INSTRUCTION MANUAL

FOR

RIKEN PERSONAL OXYGEN MONITOR

MODEL OX-82

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1. DETECTION PRICIPLE

The oxygen detector is a plug-in cell assembly in a metal enclosure with pins to retain the detector in a bayonet-type socket at top of panel. The shell forms one electrical contact, and an insulated button at the bottom end marks the other contact. A perforated metal guard at top end allows the surrounding atmosphere to diffuse in and reach the active part of the cell.

Oxygen detection occurs in an electrochemical cell consisting of a gold and a lead electrode in a gel-type electrolyte, covered by a membrans. Oxygen in the atmosphere surrounding the detector diffuses through the membrane at a rate proportional to the partial pressure of oxygen. This oxygen enters into an electrochemical reaction which produces a current directly proportional to the oxygen concentration and this current in turn develops voltage across a temperature-compensating thermistor/resistor network.

The voltage is applied to the detector terminals, and thence to the instrument circuitry where it produces a reading in percent oxygen, and triggers an alarm preset point.

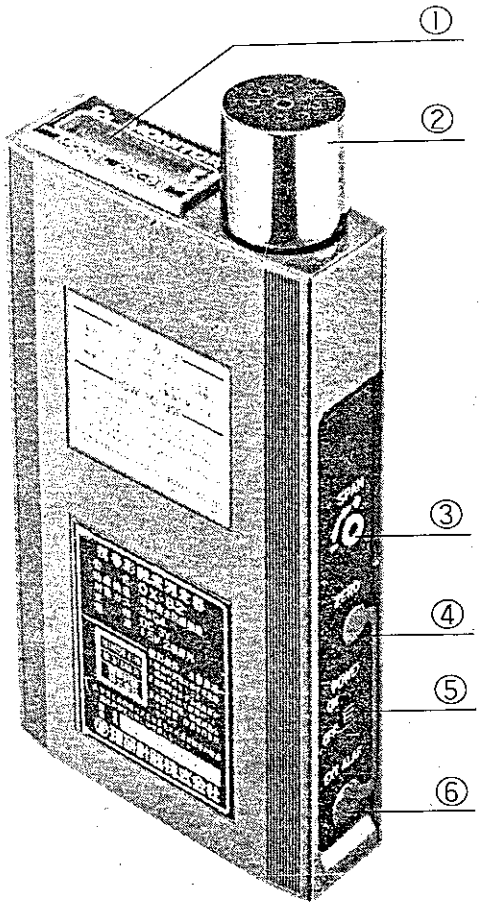
2. FEATURES

* In trinsically sage design
* Minature size and lightweight (300 g)
* Percent oxygen digital readout
* Low battery alarm
* Alarm circuit and metal clip provided
* Automatic self-illumination display in a dark place
* Remote alarm capability
* Remote monitoring capability

3. SPECIFICATIONS

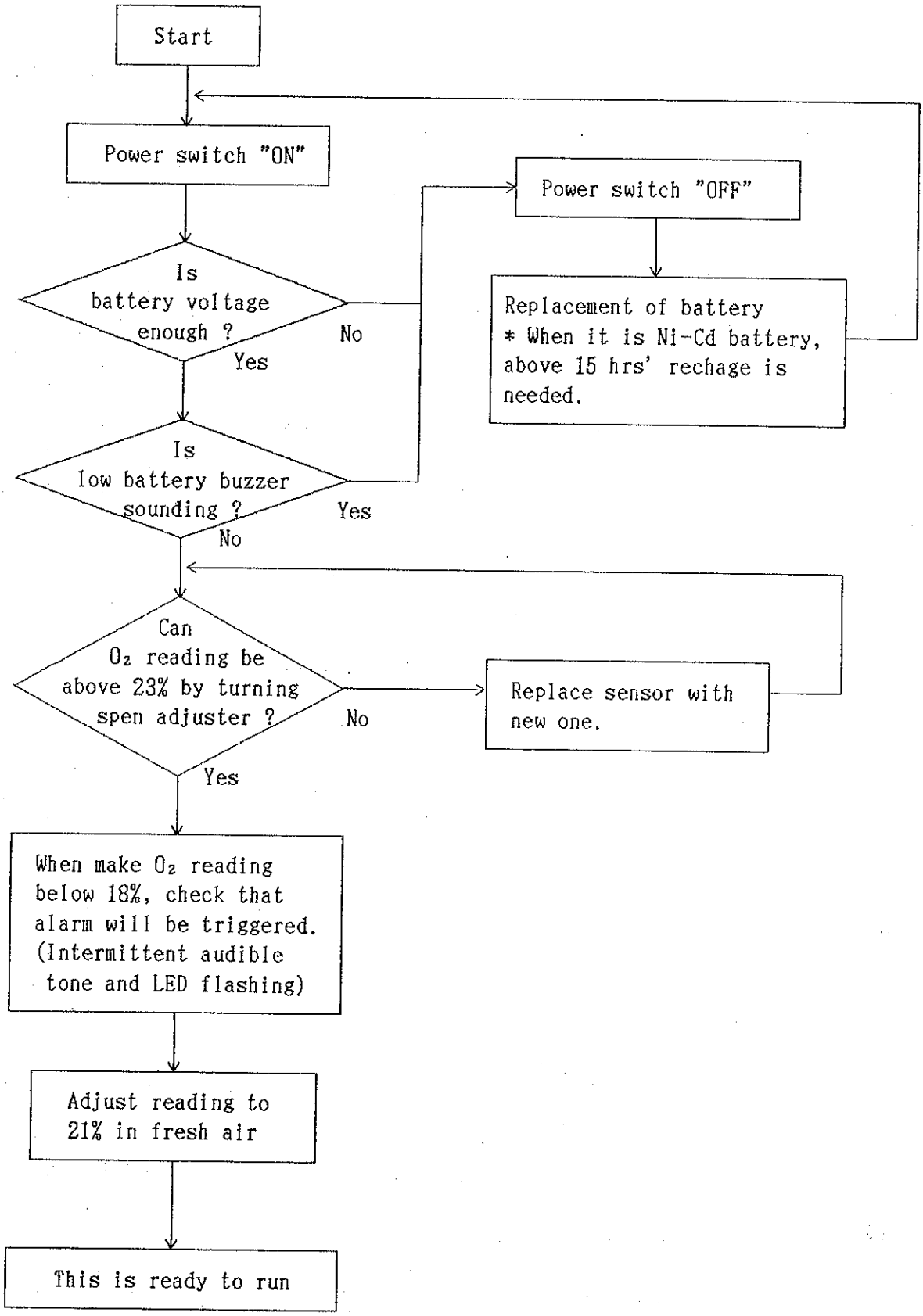
1) Model	:	OX－82
2) Detection principle	:	Electrochemical
3) Sampling method	:	Diffusion sampling Built-in and/or remote sensor type
4) Range	:	0 ～ 25% oxygen content
5) Accuracy	:	± 0.3% by volume at constact temp.
6) Readout	:	Digital display readable to nearest 0.1% oxygen (3-digit)
7) Alarm	:	① Intermittent audible tone and flashing alarm light, activated when oxygen concent falls below alarm level (preset at 18%). ② Continuous audible tone for low battery alarm ③ External alarm buzzer receptacle
8) Response time	:	Better than 20 sec. to 90% response at 20 ℃
9) Operating temperature	:	－10℃ ～ ＋40℃
10) Power supply	:	Dry cells (Standard), 2 pcs
11) Battery life	:	100 hrs continuous operation minimum in case of no alarm/illumination, using dry cells.
12) Dimensions	:	78(W) x 142(H) x 26(D) mm
13) Weight	:	Approx. 300g (Inc. carrying case)
14) Life expectancy of the sensor	:	Above 18 months
15) Warranty	:	1 year material & workmanship
16) Applicable sensor	:	Type OS-B12
17) Explosion- proof	:	Intrinsically safe

4. NAME OF EACH PART



① Digital O_2 display
② Oxygen sensor
③ Span adjuster
④ Zero adjuster
⑤ Power switch
⑥ External alarm receptacle

5. OPERATIONAL PROCEDURE



1) Operational procedure

The following steps should be followed for normal routine operation.

① While in a location having normal oxygen content, turn POWER switch to ON.

② If the instrument gives continuous sudible tone even though the reading is above 18%, battery replacement is required.
(When applying Ni-Cd rechargeable batteries, recharge them through battery charger.)

③ Turn SPAN adjuster clockwise using a fingertip to bring the reading above 23%. Then turn SPAN adjuster counterclockwise to bring the reading below 18% and check that the alarm (intermittent audible tone and LED flashing) is triggered.
Performances of oxygen sensor and alarm function have been confirmed with this step.

④ Set to 21.0 by turning SPAN adjustment using a fingertip. Turn clockwise (+) to increase reading.
Note : In a digital in the last place. Do not be concerned about the difference between 19.4 and 19.5 or 20.9 and 21.0.

⑤ Allow detector to recover, and note that reading returns to 21.

⑥ Instrument is now adjusted and ready for a day's use an oxygen indicator or monitor. The OX-82 can be carried or worn during normal activities, and will actuate alarm whenever oxygen content drops below 18.0%.

2) Function of each part

This instrument is provided with the each function in the following;

① Cancel of audible tone for oxygen dificiency

The standard instrument gives intermittent audible tone automatically when oxygen content drops below 18%. If you do not need this function, you can cancel it by means of change-over switch (SW2) located inside instrument. But low battery alarm has nothing to do with the position of change-over switch.

② Zero adjustment

This adjustment has been done by our factory before shipment. It is recommendable to perform this adjustment with oxygen-free gas if the instrument is used to detect oxygen content in inert gas or to detect low oxygen content.
But it is of no need to perform this adjustment with regard to the measurement of oxygen difficiency.
To adjust, prepare calibration kit (gas sampling bag and adaptor/cap - optional accessories). Pack the oxygen-free gas, such as 99.9% Nitrogen into the gas sampling bag. Cover the sensor of the instrument with adaptor/cap.
Connect it with the adaptor and let its N_2 gas inducted into the instrument, while instrument is operating.
Watch display and set it to read 0.0 by use of ZERO adjuster ④ after reading gets stable (for about 1 minute).

For adjustment, set it to read [-00.0] once and gradually turn it to (+) direction until - sign is disappeared.
Now the reading would be [00.0] and accurate zero adjustment is completed. Take off the adaptor and leave it in a fresh air.
Note that reading returns to 21.0. If not, adjust to 21.0 by turning SPAN adjuster using fingertip.

③ Self-illumination

The instrument provides the self-illumination circuit to read out oxygen content definitely in a dark place.
The display board is illuminated automatically when it gets dark.
It is put out automatically when it gets light.

④ External alarm buzzer

An external buzzer is available as a optional accessory. The buzzer is fitted with a lapel clip so it can be fastened to shirt collar or belt where it can be heard easily even in a high-noise environment. To use, simply plug buzzer cable into EXT.ALARM socket ⑥.
Both the internal and the external buzzers will sound simultaneously.
The capacity of this buzzer is 90db/30cm.

6. REMOTE MEASUREMENT BY USE OF EXTENSION CABLE

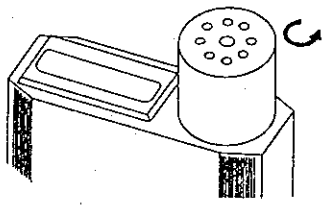
If the extension cable is to be used, first unplug the sensor.

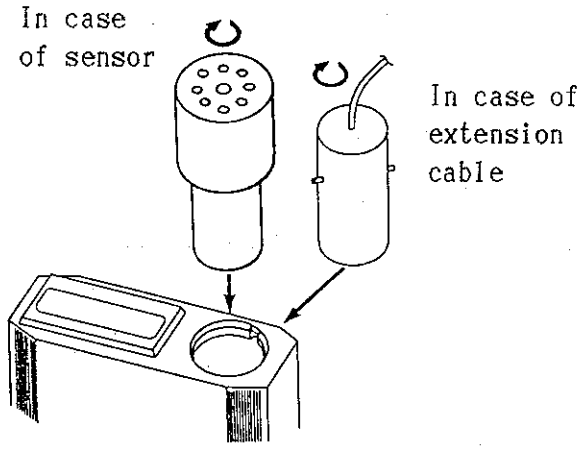
1) It is secured in a bayonet-type socket : press and turn counterclockwise to release.

2) Insert plug end of cable into same socket and install sensor in socket end of cable.

3) Verify operation and adjustment as before.

4) Insert the remote sensor into the place to be tested and read out oxygen content in the normal way.





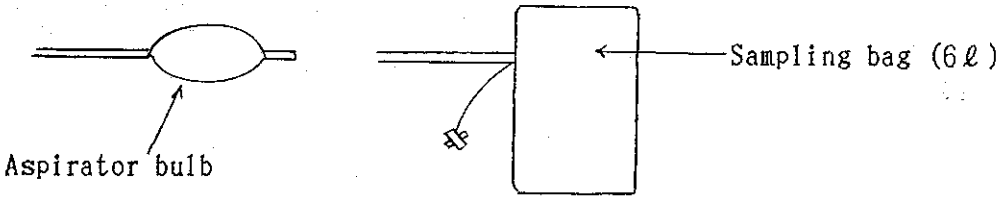
7. HOW TO USE THE CAL KIT FOR THE PRESSURIZED AIR

(Useable under the pressurized environment of below 2.0 kg/cm²)

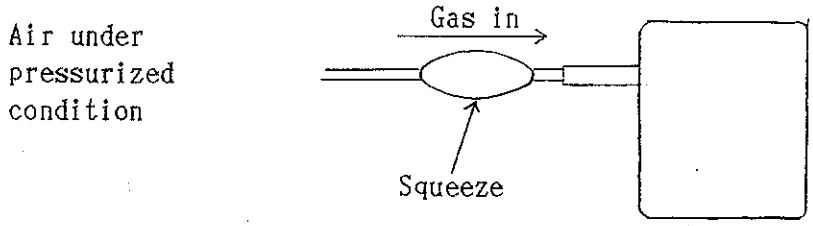
This KIT is consists of ; a) Calibration adaptor ..... 1 pce
b) Sampling bag (6 ℓ) ..... 1 pce
c) Neoprene hose (50cm) ..... 1 pce
d) Aspirator bulb ..... 1 pce

When utilize the instrument under the pressurized environment, prepare the calibration kit for the pressurized air which is supplied as optional accessories.

1) Connect the end of aspirator bulb to the inlet hose of sampling bag(6 ℓ) as follows



2) After above connection, introduce the ambient pressurized gas into the sampling bag(6ℓ) by squeezing the aspirator bulb.



3) Pack the fresh air into the gas sampling bag (optional accdessories) and close it with its clip.

4) Carry the adaptor (optional accessories), foresaid gas sampling bag and the instrument into the pressurized environment.

5) Fix the adaptor to the sensor of instrument. Send air into the adaptor from the gas sampling bag.

6) Put power switch⑤ to "ON" position and set the reading to 21.0 with SPAN adjuster, observing the display board.

7) When the adaptor is taken off swiftly just after having made the span adjustment, this is ready to start operation.

8) When the pressure is changed, repeat the above procedures.

8. REPLACEMENT OF OXYGEN SENSOR

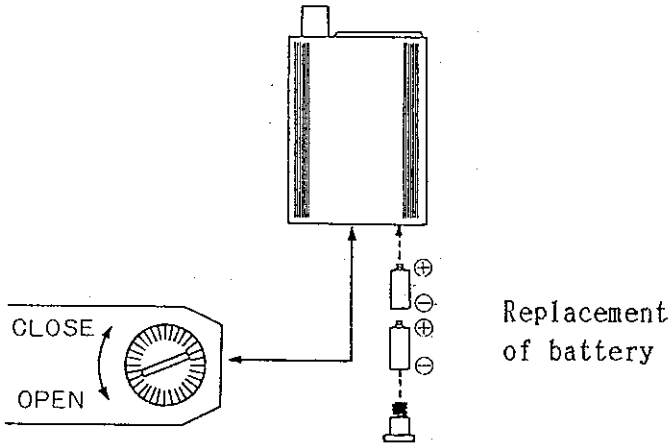
The oxygen sensor is a plug-in assembly which is easily replaced but is not field-repairable. It should be replaced ;

1) When the reading is below 23.0 in normal air even if turning SPAN adjuster clockwise fully.
2) When the reading becomes eratic, or affected by position or movement of detector.

When oxygen sensor needs replacement, a new sensor should be installed. The old one should be sent to RIKEN's authorized dealer for reactivation, which is done at a flat rate.
Oxygen sensor is guaranteed to operated satisfactorily for a period of one year from date dated of purchase. If it fails within that time, it will be reactivated at no charge.

9. REPLACEMENT OF BATTERTY

When the capacity of battery is dropped and the battery is replaced with new one, prepare 2 pcs of small size(AA or R6) dry cells.
Note : The replacement of battery should be made surely at the safety area.



10. CAUTION IN OPERATION

This instrument is deeply concerned with the life of one's life, operate the instrument with the following notes taken carefully;

1) Be careful to keep the instrument from any water.
2) When operate it in ship, put it on the optional weather-proof rubber cover.
3) Do not drop nor throw it.
4) When not in use for a long time, it should be stored after removing battery (2 pcs of dry cells) from it.

12. ACCESSORIES

* Standard accessoies
  1) Dry cells (R6 or AA size) ..... 2 pcs
  2) Instruction manual ..... 1 copy
  3) Carrying case (with hand strap) ..... 1 pce
  4) Certificate ..... 1 sheet

**Optional accessories
  1) Ni-Cd battery and charger (Please specify voltage)
  2) External alarm buzzer (with clip)
  3) Extension cable (5m, 10m, 20m or 30m)
  4) Calibration kit for pressurized air (Gas sampling bag and adaptor)
  5) Carrying bag
  6) Weather-proof rubber cover(for marine use)
  7) (-) Small screwdriver