EC-P4Z

4 Zone Conventional Panel
Installation Manual

Contents

Table of Contents

1 System Overview

1.1 System Capabilities List

The fire alarm panel has the following characteristics:

1.1.1 Maximum number of Conventional Detector Inputs: 20 detectors per zone

1.1.2 Available Options: 4 Zones

1.1.3 4 outputs for Alarm devices: Including 2 sounder circuits/1 fire relay /1 fault relay

1.1.4 Auxiliary re-settable power output: 24VDC / 100mA limiting protection

1.1.5 Automatic power switchover: mains power and secondary power (from batteries)

1.1.6 Independent functional buttons with indication: User friendly interface for easy operation and recognition.

1.1.7 Control key-switch to enable/disable control buttons on panel

1.1.8 Fault supervision and notification: input, outputs, system, power, earth, fuse

1.1.9 Disablement: zones disablement

1.1.10 Evacuation: Fire drills to simulate fire alarm condition on panel

1.1.11 Silence: sounders and buzzer silence

1.1.12 Lamp test: indicators check

1.2 Panel Fascia

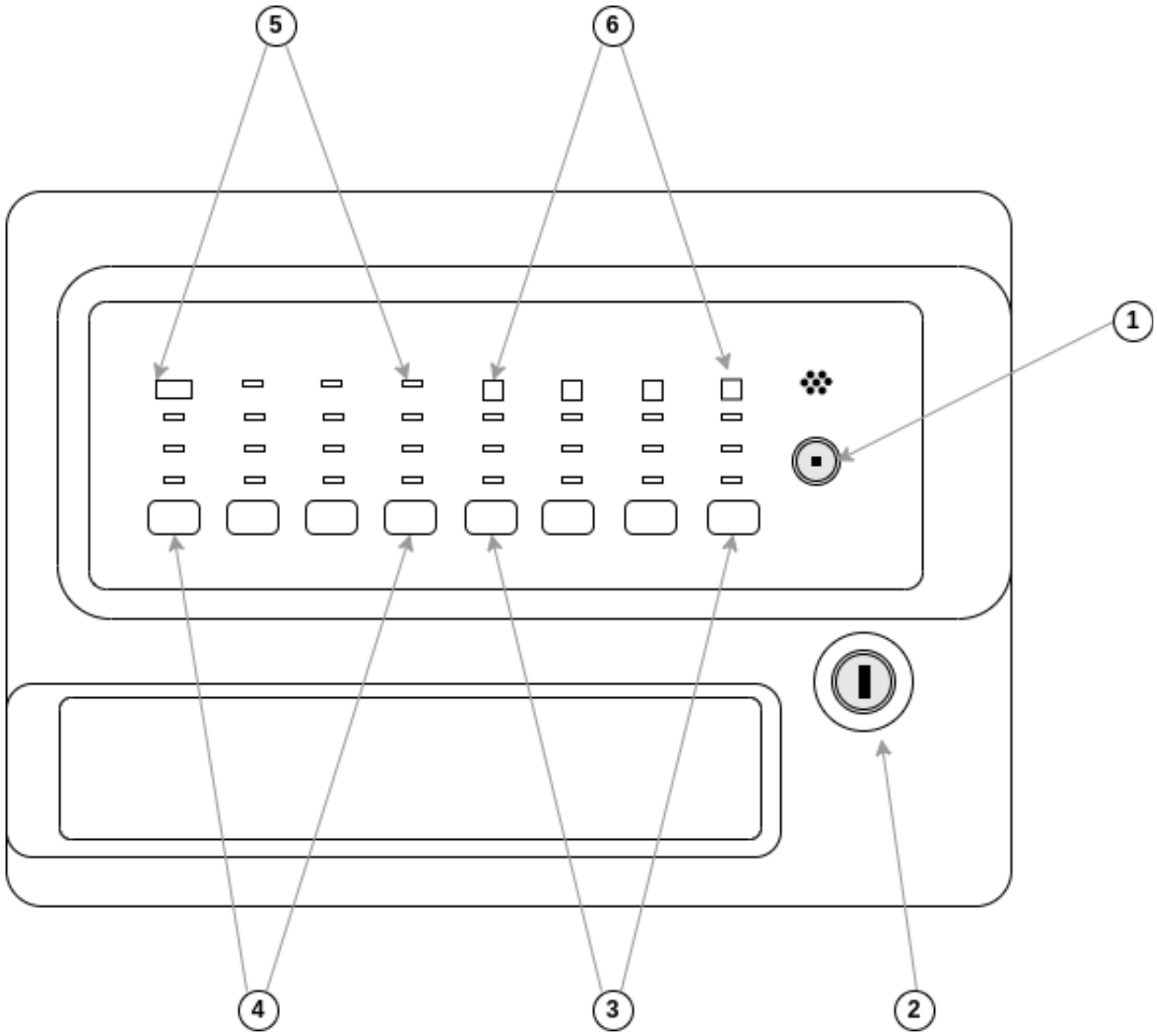

Figure 1. Front panel fascia

1	Control Key-switch	4	Panel control buttons
2	Door Key	5	Panel status LEDs
3	Zone buttons	6	Zone Status LEDs

1.3 Panel Motherboard

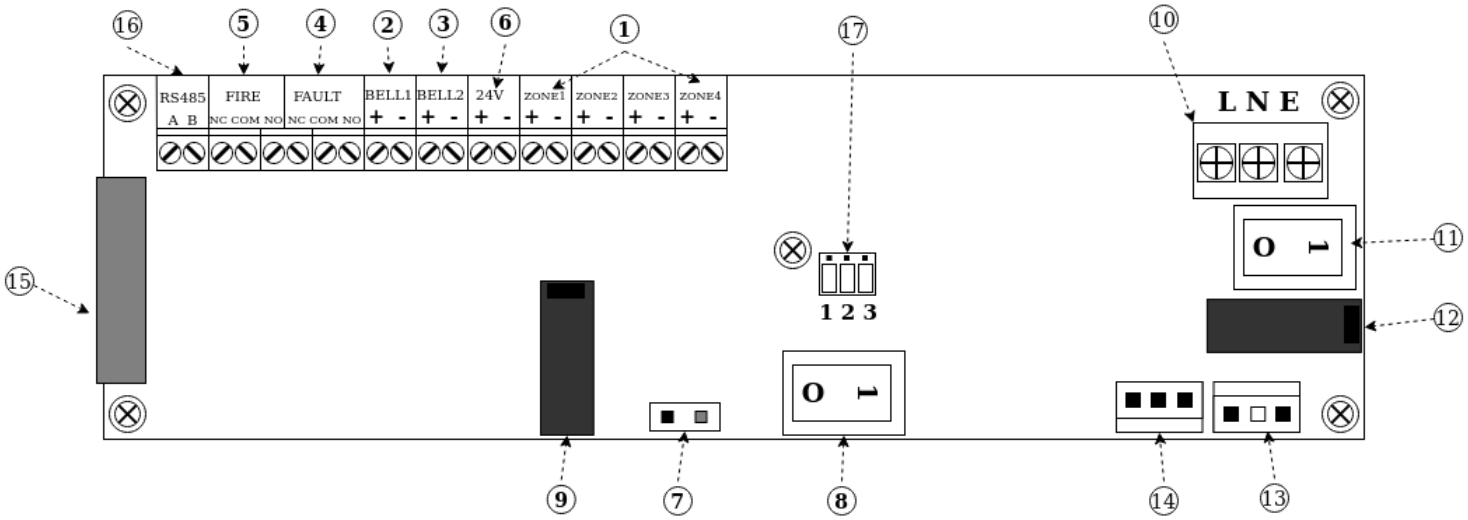

Figure 2. Interface board components identification

1	Zones 1 – 4 connections	9	Battery fuse
2	Sounder circuit 1	10	Mains connector block
3	Sounder circuit 2	11	Mains switch
4	Fire relay	12	Mains fuse
5	Fault relay	13	AC Out (to transformer)
6	24Vdc Auxiliary output	14	24V AC input (from transformer)
7	Battery connectors	15	Ribbon cable to door controls
8	Battery switch	16	RS485 – NOT USED

2 System Installation

2.1 Installation Checklist

2.1.1 Prepare the site: Make sure the installation location is free from construction dust, debris and other extreme temperature ranges and relative humidity.

2.1.2 Unpack the equipment

2.1.3 Install the cabinet: See ‘Installing the cabinet’ for cabinet dimensions.

2.1.4 Install optional components

2.1.5 Review wire routing.

2.1.6 Connect the field wiring. See Figure 5.

2.1.7 Check for opens, grounds and shorts before connecting.

2.1.8 Connect batteries.

2.1.9 Connect ground then AC power. We strongly suggest connecting mains power by minimum of 16AWG (1.5mm^2) wire.

2.1.10 Test for proper operation.

2.1.11 Use fire rated shielded wire for detectors and alarm device connections.

Ensure that the AC circuit breaker is OFF before connecting high voltage wires (220-240 VAC) to the mains connector.

2.2 Required tools and components

Required tools and components:

- Slotted screwdriver, insulated
- Cross screwdriver, insulated
- Socket
- 6.8K Ohm, 1W resistors
- 470 Ohm, 1W resistors
- 1N4007 diode
- Wire stripper
- Digital multimeter
- Panel’s enable switch-lock key
- Panel’s door key
- Glass tube fuse: 250V/1A

2.3 Installing the cabinet

Cabinets can be surface or flush mounted. See Figure 4 for framing and mounting dimensions:

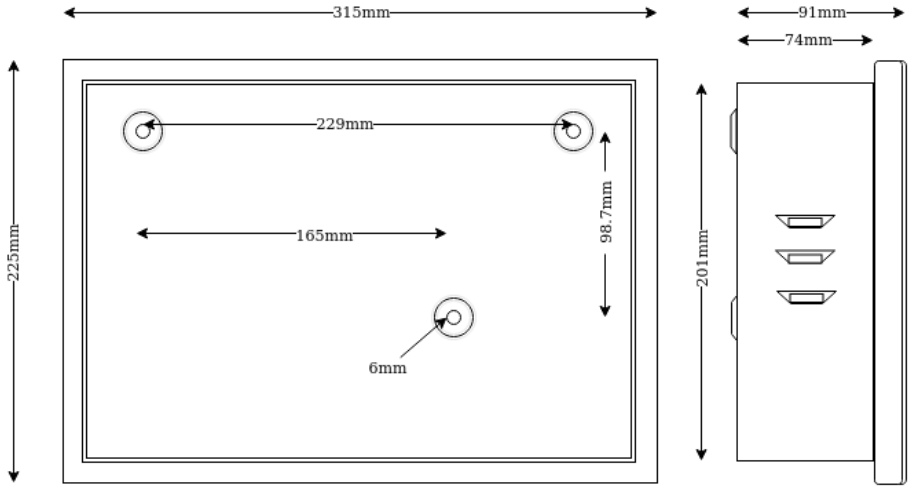

Figure 3. Cabinet dimensions

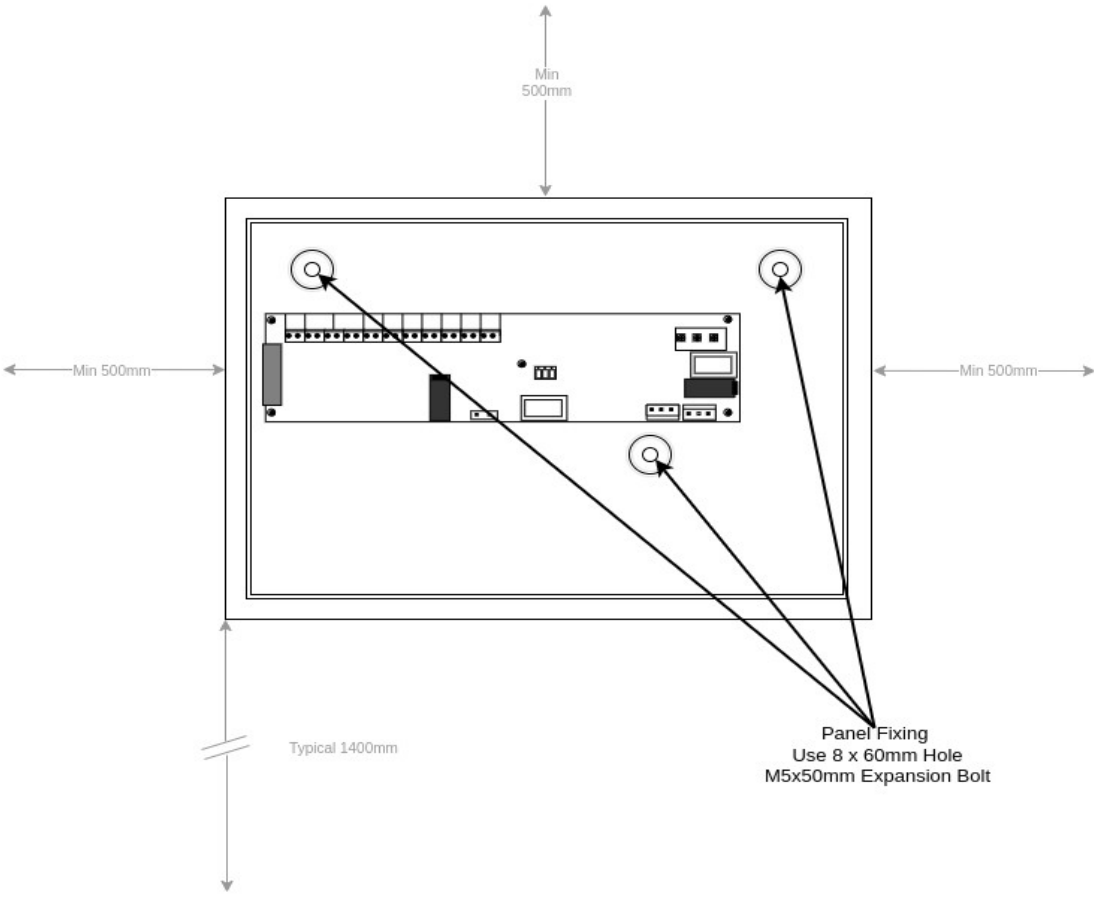

Figure 4. Mounting the panel

2.4 Zone Wiring

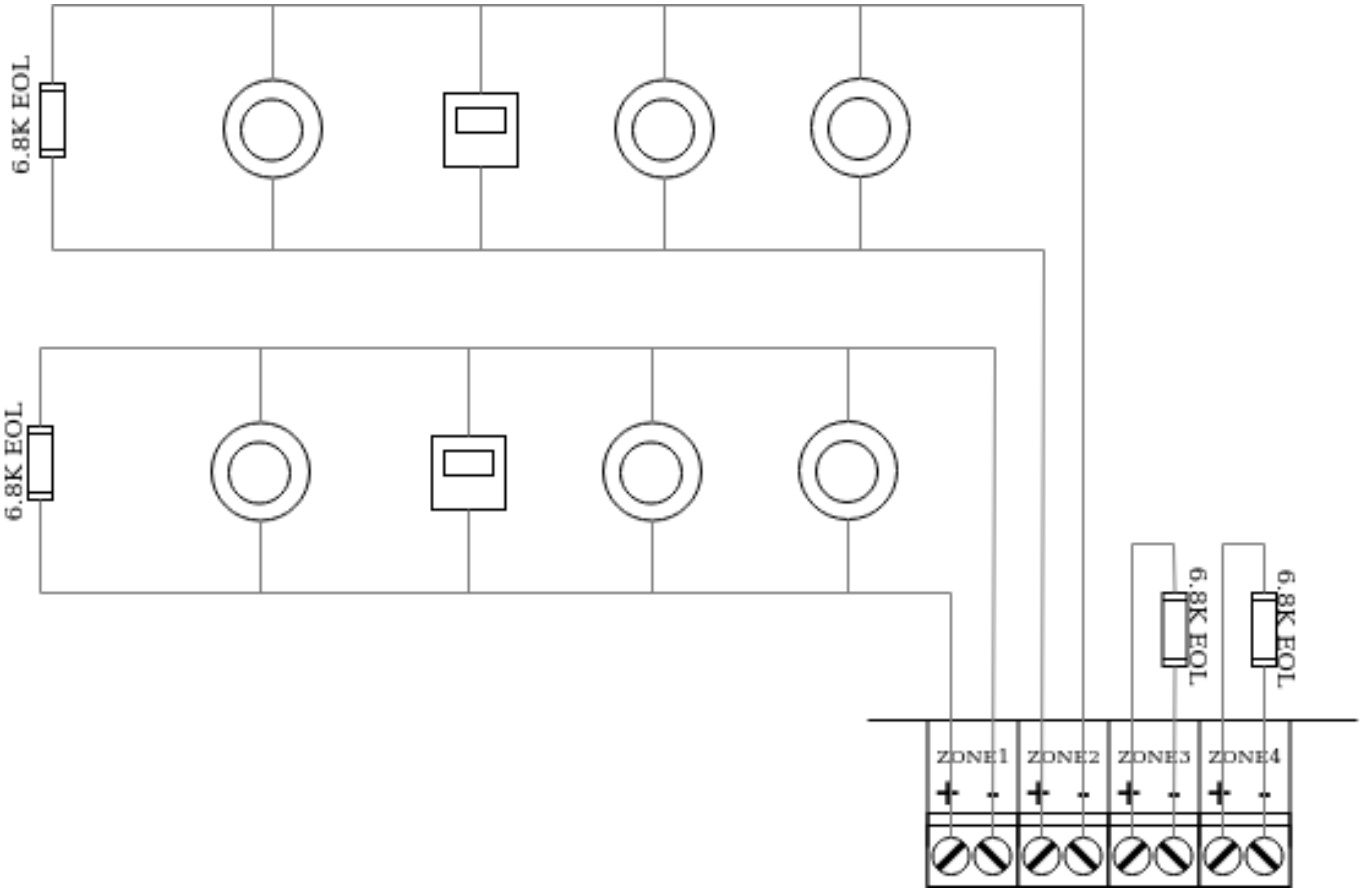

Figure 5. Zone wiring

Detectors and manual call points are connected to their respective Zone circuit. End of line resistor of 6K8 Ω to be fitted across last device.

Where a zone does not have any devices, the end of line resistor will be fitted across the terminals.

2.5 Output Connections

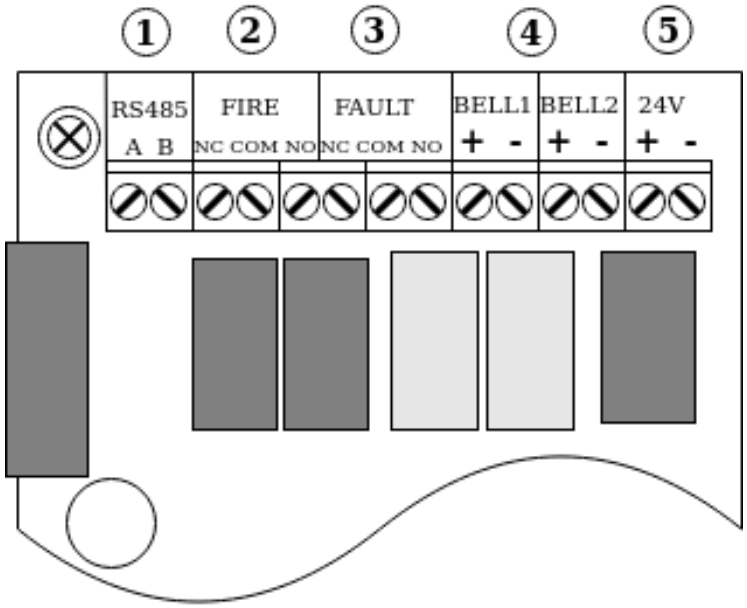

Figure 6. Panel output connections

1	RS485 – Not used	4	Bell 1 & 2 Sounder Circuits
2	Fire Relay	5	Auxiliary power 24Vdc
3	Fault Relay		

2.6 Bell/Sounder Wiring

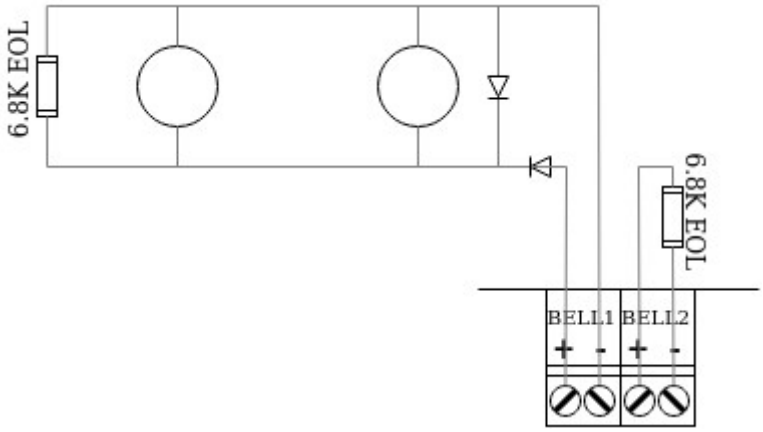

Figure 7. Bell 1& 2 sounder circuit wiring

Sounders are connected to the outputs marked BELL1 and BELL2. Care should be taken to ensure the polarity of the connections are correct. A diode may be required to protect the sounder if it doesn't have one built in.

An end of line resistor of 6K8 Ω must be installed at the last sounder. Where the sounder circuit is not used the end of line resistor will be installed at the panel.

2.7 Battery installation

The panel uses two lead acid 12V/2.2Ah batteries connected in series. Connect the batteries with the supplied free lead and the batteries to the power supply unit with the red (positive) and black (negative) wires. Then fix them by two right-angle metal plate with nuts.

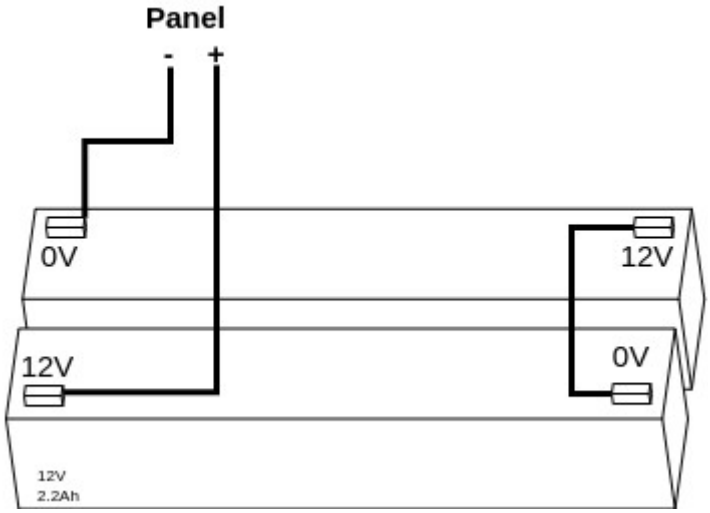

Figure 8. Battery wiring

2.8 Mains connection

Use the mains terminal (Item 10 in Figure 2) to connect the AC power cable to the panel. Ensure that the power cable is safe to handle (has no power). Pay attention to the order of L/N/E, put them in the 3 pin terminal (5mm space between) and screw down. Then replace the plastic protective cover.

The diameter of the wires must be between 0.75 and 2.5mm^2.

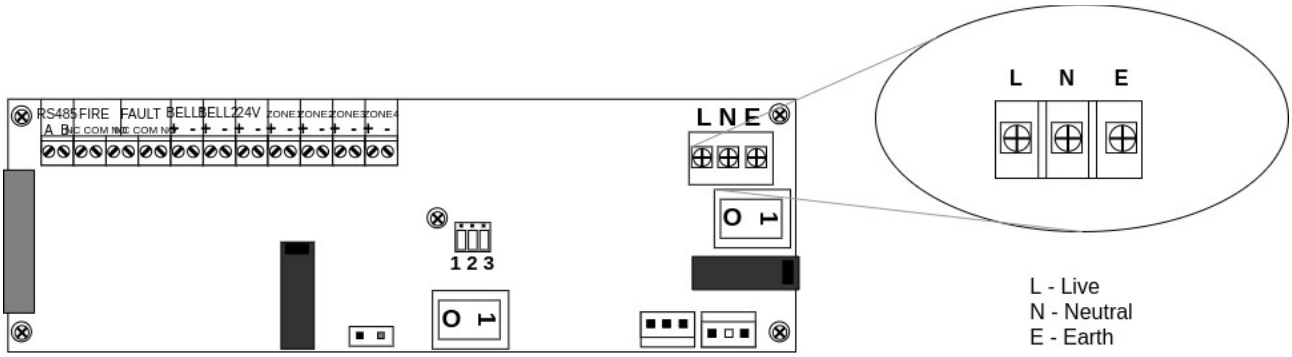

Figure 9. Mains wiring

2.9 Initial Power Up

Check and confirm all the wires are connected correctly. On the motherboard, there are 2 rocker switches, the right one is mains switch (Item 11 in Figure 2), the other is battery switch (Item 8 in Figure 2). If using battery only, turn battery switch on.

At start up, all LEDs on the panel light one column at a time. This allows you to check if any LED has a fault. When complete the green power indicator should be visible.

3 Panel Indication

3.1 Main indication on main board

The panel front shows status indication. Green Power LED, Red FIRE LED and yellow LEDs to indicate any fault status.

The main panel control buttons are located here. Note they will only work if the Control Keyswitch keys are in the enabled position.

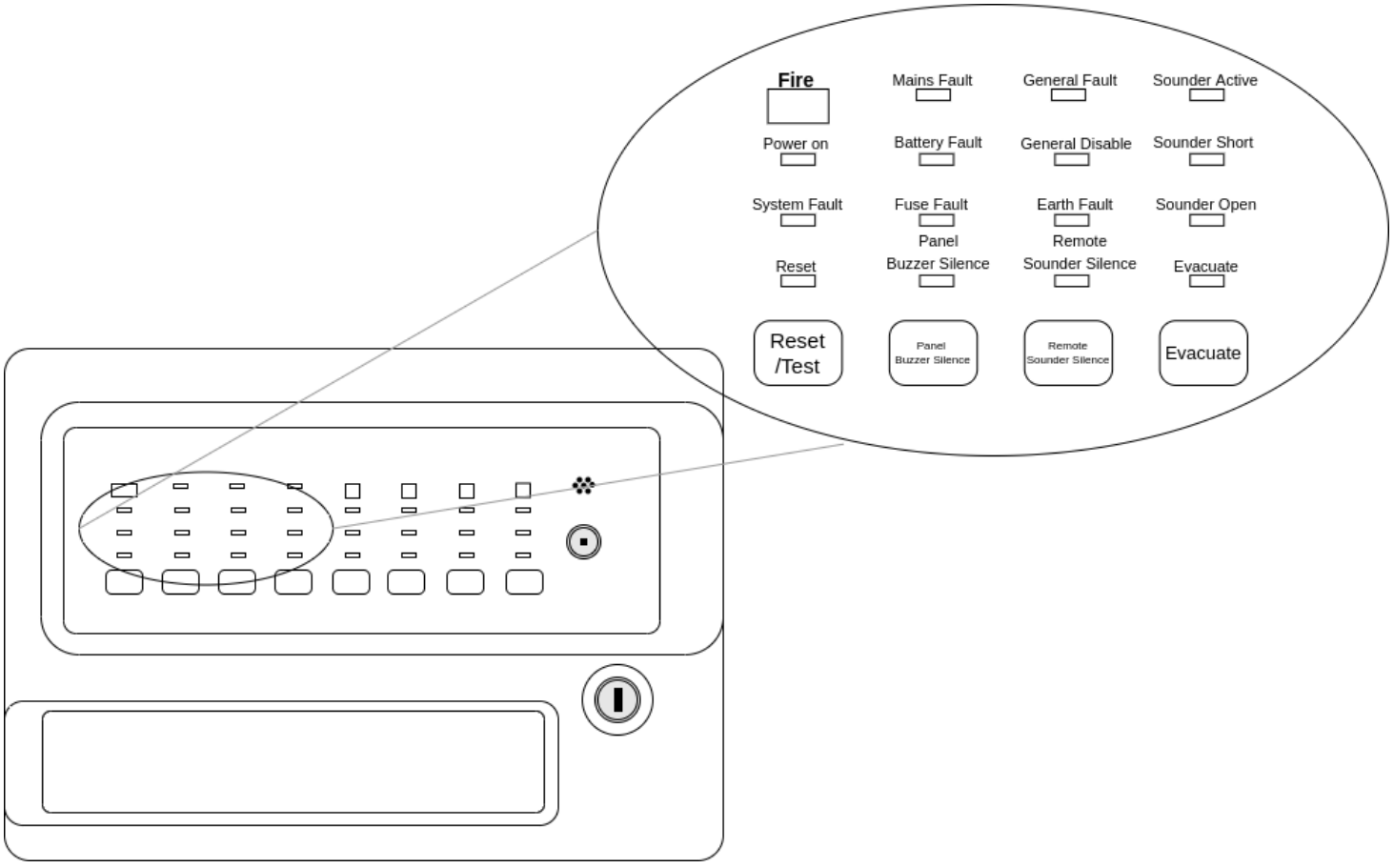

Figure 10. Panel Status LED indications and control buttons

Fire	Dual Red FIRE LED will light to indicate a fire alarm condition
Mains Fault	Yellow LED will light to indicate no mains power detected
General Fault	Yellow LED will indicate there is a fault somewhere on the system. See other LEDs for detail of fault.
Sounder Active	Yellow LED will indicate the system sounders are active.
Power On	Green LED indicates the panel is on.
Battery Fault	Yellow LED indicates the battery voltage is not being detected.

General Disable	Yellow LED indicates one of the zones has been disabled. See Zone indications to identify which Zone has been disabled.
Sounder Short	Yellow LED indicates short circuit detector on a sounder circuit
System Fault	Yellow LED indicates a general system error
Fuse Fault	Yellow LED indicates internal mains fuse is blown.
Earth Fault	Yellow LED indicates that an earth fault is detected.
Sounder Open	Yellow LED indicates that the sounder output has an open circuit
Reset LED	Yellow LED indicates that the Reset button has been activated
Buzzer Silence LED	Yellow LED indicates that the Buzzer Silence button has been activated
Sounder Silence LED	Yellow LED indicates that the Sounder Silence button has been activated
Evacuate LED	Yellow LED indicates that the Evacuate button has been activated

Reset/Test Button	Resets the panel and tests the LEDs on the panel.
Buzzer Silence Button	Button to silence the panel buzzer
Sounder Silence Button	Button to silence the sounders connected to the fire alarm system
Evacuate Button	Press button to enter the evacuation condition, which will activate all sounders and outputs on the alarm. Press again to stop.

3.2 Zonal Indication

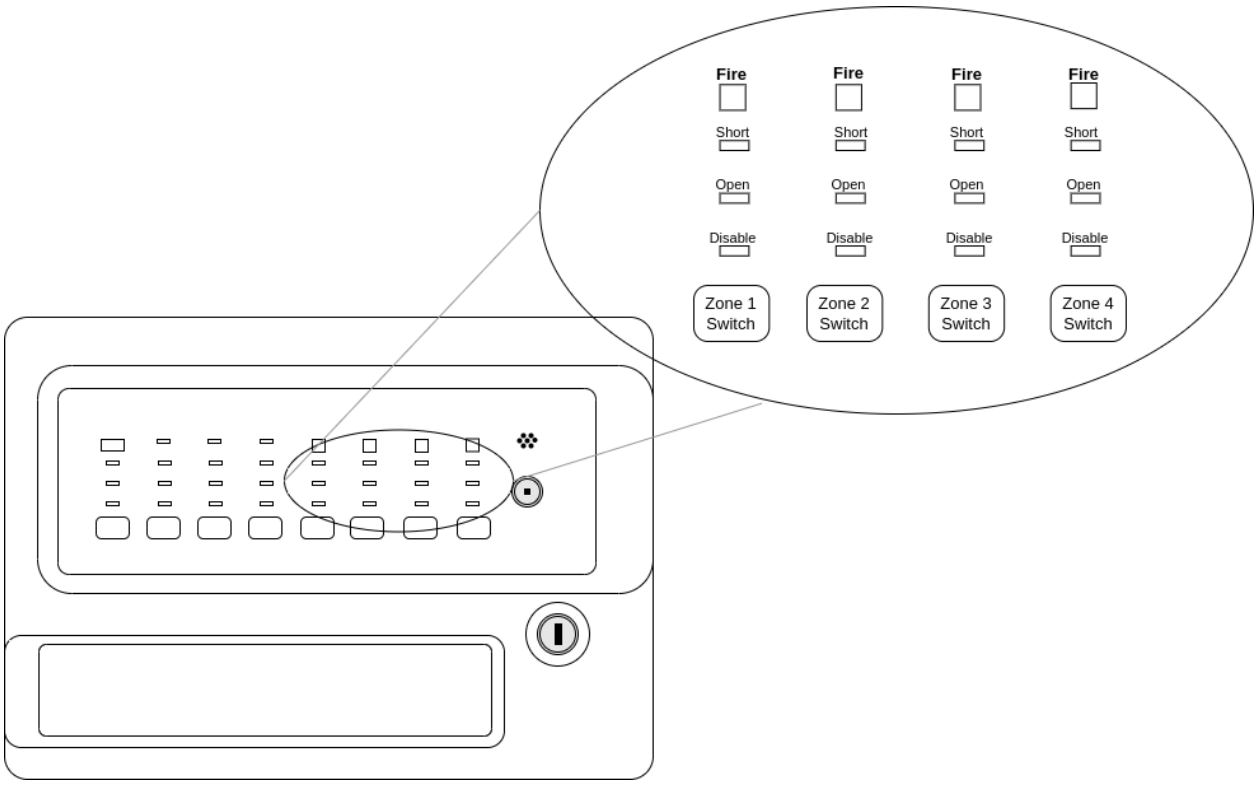

Figure 11. Zone status indicators and control buttons

Fire	RED Fire LED will indicate which Zone has detected the fire alarm condition
Short	Yellow LED will indicate wiring short detected on the zone cable
Open	Yellow LED will indicate open circuit detected on the zone cable
Disable	Yellow LED will indicate the zone has been disabled
Zone Buttons	Press the button to disable the zone. Disabling the zone will make the panel ignore any fire and faults from all devices on the zone. Press again to re-enable.

3.3 Inside indication

On the power board there are another 2 LED indicators for mains and battery. The right one is the mains indicator, the other is the battery fault indicator.

4. Commissioning of the panel

4.1 Key Control

Disable: Can inspect the panel only. None of the buttons on the control panel will operate.

Enable: Turn key to “enable” to activate the buttons on the control panel. Now you can Reset/Test, silence buzzer, silence/resound sounders/ evacuate and enable and disable zones.

4.2 Commissioning Checklist

- Entire system should be checked to ensure it has been installed correctly as per the standards
- All manual call points and detectors tested for fire and fault
- Verify siting of all devices as per national standards
- Ensure the mains power is correctly connected.
- Verify there are no short or open circuits in any of the zone circuits.
- Check all zones have correct end-of-line terminations.
- Standby calculations conform with the standards

4.3 Commissioning of the panel

Once the above checks are confirmed the following tests should be carried out:

- Create short and open circuits in the zones to test fault reporting
- Activate manual call point to test manual fire reporting.
- Activate a detector to test automatic alarm reporting.
- Check sound pressure levels throughout all areas of the building conform to standards.
- Using a multimeter, test the fire and fault relays activate when the relevant fire and fault condition is created.
- Confirm battery back up works when mains removed

5. Troubleshooting

Any fault occurring on the panel will result in the panel buzzer activating and a yellow LED on the control panel to indicate the nature of the fault.

Item	Description	Fault details
1	System Fault	Undetermined fault on the panel. Reboot panel. If problem persists contact supplier.
2	Mains Fault	No mains detected. Check mains power is available. Check mains live, neutral and earth connections. Check mains fuse and mains on/of switch on motherboard.
3	Battery Fault	Check batteries are present. Check battery switch is on. Confirm battery cable connections. If everything else is good, replace the batteries.
4	Fuse Fault	Check fuse on the interface board. Replace fuse.
5	General Fault	This LED will illuminate when any fault if detected on the panel. There will be other LEDs indicating the nature of the fault.
6	General Disable	Any zone disable will also indicate cause the General Disable LED to illuminate.
7	Earth Fault	Indication that part of the PCB may be touching the enclosure. Check connections and stray cables.
8	Sounder Short	Short circuit sensed on sounder output. Check and correct wiring.
9	Sounder Open	Open circuit (break) sensed on sounder output. Check and correct wiring.
10	Zone Short	Short circuit sensed on zone circuit. Check and correct wiring.
11	Zone Open	Open circuit sensed on zone circuit. Check and correct wiring.

Warning: Don’t pull in or out any cable or board when the power is on!

5.1 Fault Monitor Jumpers

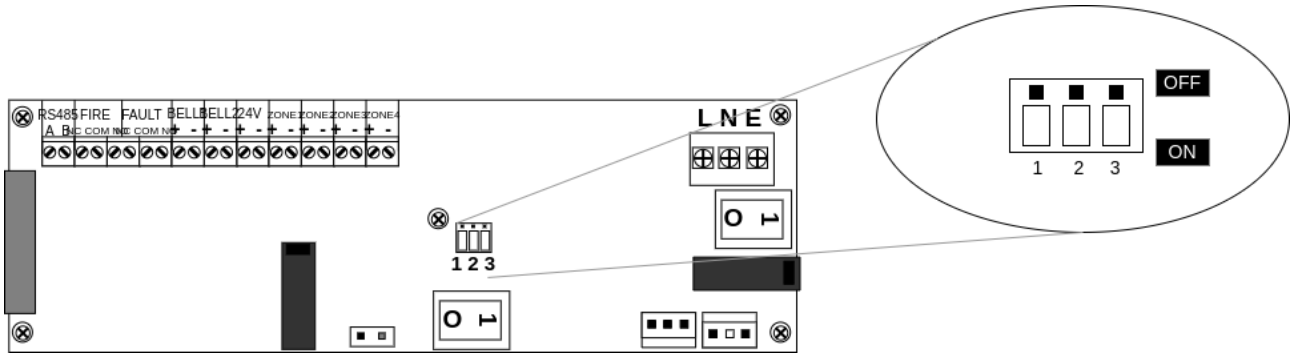

Figure 12. Fault Monitoring Jumpers

1 Earth Fault

2 Battery Fault

3 AC Fault

6. Routine Maintenance

6.1 Procedure

6.1.1 Before commencing testing, notify all personnel within the areas where the alarm sounds or locations that monitor alarm, that testing is in progress.

6.1.2 Records of all testing and maintenance shall be kept as required by the standards.

6.1.3 A complete check of installed field wiring and devices should be made at regular intervals. This includes testing all alarm and supervisory initiating devices and circuits.

6.1.4 Panel operation should be verified in the alarm, fault and standby modes.

6.1.5 To ensure that the panel can be powered when primary power is lost, the batteries should be periodically inspected, and replaced (at least) every two years.

6.2 Battery maintenance

6.2.1 The batteries must be inspected semi-annually as follows:

A. Visually to verify that they are free of damage

B. Voltage tests under load

6.2.2 An annual charger test.

The system is performing an automatic battery test by loading the batteries with the system current and measuring the voltage. In case of a battery or charger problem a battery fault will eventually be indicated.

Batteries should be installed with a date label, and should be changed every 2 years, irrespective of their condition.

Panel will disconnect from the batteries if the charging voltage goes below 21Vdc to protect the batteries. When the mains is re-applied they will be able to recharge.

6.3 Preventative Maintenance Schedule

6.3.1 For detector sensitivity and functionality testing, refer to the detector manufacturer’s installation instructions.

6.3.2 Tests for earth, open and short require that you test earth fault, open circuit and short circuit indications.

6.3.3 Test for system fault/disablement condition furthermore occur to indications.

It is recommended that all tests from the user should be performed periodically in order to detect any malfunctions of the system.

Appendix A – Electrical Specifications

Mains supply	110VAC/220VAC (-15%, +10%) 50/60Hz
Auxiliary output	18 -28 VDC (24VDC typical) 100mA max, current limiting
Detectors connection allowed each zone	20 (including MCP)
Sounder output	2 x 0.3A maximum
Batteries	2 x 12V 2.3Ah sealed lead acid, self-regulated*
Battery low-voltage protection	21V
Power rating	Imax.a=0.5A; Imax.b=0.75A;Imin=0.1A
Zone alarm current	8-20mA
Fire Relay Capacity	1A @30VDC maximum
Fault Relay Capacity	1A @30VDC maximum
Communication protocol	2 wires RS485 bus system
EOL Resistor Zones	6.8K Ohm 1W
EOL resistor for outputs	6.8K Ohm 1W
Fuse for AC Power	1A / 250V glass tube fuse slow blow 5 x 20mm
Fuse for DC Power	1A / 250V glass tube fuse slow blow 5 x 20mm
Environmental	Class A temperature range: 5 to 40°C (23-104°F) Humidity: 5 to 95% RH, non-condensing
Terminal blocks rating	All terminals for 12 to 18 AWG (0.75 to 2.5mm^2)

*Batteries are optional, usually bought based on design requirement.