

OPERATING INSTRUCTION MANUAL
FOR
RIKEN INDOOR CARBON MONOXIDE MONITOR
MODEL EC-500

Operational Precautions

- Read and understand this instruction manual carefully before operating instrument.
- Follow the instruction manual when operate instrument.
- It may cause a trouble once instrument was operated without following the instruction manual.
- The safety and quality of the instrument is not guaranteed if the instrument was used without following the instruction manual, or the instrument was individually remodeled or was repaired by undesignated parts. Also, Riken assumes not responsible for accidents that may occur as a result of the above reasons.



RIKEN KEIKI CO., LTD.

2-7-6 Azusawa Itabashi-ku Tokyo, 174-8744 Japan

Phone : 81-3-3966-1113

Fax : 81-3-3558-9110 GIII

E-mail : intdept@rikenkeiki.co.jp

In the beginning

Thank you for your order of Riken carbon monoxide (CO) monitor, Model EC-500 (hereinafter EC-500). The instrument is to notify the concentration of carbon monoxide ascent by alarm lamp or buzzer to prevent accident of CO poisoning by any chance.

To operate the instrument correctly, be sure to read the instruction manual before operating the instrument.

To assure safe and effective operation, the following outlines are used in this manual:

 **Danger**

This mark means that it may occur serious damage on the human's life or instruments if the instrument is used in improper way.

 **Warning**

If the instrument is not operated following the manual, it causes a serious damage on the human bodies or objects.

 **Caution**

If the instrument is not operated following the manual, it causes some damage on the human bodies or objects.

*** Note**

Advice on usage

Important instruction for the safety

 **Danger**

- Gas sensitivity adjustment should be done periodically. Please contact our sales office or service agent for gas sensitivity adjustment.
- Make sure to install the instrument in air. Otherwise, it cannot be measured correctly and there is a possibility to lead up to an accident of CO poisoning.

 **Danger**

- The EC-500 should not wiring parallel with a wire which includes power source, high hertz , high voltage and any other instruments' wires.
- The intersect wiring should be done when the EC-500 is to intersect with high hertz, high voltage and wires.

 **Caution**

- Do not poke opening of sensor or buzzer with a sharply pointed one. It may cause failure or breakage of the instrument and there is a possibility not to measure correctly.
- Do not put some water on the EC-500 which may cause failure.
- Do not give shock or vibration since the EC-500 is precision instrument.

 **Caution**

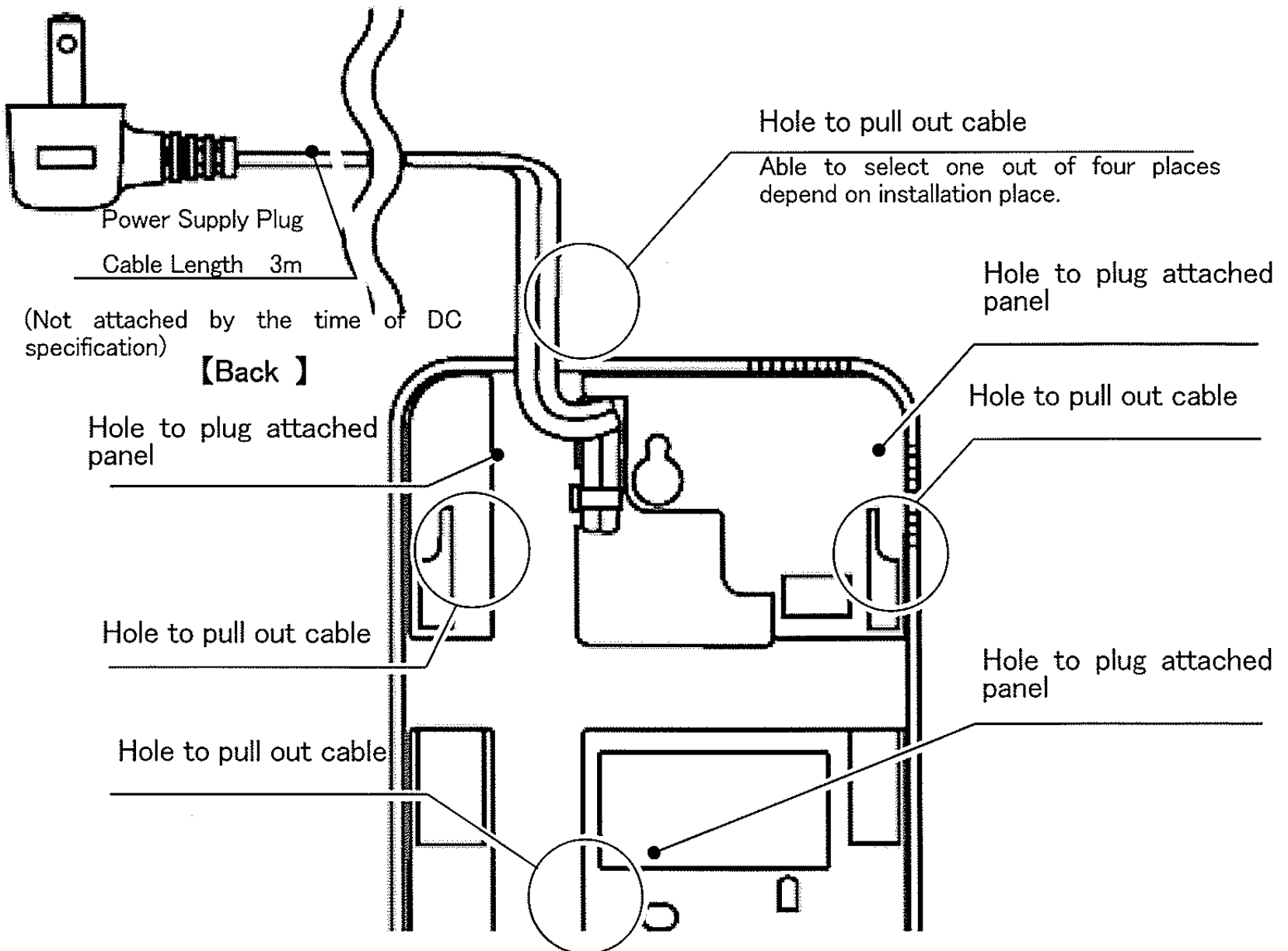
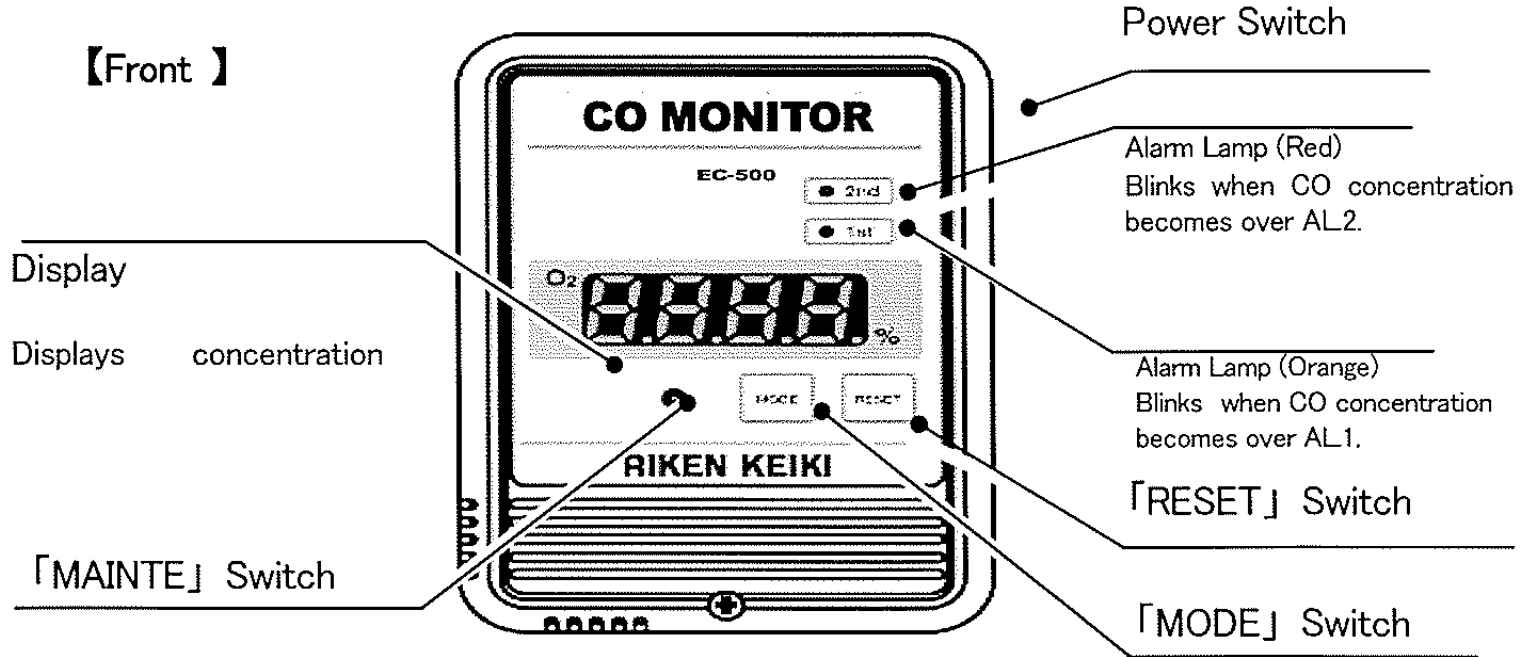
- Install the instrument in the place where not to get wet since the instrument is not water-proof or not for water use.
- Do not touch parts in the case when you opened it.
- Install the instrument without excessive power will not be taken at power/signal cable.

Contents

	Page
1. Name of each part and function	5
2. Installation Place	6
3. How to install	7
3-1 How to install	7
3-1-1 Using attached panel	7
3-1-2 Not using attached panel	9
3-2 Take in power supply directly	
3-2-1 How to connect AC Cable	11
3-2-2 Cable using	14
4. How to use	15
4-1 Operation after power on	15
4-1-1 Operation Flow	15
4-1-2 Self Diagnosis	15
4-1-3 Initial Clear	15
4-2 Basic Function	15
4-2-1 Indication Display	16
4-2-2 Gas Alarm	16
4-2-3 Scale Over	16
4-2-4 Trouble Display	17
5. User's Maintenance Mode	18
5-1 Confirm Alarm Point	19
5-2 Confirm Alarm Summary	20
5-3 Set and Confirm Date and Time	22
5-4 Alarm Test	26
6. Connect Wiring	27
7. External Output Operation	27
7-1 External Output	27
7-2 4-20mA Output Chart	28
7-3 LED, Output Status Chart for Contact Point	29
8. When instrument is not in a good condition.....	29
9. Specifications	30

1. Name of each part and function

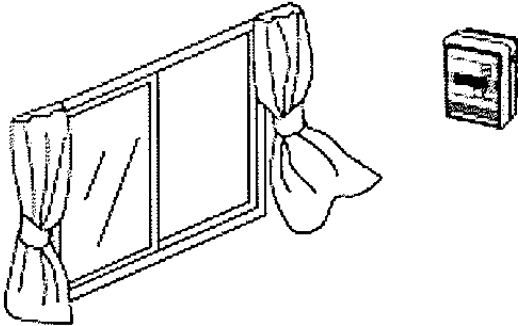
【Front】



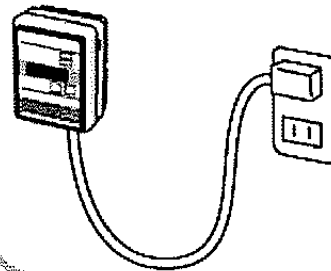
2. Installation Place

Cautions on usage

1. Open the window and ventilate the air in the room.

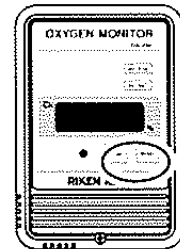


2. Put the power plug into the power point and turn the power on.

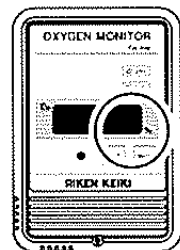


All lamps are on and 「- - - -」 sign will be indicated for about 3 minutes. After that it will be able to measure.

- ★ CO concentration rises from 0ppm and when it becomes over than 50ppm【average】, the alarm lamp (orange) start blinking and the buzzer start beeping.



- ★ CO concentration rises again and when it becomes over than 100ppm【average】, the alarm lamp (orange, red) start blinking and the buzzer starts beeping continuously.



3. How to install

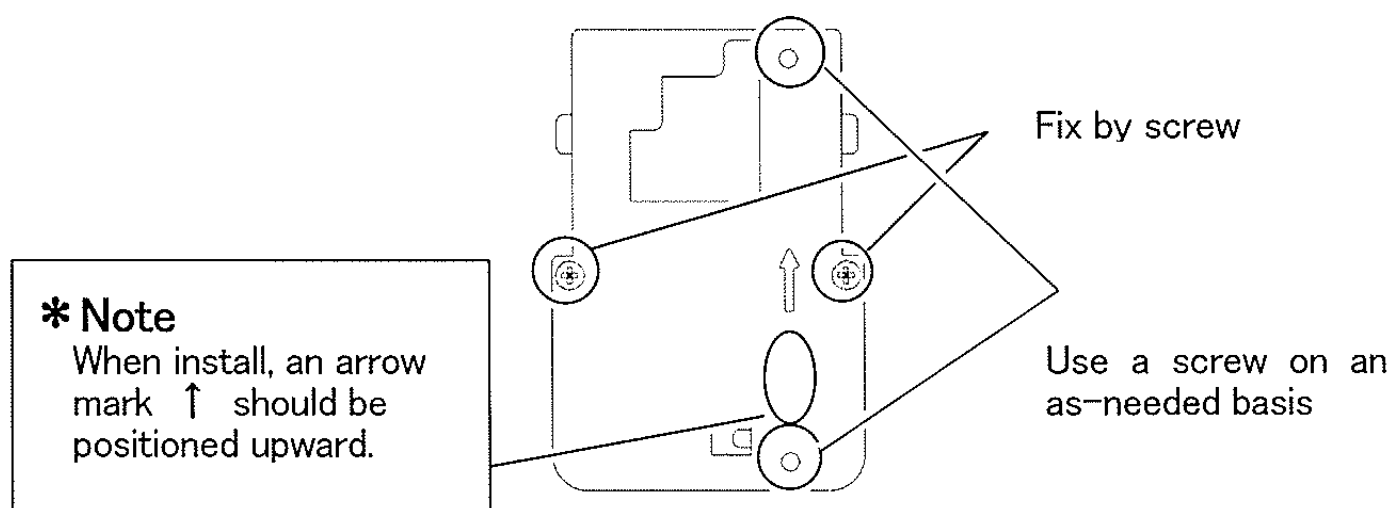
3-1 How to install

Caution

Make sure to confirm the power is off when install the instrument. Otherwise, you will get an electrical shocks.

3-1-1 When using attached panel

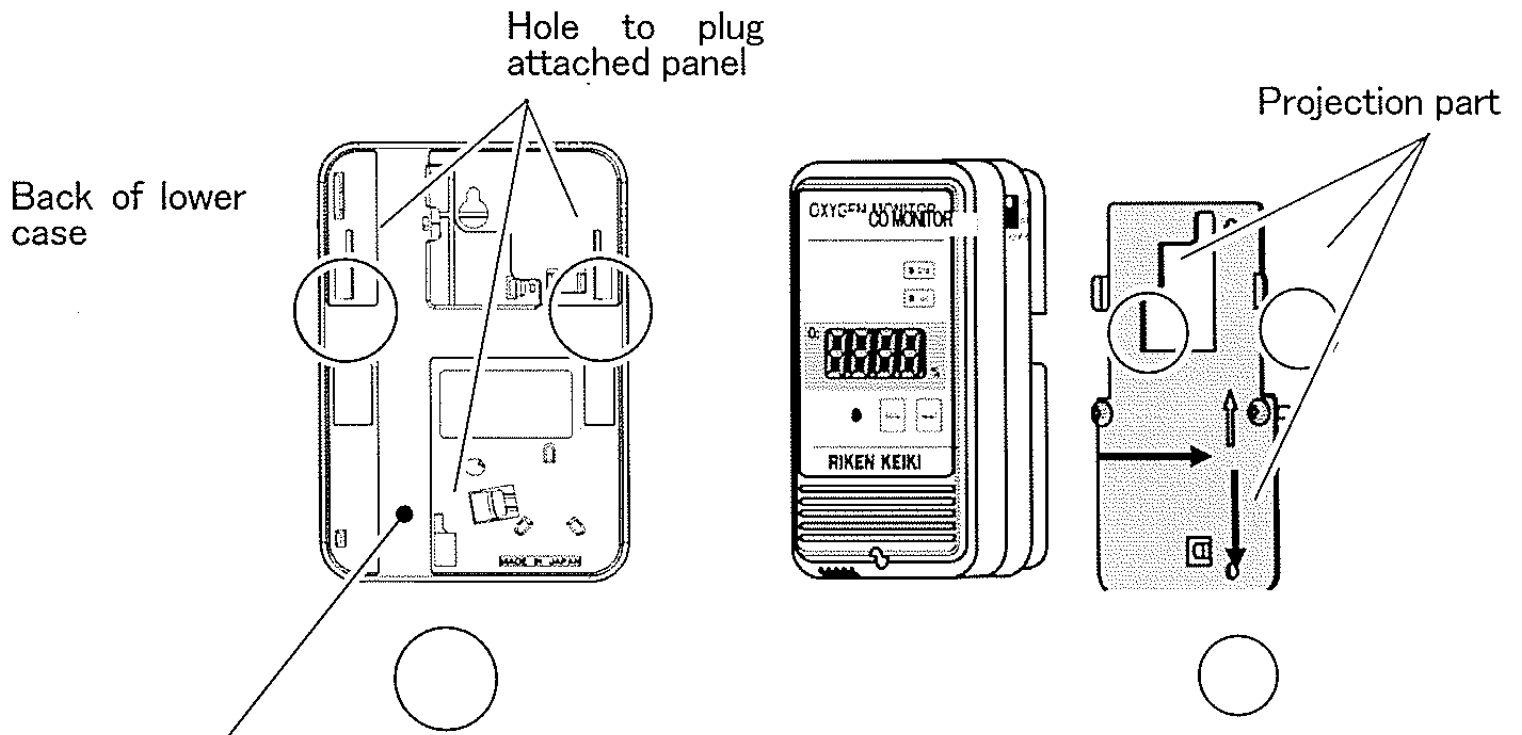
- ① To fix attached panel to wall surface by attached screws. (pan head screw or screw spike. Make sure the panel is not inclined. Basically it should be fixed at two places. Other two screw holes will be used on an as-needed basis.



Caution

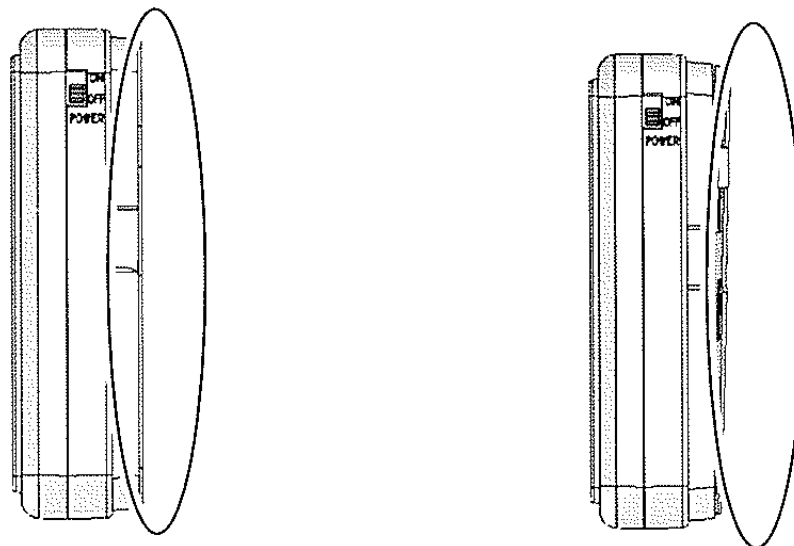
Install the panel, which has enough intensity, to the wall surface where has no vibration.

- ② Press the body of the instrument so that the projections (3 places) of the attached panel get in to the hole to plug attached panel of the back of lower case slide body of the instrument to a lower direction with the attached panel close to the lower case.



According to the installation place, an electric power code should be pulled out along with a hole to pull out cable (regle).

- ③ Confirm whether the back of the lower part of the case is attached closely with the attached panel.



◎ Good example

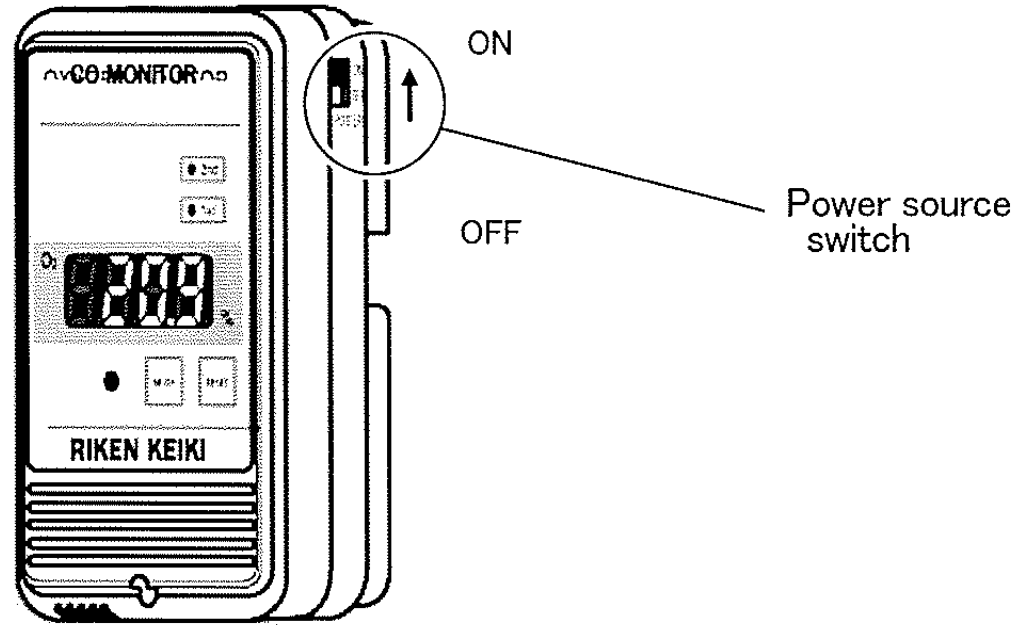
× Bad example



Caution

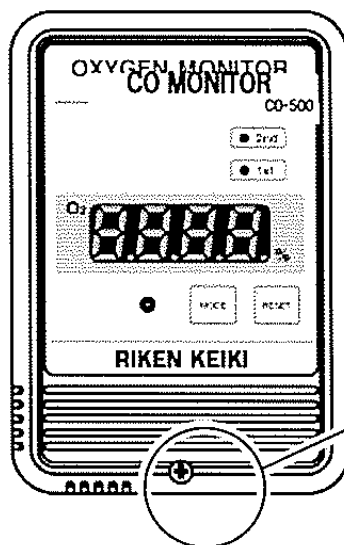
When installation, be careful not to pinch the cable between the body of the instrument and the attached panel.

- ④ It is able to measure three minutes and thirty seconds later after connecting power source cable and turn the power on,



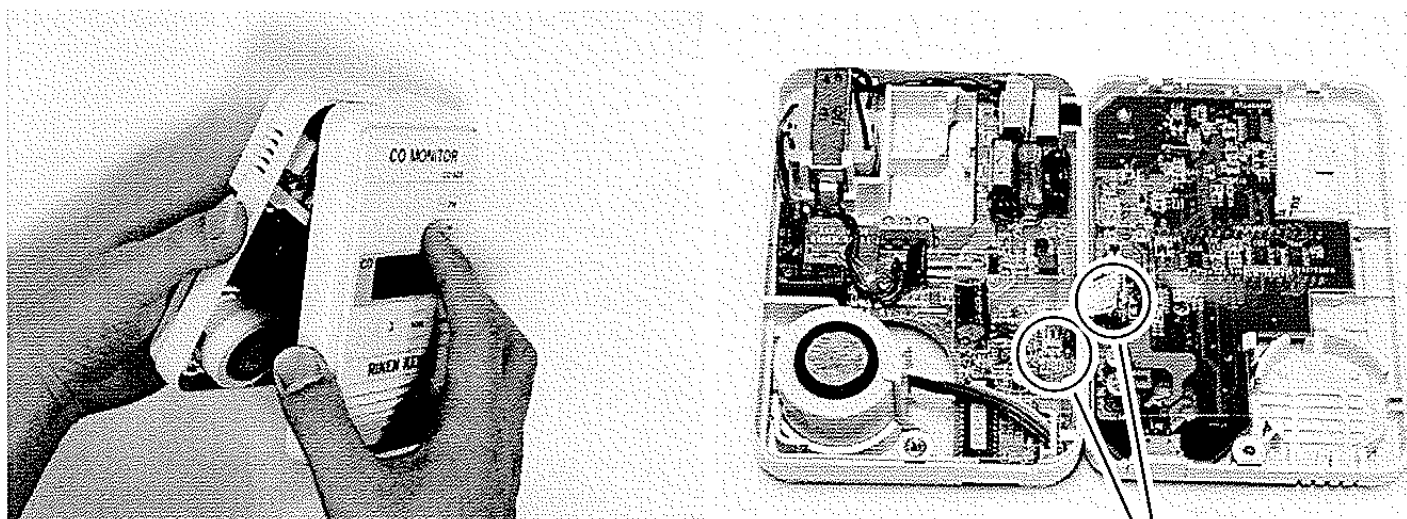
3-1-2 Not using the attached panel

- ① Loosen the screw of the lower part of the front body of the instrument and open the upper part of the case.



Loosen the screw

- ② Open the upper part of the case and take of the connector which is connected with the lower part of the case.

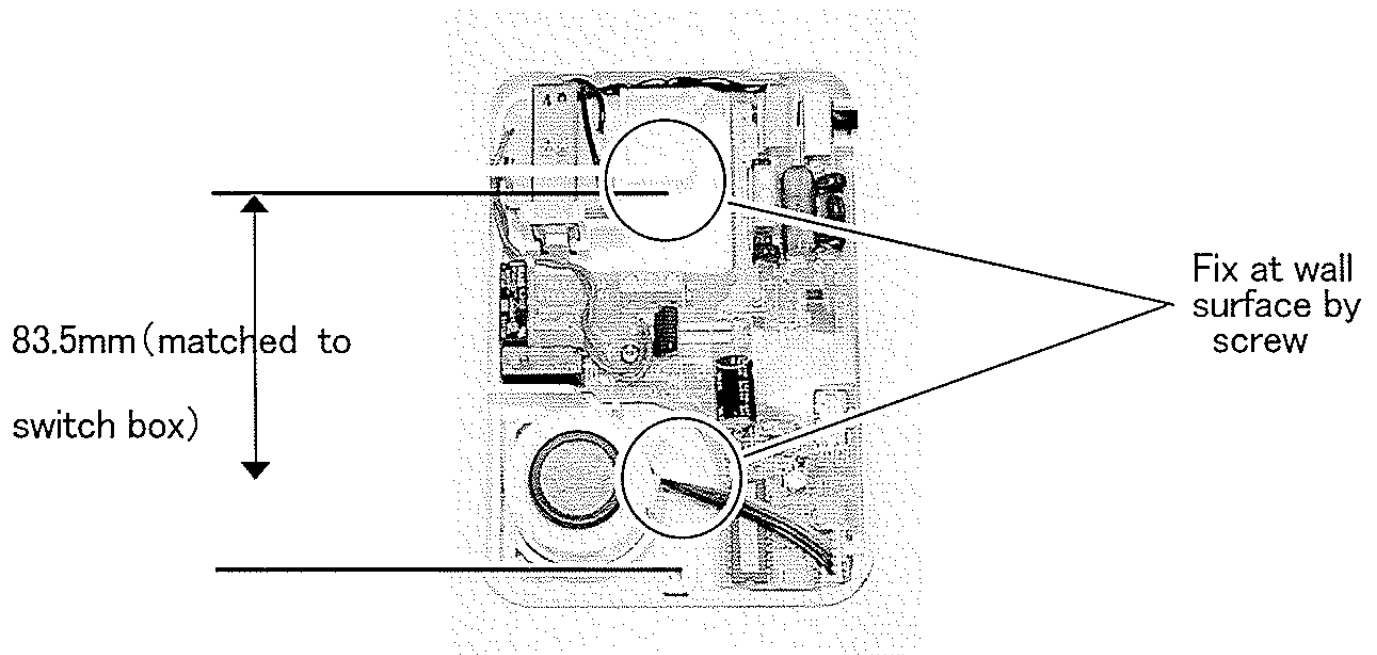


Connector

⚠ Caution

- Open the case without breaking the wires since each case is connected with the connector.
- Make sure not to pull the connector when you pull out the wire.

- ③ Fix at two places of the lower part of the case by attached two screws (pan head small screw or screw spike). At this time, confirm whether the body of the instrument is not inclined.




⚠ Caution

- Instrument should have enough intensity and install it where wall surface has no vibration.
- When installation, be careful not to pinch the cable between the body of the instrument and the wall.

- ④ Connect the upper and lower case with the connector and close the case. At this time, confirm whether the two clicks of the upper part of the case are snapped on the lower case (the upper and lower case should be attached closely) and the cable is not stick out from the case. Screw the lower part of the front body of the instrument.

- ⑤ Turn the power on.

⚠ Caution

- Install the connector correctly. Otherwise, it won't detect rightly.
- When install the connector, install  part at the left side.

⚠ Caution

The direction of the installation is the upper. (Please refer to P.7)

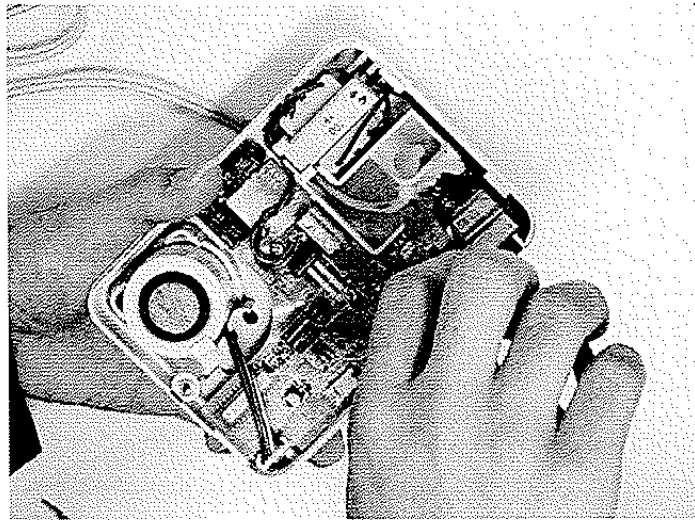
3-2 Take in power source directly

Caution

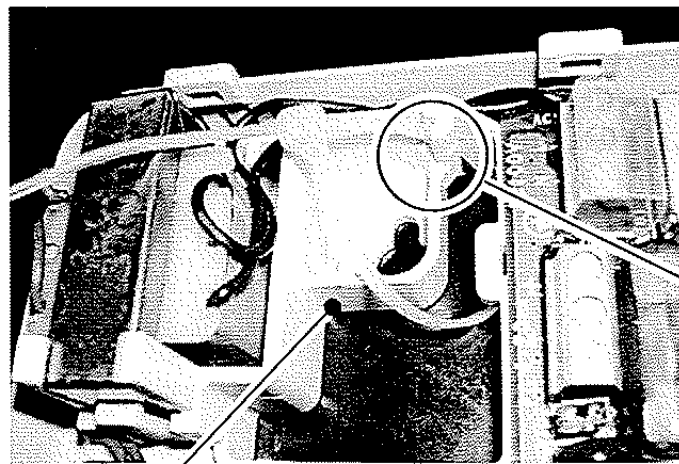
Make sure to confirm the power is off when you install the instrument. Otherwise, you might get an electrical shock.

3-2-1 How to connect AC cable

- ① Loosen screws of the front body of the instrument, and open the upper part of the case.
- ② Cut the cable clamp which is to stop the AC code to pull out, and take out the AC from the terminal block.



- ③ Let cable clamp into the upper part of the hole to pull out cable and fasten the cable clamp halfway.



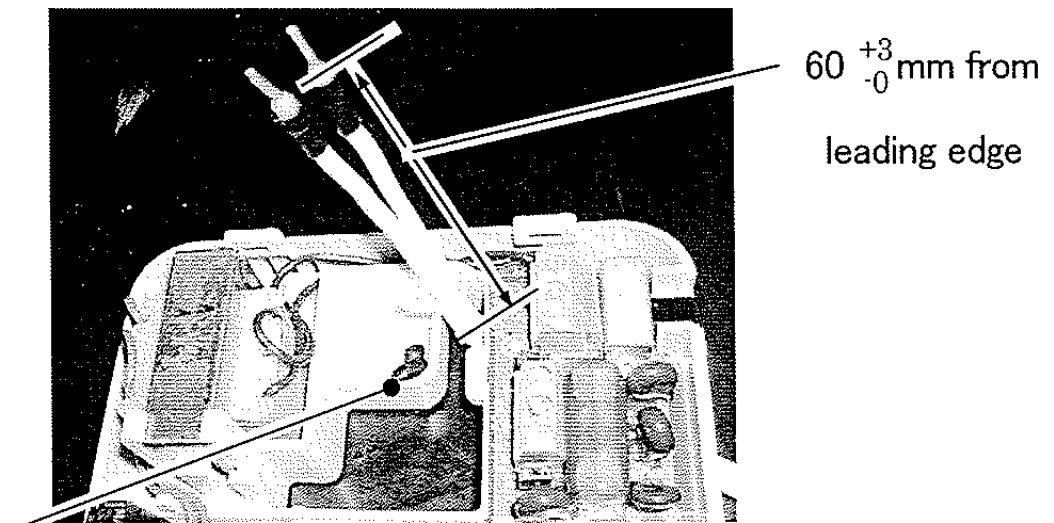
Hole to pull out cable

Cable Clamp

*** Note**

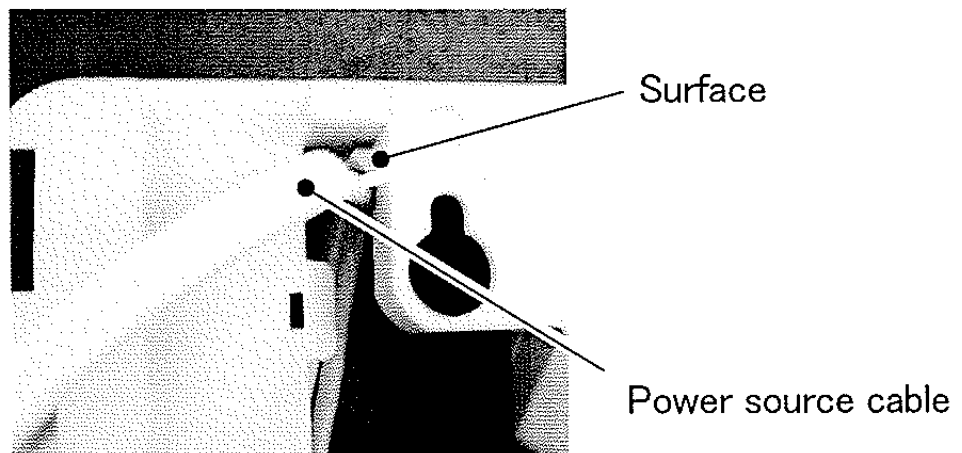
Let the cable clamp into the back of the case.

- ④ Fix the power source cable, which will be used, by the cable clamp.



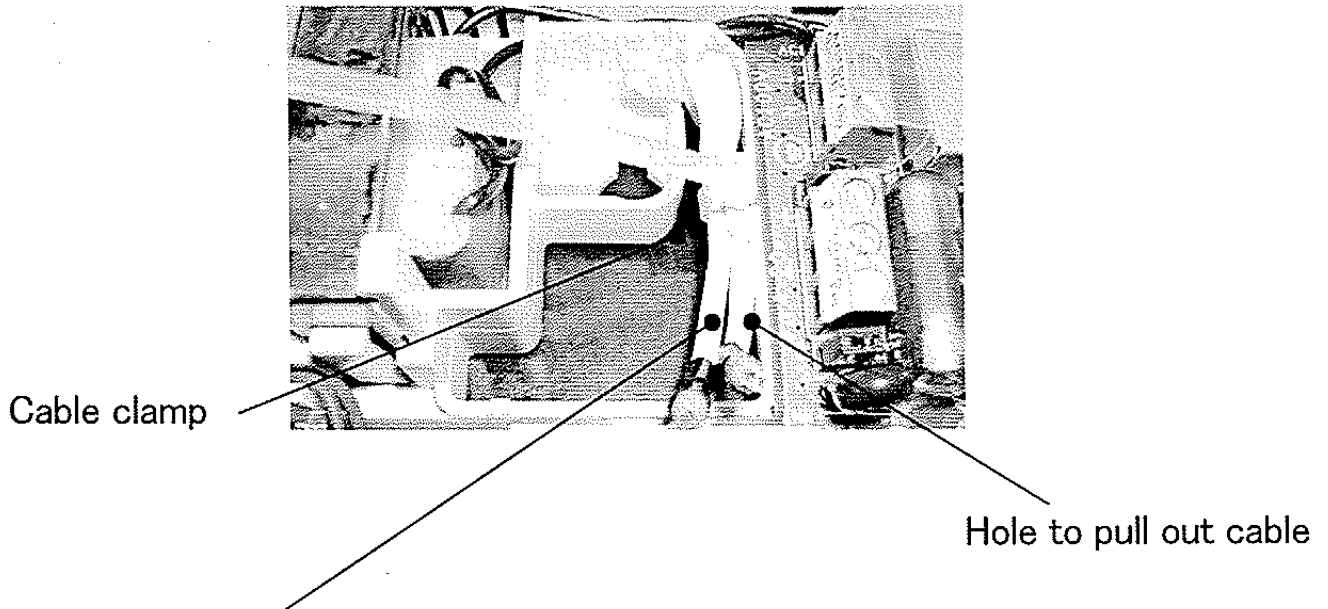
Cut from the base

Lower part of the case

*** Note**

- The position to fasten the cable clamp is $60 \begin{smallmatrix} +3 \\ -0 \end{smallmatrix}$ mm from the leading edge of the cable.
- Fix the power source cable to contact with the surface of the installation position.
- After fixing the power source cable, cut the cable clamp, which left over, from the base.

- ⑤ Let the cable clamp into the hole to pull out cable, and fix the power source cable.

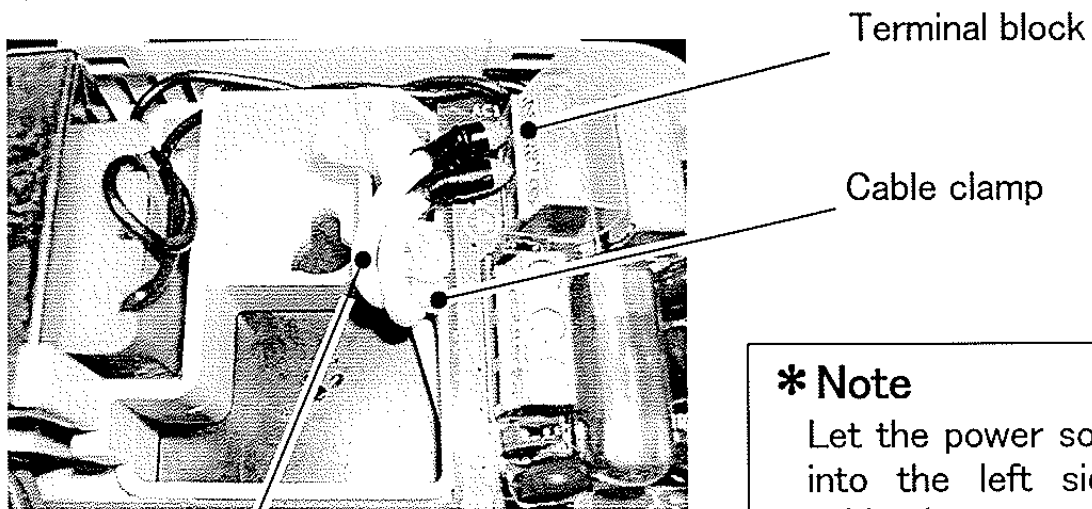


Power source cable (let the cable clamp into beneath of the hole to pull out cable)

*** Note**

- The cable clamp should be laced from backside of the case.
- Put the power source cable beneath of the hole to pull out cable and fix it to contact with the surface of the installation position.
- After fixing the power source cable, cut the cable clamp, which left over, from the base.

- ⑥ Connect the cable terminal to the terminal block



*** Note**

Let the power source cable into the left side of the cable clamp.

AC power cable (let the cable into the left side of cable clamp).

 **Caution**

The cable clamp, which will be used, should be 4mm width and within 1.5mm thickness. Please refer to 3-2-2 for adjustment cable.

⑦ Close the case

⑧ Turn the power on

 **Caution**

- Cables, except for AC cable, should be basically wire in the wall surface via switch box. In case the cable will be wired outside of the wall surface, fix the cable not to get unreasonable force since there is no cable through cramp.
- Do not pull the cable when you pull out the connector which connect each case. If you do, it may cause a loose connection.

 **Caution**

The power source code should be cramped to the case of the body so that the terminal connecting part (terminal block) should not take any overloading caused by pulling out the cable.

3-2-2 Cable to use

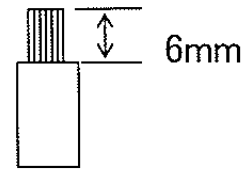
① Connectable cable:

Single wire : $0.14\text{mm}^2 \sim 1.5\text{mm}^2$

Twisted wire : $0.14\text{mm}^2 \sim 1.5\text{mm}^2$

Length of bare wire : 6mm

Cable finished dimension is not over $\phi 7.0\text{mm}$



② Specification of terminal block

Voltage Rating: AC250V

Current Rating: 13A

Torque to tighten up screw: 5~8kg

Compatible driver: Minus driver, width of leading edge: Below 3mm

Compatible stick terminal: Model AI series (Phoenix)

Compatible clamping tool: CRIMPFOX UD 6 (Phoenix)

4. How to use

4-1 Movement after power source is ON

4-1-1 Self diagnosis

Confirm the setting status of the indicator after the power source is ON.



4-20mA output: 2.5mA fixation

4-1-2 Initial Clear

Is the warm up time before the sensor output becomes stable.

The time for the initial clear is 3 minutes and 30 seconds including the self diagnosis time.

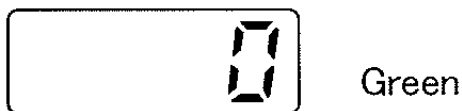


4-20mA output: 2.5mA fixed

4-2 Basic function

4-2-1 Indication for concentration

Indicate gas concentration in 「green」.



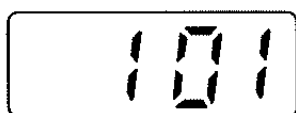
Indication range: 0~150

4-20mA output: 4~20mA (by gas concentration)

4-2-2 Gas alarm

The alarm start blinking and buzzer start ringing when the gas concentration rate becomes over than the alarm setting rate.

The Mode EC-500 has a two step alarm function (H/HH).



Orange or Red

※ The average alarm operation is the automated return operation after self hold reset.

The indication of the concentration blinks when alarm start ringing and will be lighted after resetting. (1st time「orange」, 2nd time「red」)

The alarm lamp blinks when alarm start ringing, lighted after resetting. The lights will be out when concentration rate becomes below the alarm point. The alarm contact point will be operated over the alarm point and will be released when alarm restores.

4-20mA Output: 4~20mA (Depending on gas concentration)

4-2-3 Scale Over

During the measurement, it will be indicated when detected the gas which exceeded full scale



Red

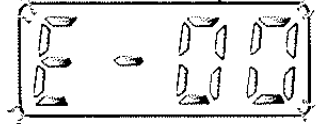
4-20mA Output: 20~22mA

4-2-4 Indication when trouble occurs

There are two kinds of troubles, i.e. memory error and breaking of wire error. The error notice will be indicated and buzzer rings when error occurs.

① Memory error

Turn off the power is the only way to release the memory error.



Red (Blinks)

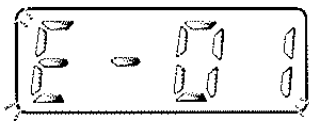
Memory error: Occurs by the result of self diagnosis when power is ON

4-20mA Output: 0.5mA

② Breaking of wire error

The buzzer sounds will be OFF by 「RESET」switch.

Indication of the breaking of wire error will be released by restoring the condition of breaking the sensor.



Red (blinking)

Breaking of wire error: Occurs by breaking the sensor when measuring



Restoring from the condition of sensor breaking



Green

Warm up time for three minutes and thirty seconds to restore caused by the breaking of wire error.

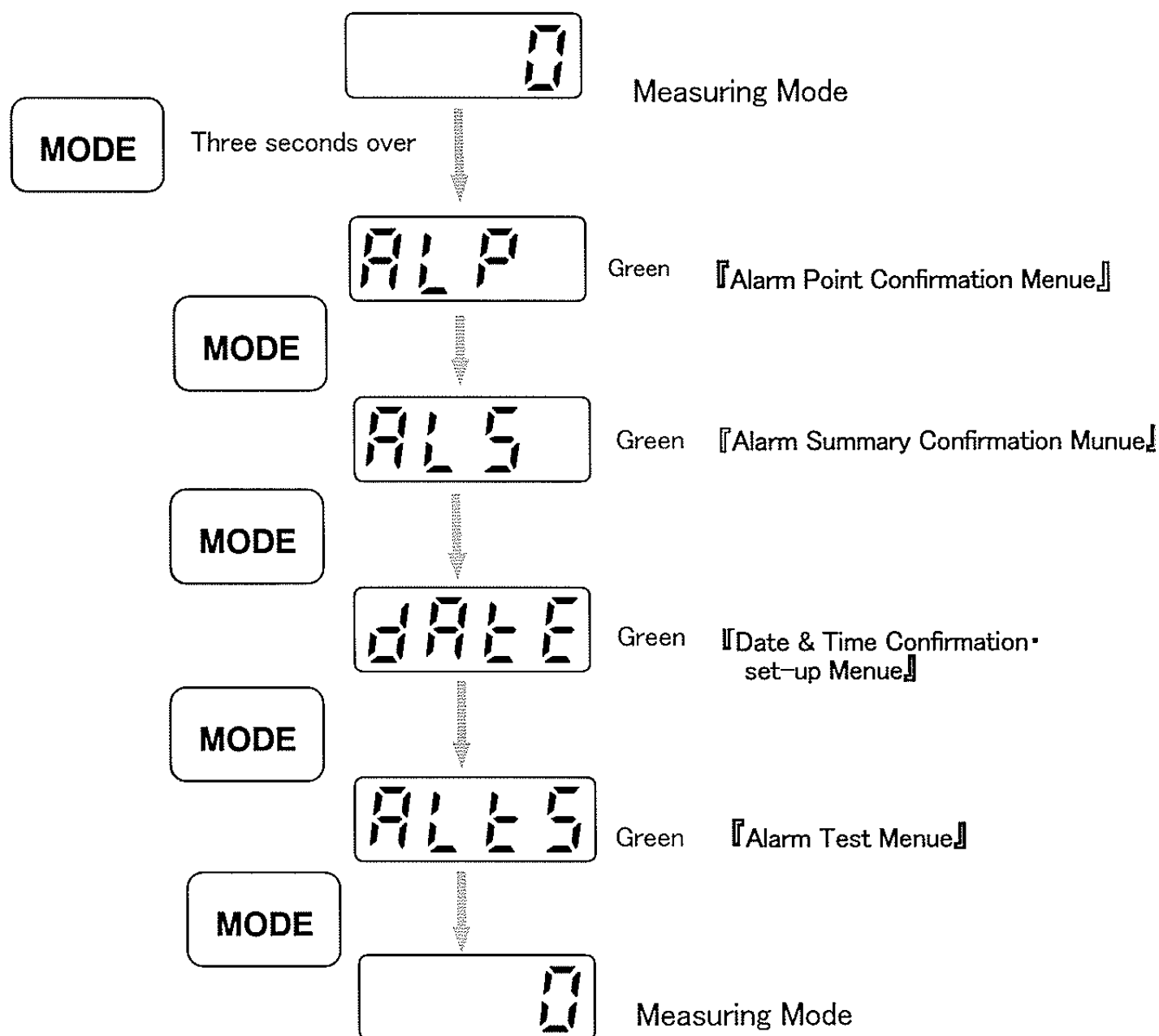
4-20mA output: 2.5mA

5. User's Maintenance Mode

If you continue to push the 「MODE」switch for 3 seconds when the 「Measuring Mode」, it becomes to the 「User Maintenance Mode」.

There are four items for the User Maintenance Mode. They are 「Alarm Point Confirmation」, 「Alarm Summary Confirmation」, 「Date & Time Confirmation Set-up」 and 「Alarm Test」.

When menu is indicated, the following items will be selected by pushing the 「MODE」switch.



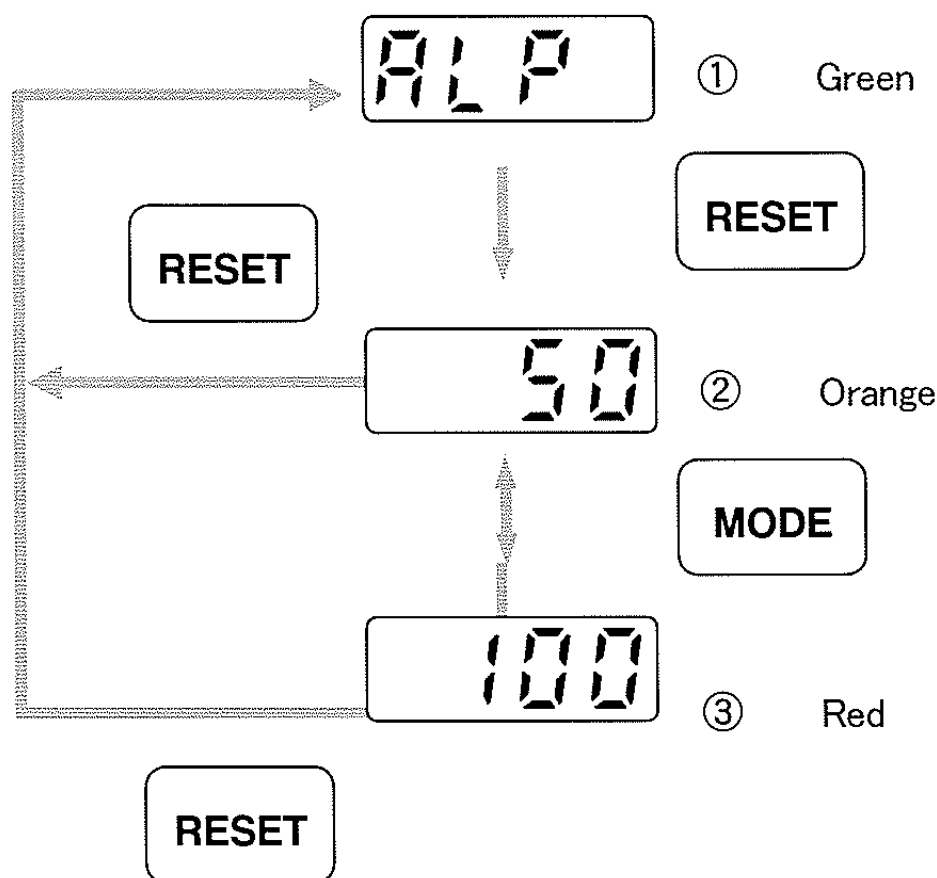
※At 『User Maintenance Mode』, if condition of no operation continues for one minute, notice of completion ring and will be returned to 『Measuring Mode』.

※Even it is 『User Maintenance Mode』, supervising gas concentration has been done. It will return to 『Measuring Mode』 once the alarm start ringing,

※ Once 『User Maintenance Mode』 was set caused by gas alarming or while in trouble , it will not be able to supervise gas concentration for thirty seconds.

5-1 Alarm Point Confirmation

It is the mode to confirm alarm point.



① <<Alarm Point Confirmation Menu>>

When you push the「MODE」switch, the 『Alarm Summary Menu』 appears.
When you push the「RESET」switch, the『Alarm Confirmation』appears.

② <<Alarm Point Confirmation 1>>

AL1 concentration will be indicated.

When you push the「MODE」switch, the『Alarm Point Confirmation 2』 appears.
When you push the「RESET」switch, it returns to『Alarm Confirmation Menu』.

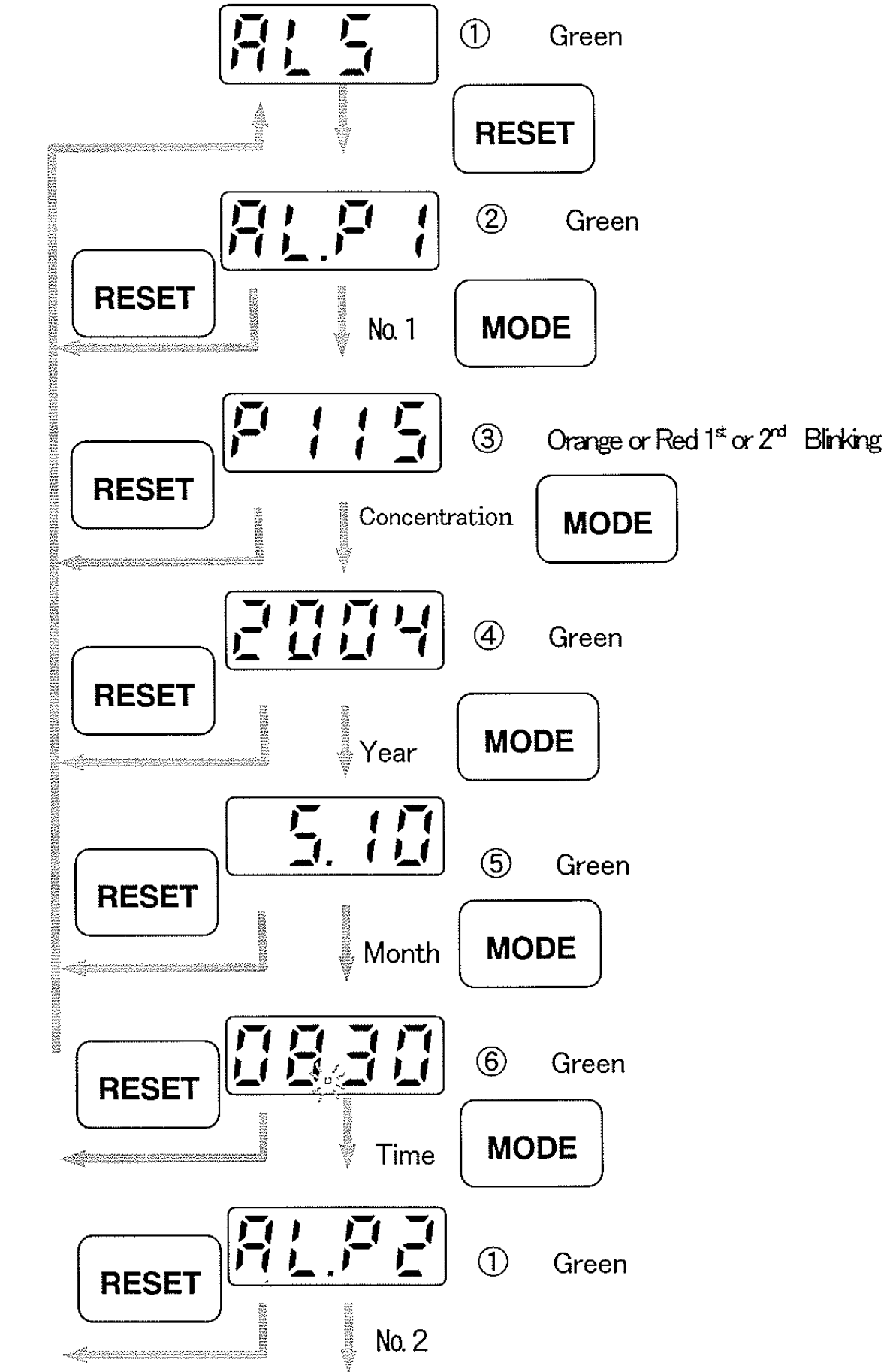
③ <<Alarm Point Confirmation 2>>

AL2 concentration will be indicated.

When you push the「MODE」switch, the 『Alarm Point Confirmation 1』 appears.
When you push the「RESET」switch, it returns to 『Alarm Confirmation Menu』.

5-2 Alarm Summary Confirmation

It is the mode to confirm the alarm summary. The contents of the indication are 「Track Record No.」(ALP1、ALP2...ALP0)「Gas Concentration」 「Year」 「Month & Date」 「Time」. It is able to confirm for 10 cases maxim.



※Track Record No.1 (P1) will be the latest data.

① <<Alarm Summary Confirmation Menu>>

When you push the「MODE」switch, 『Date&Time・Set-up Menu』appears.

When you push the「RESET」switch,『Indication of Truck Record 』appears.

The alarm summary will be all cleared if you continues to push the「MAINTE」switch for three seconds when the「ALS」is indicated, (The 『ALS』which is indicated blinks, and once it is cleared, completion sounds ring and light will be indicated.)

② <<Track Record Indication>>

Track record 1 (P1) will be indicated.

When you push the「MODE」switch, the『Indication for Concentration』appears.

When you push the「RESET」switch, the『Alarm Summary Confirmation Menu』appears.

③ <<Indication for Concentration>>

The Alarm Summary Concentration will be indicated.

Once the memory concentration is the 1st alarm time, the indication of the concentration becomes orange. (1st LED Blinking)

Once the memory concentration is the 2nd alarm time, the indication of the concentration becomes red (2ndLED Blinking)

When you push the「MODE」switch, 『Indication for Year』appears.

When you push the 「RESET」switch, it returns to the 『Alarm Summary Confirmation Menu』.

④ <<Year Indication>>

Year of the alarm summary will be indicated.

When you push the「MODE」switch,『Month & Data Indication』appears.

When you push the「RESET」switch, it returns to the 『Alarm Summary Confirmation Menu』.

⑤ <<Month & Date Indication>>

Month & Date of the Alarm Summary will be indicated.

When you push the「MODE」switch, the『Time Indication』appears.

When you push the「RESET」switch, it returns to the 『Alarm Summary Confirmation Menu』.

⑥ <<Time Indication>>

Alarm Summary Time will be indicated. (『. 』 blinks)

When you push「MODE」switch, the next 『Track Record Indication』appears.

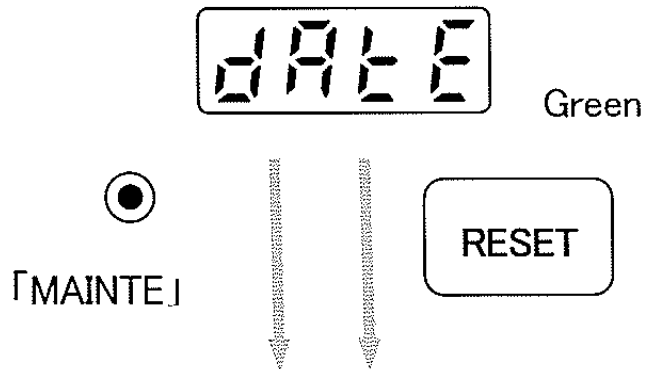
When you push the「RESET」switch, it returns to the 『Alarm Summary Confirmation Menu』.

After that, along with the「Track No. 1」2→3→...9→0→1→...will be repeated.

※Track No. 1 (P1) will be the latest data.

5-3 Date & Time Confirmation・Set-up

This is the mode to confirm and set up the date & time of the inner clock.



【Date & Time Setting Mode】

【Date & Time Confirmation Mode】

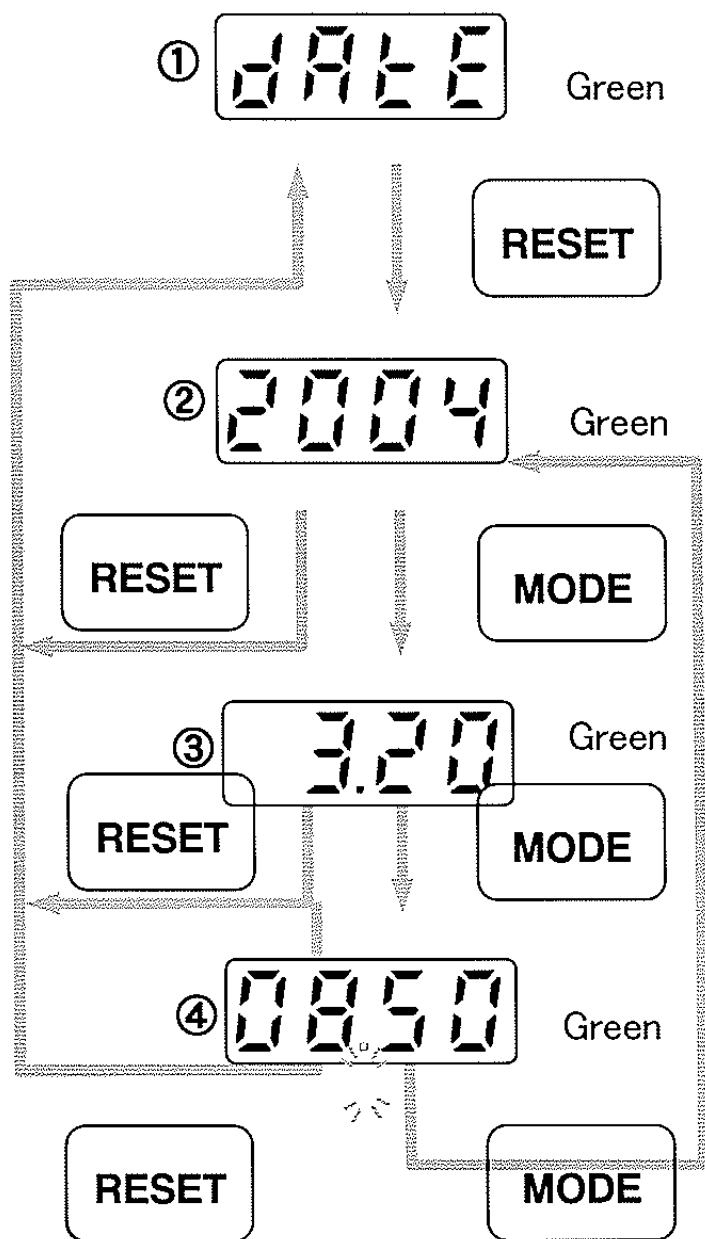
① <<Date & Time Confirmation・Set-up Menu>>

When you push the「MODE」switch, the 『Alarm Test Menu』 appears.

When you push the「RESET」 switch, the 『Date & Time Confirmation Year』 appears.

When you push the「MAINTE」 switch, the 『Date & Time Set-Up Year』 appears.

【Date & Time Confirmation Mode】



To 『Date & Time Confirmation Year』

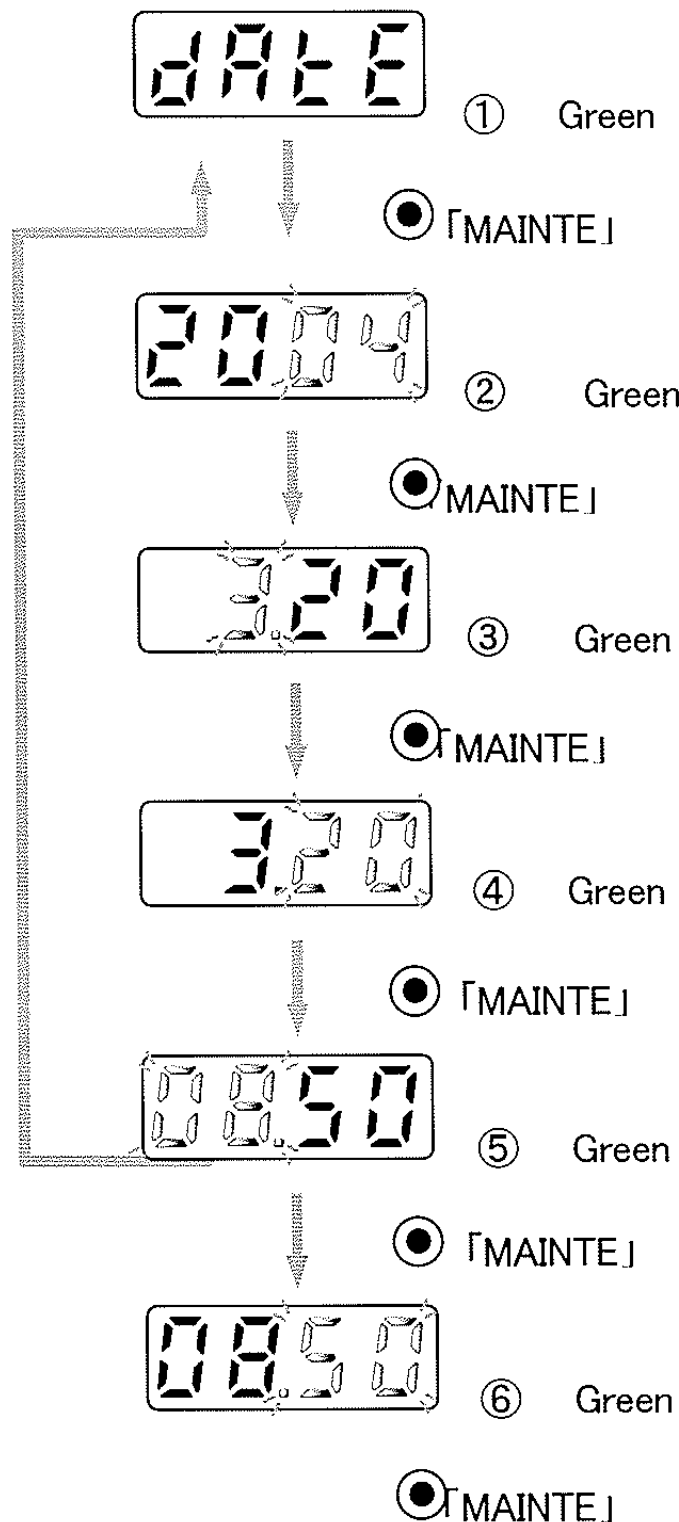
① <<Date & Time Conf. -Set-up Menu>>
When you push the「RESET」 switch, it returns to the 『Date & Time Confirmation Year』.

② <<Date & Time Confirmation Year>>
Current year will be indicated.
When you push the「MODE」 switch, the『Date & Time Confirmation Month & Date』 appears.
When you push the「RESET」switch, it returns to the『Date & Time Confirmation -Set-up Menu』.

③ <<Date & Time Confirmation Month & Date>>
Current date and time will be indicated.
When you push the 「MODE」switch, 『Date & Time Confirmation Time』 appears.
When you push the「RESET」switch, it returns to the『Date & Time Confirmation -Set-up Menu』.

④ <<Date & Time Confirmation Time>>
Current time will be indicated.
When you push the「MODE」switch, 『Date & Time Confirmation Year』 appears.
When you push the「RESET」switch, it returns to the 『Date & Time Confirmation -Set-up Menu』.

【Date & Time Set-up Mode】



① <<Date & Time Confirmation・Set-up Menu>>

When you push the 「MAINTENANCE」 switch, the 『Date & Time Set-up Year』 appears.

② <<Date & Time Set-up Year>>

Current year will be indicated. When you push the「RESET」 switch, the Year will go UP. (Once you keep pushing it, the Year goes UP continuously.)

When you push the「MODE」 switch, the Year will go DOWN.(Once you keep pushing it, the Year goes DOWN continuously.)

When you push the「MAINTENANCE」switch, the 『Date & Time Set-up Month』 appears.

※Year set-up range: 2000~2099

③ <<Date & Time Set-up Month>>

Current date will be indicated. (Indication for the Month will be blinked)

When you push the「RESET」switch, the Month will go UP. (Once you keep pushing it, the Month goes UP continuously)

When you push the「MODE」switch, the Month will go DOWN. (Once you keep pushing it, the Month goes DOWN continuously)

When you push the「MAINTE」switch, the 『Time Set-up Date』 appears.

※Month set-up range: 1~12

④ <<Date & Time Set-up Date>>

Current month & date will be indicated. (Indication for the Date will be blinked)

When you push the「RESET」switch, the date will go UP. (Once you keep pushing it, the date goes UP continuously.)

When you push the「MODE」switch, the date will go DOWN. (Once you keep pushing it, the date goes DOWN continuously.)

When you push the「MAINTE」switch, 『Date & Time Set-up Hour』 appears.

※Date set-up range: 1~31 (differs depend on the set-up month)

⑤ <<Date & Time Set-up Hour>>

Current time will be indicated. (Indication for the Hour blinked)

When you push the「RESET」switch, the time goes UP. (Once you keep pushing it, the times goes UP continuously.)

When you push the「MODE」 switch, the time will go DOWN. (Once you keep pushing it, the time goes DOWN continuously.)

When you push the 「MAINTE」switch, the 『Date & Time Set-up Minute』 appears.

※Time set-up range: 00~23

⑥ <<Date & Time Set-up Minute>>

Current time will be indicated. (Indication for the Minute will be blinked.)

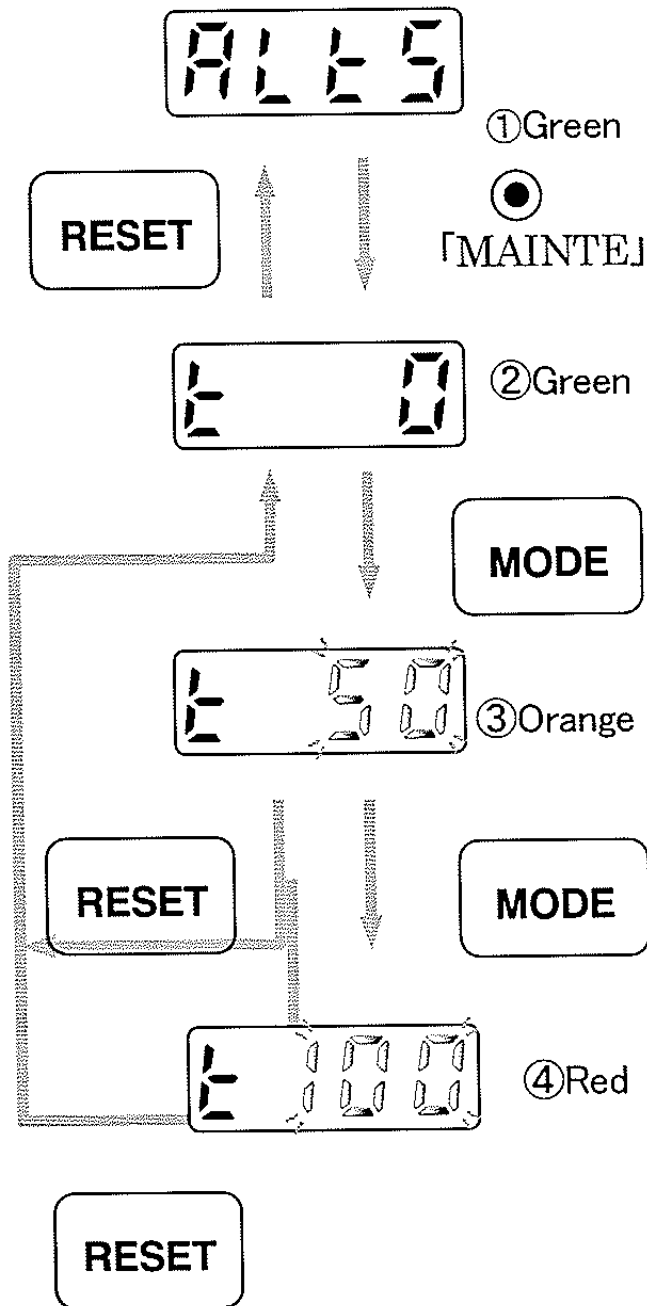
When you push the「RESET」 switch, the minute will go UP. (Once you keep pushing it, the minute goes UP continuously.)

When you push the「MODE」 switch, the minute will go DOWN. (Once you keep pushing it, the minute goes DOWN continuously.)

When you push the「MAINTE」 switch, the inner clock will be updated as 00 second and then 『Date & Time Confirmation・Set-up Menu』

※Minute set-up range: 00~59

5-4 Alarm Test



※「t」 which is located in the left side of the test rate will be indicated in Green.

① <<Alarm Test Menu>>

When you push the「MODE」 switch, it returns to the「Measuring Mode」.

When you push the「MAINTENANCE」 switch, the「Alarm Test 0」 appears.

② <<Alarm Test 0>>

The test rate 0 will be indicated.

When you push the「MODE」 switch, the「Alarm Test AL1」 appears.

When you push the「RESET」 switch, it returns to the「Alarm Test Menu」.

③ <<Alarm Test AL1>>

The test rate AL1 will be indicated.

(AL1 rate blinking, AL1 LED blinking, buzzer 1ON)

When you push the「RESET」 switch, it becomes the alarm reset mode. (AL1 rate blinking, AL1 LED blinking, buzzer 1OFF)

When you push the「MODE」 switch, it becomes「Alarm Test AL2」.

(AL1 mode will be cleared.)

When you push the「RESET」 switch while at the alarm reset mode, it becomes the「Alarm Test 0」.

(AL1 mode will be cleared.)

④ <<Alarm Test AL2>>

The test rate AL2 will be indicated.

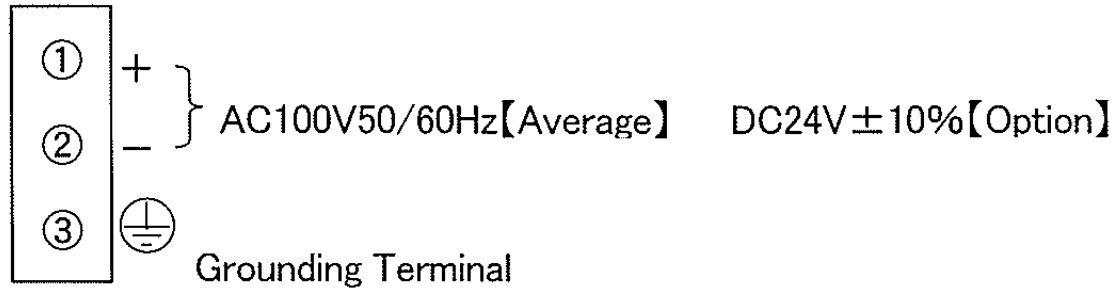
(AL2 rate blinking, AL2 LED blinking, buzzer 2ON)

When you push the「RESET」 switch, it becomes the alarm reset mode (AL2 rate blinking, AL2 LED blinking buzzer 2 OFF)

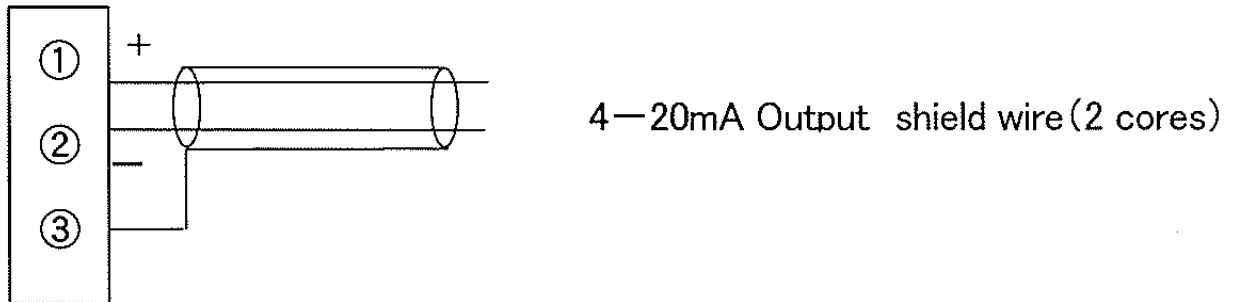
When you push the「RESET」 switch while at the alarm reset mode, it becomes the「Alarm Test 0」. (AL2 mode will be cleared.)

6. Connecting Wire

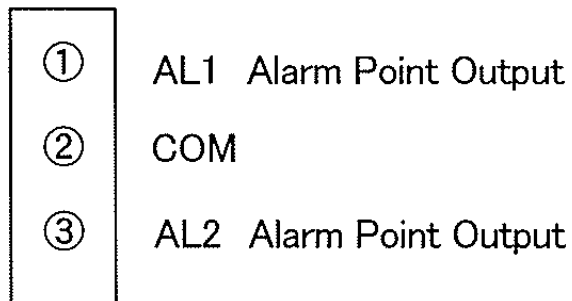
TD1



TD2



TD3



7. External Output Operation

7-1 External Output

4-20mA Output Specification

- (1)Signal Transmission System :Power Current Transmission (non-insulation)
- (2)Transmission Channel :Shield Wire
- (3)Transmission Distance :Below 1km
- (4)Connecting Load Resistance :Below 300 Ω
- (5)Mode for Signal Level
- ①Detector Mode :4~20mA (by gas concentration)
- ②Gas Alarm :4~20mA (by gas concentration)
- ③Initial Clear :2.5mA (Fixed)
- ④Maintenance Mode :2.5mA (Fixed)
- ⑤Alarm Test :4~20mA (by gas concentration)
- ⑥Accident Alarm :0.5mA (Fixed)
- (6)Power Source OFF :0mA

7-2 Chart for 4-20mA Output

Status	Output mA	Remarks
Initial	2.5	Fixed rate
Ordinary	4.0~20.0	By gas concentration
Scale Over	20.1~22.0	By gas concentration
Trouble	0.5	Fixed rate
User Maintenance Mode Menu	4.0~22.0	By gas concentration
Maintenance Mode Menu	2.5	Fixed rate
Alarm Point Confirmation	4.0~22.0	By gas concentration
Alarm Summary Confirmation	4.0~22.0	By gas concentration
Date & Time Confirmation*Set-up	4.0~22.0	By gas concentration
Alarm Test	5.6~20.0	By gas concentration

7-3 L E D, Chart for Status of Contact Point Output

Status	1stLED	2ndLED	1 st Contact Point	2 nd Contact Point
Initial	LIGHT OUT	LIGHT OUT	OFF	OFF
Ordinary	LIGHT OUT	LIGHT OUT	OFF	OFF
1 st Alarm Time	Blinking (Lighted after reset)	Lights out	ON	OFF
2 nd Alarm Time	Blinking (Lighted after reset)	Blinking (Lighted after reset)	ON	ON
Trouble	Lights out	Lights out	OFF	OFF
User Maintenance Mode Menu	Lights out	Lights out	OFF	OFF
Alarm Point Confirmation	Lights out or blinking	Lights out or blinking	OFF	OFF
Alarm Summary Confirmation	Lights out or blinking	Lights out or blinking	OFF	OFF
Date & Time Confirmation • Set-up	Lights out	Lights out	OFF	OFF
Alarm Test	Lights out or blinking (Lighted after reset)	Lights out or blinking (Lighted after reset)	ON or OFF	ON or OFF

7. When instrument is not a good condition

(1) Power source is not ON.

- Power source plug is not engaged → Connect the power source code to the plug
- Power source switch is OFF → Turn the power switch ON
- Fuse is cut off → Find out the cause of cut off, and exchange it with a new fuse. If you cannot find causes, ask our sales agent.

(2) Alarm summary time does not fit → Date & time set-up should be taken

(3) 4~20mA output is different from concentration rate

→ Make adjustment of 4mA, 20mA (Ask our sales office or service agent)

(4) No buzzer sounds

- Buzzer setting is OFF

→ Set the buzzer ON (Ask our sales office or service agent)

(5) Contact point does not operate at the time of alarm test

- The contact set at test is positioned to be OFF.

Turn on at test. (Contact Riken Keiki or nearest service agent.)

(6) Peakhold is not available at alarm

- The peakhold set is not provided.

→ Turn to peakhold. (Contact Riken Keiki or nearest service agent.)

9. Specifications

See the specifications for the separate catalog.

10. RIKEN STANDARD WARRANTY

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.

The alarm contact output specified in this system is to provide for the use of buzzer and lamp to be communicated to the other external place than the system installed. But to secure the safety, there may be the case that the following interlocking performance shall be made by use of alarm contact output from customers.

1. Stop the gas supply.
2. Stop the action of system which uses gas.
3. Let the cervices exhaust fan operated.
4. Let stop the work of the staffs in the area by the auto paging system and escaped to the outside from there
5. Let the alarm transmitted to a remote place by auto communication system.
6. Let the alarm transmitted by the lamp and buzzer to this area and that area.
7. Others.

But, we do not assume the responsibility for the secondary damage, which may be generated by this interlocking action because it is not in our scope of recognition. Then, we cannot strike the sales contract or the manufacture in the scope to reimburse this secondary damage.

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 cost, local repair costs, transportation cost, or contingent expenses incurred without our prior approval.

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