

Fire Alarm Control Panel 4-16 Zones

User & Installation Manual

M P O R T A N T

This manual should be left with the panel after installation.

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1. Introduction

The fire alarm control panels (4 Zones, 8 Zones, and 16 Zones) provide all of the sophisticated features required of a leading edge conventional fire alarm system along with the simple operation and efficient installation methods demanded by both installers and building users.

The panel can be flush or surface mounted and the generously sized metal back box allows ample space for rear or top cable entries.

A comprehensive range of auxiliary devices is available to operate with the fire control panels including optical, ionization, photoelectric, photoelectric-thermal and heat detectors.

Each of the system components has been specifically designed to operate as part of the system. This provides assurance that the control panel, smoke detectors, interface devices and the ancillary components are all fully compatible with one another and that the full range of system functionality is supported by each device.

1.1 Product Features

The panels have the following key features:

- 4, 8, or 16 conventional input zones.
- 2 notification appliance circuits (NAC) with built-in synchronization for ANSI 3.41 and Gentex.
- The panel comes with a 3 amp power supply.
- Dedicated alarm and trouble relays.
- 1 RS485 can be able to connect repeaters.
- Housed in a 335mm W x 264mm H x 88mm D metal enclosure.
- Enclosure supports two 12V, 7Ah backup batteries.

1.2 Electrical Specifications

Primary AC	120VAC 50/60 Hz Power supply rating 240VAC 50/60 Hz
Power supply rating	3 Amps @ 24VDC
Maximum Battery Charging Current	0.98 Amps @ 26VDC
Initiating Device Circuits 4 Zones	Alarm Zone 1, 2, 3, & 4
Initiating Device Circuits 8 Zones	Alarm Zone 1, 2, 3, 4, 5, 6, 7, & 8
Initiating Device Circuits 16 Zones	Alarm Zone 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, & 16
Normal Initiating Operating Voltage	23VDC, Maximum 26VDC, regulated
Short Circuit Initiating Current (per zone)	35mA Maximum
Maximum Initiating Resistance (per zone)	10 ohms
Initiating End-of-Line Resistor	3K9 ohms, 1/2W 5%
Standby Detector Current (per zone)	4mA maximum
Maximum Detector Count (per zone)	30 detectors
Initiating Cabling Type	18AWG Twisted Shielded pair (14 – 18 AWG)
Detector Base Impedance	430 ohms
Notification Appliance Circuits	2 NACs, Special Application
Maximum NAC Current Rating	1 Amp maximum per circuit
Total NAC Signaling Current	2 Amps total with 3 Amp power supply
NAC Operating Voltage	26VDC Nominal, 30VDC Maximum
NAC End-of-line Resistor	4.7K ohms 1/2W 5%
FAULT Relay rating	2A & 30VAC, resistive
Alarm(Auxiliary) Relay rating	2A & 30VAC, resistive

1.3 Fire Alarm System Limitations

An automatic fire alarm system – in general is made up of smoke, heat & other detectors, manual call points, audible warning devices, fire alarm control panels with remote notification capability, which can supply early warning of a developing fire. Such a system, on the other hand, is unable to assure protection against property damage or loss of life resulting from a fire.

The manufacturer recommends that smoke and/or heat detectors must be positioned throughout a protected premise following the recommendations of the current edition of the EN Standard, manufacturer’s recommendations contained in the Guide for proper Use of System Smoke Detectors, which is made available at no charge to all installing dealers. A study by the Federal Emergency Management Agency (an agency of the United Europe) indicated that smoke detectors may not go off in as many as 35% of all fires. A fire alarm system may not provide timely or sufficient notice, or might not function, for a diversity of reasons:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in or behind walls, on roofs, or on the other side of closed doors. Smoke detectors also may not sense a fire on another level or floor of a building. A second-floor detector, for example, may not sense a first-floor or basement fire.

Particles or combustion or “smoke” from a developing fire may not reach the sensing chambers of smoke detectors because:

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- Barriers such as closed or partially closed doors, walls, or chimneys may inhibit particle or smoke flow.
 - Smoke particles may become “cold,” stratify, and not reach the ceiling or upper walls where detectors are located.
 - Smoke particles may be blown away from detectors by air outlets.
 - Smoke particles may be drawn into air returns before reaching the detector.

The amount of “smoke” present may be insufficient to alarm the smoke detectors. Smoke detectors are designed to alarm at various levels of smoke density. If such density levels are not created by a developing fire at the location of detectors, the detectors will not go into alarm. Smoke detectors, even when working properly, have sensing limitations. Detectors that have photo electronic sensing chambers tend to detect smoldering fires better than flaming fires, which have little visible smoke. Detectors that have ionizing-type sensing chambers tend to detect fast-flaming fires better than smoldering fires. Because fires develop in different ways and are often unpredictable in their growth, both types of detectors are necessarily best and a given type of detector may not provide adequate warning of a fire. A smoke detector cannot be expected to provide adequate warning of fires caused by arson, children playing with matches (especially in bedrooms), smoking in bed, and violent explosions (caused by escaping gas, improper storage of flammable materials, etc.). Heat detectors do not sense particles or combustion and alarm only when heat on their sensors increases at a preset rate or reaches a predetermined level. Rate-of-rise heat detectors may be subject to reduced sensitivity overtime. For this reason, the rate-of-rise feature of each detector should be tested at least once per year by a qualified fire protection expert. Heat detectors are designed to protect property, not life.

IMPORTANT! Smoke detectors must be installed in the same room as the control panel and in rooms used by the system for the connection of alarm transmission wiring, communications, signaling, and/or power. If detectors are not located near the control panel, a developing fire may damage the alarm system, crippling its ability to report a fire.

Audible warning devices such as bells may not alert people if these devices are located on the other side of closed or partly open doors or are located on another floor of a building. Any warning device may fail to alert people with a disability or those who have recently consumed drugs, alcohol or medication. Please note that:

- Strobes can, under certain circumstances, cause seizures in people with conditions such as epilepsy.

Studies have shown that certain people, even when they hear a fire alarm signal, do not respond or comprehend the meaning of the signal. It is the property owner’s responsibility to conduct fire drills and other training exercise to make people aware of fire alarm signals and instruct them on the proper reaction to alarm signals.

In rare instances, the sounding of a warning device can cause temporary or permanent hearing loss.

A fire alarm system will not operate without any electrical power. If AC power fails, the system will operate from standby batteries only for a specified time and only if the batteries have been properly maintained and replaced regularly.

Equipment used in the system may not be technically compatible with the control. It is essential to use only equipment listed for service with your control panel.

Telephone lines needed to transmit alarm signals from a premise to a central monitoring station may be out of service or temporarily disabled. For added protection against telephone line failure, backup radio transmission systems are recommended.

The most common cause of fire alarm malfunction is insufficient maintenance. To keep the entire fire alarm system in excellent working order, ongoing maintenance is required as the manufacturer’s recommendations, and UL and NFPA 72 shall be followed. Environments with large amounts of dust, dirt or high air velocity require more frequent maintenance. A maintenance agreement should be arranged through the local manufacturer’s representative. Maintenance should be scheduled monthly or as required by National and/or local fire codes and should be performed by authorized professional fire alarm installers only. Adequate written records of all inspection should be kept.

1.4 Installation Precautions

WARNING – Several different sources of power can be connected to the fire alarm control panel. Disconnect all sources of power before servicing the control unit. Associated equipment may be damaged by removing and/or inserting cards, modules or interconnecting cables while the unit is energized.

Do not attempt to install, service, or operate this unit until this manual is read and understood fully.

CAUTION – System Reacceptance Testing Requirements. To ensure proper system operation, this product must be tested in accordance with NFPA 72 after any programming operation or change in site specific software. Re-acceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring. All components, circuits, system operations, or software functions known to be affected by a

change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

This system meets NFPA requirements for indoor dry operation at 0-49° C/32-120° F and at a relative humidity up to 93 ±2%RH (non-condensing) at 32 ±2° C/90 ±3° F. However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and all peripherals be installed in an environment with a nominal room temperature of 15-27°C/60-80° F.

Verify that wire sizes are adequate for all initiating and indicating device loops. Refer to the manual specifications section for maximum allowable I.R. drop from the specified device voltage.

Like all solid state electronic devices, this system may operate erratically or can be damaged when subjected to lightning induced transients. Although no system is completely immune from lightning transients and interferences, proper grounding will reduce susceptibility. Overhead or out-side aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes. Consult with the Technical Services Department if any problems are anticipated or encountered.

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

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 battery, transformer, and printed circuit board location.

Do not tighten screw terminals more than 9 in-lbs. Over-tightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static-suppressive packaging to protect electronic assemblies removed from the unit.

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation by authorized personnel.

2. Control Panel Installation

2.1 Important Notice

This product should be installed, commissioned and maintained by suitably qualified service personnel with reference to IEE regulations and any statutory requirements, for use in fire alarm signaling systems, only when installed in accordance with this manual and the latest National Fire Protection Association Standards NFPA 72; the National Electrical Code (NFPA 70); the Life Safety Code (NFPA 101); and/or the local authority having jurisdiction (AHJ). It is possible to apply system components incorrectly or arrange system components and installation wiring so that required life safety functions are NOT performed. As a result, lives may be lost.

To minimize this possibility:

- ✓ DO NOT deviate from any installation instructions contained in this manual.
- ✓ DO NOT assume any installation details not shown in this manual.
- ✓ DO NOT alter any mechanical or electrical features of the equipment supplied

BE FAMILIAR with the building code, fire prevention code, and/or requirements of the Authority Having Jurisdiction (AHJ) in the locale of the installation.

! Caution !

Under normal and fault conditions, AC line voltages may be present on any terminal. Touching any component could be hazardous and result in loss of life. A short circuit can result in arcing that could cause molten metal injuries to testing personal. To minimize this possibility, only qualified electrical technicians familiar with electrical hazards should perform these checkout procedures. Safety glasses should be worn by such personnel, and instruments used for voltage measurement should be designed for the purpose and should be in good mechanical and working order.

2.2 Mounting The Enclosure

Install the enclosure as follows:

1. Carefully unpack the system components and inspect for any damage due to shipping.

2. Mount the enclosure in a clean, dry, vibration-free area where extreme temperatures are not encountered. The location should be readily accessible with sufficient room for easy installation and maintenance.
3. Mount the cabinet by using the two mounting holes located in the upper back of the cabinet. After the panel has been properly located using the mounting holes, the panel can be secured.
4. Complete all conduit connections to the cabinet. Use the knockouts provided in the top and the sides.

Wire must NOT enter the bottom of the cabinet, since this area is intended for batteries only.

2.3 AC Power Connection

WARNING!

To reduce the risk of electrical shock, make sure that all power has been turned off or disconnected prior to attempting to connect AC power to the Power Supply.

Apply the AC Power BEFORE connecting the batteries to the Panel!

Provide the Fire Alarm Control Panel with a dedicated AC Circuit rated 10 Amps or higher. Refer to figure 2.1 for the AC power wiring diagram.

Enter the power cable into the Cabinet via a knock out hole.

Attach the brown (live) wire from the source to the terminal labeled “L” terminal..

Attach the blue (neutral) wire from the source to the terminal labeled “N” terminal..

Attach the ground wire from the source to the terminal labeled “E” terminal..

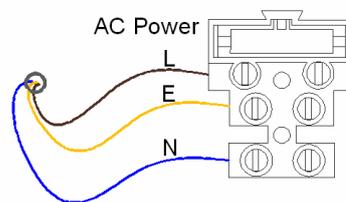


Figure 2.1 - AC Power Wiring Connection

2.4 Battery Installation

The batteries are placed at the bottom of the enclosure. The panel is fully protected if the batteries are connected in the wrong polarity. The yellow battery fault LED on the display circuit board will show steady in such a condition. When the green battery LED is on steady it shows that the battery condition and connections are normal. See Figure 2.2 below.

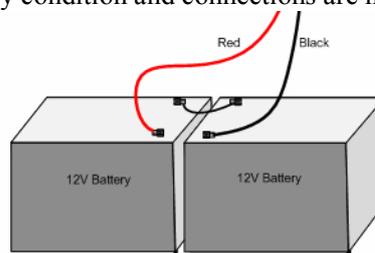


Figure 2.2 - Batteries Wiring Connection

2.5 Zone Installation

The panel has either 4, 8 or 16 class B conventional input zones. Wire the smoke, heat or multi detector positive terminals to the terminal labeled “+” and the negative detector terminals to the terminal labeled “-“ as shown in figure 2.3 which shows the panel. Each active zone requires a 3K9

2.3.

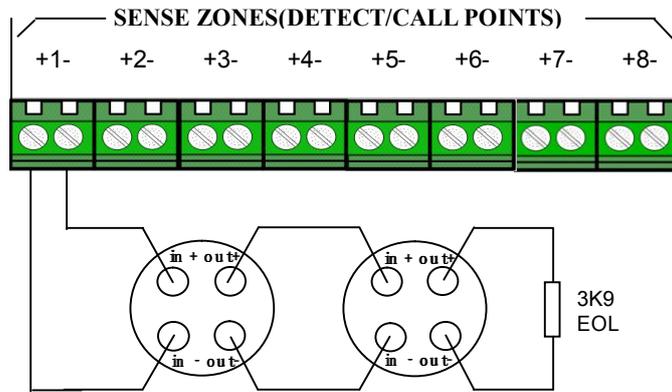
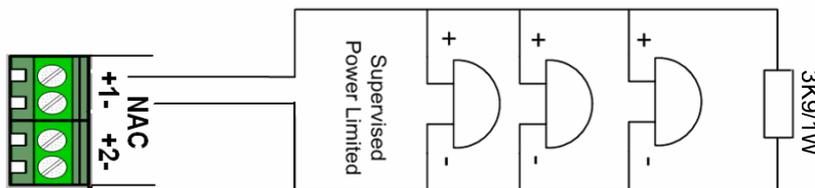


Figure 2.3 - Detectors Wiring Connection

2.6 NAC Output Circuit Installation

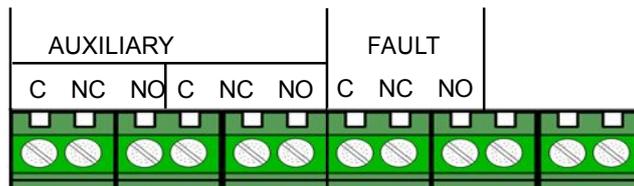
The control panel has 2 built-in output notification appliance circuits (NAC).

Figure 2.4 shows output circuit 1 wired as a class B NAC output. Observe the polarity of the wiring and the placement of the 3K9 end of line (EOL) resistor located at the very end of the class B wiring.



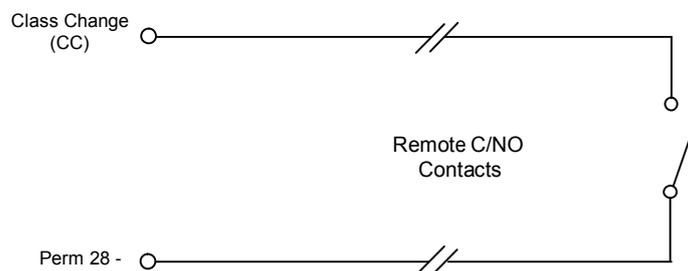
2.7 Relay Outputs

Each panel has 2 forms C relays, the relays are dedicated to common alarm (auxiliary contacts) and common fault functions. All 2 relay outputs (Alarm and fault relays) carry the same voltage and current ratings. The relays are rated 2 amps at 30VDC.



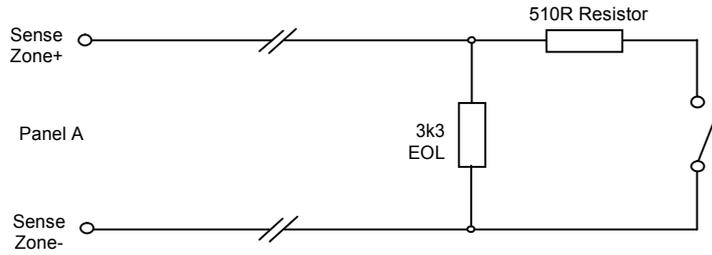
2.8 Ringing The Alarms Remotely

The class change (CC) facility allows a remote source to sound the alarms. When the CC terminal is connected to the 'Perm 28V -' terminal, the alarms will sound.



2.9 Signaling Fire To Another Panel

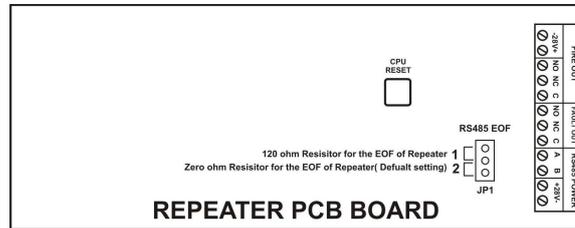
By connecting two panels as shown below, when panel B closes its auxiliary contacts, panel A will go into fire. If the zone on panel A is set to non-latching it will automatically reset when panel B opens its auxiliary contacts. If both panels need to signal fire to each other, simply duplicate the circuit substituting panel A for panel B and vice versa.



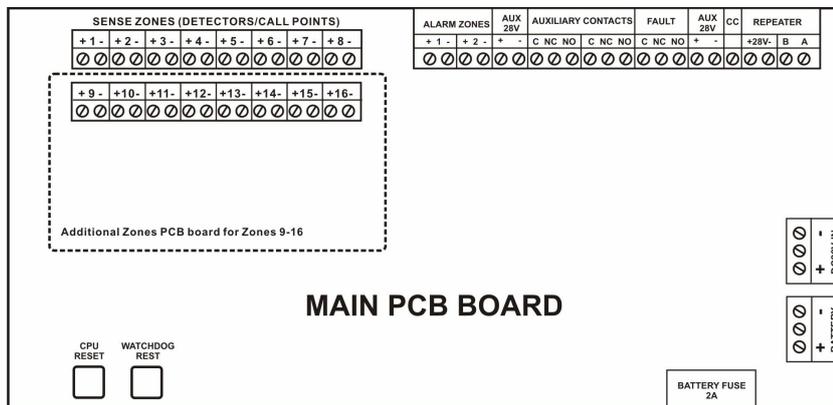
2.10 Connect To Repeater

There is one jump JP1 on the repeater PCB board. For each one fire alarm control panel can connect 64 repeaters in the same RS485 communication wires.

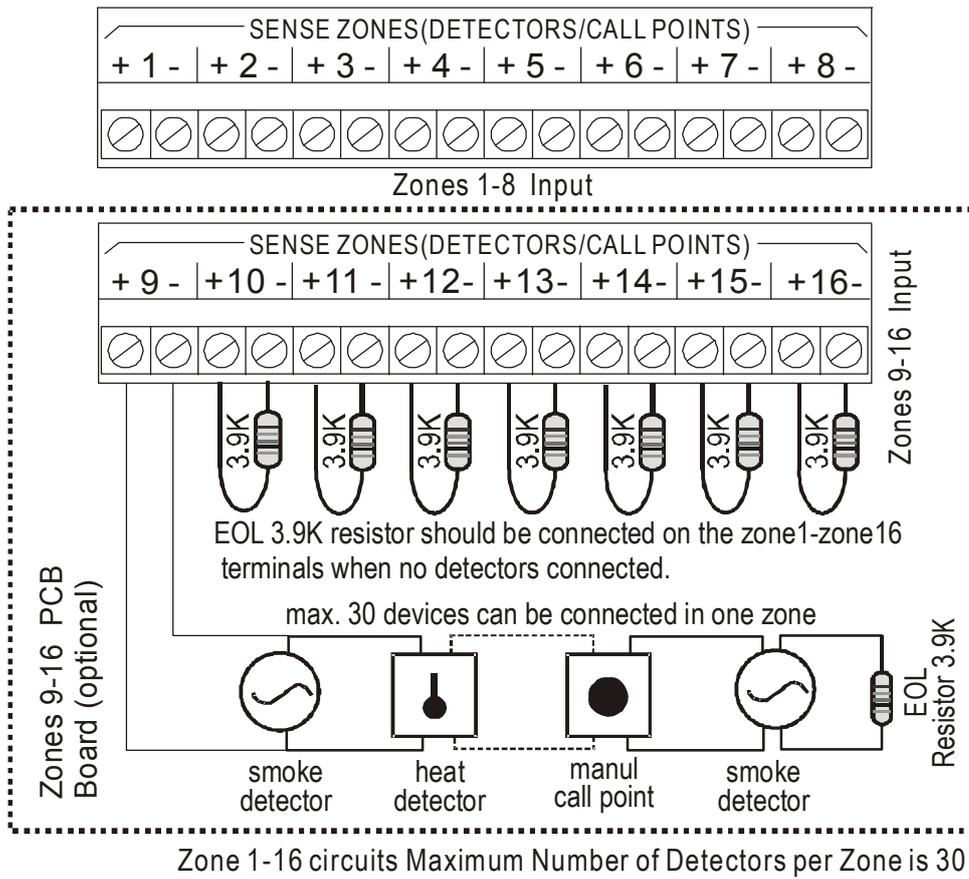
The default setting for RS485 JP1 jump is set to position 2, which EOF of RS485 is zero ohm. For the end repeater of RS485, the jump JP1 should set to position 1, which the EOF of RS485 is 120 ohm.



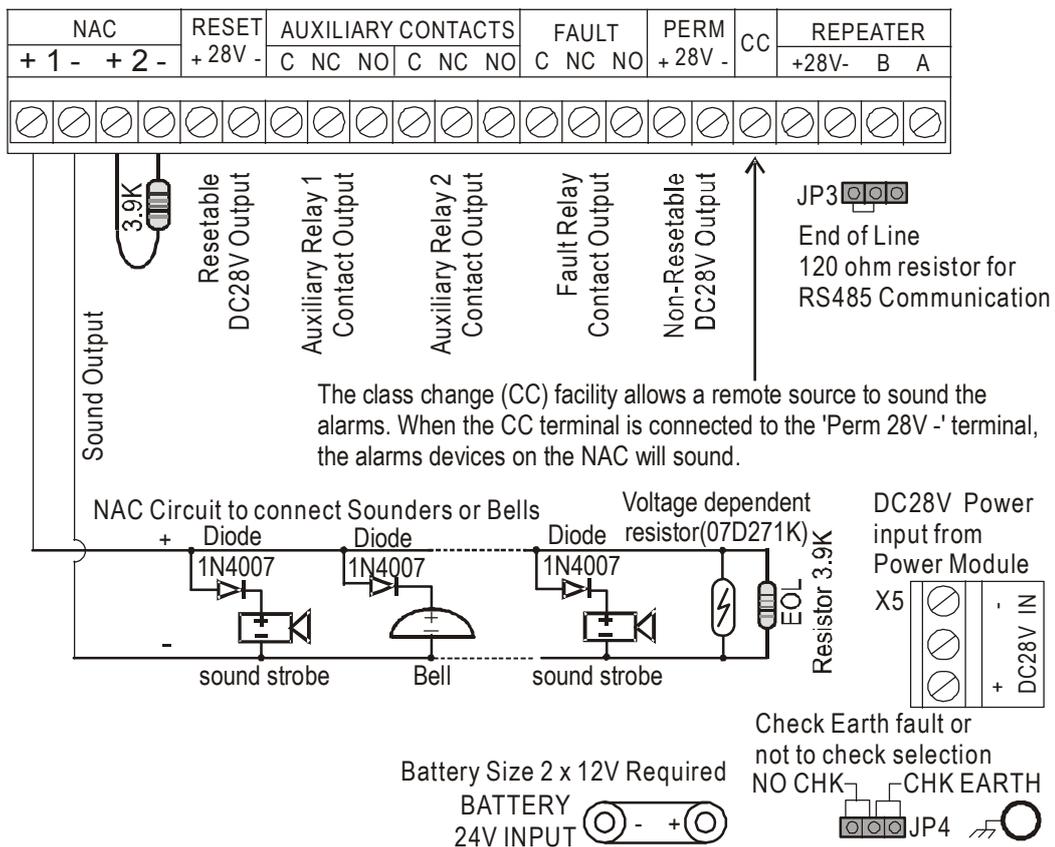
2.11 Main PCB Board



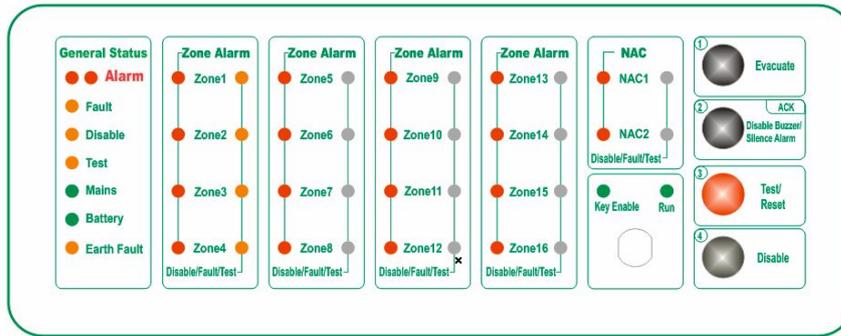
2.12 Inner Door Label (Wiring Diagram)



Main PCB board Terminal wiring instruction



3. Control Panel Operation



Enabling the front panel buttons.

To enable the front panel buttons, the key switch in the top left of the panel must be turned to the 'On' position and the Key Enable Led will be lit.

Performing a lamp test.

If the panel is in its normal condition, pressing the Test/Reset button will cause the panel to perform a lamp test.

Resetting the panel after a fire is detected.

To reset the panel after a fire event, press the Silence button followed by the Reset button.

Silencing the fault, alarm and sounder.

If a fire or fault is detected, the panel will automatically activate the alarm circuits. To silence the alarms, press the Silence button once.

In the alarm silenced condition, press the Silence button once, the sounder will be reset.

Using the disable function.

The panel allows the user to selectively disable the sense zones and the alarm zones. To enter disable mode, press the Disable button and keep more than 3 seconds. The disable LED will be lit and zone 1 disable LED will be flashing. Pressing the Disable button will toggle the status of the selected zone and pressing the Disable button will cycle through the available zones.

Once the required zones have been selected, press the ACK button (Silence alarm button). If any zones were disabled, the disable LED and the relevant zone disable LED(s) will remain lit. All incoming signals from disabled sense zones will be ignored. If the alarm zones are disabled, then the alarms will not be activated even if the panel detects a fire event on an active sense zone.

The procedure of to cancel disable is same the using disable.

Using the Evacuate function.

To evacuate the NAC output, press the Evacuate Key and keep more than 3 seconds.

To cancel evacuate, press the Silence Key twice.

4. LED Indicators

MAINS

When this indicator is green lit, AC power is being provided to the system from the building's electrical system and not from the backup battery. When the AC power condition is low or completely gone, the Fault indicator comes on and the Mains LED become yellow.

Battery

When this indicator is green lit, the Battery is normal. When the Battery power condition is low or completely gone, the Fault indicator comes on and the Battery LED become yellow.

Alarm Red LED

This Indicator is lit when an alarm condition exists in the system, initiated by smoke detectors, heat detectors, sprinkler flow switches, manual pull stations, manual call points, or other initiating devices. Along with the indicator on the panel,

notification appliances such as horns and strobes are also activated, signaling a need to evacuate the building occupants. In an alarm condition, the fire alarm control panel indicates where the alarm originated. The alarm panel can be reset once the device which initiated the alarm is reset, such as returning the handle of a manual pull station to its normal position.

Fault Yellow LED

When on steady or flashing, it means that a trouble condition exists on the panel. Fault conditions are often activated by a contaminated smoke detector or an electrical problem within the system. Fault conditions are also activated by a zone being disabled (disconnected from the system), low power on the backup battery, disabled notification appliance circuits, earth ground faults, shorted circuits or open circuits. The alarm panel's sounder will activate if a trouble condition exists. In a trouble condition, the panel displays the zone or devices causing the trouble condition. The trouble indicator goes out automatically when the situation causing the trouble condition is rectified or restores to normal.

5. Fault Finding

Front panel buttons not working.

To activate the front panel buttons, turn the key switch in the top left of the panel to the ON position.

LED blinks intermittently

This is perfectly normal and indicates that the processor is running an internal memory check.

Fault LED and sense zone fault LED flashing, buzzer sounding.

Faults monitored are:

- Open circuit on the sense zone wiring.
- Short circuit on the sense zone wiring.
- Detector head removal.

Check all detectors and call points on the sense zone indicated. Check wiring is as in example diagrams and ensure the end of line monitor is a 3k Ω resistor or an active end of line device.

Fault LED and NAC zone fault LED flashing, buzzer sounding.

Faults monitored are:

- Open circuit on the NAC zone wiring.
- Short circuit on the NAC zone wiring.

Check NAC zone wiring is as in example diagrams and ensure that the 3k Ω end of line resistor is fitted.

Fault LED flashing and Mains fault LED on, buzzer sounding.

Faults monitored are:

- Mains supply not present.
- Blown mains fuse.

Check relevant fuses and fuse clips.

Fault LED flashing and Battery fault LED on, buzzer sounding.

Faults monitored are:

- Battery supply not present.
- Batteries damaged or not fully charged.
- Blown battery fuse.

Ensure batteries are connected correctly and battery leads are secure.

