

(Carbon monoxide / Oxygen Detector)

Model XOC-2200

Instruction Manual

- Thank you for purchasing XOC-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.
- This package contains items as listed below. Please check carefully when unpacking. If any of the contains are missing, contact your authorized distributor or representative.

- CO / O2 detector 1
- Calibration Test Certificate 1
- Instruction Manual 1
- AAA alkaline battery 2
(include battery inside the gas detector)
- Safety pin Adaptor (C-10) 1
(include 4 screws)

Note The product battery has been used to adjust XOC-2200 in our factory. We recommend replacing the battery with the attached one 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.

1. Introduction

● This product is an O₂ and CO detector to prevent from occurring oxygen deficiency or gas poisoning by alarm buzzer, lamp and vibration when the gas concentration exceeds the alarm set value.



● Description of Symbols

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

 DANGER:	Failure to observe the precautions indicated by this symbol will create a potentially dangerous or hazardous condition resulting in serious injury or death.
 WARNING:	Failure to observe the precautions indicated by this symbol will create a potentially dangerous situation that may result in serious injury or death.
 CAUTION:	Failure to observe the precautions indicated by this symbol will create a potentially dangerous situation resulting in minor injury or property damage.
Note	This symbol indicates advice on how to handle the instrument.

● Safe Operation

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

- | | |
|---|--|
|  DANGER: | <ul style="list-style-type: none">• In the event of an alarm, immediately take all necessary treatment to prevent gas poisoning.• Do not block the gas detection intake in use. <p>In case liquid spill is happened from the sensor element (by mechanical shock etc.)</p> <ul style="list-style-type: none">• Immediately wash clothes in water when liquid is adhered.• In case of getting liquid in eyes or ears, immediately submit to medical treatment after receiving first aid by water. |
|  WARNING: | <ul style="list-style-type: none">• Be sure to execute daily check and periodic check. |

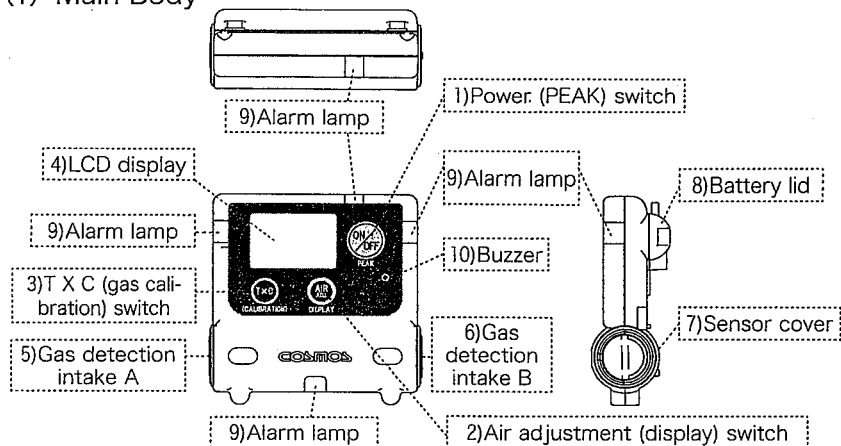


CAUTION:

- Do not disassemble or modify XOC-2200.
- Use the product in compliance with related laws and regulations.
- Avoid mechanical shocks, such as dropping or impacts.
- Avoid storing the product or leaving it for long periods of time in places or car subject to high temperatures and high humidity or low temperatures and low humidity.
- Avoid exposing the product to abrupt changes in temperature, humidity, or atmospheric pressure. Failure to do so may impair product performance.
- In a measurement where the atmospheric pressure of the local environment is different from standard atmospheric pressure (such as at high altitude), the oxygen sensor will not provide an accurate gas concentration because the sensor is influenced by pressure.
- Keep the product away from exposure to water or condensation.
- In case of condensation, dry completely before using the product.
- The sensor may detect other gases (such as hydrogen, NO_x, SO_x and alcohol); therefore, consider the environment when using the product.
- Wear the detector where audible, visible and vibration alarm can be noticed easily.
- Use AAA alkaline batteries.

2. Part Names and Functions

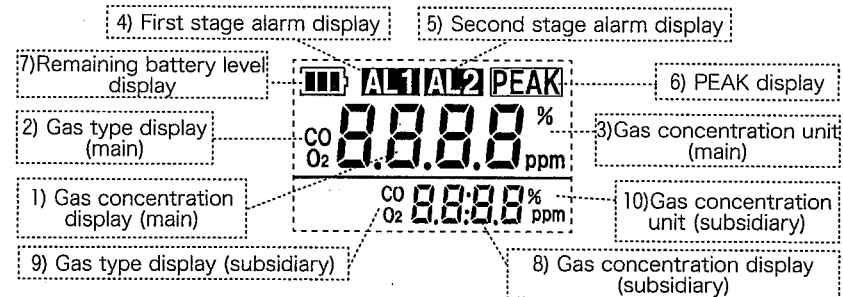
(1) Main Body



• Products body description

1) Power (PEAK) switch	Turns the power supply ON/OFF. Or used for the PEAK holding function.
2) Air adjustment (display) switch	Adjusts the air (zero / 21% adjustment). Also switches the main displays. (For two target gases)
3) T X C (gas calibration) switch	Displays T X C (TWA concentration) or releases the TWA alarm (for CO only). Also used in gas calibration. *For details about gas calibration, see the instruction manual for the gas calibration kits (available separately).
4) Liquid crystal display	Displays the different types of indications including gas concentration (refer to page 4).
5) Gas detection intake A	Port to detect carbon monoxide.
6) Gas detection intake B	Port to detect oxygen.
7) Sensor cover	The unit for storing the gas sensor.
8) Battery lid	The unit for storing the battery.
9) Alarm lamp	Blinks when the alarm is activated.
10) Buzzer	Sounds when the alarm is activated.

(2) LCD Display

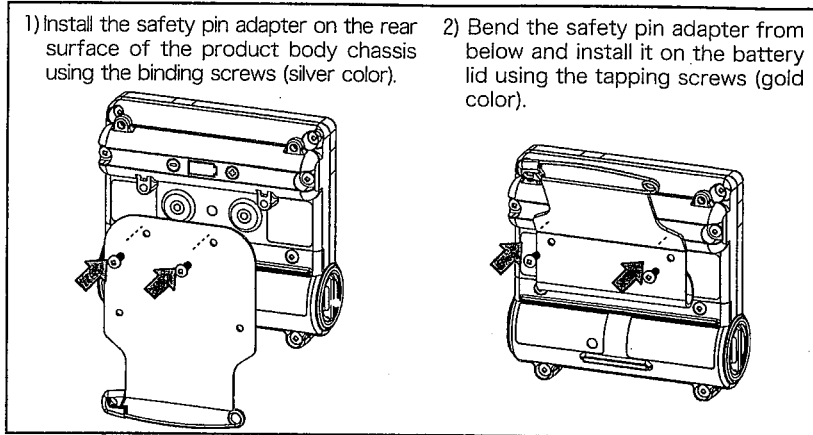


• LCD display description

1) Gas concentration display (main)	Displays digital indication of gas concentration values (main).
2) Gas type display (main)	Displays gas types (main). (Displays either CO or O ₂)
3) Gas concentration unit (main)	Displays gas concentration unit (main).
4) First stage alarm display	Blinks when the concentration exceeds the first stage alarm level.
5) Second stage alarm display	Blinks when the concentration exceeds the second stage alarm level.
6) PEAK display	Displays when the gas concentration indicates the PEAK value.
7) Remaining battery level display	Displays remaining battery level.
8) Gas concentration display (subsidiary)	Displays digital indication of gas concentration values (subsidiary).
9) Gas type display (subsidiary)	Displays gas types (subsidiary).
10) Gas concentration unit (subsidiary)	Displays gas concentration (subsidiary) unit.

(3) Safety pin adapter (C-10) installation procedure

Installing the safety pin adapter onto the battery lid allows wearing of the device with the safety pin. Follow the installation procedure described below.



(4) Options (Available separately)

Item name	Type	Outline
Leather case	C-11	Covers the whole device to protect it from dirt and water (Drip-proof type 1).
Heat-resistant leather case	C-12	Covers whole device to protect it from dirt and water. (Drip-proof type 1). It uses heat-resistant material to reduce temperature increases from high temperature radiation heat. (No change in operating temperature range of the product.)
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, supplied in a nozzle-type cartridge.
Gas calibration test kits	EG-106	For indication accuracy inspection and span gas calibration. (Calibration gas is available separately.)

(5) Replacement Parts (available separately)

Item name	Type	Outline
Filter elements (containing 10 pcs)	FE-116	Filter to protect the gas detection intake from dust and water exposure.

3. Operational Procedure

① Turning the power supply on.



Press and hold the [Power (PEAK)] switch for approximately 3 seconds. "oN" and the count down "3→2→1" are displayed; "the gas alarm concentration setting display" and "air adjustment" are implemented automatically before the gas concentration is displayed.



WARNING Always turn on the detector in clean air. Accurate gas detection results cannot be obtained when the power supply is turned on in a gas atmosphere.



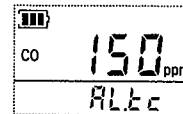
- After a switch operation, the LCD display light (backlight) turns on for a certain period of time and then turns off automatically.
- To return TWA (see "Glossary" on page 14) concentration to 0 ppm, turn off the power supply.

● Gas alarm concentration setting

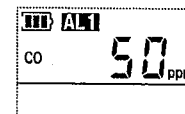
Displays in the following order:

[TWA concentration alarm value] → [CO 1st stage alarm setting value] → [CO 2nd stage alarm setting value] → [O₂ 1st stage alarm setting value] → [O₂ 2nd stage alarm setting value]

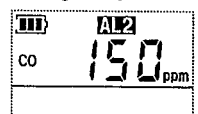
[TWA concentration alarm value]



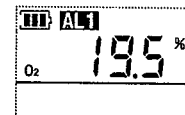
[CO 1st stage alarm setting value]



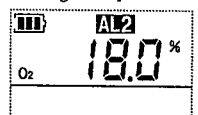
[CO 2nd stage alarm setting value]



[O₂ 1st stage alarm setting value]



[O₂ 2nd stage alarm setting value]

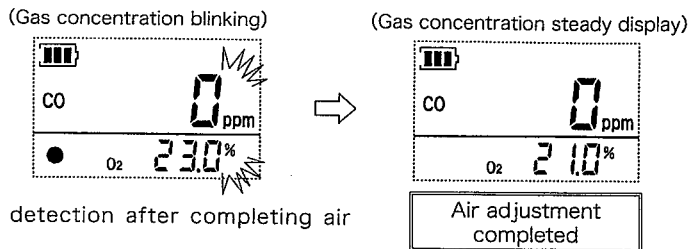


• Gas alarm concentration setting value (Standard setting value)

Target gas	Carbon Monoxide (CO)	Oxygen (O ₂)
TWA concentration alarm	150ppm·h	—
1 st stage alarm AL1	50ppm	19.5%
2 nd stage alarm AL2	150ppm	18.0%

● Air adjustment

Air adjustment (zero / 21% adjustment) is completed when the gas concentration display changes from a blinking display to a steady display of "0" or "21.0".



Operate gas detection after completing air adjustment.

Note

When the target gas is O₂, check that the blinking "23.0%" is displayed for air adjustment. When the sensor approaches the end of its lifetime, a value less than 23.0% is displayed. Replace the oxygen sensor with a new one (available separately) before the value reaches "21.0%". (See "Replacement Parts" on page 5)

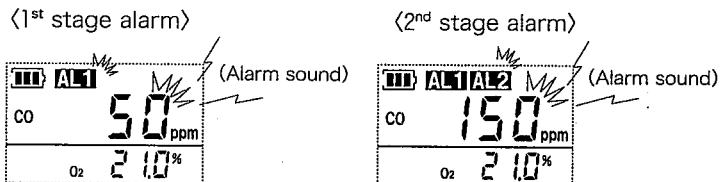
② Gas detection (Alarm status)

Note

- For simultaneous alarm, the priority for alarm activation is ① Second stage alarm, ② TWA concentration alarm, and ③ First stage alarm.
- When the gas concentration display exceeds the service range, the service range upper limit and "OL" are displayed alternately.

● First and Second stage alarm

If the gas concentration exceeds the first or second stage alarm concentration setting level, alarm activation is accompanied by sound and vibration and the gas concentration display, alarm display, and alarm lamp blink.



Note

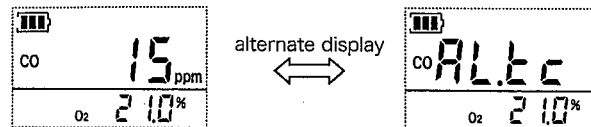
- The ON/OFF cycle of the alarm sound and the blinking cycle of the alarm light become faster for the second stage than for the first.
- During an alarm, the backlight of the LCD display remains on.

● Time Weighted Average (TWA) concentration alarm

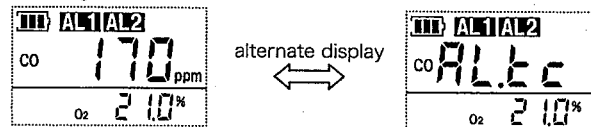
If the TWA concentration "T x C" (see "Glossary" on page 14) exceeds the alarm setting level, "the gas concentration display" and "AL. tc" are displayed alternately while the alarm lamp blinks.

Press the [T x C] switch to release the TWA concentration alarm. Note that "gas concentration display" and "AL. tc" will continue displaying alternately until the power supply is turned off.

(If only the TWA concentration alarm is activated)



(If the second stage alarm and TWA concentration alarm are activated simultaneously)



③ Air adjustment (zero adjustment)



Press and hold the [Air Adjustment] switch for approximately 3 seconds. Refer to (Air adjustment) when turning on the power supply because the product performance is the same.

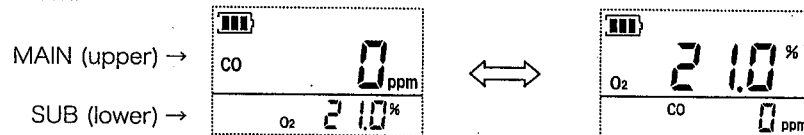
WARNING

- Be sure to execute the air adjustment in clean air. Accurate gas detection results cannot be obtained if the adjustment is made in an atmosphere mixed with gases.
- Execute the air adjustment at least once a day. In addition, make the air adjustment when the work environment (temperature or humidity) changes because the 0ppm setting may shift.

④ Switching displays



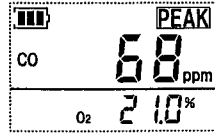
Press the [Air Adjustment (Display)] switch to change between the main (upper row) and the subsidiary (lower row) displays.



⑤ Peak hold function (function to hold a peak value)



Press the [Power (PEAK)] switch for a short period of time to display **PEAK**. The peak value of the gas concentration during the **PEAK** display remains. Press the [Power (PEAK)] switch again for a short period of time to reset the peak value and return to the instantaneous value display.

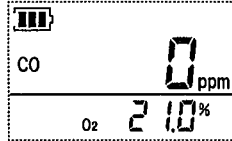


⑥ TWA concentration display

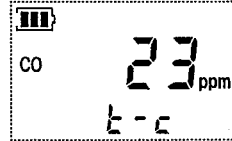


"TWA concentration t-c" is displayed only while the [T x C] switch is pressed. Release the switch to return to the normal gas concentration display. The TWA concentration is reset when the power supply is turned off, and the TWA starts from "0ppm" again the next time the power supply is turned on.

(Normal gas concentration display)



(TWA concentration display)



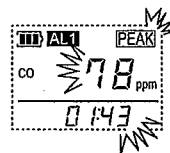
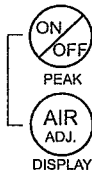
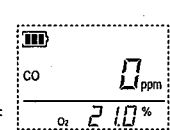
⑦ Peak value memory function [Memorize and check the peak value between power ON and OFF.]



Press the [Power (PEAK)] switch and [Air Adjustment] switch at the same time. The display will blink only while the switches are pressed 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 is observed.

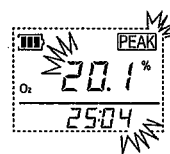
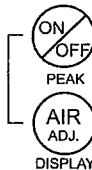
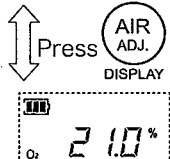


In case of



You can confirm that the peak value of CO was 78ppm 1 hour 43 minutes ago.

In case of



You can confirm that the peak value of O2 was 20.1% 25 hours 4 minutes ago.

Note

- The peak value memory function provides detailed time displays back to 99 hours 59 minutes. Beyond 100 hours, alternate displays of the peak value and 100 will be displayed, but with no detailed display of time. The time includes an error of $\pm 5\%$.
- Even after turning off the power supply, press the [Air Adjustment] switch to display only the peak value for the period between the previous power on and off. At the next power on, the peak values return to "0ppm" and "21.0%".

⑧ Turning the power supply off



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

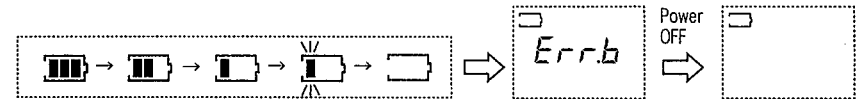
4. Replacing Battery

The remaining battery level indication decreases in increments as the battery level decreases as shown below:

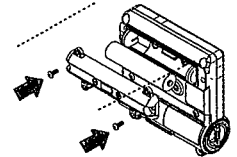
Before remaining battery level is exhausted, the last indication will blink with an intermittent alarm sound in 10 second intervals.

When the remaining battery level is exhausted, [Err.b] is displayed and accompanied by a continuous alarm sound. The product will no longer operate.

Stop the alarm sound by turning the power supply OFF.



Remove the two screws shown on the right and replace the battery with a new AAA alkaline battery.



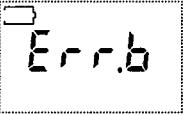
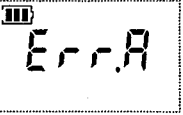
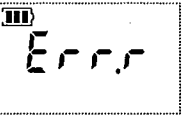
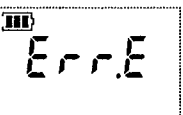
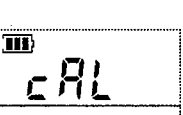
CAUTION

- When inserting the battery, match the polarities (+ and -) with the battery marks.
- If the battery polarity is reversed, the power supply cannot be turned on and a continuous vibration may occur depending on the battery types. Remove the battery promptly and insert it again with the proper polarity.

Note

- This product supplies a very small amount of current after turning the power supply off to stabilize the sensor. Keep the battery in the product even when the product is not being used.
- If the battery is removed from the product for a long period of time, initial stabilization of the sensor may take longer, causing an error. In such a case, insert the battery and leave the product with the power supply turned off for one day or longer before starting operation.

5. Alarm Displays

Display	Content
	No remaining battery level. Replace the battery. (See "Replacing Battery" on page 10)
	Incorrect air adjustment, or sensor malfunction. Execute the air adjustment again in clean air. If the alarm is activated after multiple adjustments, request repairs.
	Abnormality inside the product. Remove and reinsert the battery. Turn on the power supply to check performance. If normal operation cannot be restored with this procedure, request repairs.
	Abnormality inside the product. Remove and reinsert the battery. Turn on the power supply to check performance. If normal operation cannot be restored with this procedure, request repairs.
	If "cAL" is indicated on the gas concentration display, the product is in the gas calibration mode. If you operate the product in this condition by accident, the product may not properly detect gas; therefore, turn off the power supply promptly if you will not execute gas calibration. * For details about the gas calibration mode, see the instruction manual for the gas calibration test kits (available separately).

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

6. Maintenance Check

This product is a precision instrument. To ensure the accuracy of the instrument, execute maintenance check according to the following items.

If violation of the entries such as dropping impact, wetting or "safe operation" (refer to page 2), as well as detecting gas concentration out of measuring range, using out of operating temperature-humidity or using out of "7. Specifications" referring to page 13, contact our dealer or agency for an inspection accompanied by a briefing.

⚠ WARNING

- The sensor element is guaranteed for one year from the date of purchase. After one year, gases may not be detected properly. Consider one year of use as an indicator for replacement.
- The above sensor element guarantee is valid only if the product is maintained and used in accordance with our instructions and/or recommendations.

(1) Daily Check

Execute daily check in clean air.

1) Operation

Check alarm sound, alarm lamp, vibration and LCD display are worked properly when the power supply 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 instrument draw gas at a level that slightly exceeds the alarm level.

In the event of an abnormality in the way the gas 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 "Replacing battery" on page 10)

Note

Alarm function and low-temperature environment hasten battery drain.

4) Gas intake

Check that the gas intake is closed and the filter element is stained or wet. If not, replace a new filter element. (See "Replacement Parts" on page 5)

(2) Periodic Check

Check indication accuracy at least once a month and execute calibration test at least once in 6 months:

To ensure the accuracy of the instrument, contact the retail store where you have purchased it or contact New Cosmos Electric directly for an inspection (routine check) at least once a year.

You can check a simple test for indication accuracy by calibration test kits (Available separately) referring to "Replacement parts" on page 5.

7. Specifications

Model	XOC-2200	
Type of gas detected	Oxygen (O ₂)	Carbon Monoxide (CO)
Detection principle	Galvanic cell	Electrochemical type
Gas sampling method	Diffusion type	
Measuring range (Service Range)	0~25vol% (25~50vol%)	0~300ppm: 1ppm, (300~2000ppm: 50ppm)
Resolution	0.1vol%	0~350ppm : 1ppm 350~2000ppm : 50ppm
Indication accuracy *1	Within ±0.5vol%	Within ±30ppm
Alarm set value	19.5vol% (first stage), 18.0vol% (second stage)	50ppm (first stage), 150ppm (second stage), 150ppm · h (time weighted average)
Response time *2	Maximum 20 seconds	Maximum 30 seconds
Display mode	LCD (Hand backlight)	
Alarm mode	Buzzer sounds, flashing red light, vibration	
Functions	Remaining battery level, peak hold, memory of peak value, readout of time weighted average, remaining battery level, alarm functions except gas alarm (time weighted average, sensor malfunction, battery level, zero-adjustment malfunction), gas calibration, gas concentration indication	
Operating temperature	-10°C~40°C, 30~90% RH (non condensing)	
Operating air pressure	Air pressure ± 10%	
Power	1 x AAA Alkaline dry cell	
Battery life *3	Approx. 5,000 hours (at 20°C with less than 20ppm)	
External dimensions	W65 x D22 x H64mm (excl. projections)	
Weight	approx.75g (including battery)	
Standard accessories	1 x Alkaline dry cell, 1 x safety pin adaptor (with fixing screw)	

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 conditions, conditions of use, storage period, battery manufactures, etc.

8. Glossary

- Non-hazardous area : An area where there is no possibility of an explosion from generation of a mixture of combustible gas and air under normal or abnormal conditions.
- Air adjustment : The function to adjust the gas condition to "0 ppm" (zero) and 21.0%.
- Service range : The range where the concentration is indicated by gas detection but outside the indication accuracy.
- Time weighted average (TWA) concentration : An amount expressed by the product of gas exposure time (hour) and gas concentration (ppm). With this product, the value is calculated by the integral valued of the average concentration for 1 minute divided by 60 minutes. Time calculation includes an error of ± 5%. The unit "ppm" is used for convenience. (For example, when CO with 100 ppm is exposed for 30 minutes, the value is calculated as 100ppm x 30/60 = 50 ppm · h.)
- Gas calibration : Operation to adjust the product indication to the concentration of the calibration (standard) gas. Also called span gas calibration.

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