

# Oxygen Detector Model XO-2200 Instruction Manual

- Thank you for purchasing XO-2200.
- Keep this manual where it is readily accessible for quick and easy reference when necessary.
- Thoroughly read this manual before using the equipment so that it can be used safely and correctly.
- The descriptions in this manual are subject to change without notice.
- This package contains items as listed below. Please check carefully when unpacking. If any of the contents are missing, contact your authorized distributor or representative.

- O<sub>2</sub> Detector ..... 1
- Calibration test certificate ..... 1
- Instruction manual ..... 1
- Alkaline AAA Battery..... 2  
(One battery pre-installed)
- Safety Pin Adaptor (C-10) ..... 1  
(with 4 screws)



**Note** The pre-installed battery was used to adjust XO-2200 in our factory. We recommend replacing the battery with a new one (provided) before using the product.

## Warranty

New Cosmos Electric Company Limited (New Cosmos) offers the following as the sole and exclusive limited warranty available to Customer. This warranty is in lieu of, and customer waives, all other warranties of any kind or nature, expressed or implied, including without limitation, any warranty for merchantability or fitness for a particular purpose. The remedies set forth herein are exclusive.

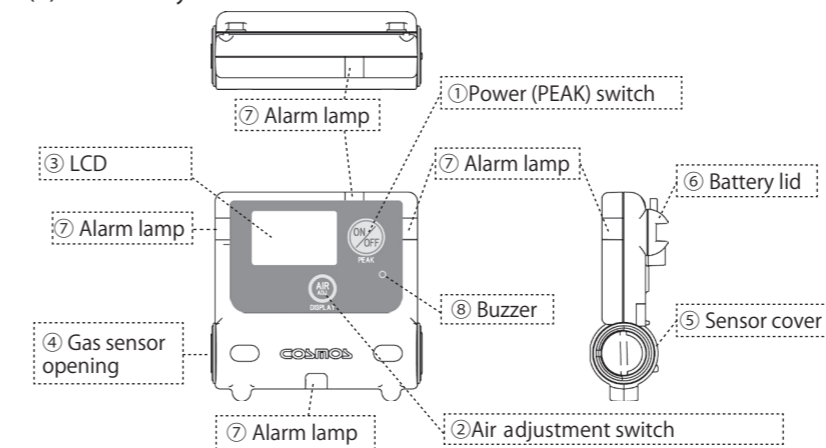
New Cosmos warrants to the original purchaser and no other person or entity (customer) that gas detection product supplied by New Cosmos shall be free from defects in materials and workmanship for a period of one (1) year from the date of purchase. This warranty does not include consumables, such as fuses, filters, etc. Certain other accessories not specifically listed here may have different warranty periods.

After examination of allegedly defective product return to New Cosmos, with freight prepaid, should the product fail to conform to this warranty, customer's only remedy and New Cosmos's only obligation shall be, at New Cosmos's sole option, replacement or repair of such non-conforming product or refund of the original purchase price of the non-conforming product. In no event will New Cosmos be liable for any other special, incidental or consequential damages or losses of any kind whatsoever, including but not limited to, loss of anticipated profits and any other loss caused by reason of non-operation of the product.

This warranty is valid only if the product is maintained and used in accordance with New Cosmos's instructions and/or recommendations. New Cosmos shall be released from all obligations under this warranty in the event repairs or modifications are made by persons other than its own or authorized service personnel or if the warranty claim results from physical abuse or misuse of the product.

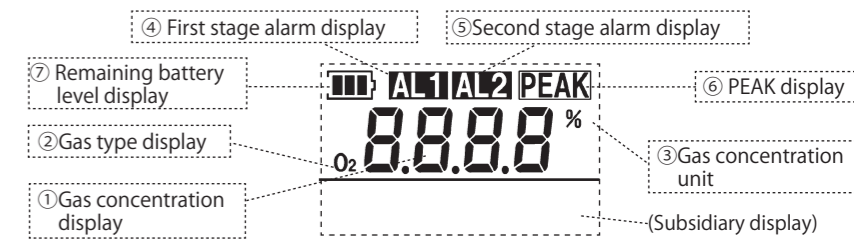
## 2. Part Names and Functions

### (1) Main Body



① Power (PEAK) switch	Turns the power ON/OFF. Or it is used for the PEAK hold function.
② Air adjustment switch	Performs 21% adjustment.
③ LCD	Displays the different types of indications including gas concentration (refer to page 4).
④ Gas sensor opening	Port to detect oxygen concentration.
⑤ Sensor cover	To hold the gas sensor.
⑥ Battery lid	Lid for the battery compartment.
⑦ Alarm lamp	Blinks when an alarm is activated.
⑧ Buzzer	Sounds when an alarm is activated.

### (2) LCD



① Gas concentration display	Digital display of gas concentration value.
② Gas type display	Displays gas type.
③ Gas concentration unit	Displays gas concentration unit.
④ First stage alarm display	Blinks when the O <sub>2</sub> concentration falls below the first stage alarm set value.
⑤ Second stage alarm display	Blinks when the O <sub>2</sub> concentration falls below the second stage alarm set value.
⑥ PEAK display	Displays when the gas concentration indicates the PEAK value.
⑦ Remaining battery level display	Displays remaining battery level.

## 1. Introduction

● This product is an O<sub>2</sub> detector to prevent from oxygen deficiency by alarm buzzer, lamp and vibration when the O<sub>2</sub> concentration falls below the alarm set value.

### ● Description of Symbols

In order to use the Gas Detector safely, be sure to observe the following symbols.

	DANGER	Indicates information that, if not heeded, is likely to result in death or serious injury.
	WARNING	Indicates information that, if not heeded, could possibly result in death or serious injury.
	CAUTION	Indicates information that, if not heeded, could result in minor injury, or damage to the product.
	Note	This symbol indicates advice on how to handle the product.

### ● Explosion-proof Requirements (Japan)

**CAUTION** XO-2200 is explosion-proof (intrinsically safe, Japan). Use the detector as directed below.

Explosion-proof: Ex ib IIB T3 Gb  
 Power Source: 1.5 VDC alkaline AAA battery x 1 pc  
 Battery to use: Panasonic alkaline AAA battery (LR03X) x 1 pc, or Toshiba alkaline AAA battery (LR03) x 1 pc

Ambient temperature: -20°C to +40°C  
 Conditions of Use

- This product should not be used in hazardous areas outside of Japan.
- Do not replace the battery in hazardous areas.
- Do not use this product for measuring the oxygen concentration in any mixture other than a mixture of air and combustible gas or a mixture of vapor and toxic gas.
- Only use specified battery.

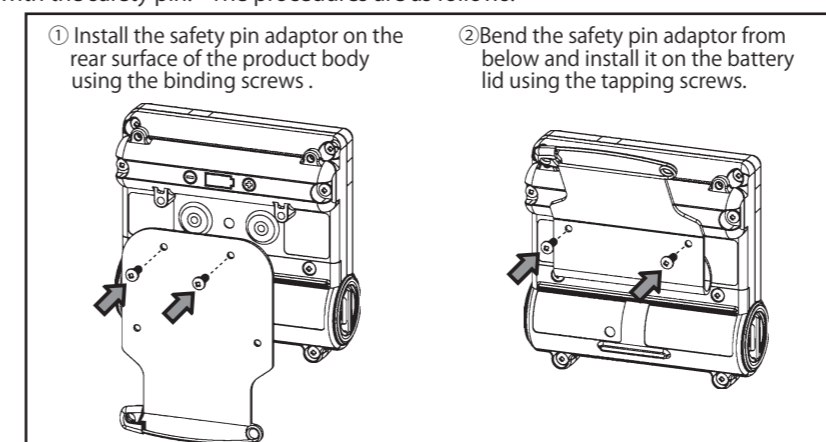
### ● Safety Precautions

In order to use the Gas Detector safely, be sure to observe the following items.

- DANGER**
  - In the event of an alarm, immediately take all necessary treatment to prevent oxygen deficiency.
  - Do not block the gas sensor opening.
  - In case liquid spill from the sensor element (by mechanical shock etc.), immediately wash clothes in water when liquid is adhered.
  - In case of getting liquid in eyes or ears, immediately wash off with water and consult a doctor.
- WARNING**
  - Be sure to execute daily check and periodic check.
- CAUTION**
  - Do not disassemble or modify XO-2200. It may impair intrinsic safety characteristics.
  - Use the product in compliance with applicable laws and regulations.
  - Do not drop or hit the product to avoid intense mechanical shocks and vibrations. It may affect the functions.
  - Do not store or leave the product in place with extremely high temperatures or humidity, or extremely low temperature or humidity.
  - Do not use the product at outside the operating temperature/humidity range, and under rapid temperature/humidity change. It may affect the functions.
  - When the pressure of the measurement environment is different from the standard atmospheric pressure (at high altitudes, etc.), perform a pressure correction of the measured values to avoid a pressure dependence of oxygen sensor.
  - Keep the product away from exposure to water or condensation.
  - In case of condensation, dry the product completely and a check should be performed to verify its accuracy before use.
  - Wear the detector where audible, visible and vibration alarm can be noticed easily.
  - Only use specified battery (Panasonic alkaline AAA battery LR03X or Toshiba alkaline AAA battery LR03). The use of unspecified battery may impair the detector's explosion-proof performance and product performance.

### (3) Safety pin adaptor (C-10) installation procedure

Installing the safety pin adaptor onto the battery lid allows wearing of the product with the safety pin. The procedures are as follows.



### (4) Optional Items (sold separately)

Item name	Part No.	Description
Leather case	C-11	Covers the whole device to protect it from dirt and water (IPX1).
Heat-resistant leather case	C-12	Covers whole instrument to protect it from dirt and water. (IPX1) The case is made of heat-resistant material to reduce temperature increases from passing high temperature. (Operating temperature range of the product remains unchanged.)
Strap with clip	ST-3	Prevents the gas detector from dropping.
Simplified inspection jig	EG-105	For simplified inspections of alarm performance and indication accuracy. (Gas used for inspection is available separately.)
Inspection gas	—	For simplified inspection.

### (5) Replacement Parts (sold separately)

Item name	Part No.	Description
Filter element (10 pcs)	FE-116	Filter to protect the gas sensor from dust and water exposure.

## 3. Operational Procedure

### ① Turning the power on

Press and hold the [Power (PEAK)] switch for approx. 3 seconds. "on" will be displayed, a countdown will begin with "3," "2," and "1", the gas alarm settings will be displayed, and then air adjustment will be automatically performed. Upon the completion of air adjustment, the measured gas concentrations will be displayed.

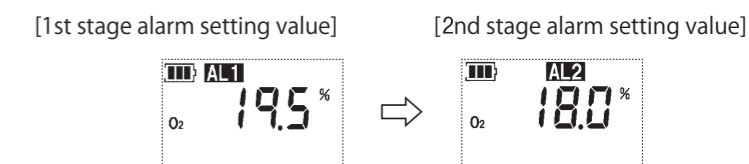
**WARNING** Make sure to turn on the power in clean air. Since air adjustment will be conducted automatically, the incorrect gas concentrations will be displayed when turned on in gas atmosphere.

**Note** After switch operation, the LCD display light (backlight) turns on for approx. 5 seconds and then turns off automatically.

### ● Gas alarm concentration setting

Displays in the following order:

[1st stage alarm setting value] → [2nd stage alarm setting value]

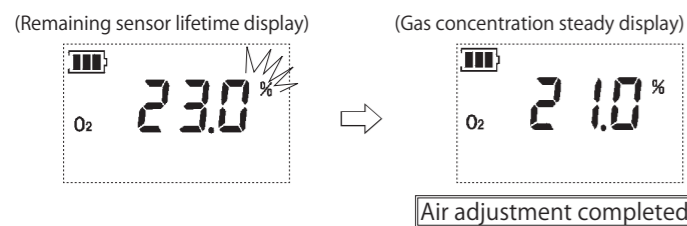


### • Gas alarm concentration setting value (Standard setting value)

Target gas	Oxygen (O <sub>2</sub> )
1st stage alarm	AL1 19.5%
2nd stage alarm	AL2 18.0%

● Air adjustment

Air adjustment (21% adjustment) is completed when the remaining gas concentration display changes from a blinking display to a steady display of "21.0".



Gas detection is ready after air adjustment is complete.

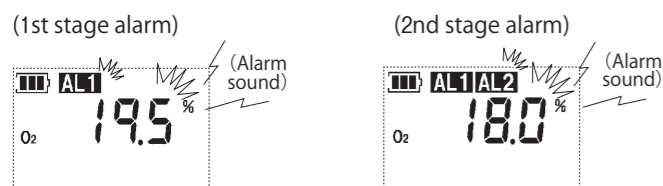
**Note** • Make sure that blinking "23.0%" is displayed during the air adjustment. When the sensor approaches the end of its lifetime, a value less than 23.0% is displayed during the adjustment. Replace the oxygen sensor with a new one before the value reaches "21.0%".

② Gas detection (Alarm status)

**Note** • For simultaneous alarms, priority is given to second stage alarm rather than first stage alarm.  
• When the O<sub>2</sub> concentration reading exceeds the service range, the service range upper limit and "OL" are displayed alternately.

● First and Second stage alarm

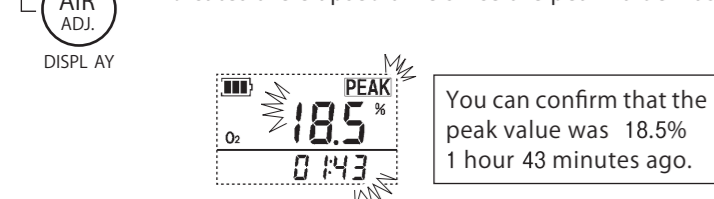
If the O<sub>2</sub> concentration falls below the first or second stage alarm concentration setting value, the O<sub>2</sub> concentration display, alarm display and alarm lamp blink, accompanied by alarm sound and vibration.



**Note** • The cycle of the alarm sound and the alarm blinks become faster for the second stage than that for the first.  
• The backlight of the LCD display turns on during an alarm.

⑤ Peak value memory function [Memorize and check the peak value between power ON and OFF.]

Press the [Power (PEAK)] switch and [Air Adjustment] switch at the same time. The display will blink only while the switches are held down at the same time, indicating the peak value from the time of power on to the present. The subsidiary display indicates the elapsed time since the peak value was displayed.



**Note** • The peak value memory function can provide the elapsed time back to 99 hours 59 minutes ago. Beyond 100 hours, "100H" and "OL" will be alternately displayed in the sub screen and the elapsed time will not be displayed. The time error is ±5%.  
• Pressing the [Air Adjustment] switch while the detector is off can display the last peak value. However, turning on the detector will reset the peak value to 21.0%.

⑥ Turning the power off

Press and hold the [Power (PEAK)] switch for approximately 3 seconds. "oFF" and count down "3→2→1" are displayed, and the power turns off.



③ Air adjustment (21% adjustment)

Press and hold the [Air Adjustment] switch for approximately 3 seconds to perform air adjustment manually.



**WARNING** • Be sure to execute the air adjustment in clean air. Accurate O<sub>2</sub> concentration reading cannot be obtained when the power is turned on in a contaminated air.  
• Execute the air adjustment at least once a day. In addition, when the work environment (temperature or humidity) changes, make the air adjustment because the 21.0% point may drift.

④ Peak hold function (function to hold a peak value)

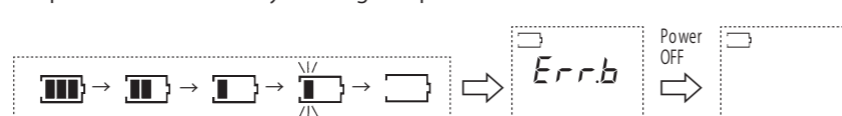
Press the [Power (PEAK)] switch to display PEAK. The highest concentration value (lowest for O<sub>2</sub>) marked during PEAK being displayed will remain displayed. To reset the value and return to the normal screen, press the switch again.



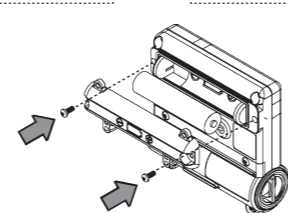
**Note** For oxygen, the lowest marked concentration will be maintained as its peak value.

4. Replacing Battery

The remaining battery level indication decreases gradually as the battery level decreases as shown below:  
Before remaining battery level is exhausted, the last indication will blink with an intermittent alarm sound in 10-second intervals. (Preliminary alarm)  
When the remaining battery level is exhausted, [Err.b] is displayed, accompanied by a continuous alarm sound. The product will no longer operate. (Final alarm)  
Stop the alarm sound by turning the power OFF.



Remove the two screws and remove the battery lid. Replace the battery with a new one.



**CAUTION** • When inserting the battery, make sure that the polarities (+ and -) are correctly positioned.  
• If the battery polarity is reversed, the detector cannot be turned on and a continuous vibration may occur depending on the type of battery. Remove the battery promptly and insert it again with the correct polarity.

5. Trouble shooting

Display	Content
	No remaining battery level. Replace the battery. (See "Replacing Batteries" on page 10)
	Incorrect air adjustment or sensor malfunction. Make an air adjustment again in clean air. Request repairs if the alarm does not disappear after several adjustments.
	Readout error. Remove and reinsert the battery. Turn on the power supply to check performance. If it cannot be restored with this procedure, request repairs.
	Readout error. Remove and reinsert the battery. Turn on the power supply to check performance. If it cannot be restored with this procedure, request repairs.

If the operation switches or displays do not operate properly other than when alarms are activated as above, remove and reinsert the battery into the product. Turn the power supply on to check performance. If it cannot be restored with this procedure, request repairs.

6. Maintenance

This product is a precision instrument. Please perform the periodical checks and inspections below to maintain the detector's performance and ensure safety. In the event of a failure to follow the safety precautions (page 2), such as impact shock from dropping or exposure to water, or use in conditions outside the specifications (page 13), such as usage in temperature/humidity exceeding the specified range, please contact New Cosmos or your New Cosmos representative for inspection. A comprehensive description of the current situation would be appreciated when you contact us.



• The recommended replacement cycle for sensors is one year. Replace the sensor with a new one annually to ensure correct detection.  
• The above-recommended cycle is only an estimate based on normal use and proper maintenance without exposure to high concentration gas or gas poisoning; therefore, no guarantee is provided.

(1) Daily Check

Execute daily check in clean air before use.

- ① Operation  
Check alarm sound, alarm lamp, vibration and LCD work properly when the detector is turned on. If not, request repairs.
- ② Alarm function  
Check the alarm indications such as alarm sound, alarm lamp and vibration by having the detector draw O<sub>2</sub> at a level that is slightly below the alarm set value.  
In the event of an abnormality in the way the O<sub>2</sub> concentration readings change, such as the alarm lamp does not flicker or the buzzer does not sound, request repairs.
- ③ Remaining battery level  
Check the remaining battery level of the gas detector.  
If the remaining battery level is low, replace new battery. (See "4. Replacing Battery" on page 10)

**Note** Alarm activation and use at low temperature may shorten the battery life.

④ Gas sensor opening

Check that the gas sensor opening is not blocked and the filter element is clean and dry. Replace the element if dirty or wet. (See "Replacement Parts" on page 5)

(2) Periodical Check

Check the product accuracy at least once a month and perform gas calibration at least once every 6 months. It is recommended to contact New Cosmos or your New Cosmos representative to perform a periodic inspection including sensor replacement at least once a year (fees apply).

7. Specifications

Model	XO-2200
Type of gas detected	Oxygen (O <sub>2</sub> )
Detection principle	Galvanic cell
Gas sampling method	Diffusion type
Detection range (Service range)	0—25vol% (25.1—50vol%)
Resolution	0.1vol%
Reading accuracy <sup>(*)1</sup>	Within ± 0.5vol%
Alarm set value	19.5vol% (first stage), 18.0vol% (second stage)
Response time <sup>(*)2</sup>	Maximum 20 seconds ( 90% of final reading)
Display	LCD (with backlight)
Alarm	Buzzer sounds, flashing red light and vibration(auto-resetting)
Functions	Remaining battery level, peak hold, memory of peak value, alarm functions except gas alarm (sensor malfunction, remaining battery level, air-adjustment malfunction), gas calibration
Explosion-proof	Ex ib IIB T3 Gb (Japan) Intrinsically safe <sup>(*)4</sup>
Operating temperature	-10°C—40°C, 30 — 85%RH (non condensing)
Operating air pressure	Atmospheric pressure (80 — 110kPa)
Power	Alkaline AAA battery (Panasonic LR03X or Toshiba LR03) x 1pc
Battery life <sup>(*)3</sup>	Approx. 5,000 hours (at 20°C with no alarm)
External dimensions	W65 x D 22 x H 64mm (excluding protrusions)
Weight	Approx.75g (including battery)
Standard accessories	1 x Alkaline AAA battery, 1 x safety pin adaptor (with 4 screws)
Approval	EMC directive ( 2014/30/EU/SI 2016 No.1091 ) and RoHS directive ( 2011/65/EU+(EU)2015/863/SI 2012 No.3032 )

• Specifications are subject to change for improvements without prior notice.  
(\*)1 Under identical measuring conditions. Except for the service range.  
(\*)2 Assuming 90% response and operating at 20 +/- 2°C  
(\*)3 Battery life may vary with ambient condition, conditions of use, storage period, battery manufacturer, etc.  
(\*)4 Outside Japan, XO-2200 should not be used in hazardous areas.

8. Glossary

- Explosion-proof structure: Structure of an electrical apparatus to not become an ignition source in a flammable atmosphere.
- Intrinsically safe (IS) structure: Structure tested (e.g., spark test) to not become an ignition source in a flammable atmosphere due to an electrical spark or hot surface during normal operation and fault conditions.
- Non-hazardous area: Area in which an explosive atmosphere is not expected to be present in quantities such as to require special precautions for the construction, installation and use of equipment
- Air adjustment: Adjusting the zero point (or 21.0% for oxygen) in clean air.
- Service range: A range of target gas concentrations the detector is able to indicate, which are usually outside the Detection Range and used only as reference.
- Gas calibration: Adjusting the indicated values by using span gas. Also called "span adjustment".
- Clean air: Air free from target or interfering gases, and composed of 20.9-21.0vol% oxygen in dry conditions.

**NEW COSMOS ELECTRIC CO., LTD.**

2-5-4 Mitsuya-naka, Yodogawa-ku, Osaka 532-0036 Japan  
https://www.newcosmos-global.com