RIKEN KEIKI

PT1E-1010

INSTRUCTION MANUAL
FOR
RIKEN COMBUSTIBLE GAS MONITOR

G P — 1 4 6

Precaution in operation

a) Read and understand all instructions and safety precautions in this MANUAL before performing operations.

b) Keep this MANUAL where to take out easily our request.

c) When carry out this MANUAL by construction etc., be sure to put it back where it was.

d) This indicator/alarm unit can not be used for no other purpose than it given one.

e) When operate it not to follow this MANUAL, repair it by other rating parts or modify it on his own, the safety and quality of products can not be secured. Then, when an accident take place by it, we cannot assure our responsibility on them.

f) Performing proper operation as instructed in this MANUAL shall be on your responsibility.

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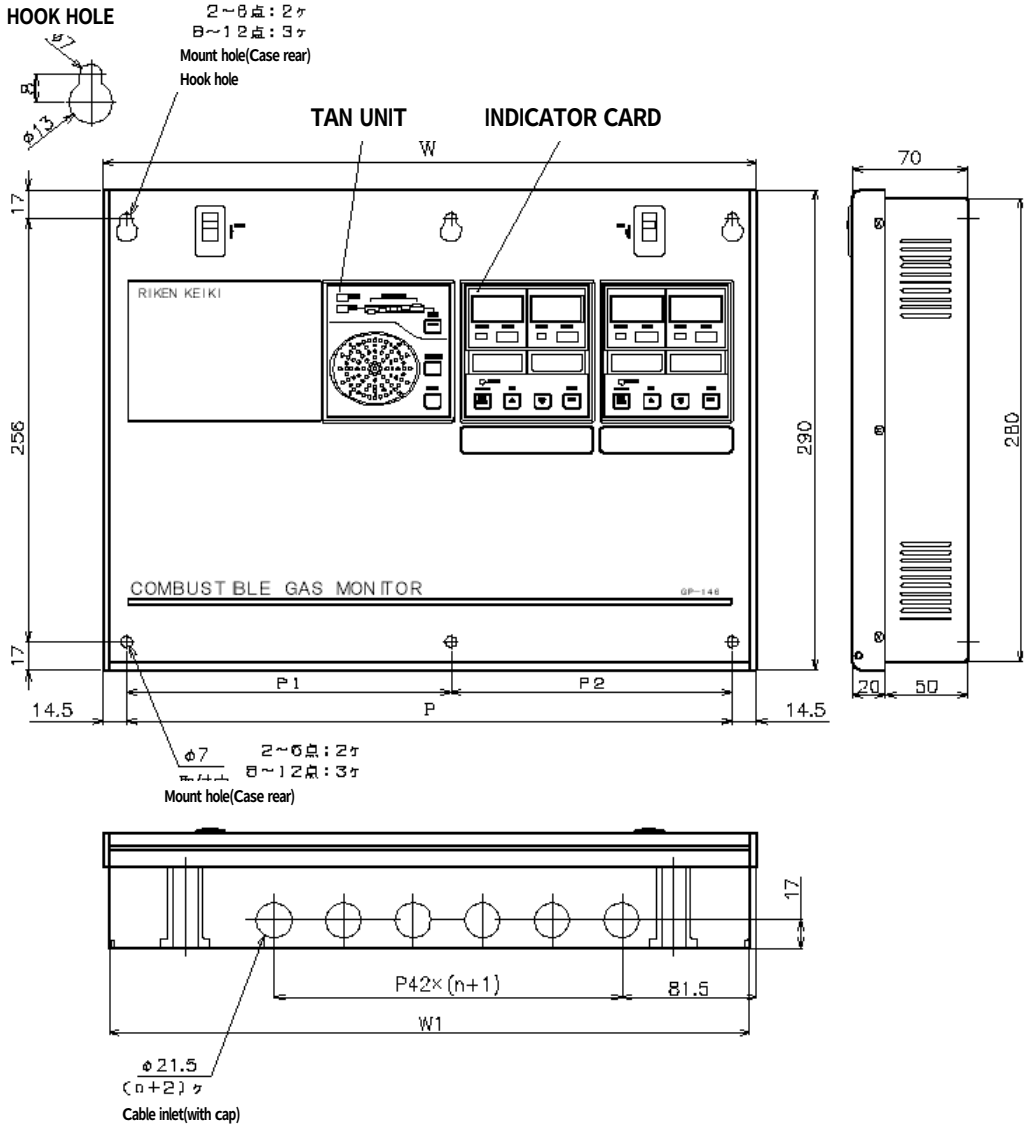
- C O N T E N T S -

1．Product function

1－1．Drawing



n-CH		W(mm)	H(mm)	D(mm)
□	2	305	290	70
□	4	395	290	70
□	6	485	290	70
□	8	575	290	70
□	10	665	290	70
□	12	755	290	70

1 — 2 . System composition

1 — 2 — 1 . System composition and designation

The system consists of Front case, panel case, switching regulator, stand-by battery, power, buzzer unit and indicator card.

Front panel

1 Switching regulator

2 Standby battery

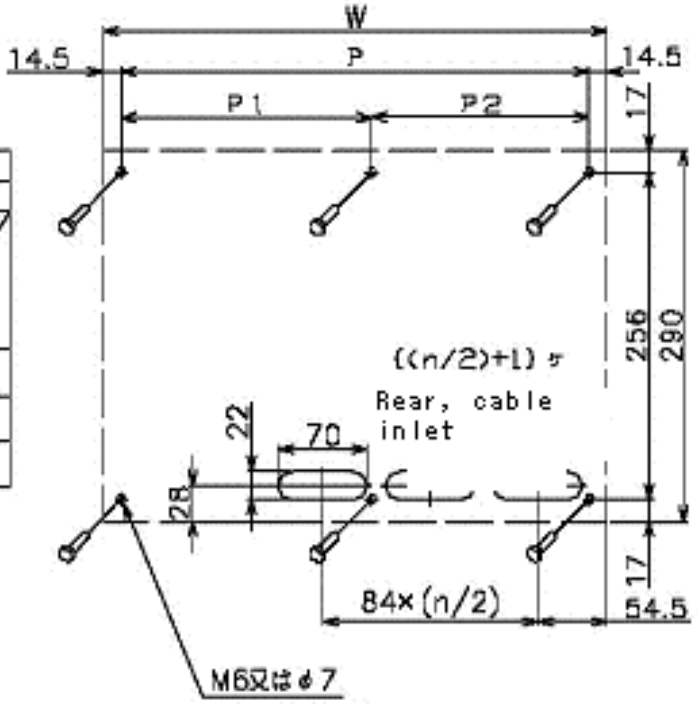
3 Power/buzzer unit

4 Indicator card

5 Instrument case

CH	W	Dimensions P	P1	P2
2	305	276		
4	395	366		
6	485	456		
8	575		296	250
10	665		302	334
12	755		308	418

n : Channel

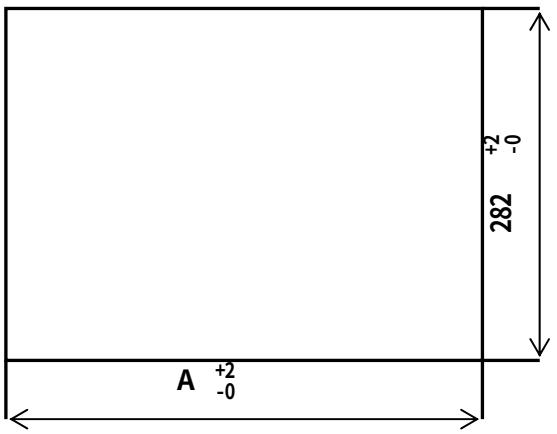


Wall mount dimensions

Panel mount

CH n	Cut hole dimensions
2	299
4	289
6	479
8	569
10	659
12	749

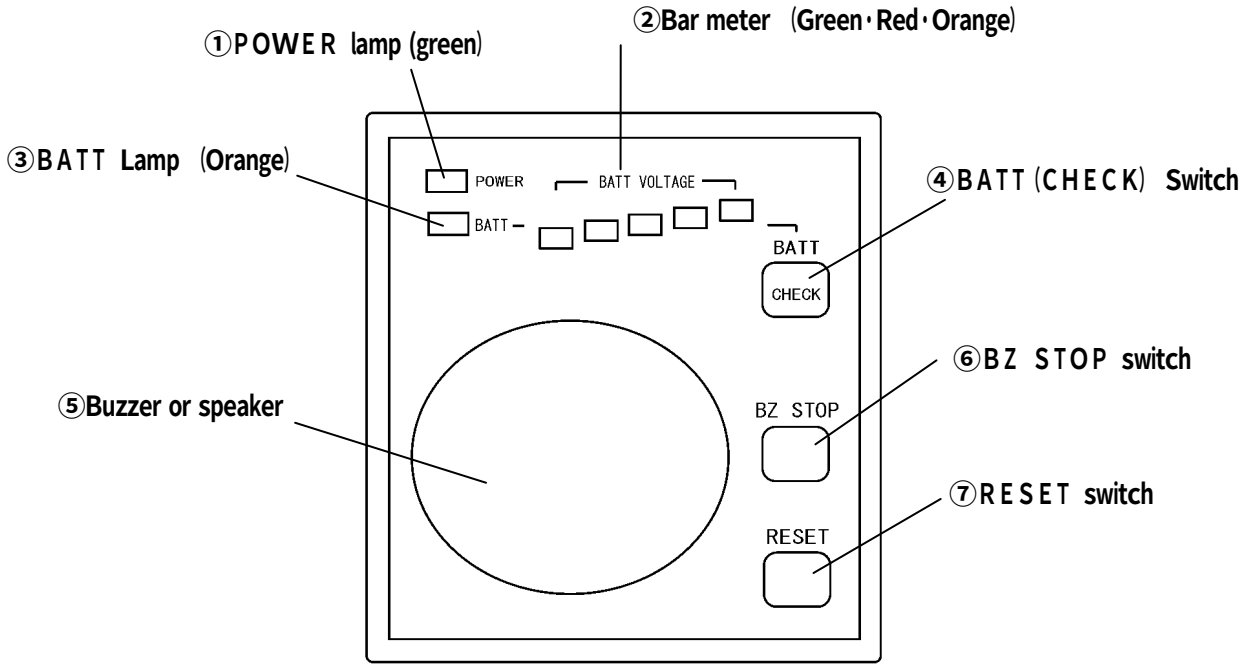
n : Channel



Panel cut out dimensions

1 — 3 . Name of each parts and function

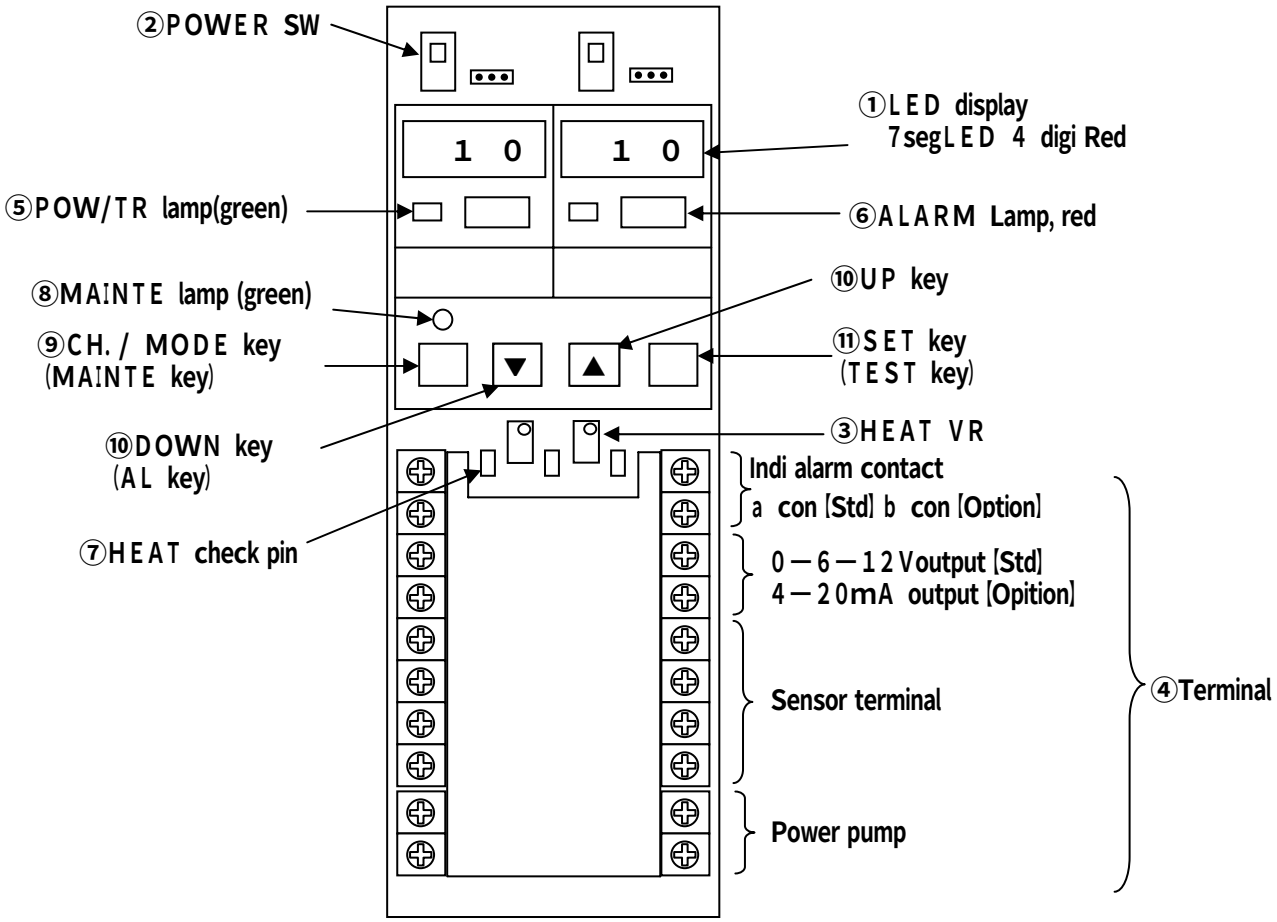
1 — 3 — 1 . Power unit



Others、「Power」switch・「Pump」switch

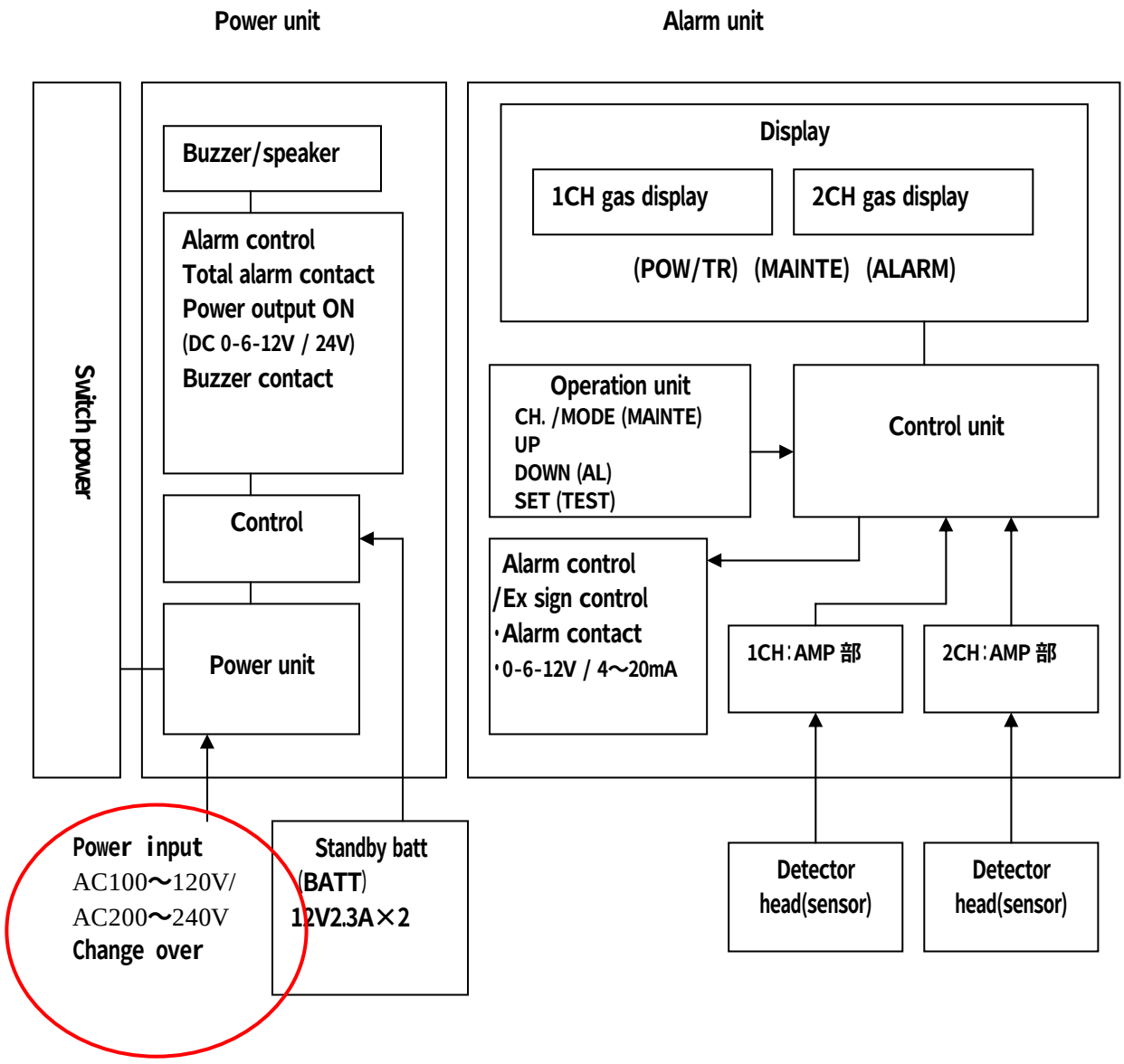
①POWER lamp (Green)	Is lit on by AC power.
②Bar meter (Gn・Rd・Orge)	Voltage level of battery is displayed by it.
③BATT lamp (Orge)	Lit on when standby battery is on. Blinking when discharged.
④BATT(CHECK)SW	Used when make battery discharging test. (for 3 sec, ON)
⑤Buzzer or speaker	Buzzer sound at alarm.
⑥BZ STOP SW	Buzzer sounds stopping.
⑦RESET SW	This is used to make alarm non-latched. When press RESET switch, this shall be changed from latched to non-latched.

1 — 3 — 2. Indicator/alarm unit



①LEDdisplay	Shows gas reading and status.
②POWER SW	Power SW. (Power SW for each indicator card)
③HEAT VR	To adjust the heater current to detector (sensor).
④Terminal plate	Connect the cable from outside.
⑤POW / TR lamp	Power and trouble lamp. Light ON : Power ON、Normal work Blinking : Trouble
⑥ALARM Lamp	Blinking (at 1st alarm) at gas alarm.
⑦HEAT check pin	Just to check heater current given to the detector (sensor).
⑧MAINTE lamp	Blinking at maintenance mode.
⑨CH. / MODE switch (MAINTE)	Used when make maintenance work.
⑩UP/DOWN switch	Used when increase the reading at zero and span (AL) and select the item at maintenance mode also when make the reading up and down for alarm test.
⑪SET(TEST) switch	Use when transfer to alarm test mode. and when to adjust the model during maintenance mode.

1 — 4. Block diagram



2. Installation

2—1. Before installation

First user and the user who installed this instrument shall kindly be in compliance with the following caution at the installation.

When do not comply with them, the trouble of instrument may take place and normal operation could not be assured.

2—2. Installation place

⚠ Caution

Keep it from the place of direct sun drought or abrupt change of temp.

Avoid the place of direct sun-drought or abrupt change of temp for this installation.
By condensing inside, it may not follow due to the abrupt change of temp.

Do install where to be at free of vibration and shock.

This consists of fine electronics components and then, install it away from vibration and shock.

Separate it from noise source(Instrument and cable)

Avoid the place where high frequency wave length seems to generate and install.

- Do not install where to be side by side with noise source.
- Do not put cable in parallel nor come near from it.

Do not install where to be deposited with sample gas.

Do not install where gas is deposited.

Do not install where danger components are installed near at calibration.

This is required to make calibration and then, do not put the danger goods or machine around this gas detector.

Place where to be hard to maintain

Keep the detector away from the place hard to maintain by hindrance of cable and pipe etc.
Be sure to make grounding construction.

Grounding is required to do

2—3. Grounding construction

By use of ⏚ terminal, connect to the terminal in customer side.

⚠ Alarm

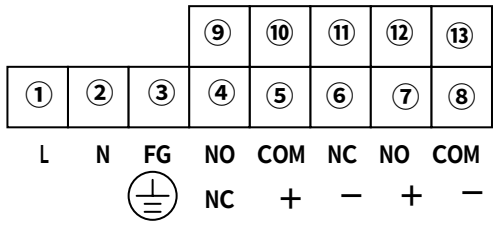
Before make power on, be sure to ground.

Terminal ⏚

Be sure to ground for safety work and safety operation and do not connect to gas tube. For ground, make it with ground "D" div equivalent (below 100Ω).

2—4. Wiring construction

A. POWER UNIT SIDE



1 (L)
2 (N) } Power input AC100～120V／AC200～240V (Auto transfer)
3 (FG)

4 (NC) —— Unused

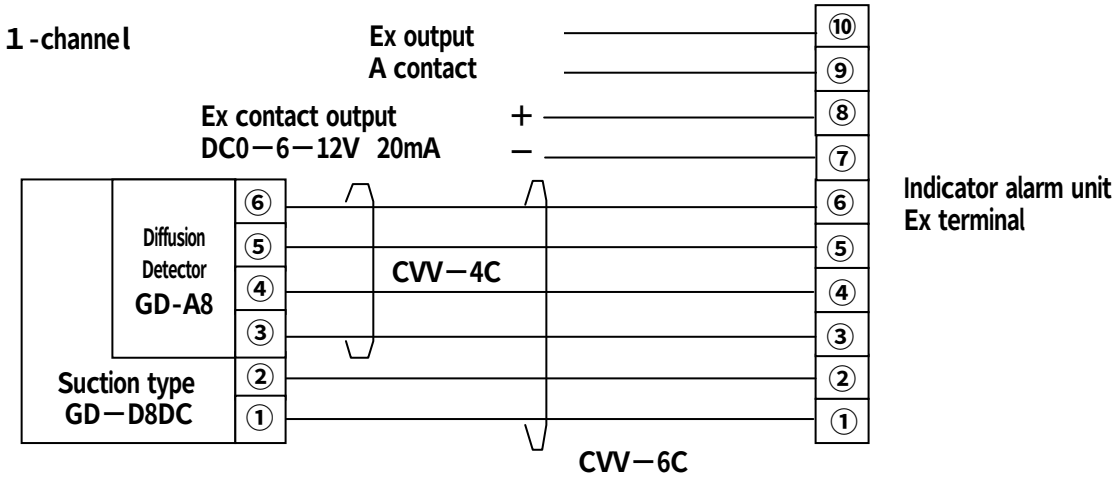
5 (+)
6 (−) } For buzzer DC 24V 10mA

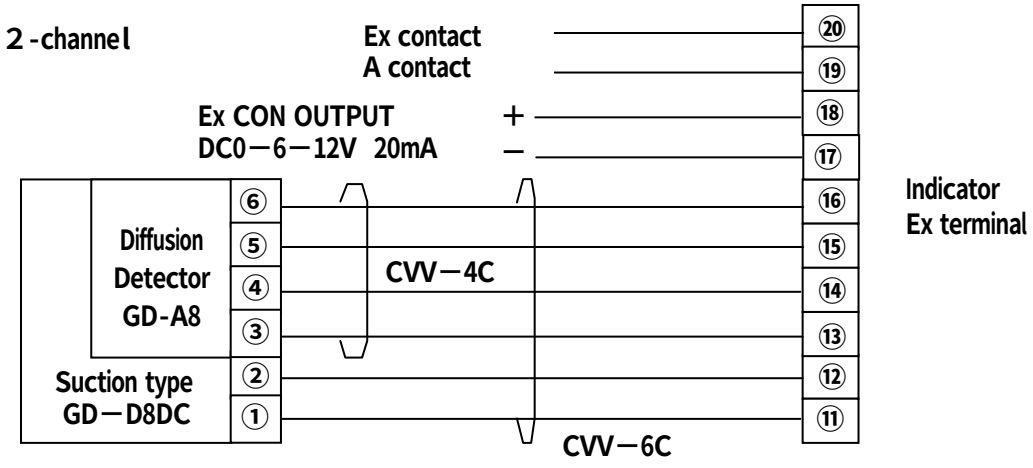
7 (+)
8 (−) } Batch voltage output DC0-6-12V 20mA

9 (NO)
10 (COM) } General alarm output.
11 (NC)

12 (NO) } Buzzer output
13 (COM)

B.CONTROL UNIT(INDICATOR/ALAEM UNIT) SIDE





3. Operation

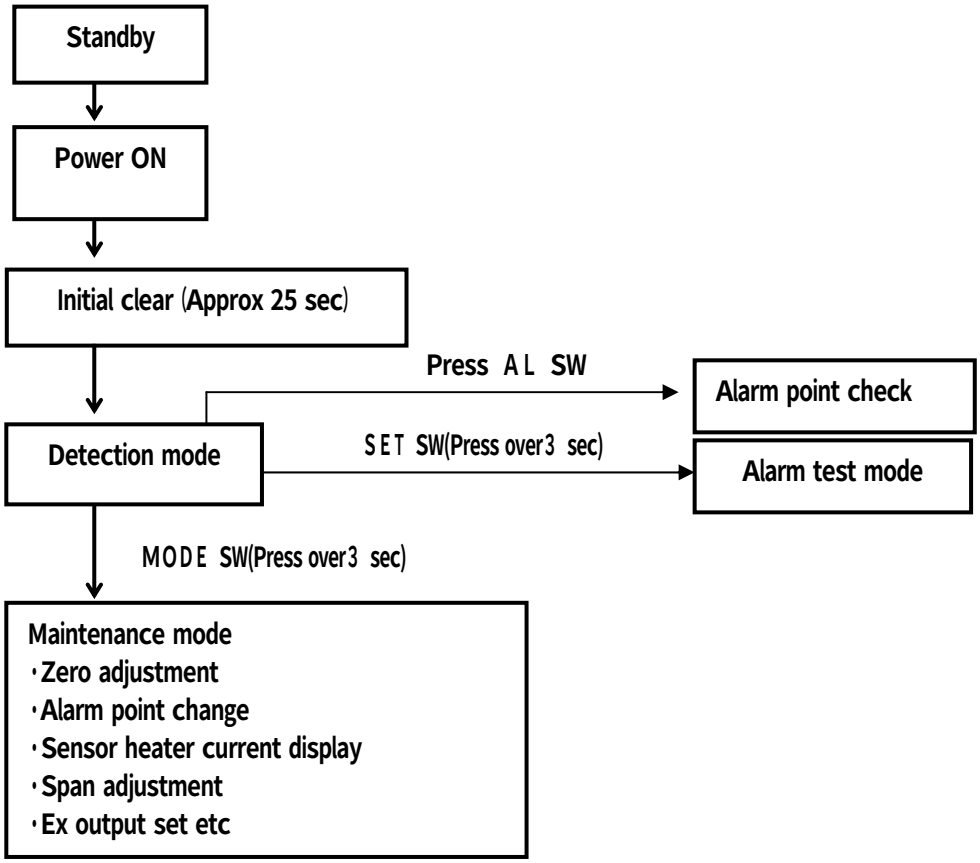
3 — 1. Stand-by

●Before connecting power, keep the following caution. If not to keep this, it may cause the danger of electric shock and damage of instrument.

(1) Make grounding.
(2) Check that the wiring with the external is connected correctly.
(3) Check that the power supply is within the rating.
(4) During the calibration/adjustment work, take the measures that it shall not affect to the external if the contact should work to the outside.
(5) For protection of fire, check that the fuse is designated rating one.

3 — 2. Basic performance flow

Normal operation is carried out on detection mode after power on.



⚠ Caution
Maintenance mode is made by the exclusive service man.
Do not operate it without permission.

3－3．Stand-by operation

3－3－1．Power ON

●Before power switch ON, check that the instrument is installed correctly.
●The position of power switch is located lower in the center when open the front panel.
●When turn up power switch ＯＮ／ＯＦＦ to upside, it gets ON. When turn down, it gets ＯＦＦ.

Put down 2 pcs hooks and open by pulling to you.

Power switch

●When turn on the power SW, the power unit ＰＯＷＥＲ lamp・ＢＡＴＴ ＶＯＬＴＡＧＥ lamp will be blinking.
●Initial clear (About 25 sec)

- System check for instrument
- Ex output：ＤＣ０-６-１２Ｖ Output：ＤＣ６Ｖ［Std］、ＤＣ４～２０ｍＡ output：About２.５ｍＡ［Option］
- Alarm ,trouble performance shutout(lamp, contact)

3 — 4. Detection mode

3 — 4 — 1. Display performance

This performance is displayed by the following two kind method.

(1) LED display : Display the gas concentration etc.
(2) LED lamp : Power／trouble (POW/TR)、Gas alarm (ALARM)
This shows MAINTENANCE condition.

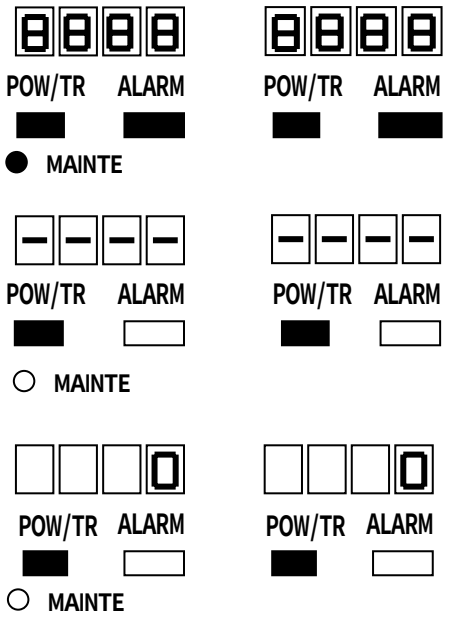
※LED display, LED lamp will differ from the status of instrument.

LED lamp explains

□ : OFF ■ : ON ◎・ ◘ ◌ Blink

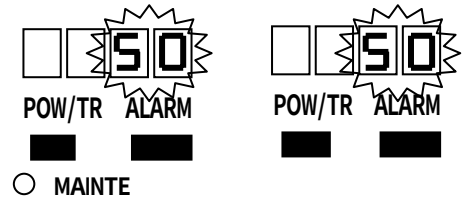
Prep
↓
Power ON
↓
Initial clear (About 25 sec)
↓
Detection mode

POW/TR lamp is ON at detection mode and display the gas density.

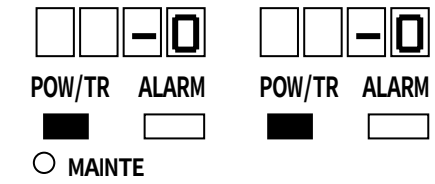


GAS ALARM

When detector more than alarm preset point, Sample gas density and alarm lamp are lit on.



The right「— 0」 is shown when zero level gets down over –10%

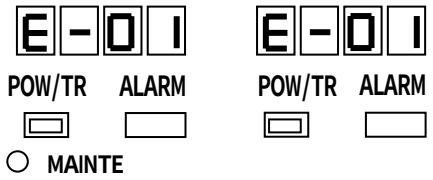


Danger

When display「— 0」, it is impossible to calibrate correct.
Do it after making correct zero adjustment.

Trouble display

When any trouble takes place in detector, it shows “Error display”,”POW/TR lamp blink” & “trouble buzzer ON”.
Buzzer sound is cancelled by “ＢＺ ＳＴＯＰ」 key.



(ＬＥＤ display)　(Trouble status)

Ｅ－００	Memory error　:Comes out by the self-diagnosis result.
Ｅ－０１	Sensor disconnect error:Comes out by sensor disconnection.

Ex output ＤＣ０－６－１２Ｖ spec:０Ｖ、４－２０ｍＡ spec:０.５ｍＡ

When error gets on simultaneously, the error is changed over every 0.5 sec.

The memory error cannot be cancelled without making power off..
The sensor disconnection error can be cancelled by resetting the sensor disconnection.
The zero follower error can be cancelled by making zero adjustment.

Ｅ－０１　Sensor disconnect error.

↓ Reset from the sensor disconnect

－ － － －　Warm up by error recovery:　25 sec

３－４－２. Ex output performance

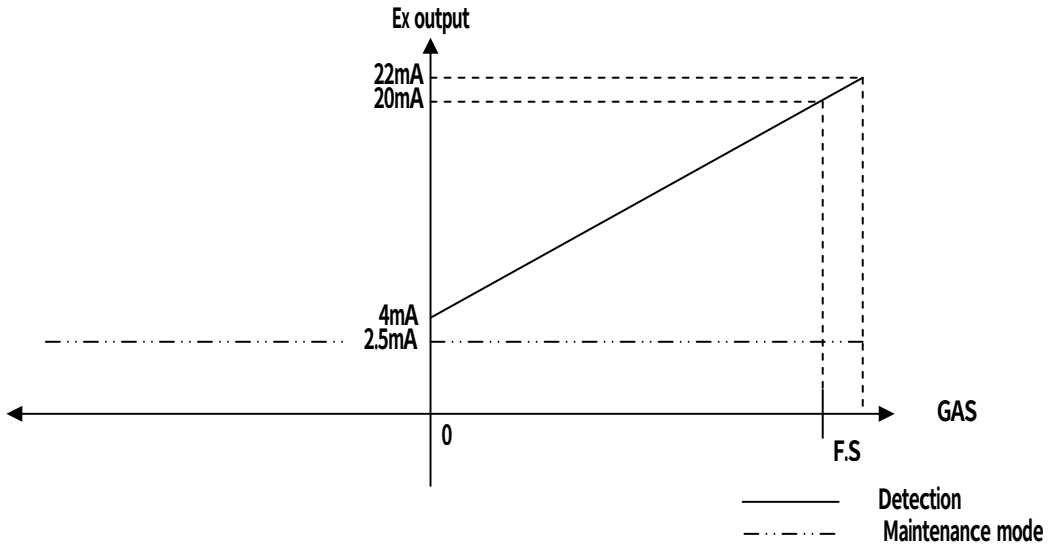
1. ＤＣ０－６－１２Ｖ spec

(1)Signal transmission　:Power output (Non-insulation)
(2)Transmission path　:ＣＶＶＳ
(3)Transmission distance:Below １０m
(4)Load resistance　:Over １ＭΩ
(5)Status signal level
　①Detection mode　:６Ｖ
　②Gas alarm　:１２Ｖ
　③Initial clear　:６Ｖ
　④Maintenance mode　:６Ｖ
　⑤Alarm test　:１２Ｖ
　⑥Trouble alarm　:０Ｖ
(6)Power shutdown　:０Ｖ

2．4－20mA output spec

(1)Signal transmission method ：Current transmission (Non-insulation)
(2)Transmission path ：ＣＶＶＳ
(3)Transmission distance ：below１ｋｍ
(4)Load resistance ：Below ３００Ω.
(5)Status
①Detection mode ：４～２０mA (by gas density)
②Gas alarm ：４～２０mA (By gas density)
③Initial clear ：２.５mA (Locked)
④Maintenance mode ：２.５mA (Locked)
⑤Alarm test ：４～２０mA (By gas density)
⑥Trouble alarm ：０.５mA (Locked)
(6)Power shutdown ：０mA

The correlation between [Gas density] and [Ex output] are shown below.



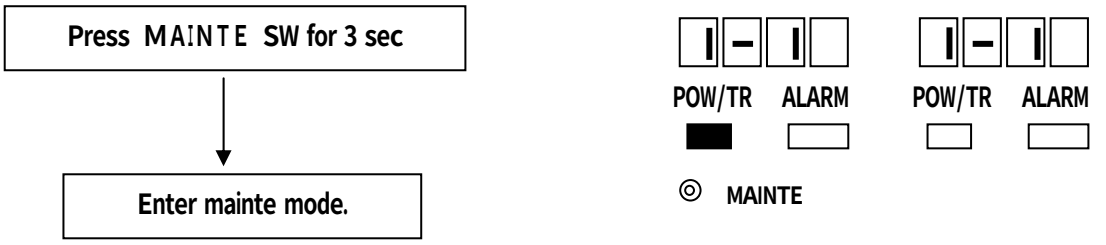
Caution

4～20mA is adjusted. When re-adjustment is required after installation, do not operated without any advice from qualified service man.

4. Maintenance and adjustment

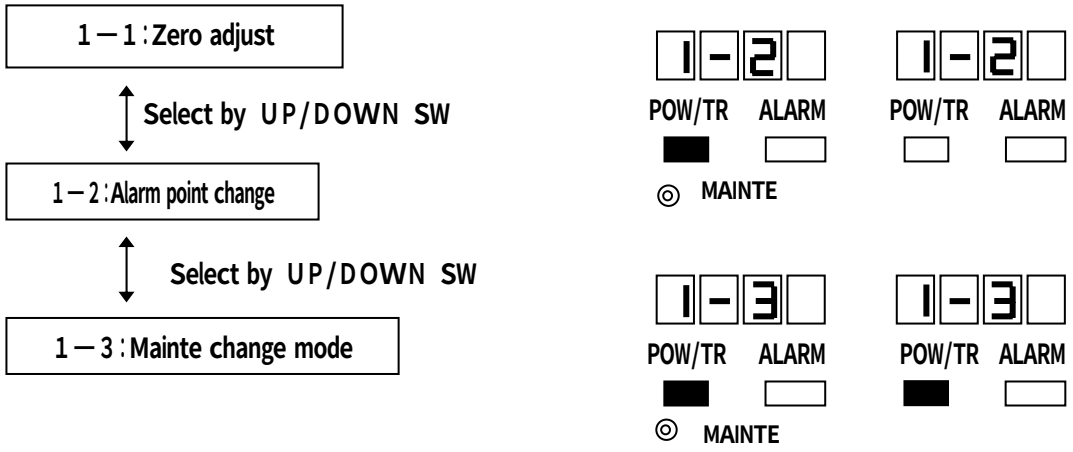
4 — 1 — 1. Enter maintenance mode

For each adjustment, need to enter the maintenance mode.



When return to detection mode, press MAINTE switch for over 3 sec.
When press CH./MODE SW, the channel can be selected and it will show the POW/TR lamp to be selected.

※ Menu details



Caution

Do not operate 「1 — 3 : Mainte mode」 without permission. Contact us or the nearest agent.

Caution

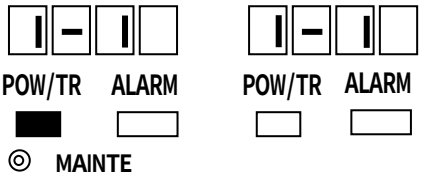
When enter Mainte mode at alarm, the alarm contact and Ex output signal (gas signal) is cancelled.

4－1－2. Zero adjustment (Daily check)

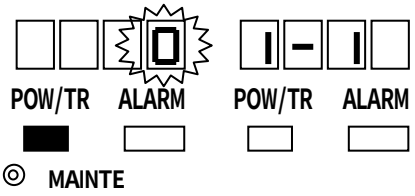
＊ Caution

When zeroing, make it by supplying zero gas into detector head and after zero reading gets stable.

①At zero adjust menu「1－1」, select channel by CH./MODE SW. The POW/TR lamp to be selected gets ON.

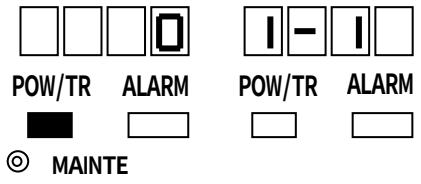


②When press SET SW, the select channel is displayed. When press SET SW again, the figure gets blinking and set at zero.

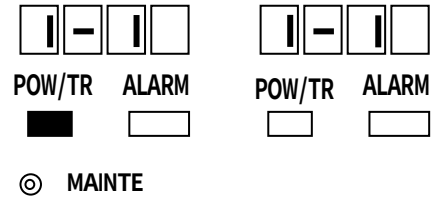


＊ Caution

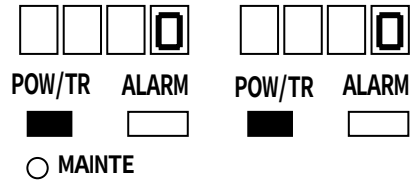
Reading may change subtly after zero adjusts. In such case adjust it by UP/DOWN switch finely. By adjusting by UP/DOWN SW, press SET switch.(By pressing SET SW, zero is set.)



③After finishing adjustment, return to zero menu by pressing CH./MODE SW.



④When return to detection mode, press MAINTE SW for over 3 sec. MAINTE lamp is block out and it shows detection mode.



⚠ Warning

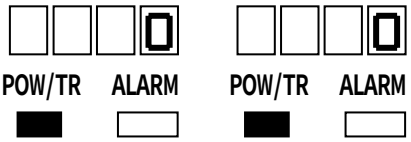
After adjustment, press MAINTE SW and be sure to return to detection mode(POW/TR lamp lights ON).

⚠ Caution

Gas alarm will not trigger except detection mode.
When leave it alone with MAINTE mode, it will return to detection mode after 10 hours later automatically.

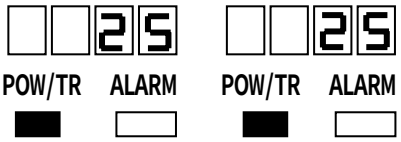
4—1—3. Alarm point check

Used when check and change alarm point.



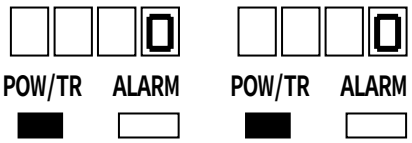
○ MAINTE

①When press AL(▼)SW at detection mode, it can check the current alarm point.



○ MAINTE

②When release from AL(▼) SW, it will turn to the detection mode.

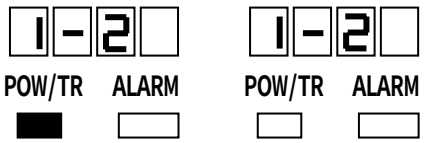


○ MAINTE

4—1—4. Alarm point change

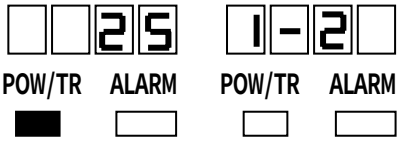
Used when change the alarm point.

①At menu「1-2」of alarm point change, select the channel by CH./MODE SW. POW/TR lamp to be selected is lit on.



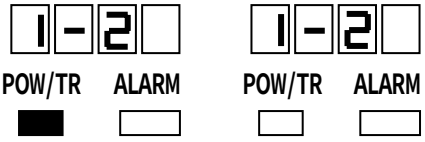
◎ MAINTE

②When press SET SW, the select channel will show alarm point. Alarm point can be changed by UP/DOWN SW. By CH. /MODE SW, the channel can be selected.



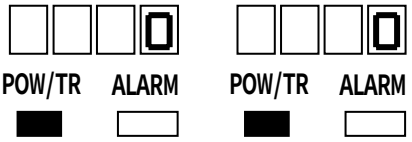
◎ MAINTE

③When press SET SW after alarm change, the alarm point is changed to the alarm change menu of「1-2」after inputting.



◎ MAINTE

④Press MAINTE SW for over 3 sec, it will return to the detection mode.



○ MAINTE

⚠ Warning

After finishing change, be sure to turn to the detection mode(POW/TR lamp is ON)by pressing MAINTE SW.

⚠ Warning

Gas alarm cannot be on except detection mode.
When leave it alone with MAINTE mode, it will turn to the detection mode after 10 hours automatically.

4—1—5. Peak hold

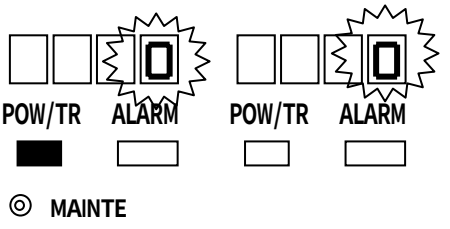
At detection mode, it holds the peak value after alarm triggers.
When it gets over full scale, it holds the over display.
After BZ_STOP, the hold can be cancelled by RESET SW (It gets true density)
Even during hold, the output of 4—20mA is given at true density.

4—1—6. Alarm test

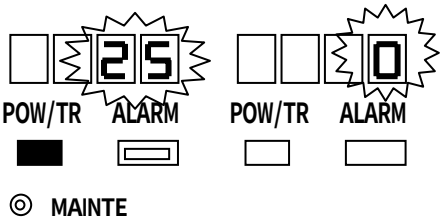
This is used when check the performance of alarm lamp, buzzer and alarm lamp, the transmission condition by supplying equivalent signals to the external machine (DC0—6—12V or 4～20mA).

> ⚠ Warning
> When make alarm test, announce it to the concerned department in advance so that they cannot take the action for the trouble.

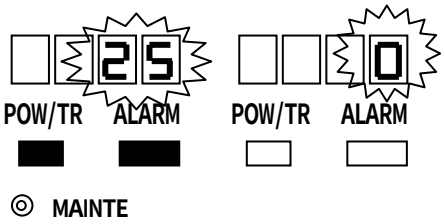
①At detection mode, press SET SW for over 3 sec. MAINTE lamp and its lamp will be ON. When it gets alarm test mode, Mainte lamp will blink. The channel is selected by CH./MODE SW. POW/TR lamp will be on.



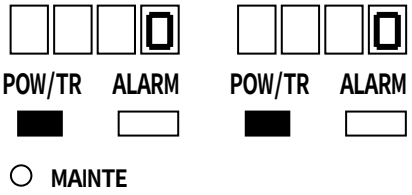
② Increase the reading by UP SW.
When it gets to alarm point, ALARM lamp will blink and alarm buzzer will sound



③When stop the buzzer sound, press BZ_STOPSW. When press the RESET SW, the reading display and alarm lamp will change from blinking to light-on and it will be non-latched. When alarm point is lower than alarm point, the alarm lamp and alarm contact will be cancelled.



④When press SET SW for over 3 sec, it turns to the detection mode.MAINTE lamp is put out and it will show the detection mode.



> ⚠ Warning
> After finishing test, be sure to turn to the detection mode(with POW/TR lamp ON).

4 — 2 . Performance(Standby battery) of power and buzzer unit

4 — 2 — 1 . Function by hardware

(1) External power monitor function

When it gets below 23V by monitoring switching power voltage and external power gets off, it will automatically be changed to the standby battery.

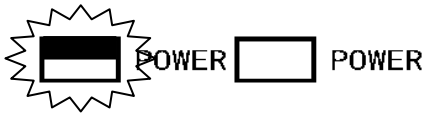
(2) Standby battery function (Excess discharge protection function)

When it gets below 20 (V), it will automatically cut off the power supply automatically.

4 — 2 — 2 . Performance of power supply

(1) Initial clear

For alarm error protection, this does not receive the information for about 6 sec after power ON.



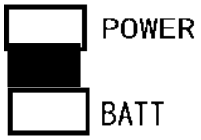
「POWER」lamp blinking

4 — 2 — 3 . Base function

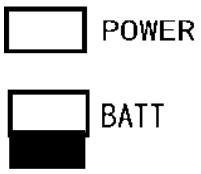
(1) Display function with power on

According to power condition,「POWWR」「BATT」lamp will be on.

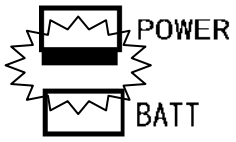
①Ex alarm lamp‥‥「POWER」lamp will light on.



②Standby battery ON‥ ‥「BATT」 lamp lights on.

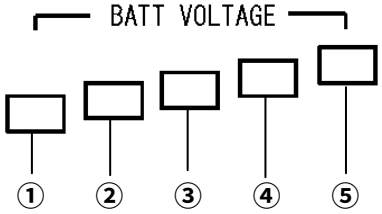


③Discharge test mode function‥‥「BATT」lamp is blinking.



（2） Battery level display function

Read battery voltage and display bar meter.



Over ２７Ｖ・・・①②③④⑤	Light ON	Color：Green
Over ２５Ｖ・・・①②③④	Light ON	Color：Green
Over ２４Ｖ・・・①②③	Light ON	Color：Green
Over ２３Ｖ・・・①②	Light ON	Color：Orange
Over ２１Ｖ・・・①	Light ON	Color：Red
Over ２１Ｖ・・・①	Blinking	Color：Red

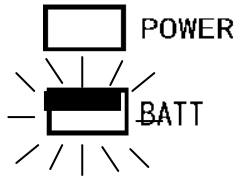
Over ２４Ｖ: Display will be green color in all.

(3) Discharge test function

It is operated as below by the self-discharge function for battery capacity check.

①Press and hold 「ＢＡＴＴ」(ＣＨＥＣＫ) switch for 3 sec.

The lamp「ＰＯＷＥＲ」is put out and 「ＢＡＴＴ」lamp will be blinking.



②Discharge test starts 30 sec.

・Buzzer sounds for 4 times. In case of buzzer spec

③Discharge test: 60 sec

・Buzzer sounds 8 times. In case of buzzer spec

・Hereafter, repeat ② and ③ every 30 min.

④After completion of discharge test,

Press「ＢＡＴＴ」(ＣＨＥＣＫ) SW.

It returns to normal operation.

4 — 3 How to switch off

When finish the operation, make the power switch off and after that, make the power (ＡＣ１００～１２０Ｖ/２００～２４０Ｖ) off.

⚠ Warning

・When finish the operation, make it after turns to point skip by central control system.

・When finish the operation, check the performance connecting to external output and external contact output terminal and judge that the power can be shut off.

5. Alarm pattern and performance

5 — 1. Alarm pattern

For alarm, there are two alarms for gas alarm and trouble alarm.

· When the sample gas density gets to or exceed the alarm preset point, this alarm will trigger.
《Latched mode→BZ_STOP→After reset, it gets Non-latched mode》

> ＊ Warning
> Alarm point(std) is preset at 1/4 of F.S(1st alarm).
> To prevent error,2 sec alarm time is preserved.

· TROUBLE ALARM : The trouble alarm will trigger by detecting the trouble alarm.
System trouble: Except 「E－00」,《Non-latched mode》。When return to normal level from trouble alarm, it will re-start from the performance(Initial clear) after power switch ON.[9. See the treatment at trouble case]

5 — 2. Gas alarm

5 — 2 — 1. Gas alarm performance

(1)Display function

①Gas alarm display
When exceed the measuring range(Full scale over),LED displays"∩∩∩∩".

②Power lamp (POWER : Green)
This keeps continuous illumination.

③Alarm lamp (ALARM:Red)
When gets to or exceeds the alarm preset point, it will light on.

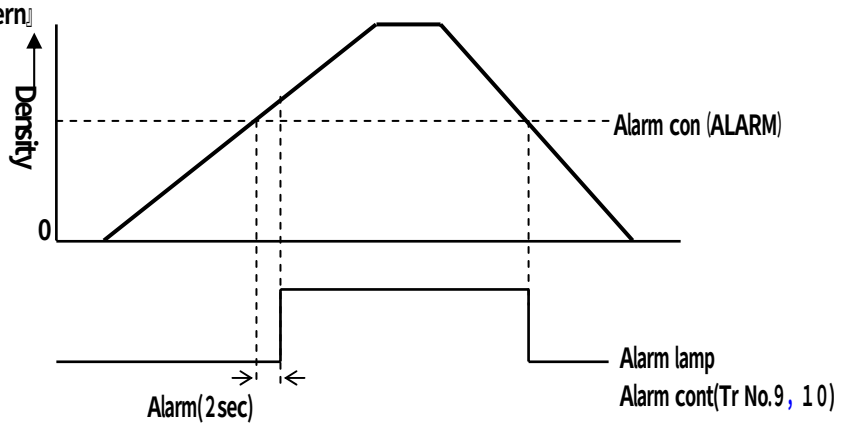
(2)External output performance

①DC0－6－12V
At alarm, it outputs DC12V. Connecting load is below 20mA.

②4～20mA output (Option)
The current proportional to gas density is outputted.
In case of over-scale, it cannot output about over 22mA.

③Alarm point
When gets to or exceed the alarm preset point, the contact will be on.
Contact performance will be non-latched mode when the gas density gets below alarm preset point after doing BZ STOP→RESET.

『Alarm pattern』



5 — 2 — 2. Measures at gas alarm time

Respond to the leak gas

For the measure at gas alarm, follow the customer's management control rule and take a quick action.
General speaking, the following measures are taken.

①Check the following reading.

> ✳ **Caution**
> For quick gas leak, there may be the case that the reading is down when look at it.
>
> Except gas alarm, there may be the case that the reading is down when it gets alarm temporarily by accidental condition.

②Based on gas alarm control density, it is needed to secure the safety of the staff away from the monitoring area.

③When gas continues monitoring, close the original stopper and check that the reading gets down.

④Suppose that the gas remains and after protecting himself from danger, go to the gas leak site and check the gas remaining condition by portable gas detector.

⑤Check that there is no danger and take measure against the gas leak.

5 — 2 — 3. Other case gas alarm than gas sensing

It may sense to some interfering gases to be influenced.

For interfering (cross) gas, contact the nearest sales agent

It may be caused by drifting through the secular change of sensor.

Check the reading by daily check and make the calibration of detector head on request.

It may caused by nose from the spherical apparatus.

The re-check for the installation place and wiring and noise measure parts for instrument and detector head can be considered.
The specific measures will differ by the each site condition.

The influence by temporary noise such as lightning etc can be considered. When the cause and result could be known, take measure for the surge to each condition.

6. Maintenance check

This is the safety instrument for safety and health from gas disaster.
To improve the reliability on the safety and fire/hazard protection, proceed to the regular maintenance check.

6 — 1. Frequency of check and check item

6 — 1 — 1. Daily check

This is a check carried out by customer.

①Check for POW/TR lamp.
Lamp is light on condition.

②LED reading check
Check that LED reading is"0".
If it is not"0", check that there is a gas free and proceed to Maintenance mode and make zero adjustment.

> ⚠ Caution
> For accurate zeroing, follow the maintenance mode「1 — 1.Zero adjustment」.

③Alarm test
For alarm lamp blinking, check that the buzzer will sound.

> ⚠ Caution
> When test alarm, see「5 — 5 — 6.alarm test」.

6 — 1 — 2. Regular maintenance

At regular maintenance, the following shall be checked.

①Daily check
②Instrument cleaning
③Gas calibration
④Instrument check
⑤Parts replacement
⑥Others

6 — 1 — 3. Maintenance contract at regular maintenance

To keep the safety operation, it is recommended to make the service contract for regular check, adjustment and arrangement.
To keep the maintenance contract.
The detail of maintenance service, contact the nearest agent.

6 — 2 . Calibration method (Gas calibration etc)

> ⚠ Caution
> Do not operate 「7 — 2 : Cal method」 without instruction, contact the nearest agent.

Make gas calibration and adjustment of detector head connecting to instrument.
Preparation : Prepare the calibration gas known with gas density.
1.6 times gas density of alarm point is best. (Alarm delay time check is available by it)

> ⚠ Caution
> For calibration gas, dilute it with air and make O2 at over 10% so that the humidity gets to the same level atmosphere with that of detector head.

For gas calibration, proceed to the maintenance mode.

Press MAINTE SW for 3 sec.

Get back to Mainte mode.

※Menu details

1 — 1 : Zero

Select by UP/DOWN SW

1 — 2 : Alarm check

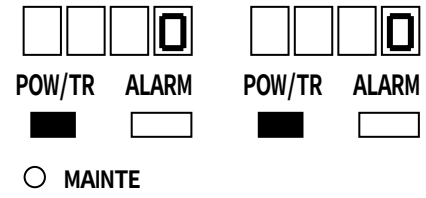
Select by UP/DOWN SW

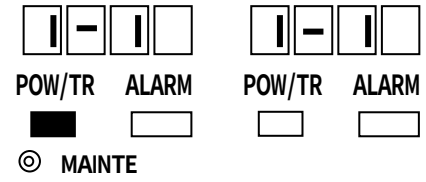
1 — 3 : Mainte mode

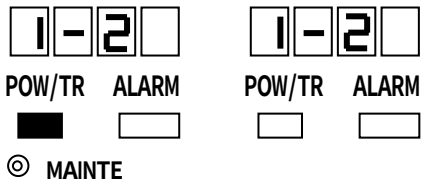
Press SET SW.

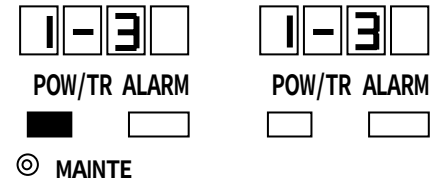
「Adj」 display

Press SET SW for over 3 sec.

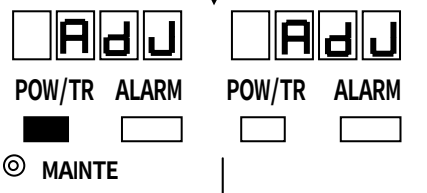




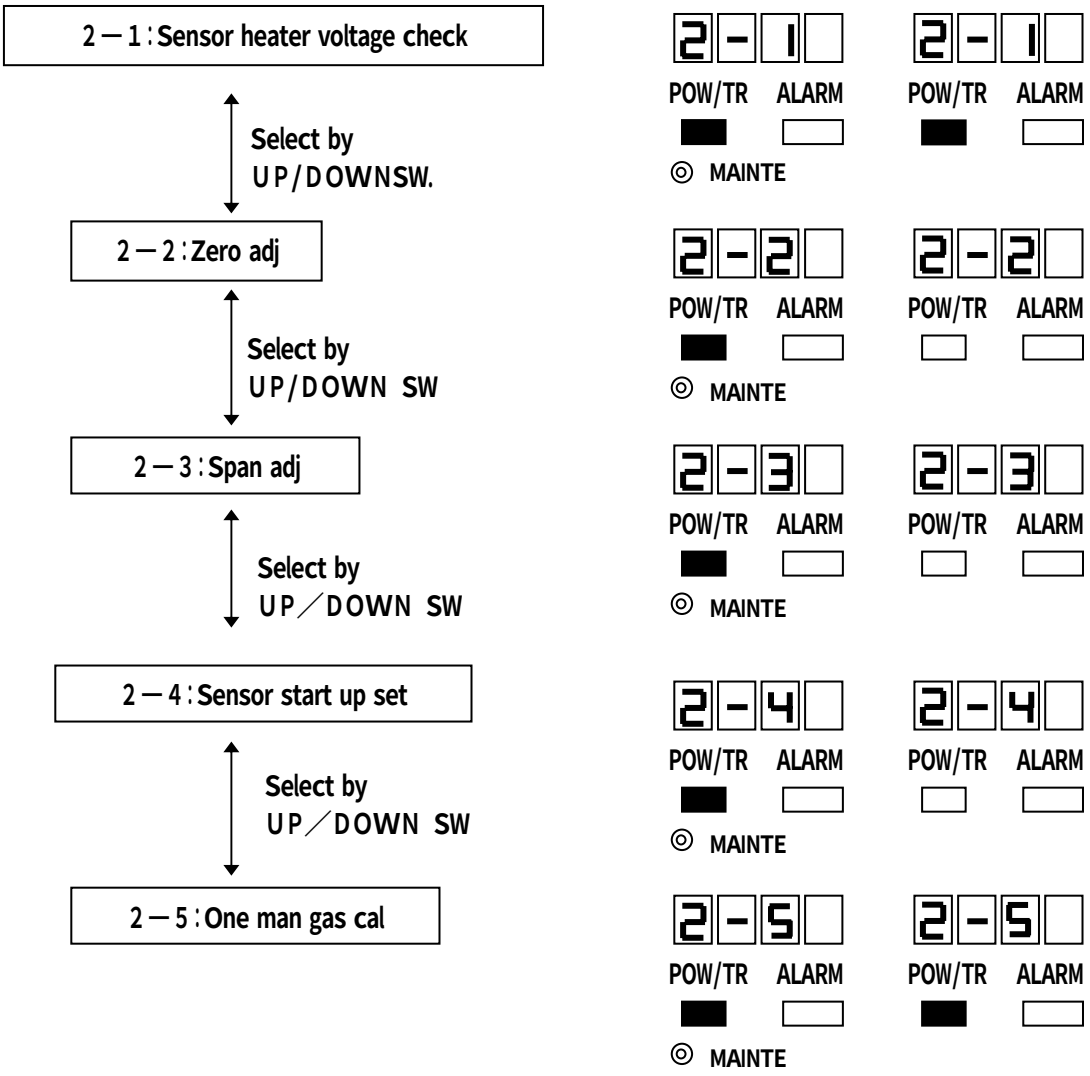




Press SET SW



Press SET SW for 3 sec.



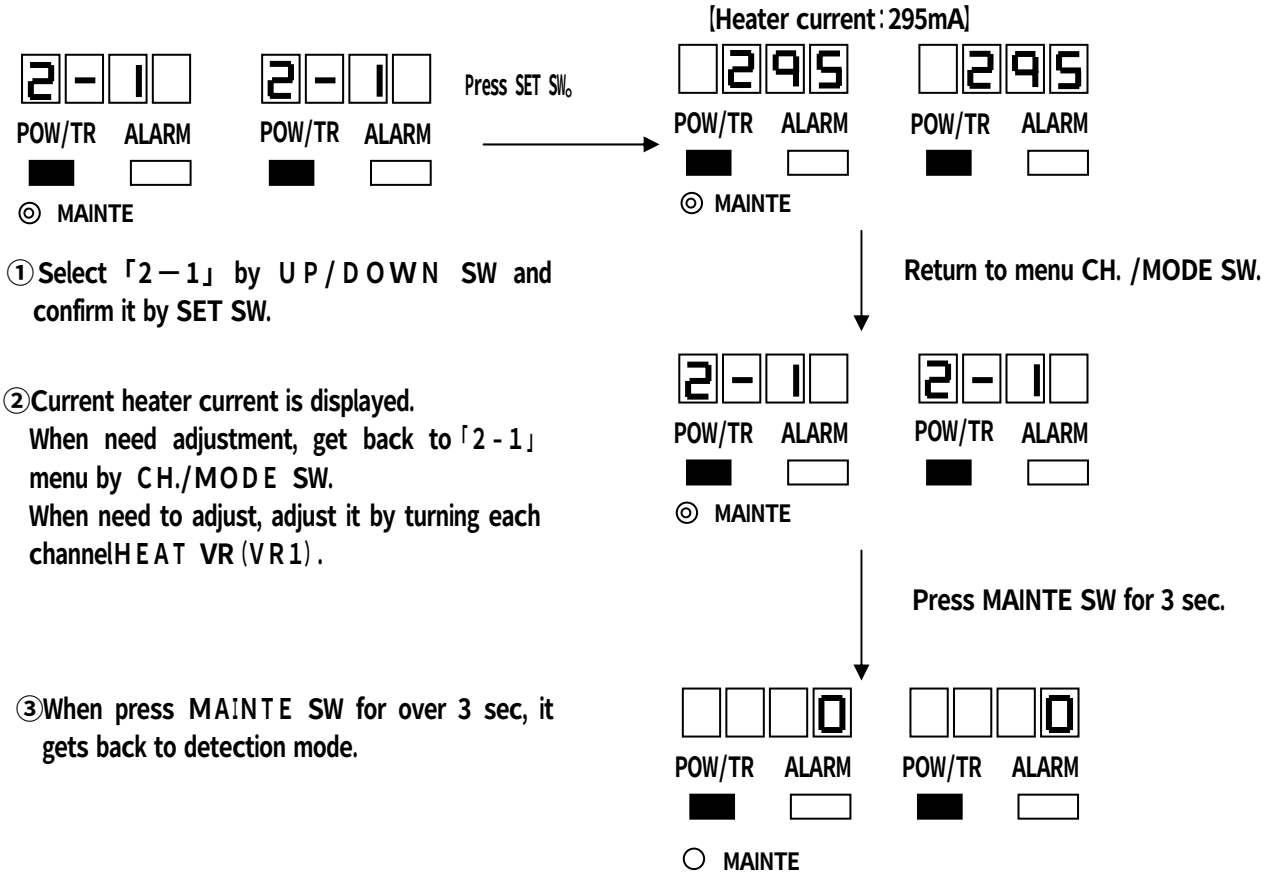
⚠ Caution

When get to mainte mode at gas alarm, alarm contact and output signal shall be cancelled.

⚠ Caution

Other gas alarm than detection mode cannot trigger.
When leave it alone by mainte mode, it shall get back to detection modeafter10 hours.

6 — 2 — 1. Sensor heater voltage check and adjustment

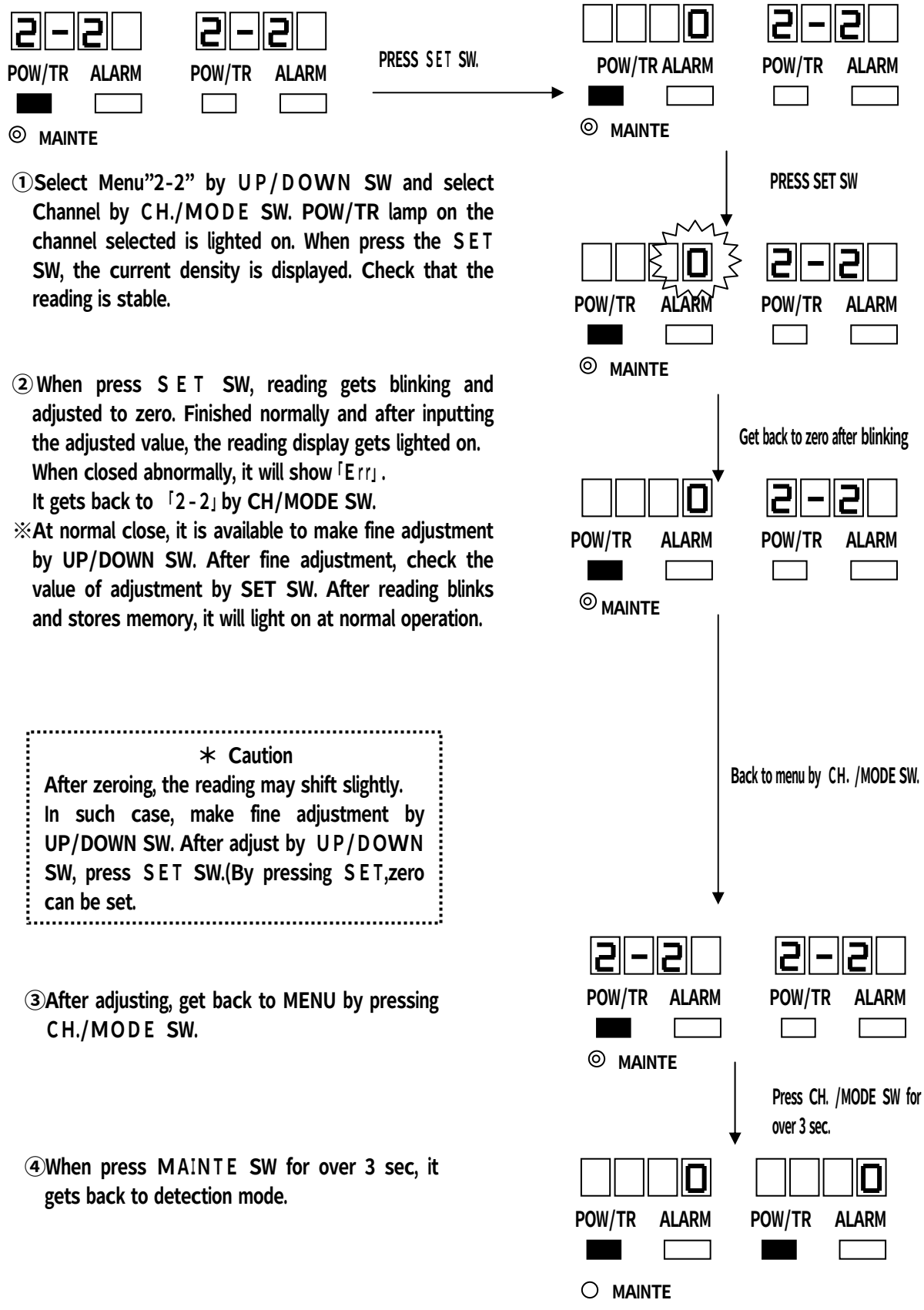


① Select 「2 — 1」 by UP/DOWN SW and confirm it by SET SW.

② Current heater current is displayed.
When need adjustment, get back to 「2 - 1」 menu by CH./MODE SW.
When need to adjust, adjust it by turning each channel HEAT VR (VR1).

③ When press MAINTE SW for over 3 sec, it gets back to detection mode.

6 — 2 — 2 . Zero adjustment



①Select Menu"2-2" by UP/DOWN SW and select Channel by CH./MODE SW. POW/TR lamp on the channel selected is lighted on. When press the SET SW, the current density is displayed. Check that the reading is stable.

②When press SET SW, reading gets blinking and adjusted to zero. Finished normally and after inputting the adjusted value, the reading display gets lighted on.
When closed abnormally, it will show「Err」.
It gets back to 「2-2」by CH/MODE SW.

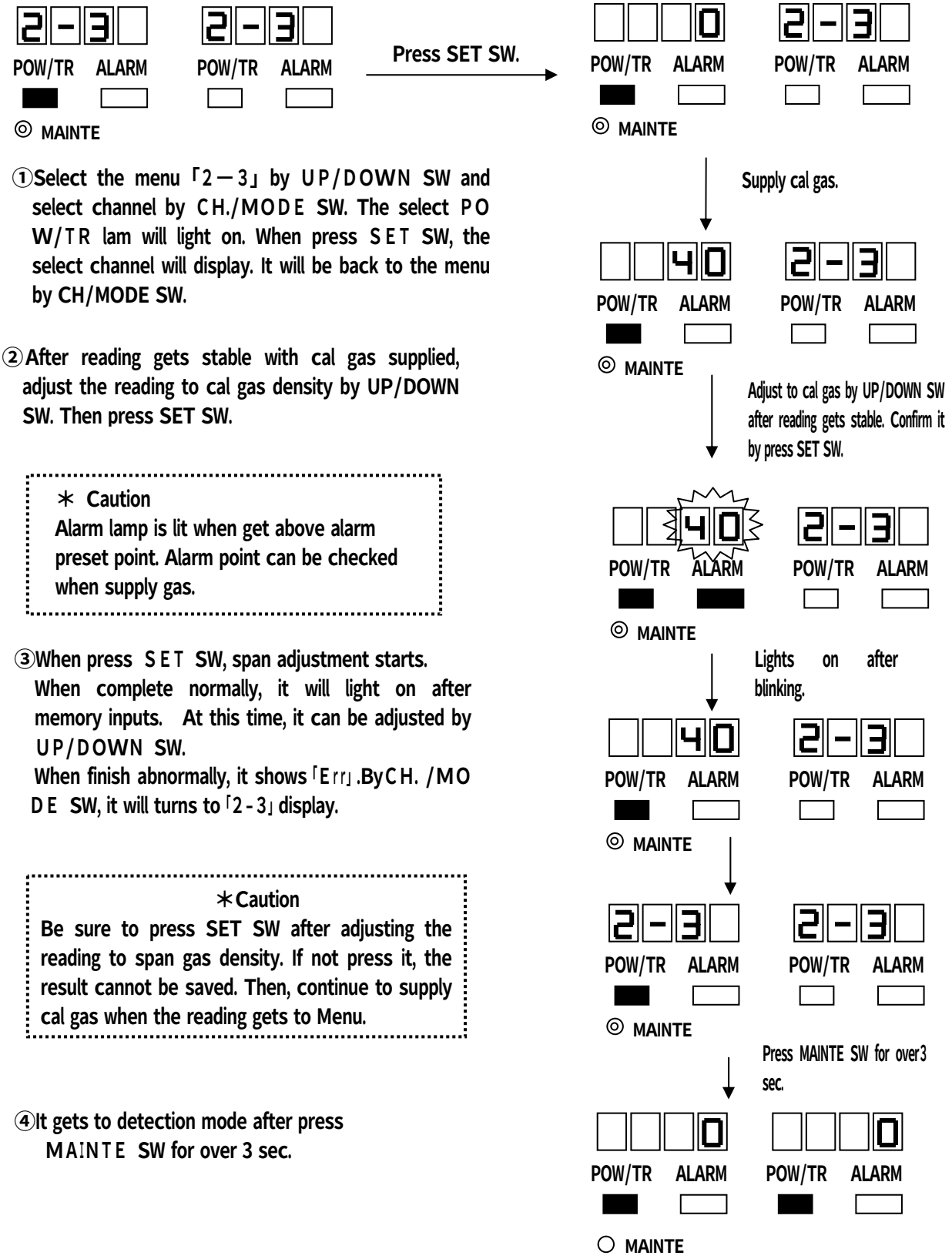
※At normal close, it is available to make fine adjustment by UP/DOWN SW. After fine adjustment, check the value of adjustment by SET SW. After reading blinks and stores memory, it will light on at normal operation.

＊ Caution
After zeroing, the reading may shift slightly.
In such case, make fine adjustment by UP/DOWN SW. After adjust by UP/DOWN SW, press SET SW.(By pressing SET,zero can be set.

③After adjusting, get back to MENU by pressing CH./MODE SW.

④When press MAINTE SW for over 3 sec, it gets back to detection mode.

6 — 2 — 3 . Span adjustment



①Select the menu 「2－3」 by UP/DOWN SW and select channel by CH./MODE SW. The select POW/TR lam will light on. When press SET SW, the select channel will display. It will be back to the menu by CH/MODE SW.

②After reading gets stable with cal gas supplied, adjust the reading to cal gas density by UP/DOWN SW. Then press SET SW.

> ＊ Caution
> Alarm lamp is lit when get above alarm preset point. Alarm point can be checked when supply gas.

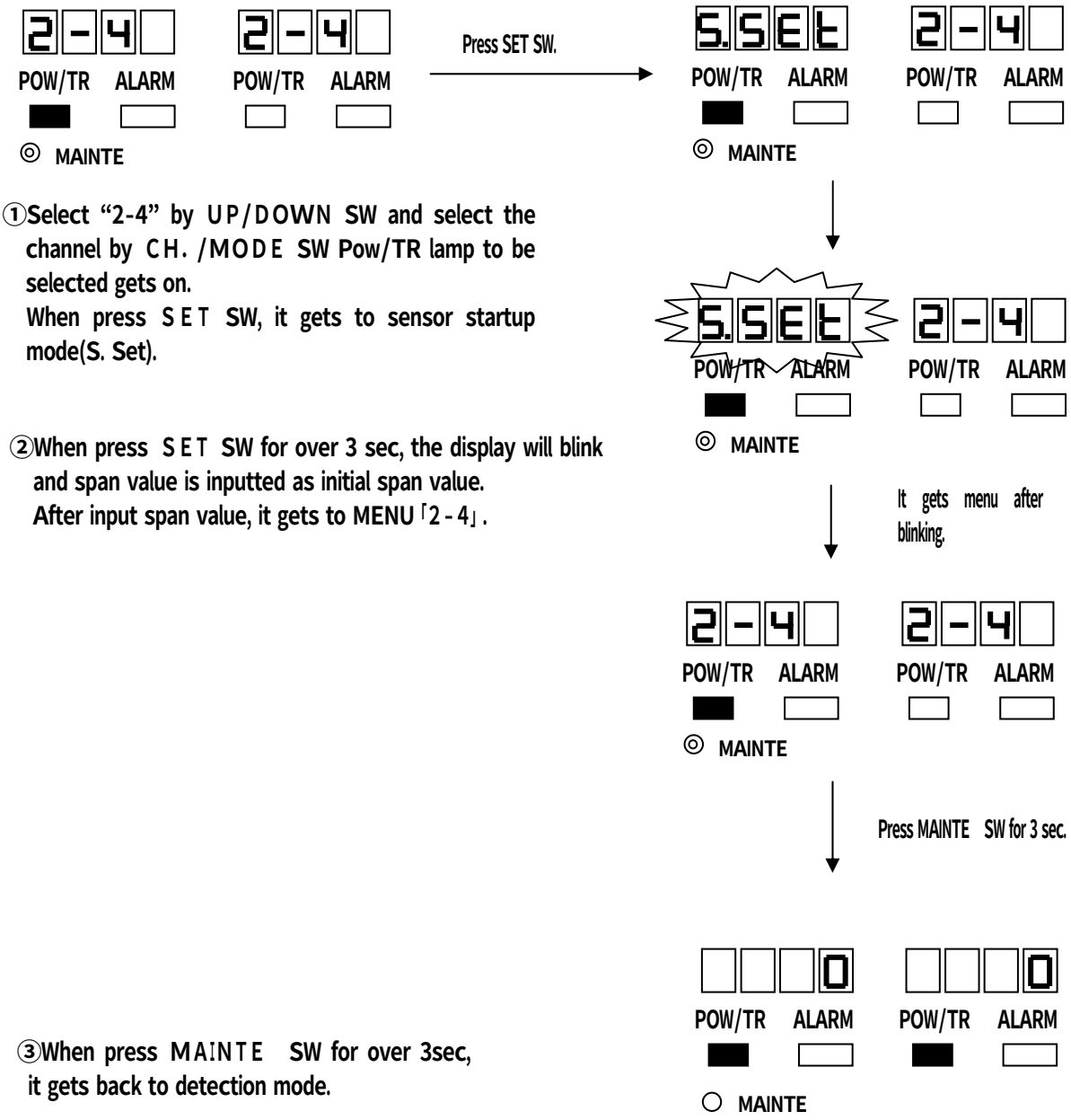
③When press SET SW, span adjustment starts.
When complete normally, it will light on after memory inputs. At this time, it can be adjusted by UP/DOWN SW.
When finish abnormally, it shows 「Err」.By CH. /MODE SW, it will turns to 「2-3」 display.

> ＊Caution
> Be sure to press SET SW after adjusting the reading to span gas density. If not press it, the result cannot be saved. Then, continue to supply cal gas when the reading gets to Menu.

④It gets to detection mode after press MAINTE SW for over 3 sec.

> ⚠ Caution
> Cal gas density for span adjustment should be made by over 10% of F.S. If make span adjustment by below 10%, it cannot be carried out with SET SW pressed.

6 — 2 — 4. Sensor start up control (Effected when replace sensor)



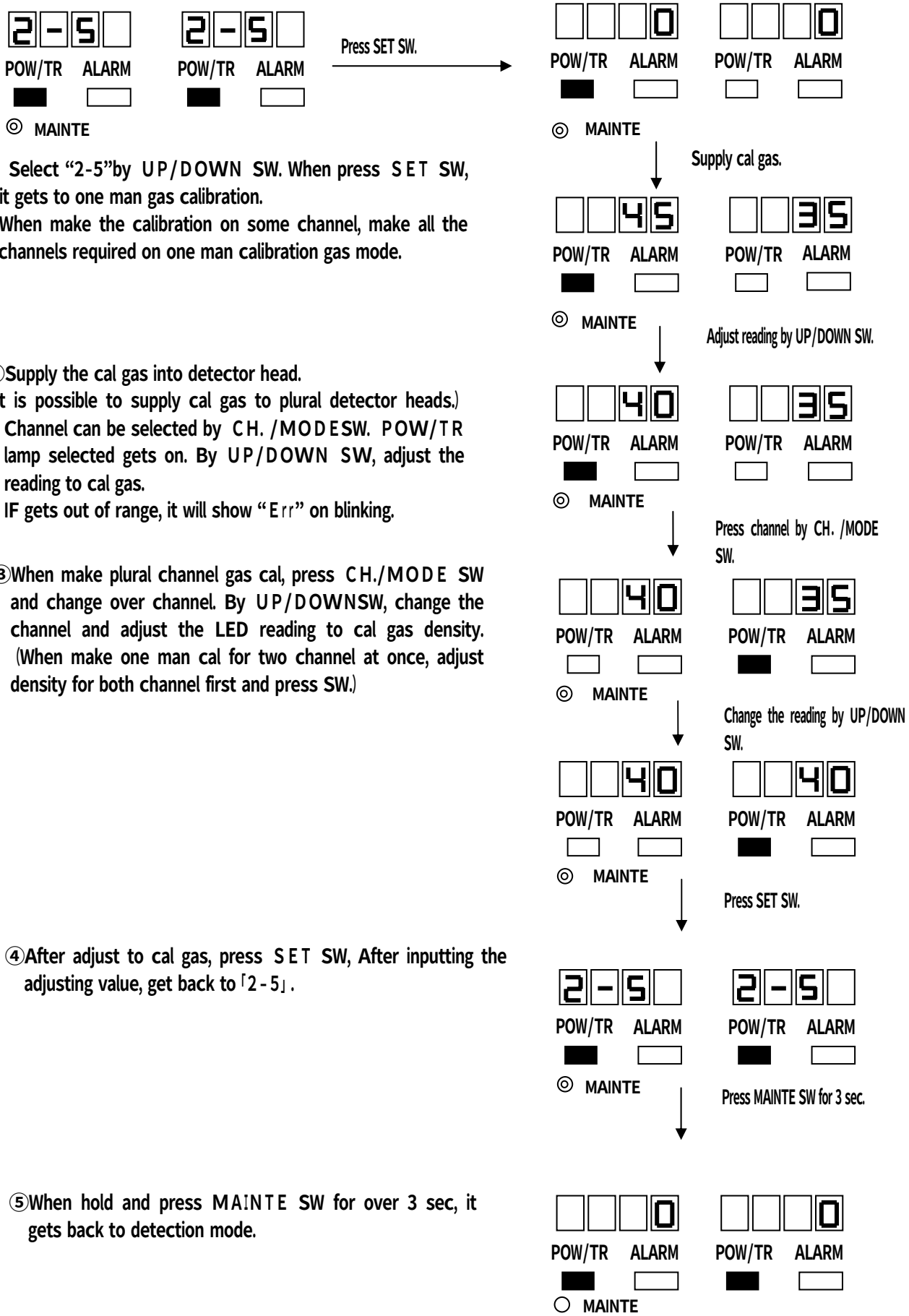
①Select "2-4" by UP/DOWN SW and select the channel by CH./MODE SW Pow/TR lamp to be selected gets on.
When press SET SW, it gets to sensor startup mode(S. Set).

②When press SET SW for over 3 sec, the display will blink and span value is inputted as initial span value.
After input span value, it gets to MENU「2-4」.

③When press MAINTE SW for over 3sec, it gets back to detection mode.

> ⚠ Caution
> When it gets to sensor use limit, the span cannot be adjusted. Replace the sensor with new one.

6 — 2 — 5 . One man gas adjustment



① Select "2-5"by UP/DOWN SW. When press SET SW, it gets to one man gas calibration.

※When make the calibration on some channel, make all the channels required on one man calibration gas mode.

②Supply the cal gas into detector head.
(It is possible to supply cal gas to plural detector heads.)
Channel can be selected by CH. /MODESW. POW/TR lamp selected gets on. By UP/DOWN SW, adjust the reading to cal gas.
IF gets out of range, it will show "Err" on blinking.

③When make plural channel gas cal, press CH./MODE SW and change over channel. By UP/DOWNSW, change the channel and adjust the LED reading to cal gas density. (When make one man cal for two channel at once, adjust density for both channel first and press SW.)

④After adjust to cal gas, press SET SW, After inputting the adjusting value, get back to「2-5」.

⑤When hold and press MAINTE SW for over 3 sec, it gets back to detection mode.

6 — 2 — 6. Sensor/parts replacement method.

> **⚠ Caution**
> For sensor/parts replacement, contact the nearest agent or Riken office.

6 — 3. Measures at operation stop and transfer

6 — 3 — 1. Stop of normal operation

Turn the power SW off on front of instrument.
Turn off the power for AC100～120V/200～240V.

6 — 3 — 2. Installation at transfer

When transfer to install, follow [2-2. Installation place] for installation place.
For wiring, see [2-4. Caution for wiring construction].

> **⚠ Caution**
> Be sure to calibrate after transfer to install.
> For adjustment including gas cal, contact nearest agent or Riken.

6 — 4. Measures at storage or re-use for instrument after a long time

Operate the instrument within the following condition.
①Temp：0℃～40℃
②Humidity：Over 85%RH
③Environment condition：Not to generate gas, solvent and vapors.

> **⚠ Caution**
> ・When re-use it, be sure to make calibration.
> ・For adjustment including gas cal, contact nearest agent or Riken.