



OI-415-CO

Cockpit Carbon
Monoxide Monitor



CAUTION

CAUTION: FOR SAFETY REASONS, THIS EQUIPMENT MUST BE OPERATED AND SERVICED BY QUALIFIED PERSONNEL ONLY. READ AND UNDERSTAND THE INSTRUCTION MANUAL COMPLETELY BEFORE OPERATING OR SERVICING.

DANGER

DANGER: OTIS INSTRUMENTS INC. OI-415-CO IS AN AMBIENT AIR TOXIC GAS SENSOR ASSEMBLY AND ONLY MONITORS IN THE IMMEDIATE VICINITY OF THE SENSOR OPENING. IMPROPER INSTALLATION CAN LEAD TO AN UNDETECTABLE GAS LEAK WHICH COULD RESULT IN PERSONAL INJURY OR LOSS OF LIFE.

TABLE OF CONTENTS

| | | |
|----------|-------------------------------------------------------------------|-------------------------------------|
| 1 | PRODUCT OVERVIEW..... | 2 |
| 1.1 | INTRODUCTION | 2 |
| 1.2 | PRODUCT SPECIFICATIONS | 3 |
| 1.3 | SYSTEM DIAGRAMS | 4 |
| 1.3.1 | EXTERNAL SYSTEM DIAGRAM | 4 |
| 1.3.2 | INTERNAL SYSTEM DIAGRAM..... | 5 |
| 2 | INSTALLATION AND START-UP..... | 6 |
| 2.1 | INSTALLING OR REPLACING BATTERIES | 6 |
| 2.2 | SYSTEM START-UP | 8 |
| 2.3 | TURNING OFF THE OI-415 | 9 |
| 3 | NORMAL OPERATING MODE..... | 10 |
| 3.1 | PERFORMING A DEMAND ZERO..... | 11 |
| 3.2 | ALARMS | 12 |
| 4 | DISPLAY MODE | 15 |
| 4.1 | GAS READING HISTORY DISPLAYS | 15 |
| 4.1.1 | PEAK READING | 15 |
| 4.1.2 | STEL READING | 15 |
| 4.1.3 | TWA READING | 16 |
| 4.2 | CALIBRATION DATA DISPLAY | 16 |
| 4.2.1 | DISPLAYING THE LAST CALIBRATION DATE..... | 16 |
| 4.3 | UNIT INFORMATION DISPLAY | 17 |
| 4.3.1 | DATE/TIME DISPLAY | 17 |
| 4.3.2 | TEMPERATURE DISPLAY..... | 17 |
| 4.4 | ALARM SETPOINTS DISPLAY | 18 |
| 4.4.1 | VIEWING AND SIMULATING ALARMS..... | 18 |
| 4.5 | ADJUSTING BUZZER VOLUME | 19 |
| 4.6 | ADJUSTING DATE AND TIME..... | 20 |
| | APPENDIX A: PRODUCT WARRANTY STATEMENT | 23 |
| | APPENDIX B: INFORMATION ABOUT RMA SERVICE REPAIRS | 25 |
| | APPENDIX C: INFORMATION ABOUT RMA RETURNS FOR CREDIT | Error! Bookmark not defined. |

1 PRODUCT OVERVIEW

1.1 INTRODUCTION

The Otis Instruments, Inc. (Otis) Model OI-415-CO (OI-415) Ambient Air Toxic Gas Detector is designed to detect the presence of carbon monoxide (CO). The OI-415 is designed to be compact in size and easy to use which makes it ideally suited for use in the cockpit of your personal airplane.

This document is an operation manual containing diagrams and step-by-step instructions for the proper and safe installation, start-up, configuration and settings, normal operation, and product maintenance of the OI-415.

The OI-415 offers a full range of features, including:

- LCD display for complete and understandable information in a glance
- Ultrabright alarm LED
- Distinct audible and vibrating alarms for dangerous gas concentrations and unit malfunction
- Datalogging functions
- Peak reading logging



NOTICE

This document should be read in its entirety before the initial operation of the product.

Should a question arise during the use of the product, this document will serve as a first reference for the end-user. For inquiries beyond the information and instructions provided within this manual, contact the sales representative of this product for assistance.

1.2 PRODUCT SPECIFICATIONS

System Specifications

| | |
|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Operating Voltage | 2 AAA 1.5V Alkaline Batteries or 2 AAA 1.2V Ni-MH Batteries |
| Operating Lifetime (77°F/25°C) Non-Alarm Operation | Alkaline Batteries: Up to 9,000 hours NiMH Batteries: Up to 6,000 hours |
| Current Draw | 1.0 mA (When not in alarm) |
| Operating Temperature Range | Continuous: -20°C to +50°C, 10-90% RH Temporary (up to 15 minutes): -40°C to +60°C, 0-95% RH |
| Measurement Range | 0 – 2,000 PPM, lowest detectable limit: 3 PPM |
| Response Time | T ₉₀ within 10 seconds |
| Resolution | 0 – 300 PPM: 1 PPM 310 – 2,000 PPM: 10 PPM |
| Accuracy | 0 – 500 PPM: +/- 5% of reading or +/- 5 PPM, whichever is greater 510 – 2,000 PPM: +/- 20% of reading |
| Display | Graphic LCD Screen |
| Interface | 2 Push-Buttons (AIR, POWER/MODE) |

Factory Alarm Settings

| | |
|------------|-----------|
| Warning | 25 PPM |
| Alarm | 50 PPM |
| Alarm High | 1,200 PPM |
| STEL Alarm | 200 PPM |
| TWA Alarm | 25 PPM |

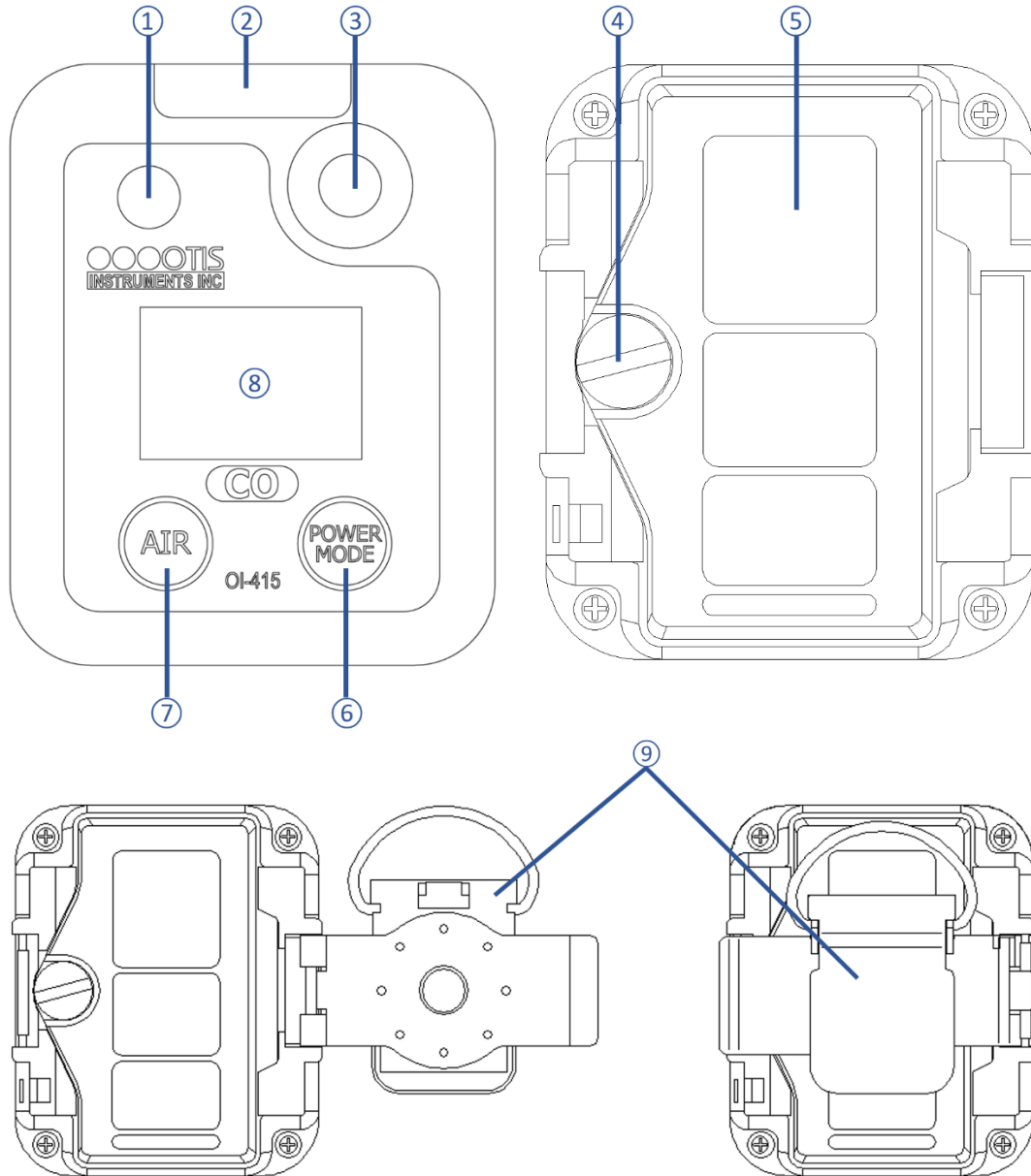
Mechanical Specifications

| | |
|----------------------|--------------------------------------------------------------|
| Enclosure Materials | High Impact Plastic, RF Shielded, Dust and Weatherproof IP67 |
| Standard Accessories | Alligator Mounting Clip Removable Rubber Over Mold |
| Product Dimensions | 67 H x 54 W x 24D mm, 2.6" H x 2.1" W x 0.9" D |
| Product Weight | 93 grams, 3.3 ounces |

1.3 SYSTEM DIAGRAMS

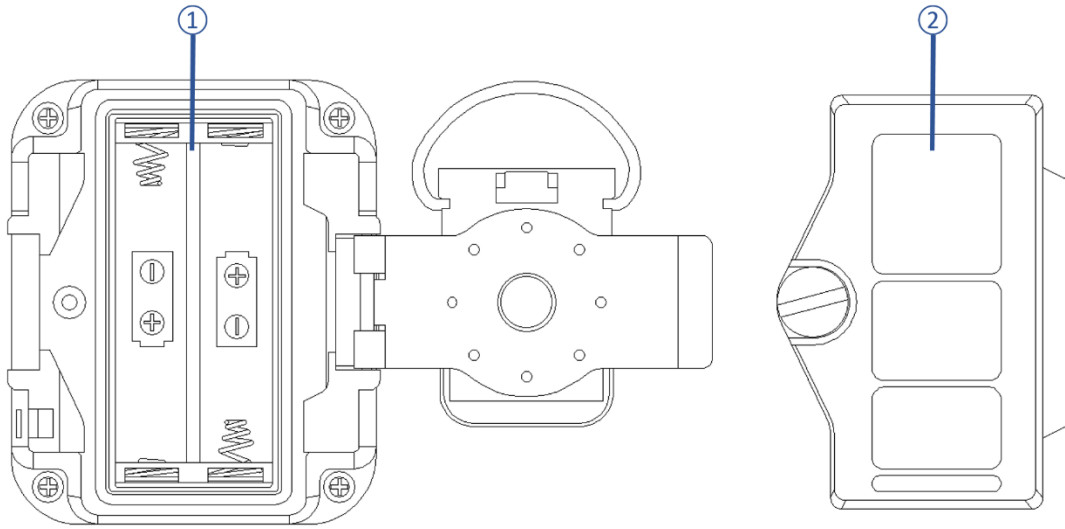
Refer to the following diagrams for identification of the external and internal system components that may be referred to in this manual.

1.3.1 EXTERNAL SYSTEM DIAGRAM



- | | | |
|-----------------------|--------------------|---------------------|
| 1 Alarm Buzzer Port | 2 Alarm LED Window | 3 Sensor Port |
| 4 Battery Cover Screw | 5 Battery Cover | 6 Power/Mode Button |
| 7 Air Button | 8 LCD Display | 9 Alligator Clip |

1.3.2 INTERNAL SYSTEM DIAGRAM



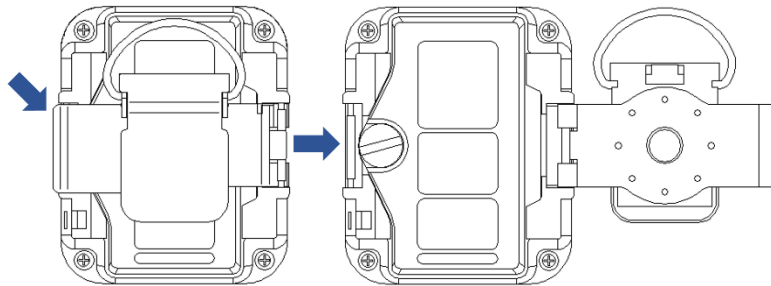
- 1 Battery Compartment
- 2 Battery Cover

2 INSTALLATION AND START-UP

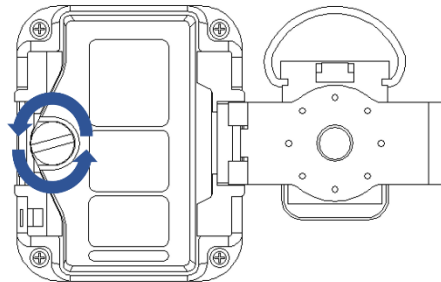
2.1 INSTALLING OR REPLACING BATTERIES

The OI-415 is supplied with a set of AAA batteries to allow you to immediately start using the monitor. Installing the batteries, or replacing the batteries, will follow the steps outlined below. You will want to replace the batteries when the last bar in the battery icon begins to flash.

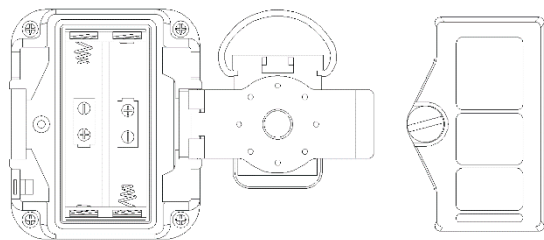
1. Make sure the OI-415 is turned off.
2. Release the alligator clip mounting strap from the enclosure by pulling the left side of the clip back to unclip it from the enclosure, there is a hinge on the right side that allows it to swing open.



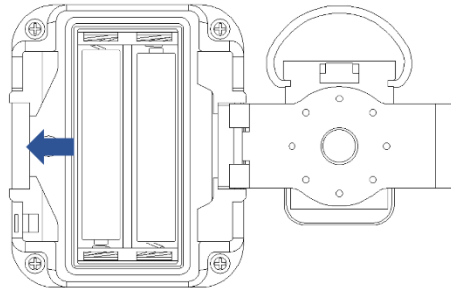
3. Unscrew the captive battery cover screw.



4. Remove the battery cover and set aside.



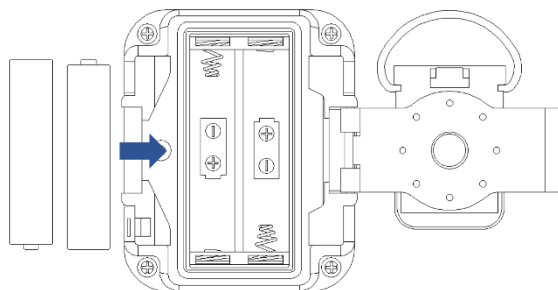
- Remove the old batteries from the OI-415.



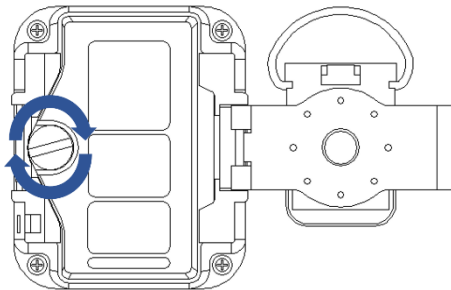
NOTICE

Never mix old and new batteries, ALWAYS replace them in pairs. Ensure the new batteries are installed within 5 minutes to avoid having to reset the date and time settings.

- Install the new batteries in the OI-415, orient as shown in the battery compartment.



- Reinstall the battery cover and tighten the battery cover screw.

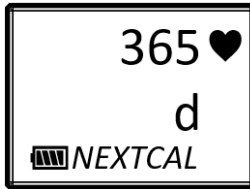


- If the OI-415 has been without batteries for an extended period the date and time will need to be set, that process is described further in this manual. If the date and time set process is not started within 30 seconds, the current values will be used and the OI-415 will begin its warmup sequence.

2.2 SYSTEM START-UP

After the batteries are installed the OI-415 is ready to turn-on and detect unsafe levels of carbon monoxide in the cockpit.

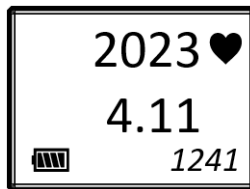
1. **Press** and **hold** the **POWER/MODE** button until you hear a beep, then you can release the button.
2. During startup the OI-415 will determine if it is time to be calibrated.
 - a. If calibration is NOT due, the unit will show the number of days remaining before calibration is needed.



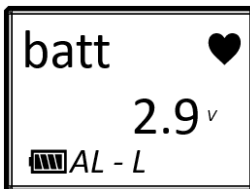
- b. If calibration is needed, the unit will alert you on startup. Otis recommends the OI-415 be sent in yearly for calibration. You can **press** the **AIR** button to bypass the alert and continue the startup process.



3. The current date and time will be shown for a few seconds. If the values shown are not right, they can be adjusted, that process is detailed later in this manual.



4. The battery voltage screen will appear for a few seconds. The "AL-L" at the bottom of the screen indicates that the alarms are set to latch.



- The next seven screens will automatically display for about 1 second each. They will detail the gas type, full scale range, and alarm and warning setpoints for the OI-415.



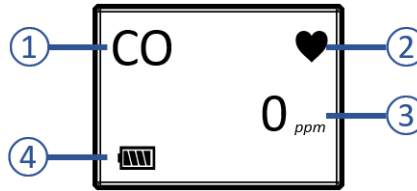
- The OI-415 is now monitoring for gas in Normal Operating Mode.

2.3 TURNING OFF THE OI-415

- Press and hold** the **POWER/MODE** button, the buzzer will beep 4 times, the screen will go blank when the unit is turned off. Release the button and store until the OI-415 is needed again.

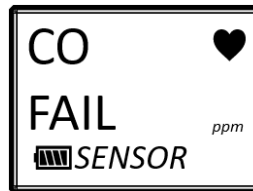
3 NORMAL OPERATING MODE

During normal operating mode, the OI-415 continuously samples the air and updates the measured concentration of carbon monoxide gas on the display screen. The display, when in normal operation, appears as shown below.



- 1 Gas Type
- 2 Heartbeat Icon – Flashes in normal operation
- 3 Gas Concentration and units
- 4 Battery Icon

In the event of a sensor element failure being detected during startup, the OI-415 will show the following screen and the buzzer will sound a double pulsing tone once per second. Please contact Otis for support if this screen appears, the device cannot be used with a failed sensor element.

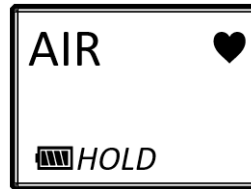


For any fault codes that appear please contact Otis for support.

3.1 PERFORMING A DEMAND ZERO

Otis strongly suggests performing a demand zero of the OI-415 before each use, this will set the reading to 0 PPM and ensure the OI-415 is reading accurately. This process needs to be performed in a fresh-air environment that is free of carbon monoxide, the process should take less than 10 seconds to complete.

1. Ensure the unit is turned on and in Normal Operating Mode, refer to the previous section for this process.
2. **Press** and **hold** the **AIR** button, the buzzer will beep twice, and the bottom of the screen will prompt you to continue to *HOLD* the button.



3. Release the **AIR** button when the prompt at the bottom of the screen says *RELEASE*, the buzzer will also beep once.



4. After releasing the **AIR** button, the screen will say *ADJ* in place of *CO*, the buzzer will beep once more when the demand zero process has been completed and the screen will return to Normal Operating Mode.

3.2 ALARMS

In Normal Operating Mode the OI-415 is constantly detecting any concentration of Carbon Monoxide in the environment and will automatically trigger the alarms as needed. The OI-415 sounds an audible alarm, the LED at the top of the case flashes, and a built-in vibration motor pulses when an alarm condition occurs. The different alarms have different audible, visible, and tactile alert patterns depending on the alarm condition that is occurring.

All alarm conditions on the OI-415 are latching and will require the alarm condition to clear before being able to deactivate the audible, visual, and tactile alarms.

The tables below show the different audible, visual, and tactile alarm indicators for the different alarm states that can occur and how to reset them once the cause of the alarm condition is cleared. The alarm setpoints are configured at Otis to OSHA recommendations, if your situation requires different values, please contact Otis for assistance.

Warning– Gas reading rises above the Warning setting

| | |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Visual Indications | Gas reading flashes on the screen. WARNING appears at the bottom of the LCD. The alarm LED flashes once every second. The backlight will turn on. |
| Audible Indication | A high/low tone pair will sound once every second. |
| Tactile Indication | Vibration motor will pulse once every second. |
| Reset | Press the POWER/MODE or AIR button once. |

Alarm – Gas reading rises above the Alarm setting

| | |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Visual Indications | Gas reading flashes on the screen. ALARM appears at the bottom of the LCD. The alarm LED flashes twice every second. The backlight will turn on. |
| Audible Indication | A high/low tone pair will sound twice every second. |
| Tactile Indication | Vibration motor will pulse twice every second. |
| Reset | Press the POWER/MODE or AIR button once. |

Alarm H – Gas reading rises above the Alarm H setting

| | |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Visual Indications | Gas reading flashes on the screen. ALARM H appears at the bottom of the LCD. The alarm LED flashes twice every second. The backlight will turn on. |
| Audible Indication | A high/low tone pair will sound twice every second. |
| Tactile Indication | Vibration motor will pulse twice every second. |
| Reset | Press the POWER/MODE or AIR button once. |

TWA or STEL – Gas reading rises above the TWA or STEL alarm setting

| | |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Visual Indications | Gas reading flashes on the screen. TWA or STEL appears at the bottom of the LCD. The alarm LED flashes once every second. The backlight will turn on. |
| Audible Indication | A high/low tone pair will sound once every second. |
| Tactile Indication | Vibration motor will pulse once per second. |
| Reset | Press the POWER/MODE or AIR button once. |

Table Continues on Next Page

| Over Range – Gas reading rises above the measurement range of the OI-415 | |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Visual Indications | Gas reading replaced with flashing n n n on the screen. OVER appears at the bottom of the LCD. Gas name and unit flash. The alarm LED flashes twice every second. The backlight will turn on. |
| Audible Indication | A high/low tone pair will sound twice every second. |
| Tactile Indication | Vibration motor will pulse twice every second. |
| Reset | Press the POWER/MODE or AIR button once. |
| Minus Over Range – Gas reading drops below zero | |
| Visual Indications | Gas reading replaced with flashing ----- on the screen. M OVER appears at the bottom of the LCD. Gas name and unit flash. The alarm LED flashes twice every second. The backlight will turn on. |
| Audible Indication | A high/low tone pair will sound twice every second. |
| Tactile Indication | Vibration motor will pulse twice per second. |
| Reset | Press the POWER/MODE or AIR button once. |
| Low Battery Warning – The batteries are low and should be replaced soon | |
| Visual Indications | The last bar in the battery icon starts to flash. |
| Audible Indication | None. |
| Tactile Indication | None. |
| Reset | Replace the batteries in the unit. |
| Dead Battery Alarm – The batteries are critically low and must be replaced | |
| Visual Indications | Gas reading replaced with FAIL BATTERY on the screen. The alarm LED flashes once every second. |
| Audible Indication | Double pulsing tone will sound once every second. |
| Tactile Indication | None. |
| Reset | Replace the batteries in the unit. |
| Sensor Failure Alarm – The sensor element has failed | |
| Visual Indications | Gas reading replaced with FAIL SENSOR on the screen. The alarm LED flashes once every second. |
| Audible Indication | Double pulsing tone will sound once every second. |
| Tactile Indication | None. |
| Reset | Contact Otis to send the unit in for service. |
| Clock Failure Alarm – The unit has lost its time and date settings | |
| Visual Indications | Gas reading replaced with FAIL 050 CLOCK on the screen. The alarm LED flashes once every second. |
| Audible Indication | Double pulsing tone will sound once every second. |
| Tactile Indication | None. |
| Reset | Setting/Changing the time and date are covered later in this manual. |

Table Continues on Next Page

System Failure – An internal fault has occurred in the unit

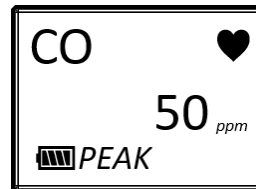
| | |
|--------------------|------------------------------------------------------------------------------------------------------------------------|
| Visual Indications | Gas reading replaced with FAIL SYSTEM and an error code on the screen. The alarm LED flashes once every second. |
| Audible Indication | Double pulsing tone will sound once every second. |
| Tactile Indication | None. |
| Reset | Contact Otis to send the unit in for service. |

4 DISPLAY MODE

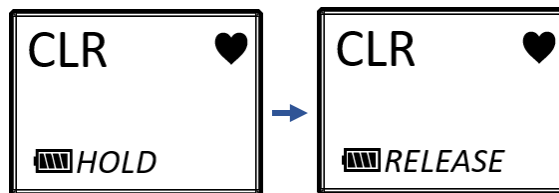
To enter Display Mode, you need to press and release the **POWER/MODE** button after the unit is in Normal Operating Mode. Each screen will display for 20 seconds, if there are no button presses within 20 seconds the unit will automatically return to Normal Operating Mode. **Pressing** and **releasing** the **POWER/MODE** button will advance through each screen until returning you to Normal Operating Mode.

4.1 GAS READING HISTORY DISPLAYS

4.1.1 PEAK READING



The Peak Reading Display will show the highest value the OI-415 has detected since being turned on. This reading is stored until a higher reading is detected, the reading is cleared, or the OI-415 is turned off. To clear the peak reading perform the following steps:



1. **Press and hold** the **AIR** button until the bottom of the screen prompts you to release the button, the buzzer will beep once at the beginning of the process, and then again when the screen says *RELEASE*.
2. Release the **AIR** button, the unit returns to the Peak Reading Display screen which should now show 0 PPM.

4.1.2 STEL READING

The STEL Reading Display screen shows the short-term exposure limit reading. This value is calculated by averaging the readings that have been collected over the last 15 minutes that the OI-415 has been turned on.



4.1.3 TWA READING

The TWA Reading Display screen shows the average reading over the last 8 hours. If 8 hours have not elapsed since the unit has been operational, the average is still calculated over 8 hours, 0 PPM values are used for the missing readings.

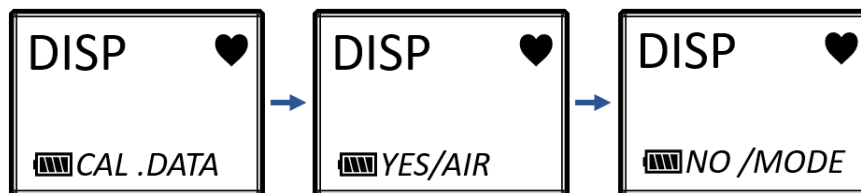


4.2 CALIBRATION DATA DISPLAY

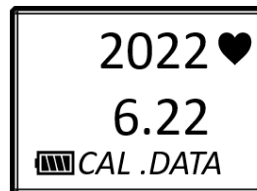
The OI-415 is calibrated at the factory before shipment and is valid for 365 days before needing to be calibrated again. Once a year has passed since the last calibration date you will be reminded on startup that the calibration is due again. This screen will show you the last date the OI-415 was calibrated.

4.2.1 DISPLAYING THE LAST CALIBRATION DATE

1. After the TWA reading screen is the first Display Mode screen with a submenu to access more information. Press the **AIR** button to display the date of the last successful calibration. Press the **POWER/MODE** button to advance to the Date/Time Display screen.



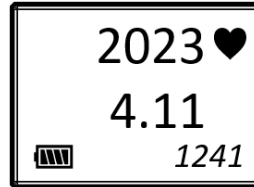
2. If you press the **AIR** button above the screen will show you the last date the OI-415 was nulled and calibrated. Press the **POWER/MODE** button twice to advance to the Date/Time Display screen.



4.3 UNIT INFORMATION DISPLAY

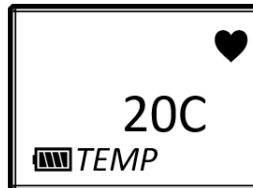
4.3.1 DATE/TIME DISPLAY

The DATE/TIME Display shows the current date and time set on the OI-415. Adjusting these values for your specific location are discussed later in this manual.



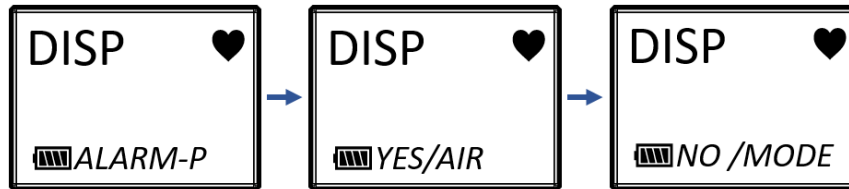
4.3.2 TEMPERATURE DISPLAY

The OI-415 has a built-in temperature sensor that measures the temperature of the environment where it is operating.



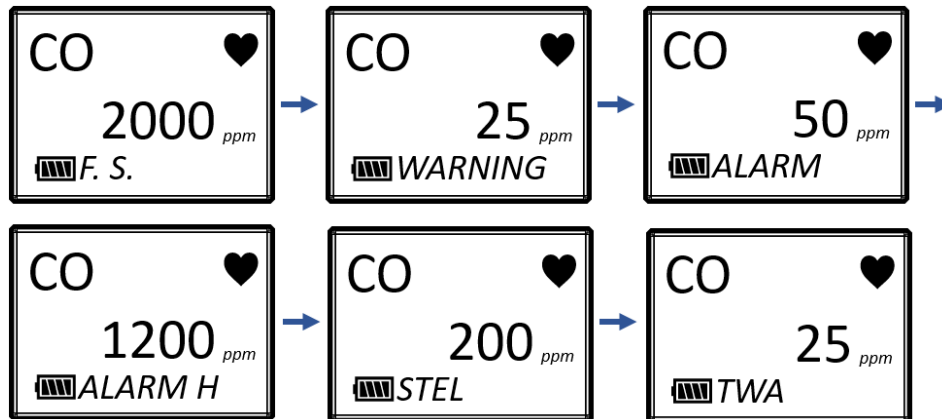
4.4 ALARM SETPOINTS DISPLAY

The Alarm Setpoints Display shows the current values the OI-415 has set for reacting to elevated gas concentrations. These screens will also allow you to simulate the gas alarm occurring so that you can be familiar with what will happen for each of the different alarm setpoints. The alarm setpoints are configured at Otis to OSHA recommendations, if your situation requires different values, please contact Otis for assistance.



4.4.1 VIEWING AND SIMULATING ALARMS

Press the **AIR** button to scroll through viewing the alarm setpoint values, the order is shown below, these displays loop back to the first screen when reaching the end. To simulate the alarm reaction for the displayed setpoint **press** the **AIR** and **POWER/MODE** buttons at the same time. To end the test and advance to the next screen **press** the **AIR** button. Exit these displays by **pressing** the **POWER/MODE** button twice, you will then be at the screen to adjust the buzzer volume.



4.5 ADJUSTING BUZZER VOLUME

The OI-415 comes from the factory with the buzzer volume set to the high value, if the buzzer value is too loud for your environment you can adjust it to the low value in this menu. Follow the steps below to adjust the volume setting.

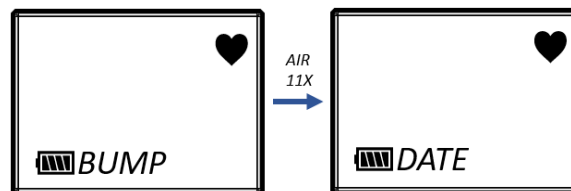


1. **Press** the **AIR** button, the current setting will start to flash on the screen.
2. Use the **AIR** button to toggle between the two volume settings.
3. **Press** the **POWER/MODE** button three times to save the value and return to Normal Operating mode.

4.6 ADJUSTING DATE AND TIME

The OI-415 comes from the factory with the date and time set for the Central Time zone of the United States. If you are in a different time zone and would prefer to adjust this, or the batteries were removed for too long and the time settings were lost, please follow the steps below.

1. Turn off the OI-415, this process was detailed earlier in this manual.
2. **Press and hold** the **AIR** button, then **press and hold** the **POWER/MODE** button at the same time. When you hear a single beep, release both buttons.
3. At the bottom of the screen the word *BUMP* will appear, **press** the **AIR** button until the bottom of the screen shows *DATE*, there will be eleven presses of the **AIR** button.



4. **Press** the **POWER/MODE** button to enter the date configuration menu.



5. The *YEAR*, *YYYY*, will be flashing, **press and release** the **AIR** button to increase the year if needed.
 - a. To decrease the year, **press** both the **AIR** and **POWER/MODE** buttons simultaneously, then **press** the **AIR** button to decrease the year.
 - b. **Press** both the **AIR** and **POWER/MODE** buttons simultaneously again to reset the **AIR** button to increase the year.
6. **Press** the **POWER/MODE** button to move to setting the month.
7. The *MONTH*, *MM*, will be flashing, **press** the **AIR** button to increase the month if needed.
 - a. To decrease the month, **press** both the **AIR** and **POWER/MODE** buttons simultaneously, then **press** the **AIR** button to decrease the month.
 - b. **Press** both the **AIR** and **POWER/MODE** buttons simultaneously again to reset the **AIR** button to increase the month.
8. **Press** the **POWER/MODE** button to move to setting the day.
9. The *DAY*, *DD*, will be flashing, **press** the **AIR** button to increase the day if needed.
 - a. To decrease the day, **press** both the **AIR** and **POWER/MODE** buttons simultaneously, then **press** the **AIR** button to decrease the day.
 - b. **Press** both the **AIR** and **POWER/MODE** buttons simultaneously again to reset the **AIR** button to increase the day.

10. **Press** the **POWER/MODE** button to move to setting the hour.
11. The *HOUR*, hh, will be flashing, **press** the **AIR** button to increase the hour if needed.
 - a. To decrease the hour, **press** both the **AIR** and **POWER/MODE** buttons simultaneously, then **press** the **AIR** button to decrease the hour.
 - b. **Press** both the **AIR** and **POWER/MODE** buttons simultaneously again to reset the **AIR** button to increase the hour.
12. **Press** the **POWER/MODE** button to move to setting the minute.
13. The *MINUTE*, mm, will be flashing, **press** the **AIR** button to increase the minute if needed.
 - a. To decrease the minute, **press** both the **AIR** and **POWER/MODE** buttons simultaneously, then **press** the **AIR** button to decrease the minute.
 - b. **Press** both the **AIR** and **POWER/MODE** buttons simultaneously again to reset the **AIR** button to increase the minute.
14. **Press** the **POWER/MODE** button to move to the *EXIT* menu option, **press** the **AIR** button to save the entered values and return to the previous menu.
15. **Press** the **AIR** button three times until the bottom of the screen says *START*, **press** the **POWER/MODE** button to complete the startup procedure of the OI-415.

APPENDICES

- APPENDIX A: OTIS INSTRUMENTS PRODUCT WARRANTY STATEMENT
- APPENDIX B: INFORMATION ABOUT RMA SERVICE REPAIRS

APPENDIX A: PRODUCT WARRANTY STATEMENT

Warranty Coverage

Otis Instruments, Inc., 301 S. Texas Avenue, Bryan, Texas, 77803 (“Otis”) warrants the manufacture of all Otis hardware, firmware, software, components, and product accessories (“Otis Products”), contained in the original packaging, against defects in materials and workmanship when used normally in accordance with Otis’ published guidelines for a period of ONE (1) YEAR from the date of original purchase by the end-user/purchaser from the manufacturer or from the product’s authorized sellers/distributors (“Warranty Period”). Otis’ published guidelines include but are not limited to information contained in technical specifications, operation/user manuals and service communications.

Warranty Exclusions

This Warranty does not apply to any non-Otis manufactured products, even if packaged or sold with Otis Products. Otis does not warrant that the operation of their manufactured products be uninterrupted or error-free. Otis is not responsible for damage arising from failure to follow instructions relating to the Otis Product’s use.

This Warranty does not apply to: (a) batteries; (b) protective coatings that are designed to diminish over time, unless failure has occurred due to a defect in materials or workmanship; (c) cosmetic damage, including scratches, dents and chipping of paint; (d) damage, caused by use with another product accident, abuse, misuse, or any external cause of force majeure; (e) damage, caused by operations outside of Otis’ published guidelines; (f) damage, caused by service performed by anyone who is not a representative of Otis or who is not an Otis authorized service provider; (g) damage, caused by product modifications, alterations of functionality or capability; (h) defects, caused by normal wear and tear or otherwise due to the normal aging of the Otis product, or (i) any product in which a product-labeled serial number has been removed, defaced, or altered in any way.

If examination and assessment discloses that the alleged defect in the product does not exist, or was caused by the end-user/purchaser (or any third-party) misuse, neglect, improper wiring or installation, testing or calibrations, the Otis Product Warranty will be null and void. Any unauthorized attempts of repair, modification, or any other cause of damage beyond the range of the Otis Product’s intended use, including force majeure, voids all liability of the manufacturer.

Replaceable Batteries

All batteries supplied to the end-user/purchaser by Otis are covered, from the date of shipment, for ninety (90) days.

End-User Responsibilities

End-user/purchaser should have Otis perform a calibration procedure every 365 days for optimal performance, proper maintenance, and as a precaution against possible operational failures.

Before the end-user/purchaser receives the initial Warranty service, Otis may require the end-user to furnish proof of purchase details, respond to questions designed to assist with diagnostics, and follow Otis procedures for obtaining Warranty service.

Otis Products submitted to Warranty service must be returned in their complete assembly, as originally shipped from the manufacturer. Warranty service will not service/repair Otis Products that are not in their original condition. For Otis Gas Detection Products the end-user/purchaser must remove all batteries before shipping.

Otis Products submitted to Warranty service will be returned, as originally configured, with the factory default settings, upon completion of the service/repair. Otis is not responsible for maintaining end-user/purchaser settings, resetting the null, recalibration, or any other preparations for reinstallation and/or reintegration of the device.

Warranty Service

Please refer to the Otis published guidelines and/or the Otis website before seeking Warranty service. If the Otis Product continues to malfunction/error after consulting these resources, please contact the product's authorized seller/distributor or consult the Otis RMA/Service webpage at www.otisinstruments.com/service for information and instructions on submitting the Otis Product for Warranty service.

Otis Warranty service, at their discretion, will (a) repair the device using new or previously used parts that are equivalent to new in performance and reliability, (b) replace the Otis Product with a device that is at least functionally equivalent to the Otis product and is formed from new and/or previously used parts that are equivalent to new in performance and reliability, or (c) exchange the Otis Product for a refund of your purchase price, when an Otis Product is submitted.

Otis Warranty service will treat service/repairs as quick-turn exchanges. Otis Warranty service does not replace any board level components, (i.e. magnetic switches, resistors, capacitors, relays, etc.).

Otis Products may require the replacement of certain user-installable parts or Otis Products. A replacement part or Otis Product, including a user-installable part that has been installed in accordance with instructions provided by Otis, assumes the remaining term of the Warranty, or ninety (90) days from the date of replacement or repair, whichever provides the longer coverage for the end-user/purchaser. When an Otis product or part is replaced, or a refund is provided, any replacement item becomes your property and the replaced or refunded item becomes Otis' property.

For Otis Products requiring Warranty service that are located outside of the United States, the customer is responsible for compliance of all import/export laws and regulations/requirements, including associated taxes and other charges. Where applicable, Otis Warranty service may repair/replace products with parts that comply with local/regional standards.

Otis Products covered under Warranty will receive service/repairs at no charge to the end-user/purchaser. Otis Products not under Warranty will be diagnosed for service/repair and the end-user/purchaser will be notified of the recommended service/repairs and applicable charges. The completion of the service/repairs, or the return of the unrepaired product, is at the discretion of the end-user/purchaser. Charges assessed for service/repair on Otis Products not under Warranty are at a rate of list cost minus dealer/distributor percent discount.

Upon completion of Warranty service, Otis Warranty service will return the device to the end-user/purchaser. Please consult the Otis website for more information concerning shipping costs for Warranty service.

Otis reserves the right to change the method by which Otis Warranty service is provided. Otis also reserves the right to change the Otis Product's eligibility to receive a particular method of service. Warranty service may be limited for Otis Products in the country where the manufacturer or product's authorized sellers/distributors originally sold the product. Warranty service options, parts availability and response times may vary.

APPENDIX B: INFORMATION ABOUT RMA SERVICE REPAIRS

Otis Instruments, Inc. offers technical support to our customers. Please contact the Otis Instruments RMA Service Department for technical support, repair requests, warranty inquiries, end-user commission reports, dealer/distributor support, and Modbus setup inquiries and services.

This appendix is for information purposes only. Please visit our website at www.otisinstruments.com/RMA to obtain the latest version of the Otis Instruments, Inc. Return Material Authorization (RMA) Service Repair Form and shipment instructions.

IMPORTANT INFORMATION

All RMA Service repairs must be shipped to OTIS Instruments / Repairs, 301 South Texas Ave., Bryan, Texas 77803.

To ensure that RMA Service repairs are processed as timely as possible, the Otis Instruments, Inc. Return Material Authorization (RMA) Service Repair Form must be completed in its entirety and included within the box at the time of shipment. Customer contact information and product information, including model number, serial number, and specific reason(s) for service, will need to be accessible in order to complete the form. Shipments received that do not include the form, or if the form is incomplete, will be returned (unrepaired) to the customer at their expense.

Products/parts must be shipped in the proper packaging and the shipping materials must adhere to ESD safety precautions, as applicable. The entire assembly, as originally shipped from the manufacturer, must be returned for repair. When shipping sensor assemblies (gas detectors), the antenna, rain guard, and battery must be removed prior to shipment. Failure to adhere to these instructions will result in the products/parts being returned to sender at their expense.

Once the RMA Service Repair Form is received by the Otis Instruments RMA Service Department, a RMA Service number will be generated. The RMA Service number will be sent to the email address provided for verification of receipt.

RMA Service quotes have a thirty (30) day expiration. Quotes that do not receive a purchase order response within thirty (30) days of the quote will be canceled and all products/parts will be returned (unrepaired) to the customer at their expense.

Declined repairs will be subject to evaluation fees per hour of time required to diagnose the equipment.

Discontinued products may not be returned for RMA Service for repair. For a listing of the Otis Instruments, Inc. discontinued products, please visit our website at www.otisinstruments.com/RMA. If your product/part has been discontinued, please contact your local sales representative for replacement options.

All RMA Service repairs are treated as quick-return exchanges. Otis Instruments, Inc. does not replace board level components (i.e. magnetic switches, resistors, capacitors, relays, etc.).

There is no charge for RMA Service repairs that are within the specified warranty period. For a copy of the Otis Instruments, Inc. Product Warranty Statement, please visit our website at www.otisinstruments.com/official_statements. Products/parts that are not within the specified warranty period will result in a charge to the customer for service.

Products/parts that fall within the Otis Instruments, Inc. operating specifications deemed defective due to customer misapplication will be returned as is and may result in a per unit evaluation fee to the customer. Otis Instruments, Inc. reserves the right to return customer-damaged or no-fault found products/parts from the Otis Instruments RMA Service Department to the customer at their expense.

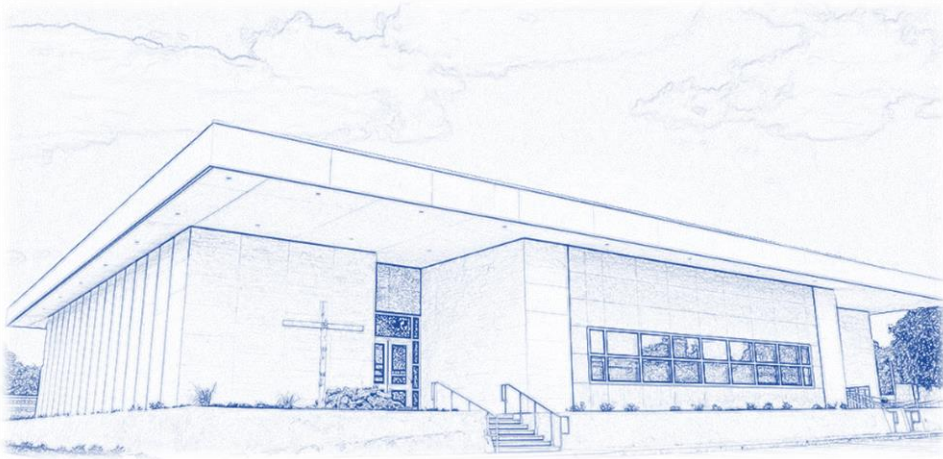
If advanced replacement is required, please contact the Service Department for more information.

INTERNATIONAL RMA SERVICE REPAIRS

The customer is responsible for complying with all import/export requirements for shipment of RMA/Service repairs to Otis Instruments, Inc.

OTIS INSTRUMENTS RMA SERVICE DEPARTMENT

Otis Instruments / Repairs
301 South Texas Ave.
Bryan, Texas 77803
Office: 979.776.7700
Fax: 979.776.7719
service@otisinstruments.com
www.otisinstruments.com/RMA



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