



GST104S/108S/116S

Conventional Fire Alarm Control Panel



Installation and Operation Manual

Issue 1.01

ERP: 30314277

QUICK OPERATION GUIDE	
PANEL BUZZER:	Press the “SILENCE BUZZER” button to silence the panel buzzer.
For any of the below functions you must be in Access Level II mode	
ACCESS LEVEL II MODE:	Insert the Control Enable and turn to the “ON” position.
WARNING SYSTEM ACTIVATION:	Press the “EVAC” button for manual activation of the warning system. Alternatively, if an alarm has been activated press the “SILENCE/RESOUND ALARM” button to silence or reactivate the warning system.
FIRE MODE DISABLING:	To disable zones in fire mode, press “DISABLE” to disable all zones that have been activated in fire mode.
DISABLING ZONES:	<p>Press the “Disable/Enable” button.</p> <p>Use the “Scroll” button to cycle through to the desired zone or sounder output.</p> <p>Press the “Enter” button to save.</p> <p>Press the “Scroll” button to continue to additional zones/sounder outputs.</p> <p>Press the “Cancel” to exit this menu.</p>
DELAY MODE ON/OFF	Press the “Delay” button to switch the Delay Mode.
PANEL RESET:	Press the “RESET” button.
EXIT:	Turn the Control Enable to the “OFF” position and remove the key.

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Installation Precautions

Adherence to the following will aid in problem-free installation with long-term reliability:

- ✧ Do not attempt to install, service, or operate this unit until this manual is read and understood.
- ✧ This equipment must be installed in accordance with these instructions and the appropriate national, regional and local regulations specific to the country and location of the installation. Consult with the appropriate authority having jurisdiction for confirmation of the requirements.
- ✧ The CIE shall only be installed and serviced by specially trained fire alarm system technicians.
- ✧ Disconnect all sources of power before servicing. The CIE may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized.
- ✧ Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with batteries and printed circuit board location.

Chapter 1 Product Overview

104S/108S/116S Conventional Fire Alarm Control Panel is designed by GST. It is compatible with a series of GST conventional products. For details, please refer to Appendix A. The panel is easy to install and operate. Control functions are enabled by a key switch. Programming functions are enabled by an internal switch.

This series of panels are basically the same in application and operation, their only main differences being the amount of zones, see table 1-1.

Table 1-1

FACP	Number of Detection Zones
GST104S	4
GST108S	8
GST116S	16

1.1 Features

- ✧ Supports up to 16 detection zones, with conventional detectors and manual call points; the maximum number of external conventional points per zone is 32.
- ✧ Two sounder outputs, one alarm output, one fault output and one AUX output.
- ✧ Detecting open-circuit and short-circuit faults of the zones and sounders, and detecting short-circuit faults of AUX.
- ✧ Test and disable functions
- ✧ Programmable on System Configuration and Output Configuration by Config Tool.exe.
- ✧ Three access levels settable via the key switch and the internal switch.
- ✧ Optional repeater board with repeater panel interface for fire alarm indication of multiple zones.
- ✧ Optional relay board with relay interface for fault and fire alarm indication of multiple zones.
- ✧ Designed with standby batteries and space provision for two sealed lead-acid batteries.
- ✧ The maximum number of points per CIE as shown in Table 1-2.

Table 1-2

FACP	GST104S	GST108S	GST116S
Max points	≤128	≤256	<512

1.2 Technical Specifications

1.2.1 Operating Voltage

- ✧ AC power: 110VAC~240VAC, 50/60Hz, 1.5A~0.7A(Maximum Alarm)
- ✧ Recommended Wiring: 1.5mm² or above of shielded cable, complying with local installation code.

Note:

Please note the AC power input (with ground bonding wire) must be in compliance with ratings on the FACP's label.

1.2.2 Batteries

- ✧ Rated voltage: 24VDC
- ✧ Float charging voltage: 27.3V
- ✧ Minimum Operating Voltage: 21V
- ✧ Maximum Charging Current: 700mA
- ✧ Maximum Internal Resistance: 1.0 Ω
- ✧ Battery Type: Sealed lead-acid battery
- ✧ Minimum Batteries: 2 batteries, 7Ah/12VDC
- ✧ Recommended Battery and Model: LEOCH DJW12-7.0
- ✧ The maximum output current in standby condition ($I_{max a}$): 0.2A
- ✧ The maximum output current in alarm condition ($I_{max b}$): 2.6A
- ✧ The minimum quiescent current when the FACP is without load (I_{min}) is shown in Table1-3.

Table 1-3

FACP	GST104S	GST108S	GST116S
$I_{min}(mA)$	60	80	120

1.2.3 Detection Zone

The control panel supports up to 16 detection zones, and the number of external conventional detectors in each zone reaches 32, with the following parameters:

- ✧ Loop Voltage: 15VDC~28VDC
- ✧ Maximum output current per zone: 200mA.
- ✧ Dynamic Current: Resistance range for fire alarm is about 100 Ω ~1.3k Ω (normally 470 Ω), using a 4.7k Ω end of line resistor or AEOL (active end of line unit). The alarm current for a zone depends on the number of conventional devices in the zone. The alarm current for a conventional detector is about 25mA.
- ✧ Maximum output current for the 16 detection zones is 400mA.
- ✧ Recommended Wiring: 1.0mm² or above 2 core cable, complying with local installation codes.
- ✧ Recommended Cable Length: no more than 1000m

1.2.4 Output Interface

- ✧ Fault Output
 - Type: normally open/close contact output
 - Contact capacity: 1A/24VDC
- ✧ Alarm output
 - Type: normally open contact output
 - Contact capacity: 1A/24VDC
- ✧ Sounder 1/2 output
 - Type: voltage output
 - Output voltage: 20VDC~28VDC

- Output current: 300mA in alarm
- End-of-line-resistor: 4.7kΩ
- ✧ Auxiliary Power Output
 - Type: voltage output
 - Output Voltage: 20VDC~28VDC
 - Output current: 20mA in standby mode and Maximum 1A in alarm mode
- ✧ Repeater 24V output (on Repeater Board)
 - Type: voltage output
 - Output Voltage: 20VDC~28VDC
 - Output current: Maximum 0.06A
- ✧ Repeater other output (on Repeater Board)
 - Type: open-collector output
- ✧ Fault and alarm output (on Relay Board)
 - Type: normally open contact output
 - Contact capacity: 1A/24VDC
- ✧ Recommended Wiring: 1.0mm² or above 2-core cable, complying with local installation codes.
- ✧ Recommended Cable Length: no longer than 1000m

1.2.5 Input Interface

- ✧ RESET/EVAC/SILENCE input (on Repeater Board)
 - Type: normally open contact input
- ✧ Recommended Wiring: 1.0mm² or above 2-core cable, complying with local installation codes.
- ✧ Recommended Cable Length: no longer than 1000m

1.2.6 Installation and Storage

Temperature: -5°C~50°C

Relative humidity ≤ 95%, non-condensing

1.3 Controls and Indications

The fascia of the GST116S is shown below in Fig. 1-1. The fascia of the GST108S/GST104S is similar to GST116S with fewer zones.

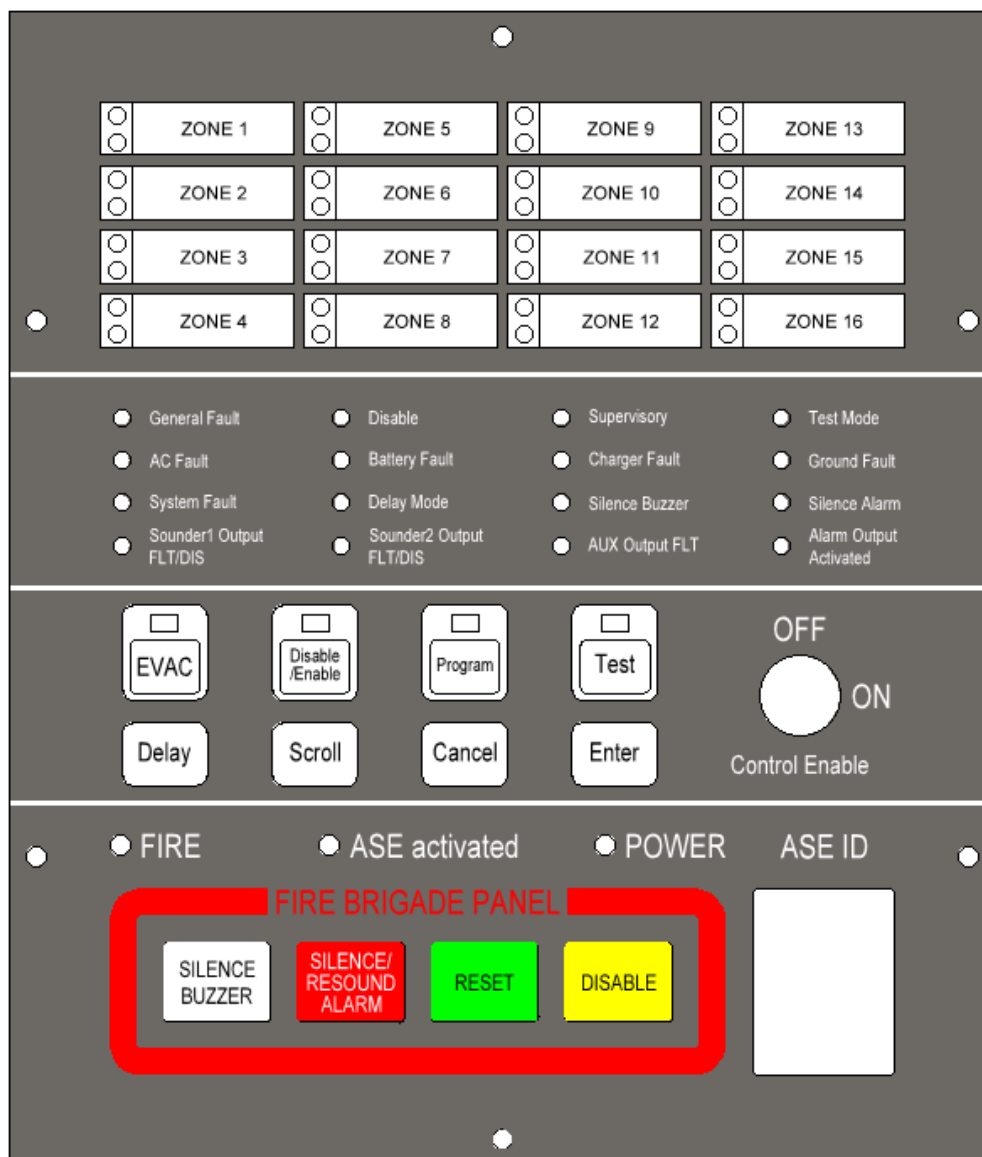


Fig. 1-1

1.3.1 Common Status Indicators

- ✧ **FIRE:** Red. It flashes when there is fire alarm and illuminates steadily when the fire sound is silenced.
- ✧ **ASE activated:** Red. It illuminates steadily when the sounder output is activated.
- ✧ **POWER:** Green. It illuminates steadily when the CIE is powered up.
- ✧ **General Fault:** Yellow. It flashes when there is a fault and illuminates steadily when the fault sound is silenced or the CIE enters safe state.
- ✧ **Disable:** Yellow. It illuminates steadily if any zone, sounder output is disabled.
- ✧ **Supervisory:** Yellow. It flashes when any zone defined as supervisory is activated. It illuminates steadily when the supervisory sound is silenced.
- ✧ **Test Mode:** Yellow. It illuminates steadily when any zone is in test condition.
- ✧ **AC Fault:** Yellow. It flashes when there is mains fault and illuminates steadily when the fault sound is silenced.
- ✧ **Battery Fault:** Yellow. It flashes when there is battery fault and illuminates steadily when the fault sound is silenced.

- ✧ **Charger Fault:** Yellow. It flashes when there is charger fault and illuminates steadily after the fault sound is silenced.
- ✧ **Ground Fault:** Yellow. It flashes when any cable of sounder output, auxiliary power output or zone input, connects with the enclosure of the panel. It illuminates steadily when the fault sound is silenced.
- ✧ **System Fault:** Yellow. It illuminates steadily when the CPU is in fault condition or CPU communication is abnormal.
- ✧ **Delay Mode:** Yellow. It illuminates steadily when the alarm output and sounder output delay switch is on. It flashes when there is an alarm output or sounder output in delayed condition.
- ✧ **Silence Buzzer:** Yellow. It illuminates steadily when the buzzer is silenced.
- ✧ **Silence Alarm:** Yellow. It illuminates steadily when the sounders are silenced.
- ✧ **Sounder1 Output FLT/DIS:** Yellow. It flashes when Sounder 1 output is in fault condition, and it illuminates steadily when Sounder 1 output is disabled.
- ✧ **Sounder2 Output FLT/DIS:** Yellow. It flashes when Sounder 2 output is in fault condition, and it illuminates steadily when Sounder 2 output is disabled.
- ✧ **AUX Output FLT:** Yellow. It flashes when there is AUX Output fault and illuminates steadily after the fault sound is silenced.
- ✧ **Alarm Output Activated:** Red. It illuminates steadily when the alarm output is activated.

1.3.2 Zone Status Indicators

- ✧ **ZONE RED LED:** Red. It flashes when a zone is in fire condition (0.5: 0.5) . And it illuminates steadily after Silence Buzzer is pressed.
- ✧ **ZONE YELLOW LED:** Yellow. It flashes when the zone is in fault condition (0.5: 0.5) . And it illuminates steadily when the zone is disabled or in test mode.
- ✧ **ZONE Supervisory LED (Z1~Z16) :** It flashes when the zone defined as supervisory is activated. It illuminates steadily when the supervisory sound is silenced.

1.3.3 Operating Indicators and Keys

An audible prompt will be generated when any key is activated.

- ✧ **Keys**
 - **SILENCE BUZZER:** In Access Level I fault sound, supervisory sound, and alarm sound can be silenced. Silence Buzzer LED illuminates yellow steadily when the buzzer is silenced.
 - **SILENCE/RESOUND ALARM:** It is available in Access Level II. Pressing this key can silence all the sounder outputs; pressing it again in fire condition, the silenced sounders output will be activated again. Silence Alarm LED illuminates yellow steadily when the sounders are silenced.
 - **RESET:** It is available in Access Level II for resetting the control panel.
 - **DISABLE:** It is available in Access Level II. Pressing this key can disable all zones with a fire condition.
 - **Delay:** It is available in Access Level II. Pressing this key can switch delay mode.
 - **Scroll:** It is available in Access Level II for scrolling to choose.
 - **Cancel:** It is available in Access Level II for cancellation.
 - **Enter:** It is available in Access Level II for confirmation.
- ✧ **Keys with LEDs**

- **EVAC:** It is available in Access Level II. Pressing this key can start all sounders for evacuation and the LED illuminates yellow steadily.
- **Disable/Enable:** It is available in Access Level II. Pressing this key can disable or enable an output or a zone and the LED illuminates yellow steadily.
- **Program:** It is available in Access Level III. Pressing this key can program system configuration and output configuration. The LED illuminates yellow steadily.
- **Test:** It is available in Access Level II. Pressing this key can set test status and the LED illuminates yellow steadily.
- ✧ Control Lock
 - **CONTROL ENABLE:** If it's switched to the "OFF" position, the CIE is at the access level I. If it's switched to the "ON" position, the CIE is at the access level II.

1.4 Configuration and Functions

1.4.1 Internal Components

The internal construction of the CIE cabinets is shown in Fig. 1-2.

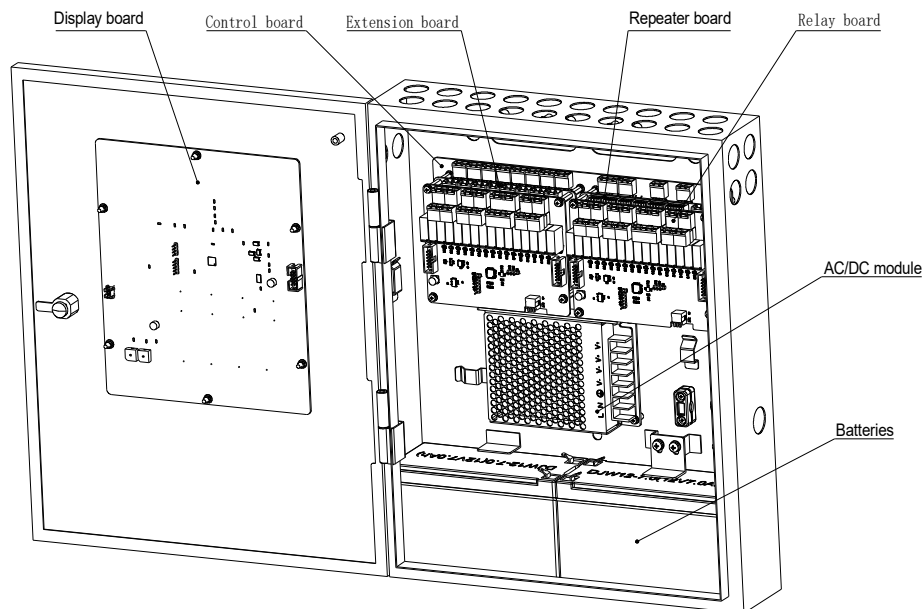


Fig. 1-2

Note: The relay boards need to be installed on the outermost layer.

The relay board, extension board and repeater board shall be set to different addresses via SW1.

1.4.2 Configuration and Functions of GST116S

GST116S control panels have the following configuration and functions.

- ✧ Batteries: Standby power source for the CIE.
- ✧ Control board: For controlling power supply, charger, and all outputs such as fault/alarm relay output, AUX output, sounder outputs and monitoring the state of zone 1 to 8.
- ✧ Display board: For information display and key operation.
- ✧ Extension board: Monitoring the state of zones 9 to 16.
- ✧ Repeater board(optional): Providing RESET/ EVAC/ SILENCE input and repeater output.

- ✧ Relay board (optional): Controlling outputs of alarm relay and fault relay for zone 1 to 16.

1.4.3 Configuration and Functions of GST108S

GST108S control panels have the following configuration and functions.

- ✧ Batteries: Standby power source for the CIE.
- ✧ Control board: For controlling power supply, charger, and all outputs such as fault/alarm relay output, AUX output, sounder outputs and monitoring the state of zone 1 to 8.
- ✧ Display board: For information display and key operation.
- ✧ Repeater board(optional): Providing RESET/ EVAC/ SILENCE input and repeater output.
- ✧ Relay board (optional): Controlling outputs of alarm relay and fault relay for zone 1 to 8.

1.4.4 Configuration and Functions of GST104S

GST104S control panels have the following configuration and functions.

- ✧ Batteries: Standby power source for the CIE.
- ✧ Control board: For controlling power supply, charger, and all outputs such as fault/alarm relay output, AUX output, sounder output and monitoring the state of zone 1 to 4.
- ✧ Display board: For information display and key operation.
- ✧ Repeater board(optional): Providing RESET/ EVAC/ SILENCE input and repeater output.
- ✧ Relay board (optional): Controlling outputs of alarm relay and fault relay for zone 1 to 4.

1.5 Terminal Description

1.5.1 Terminals on the Control Board

Plug terminals on control board of CB108S are shown in Fig. 1-3. control board of CB104S is similar to CB108S with fewer terminals.

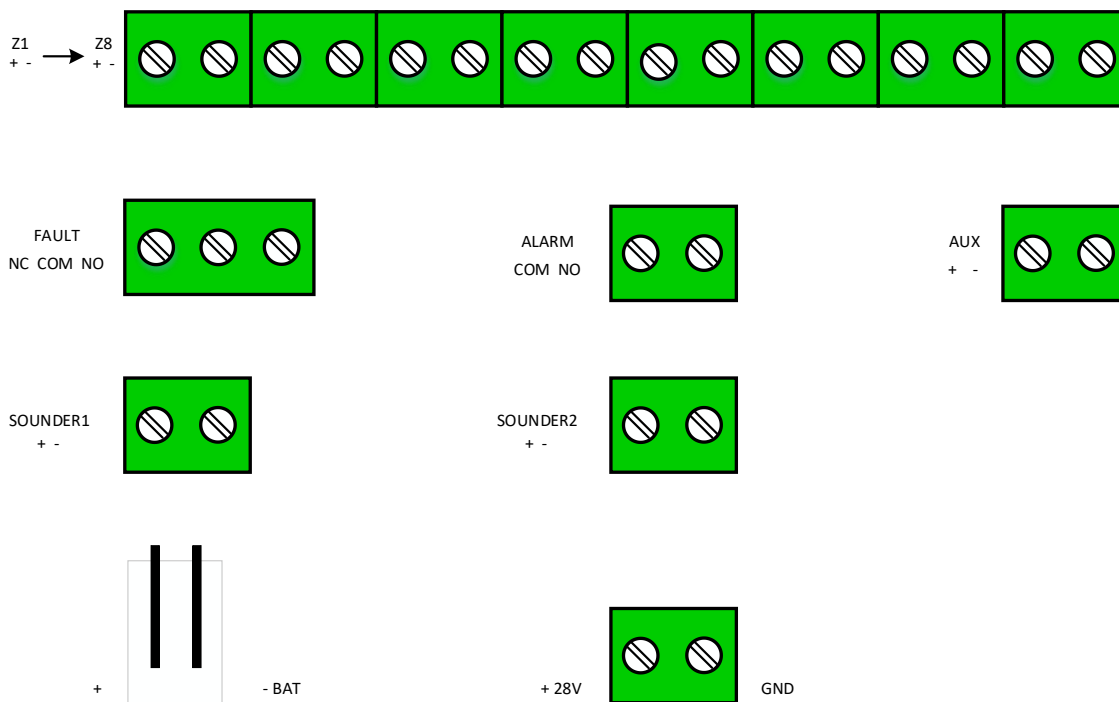


Fig. 1-3

- ✧ **ZONE INPUT (1~8):** Zone 1 to 8 input terminals.
- ✧ **FAULT (NC, COM, NO):** Fault output terminal.
- ✧ **ALARM (COM, NO):** Alarm output terminal.
- ✧ **AUX:** AUX output terminal.
- ✧ **SOUNDER (1~2) (+, -):** Sounder output terminal.
- ✧ **BAT (+, -):** Battery input terminal.
- ✧ **28V:** DC28V input terminal.

1.5.2 Terminals on Extension Board

Plug terminals on the extension board are shown in Fig. 1-4.

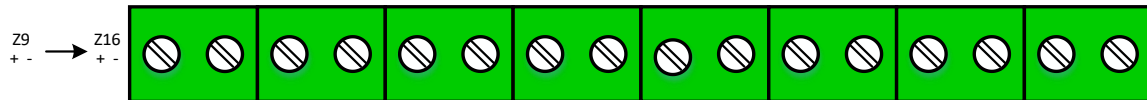


Fig. 1-4

- ✧ **ZONE INPUT (9~16):** Zone 9 to 16 input terminals(only for GST116S).

1.5.3 Terminals on Repeater Board of RP116C

Terminals on Repeater board of RP116C are shown in Fig. 1-5. Repeater Board of RP104C/RP108C is similar to RP116C with fewer terminals.

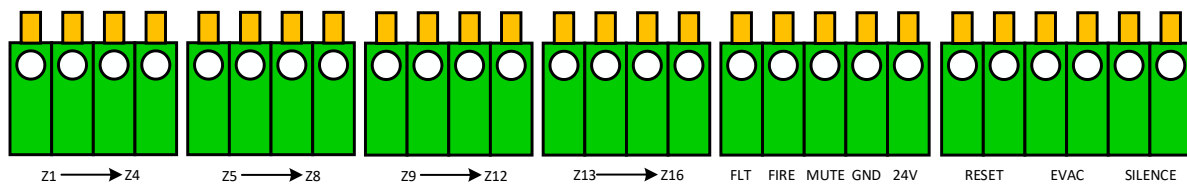
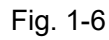


Fig. 1-5

- ✧ **REPEATER OUTPUT (Z1~Z16):** Output terminals of repeater panel for zone 1 to 16.
- ✧ **FLT:** Fault terminal for repeater panel connection.
- ✧ **FIRE:** Fire alarm terminal for repeater panel connection.
- ✧ **MUTE:** Mute terminal for repeater panel connection.
- ✧ **GND:** Power supply negative terminal for repeater panel connection.
- ✧ **24V:** Reserve terminal for repeater panel connection.
- ✧ **RESET INPUT:** For remote operation of reset.
- ✧ **EVAC INPUT:** For remote operation of EVAC.
- ✧ **SILENCE INPUT:** For remote operation of silence.

1.5.4 Terminals on Relay Board of RB108C

Plug terminals on relay board of RB108C are shown in Fig. 1-6. Relay board of RB104C is similar to RB108C with fewer terminals.



- ## 1.6 Appearance and Dimensions

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Chapter 2 Installation and Wiring

2.1 Installing the Cabinet

The FACP is wall-mounted as in Fig 2-1.

Note: Cable connector should be installed in the knock-out hole to avoid cable abrasion and foreign objects.

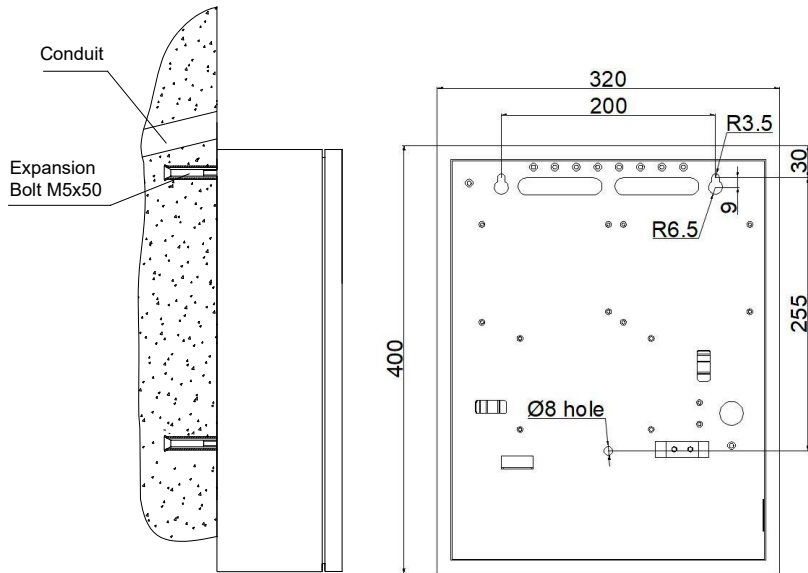


Fig. 2-1

2.2 Mains Connection

The incoming AC power cable ground (Green/Yellow) wire should be connected to terminal $\perp$. Connect the neutral (Blue) wire to terminal N and connect the Live (Brown) wire to terminal L. See the Fig. 2-2.

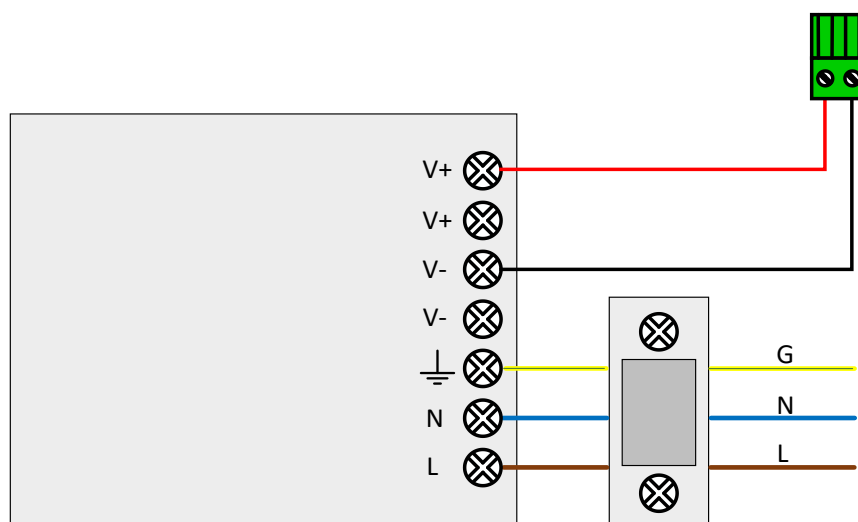


Fig. 2-2

Note:

- The power cables shall be fixed to the enclosure using a restraint clamp for strain relief.
- Do not power the system until the installation is completed.

2.3 Battery Connection

Connect the batteries as in Fig. 2-3 and then to the battery terminal XT15 on the control board.

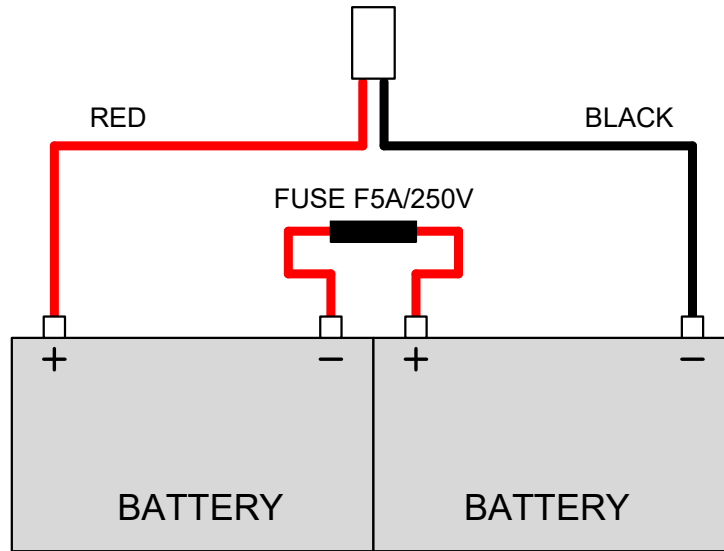


Fig. 2-3

Note:

- Refer to Chapter 5 for Calculation of Batteries.
- Do not make battery connections until the installation is completed.
- The fuse of the batteries may be broken if the polarity is connected incorrectly.

2.4 Zone Input Connection

Each zone can have maximum 32 fire detectors. The total number of detectors and call points in a zone should not exceed 32. They can be connected in two ways.

2.4.1 Using end of line resistor

Connect all manual call points in front of the detectors and put a $4.7k\Omega$ resistor at the end of the loop, as shown in Fig. 2-4.

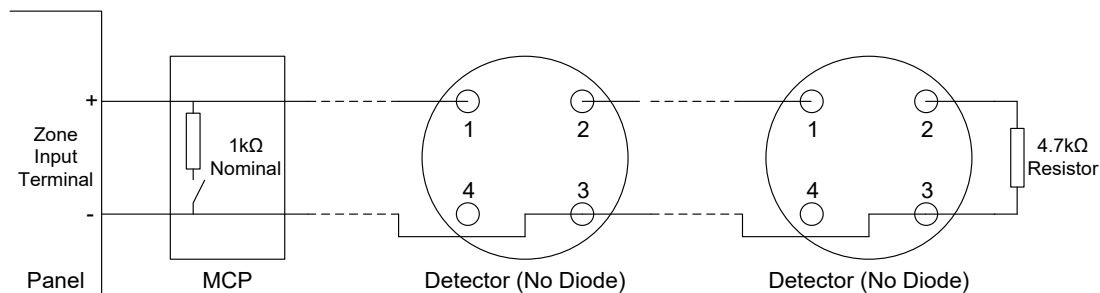


Fig. 2-4

2.4.2 Using an Active End of Line Unit

If an active end of line unit (AEOL) is used at the end of the loop, then the detectors and manual call points can be connected at any position. Ensure the detector base is fitted with a diode to keep the cable continuity in case any detector is removed, as shown in Fig. 2-5.

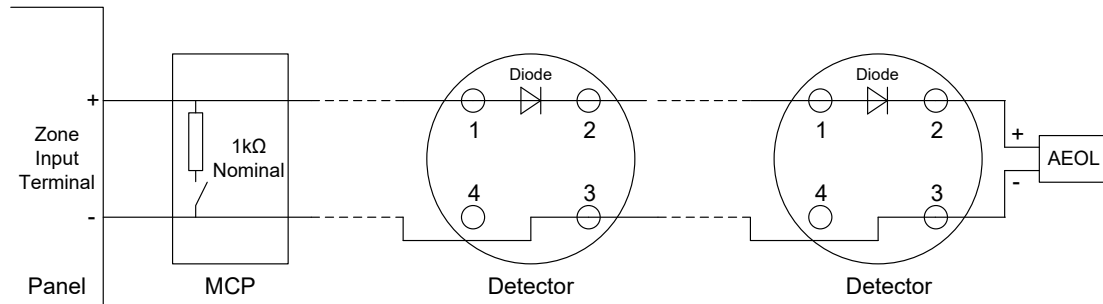


Fig. 2-5

2.5 Sounder Connections

All sounders are polarity-sensitive and need to be connected with the correct polarity. A 4.7kΩ resistor shall be connected in parallel at the end of the wiring circuit. Fig. 2-6 shows the connection of Sounder Output.

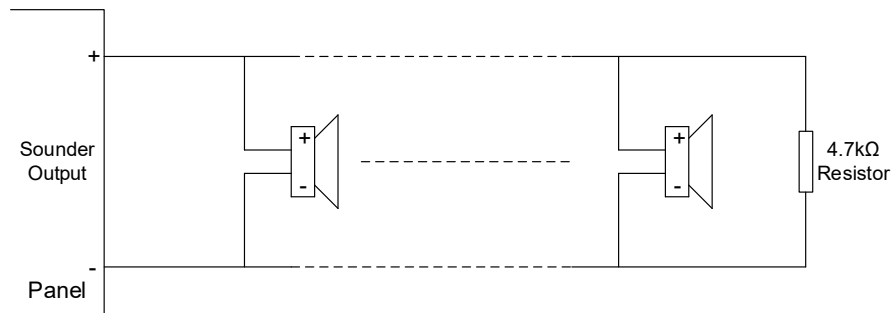


Fig. 2-6

Chapter 3 System Setup

3.1 Setting Access Levels

The CIE provides three access levels:

- ✧ Level I, for anybody to silence the buzzer by pressing SILENCE BUZZER key.
- ✧ Level II, for a fire warden or fire brigade personnel to disable, test, reset the panel, silence/resound the sounder outputs, evacuate the building and so on.
- ✧ Level III, Used by fire service maintenance companies for the system configuration and output configuration.

Access Level	Control Enable lock	Level 3 (X1)
I	OFF	OPEN
II	ON	OPEN
III	X	SHORT

Control Enable lock shown in Fig.3-1 and Level III shown in Fig.3-2.

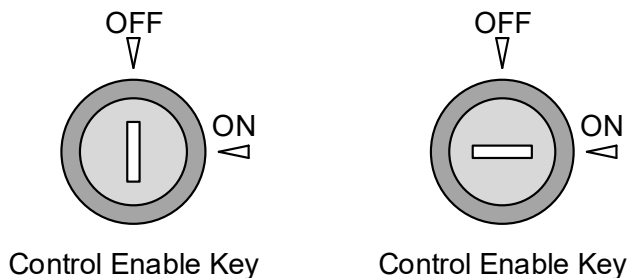


Fig. 3-1



Fig. 3-2

3.2 Disablement of a Zone or Output

3.2.1 Use of Disablement Function

In case there is any fault with a detection zone or a sounder output, it can be disabled so that it does not affect normal operation of other zones. After the fault is removed, the disabled detection zone or output can be enabled again. This operation applies to the 16 detection zones, 2 sounder outputs.

There are two ways for using disablement function: basic steps and quick disablement.

Note: Disable status setting will be saved even if the CIE is powered off.

3.2.2 Operation Basic Steps – Generally used for individually Disabling Zones or Sounder Outputs when the panel is in normal operation mode.

- 1) Enter access Level II as described in Section 3.1.
- 2) Pressing the **Disable/Enable** button will illuminate the yellow LED directly above it steadily. At the same time the yellow LED of zone 1 will start flashing to show zone 1 is selected for disablement setup. The Disable LED illuminates steadily when any disablement event occurs.
- 3) Pressing the **Scroll** button will toggle through zones 1 to 16 and the Sounder Outputs.
- 4) The yellow LED for zones 1 to 16 and sounder outputs will flash when the zone and output is to be selected. Pressing the **Enter** button will confirm the selection of the zone or output selected. That zone or output is now Disabled. The illuminating DISABLE LED indicates the zone or output is disabled.
- 5) Pressing the **Enter** button again can change the disable/enable state of the zone and sounder outputs .
- 6) Pressing the **Cancel** button exits the disablement setting status and the Disable/Enable LED will be turned off.
- 7) Exit access level II.

3.2.3 Quick Disablement Function – Generally used for group Disablements of Zones when the panel is in Alarm mode.

The **DISABLE** button can be used for quick disablement. The **DISABLE** button can disable those zones in a fire condition.

The following steps show how to operate the DISABLE button.

1. Enter access level II as described in Section 3.1.
2. Pressing the **DISABLE** button, Disable LED illuminates steadily and the yellow LEDs of all zones in fire condition illuminate. The sounder outputs associated with the disabled zones will be off.
3. Exit access level II.

3.3 Setting Test Mode

3.3.1 Use of Test Mode

Test mode is for testing that the detection zones operate correctly. In this mode, it tests if a zone can generate a fire alarm signal when it's manually activated into fire condition, Alarm Output will not be activated, and sounder outputs can be programmed to either output for 10 seconds or no output by Config Tool in level III. Default no output.

Note: Test mode cannot be saved if the CIE is powered off.

Note: The reset operation can restore the fire in test mode.

3.3.2 Operation Steps

- 1 Enter access Level II.
- 2 Pressing the **Test** button, Test LED illuminates steadily. The yellow LED of zone 1 starts flashing, showing the CIE is in test mode and that zone 1 is selected.
- 3 Pressing the **Scroll** button will toggle between zones 1 to 16.

- 4 Zone yellow LED for zone 1 to 16 will flash when the zone is to be selected. Pressing the **ENTER** button to set the zone to test mode. The illuminating Test Mode LED indicates the zone is in test mode.
- 5 Pressing the **Enter** button can change the zone is defined as test zone or not.
- 6 Pressing the **Cancel** button exits test mode setting status and Test LED turns off.
- 7 Exit access Level II.

3.4 Programming

All programming has to be done by Config Tool under Access Level III. So before programming the Outputs, please first enter Access Level III according to the instructions in Section 3.1.

The programming steps as below:

1. Enter access level III.
2. Press the Program button until its indicator lights up.
3. Connect a USB Type-C cable to the USB connector (J1) on the control board.
4. Launch the configuration software Config.exe to perform programming..
5. Download the configuration file.
6. Exit access level III.

The CIE can be programmed for the functions below:

- ✧ Setting a zone “With Manual Call Point”. If a zone is set “With Manual Call Point”, a fire alarm from the zone (either from a detector or a manual call point) will immediately activate its associated sounder outputs and alarm output, regardless of whether the zone is set with delayed output or not;

Note: If one of the outputs (sounder outputs or alarm output) is programmed with delay, then there should be at least one zone set as “With Manual Call Point” to ensure the delay could be overrode for immediate output.

Note: The zone “with manual call point” can override all delay functions.

Note: Every zone is default set “With Manual Call Point”.

- ✧ Setting associated sounders to a zone. Any zone can be set to associate with Sounder 1 and/or Sounder 2. You can also configure each sounder for immediate output or delayed output (configured per zone). When delayed output is enabled, the delay time (0–600 seconds, adjustable) for Sounder 1 and Sounder 2 can be set uniformly per sounder..
- ✧ Setting delay time for alarm output. Delay time of alarm output can be set (0~600s adjustable) .

Note: If you want to enable the delay function, you must first cancel the "with manual call Point" setting in the zone.

- ✧ Setting supervisory mode. Zones can be defined as supervisory for monitoring field device status. The supervisory indicator is **unlatched by default**, meaning it automatically clears when the supervisory signal is removed. It can also be set to **latched**, in which case the supervisory indicator can only be cleared by a reset.

Note: Supervisory setting will be saved even if the CIE is powered off.

- ✧ Setting resound mode. When the resound mode is turned on. If there is fire alarm from a zone, the sounder outputs associated to this zone will be started. Pressing SILENCE/RESOUND ALARM key and these sounder outputs can be silenced; if there is an alarm signal from another zone at this moment, the silenced sounder outputs that are not associated to this new alarm zone will resound. If resound mode is turned off, the silenced sounder outputs not associated to this new alarm zone will remain silenced.
- ✧ Setting silence delay mode. When there is fire alarm from a zone and its associated sounder outputs are started, the CIE has to stay in fire condition for the silence delay time before the sounder outputs could be silenced. The silence delay time can be programmed 0s to 180s. If silence delay time is 0s, the sounder outputs can be silenced immediately.
- ✧ Setting earth fault detection. The CIE can be programmed to detect ground fault or not.
- ✧ Setting AUX reset mode. When AUX reset delay mode is off. the AUX supply output will be constant. When AUX reset delay mode is on the delay time can be programmed 3s to 20s.
- ✧ Setting repeater 24V reset mode. The reset mode can be on(delay 12s) or off.
- ✧ Setting sounder test mode. In test mode the sounder outputs can be programmed to either output for 10 seconds or no output.

3.5 Restore Default Settings

The function of the default settings are as follows:

- ✧ Every zone is set "With Manual Call Point"(MCP mode is normal).
- ✧ When there is fire alarm from any zone, all sounder outputs and alarm outputs will be started, and these outputs will be continuous and not be delayed.
- ✧ Supervisory mode is off.
- ✧ The resound mode is off.
- ✧ The silence delay time is 0s.
- ✧ Earth fault detection is on.
- ✧ AUX reset delay time is 12s.
- ✧ Repeater 24V reset delay time is on(12s).
- ✧ The sounder output in test mode is no output.

The ways to restore default settings are as follows:

- 1 Enter access level III.
- 2 Pressing the **Program** button for at least 3 seconds, the CIE gives 1 second sound and illuminate the Program LED to indicate a successful reset to factory settings. Or by Restore Defaults of Config Tool.
- 3 Exit access level III.

Chapter 4 Operation Instructions

4.1 Working State Description

4.1.1 State of Detection Zones

- ✧ Normal: If a zone is in normal condition, the zones' red and yellow LEDs are off, only the power LED (green) is on.
- ✧ Fire: If there is a zone in fire condition, FIRE LED and zone red LED flash. In access level I, pressing the **SILENCE BUZZER** button, they will illuminate steadily.
- ✧ Supervisory: non-activated supervisory zone green LED off. Activated supervisory zone green supervisory LED and general yellow supervisory LED flash. In access level I, pressing SILENCE BUZZER key, Zone and general supervisory LED illuminate steadily.
- ✧ Fault: If there is a zone in fault condition, FAULT LED and zone yellow LED flash. In access level I, pressing the **SILENCE BUZZER** button, FAULT LED illuminates steadily and zone yellow LED remains flashing.
- ✧ Disabled: If there is a zone disabled, Disable LED and zone yellow LED illuminate steadily.

4.1.2 Alarm Output State

- ✧ Normal: If alarm output is in normal condition, Alarm Output Activated LED should be off.
- ✧ Fire: If the alarm output is activated, Alarm Output Activated LED illuminates steadily.

4.1.3 Sounder Outputs State

- ✧ Normal: If a sounder output is in normal condition, Sounder Output X FLT/DIS LED should be off.
- ✧ Fault: If there is a fault with any of the sounders, General Fault LED and Sounder Output X FLT/DIS LED flash. In access level I, pressing the **SILENCE BUZZER** button, General Fault LED illuminates steadily and Sounder Output X FLT/DIS LED remains flashing.
- ✧ Disabled: If any of the two sounder outputs are disabled, Disable LED and Sounder Output X FLT/DIS LED illuminate steadily.

4.1.4 Safe State

When there is a fault with any CPU that makes the CIE unable to work properly, the CIE will enter safe state.

- ✧ General Fault and System Fault LED illuminate.
- ✧ The buzzer sounds continuously.
- ✧ The keypad cannot be operated.
- ✧ The CIE cannot monitor fire.
- ✧ Fault output is activated.
- ✧ Other outputs remain the same before the CIE enters safe state.
- ✧ Other indicators remain the same before the CIE enters safe state.

Note: Safe state can only be cleared by re-powering the CIE.

4.1.5 Description of the Buzzer

The buzzer of the CIE sounds by priority coming from high to low as follows: safe state, fire, supervisory, fault and normal. The sound patterns of the buzzer are:

- ✧ Safe state, sounds steadily.

- ✧ Fire alarm, 0.5 second on, 0.5 second off.
- ✧ Supervisory, 1 second on, 1 second off.
- ✧ Fault, 2 second on, 2 second off.
- ✧ Normal, no sound.

4.1.6 Others

- ✧ Access levels are downwards applicable. A higher level enables access at levels lower than it.
- ✧ If there is no key pressed for over 1 minute, the CIE will exit the operation.
- ✧ Remote EVAC input, SILENCE input and RESET input are dry contact input type. If an input is shorted for 2 seconds, the CIE will operate correspondingly regardless of access levels.
- ✧ A Sounder output delay will only work if all of the following conditions are met:
 - The sounder is associated with a zone and is programmed with delay.
 - Zone has been set as “No Manual Call Point”.
 - This sounder output is not activated, not in fault or disabled condition.
 - If fire alarm comes from the associated zone, the sounder output will be started with a delay and Delay Mode LED flashes.
- ✧ Sounders and Alarm Output will not be activated if they are disabled or in fault.

Note: If a sounder output is activated with delay, and another zone is also associated with this sounder output but is programmed as immediate output, then a fire alarm from this zone will override the delay and activate the sounder output immediately.

If a sounder output is activated with delay, and another zone is also associated with this sounder but is programmed with a delay time shorter than the remaining delay time, then a fire alarm from this zone will override the previous delay and activate the sounder output with the shorter delay time.

4.2 Acknowledgement and Silence of Fault

A fault condition can be acknowledged and silenced from access level I.

Pressing the **SILENCE BUZZER** button under a fault condition, the buzzer of the CIE will be silenced and the fault is acknowledged. General Fault LED will illuminate steadily.

4.3 Acknowledgement and Silence of Fire Alarm

A fire alarm can be acknowledged and silenced from access level I.

Pressing the **SILENCE BUZZER** button under fire alarm condition, the buzzer of the CIE will be silenced and the fire alarm is acknowledged. FIRE LED and zone red LED will illuminate steadily.

4.4 Silencing the Sounder Outputs

The Sounder Outputs can be silenced at access level II.

Pressing the **SILENCE/RESOUND ALARM** button can silence the sounder outputs. In fire condition, pressing the **SILENCE/RESOUND ALARM** button again will make them resound.

If the remote **SILENCE** input contact is shorted for over 2 seconds, the CIE will silence the sounder outputs regardless of the current access level.

4.5 Evacuation

The evacuation can be operated at access level II.

Pressing the **EVAC** button, all sounder outputs will be started immediately.

If the remote **EVAC** input contact is shorted for over 2 seconds, the CIE will activate EVAC function to start all sounder outputs immediately regardless of the current access level.

4.6 Self-test and Reset

Self-test and reset can be carried out at access level II.

The CIE will start self-test on power-up. Pressing the **Reset** button can clear all audio and visual indication and carry out self-test. The self-test can check all indicators and the buzzer. All indicators illuminate and the buzzer sounds. After self-test, the panel returns to normal condition.

If the remote **RESET** input contact is shorted for over 2 seconds, the CIE will start reset and self-test regardless of the current access level.

Chapter 5 Calculation of Batteries Capacity

The formula for calculating batteries capacity is as follows:

$$\text{Batteries Capacity (Ah)} = (I_{Q_{\max}} + I_{Q_{\text{out}}}) \times T_1 + (I_{Q_{\min}} + I_{L_{\max}} + I_{F_{\text{out}}}) \times T_2$$

In which,

$I_{Q_{\max}}$ is the maximum standby current of the FACP in full load, which is 0.13A (calculated based on 16 zones).

$I_{Q_{\text{out}}}$ is the auxiliary output current in standby condition, which is 0.04A

$I_{Q_{\min}}$ is the FACP circuit consumption in fire condition, which is 0.12A.

$I_{L_{\max}}$ is the loop maximum current allowed for 16 detection zones, which is 0.4A.

$I_{F_{\text{out}}}$ is the output current in alarm condition, which is 1.66A (0.6A for 2 sounder outputs and 0.06A for repeater 24V output, and 1A for the auxiliary output).

T_1 is the time for the batteries to work in monitoring status (24 hours) .

T_2 is the time for the batteries to work in alarm status (30 minutes) .

From the above, we can get the maximum battery capacity is 5.2Ah.

Battery Size = Multiply (C) by 1.20 to derate battery.

so that we recommended a 7Ah battery to be used for the system.

If $T_2 = 1$ hour, the maximum battery capacity is 6.3Ah.

And as the above calculations are based on the 16-zone GST116S, they are also applicable to GST104S and GST108S.

Chapter 6 Servicing

The CIE shall be serviced by specially trained technicians. Please disconnect power before servicing.

6.1 Replacing the Batteries

- ✧ Type: Sealed lead-acid battery.
- ✧ Recommend period for replacement: 5 years (25°C)
- ✧ Recommended manufacturer and model: LEOCH DJW12-7.0
- ✧ Disposal of used batteries: Please properly dispose the used batteries according to your local rules and regulations.

WARNING:

RISK OF EXPLOSION IF BATTERIES ARE REPLACED BY AN INCORRECT TYPE!

6.2 Replacing the Fuse

There is a fuse in the CIE, located on the battery cable as shown in Table 6-1.

Table 6-1

Position	Mark	Rated value
Battery Cable	F5A/250V	5A/250VAC, Fast, Low breaking capacity glass tube fuse

6.2.1 Follow the Steps Below to Replace 5A Fuse.

- 1 Unfasten the fuse holder in the battery connection to find 5A fuse.
- 1 Replace the 5A fuse
- 2 Fasten the fuse holder.

Note: Please disconnect power before replacing the fuse.

6.3 Troubleshooting

No.	Problem	Possible Reason	Resolution
1	No LED lights on power-up	A. Power not connected B. Power supply doesn't work properly. C. Connection between the control board and display board is loose.	A. Check power connections B. Replace the AC/DC power module. C. Check and reconnect the cable.
2	Battery fault	A. Loose battery connection. B. 5A fuse is blown. C. The voltage of batteries is low.	A. Check cable connector. B. Replace 5A fuse in battery cable. C. Replace the batteries.
3	Incorrect report on Sounder Output and Alarm Status	A. Control board is damaged.	A. Replace the control board.
4	Settings cannot be saved	D3 on the control board is damaged	Replace the control board.

Appendix A Compatible Devices

A.1 Conventional Detectors

10101781	JTFB-GOF-GST601	Conventional Combine Smoke and Heat Detector
10101784	JTY-GF-GST104	Conventional Photo-electronic Smoke Detector
10104659	JTWB-ZCD-G1(A)	Conventional Heat Detector
20100045	DZ-03	Common Detector Base
30200675	DZ-03(No diode)	Common Detector Base
10106675	JTY-HF-GST102E	Conventional beam detectors
10102430	C-9104	Conventional Ultraviolet Flame Detector
30204898	DZ-03	Common Detector Base
10106284	DC-9101E	Conventional Combination Heat Photoelectric Smoke Detector
10106286	DC-9102E	Conventional Photoelectric Smoke Detector
10106288	DC-9103E	Conventional Rate of Rise and Fixed Temperature Heat Detector
30205764	DB-01	Common Detector Base
20101432	DB-01D	Diode Base
10103044	DP-9907	Active End of Line Unit

A.2 Conventional Manual Call Point

10106301	DC-9204E	Innovative Conventional Manual Call Point
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A.3 Conventional Sounders

10106051	GST-HX-200A	Conventional Sounder and Strobe
10106617	C-9401N	Conventional Sounder Strobe
10106299	C-9403	Conventional Sounder Strobe
10104816	C-9404	Conventional Sounder
30600362	GST-JL	Bell

WEEE Information



2012/19/EU (WEEE directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points.

For Article33 information, please refer to the following website:
<https://www.gst.com.cn/en/reacharticle33.asp>

Limited Warranty

GST will repair or replace the product to the original purchaser free of charge, if defective in materials or workmanship during the warranty period, subject to the terms below. GST and KDSS are not responsible for defects or problems as a result of conditions or applications including normal wear and tear; catastrophe; fault or negligence of any user or any party other than GST and KDSS; improper installation, application, storage, maintenance, or use of products; other causes external to products; or failure to conform to any applicable recommendations of GST and KDSS. In no event shall GST and KDSS be liable for incidental, indirect, special or any other consequential damages. To the fullest extent permissible by law, the foregoing limited warranty is exclusive and in lieu of all other warranties, whether written, oral, implied or statutory. Subject to applicable law, in no event shall the liability of GST and KDSS exceed the purchase price of the products. NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE SHALL APPLY. Anybody, including the agents, distributors or employees, is not in the position to amend the contents of this warranty.

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