GasGuard M16

Gas Detection Controller

Operation and Maintenance Manual

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RESPO
Responsive Detection

Warning

Respo reserves the right to update the contents of this manual, in accordance with the evolution of the product.

Text and pictures in the manual are not binding on Respo.

CONTENTS

1. Warning

1.1. Notes

All users must imperatively read this manual for their own safety, the safety of those around them and safety of the device. In order to protect the device from being damaged, all users are required to operate the device in accordance with the instruction manual.

Respo shall not be reliable if the device is not used other than as instructed.

Respo shall not be reliable in event of abnormal use of the device or malicious tampering with the product.

1.2. Recommendations

For safety consideration, only professional personnel who have been trained regularly can operate the controller.

The device shall be maintained regularly only by people who have been trained by Respo. Only Respo permitted spare parts can be used.

Respo shall not be reliable if all recommendations above are not obeyed correctly.

If users modify, repair or replace parts without Respo permission, it may cause damage to the equipment, the user should be responsible for it themselves.

In some strong electromagnetic interference environments, it may cause the instrument under abnormal working proceeding.

Please ground the instrument effectively to ensure normal operation of the product.

If you have any questions, please call Respo after-sales hotline: 400 880 6090, or contact the authorized distributors.
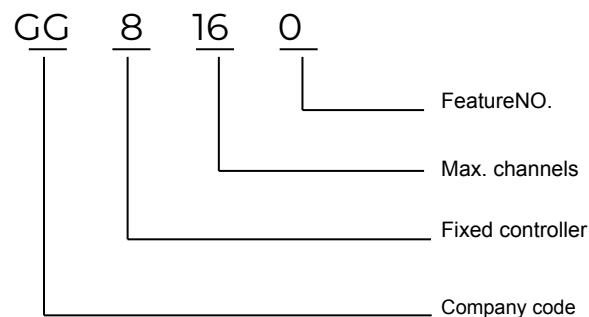
1.3. Instruction

Model number: GasGuard M16 gas detection controller, worked together with GC710 or GC720 gas detector as gas detection alarming system.

2. General introduction of product

GasGuard M16 gas detection controller is designed to detect the gas concentration in the air with multi-point detection, connecting with any fixed gas detector to form a complete gas detection system. The controller uses an advanced ARM microprocessor as a control unit. It can show the real time gas concentration very quickly. When gas concentration in the air reaches or exceeds the preset alarm value, the controller will immediately give out audio and visual alarming to remind the user to take some measurements in time and control the driver ventilation or other parts to avoid explosion, fire or poisoning accidents. GasGuard M16 is widely used in factories, oil tanks, gas stations, painting rooms or other environments where a Gas Detection Controller is required.

2.1. Model number and meaning

```
GG    8    16    0
                 └──── FeatureNO.

           └──────── Max. channels

      └────────────── Fixed controller

└──────────────────── Company code
```

2.2. Standards

GasGuard M16: Gas detection alarming controller for 16 Channels
GasGuard M8: Gas detection alarming controller for 8 Channels

2.3. Working condition

1) Ambient temperature: -20℃～+55℃
2) Relative humidity: ≤93%RH non-condensation

3. Main features and function

- Independent units for free combination, available with many gas detectors;
- High precision, complete function and high stability;
- Diverse processing method, e.g. software compensation, and digital filtering, which increased not only detection precision, but also enhanced anti-interference to effectively avoid fault alarming.

- Interaction output for each channel
- Password locking function to avoid wrong operation or unauthorized people to install; easy maintenance;
- Panel-mounted design for easy installation;
- Simultaneously detection of 16 channels, real time detection of gas concentration for each channel, High / low alarm function, record alarm period and remain alarming till reset position;
- In case of simultaneous alarming of different channels, the main control panel records alarming quantity and sequence for easier checking;
- Short circuit, open fault can be detected in the connecting cables and sensors;
- It can detect the lack of pressure in main power and spare power, short circuit and open fault;
- Many functions, such as reset, self-checking, silencer, concentration display, output control, recording etc.

4. Description of main parts

4.1.Controller

GasGuard M16-controller casing is standard 3U19 casing, made of aluminium alloy. Clear LCD show and LED warning lights of state are fixed on the front panel. The key press is easy to operate and the response is sensitive. As shown in Figure 2:
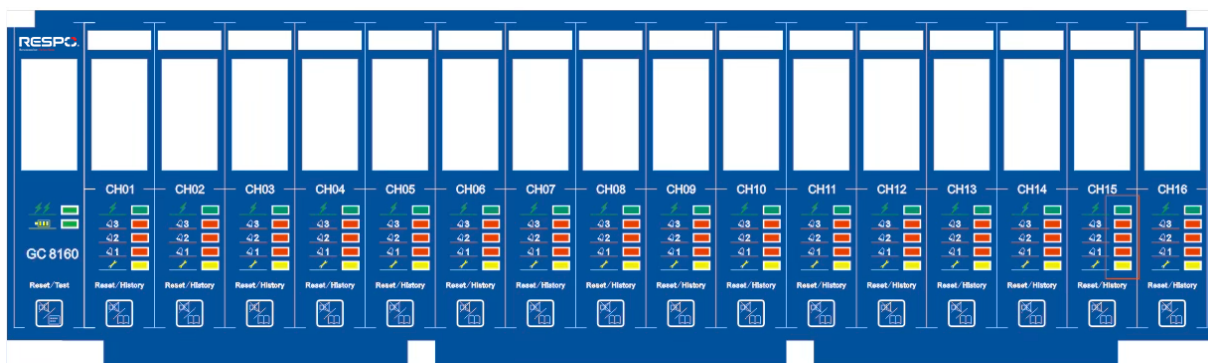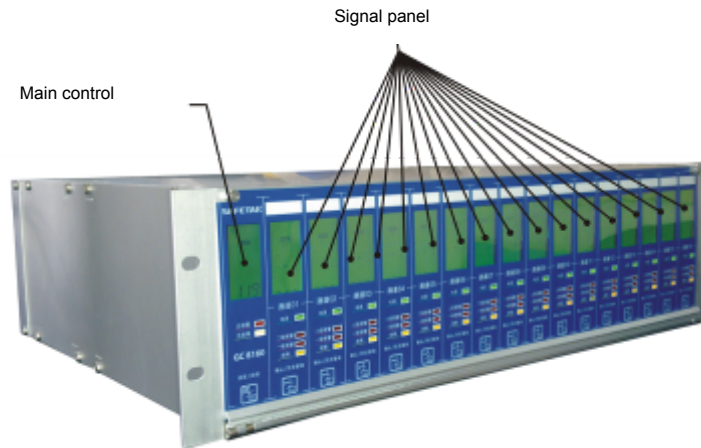
Figure 1

Three kinds of circuit panel for GasGuard M16:
- Main control panel: main status handling, main signal output and programming operation.
- Signal panel: power supply, receiving data and showing status of all detection channel.
- Back pack: signal output and input interface for power and detectors

The channel board can install maximum 16 pieces, to achieve the four-channel or 8-channel input signal.

5. Installation

5.1. Installation recommendations

GasGuard M16 should be placed in a safe place (not explosive place). Ventilation and monitored place is best (such as guard room, the control room, instrument room)

Points for Attention:

1. Do not install it in humid areas with much water drops, water vapour, etc.
2. The removal or repair is prohibited. If you have any questions, please contact us as soon as possible.
3. Main power supply: AC 220V, 50Hz±5Hz
4. The main power ground wire must be connected to the earth (the inside ground connection inside the controller is through the power line to the ground and the earth) to ensure that the controller can be safe and reliable operation.

5. The ambient environment is forbidden to have strong magnetic influence, which can effect the normal operation of the equipment. (e. g. high power motor, transformer)
6. The controller has the function of audible and visual alarm, thus it should be fixed in places where the user can see and hear it easily, so that it is easy for checking and maintenance regularly.
7. The detector connected with this controller is mainly to detect gas, so the user has to be very careful to avoid ant damage to the detector.
8. A protection hose has to been equipped on connecting cable for alarm circuit. It is suggested to add a metal hose on the connection to the detector. Pay attention to the have the same EX proof level with the factory.
9. After installation and calibration, the exposed parts have to be equipped with a ventilated water proof cover in order to avoid damage caused by water.

5.2.Connection mode

Please refer to appendix A for the connection diagram.

Notes: Three core power cables should be used to connect the detector. Shielding layer should be connected with the ground line of the controller to ensure normal operation of the equipment.

6. Switch on

6.1.Switch on

1) Connect main power and all detectors well, and then turn on the main power inside the controller;
2) Turn on the emergency power supply and the standby power supply. Hereunder is the content shown on the screen and the meanings:

Count down of the main control panel:
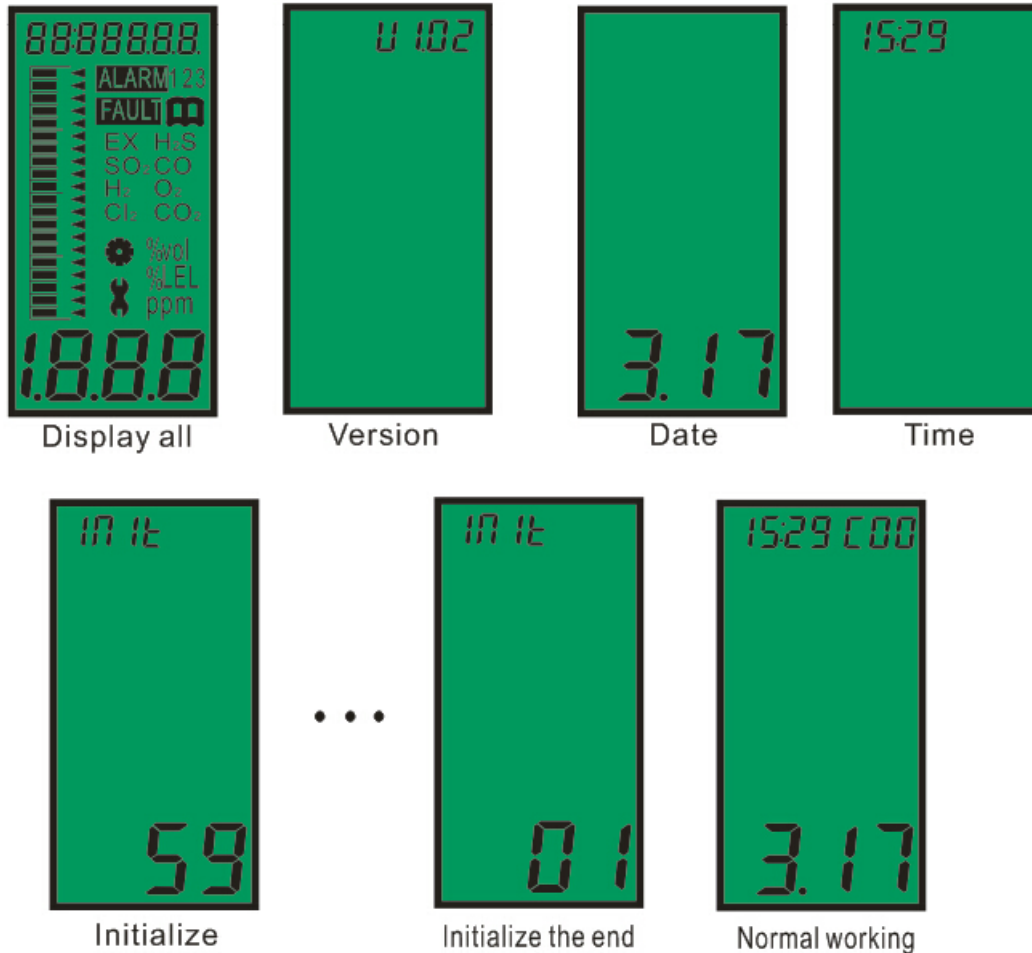
| Display all | Version | Date | Time |

| Initialize | Initialize the end | Normal working |

Notes :
1) Check if all the letters are written well without any missing characters;
2) Check if the version number conform with the user's requirement;
3) Check if the date and time is correct; if not, modify it after count down.
4) When the count down finished, the controller comes into normal working status.

Display of channel board during count down:

| Display all | Version | Range | Alarm 1 | Alarm 2 | Alarm 3 |

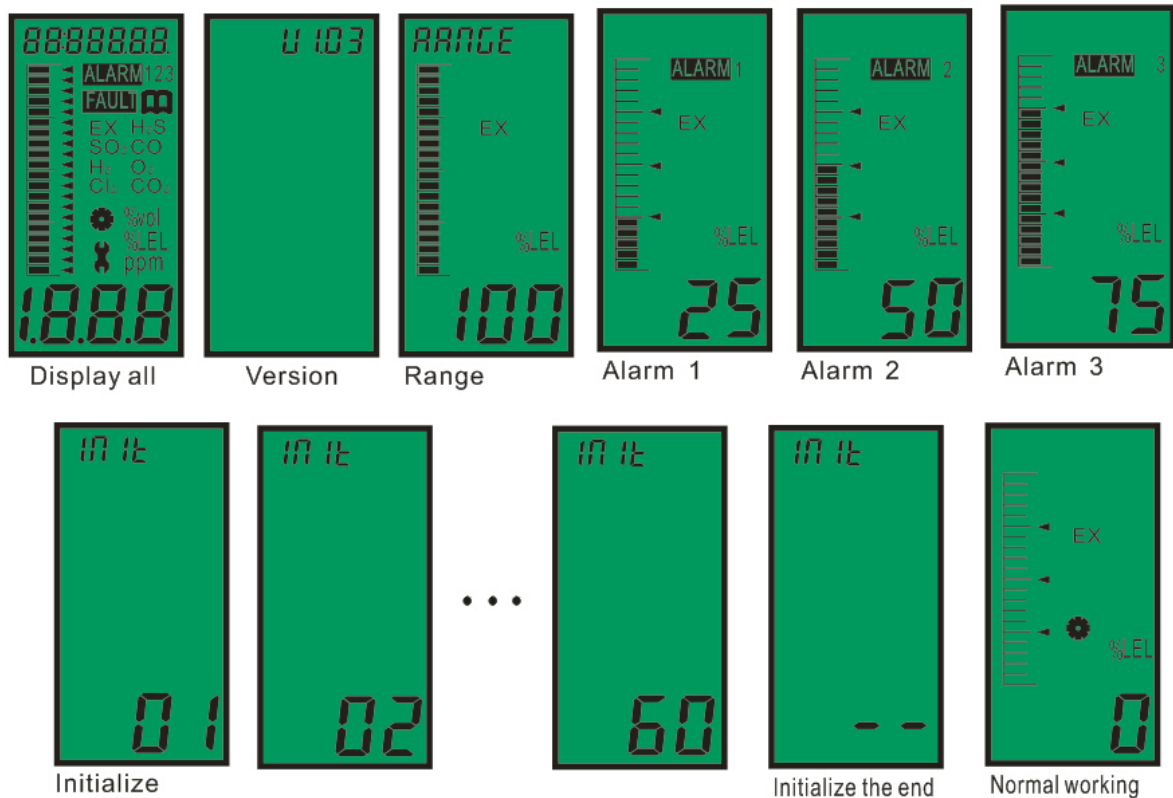| Initialize | | ... | | Initialize the end | Normal working |

Notes :
1) Check if all the letters are written well without any missing characters;
2) Check if the version number conform with the user's requirement;
3) Check if the range and alarm points are correct ;
4) After count down, the controller came into normal working status.

Note :
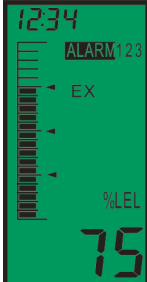- During count down, if the range or alarm points are not correct, please reset it after finish of the count down to avoid mistakes on wrong detection;
- After entering normal working status, the real time concentration of gases detected is shown on the screen ;

6.2.Fault status

Under normal working status. If problems happened, the status of LED, indicator, sound and relay are as follows.
Working status of channel board:

Status	Fault alarm	Alarm 1	Alarm 2	Alarm 3	Over range alarm
Trouble light	on	/	/	/	on
Alarm 1	/	on	on	on	on
Alarm 2	/	/	on	on	on
Sound	on	on	on	on	on
Relay 1	/	Action	Action	Action	Action
Relay 2	/	/	Action	Action	Action
LED display					

Working status of the main control panel:

Status	Fault alarm	Alarm 1	Alarm 2	Alarm 3	Over range alarm
Main fault light	on	/	/	/	on
Main alarm light	/	on	on	on	on
Sound	on	on	on	on	on
Fault relay	Action	/	/	/	Action
Alarm relay	/	/	/	Action	Action

LED display	15:29 00 3.17	15:29 02 ALARM -A-	15:29 02 ALARM -A-	15:29 02 ALARM -A-	15:29 02 FAULT -F-

6.3.Operation

6.3.1.Introduction of the control panel
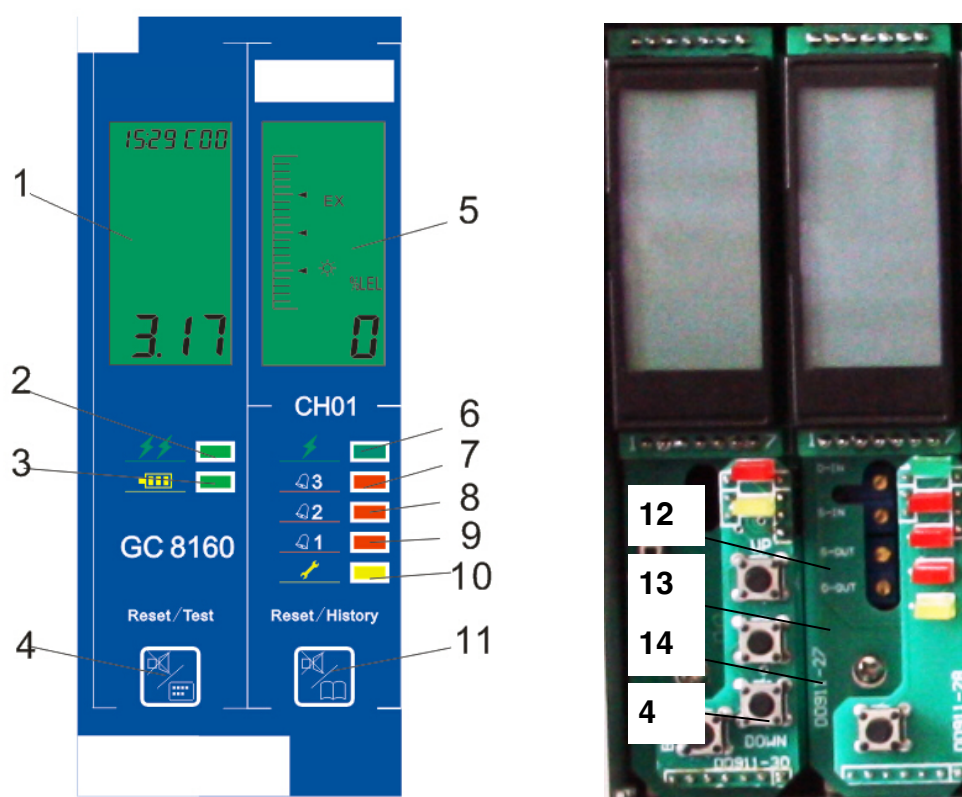
Figure 3

Item	Description	Item	Description
1	LCD display of main control panel	8	Alarm 2
2	Power of main control panel	9	Alarm 1

3		10	Fault indicator
4	Silencer key Upward key	11	History data checking key
5	LCD display of channel board	12	Upward key
6	Power indicator	13	Funtion key
7	Alarm 3	14	Downward key

6.3.2.Normal detection mode

Under normal detection mode, if the channel board is on, it is displayed relative gas information and real time concentration value; if not, no any indication and the backlight is off.

6.3.3.Self-checking mode

Turn on the power key, restart the equipment or press on the main control panel to enter self-checking mode.

6.3.4.Program mode

When there is no malfunction or alarm, you can press "confirm" button and then enter password mode (See Figure 4). Blank screen on each channel and type in the password, press "confirm" button to enter menu mode.

Notes: The original password for control module is 112. The original password signal channel module is 806.

If the password is wrong, you will enter the error message interface, shown as in Figure 5, and you can enter password again.
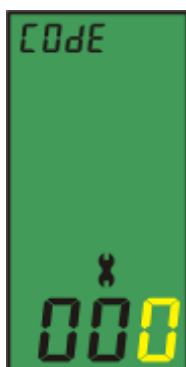
Figure 4   Figure 5

6.3.5.Menu

After inputting the correct password, you can select the up or down key to enter into the sub-menu.

Function No.	Description
01	Main control panel menu
02	Channel board menu
03	Machine Self-checking
04	Machine reset

6.3.6.Main control panel

Main control panel has totally 9 sub-menus as follows.

Function No.	Description
01	Change date
02	Change time
03	Change password of main control panel
04	Change password of channel board
05	Change ID
06	Back light setting ①
07	Remove all history
08	The whole machine restore factory Settings
09	Channel parameter copy

Notes: ①When LCD backlight is off, any alarm status of the system will still automatically start backlight and will be off after the alarm status recover.

6.3.7.Channel board

Panel board have totally 14 sub-menus, they are:

Function No.	Description
01	Channel switch
02	Set gas type
03	Set gas measuring unit
04	Set range
05	Set decimal point
06	Set Alarm 1 ①
07	Set Alarm 2 ②
08	Set Alarm 3 ③
09	Level 1 relay delay time
10	Level 2 relay delay time
11	Level 3 relay delay time
12	Fault relay delay time
13	Remove history
14	Restore factory Settings

Note: Alarm set must follow: ③ > ② > ①

7. Technical data

Type	Flammable gas detection controller
Model	GasGuard M16
Input signal	4～20mA
Detection mode	Continuous detection, detect multi-channels simultaneously
Alarm type	Fault, alarm and over range
Alarm method	Audible alarm, visual alarm and relay output
Alarm level	Alarm 1 Alarm 2 and Alarm 3
Output interface	Three separate alarm 1 relay alarm 2 relay and alarm 3 relay for each channel
Connection capacity	AC250V 3A
Output signal	4-20mA signal simulation output for each channel (optional)
Communication interface	RS485/RS232
Power supply	AC220V
Current	≤1.0A (for the whole device)
consumption	≤4W (each channel)

Appendix A
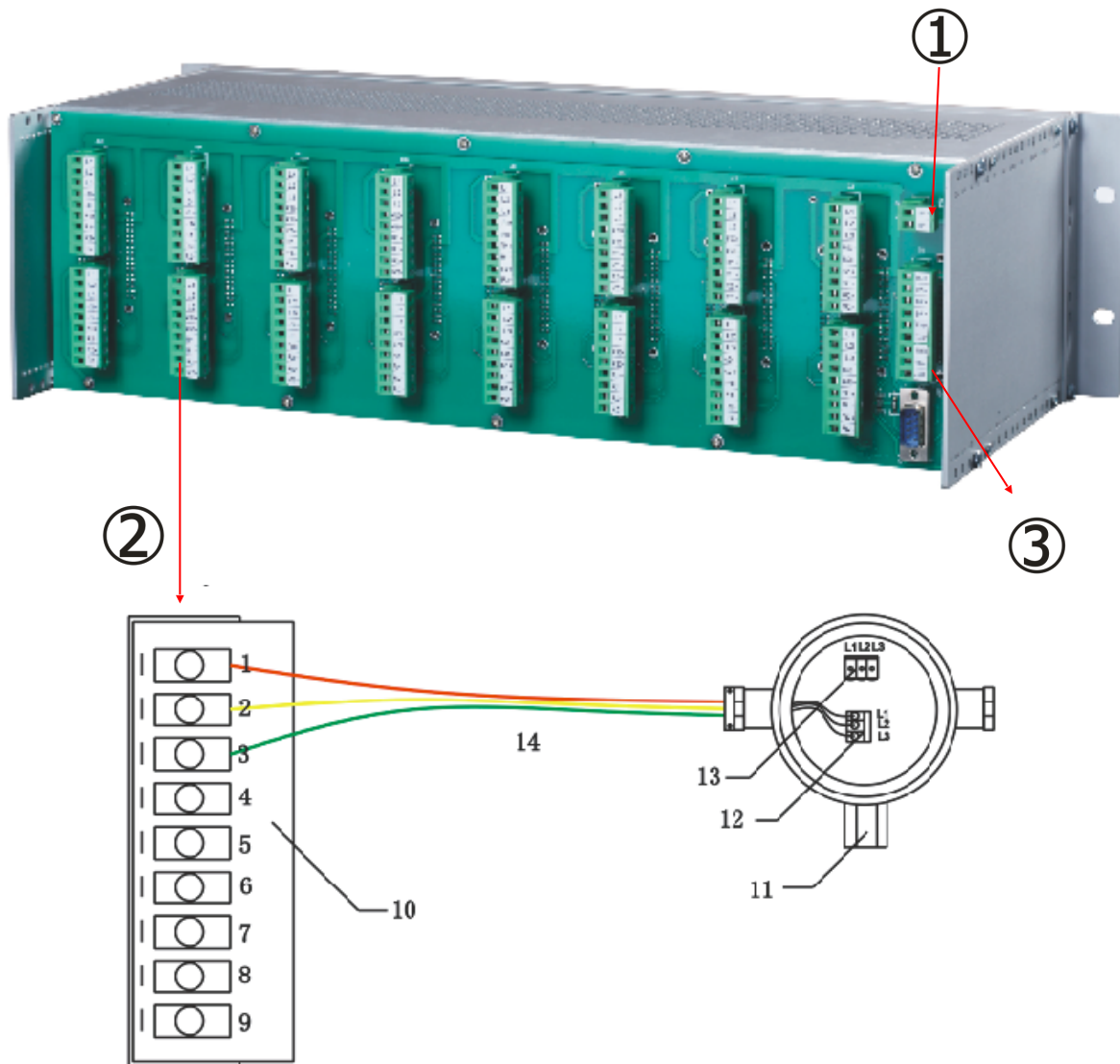
Instruction:
1. Reserve 5cm of the shielding layer, reserve the conductor wire 2cm, and peel off 0.5cm cover of the conductor wire;
2. Cross the cable through the detector and make sure the shielding layer is completely inside the detector cover. Fasten and fix the cable with the fastening screw without any movement.

3. Connect firmly the cable to the plug as the sequence of RED-L1, YELLOW-L2 and GREEN-L3. And then connect the plug(item 12) to the plug (item 13) as the sequence of L1L2L3.

Terminal	Description
Up	DC 24V
Down	GND

Excel 1: Introduction of power terminals
(See Terminal① in Appendix A)
Excel 2: The connection list with the flammable gas detector
(See Terminal②in Appendix A)

item	Name	Description
1	4～20mA ＋ （IN） （L1）	Detector's signal output to the controller
2	GND （L2）	The ground has to been connected with the outer cover, and connect with ground of cabinet throught cable.
3	DC24V （L3）	Working power supply of detector is supplied by the controller.
4	4～20mA ＋ （OUT）	Standard 4～20mA output, available with other instruments display or other functions.
5	4～20mA － （OUT）	
6	Aarm 1 relay ＋	When concentration reaches Alarm 1 point, the relay works, available with always on or off. Contact load: AC250V 3A
7	Aarm 1 relay －	
8	Aarm 2 relay＋	When concentration reaches Alarm 1 point, the relay works, available with always on or off. Contact load: AC250V 3A
9	Aarm 2 relay －	
10	GasGuard M16 connection terminals inside signal board	Input and output terminals for connecting of detector or others
11	GC710/720 flammable gas detector	Transfer concentration of flammable gas into 4～20mA signal
12	Connection plug	Screw on the three core cable, connect 4～20mA signal, GND and DC24V
13	Detector connection plug	Detector's 4～20mA signal, GND and DC24V

14	Three core shielding cable	Three core cable is used to prevent influence by the ambient environment, which makes the using of equipment more reliable.

item	Name	Description
1	RXD	Serial Port Communication interface
2	TXD	
3	GND	
4	RS485 A	RS485 Communication interface (standard RS485)
5	RS485 B	
6	R3+	When concentration reaches Alarm 3 point, the relay works, available with always on or off. Contact load: AC250V 3A
7	R3-	
8	F +	When GC710/720 open circuit or short circuit, the relay works, available with always on or off. Contact load: AC250V 3A
9	F -	

Appendix B

RESPO.

Responsive Detection
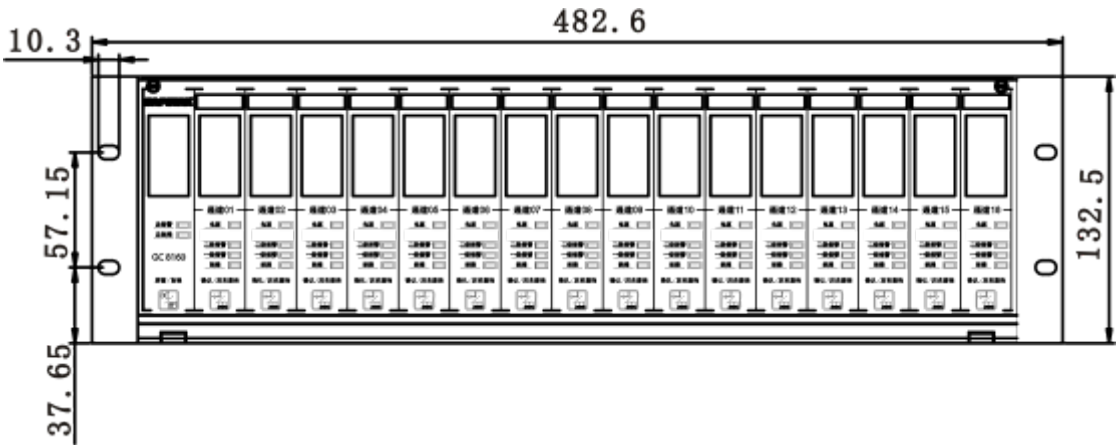
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