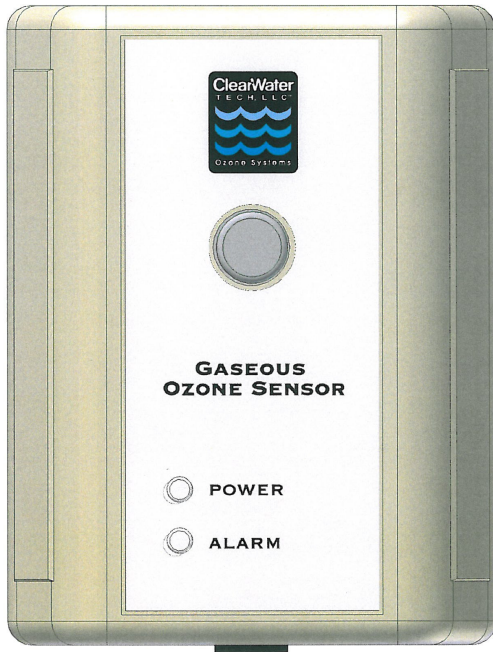
Cleaning Cycle

For three minutes every hour, the sensor will go through a head cleaning cycle. The green LED on the front of the sensor will flash to indicate the unit is in the cleaning cycle (See Figure 4).

Summary of LED Indicators

Figure 4

Power LED	Alarm LED	Description
Flashing	Off	The head is in a cleaning cycle
On Solid	Off	The unit is powered and functioning normally
On Solid	Flashing	Ambient ozone level above high-limit set-point – Relays Open
Flashing	Flashing	Sensor head failure – Relays Open



CARE AND MAINTENANCE

Your Ozone Controller is a product of superior design and quality and should be treated with care. When using your Ozone Controller:

- Keep sensor and all its parts and accessories out of the reach of small children.
- Keep sensor dry. Avoid water and/or condensation as humidity and liquids containing minerals may corrode electronic circuits.
- Do not use or store in dusty, dirty areas.
- Do not store or turn off the controller in temperatures below 10°C.
- This unit is designed for use at temperatures between 32°F (0°C) and 104°F (40°C). Sudden changes in temperature will cause condensation that may damage the electronic components.
- Do not drop, knock or shake as this could lead to internal damage.
- Do not use harsh chemicals, cleaning solvents or strong detergents for cleaning. Wipe with a soft cloth slightly dampened with a mild soap-and-water solution. Avoid getting water into the power adaptor, RJ45 connector, or the screened sensor head.

APPENDIX A - SPECIFICATIONS

Sensor type: Gas Sensitive Semiconductor

Measurement range: 0.000 to 0.250 ppm

Operating temperature range: 0°C to 40°C

Relative humidity limit: 5% to 95%

Alarm set points: Dip switches

Relay connection for control & switching Volt free contacts

Relay 1: Max voltage 50V, Max current 150mA

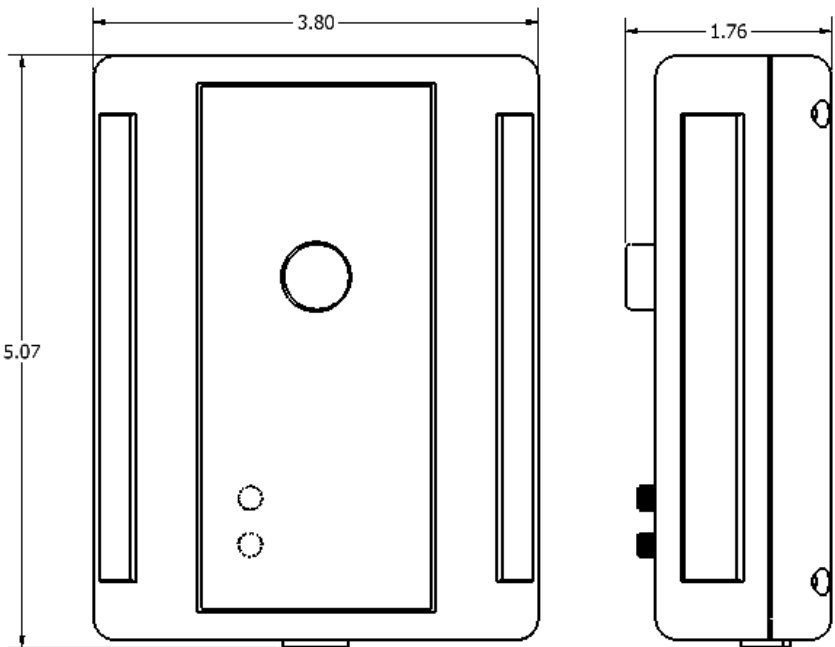
Relay 2: Max voltage 50V, Max current 150mA

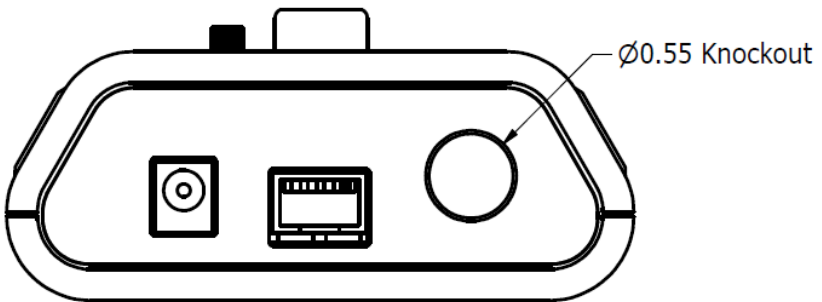
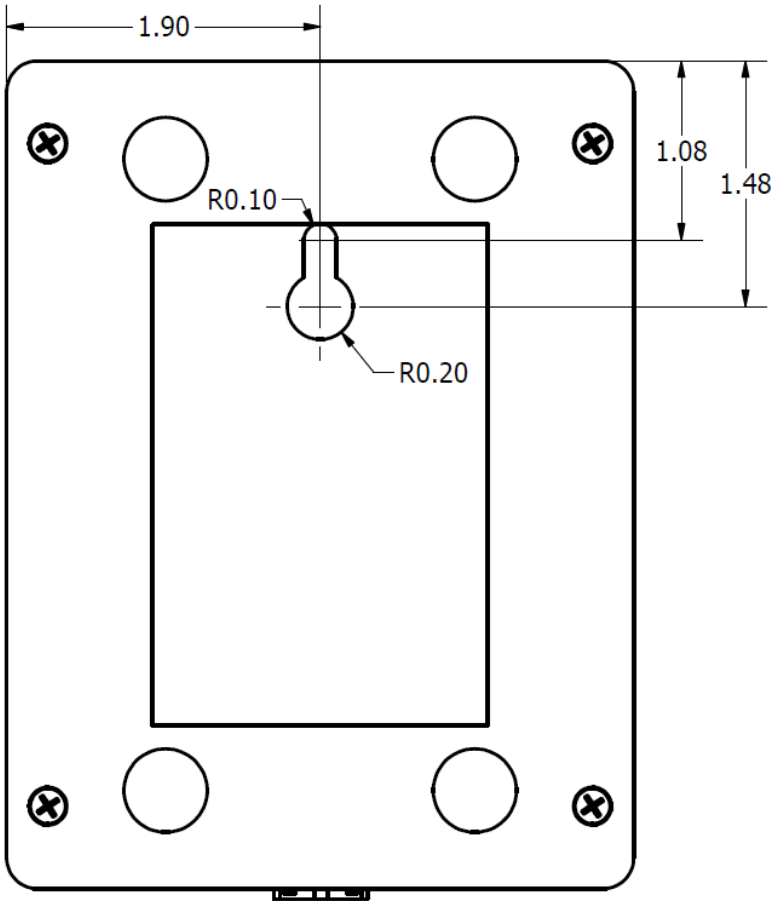
Power Relay: Max voltage 250VAC,Max current 10A

Power Requirements: 12 VDC, 400 mA

Unit Interface (power, control signal): RJ45 connector, 2.1mm

Barrel DC Connector





APPENDIX B – WARRANTY INFORMATION

ClearWater Tech, LLC. Limited One-Year Warranty

Summary of the Warranty

ClearWater Tech, LLC (“CWT”) makes every effort to assure that its products meet high quality and durability standards and warrants the products it manufactures against defects in materials and workmanship for a period of one (1) year, commencing on the date of original shipment from CWT, with the following exceptions: 1) The warranty period shall begin on the installation date if the installation is performed within 90 days of the original shipment from CWT; 2) The warranty period shall begin on the date of the bill of sale to the end user if the installation date is more 90 days after the original shipment date. To validate the warranty, a warranty card, accompanied by a copy of the bill of sale, must be returned to CWT and must include the following information:

- End user name
- Complete address, including telephone number
- Date installed
- Complete model and serial number information
- Name of company from which the unit was purchased

Repairs and replacement parts provided under this warranty shall carry only the unexpired portion of this warranty or 90 days, whichever is longer.

Items Excluded from the Warranty

This warranty does not extend to any product and/or part from which the factory assigned serial number has been removed or which has been damaged or rendered defective as a result of:

- An accident, misuse, alteration or abuse
- An act of God such as flood, earthquake, hurricane, lightning or other disaster resulting only from the forces of nature
- Normal wear and tear
- Operation outside the usage parameters stated in the product user’s manual
- Use of parts not sold by CWT
- Service or unit modification not authorized by CWT
- Check valve/solenoid valve failure
- Damage which may occur during shipping
- Failure to meet service requirements as outlined in the I & O manual
- Damage due to extended exposure to ozone levels greater than 1.0 ppm
- Damage due to exposure to other chemicals

Obtaining Service Under the Warranty

Any product and/or part not performing satisfactorily may be returned to CWT for evaluation. A Return Goods Authorization (RGA) number must first be obtained by either calling or writing your local authorized dealer, distributor or CWT direct, prior to shipping the product. The problem experienced with the product and/or part must be clearly described. The RGA number must appear prominently on the exterior of the shipped box(es). The product and/or part must be packaged either in its original packing material or in comparable and suitable packing material, if the original is not available. You are responsible for paying shipping charges to CWT and for any damages to the product and/or part that may occur during shipment. It is recommended that you insure the shipment for the amount you originally paid for the product and/or part.

If, after the product and/or part is returned prepaid and evaluated by CWT, it proves to be defective while under warranty, CWT will, at its election, either repair or replace the defective product and/or part and will return ship at lowest cost transportation prepaid to you except for shipments going outside the 50 states of the United States of America. If upon inspection, it is determined that there is no defect or that the damage to the product and/or part resulted from causes not within the scope of this limited warranty, then you must bear the cost of repair or replacement of damaged product and/or part and all return freight charges. Any unauthorized attempt by the end user to repair CWT manufactured products without prior permission shall void any and all warranties. For service, contact your authorized dealer or distributor or CWT direct at (805) 549-9724.

Exclusive Warranty

There is no other expressed warranty on CWT products and/or parts. Neither this warranty, nor any other warranty, expressed or implied, including any implied warranties or merchantability of fitness, shall extend beyond the warranty period. Some states do not allow limitation on how long an implied warranty lasts, so that the above limitation or exclusion may not apply to you.

Disclaimer of Incidental and Consequential Damages

No responsibility is assumed for any incidental or consequential damages; this includes any damage to another product or products resulting from such a defect. Some states do not allow the exclusion or limitation of incidental or consequential damages, so that above limitation or exclusion may not apply to you.

Legal Remedies of Purchaser

This warranty gives you specific legal rights and you may also have other rights, which vary from state to state.

**THIS STATEMENT OF WARRANTY SUPERSEDES ALL OTHERS
PROVIDED TO YOU AT ANY PRIOR TIME.**