

Low Temperature Oxygen Deficiency Monitoring

Frequently Asked Questions

RAD-0002 ZR Low Temperature Oxygen Deficiency Safety Three Alarm

Please find below a conglomeration of frequently asked questions about the Low Temperature Oxygen Deficiency safety monitors, their installation, application, and use. If you cannot find an answer to your questions please contact the technical sales team at CO2Meter directly at sales@co2meter.com or by calling 877- 678-4259.

Why would I need a low temperature monitor?

Some applications like cryo storage, food packaging/storage, and laboratories use gases to create extremely low temperatures in their facilities – often sub -40C. Because of these extremely cold and sustained temperatures a unique sensor needs to be utilized to ensure accuracy, repeatability, and long life.

The RAD-0002 ZR utilized a zirconium dioxide sensor that is rated for long term use down to -50C.

What are the dimensions and weight of the device?

The SEU (bigger box) is 4.5” wide, 6.5” tall, and 2.5” deep.

The RDU (smaller box) is 3.0” wide, 5.0” tall, and 1.5” deep.

The remaining components (cables, mounting brackets, screws, etc.) all vary in size.

The device weighs 4.0 lbs. boxed, and the components weigh 2.65 lbs. unboxed.

Why wouldn't I just buy a monitor for the gas I'm using?

Inert gases like nitrogen, helium, and argon are very difficult to detect accurately and repeatedly. Additionally, these gases are all lighter than air and will tend to collect higher in a room or confined/enclosed space. Thus, these gases will start to push oxygen down in the space driving it out. Monitoring for the lack of oxygen allows occupants to be notified that an asphyxiation situation is likely.

Where do I mount the sensor/device?

An oxygen deficiency monitor should be installed at 72 inches off the floor height inside the space where the gas is stored, utilized, or may collect. See the graph below indicating the molecular mass of each gas.

HYDROGEN	2.0
HELIUM	4.0
NITROGEN	14.0
OXYGEN	15.9
AMONIA	17.0
CARBON MONOXIDE	28.0
ETHYLENE	28.1
AIR	28.9
ARGON	39.9
NITRUS OXIDE	44.0
PROPANE	44.0
CARBON DIOXIDE	44.1
BUTANE et all	56.1
CHLORINE	70.9
R Rated Refrigerants	86+

What if my facility is using ammonia as its refrigerant?

CO2Meter recommends you contact you gas provider to discuss installation of ammonia detectors.

Can you give me a power cable longer than 6 feet because it will not reach the closest power outlet?

No. International Electrical Code limits the power code of the device to 6 feet.

Can I use an extension cord to reach the outlet?

No. International Electrical Code prohibits the use of extension cords to connect the device to an outlet.

How do I know which code/regulation I have to meet?

Some states and local jurisdiction have codes in place that require monitoring. Understanding these requirements is key but also not the only reason to install safety monitoring. Life safety is a key component of any organization's safety protocols.

Why can the fire inspector ask me to do something not in the code?

The Inspector is the Authority Having Jurisdiction. The AHJ is given the right to make a code/requirement more restrictive than detailed in the published document.

How many devices need to be mounted in the room?

Monitors cover approx. 1,500 sq. feet (length x width of the space). Typically, placement within 10 feet of the stored gas is sufficient. Larger spaces may require additional monitors.

Enclosed rooms/spaces (closets, offices, bathrooms, and keg coolers) may require additional monitoring as gas can be trapped in these spaces because of the enclosure.

My bulk tank or cylinders are stored outside. Do I still need a monitor?

Outside storage of tanks and cylinders is allowed by the code and the manufacturers of these storage vessels. However, the gas is being used INSIDE the facility and the people are INSIDE the facility. A monitor will be required at the "first point of use" inside or in any room where humans may enter or work in for short periods of time. Consider monitors for storage areas and labs especially.

The gas provider ran the gas lines above the drop ceiling. The inspector wants a monitor above the drop ceiling. What do I do?

First, ask your gas provider if they will move the lines down below the ceiling. If they won't move the

lines, then you will need to comply with the inspector's request and install a monitor above the drop ceiling.

The gas lines run over the top (or through) an office/bathroom. Do I need a monitor in those rooms?

An inspector may ask you to monitor these rooms as they are technically considered confined/enclosed spaces.

What are the alarm settings for the device?

Alarm 1 – pre-set to alarm when the oxygen level drops below 19.5% O₂ (195,000 ppm). This is an instantaneous alarm. Alarm 1 may be set as low as 18.0% and as high as 20.0%.

Alarm 2 – pre-set to 17.0% O₂ (170,000 ppm). This is an instantaneous alarm. Alarm 2 may be set as low as 16.0% and as high as 17.5%.

Alarm 3 – pre-set to 15% O₂ (150,000 ppm). This is an instantaneous alarm. Alarm 3 can be set as low as 13.0% and as high as 15.5%.

Note

The oxygen concentration in normal air is 20.9%.

What happens when the device “goes off”?

Alarm 1 – The display on both the main and remote units will give an accurate reading of the ppm or percentage level depending on the concentration of the gas. A flashing red LED for AL1 and 90-dB audible indication indicates that the device has exceeded the Alarm 1 threshold (pre-set to alarm when the device measures oxygen below 19.5%).

Alarm 2 – The display on both the main and remote units will give an accurate reading of the ppm or percentage level depending on the concentration of the gas. Red LED's for AL1 and AL2 will begin to flash and the 90-dB audible indication will sound twice as fast as for Alarm 1 only.

Alarm 3 - The display on both the main and remote units will give an accurate reading of the ppm or percentage level depending on the concentration of the gas. Red LED's for AL1, AL2, and AL3 will begin to flash and the 90-dB audible indication will sound three times as fast Alarm 1 only.

Note The alarms levels on the device are designed to “latch”. The latching function ensures that the device must work its way back out of the alarm levels in a descending manner.

Can the monitor trigger a secondary device if it goes into alarm status?

Yes. The device's three alarm levels each have their own normally open/normally closed, dry contact relays tied to the alarms. When the alarm level is triggered the appropriate relay will trigger the device it is wired to. The monitor will NOT power the device but will trigger it to turn on/off.

The inspector asked me to get strobe lights for my monitor. Why?

Some inspectors and jurisdictions have required the additional visual notification of 100 cd strobe lights to monitors. In loud areas and commercial applications like breweries, food packaging, welding, and industrial applications the added visual notification of strobe lights IS recommended.

I see a 4-20 ma output wire coming out of the back of the device. What is this for?

The 4-20 ma output is designed to allow you to “see” the devices readings outside the space (security system, building control system, etc.). This option is intended for industrial settings not for standard commercial settings. Consult your electrician or security company if you want to use the 4-20 ma output.

Can the two units be connected wirelessly? Why is it still hardwired?

The two units cannot communicate wirelessly. The average facilities construction materials can prevent an uninterrupted wireless signal which would render this safety device ineffective.

As of the date of publication of these FAQ’s hard wiring the device is still the preferred and recommended method for installation to ensure safety.

Can I hard wire the monitor in to my electrical system, so the plug can't be inadvertently or purposefully unplugged?

Yes. The safety monitor does allow an electrician to hard wire the device into any buildings electrical system. By wiring standard 110V electricity to a 24V volt DC power converter and then running the converted power directly into the monitor the device can be hard wired to the electrical system. Detailed instructions and a 24V DC power converter example are available [here](#).

Can I connect my oxygen monitor to a battery back-up system?

Yes. The device will accept the 12-volt back-up power supply from your facility (exit signs and lights run on this circuit). Additionally, the device can be plugged in to a Universal Power Supply (UPS) for temporary back-up power.

If my inspector doesn't require the use of the relay cables on the device, what do I do with them?

Utilizing a small screwdriver, you may remove the relay cables from the unit. Retighten the screws once done. Save the cables in the event the inspector changes their mind at a later point. DO NOT completely remove the green terminal strip holding the cables. If you lose that strip the relays will be unusable in the future.

What is the maximum distance I can mount the Remote Display from the main sensor unit?

CO2Meter provides 25 feet of CAT5 cable to connect the two units. This length of cable will ensure that the remote is outside the hazard area. The maximum distance between the two units is 300 feet. You may source longer CAT5 cable from any retailer. CO2Meter recommends not splicing CAT5 cable together.

Can multiple remotes be run in sequence?

Yes. Multiple remotes can be "daisy chained" together. The maximum number of remotes tethered to a main unit is three.

What if I only need the main unit and not the remote unit?

In some circumstances a remote display unit is not needed. In this instance you may operate the main unit without connecting the remote unit. The device will operate normally. Please keep the other pieces in the event you or your inspector changes your mind.

CO2Meter does not offer a device without the remote unit.

My inspector told me I need to add strobe lights to my device. What do I do?

Contact CO2Meter's technical sales department. They will help you to determine your best options for adding strobe lights to your existing devices.

Typically, adding the CM-1027 Strobe Kit to your devices is very simple.

How can I test the device to see if it is working correctly?

Often testing the monitor helps you, employees, and inspectors know the device is operating correctly. The first option is to hard reset the device – see below.

Another solution is so easy it will take your breath away – literally.

Lean down close the main sensing unit and blow your exhaled breath on to the sensor. 10-15 deep breaths should suffice. The CO₂ from our lungs when we exhale should be enough to drive the device down below 19.6% - its initial alarm stage.

If you or an inspector wants a more precise manner of setting the device off, you can purchase a small cylinder of nitrogen.

Using a 0.5 liter per minute of nitrogen directed at the sensor on the device until it alarms.

How do I reset the device?

The device can be "hard reset" to try and remove error codes or turn off the FLT light. Locate a small pin hole in the bottom right-hand corner of the SEU. The hole has a small white arrow that circles the hole. Behind the hole is a small, rubber button that will reset the device. Utilizing the tip of a pen, insert the pen into the hole, depress then release the rubber button, and the device will start to reset.

Be patient as the device will shut off, turn back on, and begin its warmup sequence and countdown including flashing all LED's and sounding the audible indicator.

Can I get a calibration certificate with my device?

If you request the calibration certificate at the time of purchase CO₂Meter can provide it free of charge for single piece orders. We cannot provide calibration certificates once the device has left the facility.

Can I replace the Oxygen sensor in my monitor?

The lifespan of the oxygen sensor that we utilize is typically 5+ years and should not need to be replaced. To service your device please contact CO₂Meter to begin the RMA process.