

# Premier M<sup>Plus</sup> 48

CONVENTIONAL FIRE ALARM CONTROL PANEL



## INSTALLATION MANUAL



## **PREMIER M 48 OVERVIEW.**

**The Premier M plus 48 is the latest large size conventional panel from Zeta Alarm Systems. Its Features include: -**

- **Designed to EN54 Parts 2 & 4.**
- **It is available in sizes from 24 to 48 zones in 4 zone increments.**
- **Automatically uses diode bases for line continuity.**
- **Four common sounder circuits (400mA Each).**
- **Serial Repeater Output.**
- **Fire & Fault Relays (SELV).**
- **F.A.R.E. Output (which can be disabled).**
- **Auxiliary supply (29 Volts, 250 mA).**
- **Zone & Sounder Disablement facility.**
- **One man test mode.**
- **Sounder delay facility.**
- **3 amp power supply.**
- **Is a low cost alternative to the existing Premier L panel .**

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### 1.INTRODUCTION

## **THIS FIRE ALARM CONTROL PANEL IS CLASS 1 EQUIPMENT AND MUST BE EARTHED**

**This equipment must be installed and maintained by a qualified and technically experienced person.**

### **1.1 HANDLING THE PCBs**

**If the PCBs are to be removed to ease fitting the enclosure and cables, care must be taken to avoid damage by static.**

The best method is to wear an earth strap, but touching any earth point (e.g. building plumbing) will help to discharge any static. Hold PCBs by their sides, avoiding contact with any components. Always handle PCBs by their sides and avoid touching the legs of any components. Keep the PCBs away from damp dirty areas, e.g. in a small cardboard box.

### **1.2 USING THIS MANUAL**

This manual explains, in a step-by-step manner, the procedure for the installation of the **Premier M 48 Range** of Fire Alarm Control Panels. For full operational and maintenance information, please refer to document GLT.MAN-121 (USER MANUAL, MAINTENANCE GUIDE & LOG BOOK). It also contains a System set-up table, and Design, Installation and Commissioning Certificates, that must be completed by the appropriate engineers prior to system handover.

**Unlike the User Manual, this Installation Manual must not be left accessible to the User.**

### **1.3 ABOUT THE PREMIER M 48 ALARM CONTROL PANEL & INTEGRAL PSE**

- The PREMIER M PLUS Fire alarm control panel is available in 24 & 48 Zone sizes.
- It has 4 common sounder output circuits each capable of supplying 400mA.
- It has a 250mA auxiliary 30V output
- It has a set of fire relay contacts (voltage free) rated at 1A SELV.
- It has a set of fault relay contacts (voltage free) rated at 1A SELV. (normally energised)
- It has the ability to disable any zone, or the common sounder circuits.
- It has a one man test mode, which resets the zone in test after 4 seconds. (EN54 option with requirements)
- It has a sounder delay facility (0-9 minutes in 1 minute steps). (EN54 option with requirements)

- It has a maximum battery capacity of 7 Ah.
- It has an in built capability of operating with Diode bases (for line continuity on head removal).
- It will operate in ambient temperatures of -5 to 40°C
- It will operate in a relative humidity of up to 93% (non condensing)
- It will withstand vibrations between 5 & 150 Hz
- It has a maximum capacity of 32 devices per zone (But for locating potential future problems or events, we would usually recommend a practical maximum of 20 devices per zone)
- The PSE is linear, with a 3.0A output at system voltage (18-32V)
- The charger & battery are both fused at 3.15A (TD)
- The PSE will draw a maximum of 25uA from the battery in the event of mains failure. (The FACP will continue to take around 150mA)
- The FACP & PSE should be maintained as described in section 3 of the User Manual, Maintenance Guide & Log Book.

### **1.4 DESIGNING THE SYSTEM**

This manual is not designed to teach Fire Alarm System design. It is assumed that the installer has an understanding of Fire Alarm System components and their use.

We strongly recommend consultation with a suitably qualified, competent person regarding the design of the Fire Alarm System. The System must be commissioned and serviced in accordance with our instructions and the relevant National Standards. Contact the Fire Officer concerned with the property at an early stage in case he has any special requirements.

If in doubt, read BS 5839: Pt 1: 2002 "Fire Detection and Alarm Systems for buildings (Code of Practice for System Design, Installation and Servicing)" available from the BSI, or at your local reference library.

### **1.5 EQUIPMENT GUARANTEE**

If this equipment is not fitted and commissioned according to our guidelines, and the relevant National Standards, by an approved and competent person or organisation, the warranty may become void.

## 2. FIRST FIX

**All wiring must be installed to meet BS5839: Pt1: 2002 and BS 7671 (Wiring Regs) standards. Other National standards of fire alarm system installation should be adhered to where applicable.**

### 2.1 RECOMMENDED CABLE TYPES AND THEIR LIMITATIONS

Screened cables should be used throughout the installation to help shield the Panel from outside interference and ensure EMC compatibility.

The two categories of cable according to BS5839: Pt1: 2002, Clause 26 “Fire Detection and Alarm Systems for Buildings (Code of Practice for System Design, Installation and Servicing)” are:

**Standard fire resisting cable – to PH30 classification of EN 50200**  
**Enhanced fire resisting cable – to PH120 classification of EN 50200**  
**(Note that all cables should be at least 1mm<sup>2</sup> cross section)**

On the Premier M Plus 48 Panel the general recommendation would be to use standard fire resistant cable, such as Firetuff™, GLT Exports Fire Defence Cable, FP200 or an equivalent. These cables are screened, and will provide good ECM shielding when properly grounded at the panel. Certain system specifications may demand the use of a particular type of cable and due regard should be paid to this fact.

Depending on the environment, the cables may need mechanical protection (such as a conduit).

### 2.2 MAINS WIRING RECOMMENDATIONS

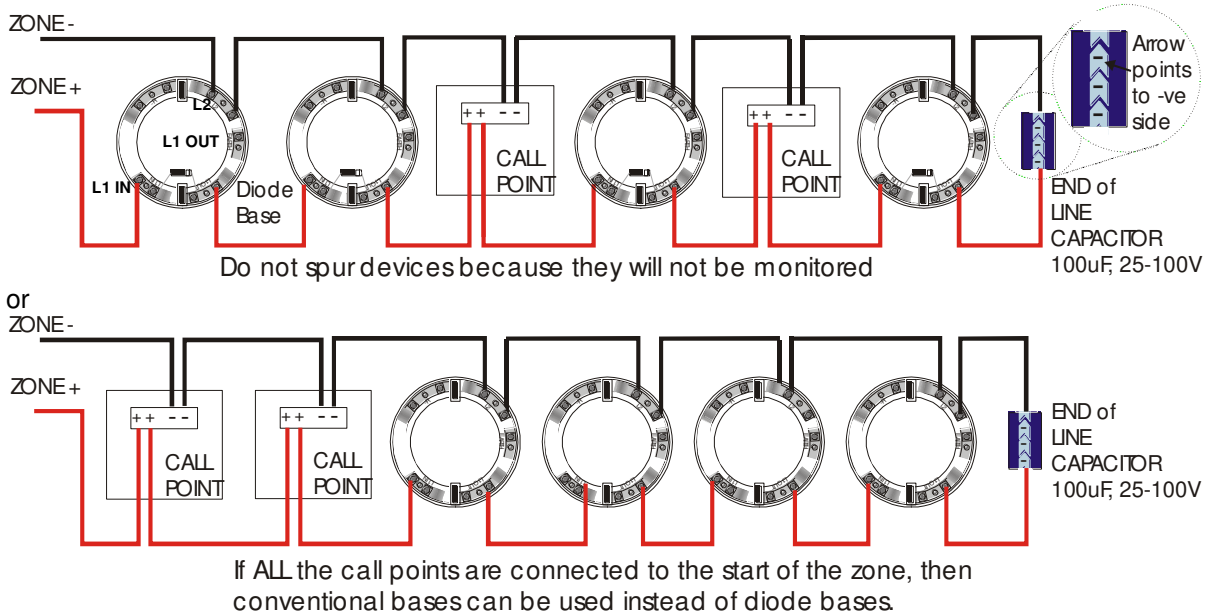
The Mains supply to the FACP is fixed wiring, using **Fire resisting** 3-core cable (Between 1 mm<sup>2</sup> and 2.5mm<sup>2</sup>) or a suitable 3-conductor system, fed from an isolating double pole switch fused spur, fused at 5A. **IT SHOULD NOT BE CONNECTED THROUGH AN RCD.** This should be secure from unauthorised operation and be marked ‘FIRE ALARM: DO NOT SWITCH OFF’. The supply must be exclusive to the Fire Panel. **MAKE SURE ANY SPARE ENTRY HOLES ARE COVERED WITH THE GROMMETS PROVIDED**

For information on how to connect Mains to the Panel’s Power Supply PCB, see page 8. Also refer to rating information on the mains cover inside the FACP.

### 2.3 DETECTOR CIRCUIT WIRING DIAGRAM

The Premier M 48 comes with 24, 28, 32, 36, 40, 44 or 48 Detection circuits (Zones). A maximum of 32 devices (i.e. smoke detectors, heat detectors, or Manual Call Points) can be fitted to each circuit. **ALL DEVICES MUST BE POLARISED.**

*Typical detector circuit wiring (Fyreye Detectors)*

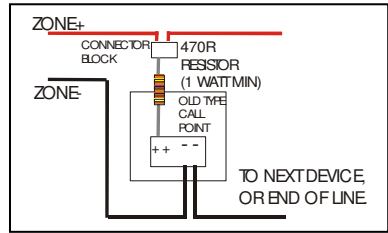


An End of Line capacitor (provided in the Panel) must be connected across the terminals of the last device on each circuit to allow the wiring to be monitored. It is polarity sensitive, and connected with the “-“ arrows pointing to zone -ve

Using detector bases with continuity diodes fitted will allow all devices, including Manual Call Points to remain operational if a detector is removed from its base.

Old Manual call points, which just cause a short circuit, are not directly compatible, as they would cause a short circuit fault. Fitting a 470R resistor in line with the call point will allow it to work.

(Note: if this is the last device, the end of line (+ve) will connect to the connector block, NOT the call point)



Other makes of detector will have different connections, but in general they are wired in one of 2 ways:

**SPLIT NEGATIVE**

**+IN & + OUT** to same terminal, **- IN** to stripe side of continuity diode, **-OUT** to non-stripe side of continuity diode.

Or

**SPLIT POSITIVE**

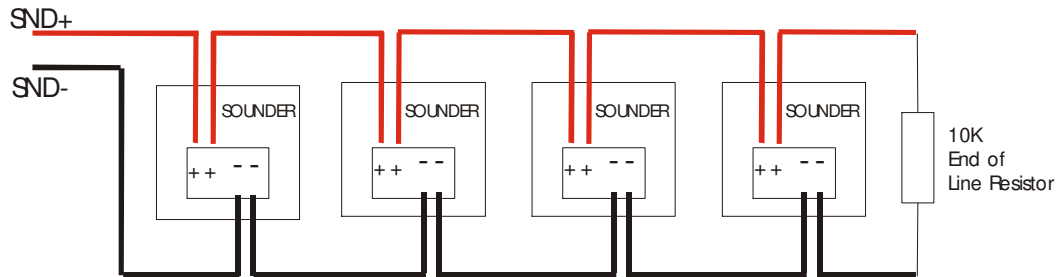
**+IN** to non-stripe side of continuity diode, **+ OUT** to stripe side of continuity diode, **- IN & -OUT** to same terminal.

Some makes of detector will connect the +ve to a 470R load resistor, or a polarisation diode, to enable the detector to work correctly with European Fire Alarm Panels.

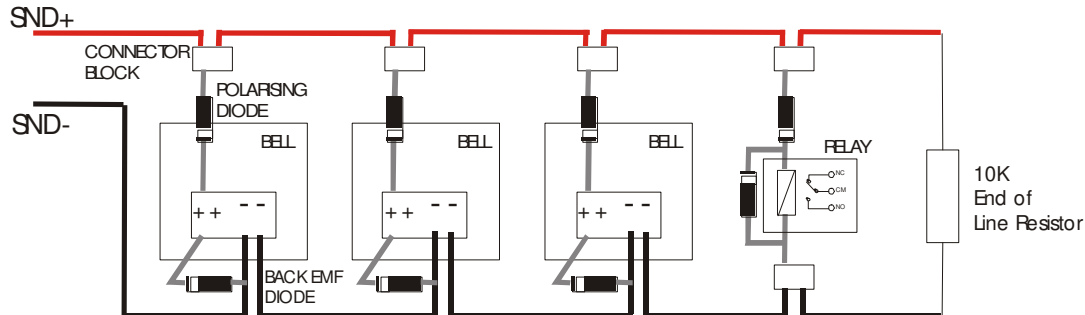
For more specific device wiring information, please refer to the device manufacturers' own instructions.

The termination of each detection circuit must be as indicated on the main PCB (See page 15). The Earthing of the cable screens should be as shown on page 9.

**2.4 SOUNDER CIRCUIT WIRING DIAGRAM**



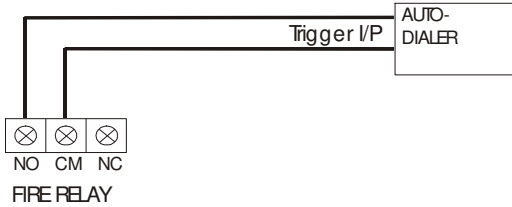
Note: If non-polarised alarm devices (eg some types of old mechanical bell, or a relay) are used, then a diode will have to be placed in line with the device to enable fault monitoring. They may also need a back EMF protection diode. (symptoms: Chattering sounder relays that don't turn off).



**2.5 AUXILIARY OUTPUT WIRING**

**2.5.1 Auxiliary Fire Output (AUX):**

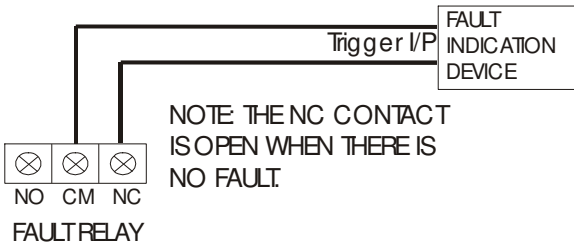
Voltage free changeover contacts. Changes over in any fire condition, and is used for driving local fire fighting equipment such as sprinkler systems, magnetic door holders, air conditioning shut off, etc.



The fire relay can be used to connect to various devices which are activated on a fire alarm. E.g. Auto dialer, magnetic door release (24V), sprinkler system etc.

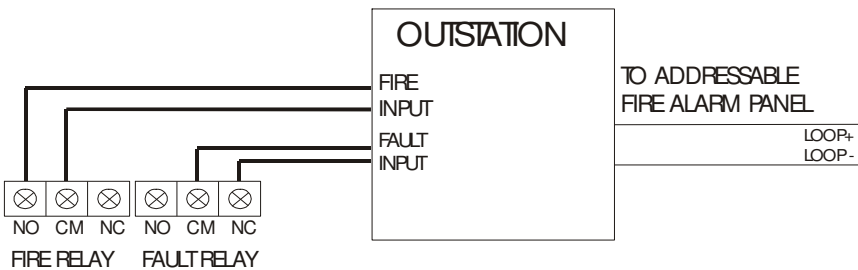
**2.5.2 Fault Output (FAULT):**

Voltage free changeover contacts. This Output is energised in the quiescent condition. In a fault condition, the output relay turns off, to ensure failsafe operation even in the event of total power loss. That is, the normally open contact will be closed when there is no fault, and open when there is a fault. This should be taken into account when any device is connected to the fault relay.



The fault relay is used to connect to a remote indication device

OR



Here the relays are used to communicate with a larger addressable fire alarm system. An example use of this might be a warehouse, which uses several flame detectors, and needs to be part of a larger system.

**2.5.3 Fire Alarm Routing Equipment Output (F.A.R.E.):**

Monitored 24V (nominal) output. This is a 24V, 100mA output that activates in any fire condition, and is used for driving local fire fighting equipment such as sprinkler systems, magnetic door holders, air conditioning shut off, etc. It is active until the panel is reset. It can be disabled through the zone/sounder disablement function, which may be useful during maintenance tests if the panel is connected to a central station via an autodialler.

**2.5.4 Serial Repeater Output:**

The Premier M 48 has an optional serial repeater. It is connected to the main panel by 4 cores (2 for power, 2 for RS485 Data). The Repeater is fully functional and can silence and reset the panel.

The termination for the above inputs must be as indicated on the main PCB (See page 15). The earthing of the cable screens should be as shown on page 9.

### 3. MOUNTING THE FIRE ALARM PANEL

It is recommended that the panels door be removed to avoid accidental damage. Also, the termination PCB could be removed and stored in a safe place, while fixing the back box to the wall.

#### 3.1 PLANNING CABLE ENTRY

Fig.2 below shows the location of the cable entries to facilitate planning of wiring (home runs) to be brought to the panel.

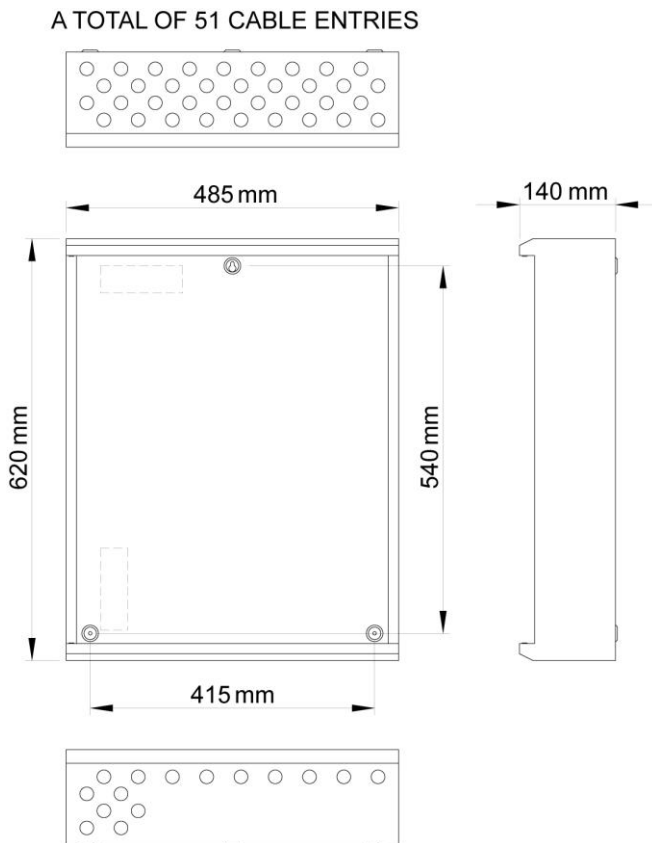
The grommets can be easily removed by a push from inside the control panel box.

If a grommet is removed, fill the hole with a brass cable gland. If any knockout is removed, but subsequently not used, it should be covered up.

The 230Va.c. Mains cable must be fed into the enclosure via one of the cable entries at the top right corner of the back box. (Refer to “Connecting the Mains” on Page 8).

#### 3.2 FIXING THE BACK BOX TO THE WALL

Figure 2: Plan view inside the enclosure without PCBs. Side view for surface / flush installation.



Fix the enclosure to the wall using the three mounting holes provided.

Check the build & condition of the wall to decide a suitable screw fixing.

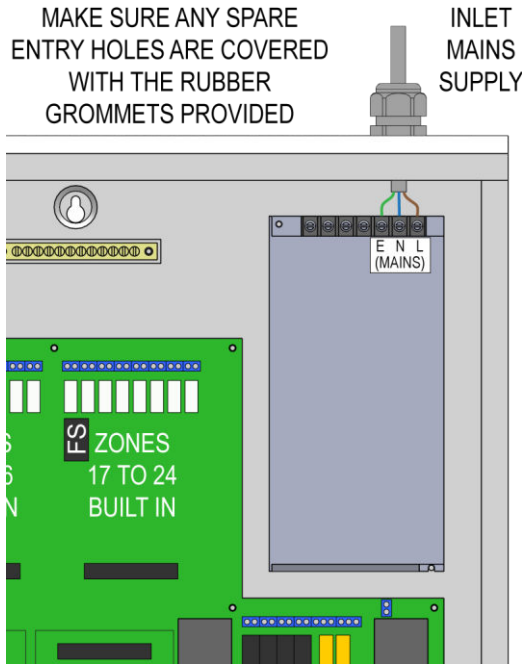
The mounting holes are designed for No 8 roundhead or countersunk woodscrews (or similar).

Remove any debris from the enclosure.

Take care not to damage the FACP during installation.

## 4 CONNECTING MAINS & BATTERY POWER

### 4.1 CONNECTING THE MAINS POWER



The panel should be connected to 220-240V AC by a 5A rated spur to the fuse box with 1mm<sup>2</sup> to 2.5mm<sup>2</sup> 3-core cable. Nothing else should be connected to this supply. This cable should be fire resistant.

The Live, Earth and Neutral connections are marked by the Connection Block. The Mains is protected by a quick blow 20mm 3.15A HBC fuse. (Also known as HRC)

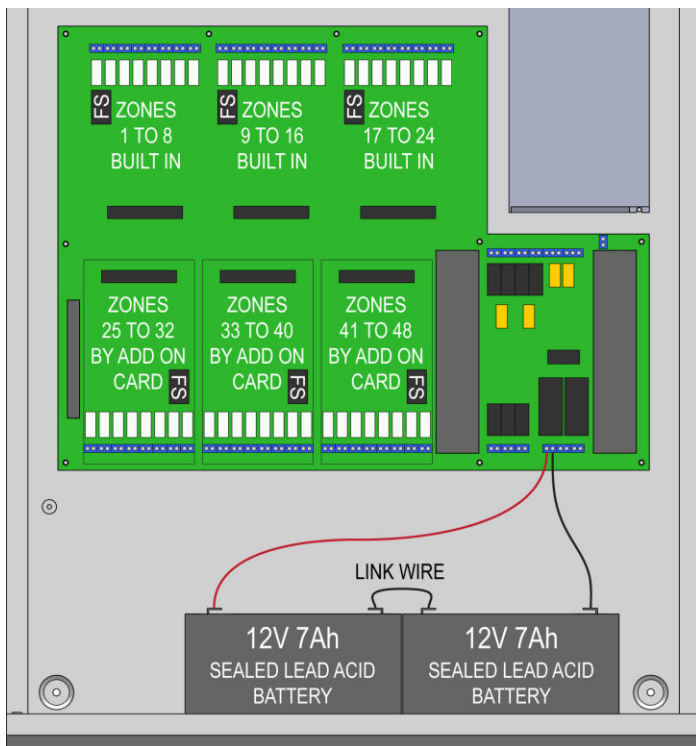
The incoming mains cable should be kept separate from the zone cables to help minimise mains interference.

**MAKE SURE ANY SPARE ENTRY HOLES ARE COVERED WITH THE RUBBER GROMMETS PROVIDED**

It is advisable to apply power to the panel before connecting any devices, to check for correct operation, and to familiarise yourself with the fire alarm panels controls.

figure 3; Power Supply PCB layout and Mains connection details.

### 4.2 CONNECTING THE BATTERIES



Although there are many sizes of suitable battery, the sizes we usually recommend are **12V 7Ah**. The enclosure has been designed to hold this size battery.

To calculate the exact requirement, use the equation in section 10, but as a rough guide:-

Panel = 4.66Ah

50 Detectors = 0.1 Ah

5 Bells = 0.1Ah

**BATTERY CONNECTIONS**

The two batteries are wired in **series**.

The **+ve** of one battery is connected to the **red** battery lead.

The **-ve** of the other battery is connected to the **black** battery lead.

The **-ve** of the first battery is connected to the **+ve** of the second battery using the link wire supplied.

4: Battery location and connection details

## 5. FIELD DEVICE TERMINATION

### 5.1 TERMINATING THE DETECTION AND ALARM (SOUNDER) CIRCUITS.

All cables entering the enclosure should have brass cable glands, which will ensure a good ground to the EMC enclosure coating. The Detector and Sounder circuits should be connected to the appropriate connector block on the Termination PCB as shown in Figure 6 below. (For detailed detector and alarm circuit wiring diagrams, please refer to pages 4 and 5.

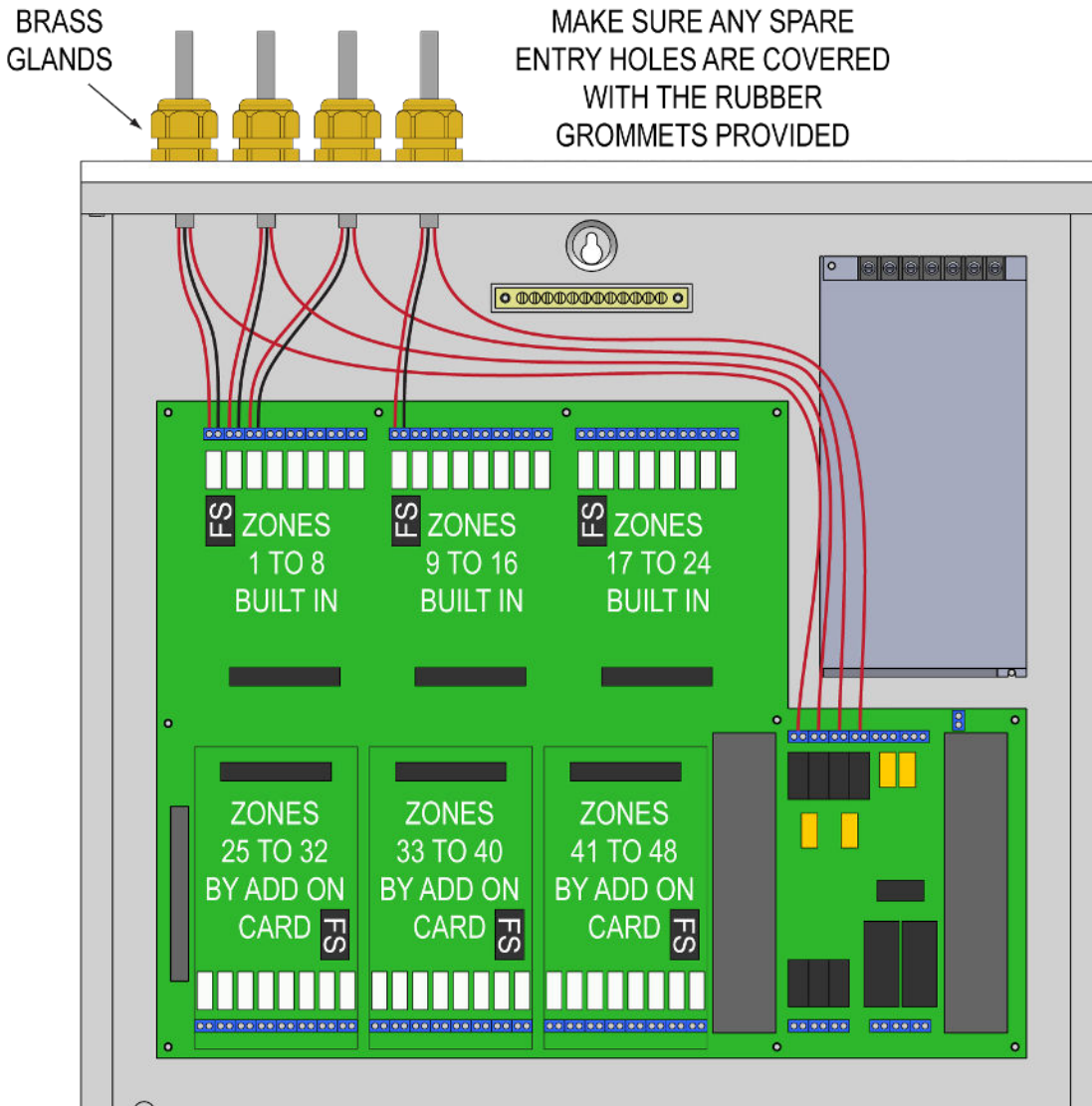


Figure 6: Detector and Sounder Circuit Connection

### 5.2 AUXILIARY INPUT AND OUTPUT TERMINATIONS

Connect auxiliary input and output cables to the appropriate connector block terminals on the Termination PCB (See Page 15). Screened cables should be terminated as per figure 6.

For a full description of the inputs and outputs available on the Premier M 48 range of Fire Panels, including typical wiring diagrams please refer to pages 5 & 6

## 6. CONFIGURING THE PANEL

### 6.1 SOUNDER ACTIVATION DELAY

#### 6.2.1 DECIDING TO USE A DELAY

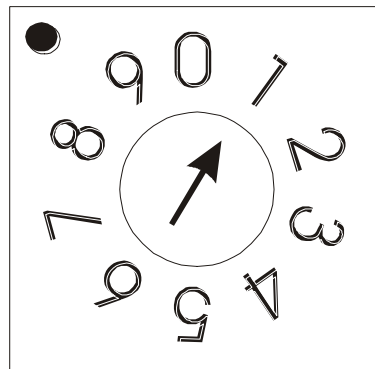
A delay of up to nine minutes from the Fire Alarm Panel being triggered, to its Alarm sounder outputs being activated, can be programmed into the panel by the Engineer. This is a particularly useful feature for schools, nightclubs and other public places where the nuisance and panic caused by a false alarm must be avoided. It should be noted that the delay period will apply to ALL zones.

When an Alarm occurs on any zone, it is processed as normal. However, the activation of the sounders is postponed until the delay period has expired, thus allowing the cause of the Alarm to be investigated by the User. If the alarm is false the alarm can be cancelled.

#### 6.2.2 TO SET A DELAY

Open the panel door and set the SND DELAY rotary switch 1 (**SW1**) using a terminal screwdriver to the delay required.

SW2 Setting	External sounder delay in minutes
0	No delay
1	1 minute
2	2 minutes
3	3 minutes
4	4 minutes
5	5 minutes
6	6 minutes
7	7 minutes
8	8 minutes
9	9 minutes



EG. The above example would have a delay of 1 minute.

### 6.2.3 DELAY INDICATION AND OVERRIDE

If a delay is set, the fire panel will light the General Disablement LED and Sounder Delay LED to indicate that the sounders are delayed. If an alarm occurs, the fire LEDs will light as usual, but the sounders will not start until the delay period has expired. After the delay period, the Gen Disablement and Delay LEDs will extinguish & the sounders will start.

Pressing the **OVERRIDE SOUNDER DELAY** switch will override the delay at any time and results in the sounders being turned on immediately.

If on investigation, the panel was activated by a false alarm, turn the keyswitch to Controls Enabled, and press the reset button. This will return the system to normal, without the sounders being activated. (Assuming the cause of the false alarm has been removed).

The delay can be removed by returning the rotary switch SW1 to position 0

## 7. ZONE DISABLEMENT

### 7.1 WHY USE ZONE DISABLEMENT

To aid commissioning and assist routine maintenance checks, any of the zones or the sounder circuits can be disabled.

When a zone (or sounder circuit) is disabled, the panel will not respond to any fault or fire signals it receives from that zone. This might be used if the system requires routine maintenance, and the customer needs the system to continue running, but doesn't want spurious false alarms.

The panel will respond in the usual manner to any events in any non-disabled zones.

### 7.2 TO PROGRAMME ZONE (OR SOUNDERS) AS DISABLED

Any number of zones (or the sounders) can be disabled, but it is good practice to only disable one zone at a time.

1. Insert and turn control key to enabled position;
2. Press **Function** button and the GENERAL DISABLEMENT LED will come on (flashing fast);
3. Press Scroll switch and the GENERAL DISABLEMENT LED will flash with a 3 quick flashes then off pattern. Zone 1 fault and zone 1 Test/Disablement LEDs will also flash with the same pattern. The panel is now in SELECT DISABLEMENT MODE.
4. Press select to disable Zone 1, or scroll to the item to disable. The panel will scroll through zones 24-48 then zone sounder 24-48, then common sounders, then F.A.R.E. Continue to press scroll until the desired Zone or sounder is flashing.
5. When an item has been disabled, the DISABLEMENT LED will be lit. The item that has been disabled will now flash 3 quick flashes then on. (This means that it has been disabled, but is still the focus of the disablement select mode.) If scroll is pressed once more, the disabled part's LED will now be lit steady, and the next item will flash 3 quick flashes then off.
6. If more than one zone needs to be disabled, then press scroll again until the required zone is selected.
7. If the panel needs to be taken out of SELECT DISABLEMENT MODE (e.g. to silence a fault on another part of the system), turn the keyswitch off, then back on again.
8. Once all the work has been done, the zones need to be enabled again. If the panel is still in SELECT DISABLEMENT MODE, jump to paragraph 9, otherwise, turn the keyswitch to controls enabled, press FUNCTION button (GENERAL DISABLEMENT LED will flash fast). Press scroll and it will flash with a 3 quick flashes then off pattern. The panel is now in SELECT DISABLEMENT MODE
9. Press the scroll button until the disabled zone or sounder has been selected. Press function button. Scroll to any other disabled zone and enable in the same way. When all zones are enabled again, the GENERAL DISABLEMENT LED will flash 3 quick flashes then off. Turn the keyswitch to off to return the system to normal.

## 8. ZONE TEST

### 8.1 WHY USE ZONE TEST

To aid commissioning and assist routine maintenance check, a non-latching 'one man test' facility is available.

When a detector or manual call point is triggered on any zone in Test, the Alarm sounders operate for approximately four seconds on and four seconds off. This cycle continues until the cause of the Alarm is removed (either by the test smoke clearing from the detector or the manual call point being reset), at which point, the detector circuit also automatically resets.

Should an Alarm occur on a zone that is not programmed to test, the Alarm will be processed in the normal way. The testing of the zone in test will temporarily be suspended until the Alarm(s) from the other zones are investigated and then reset. At this point, zone retesting may resume.

### 8.2 TO PROGRAMME ZONE IN TEST

NOTE: Only **one zone** can be programmed in test at any one time.

1. Insert and turn control key to enabled position;
2. Press FUNCTION button twice. The General Zone test LED is now on (flashing fast);
3. Press "Delay Override","Silence","Silence", "Delay Override". The General Zone Test LED will now flash 3 quick flashes then off.
4. Press scroll switch and Zone one fault & test LEDs will flash in synchronisation with the General Zone test;
5. Press scroll button to the desired Zone for test. Once the desired Zone LED is flashing, press select. The LEDs will now flash on and off. This Zone is now in test mode.
6. Once testing of that zone is completed, press select to exit test mode for that zone. The LEDs will now flash 3 quick flashes then off.
7. Press scroll button to move to another Zone to test, or turn the control key switch to off position to exit test mode.

## 9. GENERAL FAULT FINDING

### 9.1 ZONE FAULTS

The Zone Faults are non-latching faults. That is, if the fault has been cleared, the panel will automatically reset itself.

Open circuit faults will be indicated by zone(s) fault LED being lit steady, the internal Fault Buzzer will sound and the General Fault LED will be lit.

Short circuit faults will be indicated by zone(s) fault LED and the short circuit LED Flashing, the internal Fault Buzzer will sound and the General Fault LED will be lit.

#### Suggested Action

- a) If a bank of 8 zones are all showing O/C, check zone fuse FS1 on the relevant zone expansion card.
- b) Check that the correct end of line device has been fitted (100uF capacitor)
- c) Disconnect the wiring for the zone showing fault, and refit the end of line capacitor at that zone terminal in the panel. If the fault condition for that zone clears, this confirms there is a wiring fault.
- d) Double-check the wiring and the end of line capacitor on the zone. Trace the fault with consideration for the type of fault indicated.(HINT: splitting the cable half way down the zone, and fitting the end of line capacitor to the new end point helps to determine which section of cable is giving the fault)

Note: A possible fault is a detector head badly seated in a base that is not making a good connection.

- c) A short circuit on a zone could be caused by the end of line capacitor being fitted backwards.
- d) Check that the detectors are compatible with this FACP. Note that some makes of detector will require a series resistor or diode to be fitted to work properly. There is usually a spare connector on the base to accommodate this (check instructions that came with the detector).
- e) Measure the resistance of the zone cabling (Remove from panel and short out end of line). Ideally this should be less than 50 ohms. Above 70 ohms may cause an open circuit fault.

### 9.2 SYSTEM FAULT

A system fault is an abnormal microprocessor running condition due to various unexpected phenomena

This will result in the panel attempting to correct itself. Should this fault occur, the System Fault LED, General Fault LED, General Fault relay and fault internal buzzer will be constantly active until the control keyswitch is turned from off position to control enable position. This should cause this fault condition to reset. If not, consult your supplier

### 9.3 SUPPLY FAULTS

A power supply fault is indicative of one or more of the following faults: -

#### 1.Loss of Mains power – Remedy

- a. Check mains fuse (in fused mains block). Also, check that main power is present.
- b. Check charger fuse FS1.

#### 2.Loss of Battery power – Remedy

- a. Check battery fuse FS2.
- b. Check that battery connections are secure.

#### 3.Low Battery – Remedy

- a. Check battery voltage – replace if necessary.

4. Wrong Charging Voltage.

The charging voltage should be 28.4V off load at 20°C. If it has been altered, reset using potentiometer VR1

5. Overcharged Batteries.

Remove the batteries and measure the voltage. If it is reading over 27.4 then the batteries are overcharged. Try to run the panel on batteries only for half an hour or so to try to discharge the batteries. If this doesn't solve the problem, replacement batteries will be required.

#### 9.4 EARTH FAULTS

An EARTH fault indicates that something is shorting to earth (usually through the cable screen). Disconnect the earth screens one at a time to determine the problem line.

(Note: connecting other equipment, e.g. an oscilloscope, to the panel can give an earth fault)

The voltage between battery –Ve and earth should be 14-16 volts. If it is not, the voltage measured should indicate what is shorting to earth.

#### 9.5 SOUNDER FAULTS

Check that the correct END of Line resistor has been fitted. (10K – brown, black, orange, gold)

Check that all sounder fuses are OK (FS4, FS5, FS7 & FS8 – 150mA QB)

If working on an existing installation, check that the devices are polarised. (See Page 5)

Check cable continuity (remove from panel and measure continuity. Should read 10K)

#### 9.6 REPEATER FAULTS

Check that the power and RS485 connections between the panel and repeater are correct.

Check The AUX supply fuse in the panel (FS6 – 250mA).

Check the supply fuse in the repeater (FS1 – 500mA)

#### 9.7 F.A.R.E. FAULTS

Check that the correct END of Line resistor has been fitted. (10K – brown, black, orange, gold)

Check there are no open or short circuits on the F.A.R.E. line.

Check that the fuse is OK (FS3 – 100mA QB)

## 10. STANDBY BATTERY CALCULATION

In order to calculate the standby battery size required, the following formula can be used:-

$$\text{Battery Size (Standby time in Amp Hours)} = 1.25 \times [(T_{\text{ALM}} \times I_{\text{ALM}}) + (T_{\text{SBY}} \times (I_{\text{QP}} + I_{\text{QZ}}))]$$

Where:

- $T_{\text{ALM}}$  = Maximum time in hours required for the alarm [ $\frac{1}{2}$  hour is most common time]
- $I_{\text{ALM}}$  = Total Alarm Current in amps for all alarm devices connected to the alarm circuits
- $T_{\text{SBY}}$  = Standby time in hours for the system after mains failure [normally 24, 48 or 72 hr]
- $I_{\text{QP}}$  = Quiescent current in amps of control panel in fault condition [because of mains failure]
- $I_{\text{QZ}}$  = Quiescent current in amps of all detection zones. E.g. Ion detector 0.00005 Amp (50  $\mu\text{A}$ ), Optical Detector = 0.0001 Amp (100  $\mu\text{A}$ )

Typical Example:

A system comprises of 24 zones. Each zone has 20 smoke detector, 14 bells are connected to the common sounder circuit. The required standby is 24 hours. It will need to operate in alarm for  $\frac{1}{2}$  hour.

Calculate the battery size required.

$$\begin{aligned} T_{\text{ALM}} &= 0.5 \text{ Hr} \\ I_{\text{ALM (panel)}} &= 0.270\text{mA} \\ I_{\text{ALM}} &= (24+14) \times 0.025 = 0.95\text{A} \quad [\text{This typical bell current is 25 mA. Most alarm Devices show their operating current}] \\ T_{\text{SBY}} &= 24 \text{ Hr} \\ I_{\text{QP}} &= 0.150\text{A} \\ I_{\text{QZ}} &= 24 \times 20 \times 0.00006 = 0.0288\text{A} \quad [\text{the quiescent current for a typical optical detector is 60 } \mu\text{A}] \end{aligned}$$

Therefore using the equation:

$$\text{Battery Size (Standby time in Amp Hours)} = 1.25 \times [(T_{\text{ALM}} \times I_{\text{ALM}}) + (T_{\text{SBY}} \times (I_{\text{QP}} + I_{\text{QZ}}))]$$

$$\text{Battery Size (Standby time in Amp Hours)} = 1.25 \times [(0.5 \times (0.270+0.95)) + (24 \times (0.150 + 0.0288))]$$

$$\text{Battery Size (Standby time in Amp Hours)} = 1.25 \times [0.61 + (24 \times 0.1788)]$$

$$\text{Battery Size (Standby time in Amp Hours)} = 1.25 \times [0.61 + 4.2912]$$

$$\text{Battery Size (Standby time in Amp Hours)} = 1.25 \times 4.9012$$

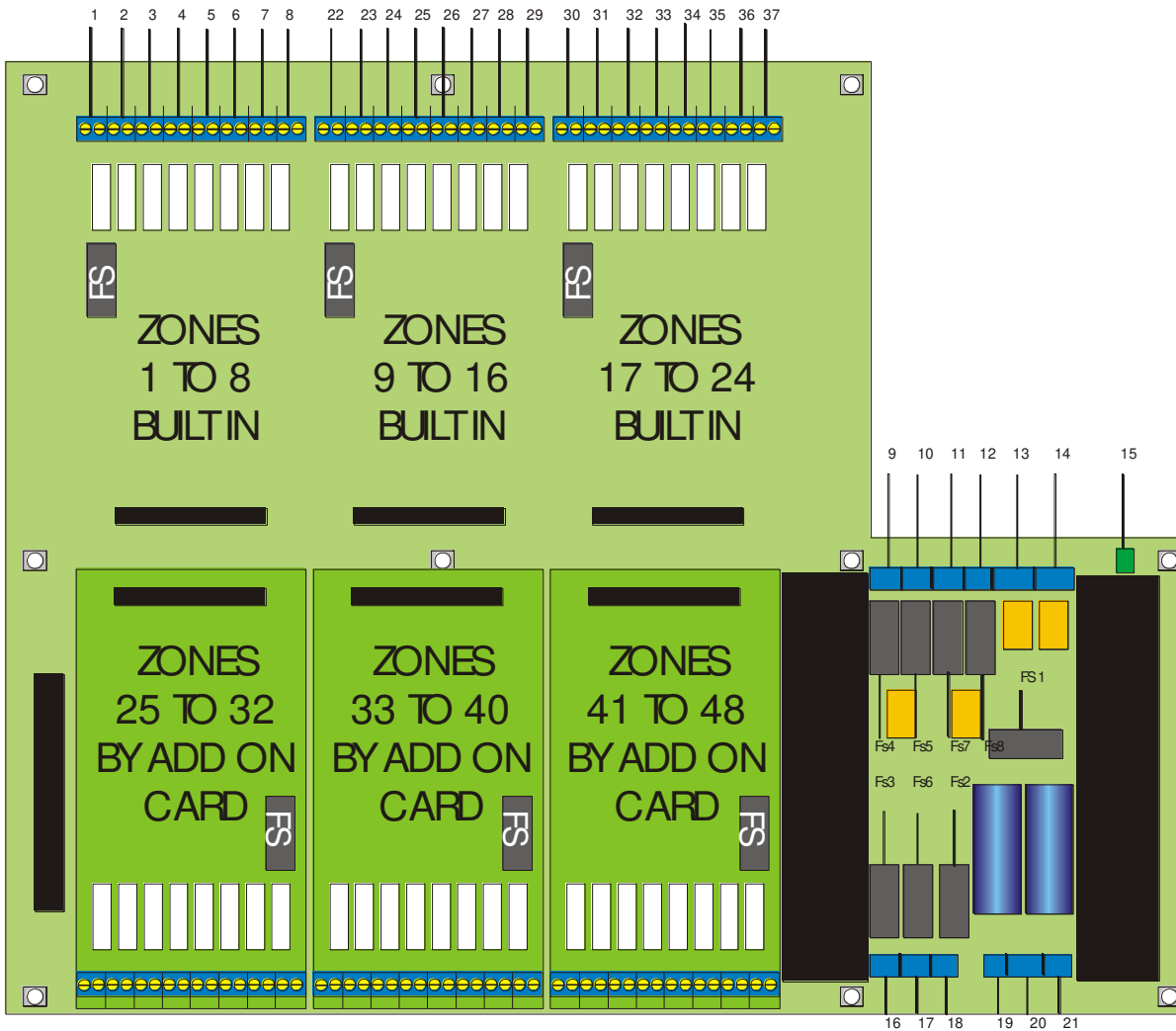
$$\text{Battery Size (Standby time in Amp Hours)} = 6.13\text{Amp Hours}$$

This system would require a minimum of 6.13Ah batteries, so we would recommend using 7Ah batteries.

\*On a system with a heavier load, it may be necessary to use larger batteries. This may require a separate battery box to hold the batteries.

## 11. PCB TERMINATION CONNECTIONS.

### 11.1 CONNECTIONS



Connection No	Description	Use
1*	ZONE 1 +&-	Connect to Zone 1
2*	ZONE 2 +&-	Connect to Zone 2
3*	ZONE 3 +&-	Connect to Zone 3
4*	ZONE 4 +&-	Connect to Zone 4
5*	ZONE 5 +&-	Connect to Zone 5
6*	ZONE 6 +&-	Connect to Zone 6
7*	ZONE 7 +&-	Connect to Zone 7
8*	ZONE 8 +&-	Connect to Zone 8
9	SND 1 +&-	Connect to sounder circuit 1 (sirens/bells)
10	SND 2 +&-	Connect to sounder circuit 2 (sirens/bells)
11	SND 3 +&-	Connect to sounder circuit 3 (sirens/bells)
12	SND 4 +&-	Connect to sounder circuit 4 (sirens/bells)
13	FIRE RELAY NO/CM/NC	Activates on fire (including test mode)
14	FAULT RELAY NO/CM/NC	Activates on fault
15	EARTH	MONITORING POINT FOR EARTH FAULTS
16	F.A.R.E. + & -	FIRE ALARM ROUTING EQUIPMENT
17	SERIAL REP A & B	RS485 SERIAL REPEATER CONNECTION
18	AUX SUPPLY	250 mA Supply @ System voltage (29-31 V dc)
19	BATTERY + & -	Connect 2 x 12V SLA batteries in SERIES (ie 24V)
20	THERM	Thermistor Connector to protect batteries
21	AC AC	Connected to transformer secondary (30VAC)
22*	ZONE 9 +&-	Connect to zone 9
23*	ZONE 10+&-	Connect to zone 10
24*	ZONE 11+&-	Connect to zone 11



## 12. PANEL SPECIFICATIONS

### 12.1 ENCLOSURE SPECIFICATIONS

DESCRIPTION	VALUE
ENCLOSURE SIZE	680 x 480 x 135 mm
TOP CABLE ENTRIES	40 x 19mm DIA GROMMETED ENTRIES
BOTTOM CABLE ENTRIES	10 x 19mm KNOCKOUT ENTRIES
REAR CABLE ENTRIES	2 SNAP OUTS, 1X 100x35mm and 1 X 70x35 mm

### 12.2 ELECTRICAL SPECIFICATIONS

ELECTRICAL DESCRIPTION	VALUE
MAINS VOLTAGE	230V AC +/- 10% @ 50/60 Hz
BATTERY VOLTAGE	24V DC (2 X 12V SLA BATTERY)
SYSTEM VOLTAGE	24V DC NOMINAL (18 – 32 V)
SYSTEM VOLTAGE RIPPLE	2V PK-PK MAX
CHARGER SIZE	UP TO 7AH in 24 Hours
ZONE VOLTAGE	21V DC NOMINAL (20 - 22.5V)
SOUNDER ALARM OUTPUTS	4 x 400mA @ 29V DC (Nominal)
AUXILIARY FAULT OUTPUT	1 x RELAY SELV (1A MAX)
AUXILIARY FIRE OUTPUT	1 x RELAY SELV (1A MAX)
F.A.R.E. OUTPUT	1 X 100mA @ 29V DC
NUMBER OF ZONES	24/28/32/36/40/44/48.
MAXIMUM ZONE CAPACITY	32 DEVICES PER ZONE
MAXIMUM ZONE RESISTANCE	70 ohms
AUXILIARY SUPPLY	250mA @ 29 V dc (NOMINAL)
SOUNDER ACTIVATION DELAY	0-9 MINUTES -IN 1 MIN INCREMENTS
ZONE END OF LINE DEVICE	100uF CAPACITOR (- STRIPE TO ZONE -VE)
SOUNDER END OF LINE DEVICE	10 K RESISTOR
CHARGER VOLTAGE	28.4V @ 25°C (NO BATTERY CONNECTED)
CHARGER SHORT CIRCUIT PROTECTION	Batteries less than 20V
TOTAL PSU OUTPUT	3 Amp
MAXIMUM CHARGING CURRENT	600mA
<b>PANEL LOAD FOR BATTERY CALCULATIONS</b>	<b>VALUE</b>
PANEL CURRENT IN MAINS FAIL (NO ZONE SOUNDERS)	180mA (160 mA with buzzer silenced)
PANEL CURRENT IN ALARM	250mA



## 12. PANEL SPECIFICATIONS

### 12.1 ENCLOSURE SPECIFICATIONS

DESCRIPTION	VALUE
ENCLOSURE SIZE	480 x 395 x 100 mm
TOP CABLE ENTRIES	20 x 19mm DIA GROMMETED ENTRIES
BOTTOM CABLE ENTRIES	10 x 19mm KNOCKOUT ENTRIES
REAR CABLE ENTRIES	2 SNAP OUTS, 60 x 20mm

### 12.2 ELECTRICAL SPECIFICATIONS

ELECTRICAL DESCRIPTION	VALUE
MAINS VOLTAGE	230V AC +/- 10% @ 50/60 Hz
BATTERY VOLTAGE	24V DC (2 X 12V SLA BATTERY)
SYSTEM VOLTAGE	24V DC NOMINAL (18 – 32 V)
SYSTEM VOLTAGE RIPPLE	2V PK-PK MAX
CHARGER SIZE	UP TO 7AH in 24 Hours
ZONE VOLTAGE	21V DC NOMINAL (20 - 22.5V)
SOUNDER ALARM OUTPUTS	4 x 150mA @ 29V DC (Nominal)
ZONAL SOUNDER CIRCUITS (OPTIONAL)	8/12/16/20/24 x 50mA @ 29V DC (Nominal)
AUXILIARY FAULT OUTPUT	1 x RELAY SELV (1A MAX)
AUXILIARY FIRE OUTPUT	1 x RELAY SELV (1A MAX)
F.A.R.E. OUTPUT	1 X 100mA @ 29V DC
NUMBER OF ZONES	24/28/32/36/40/44/48
MAXIMUM ZONE CAPACITY	32 DEVICES PER ZONE
MAXIMUM ZONE RESISTANCE	70 ohms
AUXILIARY SUPPLY	250mA @ 29 V dc (NOMINAL)
SOUNDER ACTIVATION DELAY	0-9 MINUTES -IN 1 MIN INCREMENTS
ZONE END OF LINE DEVICE	100uF CAPACITOR (- STRIPE TO ZONE -VE)
SOUNDER END OF LINE DEVICE	10 K RESISTOR
CHARGER VOLTAGE	28.4V @ 25°C (NO BATTERY CONNECTED)
CHARGER SHORT CIRCUIT PROTECTION	Batteries less than 20V
TOTAL PSU OUTPUT	3 Amp
MAXIMUM CHARGING CURRENT	600mA
<b>PANEL LOAD FOR BATTERY CALCULATIONS</b>	<b>VALUE</b>
PANEL CURRENT IN MAINS FAIL (NO ZONE SOUNDERS)	150mA (125 mA with buzzer silenced)
PANEL CURRENT IN MAINS FAIL (WITH ZONE SOUNDERS)	175mA (150 mA with buzzer silenced)
PANEL CURRENT IN ALARM	270mA