

OPERATING INSTRUCTIONS
FOR
RIKEN PORTABLE OXYGEN ANALYZER
MODEL OX-1

Caution: The model name of NK approved type is described
model OX-2 (Range of 0-10/0-2%) and in that case read
model OX-1 of this manual as model OX-2.

RKI Instruments, Inc. 33248 Central Ave. Union City, CA 94544
Phone: 800-754-5165 Fax: 510-441-5650

RIKEN PORTABLE OXYGEN ANALYZER: MODEL OX-1

Riken Analytical Instruments series OX-1 portable detector is now available for the measurement of the percentage of Oxygen in various industrial process.

1. APPLICATION

Riken Oxygen analyzer series are suitable instrument for a wide variety of process where OXYGEN must be measured in industrial process atmospheres such as MANHOLES, TANKS, SHIP HOLDS, MINE AREAS, PUBLIC WORKS, CHEMICAL and PETROLEUM. And it will effectively determine a small amount of the OXYGEN deficiency for the purpose of protection of safety for working people.

2. PRINCIPLE

The RIKEN OXYGEN SENSOR is basically a depolarization Cell. It contains a lead anode and a silver cathode, both protected from a gas or atmosphere being measured by a thin membrane of Teflon. A special electrolyte is held in place by the membrane. Oxygen diffuses through the membrane and combines with hydrogen which has been brought to the electrode as hydrogen ions by an electric current generated by the Cell itself. The hydrogen ions polarize the Cell.

This action is counteracted by the OXYGEN which acts to depolarize the Cell and changes the terminal voltage according to the amount of Oxygen in the gas being tested. The change can be directed to the indicating meter which is linearly graduated in percentage.

3. SPECIFICATIONS

3.1 Standard type of OX-1 (C type)

Intrinsically safe design 3nG5(JIS) Approval No. 14704

- 1). Measurable gas : Oxygen in gas atmosphere
- 2). Measuring range : 0 - 25% O₂
Colored scale : 0-18% Red, 18-21% Yellow, 21-25% Green
- 3). Accuracy : $\pm 5\%$ of full scale
- 4). Ambient temperature: 0 - 40°C
- 5). Response time : Within 20 sec. to reach 90% indication

- 6). Gas sampling method: By aspirator bulb (Automatic suction is available by means of MINI-PUMP)
- 7). Power source : Ni-Cd rechargeable batteries
- 8). Dimensions & Weight: 170 x 85 x 130 mm, 1.8 kgs.
- 9). Interference data : High concentration (above 10%) of SO₂, NO₂ and H₂S interferes to electrode of sensor.

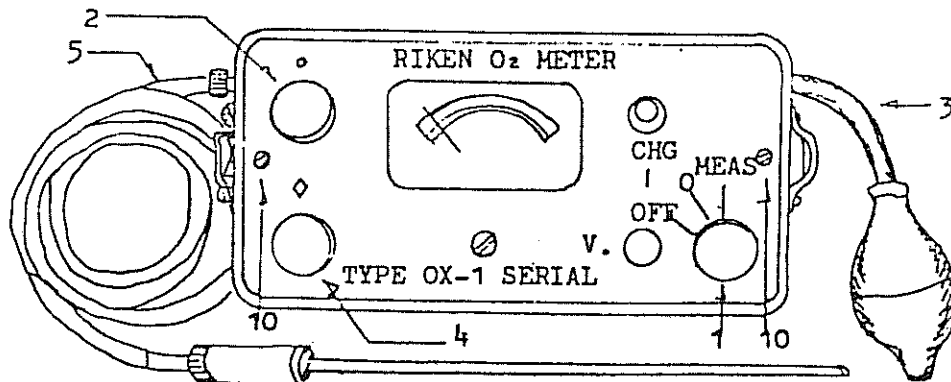
3.2 Dual range of OX-1 (D, E, F, G types)

- 1). Measuring ranges : Model OX-1, D type 0-25% & 0-100%
- E type 0-25% & 0-50%
- (Dual range) F type 0-25% & 0-10%
- G type 0-25% & 0-5%

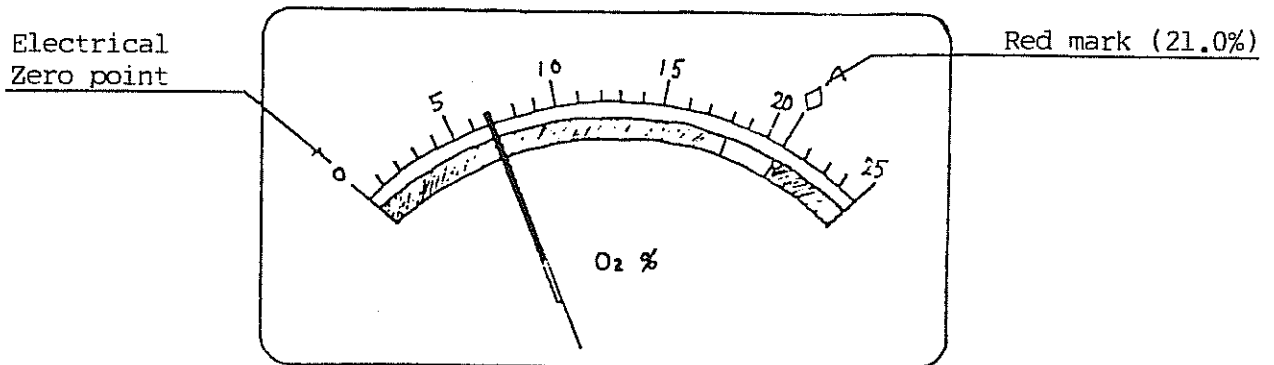
- 2). Accuracy : ± 5% of full scale (for 0-25% range)

Other specifications are identical for standard type.

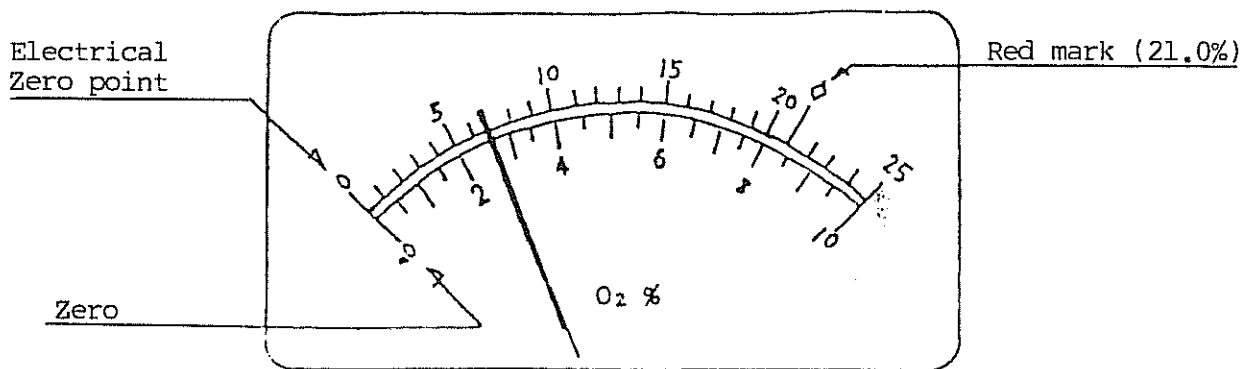
4. HOW TO USE



Top View OX-1 C Type O₂ 0-25%



Meter OX-1 C Type O₂ 0-25%



Meter OX-1 F Type O₂ 0-25%, 0-10%

4.1 Zero adjustment

(In case of C, D, and E types, only 1) and 2) are applied.)

- 1). Turn the switch knob (1) to "0 ".
- 2). Adjust the electric zero by turning the zero adjusting knob (2) with the condition of lifting them.
 · When measurement is below 10%, following procedures are recommended.
- 3). Set the switch knob (1) to " HIGH ".
- 4). Suck the fresh air by squeezing the aspirator (3) 4 or 5 times. Then, adjust the indication to \diamond mark (21%) on the scale by lifting the \diamond adjusting knob (4).
- 5). Suck the oxygen free inert gas (i.e. Nitrogen, Algon, Helium, etc.) by means of aspirator.
- 6). After the indication goes down below 1% O₂, set the switch knob (1) to "LOW ".
 Then, wait until the indication becomes in stable.
- 7). Adjust the indication to zero point by lifting the zero adjusting knob (2).

Notice : Don't touch the zero adjusting knob (2) after the zero adjustment.
 It is enough to make zero adjustment once per week.

4.2 Span adjustment

- 1). Set the switch knob (1) to the following positions:
 C type " MEAS "
 D & E types " LOW "
 F & G types " HIGH "
- 2). Squeeze the fresh air about 4 or 5 times by means of aspirator.
- 3). Adjust the indication to \diamond mark (21%) by lifting the \diamond adjusting knob (4).

4.3 Measurement

(In case of standard C type, only the procedure 1) is applied.)

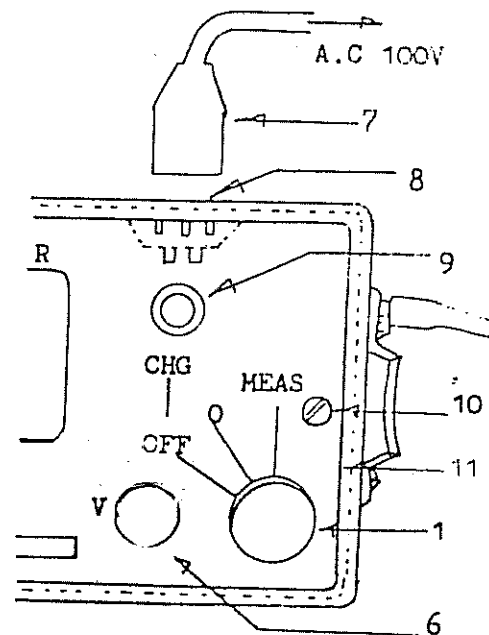
- 1). Suck the sample gas by squeezing the aspirator (3) about 5 or 6 times. After the stabilization of indication, read the concentration.
- 2). When the indication becomes above 25% or below the full scale of lower range (10% or 5%), set the switch knob (1) to respective position and read the indication.
- 3). Being over the adjustment, turn the switch knob (1) to " OFF ".

5. MAINTENANCE

5.1 Recharging

If the indicator is not within V zone when pushing the " V " button, please recharge the instrument.

- 1). Set the switch knob (1) to " OFF ".
- 2). Connect the recharging cord (7) to receptacle (8) of OX-1 and AC 100V power source.
In case of AC 220V power source, please refer to the instruction 5-5.
- 3). Illumination of red recharging lamp " CHG " shows that the instrument is recharged in good condition.
- 4). Full recharging time is 15 hours.
- 5). If you want to use the instrument before full recharging, please confirm that the indication is within a V zone.



Right part of Top View
O2 0-25%

5.2 Replacement of recharging lamp

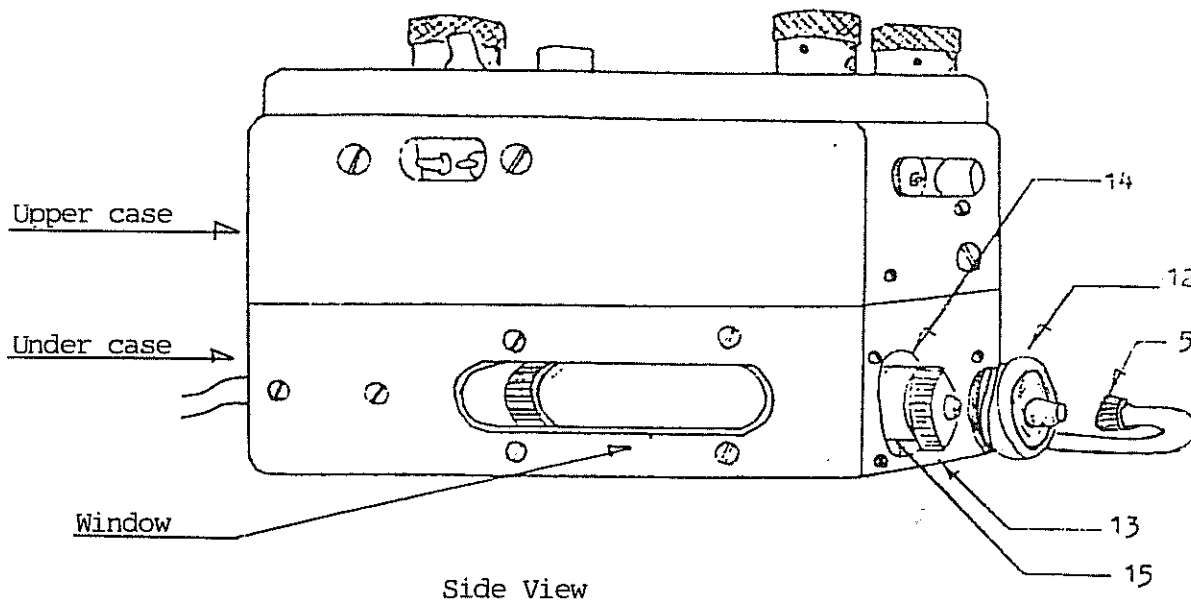
If the recharging lamp (red) is broken, replace them with new one according to the following procedures.

- 1). Take off the cover plate (11) by unscrewing two screws (10).
- 2). Replace old lamp with new one and set the cover plate as previous.

5.3 Replacement of absorbent cotton

If the absorbent cotton becomes dirty, replace them with new one.

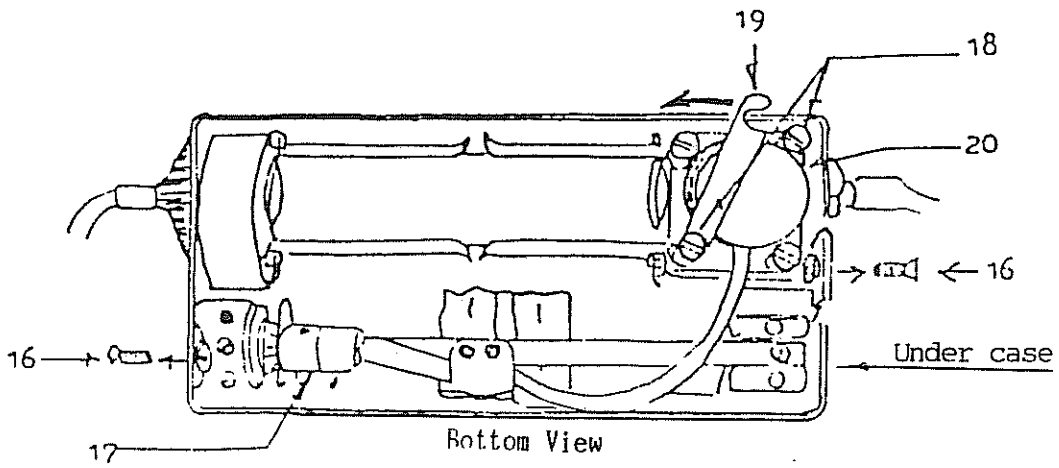
- 1). Take off the sampling tube (5) from cap (12).
- 2). Take off the cap (12) and take out the cotton container (14) from the instrument.
- 3). Take off the container cap (13) from container.
- 4). Replace the cotton with new one.
- 5). Set the container to the instrument as previous.
- 6). It is enough to make this replacement once per month in normal usage.



5.4 Replacement of sensor

If the following phenomenons would be occurred inspite of enough voltage (within a V zone), replace the sensor with new one.

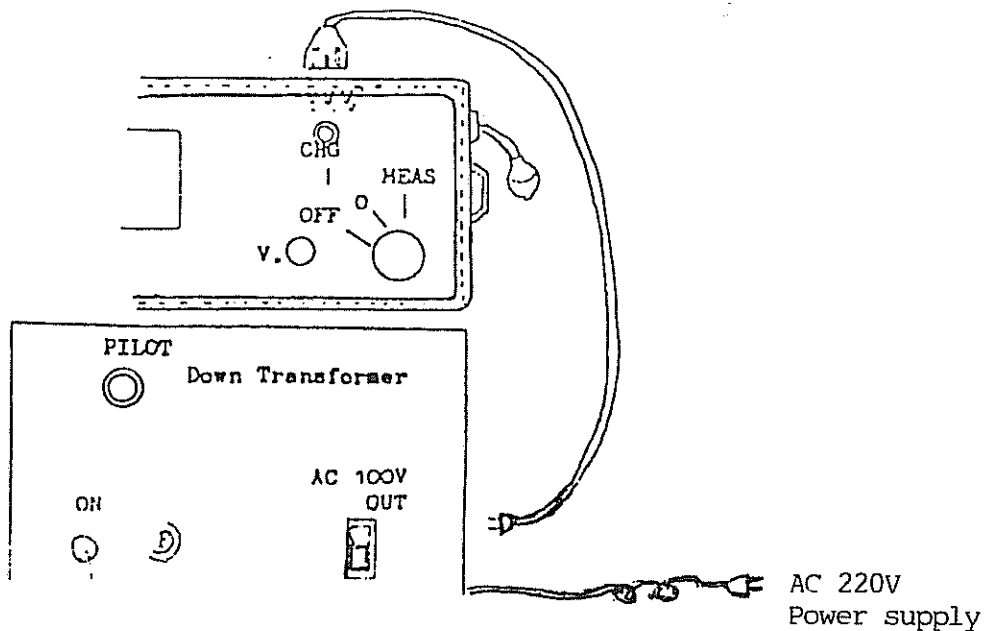
- It could not be adjusted at the \diamond mark (21%) when introducing the fresh air.
- Indication becomes unstable when introducing the sample gas.
- Response time becomes too late when introducing the smaple gas.



- 1). Take off upper part of instrument by unscrewing two screws (16).
- 2). Take off the connector (17).
- 3). Take out the sensor (20) by sliding the stopper plate (19).
Take stopper plate will slide by making loose two screws (18).
- 4). Take out the seal of new sensor and set them into the correct position.
- 5). Fix all parts as previous.

5.5 Recharging from AC 220V

- 1). After the confirmation of switches " OFF " for both OX-1 and down-transformer, connect the recharging cord to both OX-1 and AC 100V output of down-transformer.
- 2). Connect the power cord of the down-transformer to the power supply AC 220V.
- 3). Turn the switch of the down-transformer to ON, and CHG lamp (red) of OX-1 and pilot lamp (yellow) of transformer will be lighted. This shows that the instrument is recharging in good condition.



6. ACCESSORIES

1). Spare sensor	1
2). Aspirator	1
3). Gas sampling probe	1
4). Sampling tube, 1m	1
5). Recharging cord	1
6). Spare lamp, 6V 25mA	2
7). Absorbent cotton	1