

OPERATING INSTRUCTIONS  
FOR  
RIKEN PERSONAL CO MONITOR

MODEL CO-87

Please read this manual  
carefully before operation

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## PRECAUTIONS

To maintain the function of this instrument, operate the instrument with the following notes taken carefully ;

- 1) As this is based on the detection principle of electrochemical, do not leave the instrument alone with the shortage of battery capacity.
- 2) Even when not in use for a long time, it is recommendable to replace the battery with new one or recharge (in case of Ni-Cd battery ) once in a month.
- 3) Be careful to keep the instrument from any water.
- 4) Do not drop nor throw it.
- 5) Do not leave or store the instrument where the temperature gets hot and high.

### 1. DESIGNATION OF EACH PART (Fig. 1)

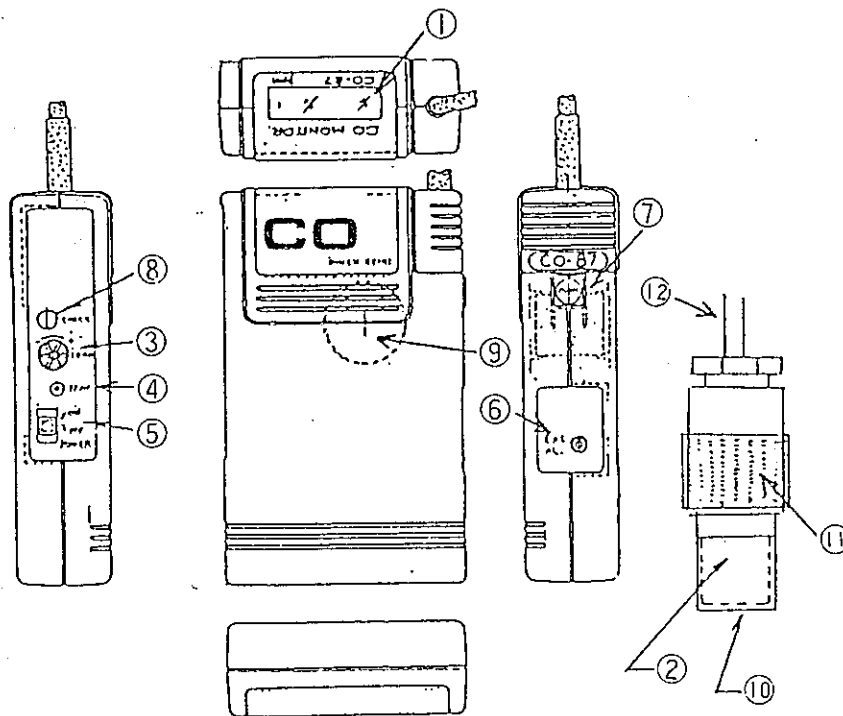
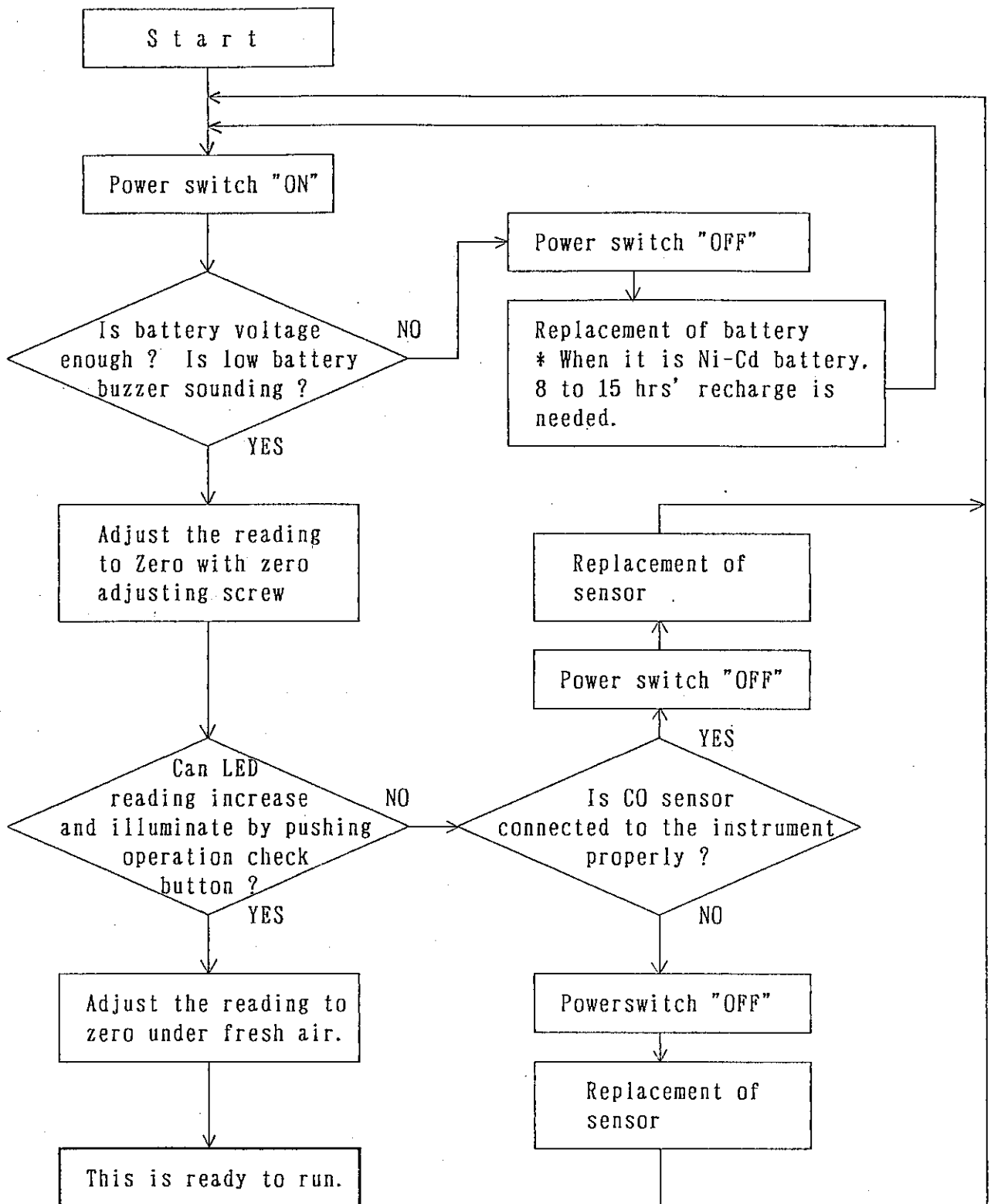


Fig. 1

- |                                    |                          |
|------------------------------------|--------------------------|
| ① Digital display                  | ⑦ Sensor release button  |
| ② CO sensor                        | ⑧ Operation check button |
| ③ Zero adjuster                    | ⑨ Buzzer                 |
| ④ Span adjuster                    | ⑩ Sensor cover           |
| ⑤ Power switch                     | ⑪ Tape with clip         |
| ⑥ External alarm buzzer receptacle | ⑫ Extension cable        |

## 2. OPERATIONAL PROCEDURE



1) Power switch on

Put the POWER switch⑤ to "ON" position.

2) Check of battery voltage

Put the POWER switch to ON. When the buzzer is sounding continuously though the reading is below 50 ppm, it is the sign of low battery and then the battery must be replaced with new one or recharged in full capacity in this case.

3) Zero adjustment and sensor connection check

After having checked the battery voltage, adjust the LCD display to 0 0 0 by turning the zero adjuster③. Check that the reading will increase and alarm (LCD illumination, continuous buzzer sound) will come out by pushing the operation check button ⑧.

\* Note 1. When the reading does not increase and alarm does not come out though pushing the operation check button⑧, check the connection of CO sensor②.

\* Note 2. Do not continue pushing the operation check button ⑧ for a long time. (Within 2 sec.)

4) Zero adjustment

Adjust the reading to 0 0 0 by turning the zero adjuster③. Make zero adjustment under fresh air.

5) Measurement

When finished the procedure from 1) to 4), this is ready to run.

\* Zero adjustment procedure

When make the operational procedure from the item 3) to 4), bring the reading to - 0 0 0 once and adjust this (-) display to 0 0 0 by turning the zero adjuster ③ gradually to (+) direction. With it, the more accurate adjustment can be made.

\* Over-scale display

When this detects the CO of above 300 ppm, this reading will disappear into 1 □ □ □. At this time, the buzzer sounds and LED lamp illuminates continuously each. When detects such high concentrated CO gas and makes over-scale display, carry this instrument to the place under fresh air and leave it alone until the reading is turned to 0 0 0.

Note 1)

When use this instrument in hazardous area, put it in the protective case.

Note 2)

Optional special interference filter must be used when use this instrument in atmosphere containing hydrogen sulfide, sulfur dioxide, and nitrogen dioxide.

### 3. OTHER FUNCTIONS

#### 1) Self-illumination

When it gets dark around, the display unit of this instrument illuminates automatically and CO gas concentrations can be read out clearly. When it is bright, this illumination will be automatically put out.

#### 2) External alarm buzzer

When the background noise is heavy and it is hard to hear the buzzer sound of this instrument, it is recommended to use the optional external alarm buzzer. As this external alarm buzzer is provided with the clip, it is easy to fix it to the pocket in a shirt or on the safety cap. This buzzer capacity is 85 dB/30cm.

### 4. CALIBRATION

As this instrument is deeply served for the safety of one's life, it is very important to maintain the function of operation by the periodical check so that this normal operation can be secured always. For this safety check, it is recommended to make calibration once in 2~3 months.

#### \* Before the calibration procedure

When make this calibration, prepare the optional calibration kit.

#### \* Preparation

- 1) Make adjustment according to the operational procedure from item 1) to 4).
- 2) Put the power switch to "OFF" position once.
- 3) Arrange and set the calibration kit.

#### \* Calibration procedure

- 1) Put the power switch ⑤ to "ON" position.
- 2) Check that the reading is "ZERO".
- 3) Adjust the needle valve so that the red float comes to the center.
- 4) Leave it alone until the reading get stable as it stands.  
(This is for about one minute.)
- 5) After the reading gets stable, adjust it to the value of standard gas by turning the span adjuster ④ with mini-screwdriver.
- 6) When turn the span adjuster④ and it can not be adjust to the value of calibration gas by turning the span adjuster, it is the deterioration of sensor life and replace it with new one.

## 5. REPLACEMENT OF CO SENSOR

When make the calibration of item 4 and the reading can not be adjusted to the value of standard gas though turning the span adjuster ④ to the right end, it is the sign of CO sensor deterioration. Then, replace it with new one.

This CO sensor is a plug-in assembly which is easily replaced but is not field-repairable.

The life expectancy of the CO sensor is 1~2 years.

## 6. REPLACEMENT OF BATTERY

When the capacity of battery is dropped and the battery is replaced with new one, prepare two pcs of small size (A6 or AA size) dry cells.

### \* Note

The replacement of battery should be made surely at the safety area.

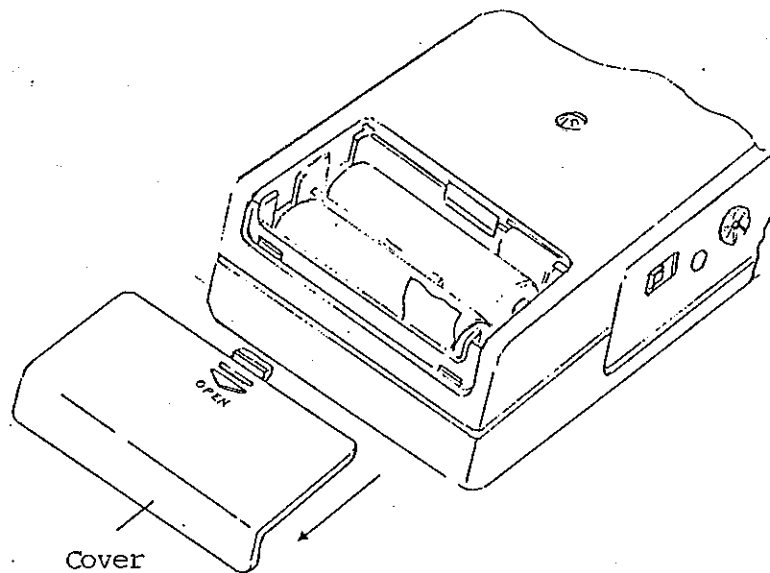


Fig. 2

# 7. SPECIFICITY OF MODEL CO-87 FOR CO

Interfering gas	Concentration tested	Reading	
		No filter	With filter
Acetylene $C_2H_2$	200 ppm	30 ppm	30 ppm
Buthane $C_4H_{10}$	2000 ppm	No interference	No interference
Hydrogen sulfide $H_2S$	20 ppm	220 ppm	"
Sulfur dioxide $SO_2$	21 ppm	9 ppm	"
Nitrogen dioxide $NO_2$	15 ppm	- 10 ppm	"
Chlorine $Cl_2$	10 ppm	No interference	"
Methane $CH_4$	5 %	"	"
Oxygen $O_2$	99.9%	"	"
Carbon dioxide $CO_2$	30 %	"	"
Hydrogen $H_2$	300 ppm	5 ppm	5 ppm

\* These data are subject to change without notice for better improvement.

## 8. SPECIFICATIONS

Model	: CO - 87
Detection method	: Electrochemical, two electrode sensor
Measuring gas	: Carbon Monoxide (CO) in air
Measuring range	: Basic range : 0~150ppm Service range : 0~299ppm
Read-out	: Digital LCD (Digital Liquid Crystal Display), 3-digit with self-illumination in a dark place
Accuracy	: Better than $\pm 10\%$ of F.S. (at constant conditions in standard range)
Alarm setting & alarm method	: Alarm preset point ..... 50ppm(CO) Intermittent audible tone Over-scale alarm ..... 300ppm(CO) Continuous audible tone Low battery alarm ..... Continuous audible tone  Buzzer and alarm lights are non-latched mode.
Alarm accuracy	: Better than $\pm 30\%$ of preset level
Response time	: Better than 20 seconds to get 90% indication(T90)
Ambient temp.	: $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$
Power source	: Alkaline cell (Standard) or Ni-Cd battery(Option) x 2 pcs
Continuous operation	: 250 hrs minimum (Under no alarm and illumination)
Dimensions & weight	: 68(W) x 112(H) x 25.6(D) mm, approx 180g
Explosion proof	: Intrinsically safe design