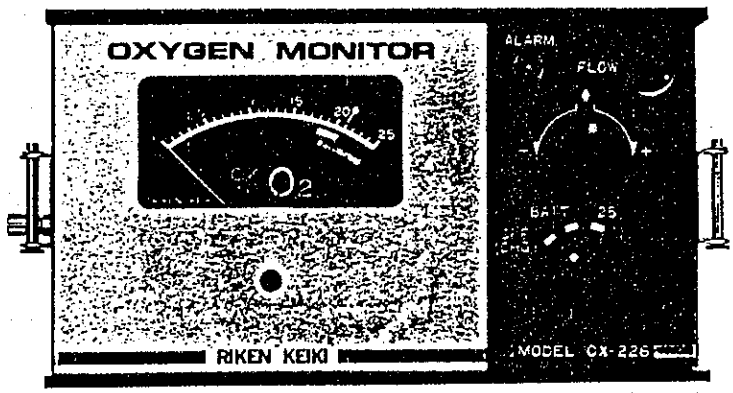
INSTRUCTION MANUAL

FOR

RIKEN PORTABLE OXYGEN INDICATORS

MODEL OX－226，227



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1. SUMMARY

RIKEN PORTABLE OXYGEN INDICATOR MODEL OX-226 and OX-227 provide a quick, convenient method for determination of oxygen content of any atmosphere. It is intended primarily as an indicator of oxygen deficiency, with good readability from 0 - 25%. Instrument is routinely calibrated on normal atmospheric oxygen concentration(21%). These models are most suitable and recommended for resting tanks, manholes, vessels and other spaces to determine safety from the standpoints of oxygen deficiency before entering and while work is in progress.

TYPICAL APPLICATIONS

* Mines & construction tunnels.
* Telephone companies and their cable vaults and manholes.
* Sewage disposal plants.
* Chemical plants & refineries.
* Gas & electrical utilities.
* Laboratories.
* Shipping industries.

FEATURES

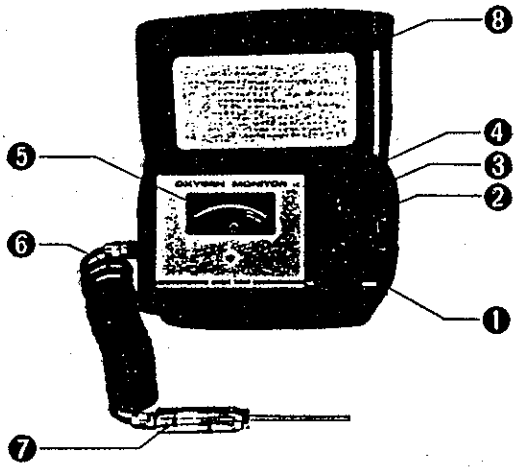
* Intrinsically safe, i3aG3 in Japan.(OX-227)
* Intrinsically safe, i3aG4 in Japan.(OX-226)
* Low battery alarm (OX-227).
* Audible and visual alarm (OX-227).
* Built-in diaphragm pump.
* Hands-free operation.
* Plug-in sensor.
* Light weight, compact design.
* Dual range (OX-227).

2. PRINCIPLE

The oxygen cell operates by an electro-chemical process in which a voltage is set up between two electrodes. One electrode is exposed to the atmosphere under test, and changes in oxygen concentration at this electrode produce proportional changes in the output voltage of the cell. Therefore, an increase in oxygen concentration will "speed up" the electro-chemical process, producing a higher output voltage, and a decrease in oxygen concentration will "slow down" the process, lowering the output voltage. The center electrode is exposed to the atmosphere by means of a teflon membrane placed directly in contact with the polished top surface. This teflon membrane serves two functions simultaneously. First, it has the ability to pass oxygen molecules freely, thus placing the electrode in direct contact with the atmosphere and secondly, it keeps the electrolyte contained in the cavity between the two electrodes.

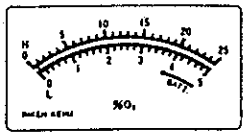
3. EACH NAME OF PARTS

Model OX-226 with alarm

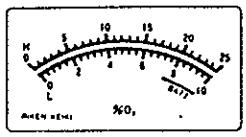


① Control switch
② Span adjustment knob
③ Flow monitor
④ Alarm light
⑤ Analog meter
⑥ Sampling hose
⑦ Sampling probe
⑧ Carrying case

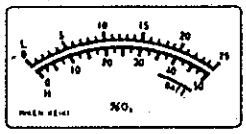
Scale plate for Model OX-227
without the alarm



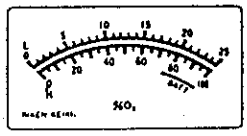
OX-227A型



OX-227B型



OX-227C型



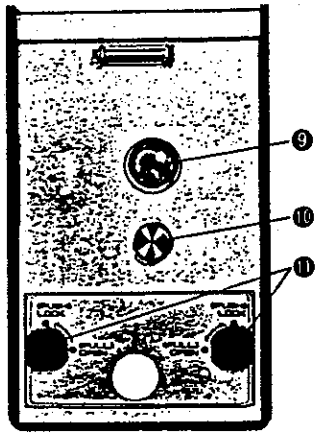
OX-227D型

4. SPECIFICATIONS

Model	OX－226	OX－227
Principle	Electrochemical cell	
Sampling method	Sample drawing by internal diaphragm pump	
Range	Built-in sensor type	
	0 - 25%	A:0-5/0-25%　C:0-25/0-50% B:0-10/0-25%　D:0-25/0-100%
Accuracy	Better than ± 0.7% by volume of indication value at constant temp. (Complies with JIS T-8201)	① Range: 0-25/0-5%, 0-25/0-10% Better than±0.7% by volume of indication value at constant temp. (Complies with JIS T-8201) ② Range: 0-25/0-50%, 0-25/0-100% Better than± 5% of full scale at constant temp. (Complies with JIS T-8201)
Alarm	Intermittent audible tone & flashing red LED light, activated when oxygen content falls below preset alarm level (18%). Continuous audible tone & continuation of red LED light, activated when battery voltage falls below certain level.	――――
Operation temp.	－10℃ ～ ＋40℃	
Power source	Dry cells(3 pcs) or optional Ni-Cd rechargeable battery	
Battery life	Above 6 hrs continuous operation with dry cell or 7 hrs continuous operation between charges (15 hrs recharging)	
Dimentions	150 (D) x 140 (H) x 85 (D) mm	
Weight	2.1 kgs (overall)	
Explosion proof	Intrinsically safe, (Except C and D type on OX-227)	
Life of expectancy of the sensor	Above 15 months	
Warranty	1 year material & workmanship	

Remarks : Specify the measuring range on model OX-227 when ordering.

3. MEASUREMENT PROCEDURE



1) Preparation

Connect the sampling hose ⑥ to the gas sampling probe ⑦ and then connect it to the gas inlet of instrument ⑨.

2) Voltage check of battery

Turn the control switch ① to "BATT" zone and check the meter needle marks inside of "BATT" zone.
If the case of model OX-226, the battery drop can be known from the buzzer sound.

3) Span adjustment

Turn the control switch ① to "25" and make span adjustment by span adjusting knob so as to bring the meter needle to 21%.
When make span adjustment of model OX-227, try it with 0-25% range.

Model	Range for span adjustment
OX-227A	"H" range
B	"H" range
C	"L" range
D	"L" range

4) Measurement

After finishing the procedure of above item 1), 2) and 3), this is ready to run. Approach the sampling probe to the leak source and start measurement. In the case of model OX-226, when the oxygen concentration is less than 18% by volume, alarm light ④ illuminates and it gives us the warning of oxygen deficiency by buzzer sound.

(Caution)

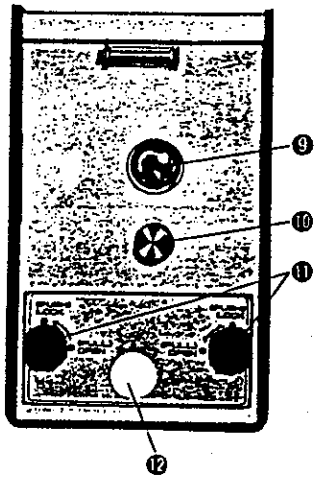
1) Check the flow of pump by the flow monitor during operation.

2) Operate the instrument with leather case on in use.

3) The replacement of batteries and recharging procedure should be done in non-hazardous.

4. MAINTENANCE PROCEDURE

1) The replacement of batteries and recharging procedure



① Take off the leather case from the instrument and turn the battery box knob⑪ of left side of "OPEN". Then pull it to this side and relace the condition of "LOCK".

② Pull out the whole of battery box and replace the batteries with new one.

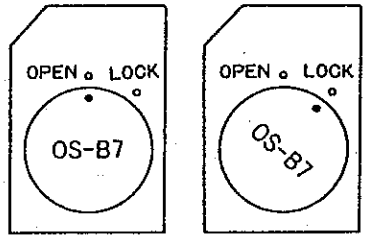
③ When the replacement of batteries is finished, fix the battery box to the right position so that the socket of battery box can be fit to the instrument and turn the battery box knob⑪ to "LOCK" position with finger press.

* Replacement procedure(Ni-Cd battery)

When Ni-Cd batteries are used for the instrument, detach the label ⑫ of charging inlet and insert the exclusive charger to the charging jack. And then plug the charger into AC 100V.
It is finished to recharge the instrument for 15 hours. In this case, use the exclusive charger(Option).

2) The replacement of sensor

When the meter needle can not be adjusted to 21% by turning the span adjusting knob, and the indication of meter needle gets unstable, this is the sign to replace the sensor with new one.
In this case, take off the bottom screw of this instrument and the cover. This cover can be taken off by sliding it to the bottom side. When turn the sensor to the left side and adjust the mark to "OPEN" the sensor can be taken off. Insert the new sensor to it and turn it to clockwise direction. It is ready to adjust its mark to "LOCK". After checking the action, fix the cover to the instrument.

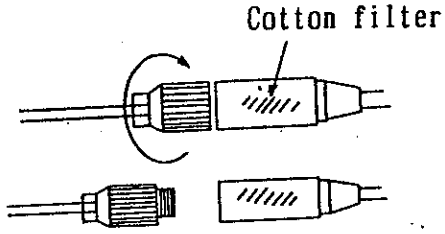


Open Lock

3) Replacement of filter

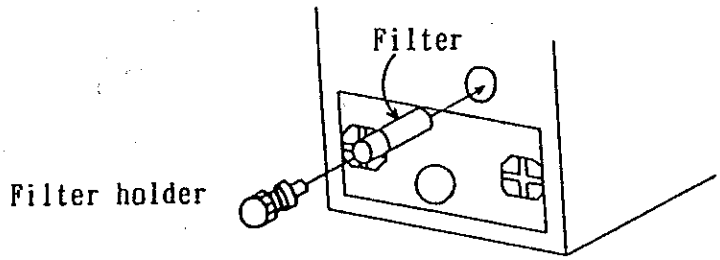
The filters are filled in the gas sampling probe and instrument. When they become dirty with eye, replace them with new ones.

* Gas sampling probe



Take off the tip of sampling probe by turning the metal part of roullete and replace the cotton filter with new one.

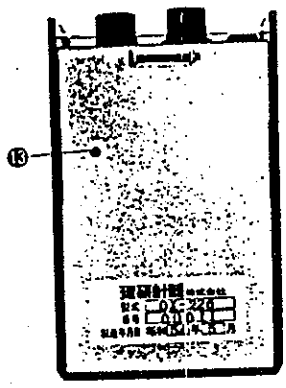
* Instrument



Pull out the filter holder⑩ of the flank of instrument and take off the filter. And replace it with new one.

4) Zero adjustment

As the zero adjustment is factory-set, there is no need of zero adjustment procedure in normal operation. But, when it is a high sensitive type instrument such as model OX-227A with 0-5/0-25% etc, make zero adjustment. Induct the N2 gas of 100% from the gas inlet and turn the zero adjusting screw ⑬ of the right side of instrument so as to bring the meter needle to zero.



5. ACCESSORIES

♯ Standard accessories

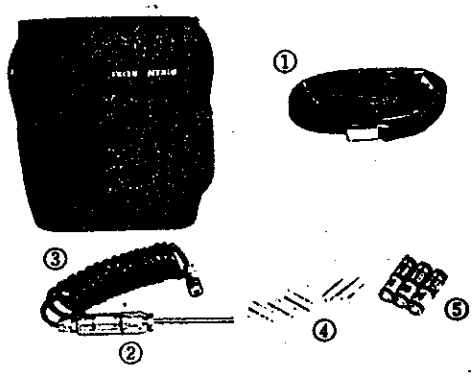
1) Carrying case with shoulder strap .... 1 pce

2) Gas sampling probe ..... 1 pce

3) Gas smapling hose(spiral) ..... 1 pce

4) Dust filter ..... 5 pcs

5) Dry cells (UM-3) ..... 3 pcs

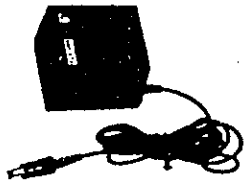


♯ Optional accessories

1) Battery recharging set(Charger & Ni-Cd batteries)

2) Water trap

3) Gas sampling hose (3m, 5m, 10m, 20m, 30m)



RIKEN KEIKI STANDARD WARRANTY

GAS DETECTION INSTRUMENTS

RIKEN KEIKI CO., LTD. warrants gas alarm equipment manufactured and sold by us to be free from defects in materials and workmanship for a period of one year from date of shipment from RIKEN KEIKI CO., LTD. Any parts found defective within that period will be repaired or replaced, at our option, free of charge, F.O.B. Factory. This warranty does not apply to those items which by their nature are subject to deterioration or consumption in normal service, and which must be cleaned, repaired or replaced on a routine basis. Such items may include :

a) Lamp bulbs and fuses
b) Pump diaphragms and valves
c) Absorbent cartridges
d) Filter elements
e) Batteries

Warranty is voided by abuse including rough handling, mechanical damage, operation, alteration or repair procedures not in accordance with instruction manual. This warranty indicates the full extent of our liability, and we are not responsible for removal or replacement costs, local repair costs, transportation costs, or contingent expenses incurred without our prior approval.

THIS WARRNTY IS EXPRESSLY IN LIEU OF ANY AND ALL OTHER WARRANTIES AND REPRESENTATIONS, EXPRESSED OR IMPLIED, AND ALL OTHER OBLIGATIONS OR LIABILITIES ON THE PART OF RIKEN KEIKI CO., LTD. INCLUDING BUT NOT LIMITED TO, THE WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL RIKEN KEIKI CO., LTD. BE LIABLE FOR INDIRECT, INCIDENTAL OR CONSEQUENTIAL LOSS OR DAMAGE OF ANY KIND CONNECTED WITH THE USE OF ITS PRODUCTS OR FAILURE OF ITS PRODUCT TO FUNCTION OR OPERATE PROPERLY.

This warranty covers instruments and parts sold (to users) only by authorized distributors, dealers and representatives as appointed by RIKEN KEIKI CO., LTD.

We do not assume the indemnification for any accident or damage caused by the operation of this gas monitor and our warranty is limited to the replacement of parts or our complete goods.