

**OPERATING INSTRUCTION MANUAL
FOR
MULTI-UNIT CASE
590-04W/590-04R
590-06W/590-06R
590-09W/590-09R
590-12W/590-12R**

Request for the Customers

- Read and understand this operating manual before using the detector.
- Use the detector in accordance with the operating manual.
- Regardless of warranty period, we shall not make any compensation for accidents and damage caused by using this product.

The compensation shall be made only under the warranty policy of products or parts replacement.

- Because this is a safety unit, a regular maintenance for every six months and daily maintenance must be performed.
- If any abnormality was found in the detector, notify them to Riken Keiki or local representative immediately.

RIKEN KEIKI Co., Ltd.

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

Phone : +81-3-3966-1113

Fax : +81-3-3558-9110

E-mail : intdept@rikenkeiki.co.jp

Web site : <http://www.rikenkeiki.co.jp/english/>

INDEX

1 . PRODUCT OUTLINE	
1 - 1 . In the beginning	2
1 - 2 . Application for use	2
1 - 3 . Identification of each cautional marks	2
2 . IMPORTANT INSTRUCTION FOR THE SAFETY	
2 - 1 . Danger items	3
2 - 2 . Warning items	3
2 - 3 . Caution items	4
3 . PRODUCT FUNCTION	
3 - 1 . External drawing	
3 - 1 - 1 . Wall mounting type	5
3 - 1 - 2 . Panel mounting type	6
3 - 2 . Name of each part and function	7
3 - 3 . Arrangement of connection terminals	8
4 . HOW TO USE	
4 - 1 . Before operation	9
4 - 2 . Mounting/dismounting of the unit	9
4 - 3 . Installation place	10
4 - 4 . Caution in the system engineering	11
4 - 5 . Grounding	14
5 . CONNECTIONS OF EACH UNIT	
5 - 1 . Connection of power cable	15
5 - 2 . Connections of detector heads	15
5 - 3 . Connections of relay outputs	15
5 - 4 . Connections of 4-20mA output	15
5 - 5 . Connection diagram for each detector head	16
6 . PRODUCT SPECIFICATIONS	19

1. PRODUCT OUTLINE

1 - 1 . In the beginning

First of all, we wish to express our heartfelt thanks for your purchase of our multi-unit case 「590-* W(R)」 for RM-590 series.

*: Number of monitoring capacity is put into . "W" and "R" mean wall mounting type and panel(rack) mounting type respectively.

This manual describes specifications and instructions for use for RM-590 series multi-unit case.

Your kind reading of this manual is requested not only for the first user but for already experienced staff.

1 - 2 . Application for use

This is an exclusive multi-unit case to house indicator/alarm units and buzzer unit for RM-590 series.

It can be used only by connecting power source and detector head as power unit is built in it. Any indicator/alarm unit for RM-590 series can be arranged in this multi-unit case.

Basic composition

- Power unit (PSU-590)..... 1 pce
- Coupling unit for buzzer unit (RM-590-MCASE)..... 1 pce
- Coupling unit for indicator/alarm unit (RM-590-MCASE)
..... Depends on mounting points (Max.12 pcs.)

Coupling unit for indicator/alarm unit is for 4,6,9 and 12 points each as standard version. It is also available for other points (2-12 points). In such case, optional mounting angle is required.

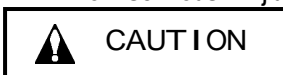
1 - 3 . Identification of each cautional marks



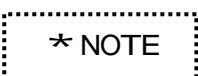
Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situation.



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.



This means "ADVICE" at operation.

2. IMPORTANT INSTRUCTION FOR THE SAFETY

2 - 1 . Danger items



DANGER

This is not a explosion proof unit. Do not use it at places where combustible/explosive gases or vapours may exist. It is very danger to operate under such environment.

2 - 2 . Warning items



WARNING

- Buzzer unit, indicator/alarm unit
Do not connect other buzzer unit and indicator/alarm unit than that of for RM-590 series.
If connected, this multi-unit case or other connected unit may be broken.
- Power source
Before supplying the power, confirm that the power source is a designated voltage.
- Maximum monitoring capacity
The maximum monitoring capacity is 12 points due to the capacity of power unit.
- Necessity of protective grounding
Do not cut inside or outside wire for earth, nor disconnect the wire from earth terminal.
In any case, the unit becomes dangerous conditions.
- Defect of protective function
Do not operate the unit if protective functions such as protective grounding or fuse are seems to be defective.
Also, before operating the unit confirm that there is no defect for protective functions.
- Fuse
Use the designated rating(current, voltage, type) fuse to prevent fire.
Replacement of fuse shall be done after put off the initial power source and put off the power switch of this unit.
Do not use other fuse than designated one, nor make short circuit for fuse holder.
- External connections
After making protective grounding firmly, connect to external control circuit or detection objective.
- Counteraction at gas alarm
When detect high concentration gas than preset alarm level, it is very dangerous.
It is required to take an appropriate measures by customer's decision.
- Mounting/dismounting
Looking mechanism may be broken if the unit is mounted into the case with disengagement lever up position. Make correct procedure for mounting/dismounting.

2 - 3 . Cautional items



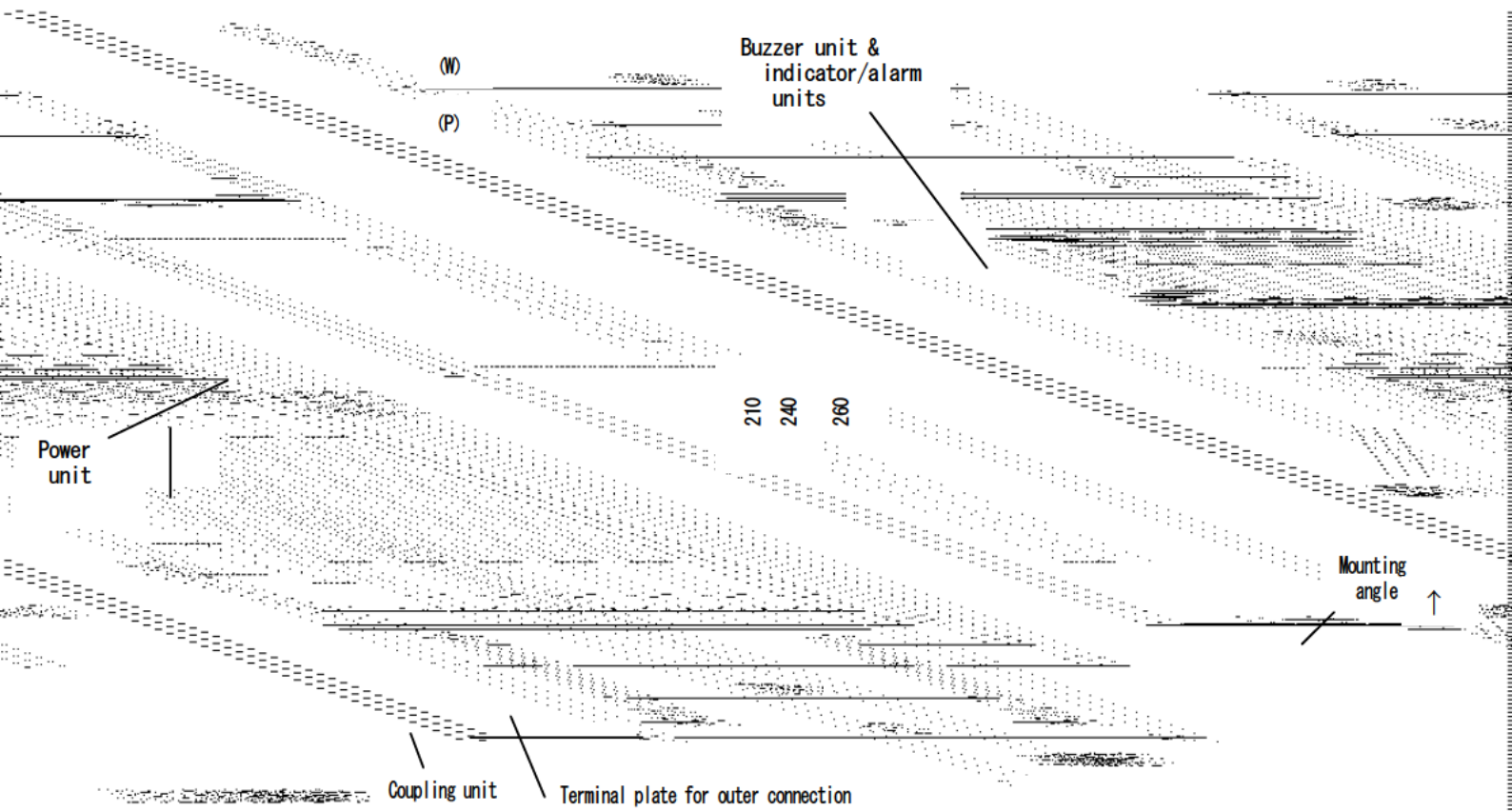
CAUTION

- Do not use walky-talky near this unit.
When this unit receives the electric waves by walky-talky etc near from the cable, this will effect the reading.
When use the walky-talky, operate it at the place where there is no influence of electric wave ejection.
- When make power on again, make it after an interval of over 5 seconds.
When make power on within 5 seconds, there may be no normal operation.
- 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.
Take enough consideration for instrumentation to keep safety even if disconnection of power and signal lines, defect of operation or trouble would be happen due to unexpected reason.
This is an electrical applied instrument.
Be care it may be effected by power noise, electrostatic and electromagnetic noise.
When use under such conditions, make protective treatment for use.

3. Product function

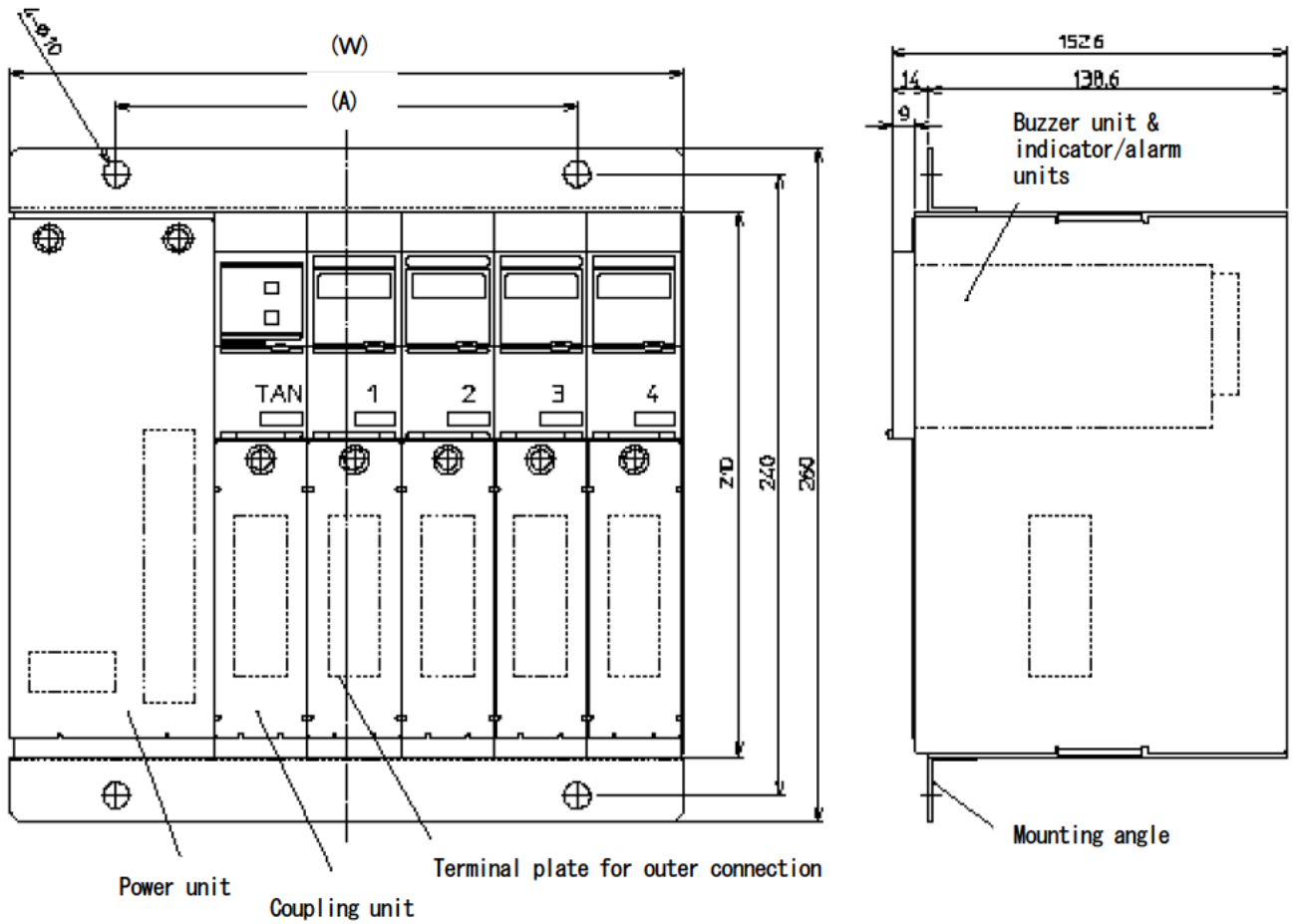
3-1. External drawing

3-1-1. Wall mounting type

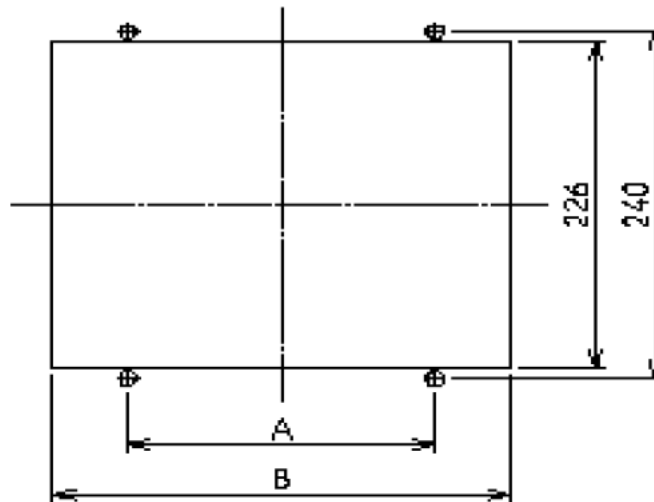


Channel Section	2	3	4	5	6	7	8	9	10	11	12
W	189	225	261	298	334	370	407	443	479	516	552
P	106	142	178	214	250	286	322	366	402	438	474

3-1-2. Panel/rack mounting type

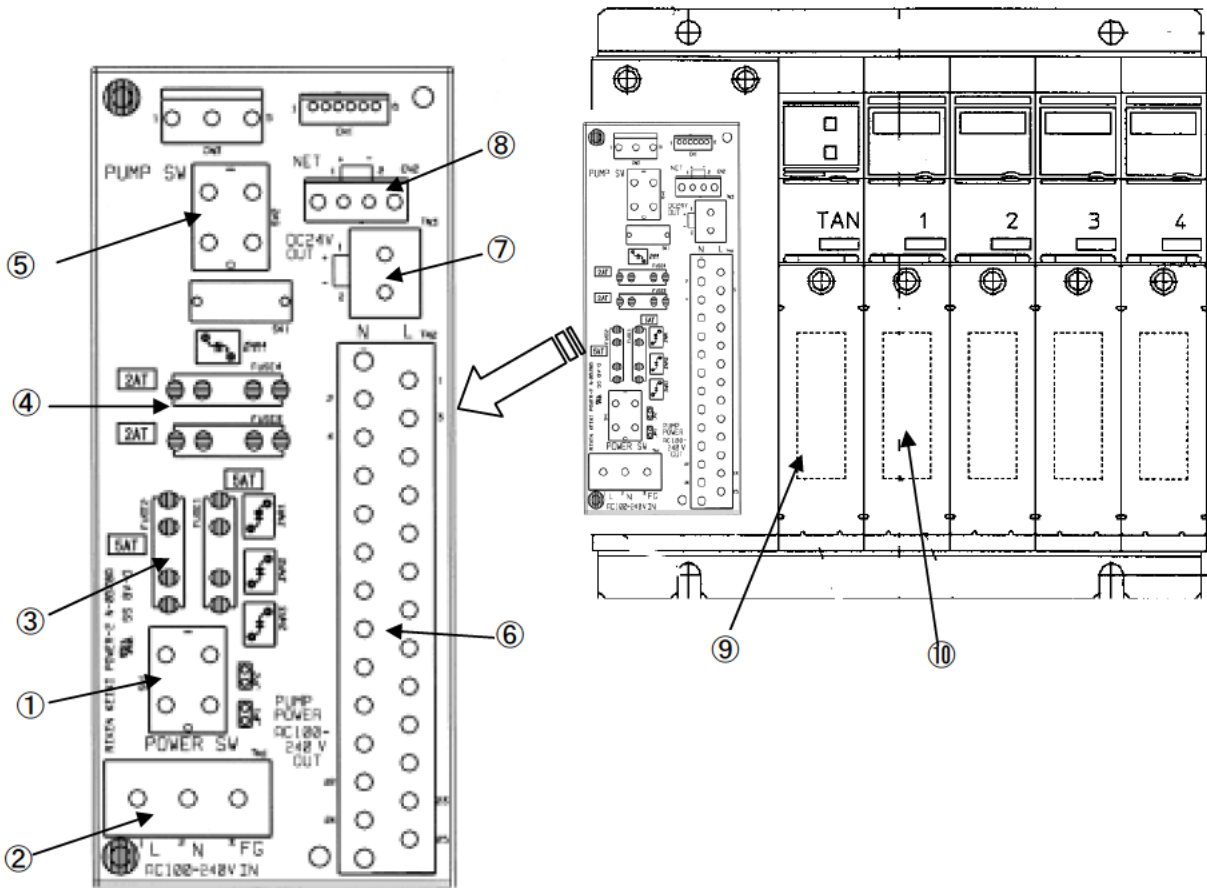


Panel cut-out dimensions



Channel Section	1	2	3	4	5	6	7	8	9	10	11	12
W	—	189	225	261	298	334	370	407	443	479	516	552
A	—	106	142	178	214	250	286	322	366	402	438	474
B	—	191	227	263	300	336	372	409	445	481	518	554

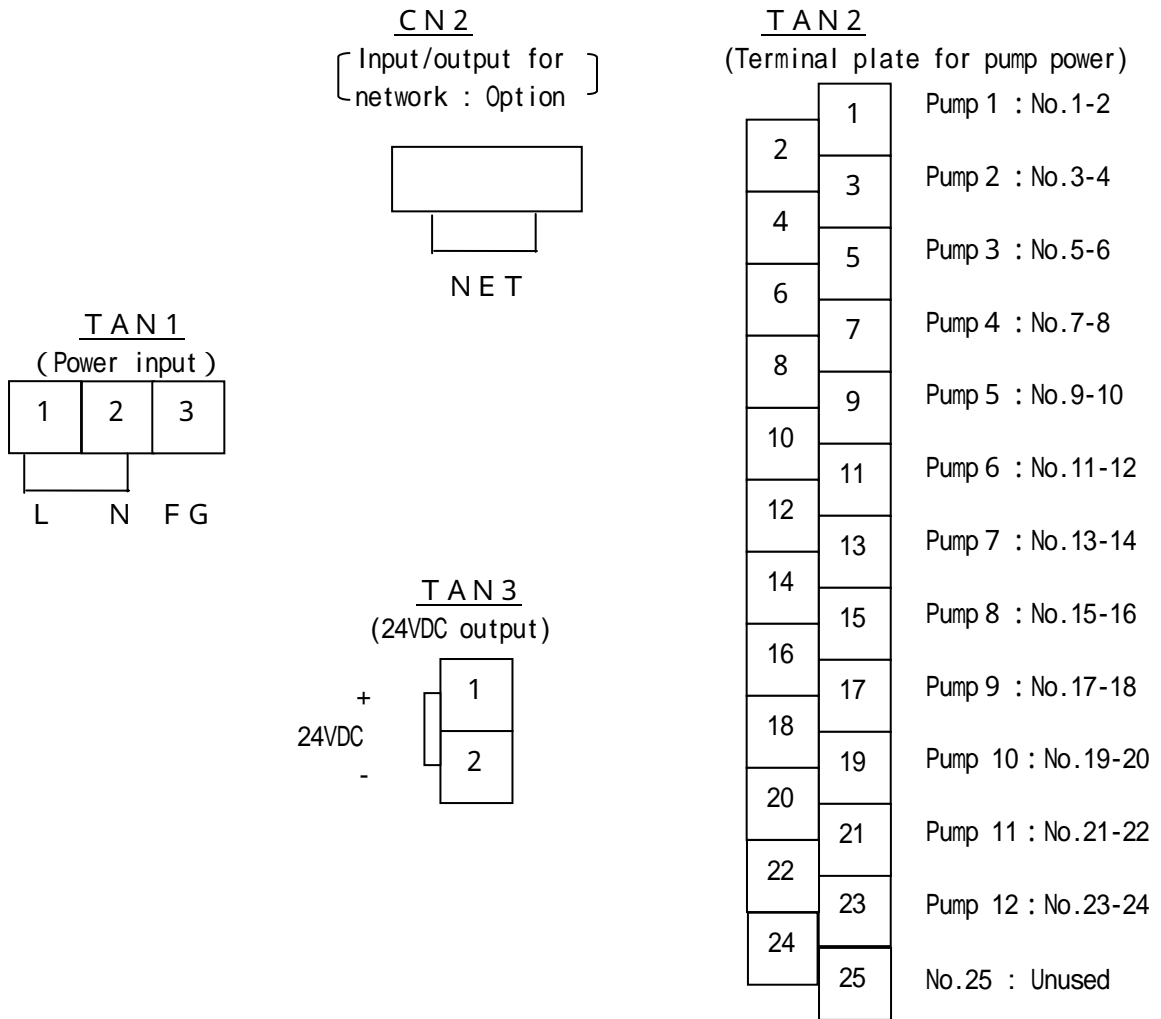
3-2. Name of each part and function



- | | |
|--|--|
| ①Power switch | Main power switch. |
| ②Terminal plate for power input | Connects AC power cable (100~240VAC) |
| ③Fuse for power source | Main fuse for AC power |
| ④Fuse for pump power | Fuse for pump power. |
| ⑤Power switch for pump | Switch for pump power. |
| ⑥Terminals for pump power | Connects power cable for pump (Same output as input voltage.) |
| ⑦Terminals for 24VDC output | 24VDC output is provided (Rating: 1A at 24VDC) |
| ⑧Network connector | Connector for LonWORKS (Option) |
| ⑨Connection terminals of buzzer unit | Connect output signal from buzzer unit |
| ⑩Connection terminal of indicator/alarm unit | Terminal plate for connecting detector heads and output for alarm contact. |

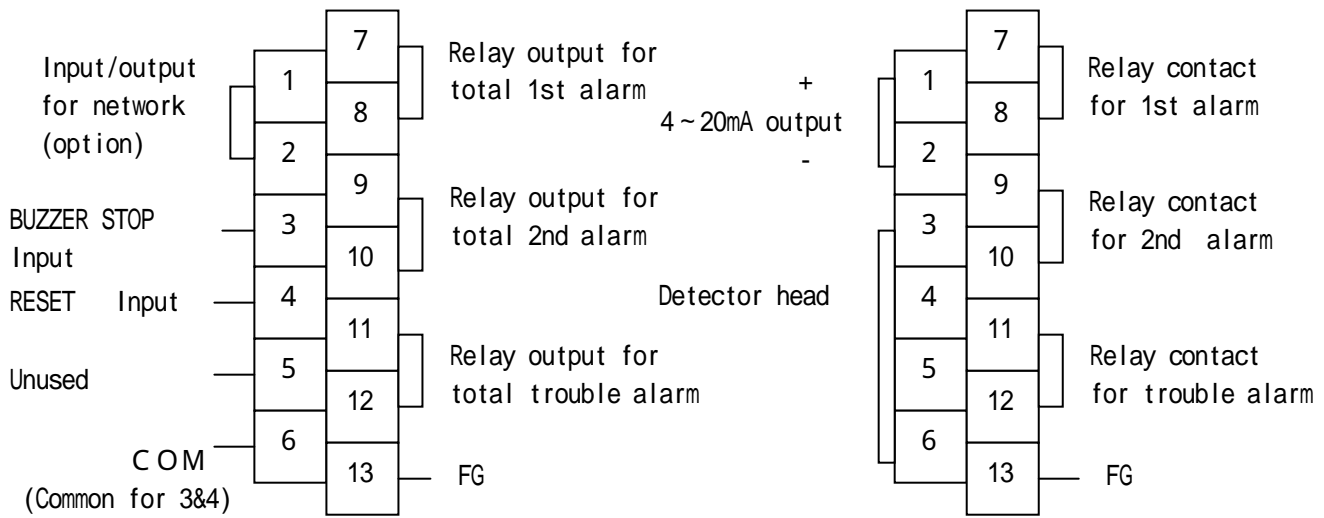
3 - 3 . Arrangement of connection terminal

Power unit



Terminal plate of buzzer unit

Terminal place of indicator/alarm unit



4 . HOW TO USE

4 - 1 . Before operation

Be sure to keep cautional items of use not only for first user but for already experienced staff.
If not keep these cautional items, the unit may be defective and correct gas detection may not be performed.

4 - 2 . Mounting/dismounting procedures

When mounting/dismounting indicator/alarm unit and buzzer unit for RM-590 series, make following procedures.

(1) Mounting method

- Open the front cover of indicator/alarm unit and buzzer unit.
- Confirm that the power switch is at OFF
- With the disengagement lever at down position, mount into the case.
(Confirm that the edge connector is put in firmly)
- Confirm that the disengagement lever is turned upward when indicator/alarm unit and buzzer unit are mounted into the case firmly.
- After confirmation of lever position, put ON the power switch, and then, close the cover.

(2) Removal of the unit

- Open the front cover of indicator/alarm unit and buzzer unit.
- Confirm that the power switch is at OFF.
- Push disengagement lever down to release the lock.
- Pull out the unit from the case.
- Turn the lever upward and close the cover.



CAUTION

Mounting/dismounting of indicator/alarm unit and buzzer unit shall be done according to the above procedures. If not, stopping metal of the unit may be transformed and the cover can not be closed.

4 - 3 . Installation place



CAUTION

Do not install at places where direct sun drought or where the temperature is drastically changed.

Keep away the system from direct sun drought or where the temperature of the system is drastically changed.

Do not install it where vibration or shocks may take place.

The system consists of fine electronics parts.
Install them where to be stable not to crush or fall down.

Keep the system from the equipment which may generate the noise (Unit & cable).

Keep the system from the equipment which may give a high frequency in the surroundings and install it.

·Do not put the system jointly each. ·Do not wire the cable in parallel nor take access.

Do not install it where the detection gas is deposited around.

Do not install and make gas detection at the place where the sample gas is deposited.

Do not install at the place where it is danger for maintenance service such as high voltage cable, etc.

This unit is required to make maintenance regularly.
Then, do not install at the place where there is danger at maintenance time.

Do not install it where it is unable to make maintenance.

When required to stop the system at maintenance time, unable to maintain if not remove a part of system or unable to detach the case due to the pipe or rack etc. do not install such place.

System housing that grounding construction is not enough.

Be sure to ground when install.

4 - 4 . Caution in the system engineering

⚠ CAUTION

Unstable power and noise may cause error of performance and alarm.
For the system to use this unit, it is required to make design based on this manual descriptions.

(1) Stable power used

While the system gets stable at power failure, the external output and alarm contact may be on and the care for it must be taken. In such case, use the standby battery or take an appropriate action in the receiver side.

Supply the following power to this unit .

Power voltage	100 ~ 240VAC, 50/60 Hz
Power failure tolerance time	Approx 50msec. (For power failure of 50msec, it re-starts) To warrant the continuous operation, install the standby battery outside.
Others	Do not contact with power involving high power load and high frequency noise. According to requirement, use line filter and separate it from noise source.

(2) Designing to consider radiation

When install the closed self-standing control panel, mount the fans in the upper and lower part.

(3) Lightning measures

Lightning surge	There is the problem "Lightning". When make outdoor wiring of cable at factory or plants etc or when make a parallel wiring in the same duct with the cable in from outdoor even at the indoor wiring. If the lightning is a huge generation source, the cable is a reception antenna and there is the case that cable connecting instrument is broken. It is impossible to prevent the generation of lightning. If the cable should put in metal tube or laid in the underground, it is impossible to prevent the inductive lightning surge generating from the thunder.
Lightning measures	There is not the complete countermeasure for it but the following method can be considered. Make the suitable treatment accordingly. a) The transmission signal route is arranged for connection by the optical fiber cable etc. b) Countermeasure by the lightning arrester (Cable safety retainer). There is the way to install the lightning arrester just before the field apparatus and the central control station. The position of the lightning arrester installation is at each point of cable laid out from the outdoor to the indoor. The lightning arrester builds in the circuit to remove the surge voltage to be the source for the damage of field apparatus (Protection resistor, zero diode etc.) and is designed to protect the apparatus. But as the signal may be attenuated due to the lightning arrester, check the action and it is required to use.
Grounding	Surge noise shall be generated from the thunder lightning or except it. To protect detector from these cause, be sure to make grounding.

* In the lightning rod, there is the circuit to remove the surge voltage to be a cause of damage from field instruments.

By installing the lightning rod, the signal may be attenuated. When install the lightning rod, it is required to check the performance in advance.

(4) Alarm contact

·Alarm contacts shall be used only for external buzzer and alarm light, and do not use it for the controlling use (such as solenoid valve control etc).

When control the external load, the bad influence may be given to the system according to the load characteristics.

In such case, the following countermeasure shall be taken to stabilize the action and protect the contents.

·Relayed by the low voltage relay and operate by connecting CR circuit (Spark Killer: SK) (Diode etc for DC) suited for relay coil directly to relay.

·Add CR circuit to the load side of relay on the request.

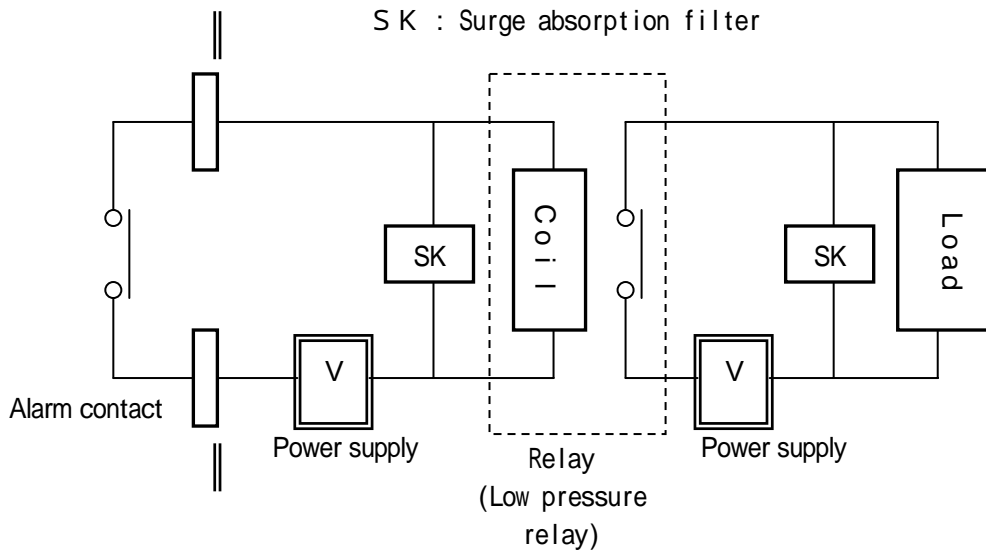


CAUTION (FOR USE OF NORMALLY-CLOSED CONTACT)

Normally-closed contact (Break contact) at non-existing condition may change to open contact in a moment due to physical shock.

Whenever alarm signals from gas detectors are used with normally-closed contact, please put delayed-circuit (for about one second) to receiver side of normally-closed contact to avoid such phenomenon.

Reference:By the condition of load, CR circuit may be better to install in the contact side but it is required to put in by checking the action of load.



- How to think alarm contacts against inductive load -

When use the inductive load for alarm contacts, the very high reverse electromotive voltage may be generated and the following trouble tends to be produced.)

- Contact part of relay is melted adhesively and the contacts can no work.
- High voltage is put inside of indicator/alarm unit and then, electrical parts may be damaged.
- As it is big noise, the trouble action may be taken by the reckless drive of CPU.


⚠ CAUTION

- The inductive load shall not be used in principle(Do not use fluorescent lamp).
- When use the inductive load, make the contact amplification outside, but the outside relay coil belongs to the inductive load, use the relay driven by the low voltage(within AC100V) and it is protected by an appropriate surge killer.
- When control the light inductive load directly, protect the contacts by an appropriate surge killer by all means.

As the inductive load, there are following samples.

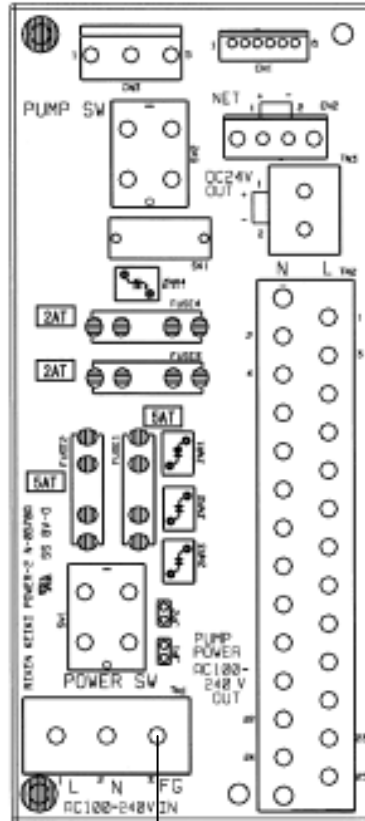
- Patlight * External relay * Buzzer *Siren *Fan *Fluorescent lamp * Motor etc.

4 - 5 . Grounding

Make grounding with terminal 

WARNING

Be sure to make grounding before putting power ON.



Terminal 

Be sure to make grounding for safety purpose and to keep stable operation of this unit.

Do not connect earth wire with gas pipe. Make grounding corresponding to D-class grounding (Grounding resistance : below 100 ohms).

5. CONNECTIONS OF EACH UNIT

5 - 1 . Connection of power cable

The power requirement of this multi-unit case is 100V ~ 240VAC \pm 10%, 50/60Hz.

Apply power source within this specified range.

Before connecting power cable, FG terminals shall be grounded.. Grounding resistance shall be according to D-class grounding(Resistance: below 100).

After grounding and it becomes in safety condition, make wirings for power source and others.

5 - 2 . Connections of detector heads.

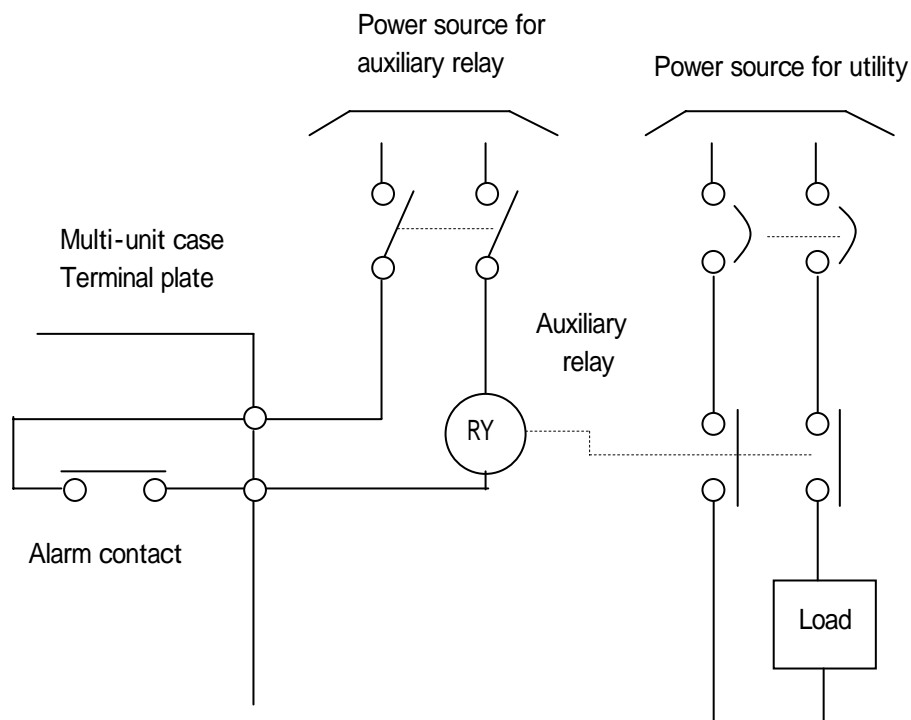
Terminal numbers , , and are the connection of detector head.

5 - 3 . Connections of relay outputs

RM-590 series provides relay outputs for 1st alarm, 2nd alarm and trouble alarm in each unit. Also, buzzer unit provides relay outputs for total 1st alarm, total 2nd alarm and total trouble alarm.

Rating of relay contact is 0.5A at 100VAC,1.5A at 30VDC(Resistive load).

When connecting the load above rating, use auxiliary relay circuit.



When the inductive load is used for alarm contact, connect an appropriate spark killer to the load side.

5 - 4 . Connection of 4-2mA output

The RM-590 series provides 4-20mADC output from each unit.

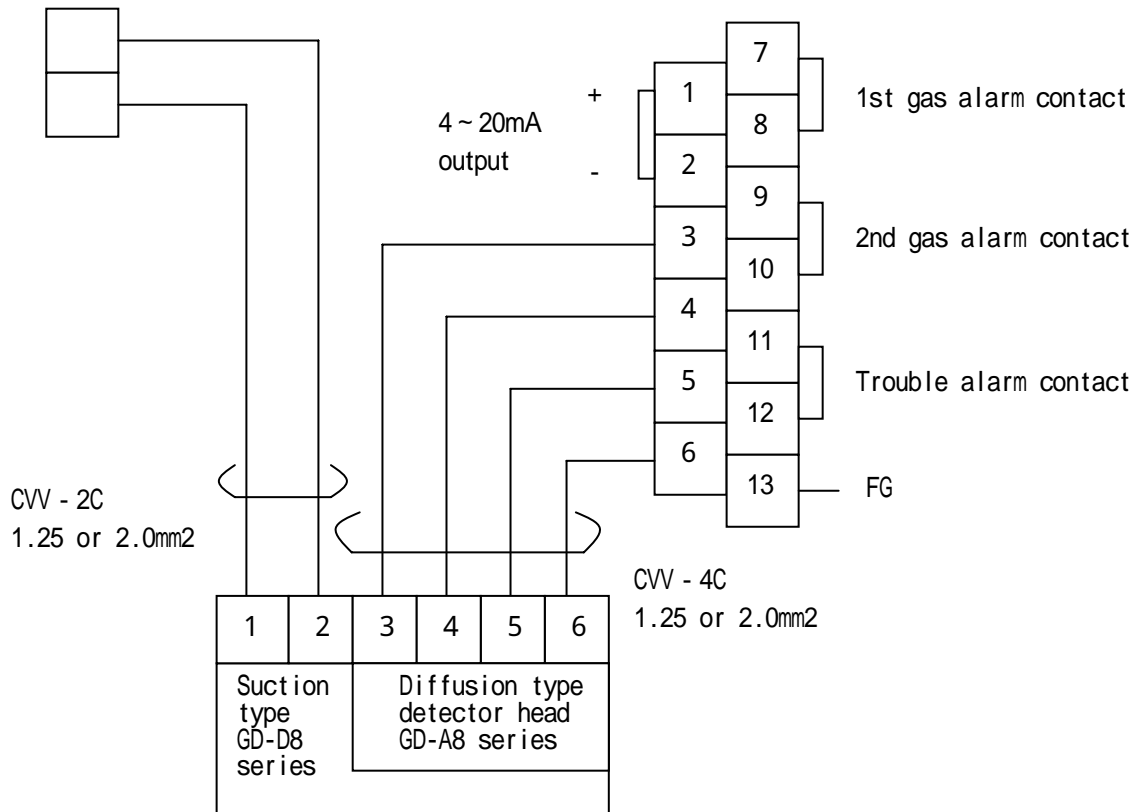
The load to be connected is up to 300 (Max.). Use a shielded cable equivalent to CWS for connection.

5 - 5 . Connection diagram for each detector head

• GP - 5 9 1 / NC - 5 9 1 / NC - 5 9 1 W for catalytic combustion gas detector heads.

Terminal plate for pump in power unit

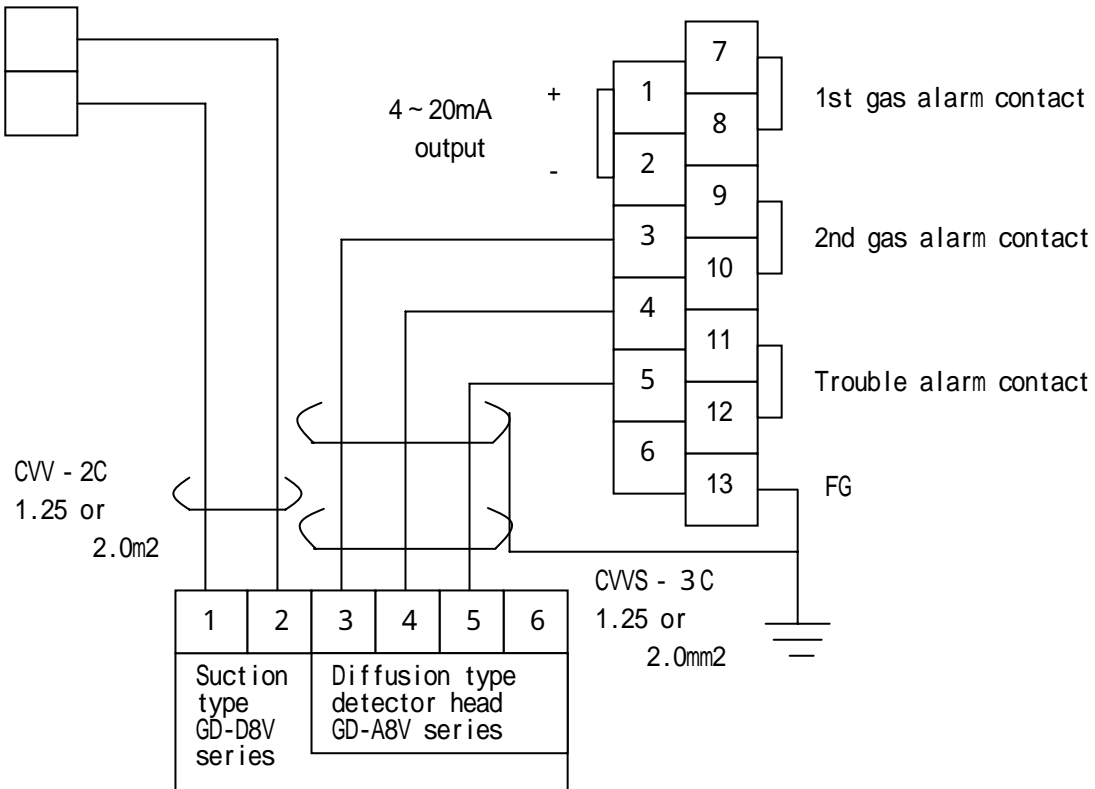
Terminal plate of indicator/alarm unit
in multi-unit case



• GH - 5 9 1 for semiconductor type gas detector heads.

Terminal plate for pump in power unit

Terminal plate of indicator/alarm unit
in multi-unit case

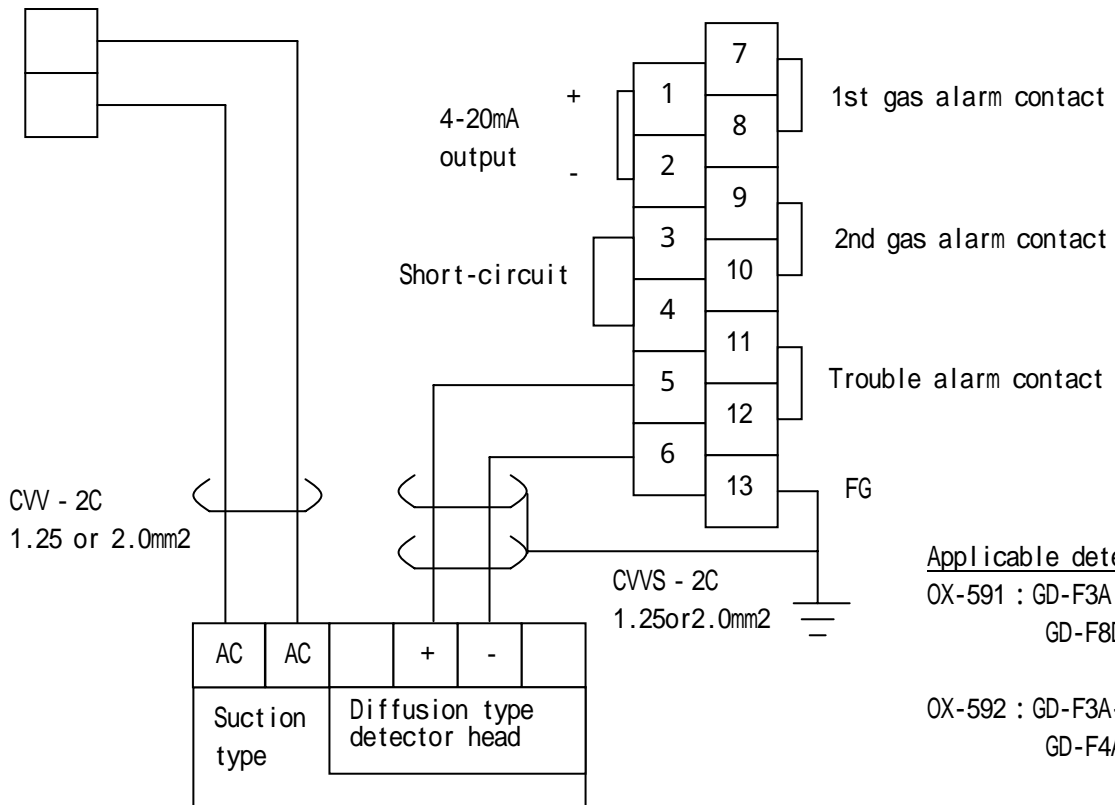


• OX - 5 9 1 (Direct transmission) / OX-592(4-20mA transmission)

for galvanic cell type detector heads

Terminal plate for pump in power unit

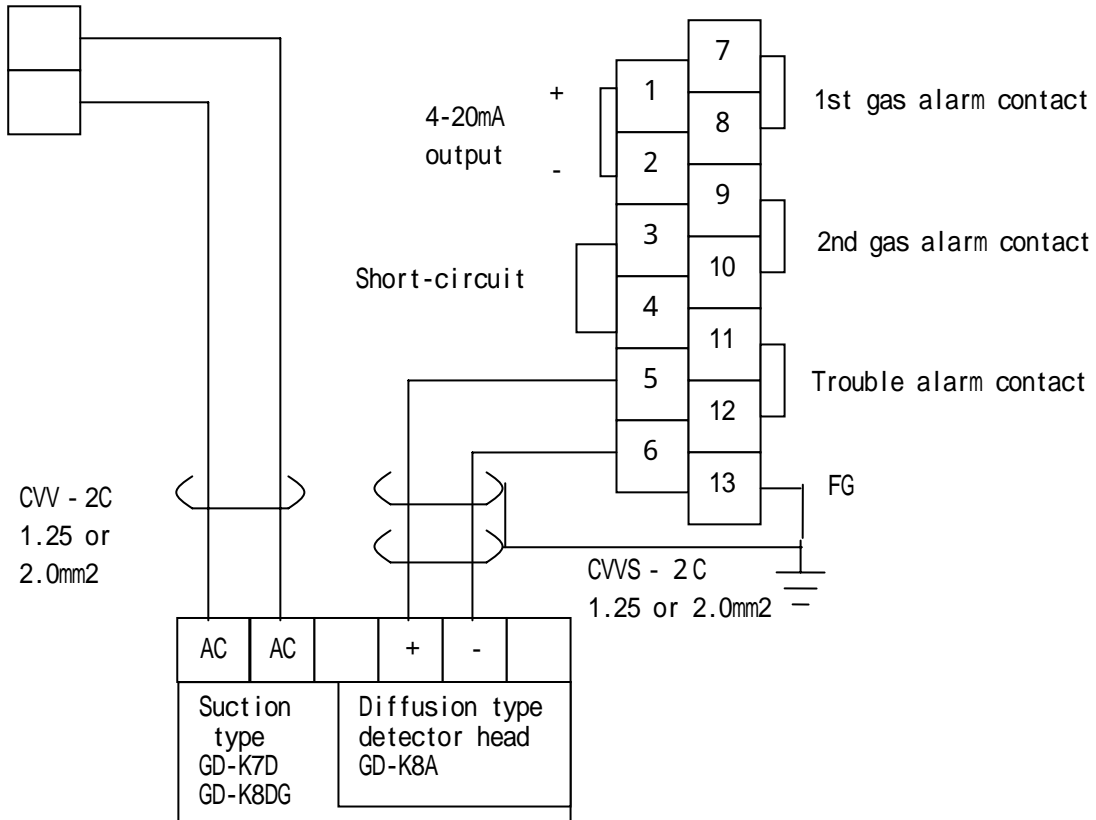
Terminal plate of indicator/alarm unit
in multi-unit case



• EC - 5 9 2 for electrochemical cell type detector heads.

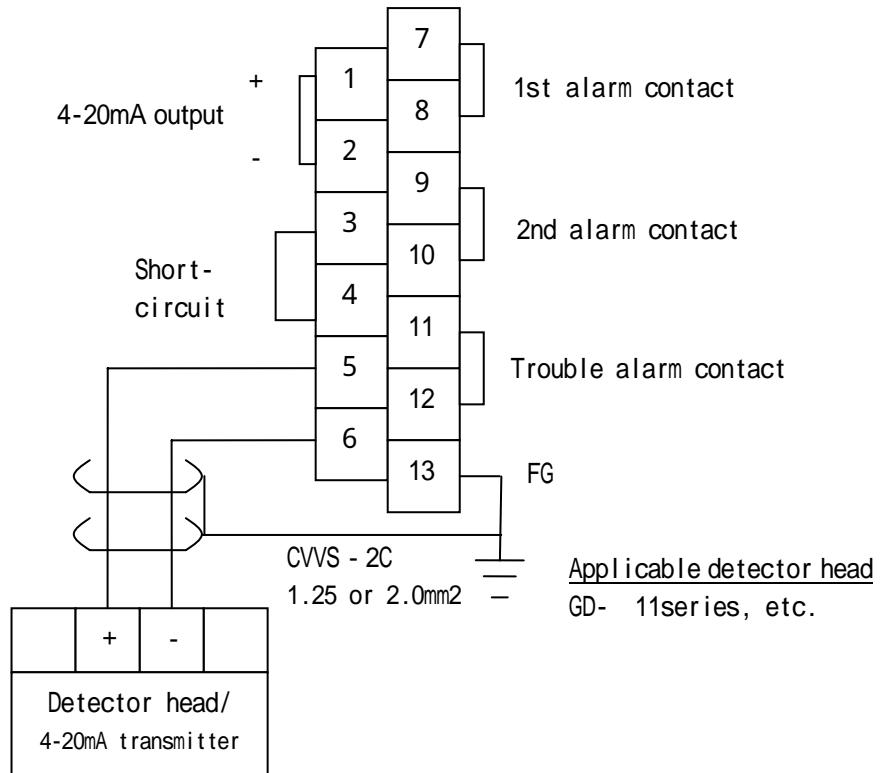
Terminal plate for pump in power unit

Terminal plate of indicator/alarm unit
in multi-unit case



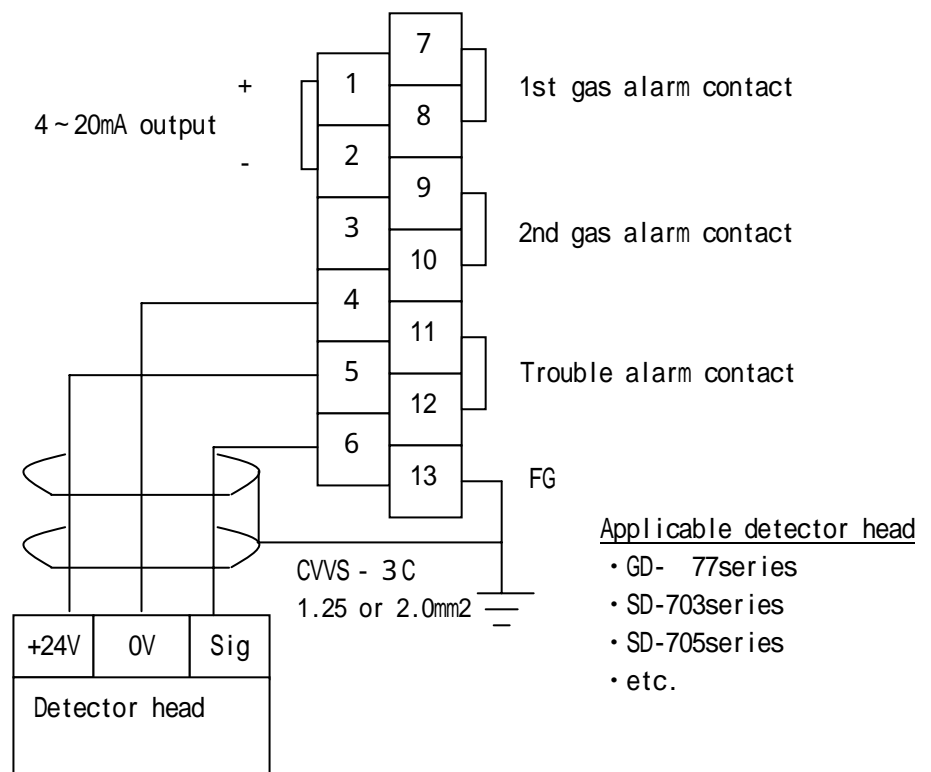
- RM - 5 9 2 for 2-wire, 4~20mA general measuring signal or detector heads.

Terminal plate of indicator/alarm unit
in multi-unit case



- RM - 5 9 3 for 3-wire, 4-20mA detector heads

Terminal plate of indicator/alarm unit
in multi-unit case



6. PRODUCT SPECIFICATIONS

Model	: 590 - W, Wall mounting design 590 - R, Panel/Rack mounting design
Applicable unit	: Indicator/alarm unit for RM-590 series and TAN-590
Structure	: Wall or panel/rack mounting, unit coupling method Number of coupling unit: Up to 12 indicator/alarm units.
Power requirement	: 100 ~ 240 VAC, 50/60 Hz
Power consumption	: Max250VA(including 12 indicator/alarm units)
Output	: 24VDC, Max 10W 100 ~ 240 VAC, 50VA(For pump)
Fuse	: 250V 5A T(For power source) 250V 2A T(For pump)
External terminal	: Screw type(3mm)
Outer dimensions & weight	: <u>Panel/Rack mounting design</u> 590-04R : Approx 261(W) × 260(H) × 153(D)mm Approx 5.7kg 590-06R : Approx 334(W) × 260(H) × 153(D)mm Approx 7.1kg 590-09R : Approx 443(W) × 260(H) × 153(D)mm Approx 9.2kg 590-12R : Approx 552(W) × 260(H) × 153(D)mm Approx11.3kg <u>Wall mounting design</u> 590-04W : Approx 261(W) × 260(H) × 156(D)mm Approx 5.7kg 590-06W : Approx 334(W) × 260(H) × 156(D)mm Approx 7.1kg 590-09W : Approx 443(W) × 260(H) × 156(D)mm Approx 9.2kg 590-12W : Approx 552(W) × 260(H) × 156(D)mm Approx11.3kg