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  - "KAC" Manual Breakglass Call Point
  - "WHEELOCK" Alarm Bells
  - "PATENT" Alarm Bells
  - "KOBISHI" Alarm Bells
  - "FULLEON" Electronic Sounder / Beacons
  - "YUASA" Sealed Lead Acid Maintenance Free Batteries
  - "HOCHIKI" Series detectors
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PATENT'S COMPANY OVERVIEW

PATENT

PATENT

A brief about the company

Our Background

Patent Engineering Co. Pte. Ltd, was incorporated in 1975 and over these more than two decades, we have all along been in the business of fire protection and detection.

Our Strength

Over the years, having dedicated ourselves to a single business of specialising in fire alarm, we have steadily accumulated a team of expertise with vast experience in both conventional and addressable fire alarm systems. We are confident of providing the best in the areas of design, supply, installation, commissioning, after sales maintenance and service support.

Our Accreditation

Patent Engineering Co Pte Ltd carries the following accreditation;

- Certification to ISO 9001 by BVQI
- Certification of products compliance under PSB's Product Listing Scheme
- Registration under category ME06 – Fire Protection and Prevention Systems with CIDB

Our Products

We are reputed for producing reliable products that can be custom built to meet customer's special requirements. Patent's fire alarm panels are manufactured through stringent design and in-process quality checks and controls mete out in our ISO 9001 procedures.

Our References

Our products have been installed in places as far afield as China, Vietnam, Cambodia, Myanmar, Brunei, Indonesia and our homeland, Singapore – Protecting lives and properties in premises as varied as petrochemical complexes, shopping centres, institutions, industrial, commercial and residential developments.

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Our Quality Policy

To produce reliable products
and Provide prompt services,
We work with **P**ride, **A**ccuracy, **T**rust and
Effectiveness whilst **N**urturing our **T**echniques
to achieve Total Customer Satisfaction.

CONVENTIONAL FIRE ALARM EQUIPMENT

PANELS & DEVICES

PATENT

PATENT *System 88*

CONVENTIONAL PANEL

Comply to **SS CP10 & BS EN 54-2 / 4** Standard

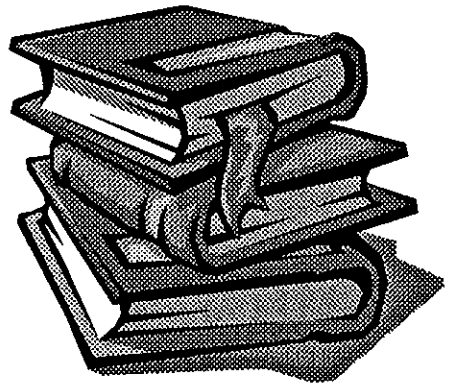
Standard

Adoption of fire Alarm Standard for PSB Corporation from
BS 5839 Part 4: 1988 to BS EN 54 Part 2 & 4 : 1998 required by FSSB.

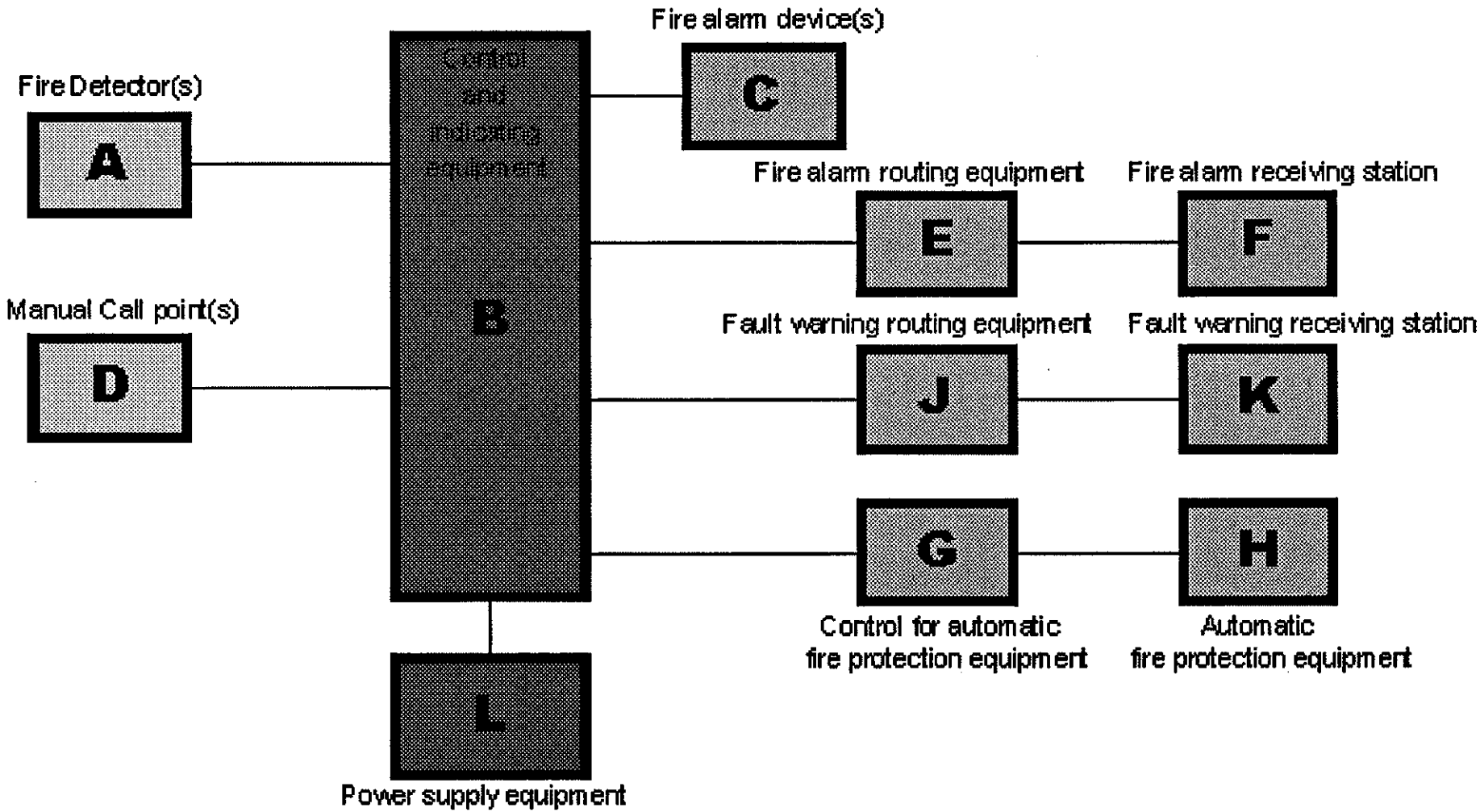
EFFECTIVE DATE

- **NEW APPLICATION**
  31 August 1999 for new application under Production Listing Scheme (PLS)

- **EXISTING (COC) HOLDER**
  Upon renewal of existing Certificate Of Conformity (COC) for existing Company listed under PLS



Components Forming
(Standard BS EN54: Part 1 1998)



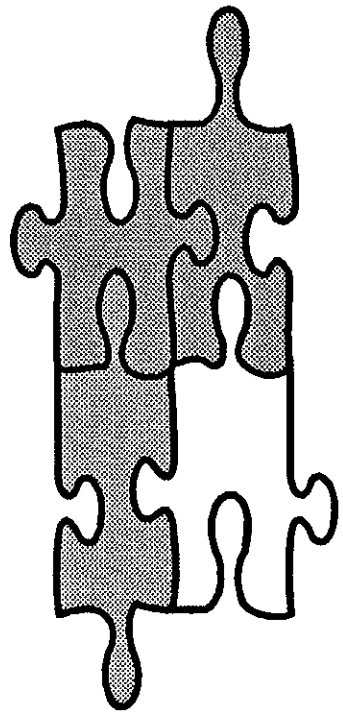
Key & New Feature

Key & New feature of **PATENT** *System 88* Fire Alarm Control Panel under BS EN54: Part 2 & 4 1998

- **OPTION WITH REQUIREMENTS**

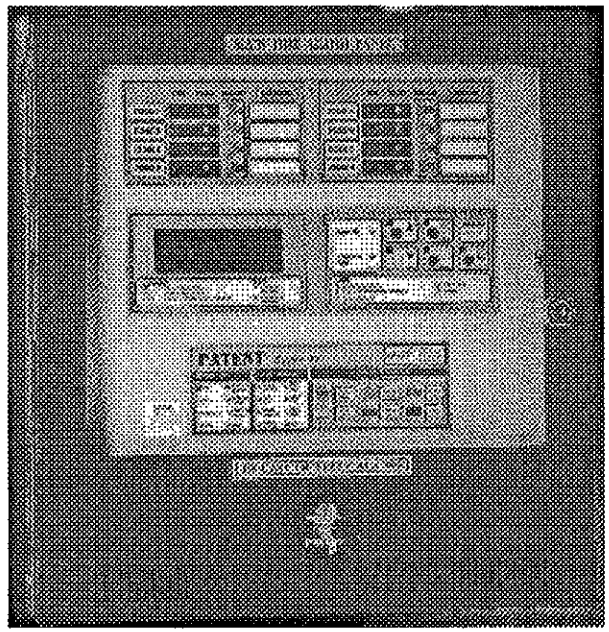
  Applicable to 19 countries members of European Union under National Code of Practice

  - **INDICATIONS**
    - ✓ Fault signal from points — Clause 8.3
    - ✓ Total loss of the power supply — Clause 8.4
    - ✓ Alarm counter — Clause 7.13
  - **CONTROLS**
    - ✓ Coincidence detection — Clause 7.12
    - ✓ Delays to output — Clause 7.11
    - ✓ Disablement of addressable points — Clause 9.5
    - ✓ Testing condition — Clause 10
  - **OUTPUTS**
    - ✓ Output to fire alarm devices — Clause 7.8
    - ✓ Output to fire alarm routing equipment — Clause 7.9
    - ✓ Output to fire protection equipment — Clause 7.10
    - ✓ Output to fault warning routing equipment — Clause 8.9
    - ✓ Standard input/output interface — Clause 11



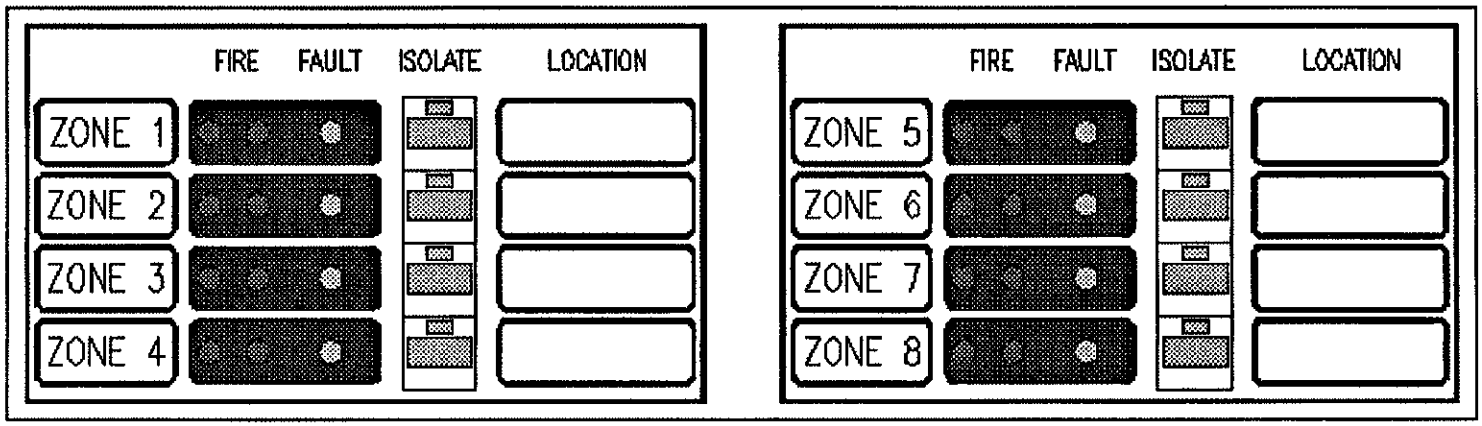
PATENT *System 88*

Conventional

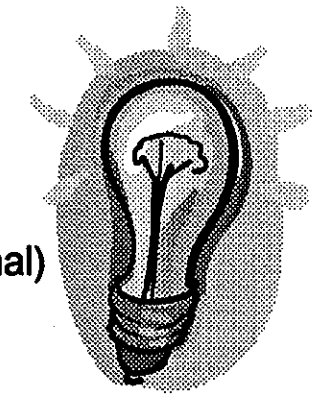


Fire Alarm Control Panel

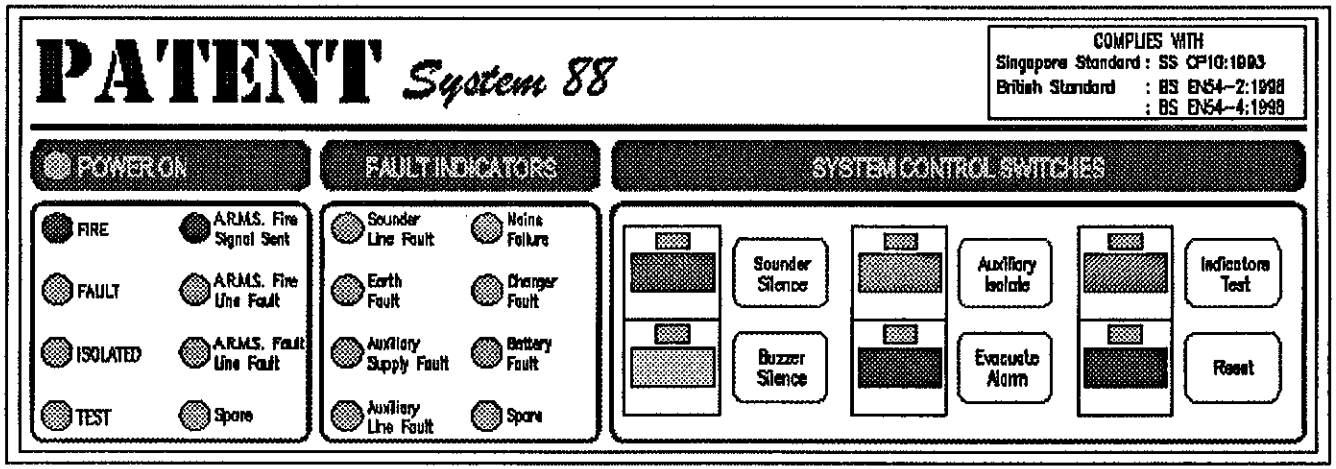
Zone Control Board



- **Indication**
  - a) Fire : Zone in fire condition
  - b) Fault : Zone detector line open/short fault condition
  - c) Isolate : Zone is isolated condition / is in test mode (Optional)
- **Control Switch**
  - a) Isolate Switch : Isolate zone fire & fault detection circuit
  - b) Test Switch : Set zone into test mode (@ Back – Optional)



System Front Control Board



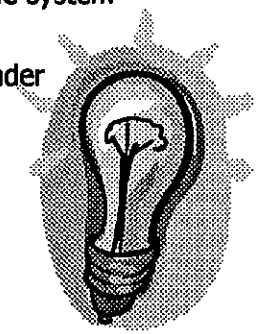
Indicator

a) Power On : System energized
b) Fire : General Fire
c) Fault : General Fault
d) Isolated : General Isolate
e) Test : General Test (Optional)
f) ARMS Fire signal sent : Sent Fire signal to DECAM panel
g) ARMS Fire Line Fault : ARMS Fire line open/short
h) ARMS Fault Line Fault : ARMS Fault line open/short
i) Sounder Line Fault : Sounder line open/short
j) Earth fault : Field wire short to chassis
k) Auxiliary Supply Fault : Aux supply fault (Primary/Standby)
l) Auxiliary Line fault : Aux control line short/open (Optional)
m) Mains Fault : Mains supply failure
o) Charger Fault : Charger low / high / fuse blow
p) Battery Fault : Battery low / high / disconnected / fuse blow

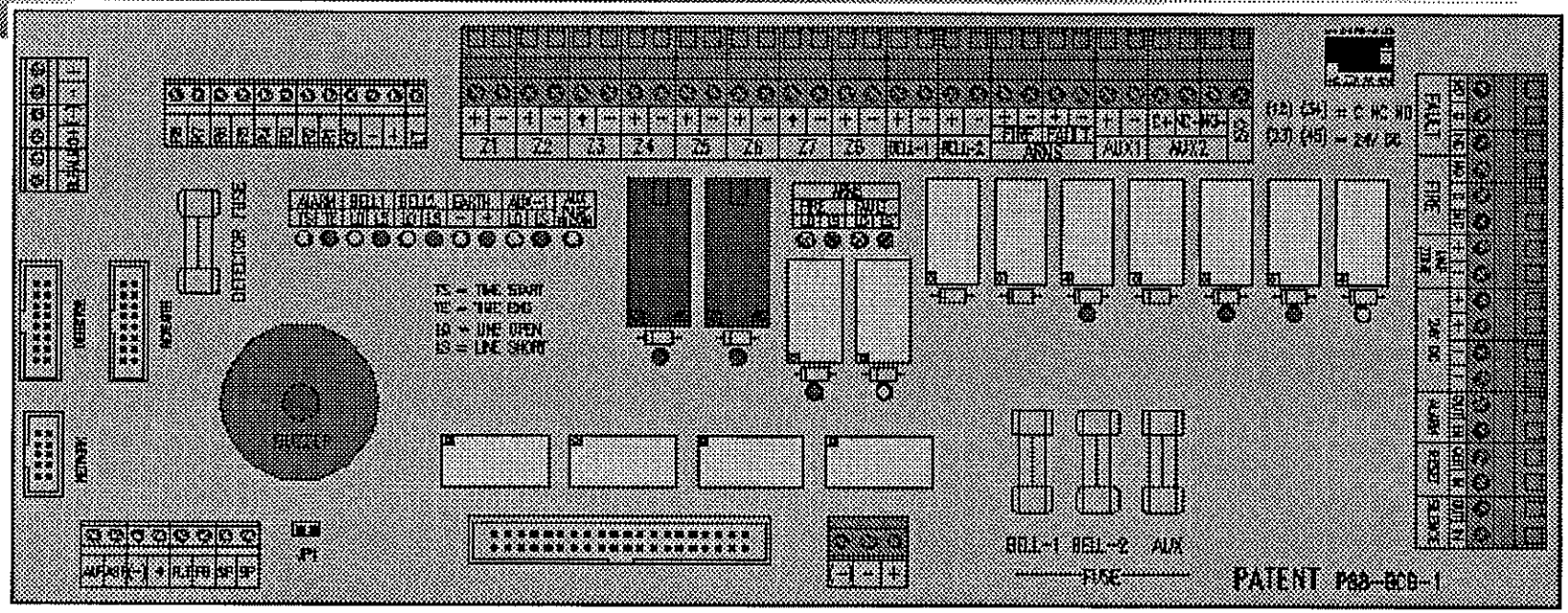
Control Switches

a) Sounder Silence : To silence alarm sounder
b) Buzzer Silence : To silence warning buzzer
c) Auxiliary Isolate : To isolate auxiliary function
d) Evacuate Alarm : To raise alarm manually
e) Indicators Test : To test all LEDs and Buzzer
f) Reset : To normalise the system

NOTE: Before Reset, silence alarm sounder



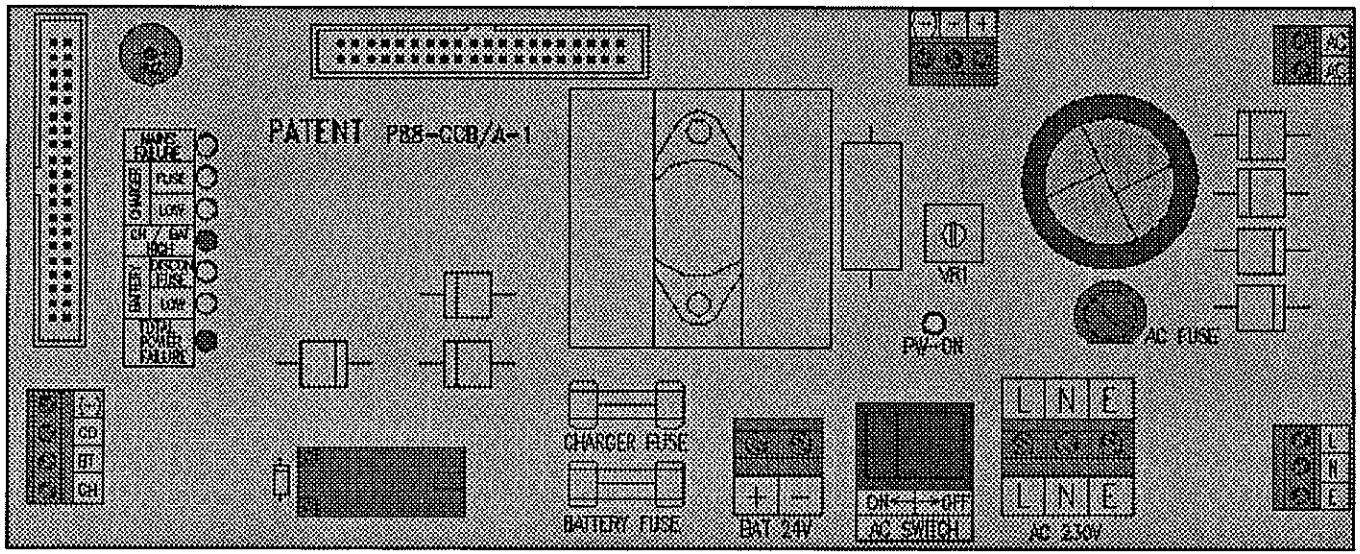
Base Control Board



FEATURE

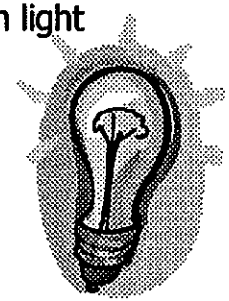
- Max 8 Zone terminals c/w Repeater outputs
- 2 Alarm bell outputs c/w individual fuse protection & open/short specific fault LEDs
- DECAM fire / fault terminal c/w open/short specific fault LEDs
- 1 X Aux-1 (Supervised) c/w open/short specific fault LEDs
- 1 X Aux-2 c/w field selector for Dry / Voltage contact
- Fire & Fault Dry contact outputs
- MAP Zone terminal, signal to Main Alarm Panel
- 2 X Aux 24V DC output terminals
- ALARM, RESET, SILENCE Network terminal c/w 2 terminals each
- Time Start/End LED indicators
- Earth +/-ve fault LED indicators
- Auxiliary fuse blown LED indicator

Charger Control Board



Feature

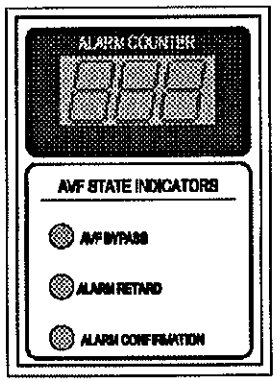
- Various capacity (1.5 Amp to 30 Amp)
- Self Diagnosis feature c/w specific fault LED
  - Mains Failure
  - Charger Blown Fuse & Low
  - Charger/Battery High
  - Battery Disconnected/Blown Fuse & Low
  - Total Power Failure c/w Buzzer warning
- Battery DEEP discharged protection
- Battery voltage TRUTH status monitoring feature
- Mains AC ON/OFF switch c/w Neon light
- Mains Transient Surge protection

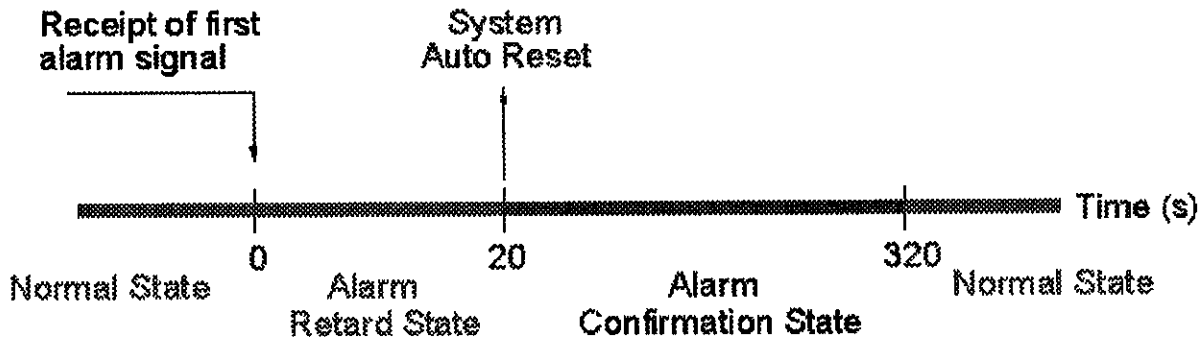


Alarm Verification Feature

Under SS CP10: 1993 Clause 2.8.9

To reduce the effects of transient environmental conditions which may cause various types of detectors to be activated, an automatic fire alarm system may be provided with an alarm verification feature, subject to the approval of the relevant authority.

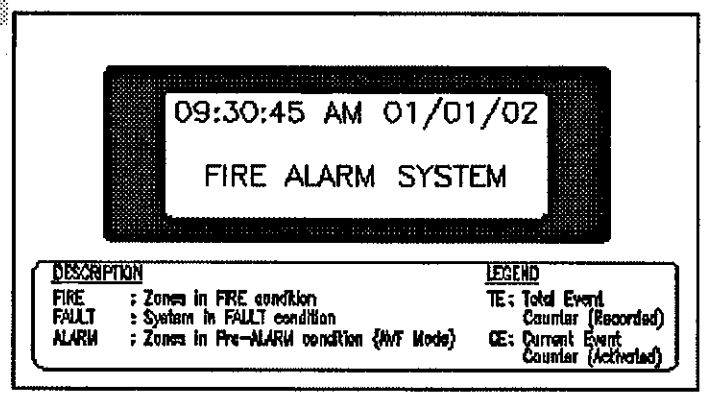


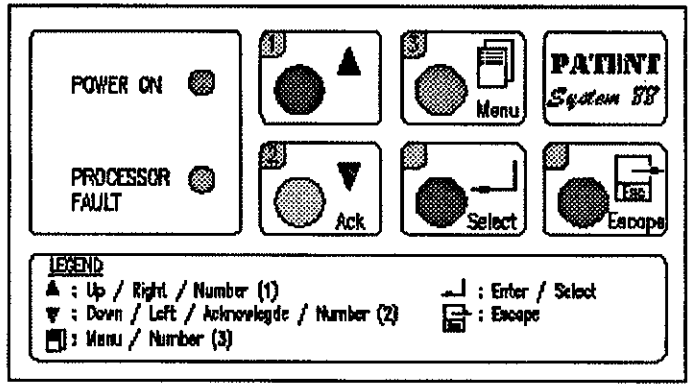


The following components of the fire alarm system shall not be subject to this feature;

a) Alarm Zone facilities containing only manual call points;
b) Circuit between sub-alarm panels and the main alarm panels;
c) Detectors used to activated fire suppression systems;
d) Detectors installed in high risk areas; and
e) Alarm zone circuits from fire suppression systems.

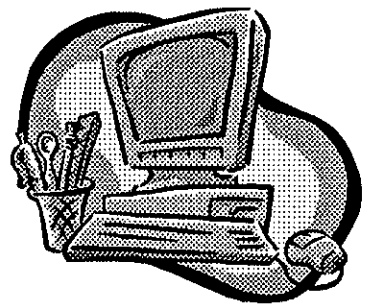
Liquid Crystal Display (LCD)
(For Fire Alarm Control Panel)





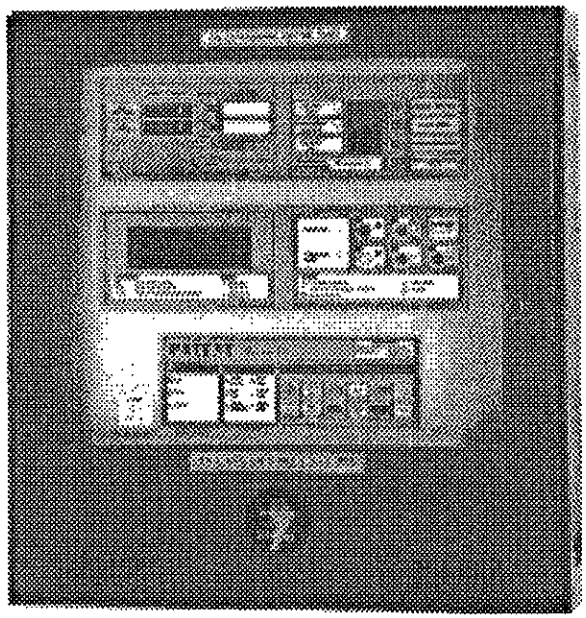
Feature:

- 20 characters, 4 line messages display
- Display all alarm event c/w Date & Time
- Event recorded up to 120 events & counter to register up to 999 events
- Stored in non-volatile memory (EEPROM)
- Total event deletion function c/w Access level control
- Color coded navigation keys
- Fully monitored for software processing c/w Processor fault indication
- Total independent Operation
  - The Failure Of The Processor Will Not Impair The Primary Function Of The Fire Alarm System
- Option to Printer (Built in / Hand Held)



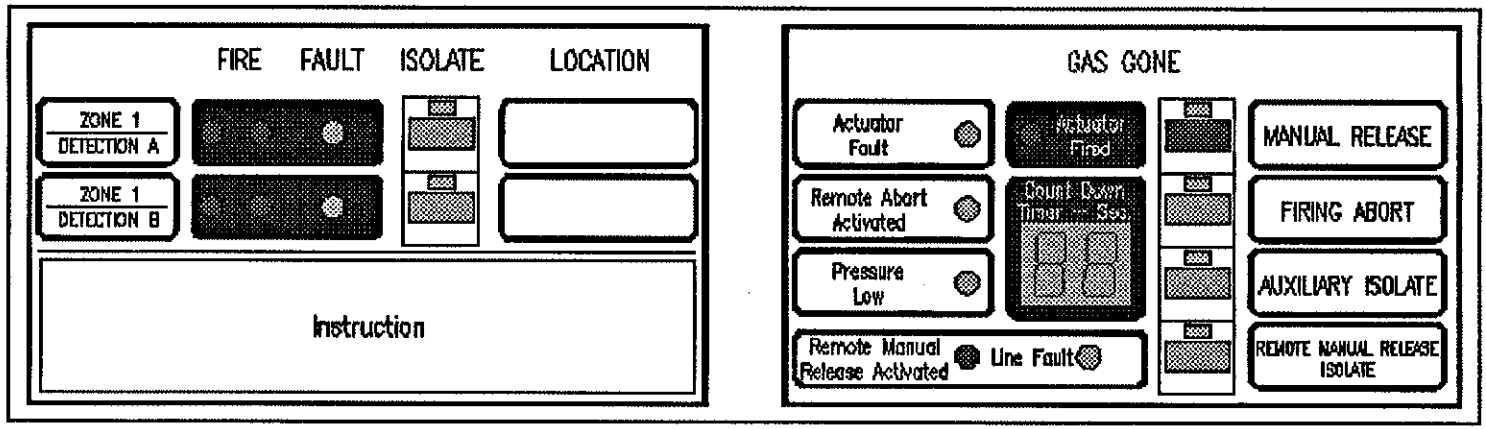
PATENT *System 88*

Conventional



Fire Extinguishing Control Panel

Zone & Firing Control Board

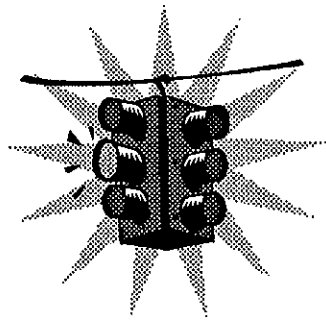


Indicators

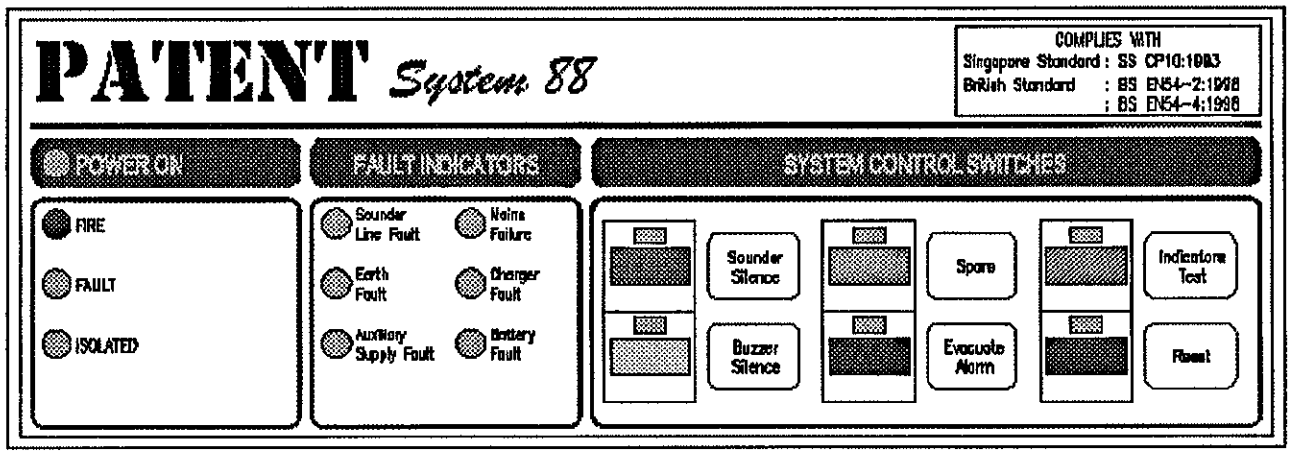
Zone Fire	: Zone in Fire
Zone Fault	: Zone in open/short Fault
Actuator Fault	: Actuator blown fuse / line open
Actuator Fired	: Actuator being fired
Remote Abort Activated	: Remote Abort station activated
Pressure Low	: Cylinder storage pressure low
Remote M/R Activated	: Remote M/R being activated
Line fault	: Remote M/R or Gas Gone line open/short
Count Down Timer	: Remaining time for activation of actuator (Setting Max-70, increase by 10)
Gas Gone	: System Gas being discharged

Control Switches

Zone Isolate : To isolate zone detection circuit
Manual Release : To manual release locally
Firing Abort : To Abort firing of Actuator
Auxiliary Isolate : To isolate 1st & 2nd Aux outputs
Remote M/R Isolate : To isolate M/R activation



System Front Control Board



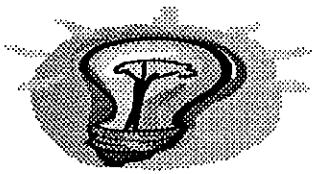
Indicator

a) Power On : System energized
b) Fire : General Fire
c) Fault : General Fault
d) Isolated : General Isolate
e) Sounder Line Fault : Sounder line open/short
f) Earth fault : Field wire short to chassis
g) Auxiliary Supply Fault : Aux supply fault (Primary/Standby)
h) Mains Fault : Mains supply failure
i) Charger Fault : Charger low / high / fuse blow
j) Battery Fault : Battery low / high / disconnected / fuse blow

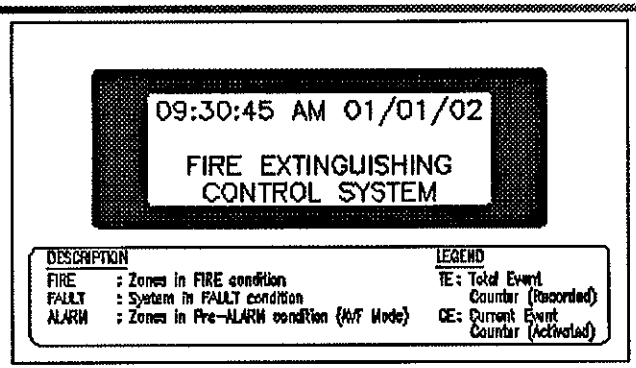
Control Switches

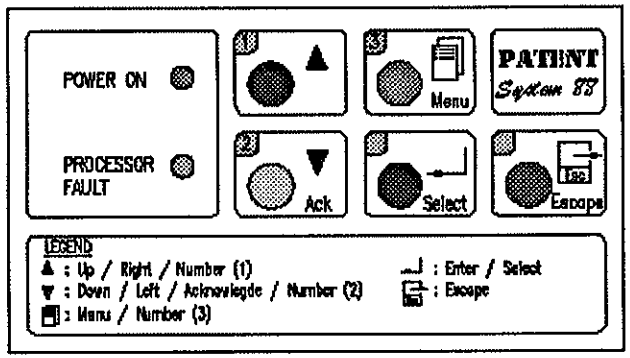
a) Sounder Silence : To silence alarm sounder
b) Buzzer Silence : To silence warning buzzer
c) Spare : Spare switch for future use
d) Evacuate Alarm : To raise alarm manually
e) Indicators Test : To test all LEDs and Buzzer
f) Reset : To normalise the system

NOTE: Before Reset, silence alarm sounder



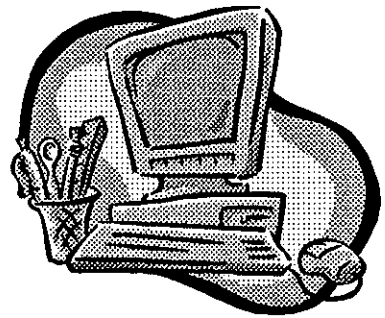
Liquid Crystal Display (LCD)
(For Fire Extinguishing Control Panel)



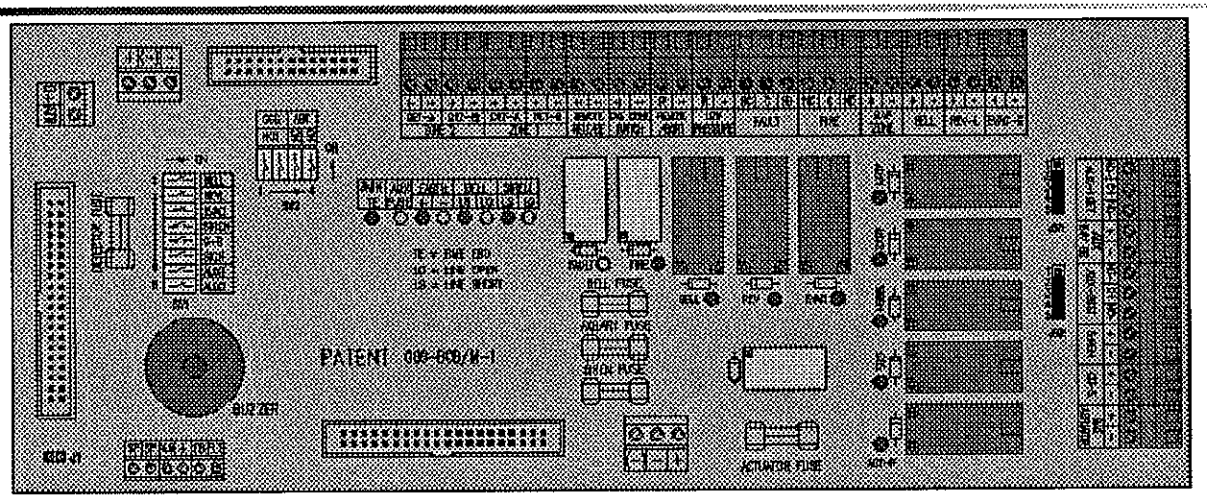


Feature

- 20 characters, 4 line messages display
- Display alarm event c/w Date & Time
  - Detection Zone A activation
  - Detection Zone B activation
  - Remote Manual Release activation
  - Local Manual Release Activation
  - Gas Discharged Signal Activated (Gas Gone P/S Switch)
- Event recorded up to 120 events & counter to register up to 999 events
- Stored in non-volatile memory (EEPROM)
- Total event deletion function c/w Access level control
- Color coded navigation keys
- Fully monitored for software processing c/w Processor fault indication
- Total independent Operation
  - The Failure Of The Processor Will Not Impair The Primary Function Of The Fire Extinguishing System
- Option to Printer (Built in / Hand Held)



Extinguishing Base Control Board



Feature

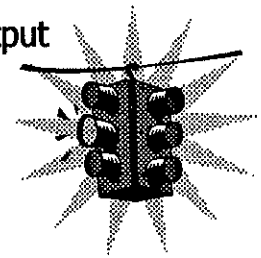
- ✓ Max 2 dual risk zone terminals
- ✓ Remote Release terminal
- ✓ Gas Gone P/S Switch terminal
- ✓ Remote Abort terminal
- ✓ Cylinder pressure low terminal c/w NO/NC field selector
- ✓ Common Fire & fault relay output
- ✓ MAP Zone signal output
- ✓ Constant 24V DC output
- ✓ Multi-Zone system output individually common facility
- ✓ Specification indicators for Time end, Aux blown Fuse, Earth +ve/-ve fault

1st Alarm Output

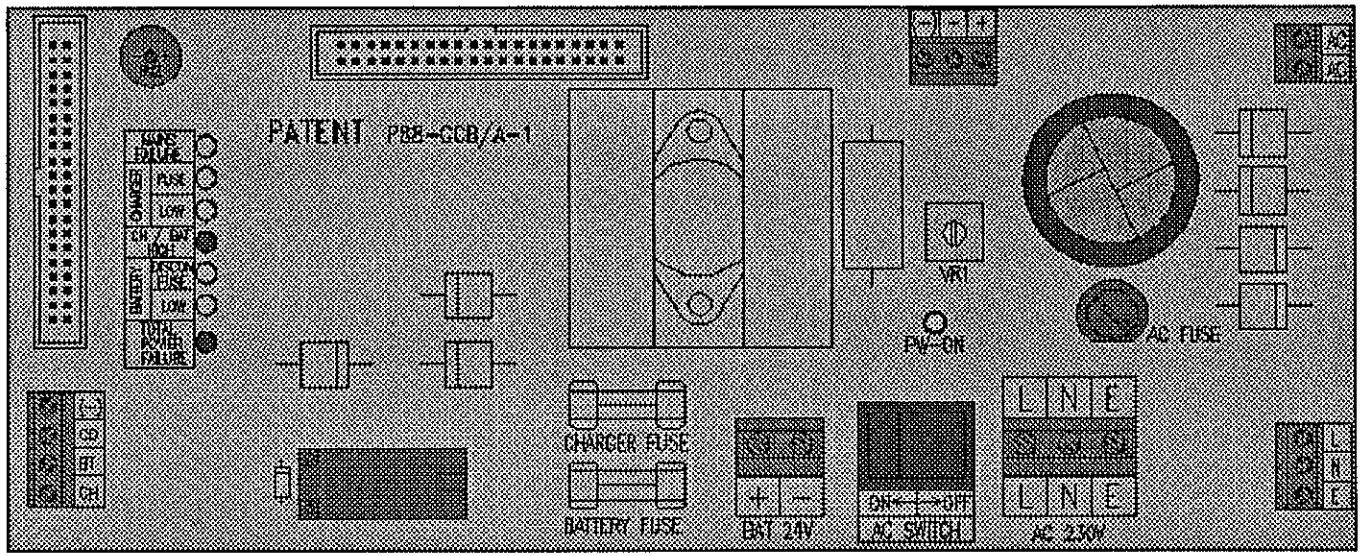
- Bell output c/w line open/short fault LEDs
- Evacuate signage signal flashing output
- Revolving light constant output
- Aux-1 output c/w Dry/Voltage contact field selector

2nd Alarm output

- Aux-2 output c/w Dry/Voltage contact field selector
- Gas Discharged signage signal flashing output
- Sire output c/w line open/short fault LEDs
- Actuator output c/w fuse protection

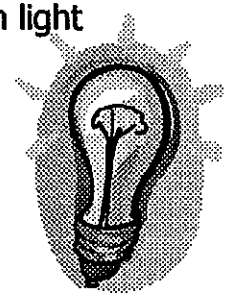


Charger Control Board

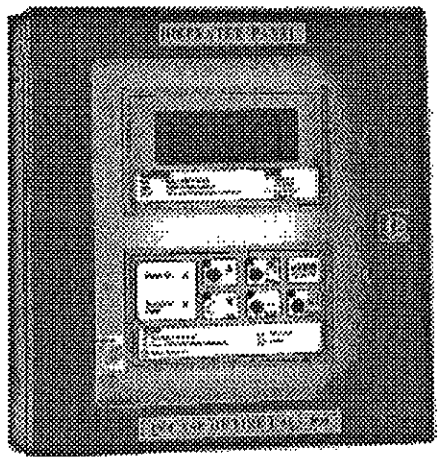


Feature

- Various capacity (1.5 Amp to 30 Amp)
- Self Diagnosis feature c/w specific fault LED
  - Mains Failure
  - Charger Blown Fuse & Low
  - Charger/Battery High
  - Battery Disconnected/Blown Fuse & Low
  - Total Power Failure c/w Buzzer warning
- Battery DEEP discharged protection
- Battery voltage TRUTH status monitoring feature
- Mains AC ON/OFF switch c/w Neon light
- Mains Transient Surge protection

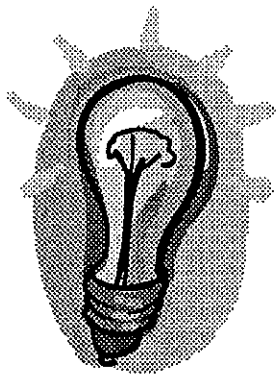


LCD Repeater Panel

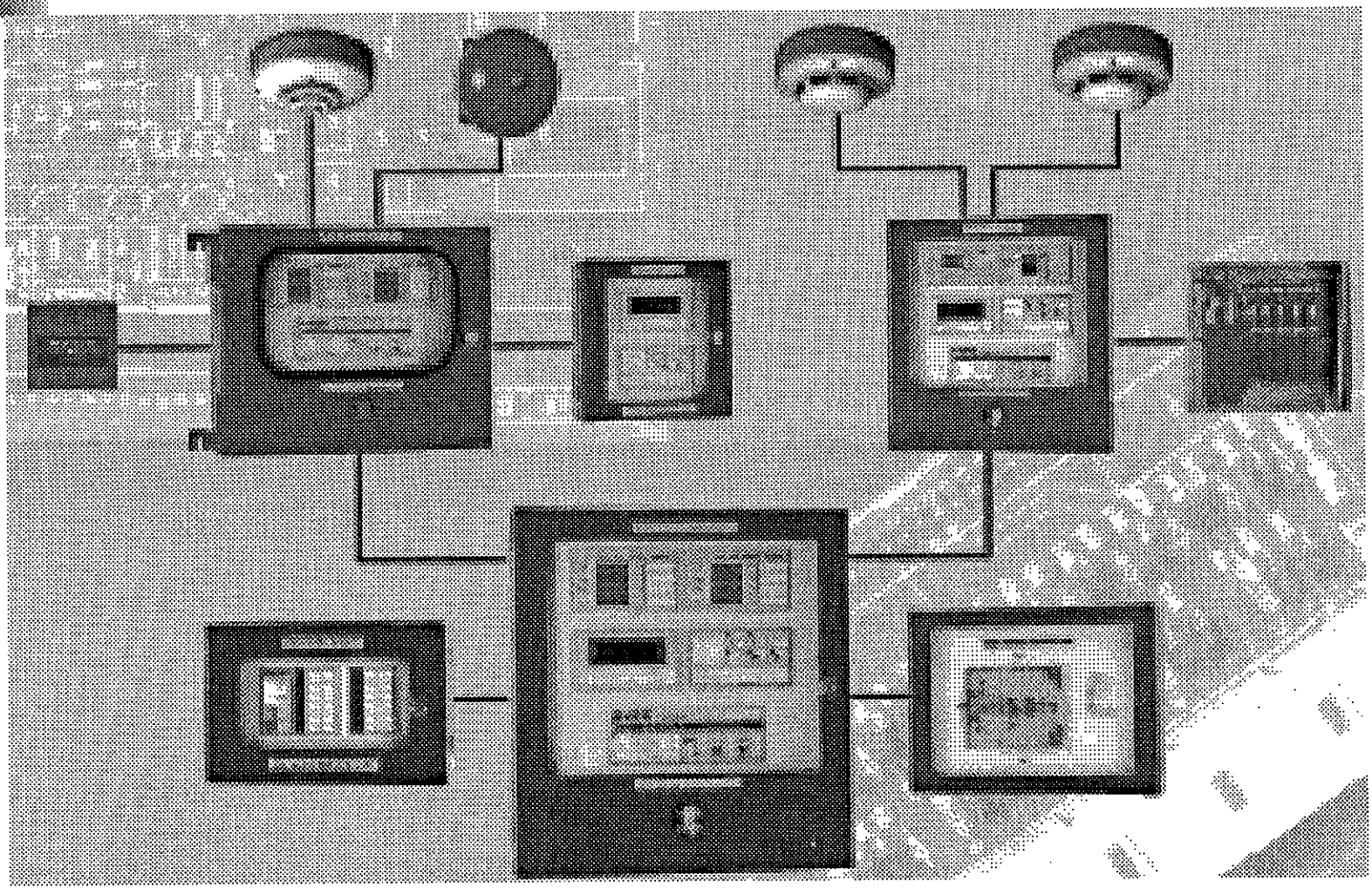


Feature

- 20 characters, 4 lines messages display
- Color coded navigation keys
- Repeat activation of alarm zones event & common fault c/w Date & Time
- Event recorded up to 120 events & counter to register up to 999 events
- Stored in non-volatile memory (EEPROM)
- Total event deletion function c/w Access level control
- Buzzer resound for subsequent alarm & fault with acknowledge function
- Fully monitored for software processing c/w Processor fault indication
- Option to incorporate Alarm Verification Feature (Software AVF)
- Option to printer (Built in / Hand Held)

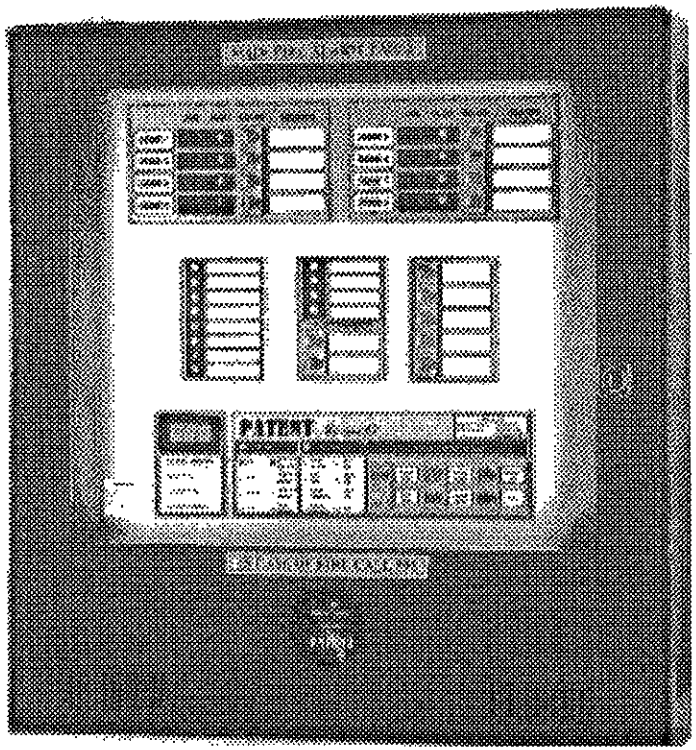


System Architecture



PATENT *System 88*

Extended Auxiliary Function

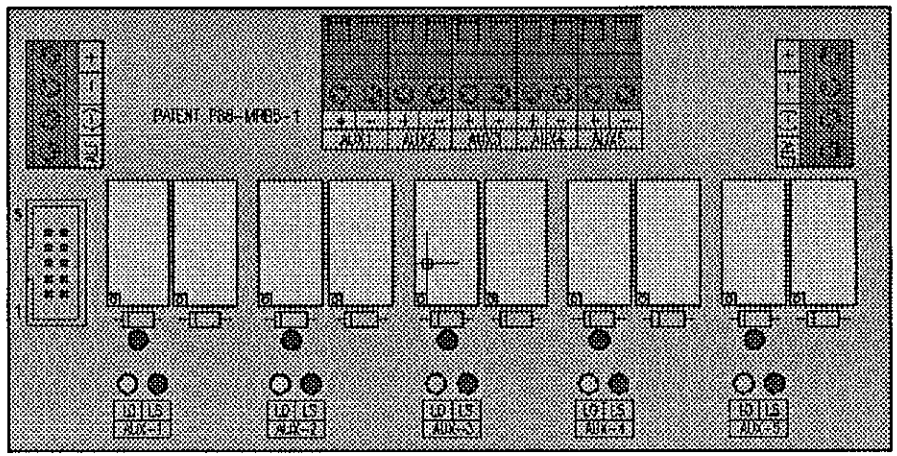


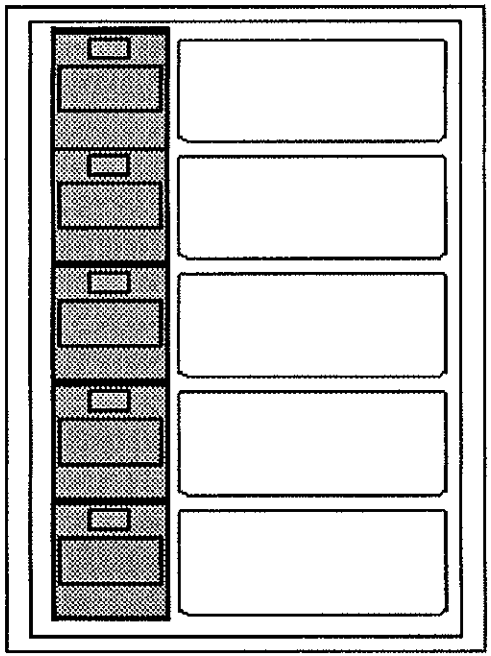
Auxiliary Control Module

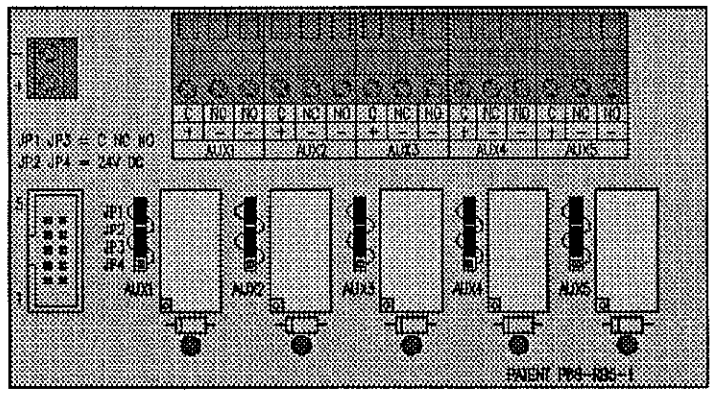
Auxiliary Relay Base Board

(c/w Line open/short supervision)

- 5 way outputs (Normally 24V – Fail safe)
- c/w specific line open/short fault LEDs







Auxiliary Relay Base Board

(w/o line supervision)

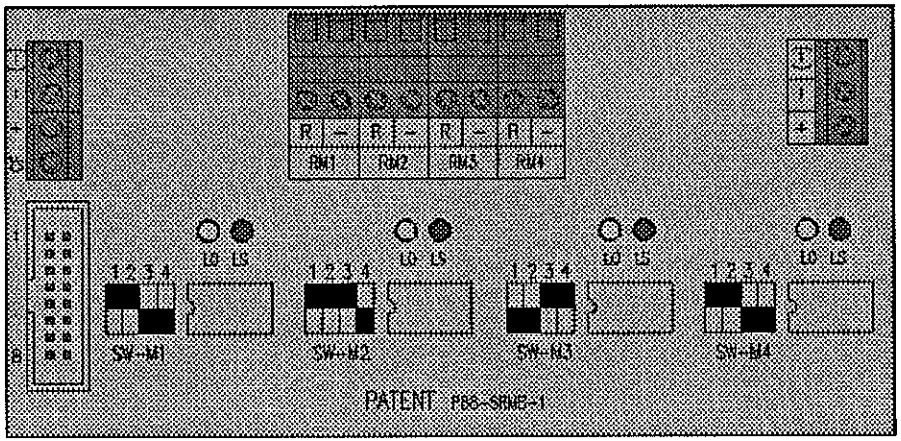
- 5 way outputs c/w field selector individually for Dry/Voltage contact output

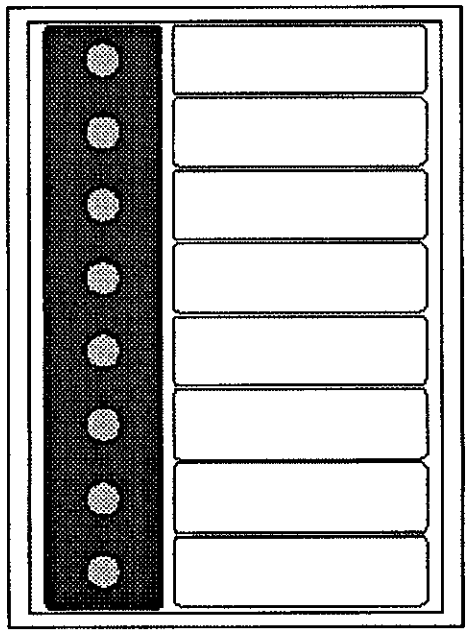
5 Way Auxiliary Control Switches Module

Status Monitoring Module

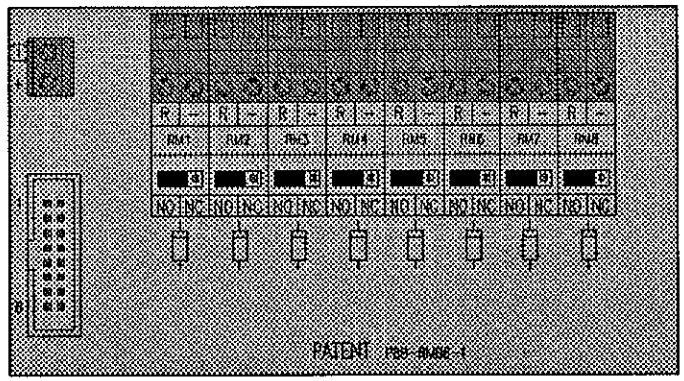
Status Base Board
(c/w line open/short supervision)

- 4 way status input terminals
- c/w specific line open/short fault LEDs
- c/w field selector switch individually for type of input – normally open/close





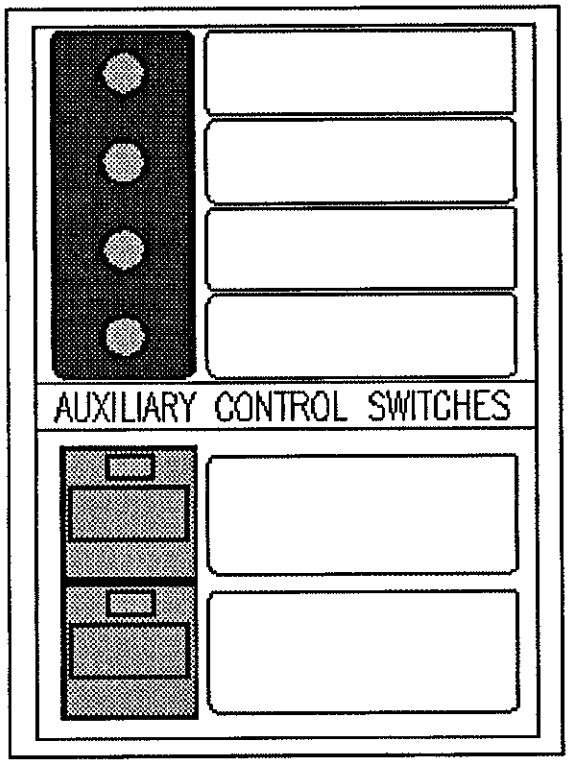
8 Way Monitoring Status Module



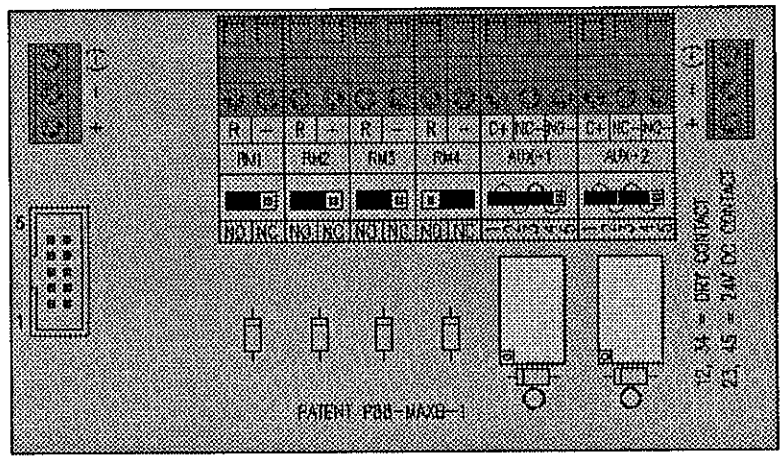
Status Base Board
(w/o Line supervision)

- ✓ 8 way status input terminals
- ✓ c/w field selector individually for type of input – normally open/close

MAX Control Module



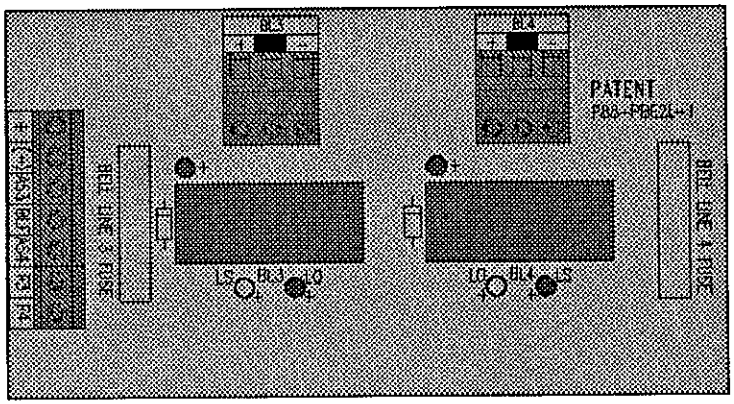
4 Status & 2 Aux (MAX) Control Module



MAX Base Terminal Board

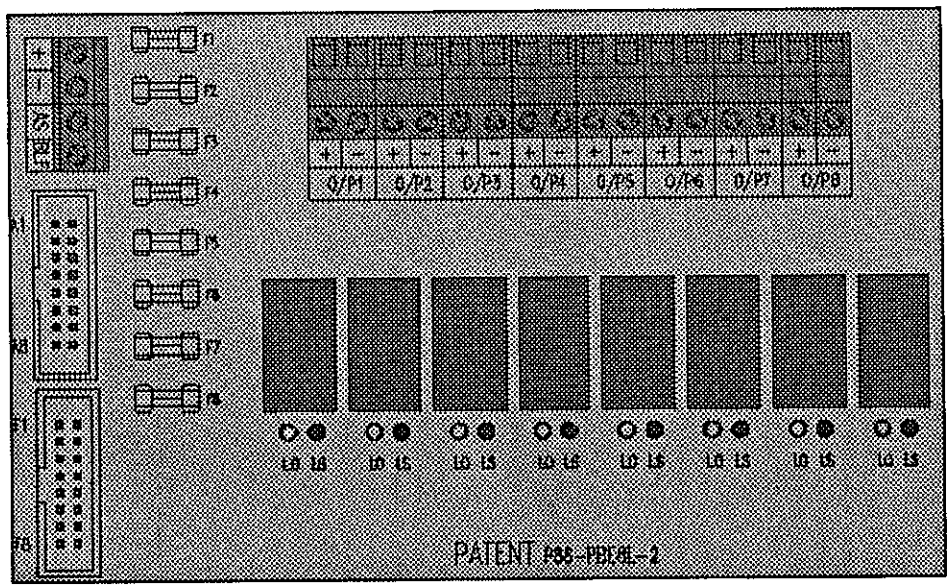
- 4 way status input terminal
  - c/w field selector for input type – normally open/close
- 2 way Aux output terminal
  - c/w field selector for Dry/Voltage contact type output

Extended Bell Board



2 Way Extended Bell Board

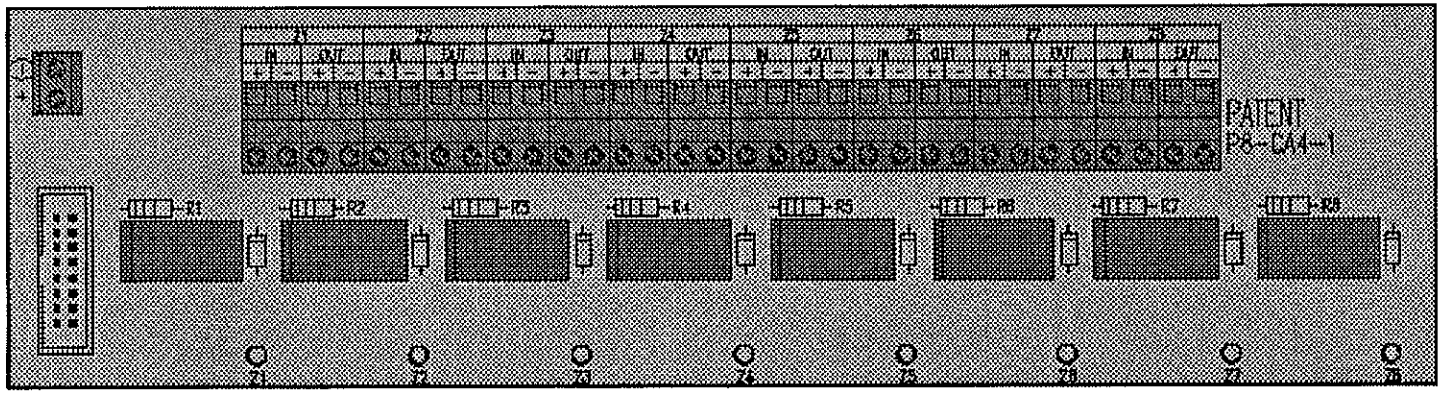
- c/w line open/short supervision & specific fault LEDs
- Individual circuit with FUSE protection



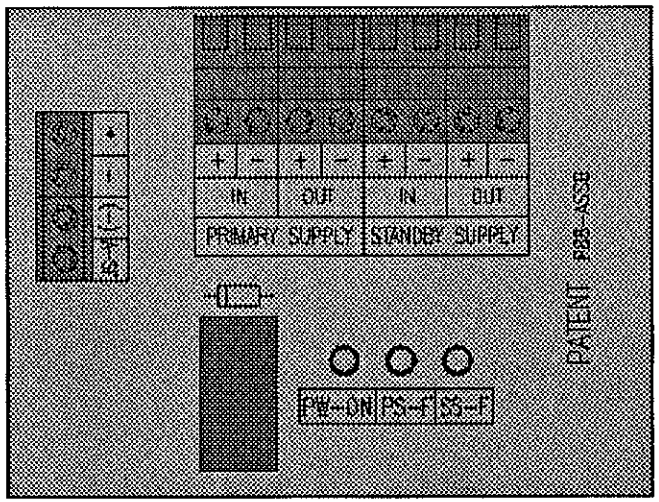
8 Way Extended Bell Board

- c/w line open/short supervision & specific fault LEDs
- Individual circuit with FUSE protection

Accessory Boards

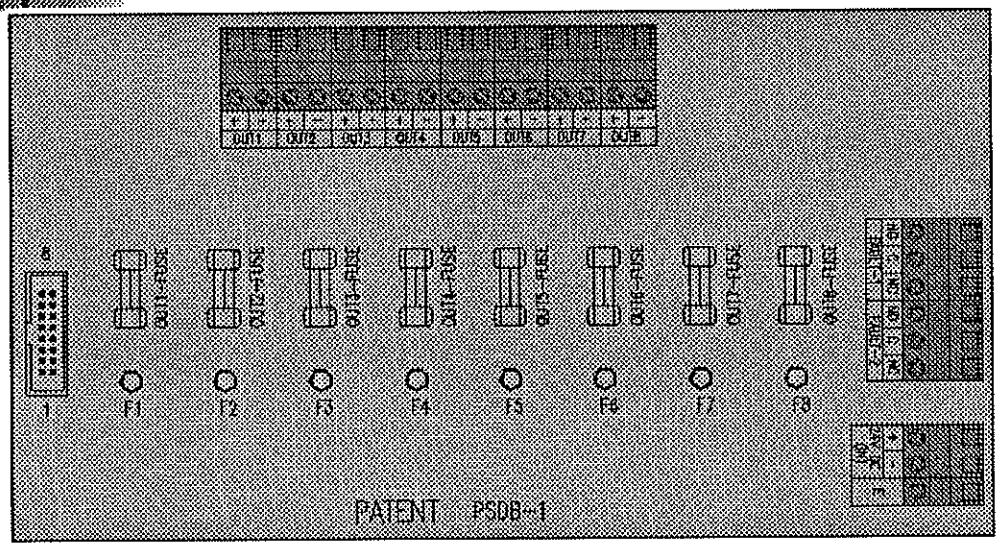


Class 'A' 4 Wire System 8 Zone Terminal Board



Auxiliary Supply Switching Board

Accessory Boards

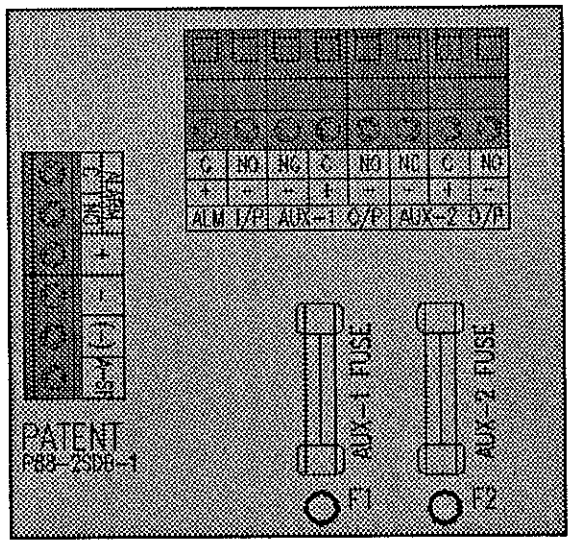


8 Way Supply Distribution Board

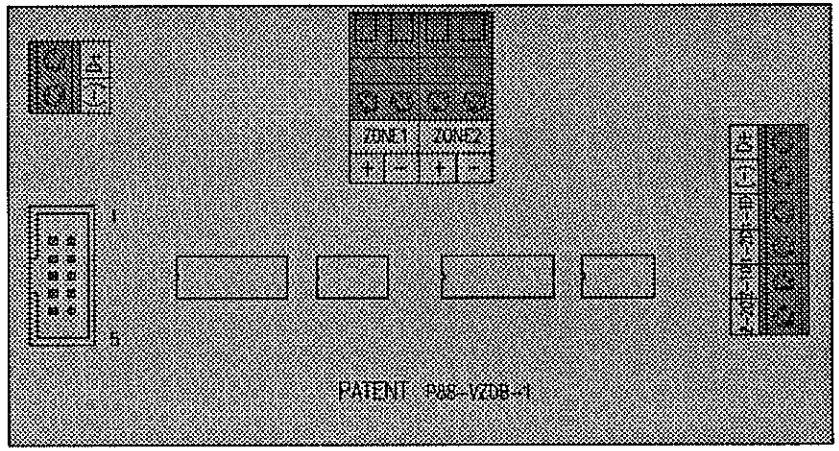
- **c/w individually FUSE protection & blown fuse monitoring with fault indicator respectively**

2 Way Supply Distribution Board

- **c/w individually FUSE protection & blown fuse monitoring with fault indicator respectively**



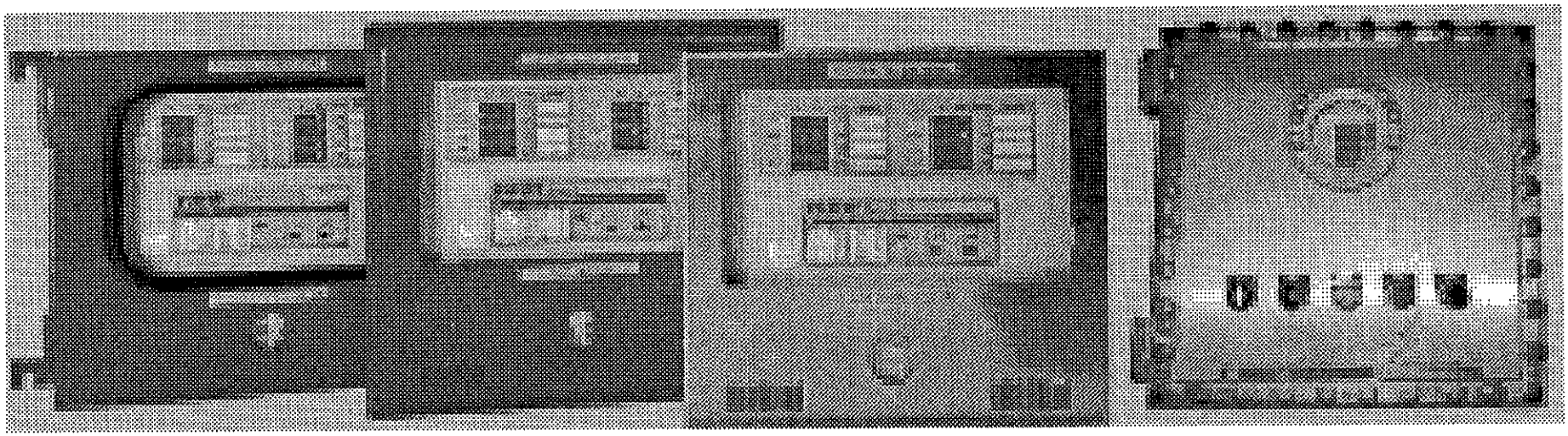
Accessory Boards



Voting Detection Zone Terminal Module

- 2 zone terminal per module
- Provided 1st alarm & 2nd alarm signal outputs

Variety of Enclosures



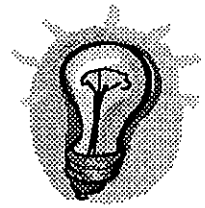
Panel housed in a variety of enclosures;

Weatherproof, Recessed Mount, Stainless Steel, Explosion proof

Comparison of Maintenance uP Addressable & Conventional



Comparison of Maintenance uP Addressable & Conventional



ANALOGUE/ADDRESSABLE SYSTEM	CONVENTIONAL SYSTEM
1) High cost in Alteration/Addition of device - Software controlled system - Re-programming required	✓ No software controlled ✓ No programming
2) Compatibility of detectors/devices - Same brand detectors/devices required - Prices very much higher than conventional type	✓ Any brands of conventional detectors/devices are compatible ✓ Prices generally lower than Addressable type
3) Spare parts / stock limitation - Single brand & sole supplier	✓ No brand and supplier limitation
4) High replacement / repair cost - Repair of PCB generally are not able to be carried out	✓ Able to repair PCB, avoiding high replacement cost
5) High cost for annual maintenance/servicing - Generally controlled and carried out only by the sole supplier - Because of the hidden information of software & knowledge	✓ Any fire maintenance contractors are able to carry out the maintenance
6) For multi-tenanted flatted factories (Different business activity) - Uncontrolled environmental condition - More vulnerable to environmental changes - High cost paid by tenants for their alteration work	✓ More stable in performance with environmental changes ✓ Lower cost paid by tenants for their alteration work
7) Knowledge of system operation - Only technically well-trained staff able to operate the system	✓ Simple and can be operated by any authorized general staff
8) Availability of the existing Products' Supplier/Manufacturer - May result to change the complete system hardware & wiring - May not be feasible in an operational ready building	✓ Conventional panels and devices with full compatibility ✓ Usually "hard" wire can be re-used ✓ Saving cost and "down time"
9) An argument of discrepancies (product failure, false alarm) - Depends very much on integrity of suppliers/manufacturers without much leeway for authentication by third parties	✓ open to neutral scrutiny, no hidden software "secrets" are involved

END

Thank You

FIRE ALARM PANEL

PRODUCT UPDATES & ENGINEER'S SPECIFICATION

PATENT

PATENT *System 88*

ENGINEER'S SPECIFICATION FOR FIRE ALARM PANEL

COMPLIES WITH

Singapore Standard	: SS CP10 : 1993
British Standard	: BS EN54-2 : 1998
	BS EN54-4 : 1998

ENGINEER'S SPECIFICATION FOR FIRE ALARM PANEL

General

The fire alarm panel shall be based upon the well proven electronic conventional principle of fire detection and alarm. The panel shall be compact and attractive, blending well with modern architecture. Operation of the panel shall be made easy by the use of simple frontal indications and colour coded switches. Maintenance and servicing shall be simplified by providing specific fault indications behind the front indicators.

The fire alarm panels shall comply with FSSB's current requirements, manufactured and tested in accordance with BS EN 54 : Part 2&4 : 1998 and Singapore Standard CP 10 : 1993. Panels shall be listed under the PSB Product Listing Scheme (PLS).

System Power Supply / Charger Circuit

The panel shall work on a 230 V AC power supply and a system voltage of 24 V DC. Constant voltage charging circuitry shall be incorporated to ensure proper battery charging and system performance.

The charging circuitry shall incorporate a self diagnostic system to monitor charger failure caused by high or low charging voltage, mains failure or blown fuse. Specific indications shall be provided to denote each type of failure to facilitate easier trouble shooting. The common supply from the main alarm panels to the sub panel/s shall be supervised. In the event of the supply line fail, additional standby supply with auto switching facilities shall be provided to ensure the continuity of the system operation. Failure of the primary supply shall cause a fault signal to be emitted.
The battery circuit shall be constantly supervised for low voltage, overcharged / defective cells and battery disconnection. Reversed polarity connection and short circuits shall also be monitored. Indications for these faults shall be provided.

Total loss of power supply (charger & battery) within the system operating voltage, shall cause the buzzer to sound for at lease ONE hour with LED indication.

Input Zones

Zone modules shall be made available in multiples of 4. Class B detection wiring (2 Wire system) shall be provided as a standard.

Where required, Class A detection wiring (4 wire system) shall be provided by means of incorporating additional module into the system.

Detection Circuits

Detection lines shall be a closed circuit continuously monitored type and individually supervised for open and short circuit faults. Separate open and short circuit LED indications shall be provided for each individual zone at the back of the zone modules. Individual zone isolations shall be provided.

All detection zone input shall be provided with Metal Oxide Veristor and Transient Voltage Suppressor Diode to prevent high transient voltage and surge current passing through the zone detection circuit, causing false activation and damage to the control panel equipment.

Sounder Circuits

Two sets of independent sounder circuits with separate terminations shall be provided at the base control board to enable the system to remain operational should one sounder line fail. This is also to facilitate ease of installation at site. Both sounder lines shall be separately supervised for both open and short circuit faults. Specific LED indications for both types of fault conditions are to be provided for both sounder lines.

Earth Fault Circuit

Earth fault monitoring shall be provided for the charger, detection, sounder and auxiliary supply output circuits. Specific LED indications for positive (+ve) / negative (-ve) earth fault shall be provided at the base control board.

Fault Resound Circuit

Occurrence of any system fault shall set off an audio and visual warning. The acknowledgement of a fault signal shall cause a reminding 'beep' to be emitted and shall not cancel the indication denoting the cause of the fault. It shall also not prevent the receipt of a subsequent fault signal from any system circuit not already providing the fault.

Alarm Resound Circuit

Occurrence of an alarm condition shall also sound the buzzer. Silencing of the alarm shall cause a reminding 'beep' to be emitted and shall not cancel the indication denoting the cause of the alarm and shall not prevent the receipt of any subsequent alarm signals originating from other zones.

Auxiliary Outputs

The panel shall be provided with the following auxiliary outputs;

With bypass facility :

One set of general alarm, field selectable for 24 VDC outputs or voltage free NO to NC/ NC to NO contacts
One set of general alarm, normally 24V DC (Fail Safe Type) complete with fully supervised for line open and line short without End Of Line (EOL) termination.
(Terminated Device: 20 Ohm<R<75K Ohm)

Without isolation facility :

One set constant 24 V DC output
One set of general alarm voltage free NO to NC/NC to NO contacts
One set of general alarm fully supervise line open and line short for DECAM connection
One set of general fault voltage free NO to NC/NC to NO contacts
One set of general fault fully supervise line open and line short for DECAM connection

Extended Auxiliary Functions

Where required there shall be a means of incorporating additional modules into the system to enable status monitoring and sending / bypass of alarm signals to trigger auxiliary functions, such as equipment tripping and activations. Switches / relays provided for such purposes shall be made individually line supervision or field selectable for voltage free/ 24VDC contacts. Status monitoring shall also be made individually line supervision or field selectable for NO/NC input contacts. The common buzzer silence / resound and the reminding 'beep' features shall also function with these additional modules.

Alarm Verification Feature (AVF)

Where required there shall be a means of incorporating additional Alarm Verification Feature (AVF) by additional hardware modules with Alarm/Fire events recorded in the Micro Controller Processing Unit (MCPU) c/w Liquid Crystal Display (LCD). (If provided)

The AVF shall perform to the requirements as stated in clause 2.8.9 of Singapore Standard Code Of Practice for the installation and servicing of Electrical Fire Alarm System :- SS CP10-1993.

While AVF are provided by means of hardware modules only, an Alarm Counter capable of recording at least 999 instances shall be provided. AVF state indicators consist of AVF bypass (Amber), Alarm retard (Amber) and Alarm confirmation (Amber) shall also be provided.

While AVF are provided with additional Liquid Crystal Display (LCD), Alarm zone activated during retard state (ALARM) and Alarm zone activated during confirmation state (FIRE) with Date & Time of zone activation shall be display by the LCD. These events shall be recorded and stored in the MCPU up to min. of 120 instances (non-volatile memory).

The terms "Normal State", "Alarm Retard State" and "Alarm Confirmation State" are as defined in SS CP10-1993 clause 2.8.9.

Main/Sub Panels System-Networking Facilities

Where main and sub alarm panels are networked as a system, the main panel shall be provided with a facility to enable active monitoring of alarm and fault condition of every sub panels. Facilities shall be provided to enable a general alarm to be generated, acknowledged or reset at the main or any sub panel irrespective of the origin of the alarm signal. The system shall be networked such that the initiation of a input device from any panel will result in a general sounding of all sounders networked in the entire system. Activation of another device at sub panel level shall also result in a general alarm resound even if the main panel had not been already reset.

Where required, there shall be a means of incorporating additional modules into the Networking System to supervise for open circuit of the Network Cable.

Main / Sub / Repeater / Mimic Panels System

Outputs for individual zone alarm and common fault annunciations from MAP/SAP shall be provided to enable connections to repeater / mimic panels. Repeater panels shall be provided with standard Indicators test and buzzer silence / resound features.

INDICATIONS

Light Emitting Diode (LED) Indicators

Only general fault / alarm indications that operators are required to be aware of shall be displayed at the front panel. All other specific indicators pertaining to maintenance and servicing shall be displayed behind the front panel to enhance ease of operation.

All alarm and fault indications shall be accompanied with an audio buzzer warning. Specific indicators denoting the specific type of fault shall be provided.

Liquid Crystal Display (LCD) Indicators

Where required, an additional 20 characters, 4 line messages Liquid Crystal Display (LCD) c/w Micro Controller Processing Unit (MCPU) shall be provided at the front panel for alarm operation and FALSE ALARM MANAGEMENT.

The LCD provided shall contain and display all alarm zone activation event with date & time recorded and stored in the MCPU. It shall be able to store up to min. of 120 events.
The MCPU provided shall be held in non-volatile memory (EEPROM) and all events stored shall not be lost with system power failure.

The MCPU shall be fully supervised and monitored for software processing. In the events of processor fault, an audio & visual signal shall be given.

Important Note: **The Failure Of The (MCPU) Processor Shall Not Impair The Normal Function Of The Fire Alarm System**

ZONE CONTROL BOARD

Detection Zones

Two RED indicators built on separate independent circuits shall be provided to signify a "FIRE" condition
One AMBER indicator shall be provided to signify a "FAULT" condition
One AMBER Indicator shall be provided to signify an "ISOLATE/TEST" condition
(A general Isolated and Test indicator shall be provided at System Control Board to signify the zone under which condition)

LIQUID CRYSTAL DISPLY (LCD) CONTROL BOARD

"Power On" Indicator (Green)

This shall be provided to indicate that the LCD control board (MCPU) is energized by either the AC or standby DC source.

"Processor Fault" (Amber)

This shall be provided to indicate the failure of the Micro Controller Processing Unit (MCPU) failure.

SYSTEM CONTROL BOARD

"Power On" Indicator (Green)

This shall be provided to indicate that the system is energized by either the AC or standby DC source.

"Mains Failure" Indicator (Amber)

This shall be provided to indicate a general incoming AC power failure.

"Charger Fault" Indicator (Amber)

This shall be provided to indicate a mains failure or blown fuse, a higher or lower than normal charging condition c/w specific fault LED indication internally.

"Battery Fault" Indicator (Amber)

This shall be provided to indicate a general battery fault caused by a battery disconnection or blown fuse, or when the battery voltage is below or above the normal level c/w specific fault LED indication internally.

"Sounder Line Fault" Indicator (Amber)

This shall be provided to indicate a fault condition when any of the sounder lines is short or open circuited c/w individual fuse protection and specific fault LED indication internally.

The indicator shall not be suppressed during Fire Alarm Condition.

"Earth Fault" Indicator (Amber)

This shall be provided to indicate a fault condition when any of the system lines (+ve / -ve) are shorted to earth c/w specific fault LED indication internally.

"Auxiliary Supply Fault" Indicator (Amber)

This shall be provided to indicate a fault condition when any of the auxiliary supply fuse blown to Sub Alarm Panel (SAP) and/or any ancillary equipment.

"Auxiliary Line Fault" Indicator (Amber)

This shall be provided to indicate a fault condition when any of the auxiliary supervised line to ancillary equipments is short and/or open circuit c/w specific fault LED per auxiliary line internally.

"Alarm Remote Monitoring Station" (ARMS) Fire Signal Sent-DECAM (RED)

This shall be provided to indicate that Fire Alarm Signal to DECAM activated from Fire Alarm Control Panel.

"Alarm Remote Monitoring Station" (ARMS) Fire Line Fault-DECAM (Amber)

This shall be provided to indicate a fault condition when the Fire Signal Line to DECAM Control Panel is short and/or open circuit.
The indicator shall not be suppressed during Fire Alarm Condition.

"Alarm Remote Monitoring Station" (ARMS) Fault Line Fault-DECAM (Amber)

This shall be provided to indicate a fault condition when the Fault Signal Line to DECAM Control Panel is short and/or open circuit.

"Fire" Indicator (Red)

This shall be provided to indicate as General Fire Alarm Indicator while one or more zones are under Fire Alarm Condition.

"Fault" Indicator (Amber)

This shall be provided to indicate as General Fault Warning Indicator while one or more zones or system are under Fault Condition.

"Isolated" Indicator (Amber)

This shall be provided to indicate as General Disablement Indicator while one or more zones or auxiliary are under Isolation Condition.

"Test" Indicator (Amber)

This shall be provided to indicate as General Test Indicator while one or more zones are under Test Condition.

CONTROLS

All front control switches shall be of the push button type with built-in LEDS that serves to indicate both the working condition of the switch and the activation of its function. They shall be colour coded to enhance ease of operation. Use of the conventional rotary switches shall not be allowed. Activation of these switches shall cause the built-in LED to be lighted up. Activation of any of the zone isolate, sounder silence, buzzer silence or auxiliary isolate controls shall cause a non-silenceable reminding "beep" to be emitted at approximate intervals of 15 seconds. This reminding warning shall persist until normal system conditions have been restored and reset. This is to prevent inadvertent isolation of the system functions.

ZONE CONTROL BOARD

Zone Isolate (Green)

Zone isolation switch shall be provided for the deliberate isolation of each individual alarm group from the alarm panel common circuitry.
Operation of the isolation switch shall prevent the alarm group from initiating either alarm or fault signals and shall not impair the normal function of other alarm groups.

Zone isolation shall be designed to function only prior to an alarm activation of the respective zone and shall not serve to cut off the alarm nor the indications during the initial three minutes alarm time.

The operation of the isolation switch shall not disable the respective zone detectors operation and LED signal to facilitate for future False Alarm Management (Trouble Shooting).

In the event of an alarm activated by the zone detectors while the zone is in Isolated Condition, the detectors LED shall remain latch on until manually reset at the control panel.

Test Condition-Dip Switches

This shall be provided only behind the front panel at every Zone Control Board (Access level 2 or 3) for testing, processing and indication of fire alarm signals from zone individually.

Zone under test condition shall not prevent the operation and outputs from zone not in test state. It also shall not activate the alarm sounders, any ancillary equipments and signal to DECAM.

LIQUID CRYSTAL DISPLAY (LCD) CONTROL BOARD

Five push button type control switches shall be provided with control capability to command all indication functions, entry of any numeric information and password control. They shall be colour coded to enhance ease of operation. Password control shall be accessible through display to prevent unauthorized system control and alteration of alarm event recorded.

- **Upward, forward and numeric no. 1 (One) (password entry) Control Switch (Gray)**
- **Downward, backward and numeric no. 2 (Two) (password entry) Control Switch (Yellow)**
- **Manu and numeric no. 3 (Three) (password entry) Control Switch (Green)**
- **Enter and Select Control Switch (Red)**
- **Escape Control Switch (Blue)**

SYSTEM CONTROL BOARD

Sounder Silence Control (Orange)

This shall be provided to silence the sounders without canceling the alarm indications. The principle of design shall be such that the alarm shall not be cancelled by any means during the initial three minutes alarm time. Acknowledgement shall only be able to be effected upon expiry of the initial three minutes alarm time and shall permit the receipt of subsequent alarm signals and restarting of sounders. A sounder alarm time bypass connector shall be provided for installations equipped with a voice communication system.

Buzzer Silence Control (Yellow)

This shall be provided to silence the fault buzzer without canceling the fault indications and shall permit the resounding of the fault buzzer upon detection of subsequent system faults.

Auxiliary Isolate Control (Green)

This shall be provided to inhibit alarm signal to auxiliary connections to facilitate routine maintenance but shall not prevent the transmission of the alarm signal to the alarm monitoring station.

Evacuate Alarm Control (Red)

This shall be provided to trigger a general alarm sounding to facilitate evacuation. It shall override all isolations and be immediately self-canceling when de-activated.

Indicators Test Control (Blue)

This shall be provided to confirm the working condition of all system indicators and the buzzer.

Reset Control (Brown)

This shall be provided to interrupt power momentarily to reset panel and shall not be operative when the sounder has not been silenced (during the initial three minute alarm time) or when normal system conditions have not been restored.

TECHNICAL SPECIFICATION

SYSTEM

Model	*System 88*
Type	a) Conventional Fire Alarm System w/o LCD Display
	b) Conventional Fire Alarm System c/w LCD Display
Standard compliance	Singapore Standard : SS CP 10 : 1993
	British Standard : BS EN54-2 : 1998 : BS EN 54-4 : 1998
Cabinet (Standard) **Optional:** - Weather-proof type - Ex-proof type - Stainless Steel material	Material : Electro Galvanised M.S Sheet
	Thickness : 16 S.W.G
	Color : Signal Red with oven baked powder paint
	IP Rating : IP30
	Labeling : Reversed silk screen overlay
Operating Voltage	27.5V (Norm)
Operating Temp Range	-5°C ~ +40°C
Standby Power Source	Sealed Lead Acid Maintenance Free Battery (Optional)

POWER SUPPLY UNIT

Mains Power Input	195V AC – 255V AC (50 Hz / 60 Hz)
Output Voltage	0V DC – 30V DC
Current Capacity (Design depends on total load in the System)	Type (A) 1.5A, 2A
	Type (B) 3A, 5A
	Type (C) 10A, 15A, 20A, 25A, 30A
Type	Constant Voltage (Linear Regulator)
Monitoring	Mains Failure, Charger Low, Charger High, Blown Fuse, Total Power Loss (c/w audio & visual indication)
Battery Charger Output	Voltage : 27.5V DC
	Charging Method : Constant Voltage (Current limiting)
	Charging Current : 100mA (Norm) – 1.5A (Max)
	Monitoring : Battery Low, Battery High, Battery Disconnected, Blown Fuse

I/O TECHNICAL SPECIFICATION

Model	: PATENT System 88 Fire Alarm System
Capacity	: - (Min) 4 Zones - Multiple of 4 Zones - (Max) 120 Zones

Zone Detection Line

Monitoring (Fault)	: Line open, Line short, Blown fuse
Normal	: 6K8 Ohm (EOL resistor)
Fire	: 470 Ohm
Max no. Of sensors/Zone	: (1) 40 heat detectors or (2) 20 smoke detectors
Isolation	: Individual Zone isolation c/w audio (reminding buzzer) and visual indication
Test Facility	: Individual Zone Test Mode is set by Sw. @ back of P88-ZCB-*
Quiescent current	: 7 mA/Zone Detection Card
Alarm current	: 30 mA/Detection
Detector fuse rating	: 1 @ 1 Amp

Alarm Bell Output

Number of output	: 2
Normal	: 6K8 Ohm (EOL resistor)
Monitoring (Fault)	: Line Open, Line Short and Blown Fuse
Operate	: On Fire
Output Voltage	: 24V DC
Output Current rating	: 2 Amp (Maximum 5 Amp)
Bell Fuse rating	: 2 Amp (Maximum 5 Amp)
Maximum no. of Bell	: Maximum quantity per bell line output may depend on current consumption of bell used.
Bell Type	: Polarized Bell

Fire Relay Output

Number of Output	: 1
Type	: NO/NC (Voltage free) Contact Output
Current Rating	: 1.25Amp @ 24V DC (Max)
Operate	: On Fire
Isolation	: No

Fault Relay Output

Number of Output	: 1
Type	: NO/NC (Voltage free) Contact Output
Current Rating	: 1.25Amp @ 24V DC (Max)
Operate	: On Fault
Isolation	: No

A.R.M.S Fire Output (Alarm Remote Monitoring Station)

Number of Output	: 1
Monitoring (Fault)	: Line open, Line short
Normal	: Terminated Device (300 Ohm < R < 10K Ohm)
On Fire	: 24V DC
Isolation	: No

A.R.M.S Fault Output (Alarm Remote Monitoring Station)

Number of Output	: 1
Monitoring (Fault)	: Line open, Line short
Normal	: 24V DC (Terminated Device 50 Ohm < R < 75K Ohm)
On Fault	: 0V DC
Isolation	: No

Auxiliary (1) Output

Number of Output	: 1
Monitoring (Fault)	: Line open, Line short
Normal	: 24V DC @ 1Amp (Max) (Terminated Device 20 Ohm <R< 75K Ohm)
On Fire	: 0V DC
Isolation	: Common isolation Sw. for Aux-1 & Aux-2 c/w audio (Reminding buzzer) and visual indication

Auxiliary (2) Output

Number of Output	: 1
Operate	: On Fire
Option to select	: - NO/NC (Voltage free) Contact Output or 24 VDC Contact Output (Option is set by jumper "JP3" on P88-BCB-*)
Output Current rating	: 2 Amp (Maximum 5 Amp) (Output current is protected by Auxiliary Fuse)
Isolation	: Common isolation Sw. for Aux-1 & Aux-2 c/w audio (Reminding buzzer) and visual indication

24V DC Output

Number of Output	: 2
Output Voltage	: Constant 24V DC
Output Current rating	: 2 Amp (Maximum 5 Amp) (Output Current is protected by Auxiliary Fuse)

MAP Zone Output

Application	: As Sub Alarm Panel, general Fire/ Fault status to Main Alarm Panel
Normal	: 6K8 Ohm Signal O/P
Fire	: 470 Ohm Signal O/P
Fault	: Open Signal O/P
Isolation	: No

Networking I/O

Facility	: a) ALARM b) SILENCE c) RESET
Operation	: (-VE) pull down signal on activation
Lines Supervision	: Optional

AVF Function / Alarm counter (Optional)

Alarm Counter Indication	: - Indicate number of Fire Alarm activation - 3 Digits - 7 Segments Counter - Max. Count 999 (Latching) (Reset counter manually by shorting pin-1 & pin-3 of "CNT RST" jumper pins @ back of P88-FCB/AVF-*)
AVF State Indication	: I) Retard State (20Sec) II) Confirmation State (max 300 Sec – Optional) III) Fire State
AVF Bypass Facility	: Individual Zone bypass facility (Set to "ON" for respective Zone @ SW-1 (AVF B/P-SW) on P88-ZCB-*)

PATENT *System 88*

ENGINEER'S SPECIFICATION FOR FIRE EXTINGUISHING CONTROL PANEL

COMPLIES WITH

Singapore Standard	: SS CP10 : 1993
British Standard	: BS EN54-2 : 1998
	BS EN54-4 : 1998

ENGINEER'S SPECIFICATION FOR FIRE EXTINGUISHING CONTROL PANEL

General

The extinguishing control panel shall be based upon the well-proven electronic conventional principle of fire detection and alarm. The panel shall be compact and attractive, blending well with modern architecture. Operation of the panel shall be made easy by the use of simple frontal indications and colour coded switches. Maintenance and servicing shall be simplified by providing specific fault indications behind the front indicators.

The Extinguishing Control Panels shall comply with FSSB's current requirements manufactured and tested in accordance with BS EN 54: Part 2 & 4: 1998 and Singapore Standard CP10: 1993. Panels shall be listed in the Singapore Directory of PSB certified products under Products listing scheme (PLS) to ensure quality standards.

System Power Supply / Charger Circuit

The panel shall work on a 230 V AC power supply and a system voltage of 24 V DC. Constant voltage charging circuitry shall be incorporated to ensure proper battery charging and system performance.

The charging circuitry shall incorporate a self-diagnostic system to monitor charger failure caused by high or low charging voltage, mains failure or blown fuse. Specific indications shall be provided to denote each type of failure to facilitate easier trouble shooting. The common supply from the main alarm panels to the sub panel/s shall be supervised. In the event of the supply line fail, additional standby supply with auto switching facilities shall be provided to ensure the continuity of the system operation. Failure of the primary supply shall cause a fault signal to be emitted.

The battery circuit shall be constantly supervised for low voltage, overcharged / defective cells and battery disconnection. Reversed polarity connection and short circuits shall also be monitored. Indications for these faults shall be provided.

Total loss of power supply (charger & battery) within the system operating voltage, shall cause the buzzer to sound for at lease ONE hour with LED indication.

Input Zones

Zone modules shall be made available in multiples of 2 (detection A, detection B) configured on a dual risk / cross-zone basis.

Where required, voting system logic circuit (any two detectors activation within a zone) shall be provided by means of incorporating additional module into the system.

Detection Circuits

Zone detection / Manual Release (Electrical & Mechanical) lines shall be a closed circuit continuously monitored type and individually supervised for open and short circuit faults. Separate open and short circuit LED indications shall be provided for each individual zone / Manual Release at the back of the zone / Firing Control modules. Individual zone / Manual Release (Electrical) isolations shall be provided.

All detection zone input shall be provided with Metal Oxide Varistor and Transient Voltage Suppressor Diode to prevent high transient voltage and surge current passing through the zone detection circuit, causing false activation and damage to the control panel equipment.

Output Circuits

The following alarm control output shall be provided at the panel upon activation of

a) 1st and 2nd detection
b) Local / Remote Manual Release (Electrical)
c) Local / Remote System Abort
d) Remote Mechanical Manual Release (Gas Gone Switch)

A1) 1st Detection

a) Alarm Sounder
One set of alarm output, supervised for both open and short circuit faults. Specific LEDs indications for both types of fault are to be provided at the base control board.

b) Beacon / Flasher
One set of output for termination of flasher

c) "Evacuate Area Immediately" Signage
One set of pulsing output for termination of "Evacuate Area Immediately" Signage.

d) Auxiliary Contact
One set of auxiliary 1st alarm output, field selectable for voltage free NO to NC/NC to NO contacts or 24VDC contacts output.

One set of alarm & fault state output.

e) Main Alarm Panel (MAP) zone contact
One set of alarm / fault signal to MAP output contact with built in End Of Line (EOL)

A2) 2nd Detection

a) Siren
One set of output for siren, supervised for both open and short circuits faults.
Specific LED indications for both types of fault are to be provided at the base control board.

b) "Gas Discharged" Signage
One set of pulsing output for termination of "Gas Discharged" Signage.

c) Auxiliary Contact
One set of auxiliary 2nd alarm output, field selectable for voltage free NO to NC/NC to NO contacts or 24 VDC contacts output.

d) Delay Timer
Activates delay timer, field adjustable in step of 10 secs from 0 to 70 secs.

e) Actuator
The actuator line shall be supervised against open circuit condition. The monitoring current shall be suitably designed to prevent inadvertent firing or excessive loading on the actuator under prolonged use.

B) Local / Remote Manual Release (Electrical)
Activate all 1st & 2nd Detection output circuit with Local / Remote released LED indications.

C) Local / Remote System Abort
Cut off only 2nd Detection output circuit with Local / Remote Aborted LED indications.

D) Remote Mechanical Manual Release (Gas Gone Switch)
Activate off 1st & 2nd Detection output circuit except the Electrical Actuator with backlighted " flashing "Gas Gone" LED indication. Field selection for internal "Gas Gone" flashing LED shall be provided if gas gone switch is not provided.

Earth Fault Circuit

Earth fault monitoring shall be provided for the charger, detection, sounder and auxiliary supply output circuits. Specific LED indications for positive (+ve) / negative (-ve) earth fault shall be provided at the base control board.

Fault Resound Circuit

Occurrence of any system fault shall set off an audio and visual warning. The acknowledgement of a fault signal shall cause a reminding 'beep' to be emitted and shall not cancel the indication denoting the cause of the fault. It shall also not prevent the receipt of a subsequent fault signal from any system circuit not already providing the fault.

Alarm Resound Circuit

Occurrence of an alarm condition shall also sound the buzzer. Silencing of the alarm shall cause a reminding 'beep' to be emitted and shall not cancel the indication denoting the cause of the alarm and shall not prevent the receipt of any subsequent alarm signals originating from other zones.

Extended Auxiliary Functions

Where required there shall be a means of incorporating additional modules into the system to enable status monitoring and sending / bypass of alarm signals to trigger auxiliary functions, such as equipment tripping and activations. Switches / relays provided for such purposes shall be made individually line supervision or field selectable for voltage free/24VDC contacts. Status monitoring shall also be made individually line supervision or filed selectable for NO/NC input contacts. The common buzzer silence / resound and the reminding 'beep' features shall also function with these additional modules.

INDICATIONS

Light Emitting Diode (LED) Indicators

Only general fault / alarm indications that operators are required to be aware of shall be displayed at the front panel. All other specific indicators pertaining to maintenance and servicing shall be displayed behind the front panel to enhance ease of operations.
All alarm and fault indications shall be accompanied with an audio buzzer warning. Specific indicators denoting the specific type of fault shall be provided.

Liquid Crystal Display (LCD) Indicators

Where required, an additional 20 characters, 4 line messages Liquid Crystal Display (LCD) c/w Micro Control Processing Unit (MCPU) shall be provided at the front panel for alarm operation and FALSE ALARM MANAGEMENT.

The LCD provided shall contain and display all the following events with date and time recorded and stored in the MCPU. It shall be able to store up to min. 120 events.

- Detection zone A (1st or 2nd alarm activation)
- Detection zone B (1st or 2nd alarm activation)
- Remote Manual Release
- Local Manual Release
- Electrical Actuator Circuitry Activated
- Gas Discharged Signal Activated (Gas Gone Switch)

The MCPU provided shall be held in non-volatile memory (EEPROM) and all events stored shall not be lost with system power failure.
The MCPU shall be fully supervised and monitored for software processing. In the events of processor fault, an audio & visual signal shall be given.

Important Note: **The Failure Of The (MCPU) Processor Shall Not Impair The Normal Function Of The Fire Alarm System**

Zone/Firing Control Board

Detection Zones
Two RED indicators built on separate independent circuits shall be provided to signify a "FIRE" condition
One AMBER indicator shall be provided to signify a "FAULT" condition
One AMBER Indicator shall be provided to signify an "ISOLATE" condition

Actuator Fault (Amber)
To signify an open circuit condition in the actuator line c/w Fuse Protection.

Remote Abort Activated (Amber)
To signify that the remote abort device has been activated to inhibit gas for discharging. Remote abort shall provide with facility for option to select the type of abort switch use (normally open / normally close)

Pressure Low (Amber)
To signify low storage pressure within the cylinder

Remote Manual Release Activated (Red)
To signify that the remote manual release device has been activated. The red LED indication shall be non-latching type. It shall provide with facility for line open / line short supervision (specific fault indication internally)

Actuator Fired (Red)
To signify that the actuator has been fired. The actuator fired red LED shall flash upon 2nd Detection / Manual Release activated. Upon expiry of pre-set timer countdown delay, the LED will become steady upon activation of gas gone switch (if provided). The actuator fired red LED change of state should not be based on the status of the actuator output circuit.

Countdown Timer (Red)
Two 7-segment LED display to indicate the remaining time in seconds before activation of actuator.

Line Fault (Amber)
To signify that either line open and/or short condition had occurred in the gas gone monitoring or remote manual release line. Specific LED indicators for both line fault conditions shall be provided at the back of the control board.

Gas Gone (Red)
One number of backlighted red "GAS GONE" Flashing indicator shall be provided to signify an actual discharge or extinguishing. Gas Gone status shall be provided with supervision for line open / line short (specific fault indication internally).
Field selectable Dipswitch shall be provided for internal Gas Gone indication if Gas Gone switch is no connected.

Liquid Crystal Display (LCD) Control Board

"Power On" Indicator (Green)
This shall be provided to indicate that the LCD control board is energized by either the AC or standby DC source

"Processor Fault" (Amber)
This shall be provided to indicate the failure of the Micro Controller Processing Unit (MCPU)

System Control Board

"Power ON" Indicator (Green)
This shall be provided to indicate that the system is energized by either the AC or standby DC source

"Mains Failure" Indicator (Amber)
This shall be provided to indicate a general incoming AC power failure

"Charger Fault" Indicator (Amber)
This shall be provided to indicate a mains failure or blown fuse, a higher or lower than normal charging condition c/w specific fault LED indication internally.

"Battery Fault" Indicator (Amber)
This shall be provided to indicate a general battery fault caused by a battery disconnection or blown fuse, or when the battery voltage is below or above the normal level c/w specific fault LED indication internally

"Sounder Line Fault" Indicator (Amber)
This shall be provided to indicate a fault condition when any of the sounder lines (Bell / Siren) are short and/or open circuit c/w individual fuse protection and specific fault LED indication internally.

The indicator shall not be suppressed during Fire Alarm Condition.

"Earth Fault" Indicator (Amber)
This shall be provided to indicate a fault condition when any of the system lines (+ve / -ve) are shorted to earth c/w specific fault LED indication internally.

"Auxiliary Supply Fault" Indicator (Amber)
This shall be provided to indicate a fault condition when any of the auxiliary supply fuse blown to any ancillary equipments.

"Fire" Indicator (Red)
This shall be provided to indicate as General Fire Alarm Indicator while one or more zones are under Fire Alarm Condition

"Fault" Indicator (Amber)
This shall be provided to indicate as General Fault Warning Indicator while one or more zones or system are under Fault Condition

"Isolated" Indicator (Amber)
This shall be provided to indicate as General Disablement Indicator while one or more zones or auxiliary output are under Isolation Condition.

CONTROLS

All front control switches shall be of the push button type with built-in LEDS that serves to indicate both the working condition of the switch and the activation of its function. They shall be colour coded to enhance ease of operation. Use of the conventional rotary switches shall not be allowed. Activation of these switches shall cause the built-in LED to be lighted up. Activation of any of the zone isolate, sounder silence, buzzer silence or auxiliary isolate controls shall cause a non-silenceable reminding "beep" to be emitted at approximate intervals of 15 seconds. This reminding warning shall persist until normal system conditions have been restored and reset. This is to prevent inadvertent isolation of the system functions.

Zone/Firing Control Board

Zone Isolate / Remote Manual Release (Electrical) (Green)

Zone isolation switch shall be provided for the deliberate isolation of each individual alarm group from the panel common circuitry.

Operation of the isolation switch shall prevent the alarm group from initiating either alarm or fault signals and shall not impair the normal function of the other alarm groups.

Zone isolation shall be designed to function only prior to an alarm activation of the respective zone and shall not serve to cut off the alarm nor the indications.

The operation of the isolation switch shall not disable the respective zone detectors LED indication and operation to facilitate for future False Alarm Management (Trouble Shooting).

In the event of an alarm activated by the zone detectors while the zone is in Isolated Condition, the detector LED shall remain latch on until manually reset at the control panel.

Manual Release (Red)
This shall be provided to manually activate the discharge of the gas. The Manual Release switch shall be of latching type.

Firing Abort (Green)
This shall be provided to manually inhibit the discharge of the gas and all the 2nd Alarm output circuits and overrides all other functions that may cause a discharge of the gas.

Auxiliary Isolate (Green)
This shall be provided to inhibit transmission of 1st and 2nd detection auxiliary output signals to prevent triggering ancillary equipment or plant shut down. However, it shall not prevent the transmission of the alarm signal to the main alarm panel.

Remote Manual Release Isolate (Green)
This shall be provided to facilitate the isolation of the remote manual release device.

Liquid Crystal Display (LCD) Control Board

Five push button type control switches shall be provided with control capability to command all indication functions, entry of any numeric information and password control. They shall be colour coded to enhance ease of operation. Password control shall be accessible through display to prevent unauthorized system control and alteration of alarm event recorded.

- ☐ **Upward, forward and numeric no. 1(One) (password entry) Control Switch (Gray)**
- ☐ **Downward, backward and numeric no. 2 (Two) (password entry) Control Switch (Yellow)**
- ☐ **Manu and numeric no. 3 (Three) (password entry) Control Switch (Green)**
- ☐ **Enter and Select Control Switch (Red)**
- ☐ **Escape Control Switch (Blue)**

System Control Board

Sounder Silence Control (Orange)
This shall be provided to silence the sounders without canceling the alarm indications. The principle of design shall be such that the alarm shall not be cancelled by any means during the initial three minutes alarm time. Acknowledgement shall only be able to be effected upon expiry of the initial three minutes alarm time and shall permit the receipt of subsequent alarm signals and restarting of sounders.

Buzzer Silence Control (Yellow)
This shall be provided to silence the fault buzzer without canceling the fault indications and shall permit the resounding of the fault buzzer upon detection of subsequent system faults.

Evacuate Alarm Control (Red)
This shall be provided to trigger alarm bell, beacon / revolving light and "Evacuate Area Immediately" signage. It shall override all indications and be immediately restored to normal when de-activated.

Indicators Test Control (Blue)
This shall be provided to confirm the working condition of all system indicators and buzzer.

Reset Control (Brown)
This shall be provided to interrupt power momentarily to reset panel and shall not be operative when the sounder has not been silenced (during the initial three minute alarm time) or when normal system conditions have not been restored.

Extended Control and Output Circuit Function

For multiple zones Fire Extinguishing Control Panel facilities shall be provided by means of field selectable DIP switches within the control panel to control / select individual firing with common signal output operation for Alarm bell, Beacon light, Evacuate sign (1st Detection), Electronic sounder, Gas Discharged sign (2nd Detection), Auxiliary relay output for 1st & 2nd Detections.

Additional facilities shall be provided by means of field selectable jumper switches within the control panel to control / select the following :

a) Individual firing zone to common actuator for other non-activated zone/s.
b) Changing the system from "Dual Risk" configuration to "Single Risk" Operation.

Where required there shall be a means of incorporating additional modules into the panel for firing multiple actuator per zone c/w actuator line fault monitoring (Individual fault indication, common timer count down and common actuator fired indication) and Auto / Manual mode selectable key switch.

PATENT

TECHNICAL SPECIFICATION

SYSTEM

Model	*System 88*
Type	a) Conventional Extinguishing Control System w/o LCD Display
	b) Conventional Extinguishing Control System c/w LCD Display
Standard compliance	Singapore Standard : SS CP 10 : 1993
	British Standard : BS EN54-2 : 1998 : BS EN 54-4 : 1998
Cabinet (Standard) **Optional:** - Weather-proof type - Ex-proof type - Stainless Steel material	Material : Electro Galvanised M.S Sheet
	Thickness : 16 S.W.G
	Color : Signal Red with oven baked powder paint
	IP Rating : IP30
	Labeling : Reversed silk screen overlay
Operating Voltage	18V DC – 30V DC
Operating Temp Range	-5°C ~ +40°C
Standby Power Source	Sealed Lead Acid Maintenance Free Battery (Optional)

POWER SUPPLY UNIT

Mains Power Input	195V AC – 255V AC (50 Hz / 60 Hz)
Output Voltage	0V DC – 30V DC
Current Capacity (Design depends on total load in the System)	Type (A) 1.5A, 2A
	Type (B) 3A, 5A
	Type (C) 10A, 15A, 20A, 25A, 30A
Type	Constant Voltage (Linear Regulator)
Monitoring	Mains Failure, Charger Low, Charger High, Blown Fuse, Total Power Loss (c/w audio & visual indication)
Battery Charger Output	Voltage : 27.5V DC
	Charging Method : Constant Voltage (Current Limiting)
	Charging Current : 100mA (Norm) – 1.5A (Max)
	Monitoring : Battery Low, Battery High, Battery Disconnected, Blown Fuse

I/O TECHNICAL SPECIFICATION

Model : **PATENT** *System 88* Fire Extinguishing Control System

Type : - Single Zone Extinguishing Control Panel
- Multiple Zone Individual Firing Extinguishing Control Panel
- Multiple Zone Common Firing Extinguishing Control Panel

Zone Detection Line

Monitoring (Fault)	: Line open, Line short and Blown fuse
Normal	: 6K8 Ohm (EOL resistor)
Fire	: 470 Ohm
Max no. Of sensors/Zone	: 40 heat detectors or 20 smoke detectors. (Max 2.4mA)
Isolation	: Individual Zone isolation c/w audio (reminding buzzer) and visual indication
Quiescent current	: 10 mA/ Zone Detection card
Alarm current	: 80 mA/ Zone Detection card
Detector fuse rating	: 1 @ 1 Amp

Remote Manual Release Line

Monitoring (Fault)	: Line open, Line short
Normal	: 6K8 Ohm (EOL resistor)
Released (Activated)	: 470 Ohm
Quiescent current	: 4 mA
Activated current	: 25 mA
Isolation	: Remote Release Line Isolate Switch c/w audio (reminding buzzer) and visual indication.

Gas Gone Monitoring Line

Monitoring (Fault)	: Line open, Line short
Normal	: 6K8 Ohm (EOL resistor)
Gas Gone (Activated)	: 470 Ohm
Indication (Activated)	: Back lighted "GAS GONE" Flashing
Quiescent current	: 4 mA
Activated Current	: 25 mA

(**Note:** If "Gas Gone" monitoring device is not in used, switch setting must be #1-ON & #2-ON @ SW2-GGS on G88-BCB-*)

Remote Abort Line

Normally Open / Close operation can be set by selectable switch (SW2 on G88-BCB-*)

Monitoring (Activated)	: Switch status change.
Option 1	
Normal	: Open (Set "#3-OFF & #4-ON @ SW2" on G88-BCB-*)
Aborted	: Close
Option 2	
Normal	: Close (Set "#3-ON & #4-OFF @ SW2" on G88-BCB-*)
Aborted	: Open

Low Pressure Monitoring Line

Normal	: Open
Pressure Low (Activated)	: Close

Fire Relay Output

Number of Output	: 1
Type	: NO/NC (Voltage free) Contact Output
Current Rating	: 1.25 Amp @ 24V DC (Max)
Operate	: On Fire
Isolation	: No

Fault Relay Output

Number of Output	: 1
Type	: NO/NC (Voltage free) Contact Output
Current Rating	: 1.25 Amp @ 24V DC (Max)
Operate	: On Fault
Isolation	: No

MAP Zone Output

Application	: As Sub Alarm Panel, general Fire/ Fault status to Main Alarm Panel
Normal	: 6K8 Ohm Signal O/P
Fire	: 470 Ohm Signal O/P
Fault	: Open Signal O/P
Isolation	: No

24V DC Output

Number of Output	: 1
Output Voltage	: Constant 24V DC
Output Current rating	: 2 Amp (Maximum 5 Amp) (Output Current is protected by Auxiliary Fuse)

Timer - Count down Display

Type	: 2 Digit, 7-segment LED display
Time	: 0 Sec (Min) - 70 Sec (Max) (Set by 4 ways DIP "Time Setting" SW. on G88-GCB-*)
Operate	: Count down is initiated upon 2nd Detection

"TIME SETTING" Switch Setting on G88-GCB-*

1	2	3	4(Not in use)	
OFF	OFF	OFF	OFF	- 0 Sec
ON	OFF	OFF	OFF	- 10 Sec
OFF	ON	OFF	OFF	- 20 Sec
ON	ON	OFF	OFF	- 30 Sec
OFF	OFF	ON	OFF	- 40 Sec
ON	OFF	ON	OFF	- 50 Sec
OFF	ON	ON	OFF	- 60 Sec
ON	ON	ON	OFF	- 70 Sec

PATENT

1st DETECTION OUTPUTS

Alarm Bell Output

Number of output	: 1
Normal	: 6K8 Ohm (EOL resistor)
Monitoring (Fault)	: Line Open, Line Short and Blown Fuse
Output Voltage Rating	: 24V DC
Output Current rating	: 2 Amp (Maximum 5 Amp) (Output current is protected by Bell Fuse.)
Bell Fuse rating	: 2 Amp (Maximum 5 Amp)
Maximum no. of Bell	: Maximum quantity per bell line output may depend on current consumption of bell used.
Bell Type	: Polarized Bell

Revolving Light Output

Number of Output	: 1
Output Voltage rating	: 24 VDC
Output Current rating	: 2 Amp (Maximum 5 Amp)

"Evacuate Area" Signage Output

Number of Output	: 1
Output Voltage rating	: 24 VDC
Operation	: Pulsing
Output Current rating	: 2 Amp (Maximum 5 Amp)

Auxiliary Output (1)(AUX-1DET)

Number of Output	: 1
Option to select	: - NO/NC (Voltage free) Contact Output or 24 VDC Contact Output (Option is set by jumper "JS1" on PG-BCB)
Output Current rating	: 2 Amp (Maximum 5 Amp) (Output current is protected by Auxiliary Fuse.)
Isolation	: Common isolation Sw. for Aux-1 & Aux-2 c/w audio (Reminding buzzer) and visual indication

2nd DETECTION OUTPUTS

Siren Output

Number of Output	: 1
Normal	: 6K8 Ohm (EOL resistor)
Monitoring (Fault)	: Line Open, Line Short and Blown Fuse.
Output Voltage rating	: 24 VDC
Output Current rating	: 2 Amp (Maximum 5 Amp) (Output current is protected by Siren Fuse.)
Siren Fuse rating	: 2 Amp (Maximum 5 Amp)

"Gas Discharge" Signage Output

Number of Output	: 1
Output Voltage rating	: 24 VDC
Operation	: Pulsing
Output Current rating	: 2 Amp (Maximum 5 Amp)

Auxiliary Output (2) (AUX-2DET)

Number of Output	: 1
Option to select	: - NO/NC (Voltage free) Contact Output or 24 VDC Contact Output (Option is set by jumper "JS2" on PG-BCB)
Output Current rating	: 2 Amp (Maximum 5 Amp) (Output current is protected by Auxiliary Fuse.)
Isolation	: Common isolation Sw. for Aux-1 & Aux-2 c/w audio (Reminding buzzer) and visual indication

Firing Actuator Output

Monitoring (Fault)	: Actuator Disconnect, Line Open and Blown Fuse
Monitoring Current	: (Max) 3m Amp
Firing Voltage	: 24 VDC
Firing current rating	: 1 @ 2 Amp (maximum 5 Amp)
Operate	: Count Down – Timer reaches to "00"

Comparison
Of
Fire Alarm Panel
Functional Requirements

(BS EN54: 1998, BS 5839 & SS CP10: 1993)

COMPARISON OF FIRE ALARM PANEL FUNCTIONAL REQUIREMENTS OF BS EN54 :1998 , BS 5839 :Part 4 : 1988 & SS CP10 :1993

BS EN54-2 : 1998		BS 5839 : Part4 : 1988		SS CP10 : 1993	
CLAUSE	**REQUIREMENTS**	**CLAUSE**	**REQUIREMENTS**	**CLAUSE**	**REQUIREMENTS**
7	**The Fire Alarm Condition**				
7.14	Manual Call Point activation- Within 10s to fire alarm condition.	**3.1.2(b)**	Manual Call Point activation- Within 3s to fire alarm condition.	**2.4.11(e)**	Manual Call Point activation- Within 3s to fire alarm condition.
7.6.2	Reset Operation- Alarm signal remain or re-established within 20s.	**3.1.5**	Reset Operation- Allowable time delay for re-established not mentioned.	**2.4.1(e)**	System Reset facility- Allowable time delay for re-established not mentioned.
7.7.2	3s delay of all mandatory output upon indication of alarm condition.	**3.1.1**	Time delay for mandatory output not mentioned.	**2.8.7**	Time delay for mandatory output not mentioned.
7.7.3	10s delay of all mandatory output upon activation of Call Point.	**3.1.1**	Time delay for mandatory output not mentioned.	**2.8.7**	Time delay for mandatory output not mentioned.
7.8	Output of Fire Alarm Devices (Bell)- possible to silence at access level 2 & resound (Option with requirement)	**3.1**	Not mentioned.	**2.4.1 (j) & 2.8.7**	Sounder acknowledge/silencing switch – silence allowed only after 3 minutes
7.9	LED Indication for activation to fire alarm routing equipment (DECAM)(Option with requirement).	**3.1**	Not mentioned.	**2.4.1(k) & 2.12**	Signal Transmitter –Mandatory -LED indication not mentioned.

BS EN54-2 : 1998		BS 5839 : Part4 : 1988		SS CP10 : 1993	
CLAUSE	**REQUIREMENTS**	**CLAUSE**	**REQUIREMENTS**	**CLAUSE**	**REQUIREMENTS**
7.10	Provision for output to fire protection equipment (Option with requirement)	**3.6**	Ancillary services.	**1.2**	For automation fire extinguishing installation, Detection system shall comply to CP-10.
7.11	Delay to output of Alarm Bell & DECAM (Option with requirement)	**3.1.1**	Not mentioned.	**2.8.4**	Restricted alarm-Delay timer for general alarm with authority approval. Delay timer shall not delay the immediate transmission of fire signal to DECAM.
7.2	Indication of the fire alarm indication. –A general fire alarm indicator is required.	**3.1.1 (b) & (d)**	General alarm indication allowed to combine with individual zone indication for multi-zone operation panel.	**2.4.1 (a)**	Fire Alarm Indication. – Each alarm zone shall have a separate indicator. -General indicator not mentioned.
7.12	Coincidence detection (option with requirement) -one or more confirmatory signals are received from the same or other detector, may inhibit either the alarm indication or the output to bell, DECAM and fire protection equipment.	**3.1**	Not mentioned	**2.8.9**	Alarm verification feature - Normal, Alarm retard, Alarm confirmation, Normal
7.13	Alarm counter (Option with requirements). -provision to record the number of instances that c.i.e enters the fire alarm condition.	**3.1**	Not mentioned.	**2.4**	Not mentioned.

BS EN54-2 : 1998		BS 5839 : Part4 : 1988		SS CP10 : 1993	
CLAUSE	**REQUIREMENTS**	**CLAUSE**	**REQUIREMENTS**	**CLAUSE**	**REQUIREMENTS**
8 **8.1.3**	**Fault Warning Condition** Fault Warning Condition within 100s of fault signal activated.	**3.2.2**	Fault Warning Condition within 100s of fault signal activated.	**2.4.5**	Time delay of fault warning signal not mentioned.
8.2	Indication of fault in specified function. - A general fault warning indicator shall be provided.	**3.2.1 (b) & (c)**	General fault indication allowed to combine with individual zone indication for multi-zone operation panel.	**2.4.1 (b) & 2.4.4 (b)**	System fault indication. -A common fault indication may be used only with display /printer provided for alarm zone facilities. If not , distinct visible fault signal shall be provided.
8.3	Faults signals from points -Indicated at least as zone faults (Option with requirement)	**3.2**	Not mentioned	**2.4**	Not mentioned
8.4	Total loss of the power supply -One hour audible indication when battery no longer able to supply to C.I.E. to fulfill mandatory functions (Option with requirement)	**3.2.2(a) & (b)**	Fault warning for Mains power and standby power sources failure -one hour audible indication not mentioned	**2.4.5 (c) & (d)**	Distinct visible & audible fault given on Mains power, Charger or Battery failure -one hour audible indication not mentioned

BS EN54-2 : 1998		BS 5839 : Part4 : 1988		SS CP10 : 1993	
CLAUSE	**REQUIREMENTS**	**CLAUSE**	**REQUIREMENTS**	**CLAUSE**	**REQUIREMENTS**
8.2.4	Fault Indication may be suppressed during Fire Alarm condition.	**3.2**	Faults warning condition	**2.4.5**	Precaution against failure
(c)	Earth Fault	-	Not mentioned	**(f)**	Electrical Earth Fault signal is required
(e)	Transmission path between parts of c.i.e. contained in more than one mechanical cabinet.	-	Not mentioned	-	Not mentioned
(f)	Transmission path between automatic fire protection equipment (Item G).	**3.6** -	Ancillary Service. Open or Short circuit fault on the lines to ancillary devices or excessive power demand shall not jeopardize the performance of the fire alarm system.	**2.7** **2.7.2**	Connection of Addition equipment -The circuit controlling this operation shall be a "fail-safe" type -excessive power demand is not allowed.
(g)	Transmission paths between fault warning routing equipment (Item J).	-	Not mentioned.	**2.4.1 (k)&** **2.12.4**	Signal Transmitter. Fault Transmitter paths for fault warning is not mentioned.
8.2.5	Fault indications shall not be suppressed during fire alarm condition.	**3.2.1** **Note 3**	Fault indication may be suppressed during on alarm condition.	**2.4.5 (b)**	Precaution against failure.
(a)	Transmission path to fire alarm devices (Bell/Beacon) (item C).	**3.2.2 (f)**	Short circuit or disconnection of any leads to fire alarm devices (sounders).		LED suppressed - not mentioned.
(b)	Transmission path to fire alarm routine equipment (item E) (DECAM)	-	Not mentioned.	**2.4.1 (k)** **&** **2.12.4**	Fire transmitter path fault warning not mentioned.

BS EN54-2 : 1998		BS 5839 : Part4 : 1988		SS CP10 : 1993	
CLAUSE	**REQUIREMENTS**	**CLAUSE**	**REQUIREMENTS**	**CLAUSE**	**REQUIREMENTS**
8.5	System Fault. -Specified fault indication for program monitoring & monitoring of memory contacts in software controlled c.i.e. -Fault indications shall not be suppressed by other functional condition of the c.i.e.	**3.2.2 (I) & (J)**	Fault Indication may be suppressed during on alarm condition.	**2.4.5 (g)**	Fault indication suppression not mentioned.
8.6.1	Fault warning audible indication silencing switch may be used for silencing fire alarm condition.	**3.2.4**	Silencing switch may be used for silencing fire alarm condition. -not mentioned.	**2.4.1 (h) & (j)**	Fault buzzer & Alarm sounder silencing switch. –both required.
8.7.2	Reset of Fault indications. -corresponding signal re-established within 20s.	**3.2.5**	Resetting Fault warning condition -fault warning response restored within 100s.	**2.4.1 (e)**	Reset for fault warning – not mentioned.
8.8 & 8.9	Fault output signal for all mandatory fault & if the c.i.e is de-energized to fault warning routing equipment (Option with requirement).	**3.2.1 (d)**	Fault output signal to remote manned center where provision for such link is made. – c.i.e de-energized to fault warning routing equipment is not mentioned.	**2.12.4 (c)**	Fault output signal to monitoring station through transmitting equipment. -c.i.e de-energized to fault warning routing equipment is not mentioned.
9 **9.2 (a)**	**<u>Disabled Condition</u>** A General disablement indicator shall be provided.	**3.3.2**	General disablement indicator – not mentioned.	**2.4.1 (d) & 2.4.4 (c)**	Isolate indicator - A common light indicator may be used only with display/printer provided for alarm zone facilities.
9.3.1	Disablement shall be indicated within 2s.	**3.3**	Time delay not mentioned.	**2.4.4 (c)**	Time delay not mentioned.

BS EN54-2 : 1998		BS 5839 : Part4 : 1988		SS CP10 : 1993	
CLAUSE	**REQUIREMENTS**	**CLAUSE**	**REQUIREMENTS**	**CLAUSE**	**REQUIREMENTS**
9.3.2 & 12.7.3	Zone fault indication may be for disablement but shall be distinguishable. Fault indications shall be flashing and disablement indication shall be steady.	**3.3.2**	Only disable audible warning may be the same as the fault warning.	**2.4.4**	Fault & isolate indications shall be provided.
9.4.1	Output signal to fire protection equipment & fault warning routing equipment allowed to disable with visual warning. Visual indication may be suppressed during fire alarm condition.	**3.3**	Disablement not mentioned.	**2.7**	Disablement to connection of additional equipment not mentioned.
9.4.2	Output signal to Alarm sounder & fire alarm routing equipment & delay output allowed to disable with visual warning. Visual indication shall not be suppressed during fire alarm condition.	**3.3.4** **3.3.5**	Disablement of Alarm sounder – shall not be possible to cancel visual & audible indication. Disablement of the connection to a remote manned center allowed with visual & Audio warning.	**2.8.7** **2.8.7 (a)**	Alarm sounder silencing switch . -Total disablement not allowed. Transmission to monitoring station shall not be prevented by the alarm sounder silencing switch.
9.5	Disablement of addressable points -Able to identify all the disablements by manual interrogation at access level 2 (Option with requirement)	**3.3.3**	Identification of disablement not mentioned	**2.4.4 (c)**	Isolation facility - Isolate of addressable point not mentioned

BS EN54-2 : 1998		BS 5839 : Part4 : 1988		SS CP10 : 1993	
CLAUSE	REQUIREMENTS	CLAUSE	REQUIREMENTS	CLAUSE	REQUIREMENTS
10	**Test condition (Option with requirement)**				
10.1	Provision for testing the processing & indication of fire alarm signals from zones allowed with requirement.	3.7	Routine testing. Provision for testing allowed with requirement.	2.4.4 & 2.14	Alarm zone facilities & Regular testing & inspection -Provision for zone Test facility not mentioned.
11	**Standardized input/output interface (option with requirement)** Provision for a standardized input/output interface for transmission and reception of signals to & from the ancillary equipment.	3.6	Ancillary services -standardized input/output interface not mentioned.	2.7	Connection of additional equipment. -Ancillary equipment may be connected either through relays or interfacing devices.
12	**Design requirement**				
12.1	General requirement & Manufacture's declaration.	-	Section Two : Requirement	2.3	System equipment-Design & construction.
(a)	Design has been carried out in accordance with a quality management system.		Design requirement not mentioned.	2.3.1	All system equipment shall be listed.
(b)	The component of the c.i.e comply with class 3k5 of IEC 721-3-3:1978			2.3.2	All individual components of the fire Alarm system shall be compatible.

BS EN54-2 : 1998		BS 5839 : Part4 : 1988		SS CP10 : 1993	
CLAUSE	REQUIREMENTS	CLAUSE	REQUIREMENTS	CLAUSE	REQUIREMENTS
12.2	**Documentation**				
12.2.1	Shall prepare installation and user documentation submit for testing.	-	Documentation – Not mentioned.	-	Documentation – Not mentioned.
12.3	**Mechanical design requirement**	4	Construction requirement.	2	General requirement. The color of the fire alarm panel shall be red.
12.3.1	Cabinet shall be robust and meet IP30 of IEC 529:1989	4.1	Enclosure meet IP2X in BS5490	2.3.3.	Special situation Equipment reliability shall not adversely affected by special condition.
12.5	**Integrity of transmission path**	3	Functional requirement.		
12.5.2 & 12.5.3	If 32 Detectors and/or Call points connected to one detection zone, any open/short circuit does not prevent the indication of fire alarm from more than 32 fire Detectors and/or Call Points for c.i.e contained in one cabinet or more than one cabinet.		-Number of detectors/Call Points circuit function not mentioned.	3.7 4.3.8 5.3.8	Manual Call Point shall not share the same zone with others detectors. Not more than 40 Heat detectors shall be connected on a single zone. Not more than 20 Smoke detectors shall be connected on a single zone.
12.5.4	As least two power supply transmission supply path to c.i.e without own power supply, any short or open circuit in one does not affect the other.	5.2	Supply of power. -Requirement of two power supply path not mentioned.	2.6 & 2.4.2	Power supply & sub alarm panel -Requirement of Two power supply path not mentioned.

BS EN54-2 : 1998		BS 5839 : Part4 : 1988		SS CP10 : 1993	
CLAUSE	REQUIREMENTS	CLAUSE	REQUIREMENTS	CLAUSE	REQUIREMENTS
12.6	**Accessibility of indications and controls** -Four access level shall be provided on the c.i.e from level 1 (most accessible) to level 4 (least accessible).	4.3	Control accessibility and indicator Visibility. -Only three access level required.	2.4.9	Fire alarm panel cabinet. -Access level requirement not mentioned.
12.11	**Testing of Indicators** All mandatory visible and audible indicators shall be testable by a manual operation at access level 1 or 2.	3	Functional requirements. -Test facility not mentioned.	2.4.1 (m)	Light indicator test facility. -A switch to energize all the light indicators to detect any faulty ones -audible not mentioned.
14 (a) (b) (c) (d)	**Marking** The c.i.e shall be marked with the following information at access level One. The number of EN54-2:1997 Manufacturer or supplier trademark or name. The c.i.e type number or other designation. The code or number identifying the production period of the c.i.e.	6 (a) (b) (c)	Marking and data. The front face of the equipment shall be clearly marked with The number of BS5839:PT4:1988 The name of the manufacturer or supplier. The type number or other designation. Additional data requirement.	2.4.9 (b)	Fire Alarm Panel cabinet. The manufacturer's name, together with any other appropriate means of identification of the alarm system , include the type of board and module number shall be clearly marked on the fire alarm panel.

Comparison
Of
Maintenance

Between

Analogue/Addressable and Conventional Fire Alarm System

Comparison of Maintenance between Analogue/Addressable & Conventional Fire Alarm System

ANALOGUE/ADDRESSABLE SYSTEM	CONVENTIONAL SYSTEM
1) System is software controlled between panel and devices. Alteration/addition of any signal device require re-programming of the system. Re-programming can only be carried out by supplier/manufacturer and charges dictated by them.	1) Panel and devices does not have any software interface, no programming is required for any alteration & addition work.
2) Only the same brand of detectors/devices can be installed to maintain software compatibility. Prices of the additional detectors/devices are very much higher as compared to conventional detectors/devices.	2) Any brands of conventional detectors/devices are compatible in any existing conventional fire alarm system. Prices are generally lower than analogue/addressable detectors/devices
3) Supply of stock for detectors/devices and spare parts are limited due to signal brand and sole supplier.	3) Supply of stock are generally available, no brand and supplier limitation.
4) The spare parts e.g. microprocessor PCB control board are usually much more expensive as compared to conventional spare parts. Repair of PCB generally are not able to be carried out, resulting in high replacement cost.	4) Prices for spare parts are generally lower and repair work can usually be done for solid-state conventional panel avoiding high replacement cost.
5) Annual maintenance/servicing costs are much higher than conventional systems. Generally controlled and carried out only by the sole supplier because of the hidden information of software and supply of spare & replacements detectors/devices.	5) Annual maintenance/servicing costs are lower. Any fire maintenance contractors are able to carry out the maintenance work priced via open market competitive bidding.
6) For multi-tenanted flatted factories, environmental conditions are difficult to control due to different business activities carried out by tenants. Software controlled equipment as compared to solid state system are more vulnerable to environmental changes.	6) More stable in performance with environmental changes.
7) Only technically well-trained staffs are able to handle and operate the system. Generally security guards find difficulty in operating the system.	7) Simple and can be operated by any authorized general staff.
8) Tenants are subjected to high cost of alteration work for their units.	8) Lower cost paid by tenants for their alteration work.
9) The long-term operation of the system is subjected to the availability of the product and the existence & commercial viability of the supplier/manufacturer. As a result of merger & acquisitions even "current" products become obsolete leaving building owners stuck to a product without future spares and support. This may result in the owner having to change the complete system hardware and the wiring, which may not be feasible in an operational ready building.	9) Conventional panels and devices can be easily changed with full compatibility. Usually the "hard" wires can be re-used, saving cost and "down time" without compromising safety protection.
10) Due to the secrecy nature of microprocessor-based systems, an argument on discrepancies (such as product failures, false alarms) depends very much on integrity of suppliers/manufacturers without much leeway for authentication by third parties.	10) Conventional solid-state designs are open to neutral scrutiny in event of discrepancy as no hidden software "secrets" are involved.

CONVENTIONAL PANELS

GENERAL LAYOUT OF STANDARD PANELS & INSTALLATION DIAGRAMS

PATENT

PATENT *System 88*

PANEL LAYOUT DIAGRAM
OF
Fire Alarm Panel

COMPLIES WITH

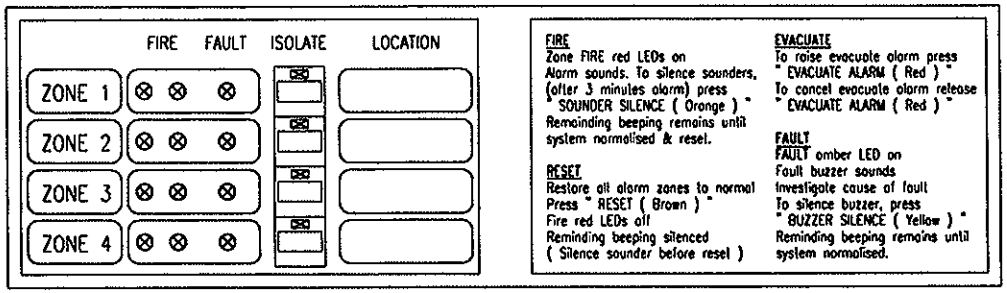
Singapore Standard	: SS CP10 : 1993
British Standard	: BS EN54-2 : 1998
	BS EN54-4 : 1998

PATENT *System 88*

Standard Panel Size and Weight

PANEL TYPE NO. OF ZONES	SIZE (mm)			BASE-PLATE SIZE	WEIGHT (Kg)
	H	W	D		
4 Zones 8 Zones	400	450	145	240(H) X 400(W)	10
12 Zones 16 Zones (4Z/8Z c/w LCD)	480	450	145	320(H) X 400(W)	12
20 Zones 24 Zones (12Z/16Z c/w LCD)	580	450	145	420(H) X 400(W)	15
28 Zones 32 Zones (20Z/24Z c/w LCD)	680	450	145	520(H) X 400(W)	20
36 Zones 40 Zones (28Z/32Z c/w LCD)	800	450	170	640(H) X 400(W)	25
44 Zones 48 Zones	750	580	220	510(H) X 500(W)	30
52 Zones 56 Zones 60 Zones	880	580	220	640(H) X 500(W)	35
64 Zones 68 Zones 72 Zones	1000	580	220	760(H) X 500(W)	40
76 Zones 80 Zones 84 Zones	1120	580	220	860(H) X 500(W)	45
88 Zones 92 Zones 96 Zones	1240	580	220	980(H) X 500(W)	50
100 Zones 104 Zones 108 Zones	1400	600	220	1120(H) X 520(W)	60
112 Zones 116 Zones 120 Zones	1550	600	220	1270(H) X 520(W)	70
4/8 Zones (Big Box)	480	450	220	240(H) X 400(W)	12
12/16 Zones (Big Box)	560	450	220	320(H) X 400(W)	14
20/24 Zones (Big Box)	660	450	220	420(H) X 400(W)	17
28/32 Zones (Big Box)	760	450	220	520(H) X 400(W)	23
36/40 Zones (Big Box)	880	450	220	640(H) X 400(W)	28

'PATENT SYSTEM 88' ZONE INDICATOR BOARD



FIRE
Zone FIRE red LEDs on
Alarm sounds. To silence sounders, (after 3 minutes alarm) press " SOUNDER SILENCE (Orange) "
Reminding beeping remains until system normalised & reset.

RESET
Restore all alarm zones to normal
Press " RESET (Brown) "
Fire red LEDs off
Reminding beeping silenced
(Silence sounder before reset)

EVACUATE
To raise evacuate alarm press " EVACUATE ALARM (Red) "
To cancel evacuate alarm release " EVACUATE ALARM (Red) "

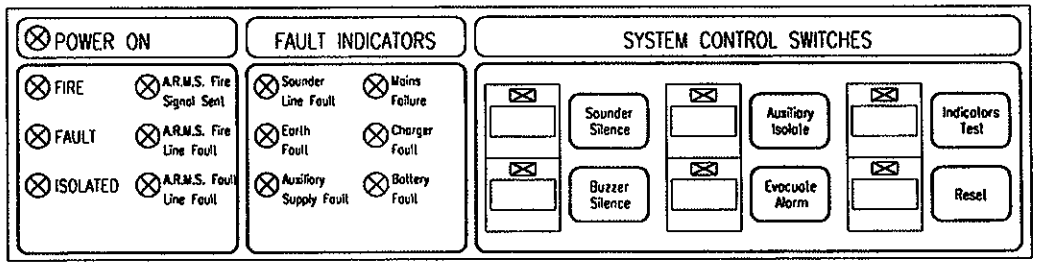
FAULT
FAULT amber LED on
Fault buzzer sounds
Investigate cause of fault
To silence buzzer, press " BUZZER SILENCE (Yellow) "
Reminding beeping remains until system normalised.

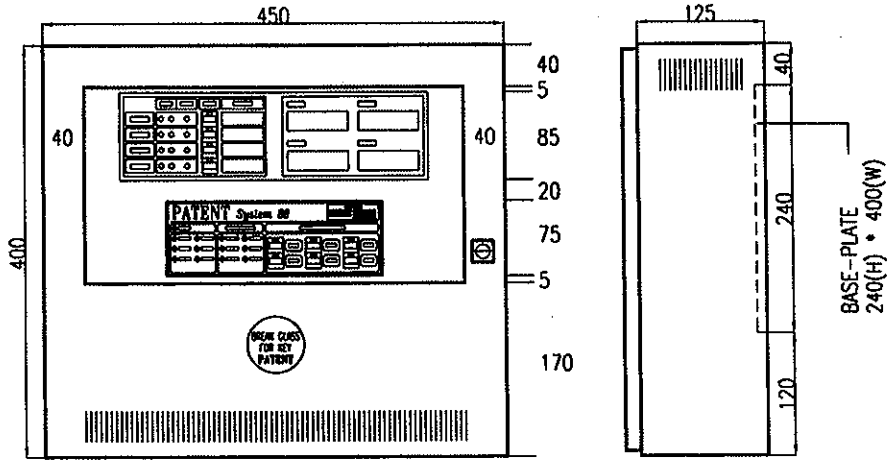
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD





INDICATORS

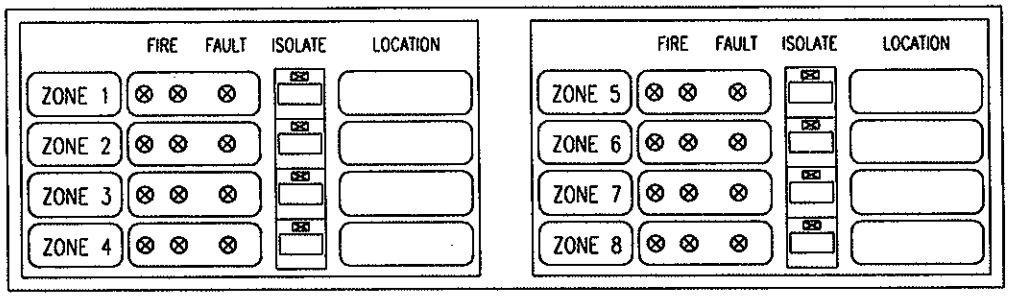
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-04M
DRAWING TITLE TYPICAL PANEL LAYOUT OF 4 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD



FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
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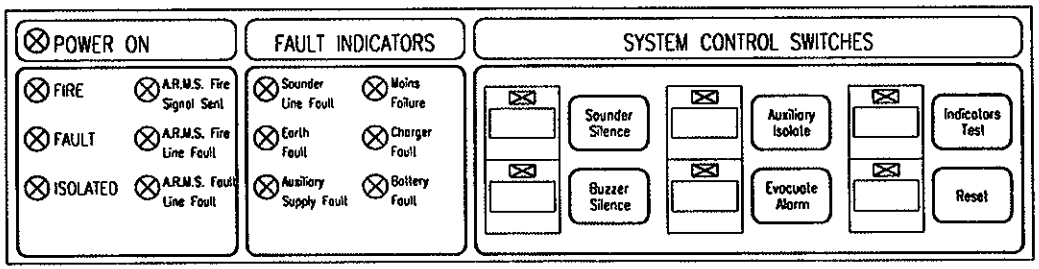
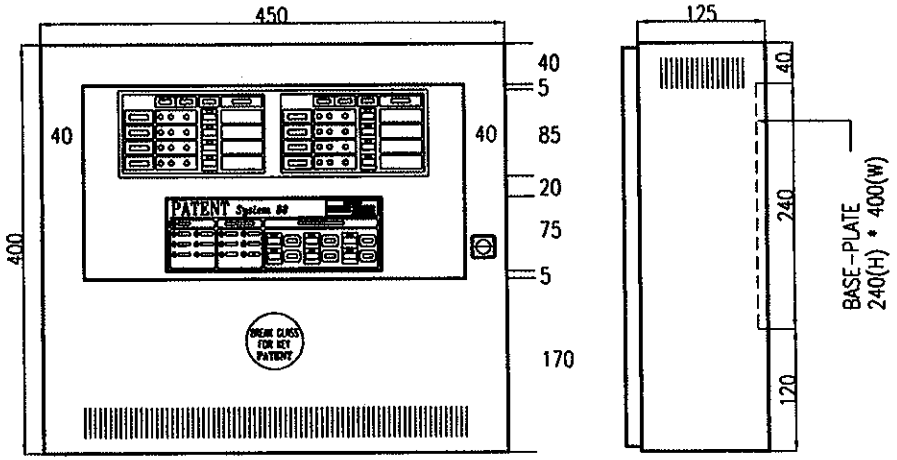
CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD





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A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
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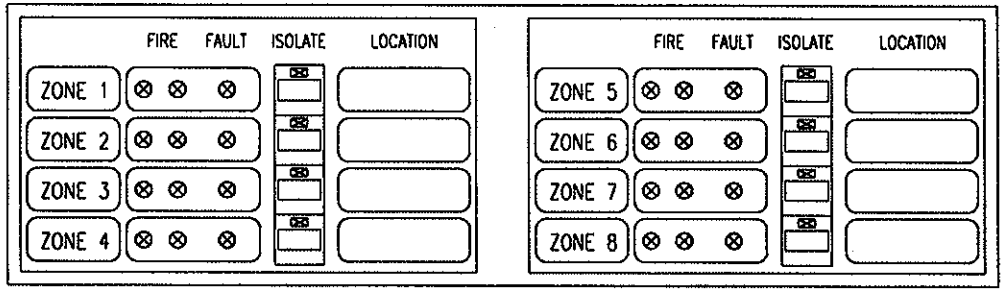
CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-08M
DRAWING TITLE TYPICAL PANEL LAYOUT OF 8 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD



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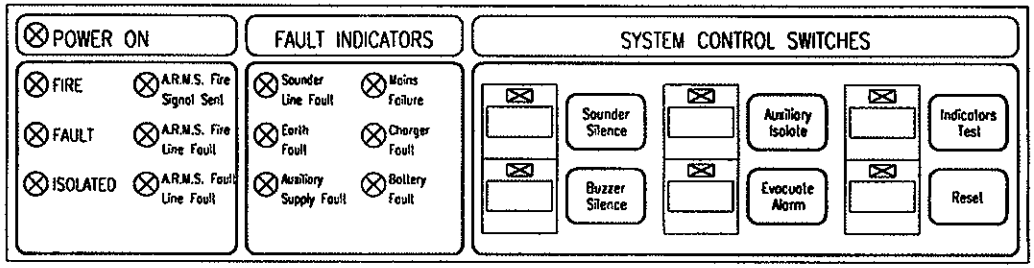
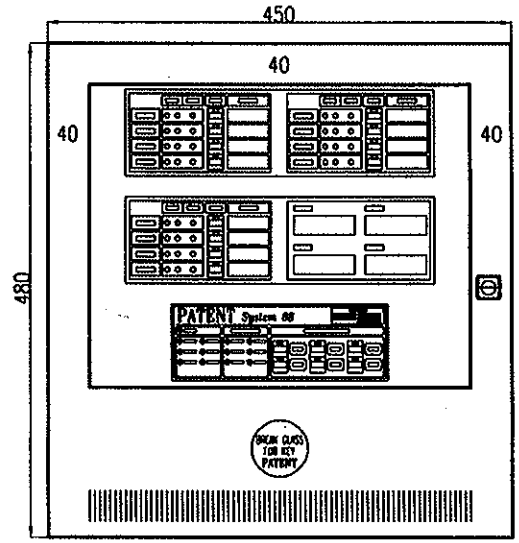
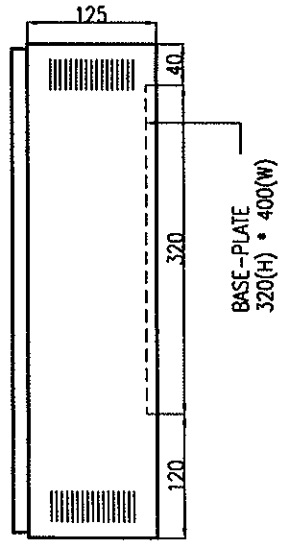
CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD







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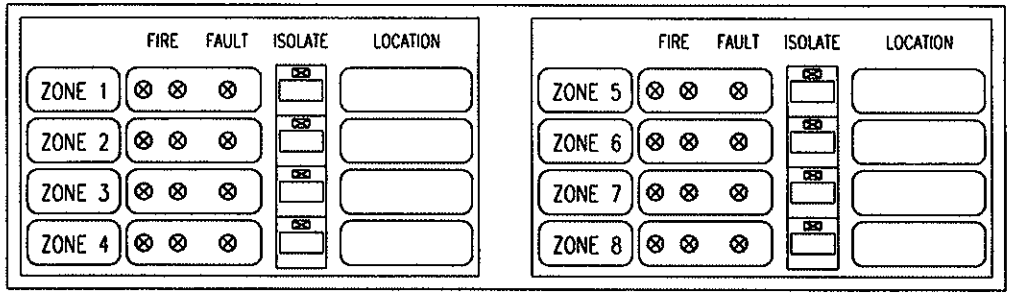
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-12M
DRAWING TITLE TYPICAL PANEL LAYOUT OF 12 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD



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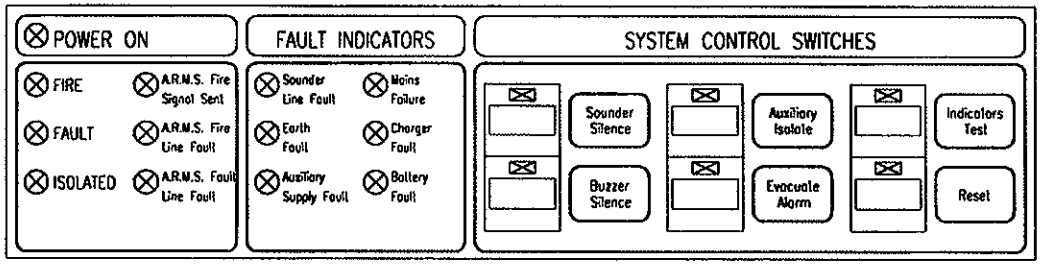
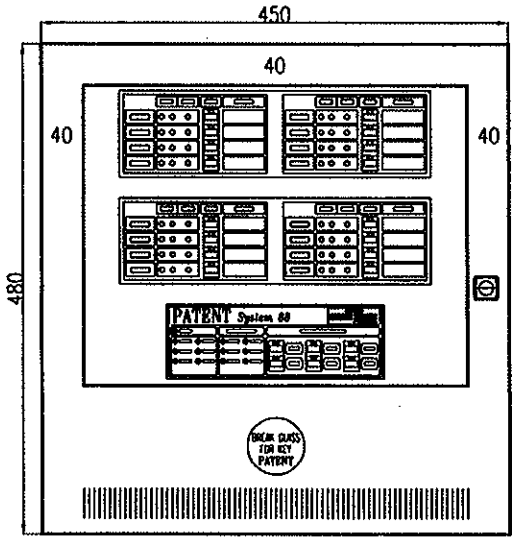
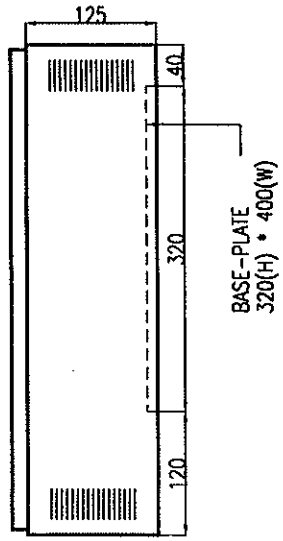
CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD







INDICATORS

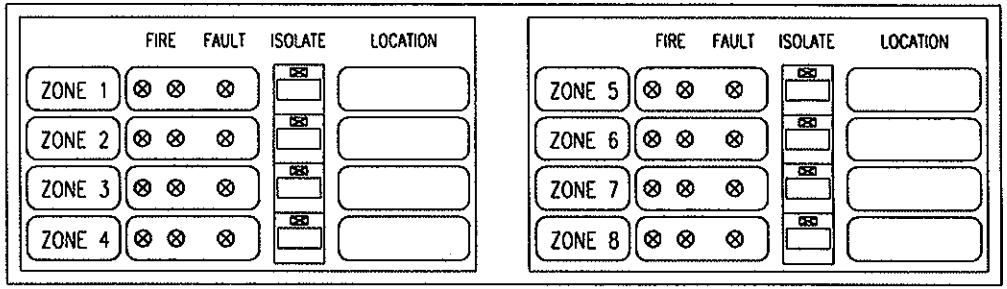
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-16M
DRAWING TITLE TYPICAL PANEL LAYOUT OF 16 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

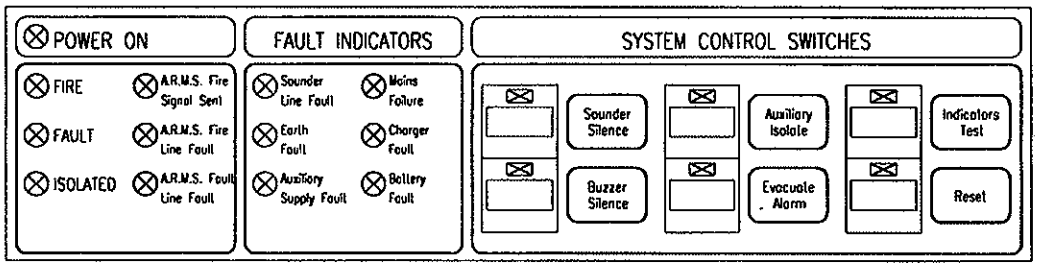


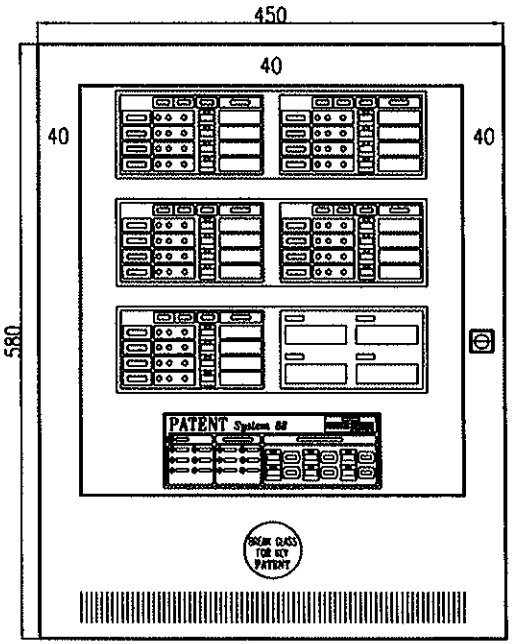
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

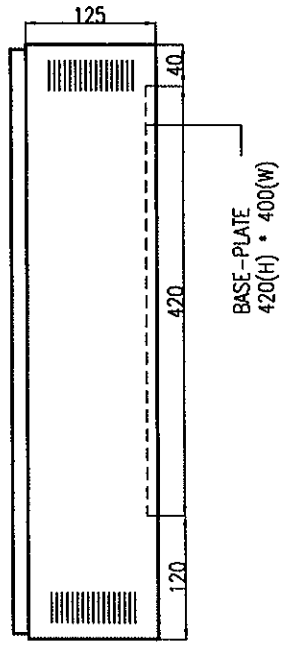
FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD







INDICATORS

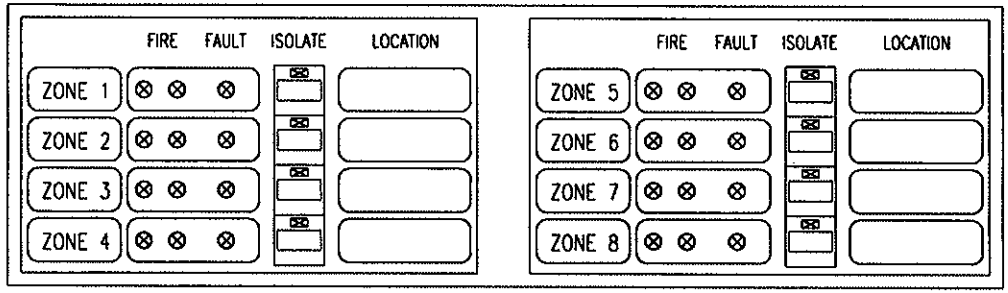
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-20M
DRAWING TITLE TYPICAL PANEL LAYOUT OF 20 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

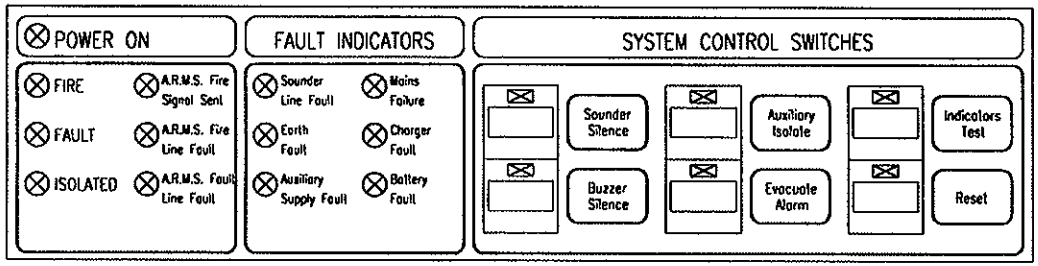


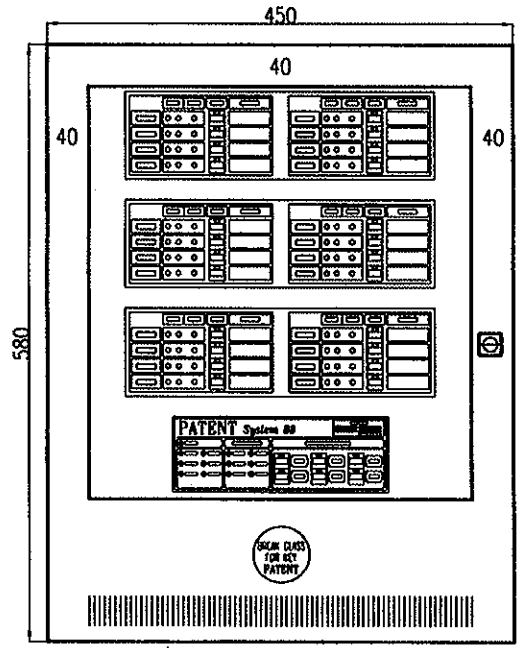
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

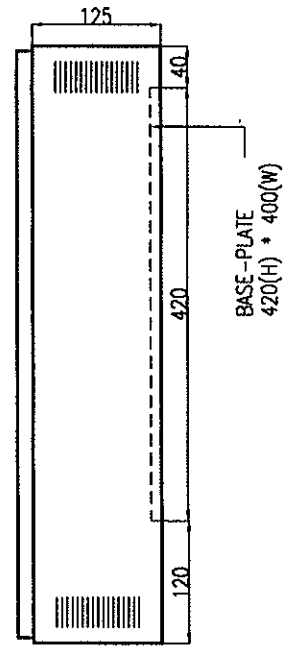
FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD







INDICATORS

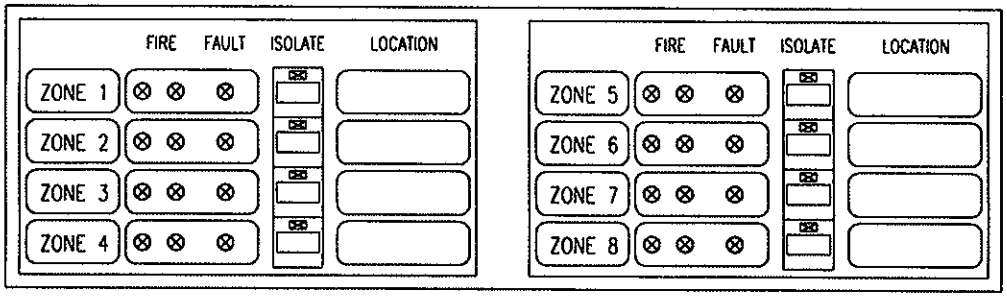
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-24M
DRAWING TITLE TYPICAL PANEL LAYOUT OF 24 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

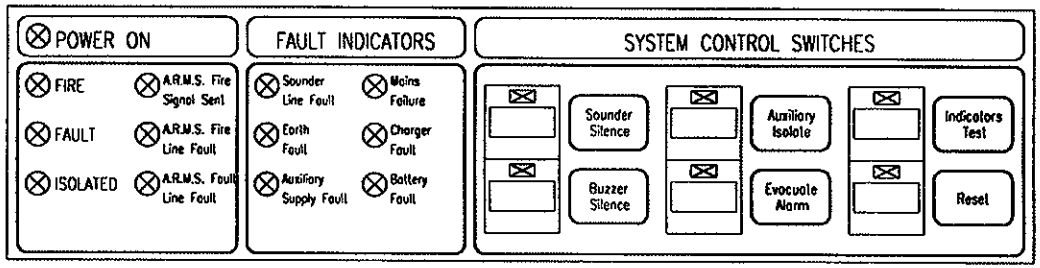


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

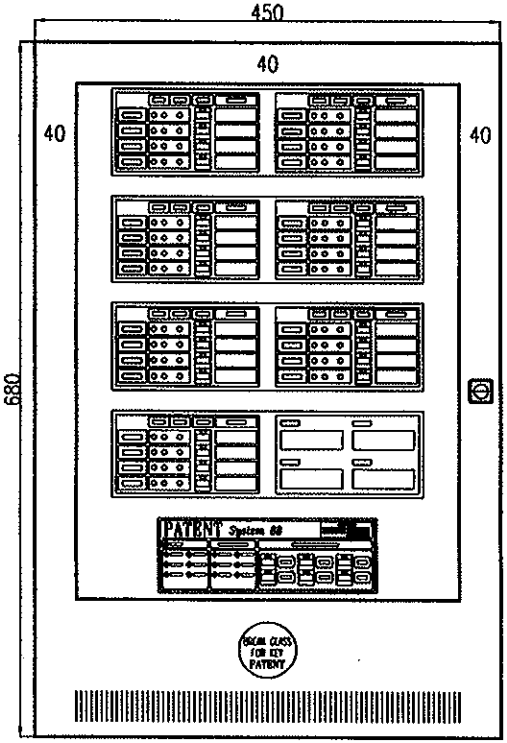


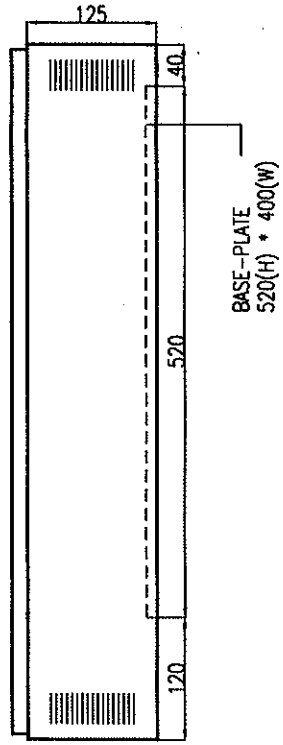
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

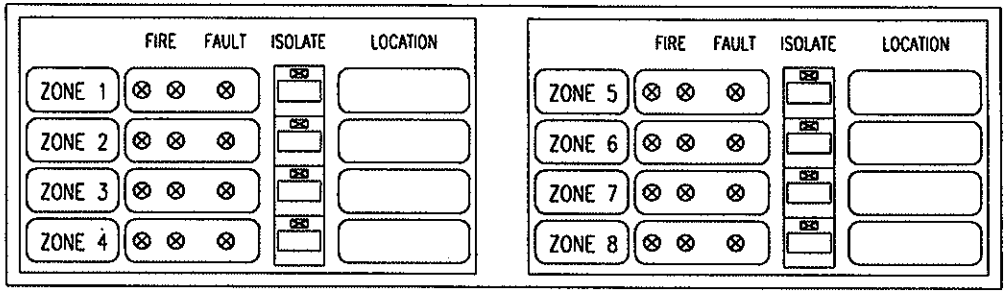
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-28M
DRAWING TITLE TYPICAL PANEL LAYOUT OF 28 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

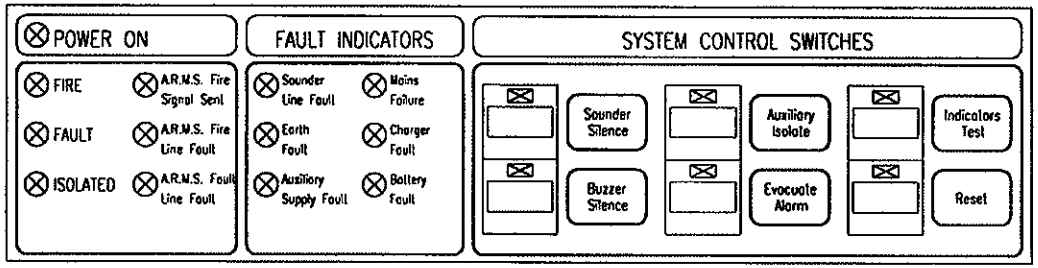


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

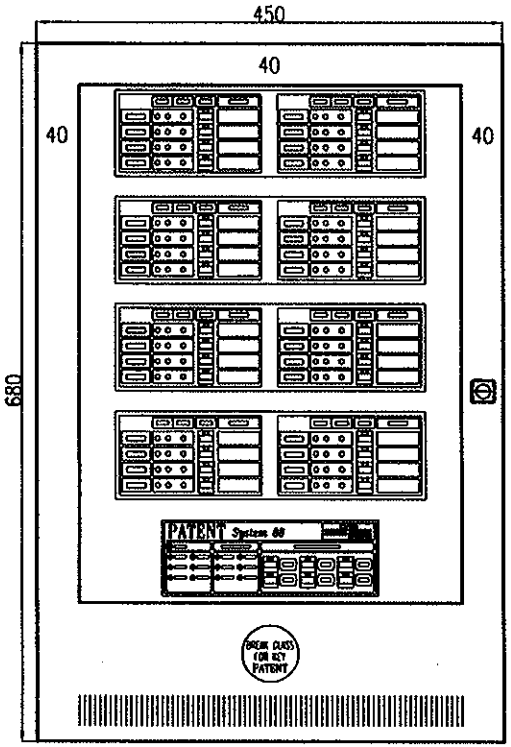


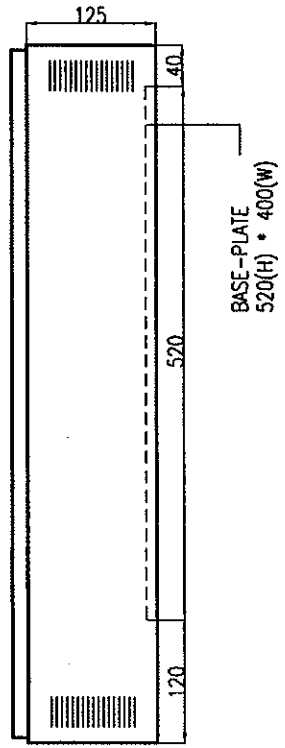
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isololes auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

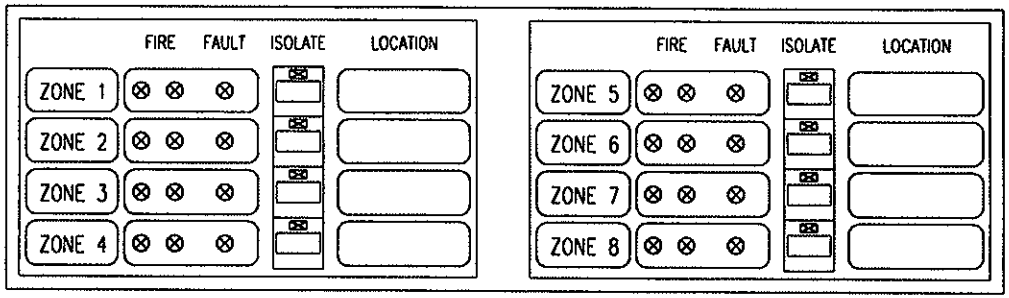




PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-32M
DRAWING TITLE TYPICAL PANEL LAYOUT OF 32 ZONES FIRE ALARM PANEL (MAIN)		

PATENT ENGINEERING CO. PTE LTD
BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455
TEL: 2732277 FAX:2732278

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

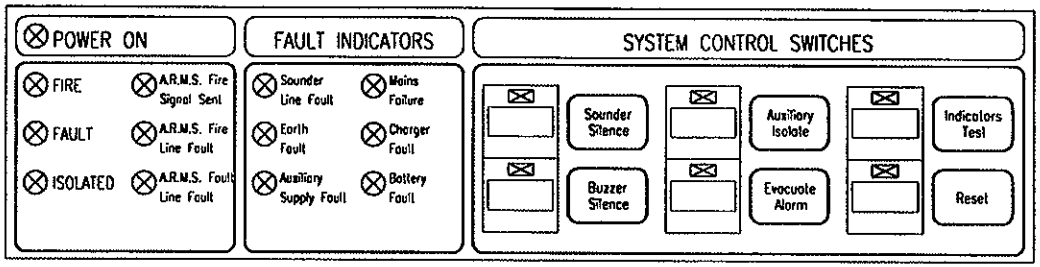


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

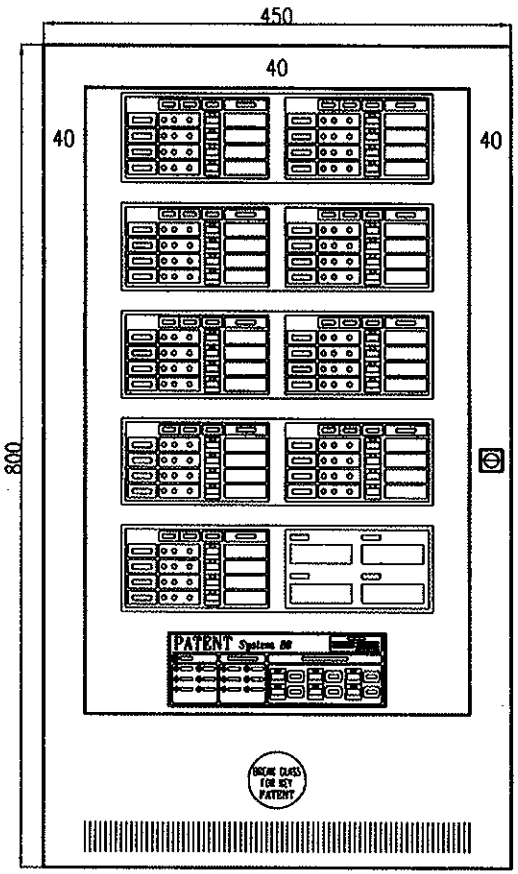


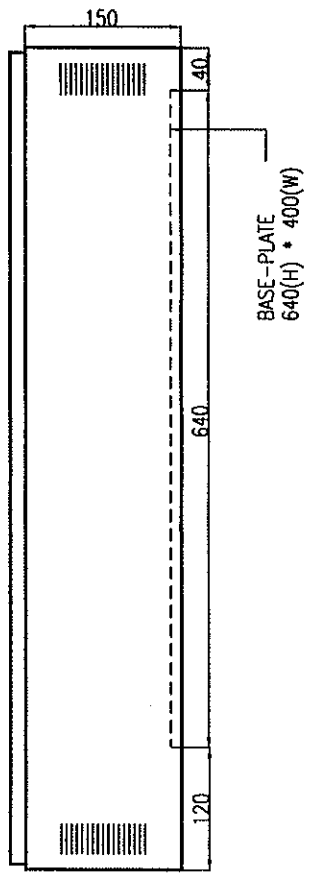
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

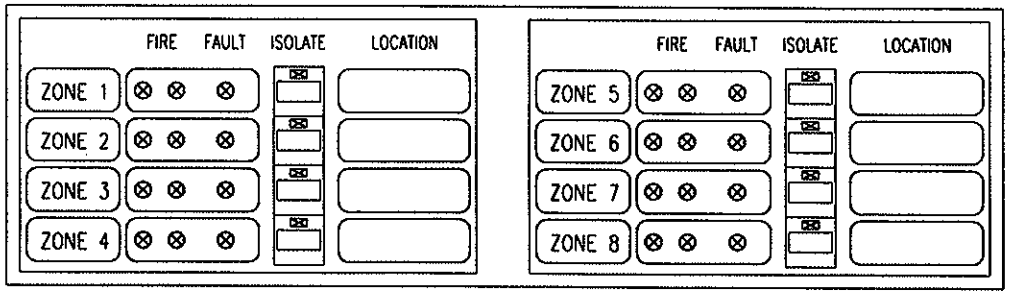
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-36M
DRAWING TITLE TYPICAL PANEL LAYOUT OF 36 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

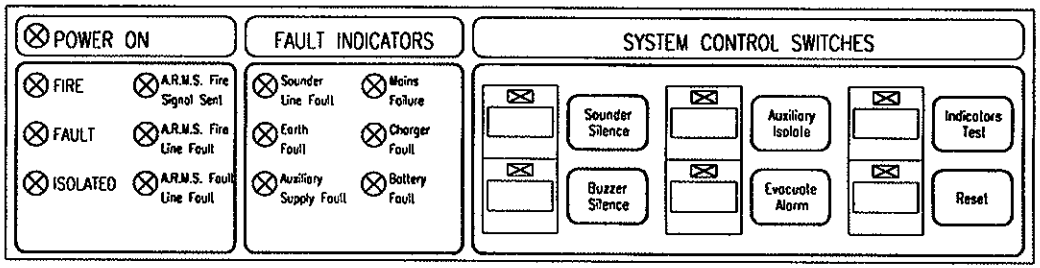


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

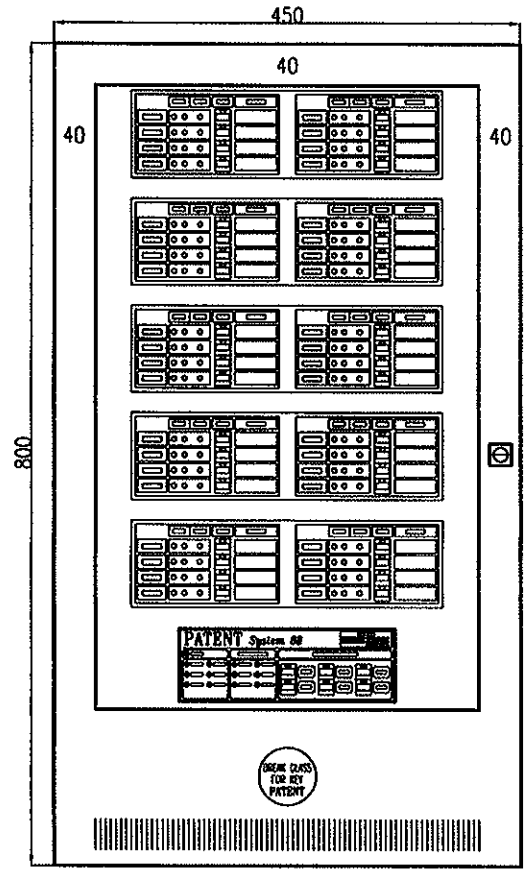


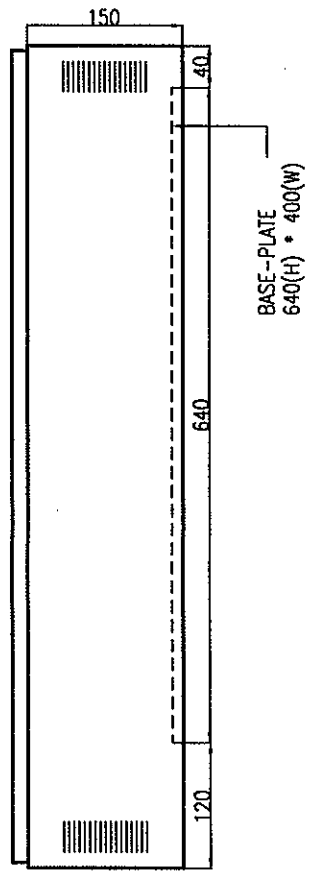
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

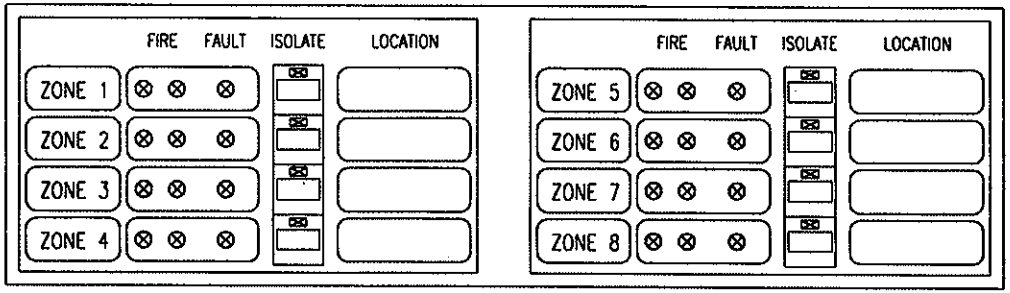
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-40M
DRAWING TITLE TYPICAL PANEL LAYOUT OF 40 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

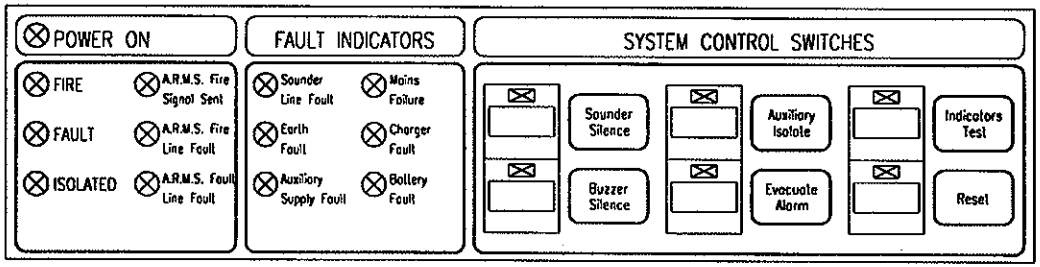


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

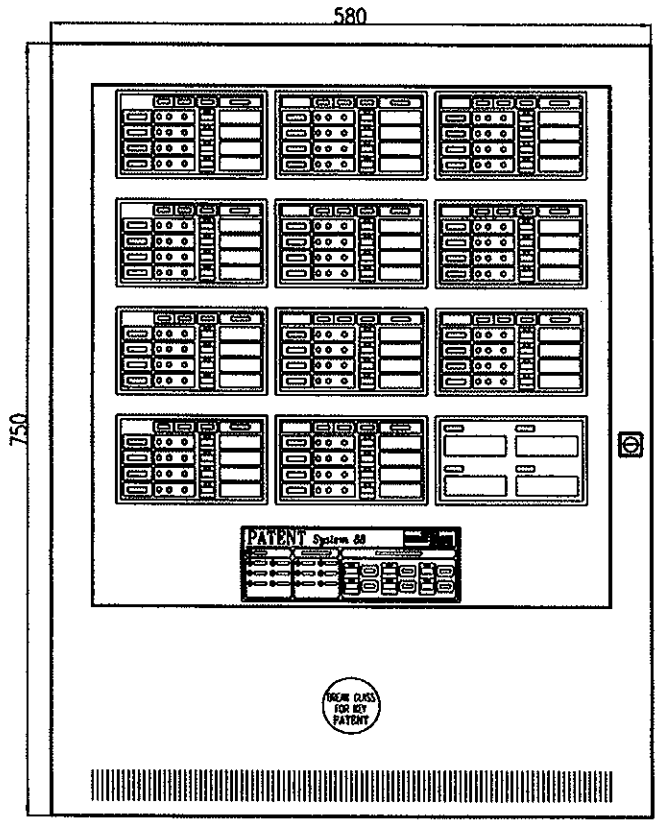


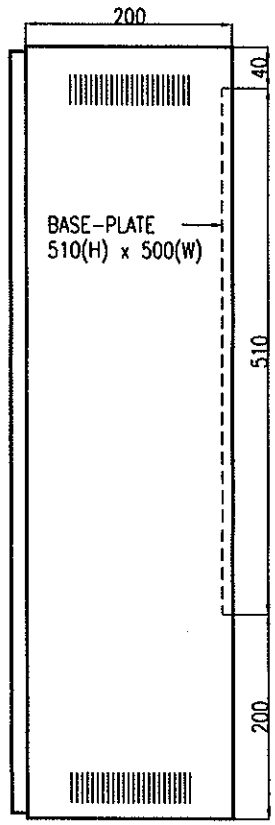
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

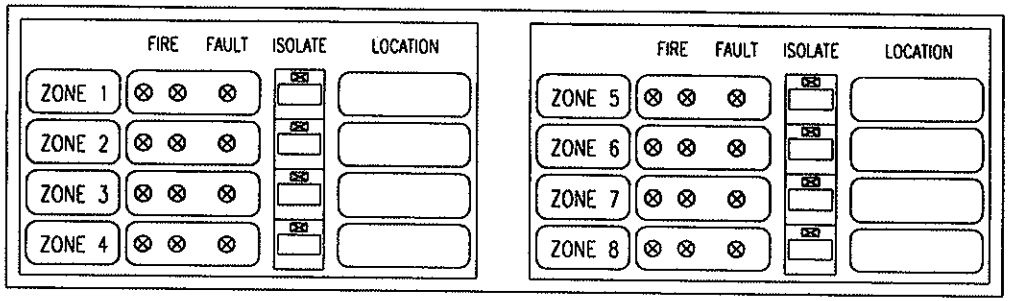
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-44M
DRAWING TITLE TYPICAL PANEL LAYOUT OF 44 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

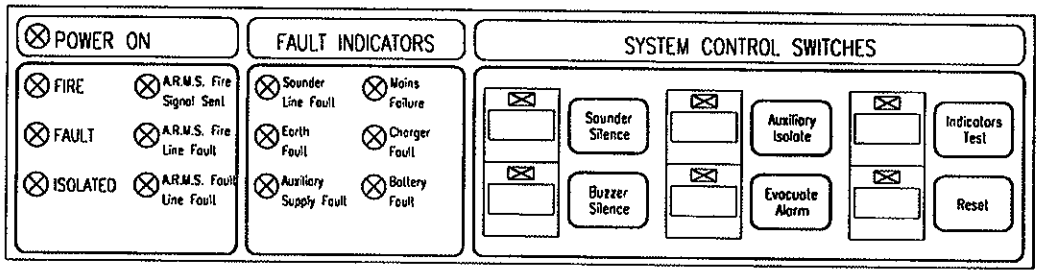


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

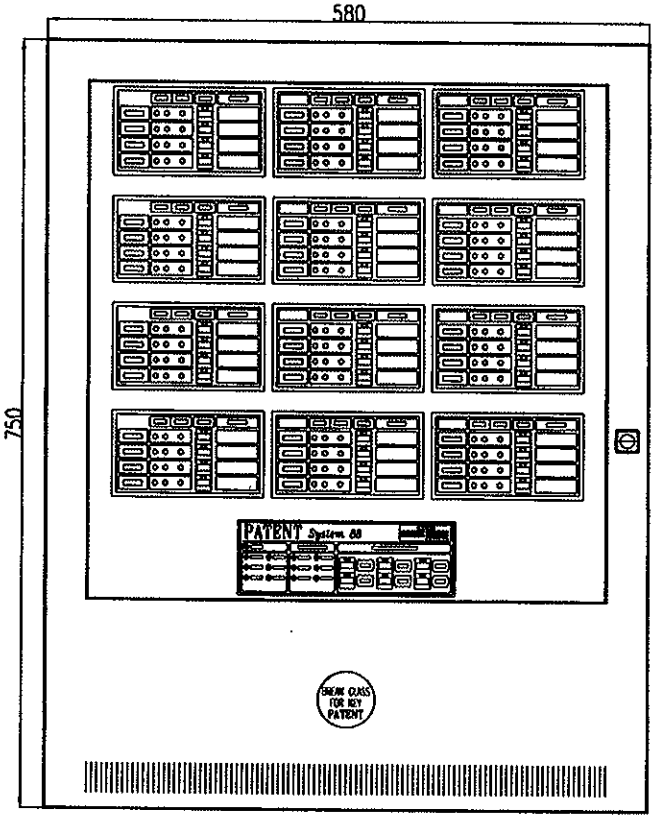


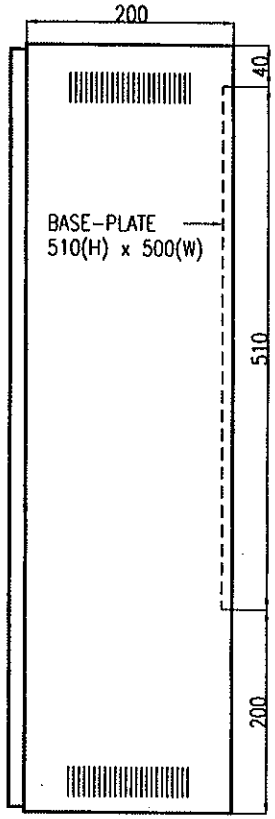
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

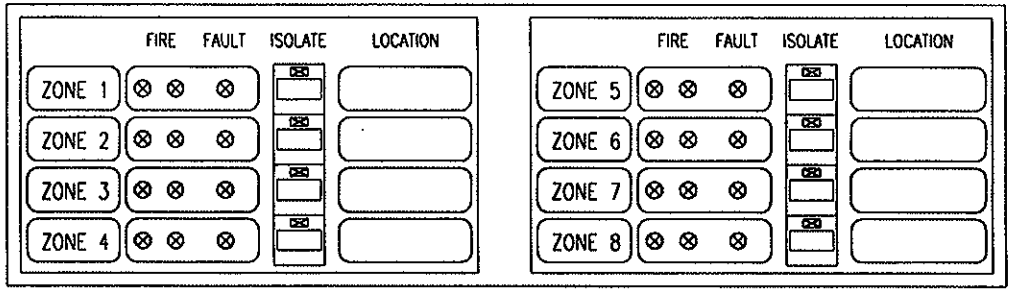
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-48M
DRAWING TITLE TYPICAL PANEL LAYOUT OF 48 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

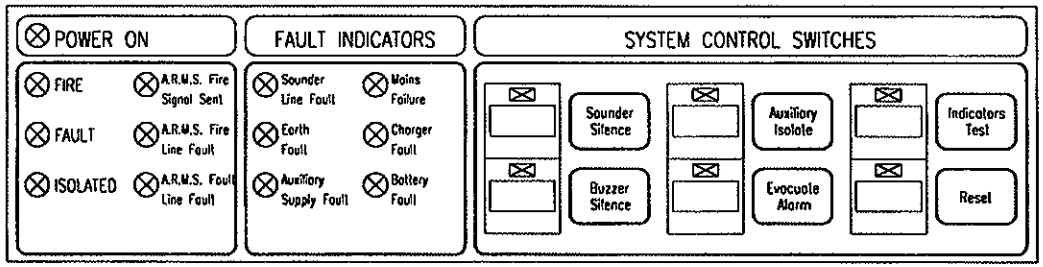


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

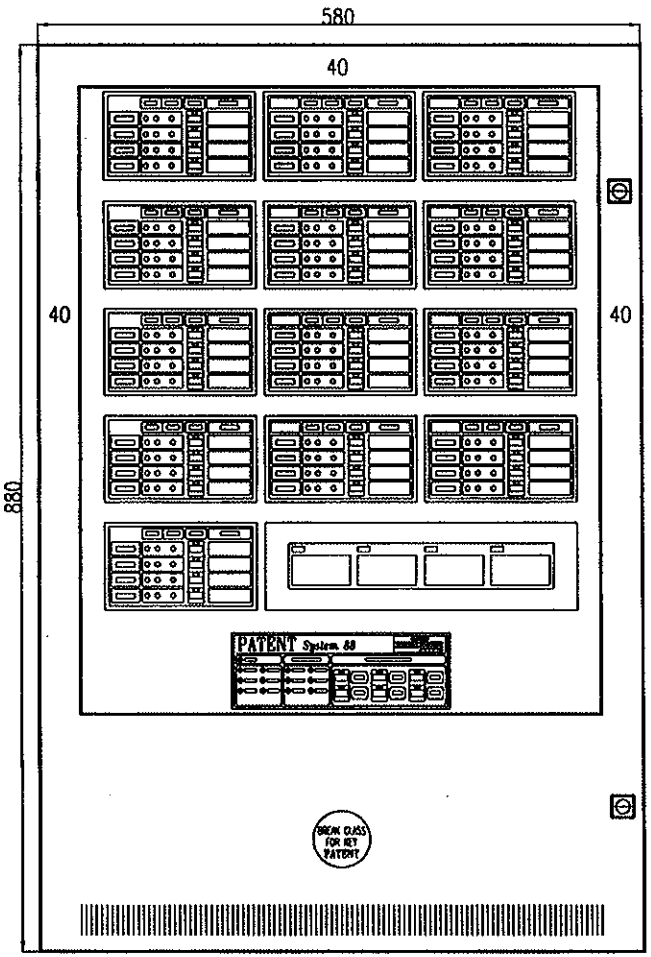


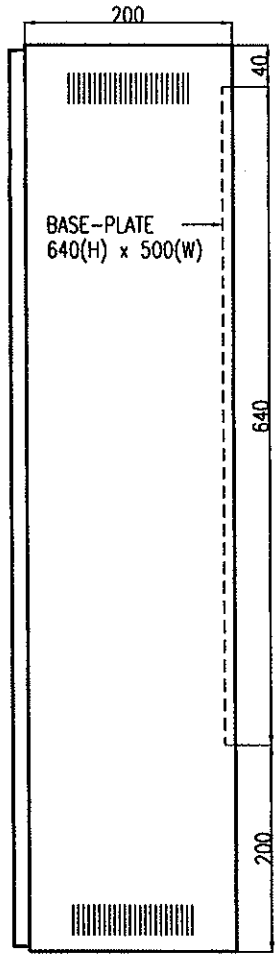
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

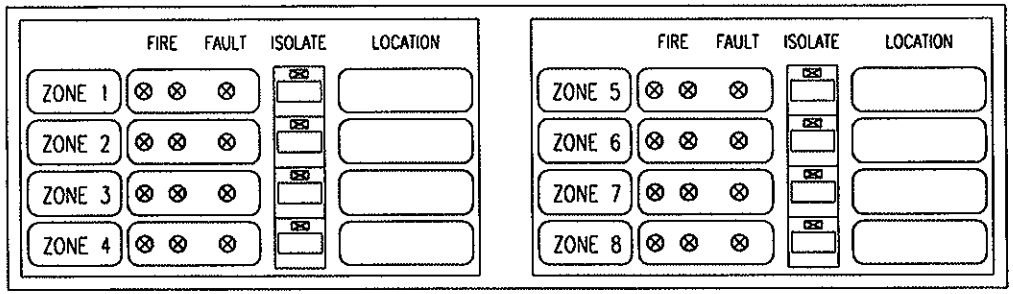
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-52M
DRAWING TITLE TYPICAL PANEL LAYOUT OF 52 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

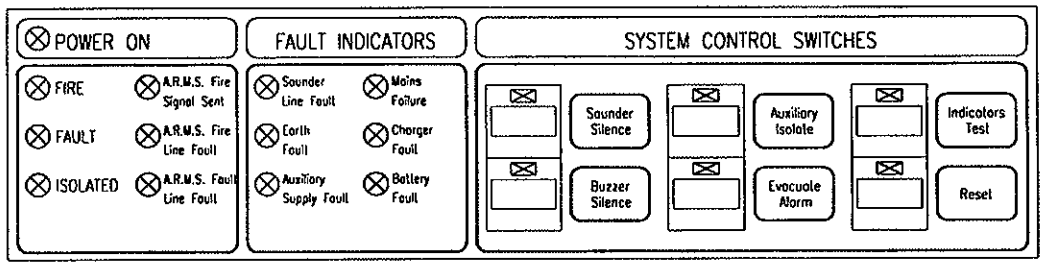


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

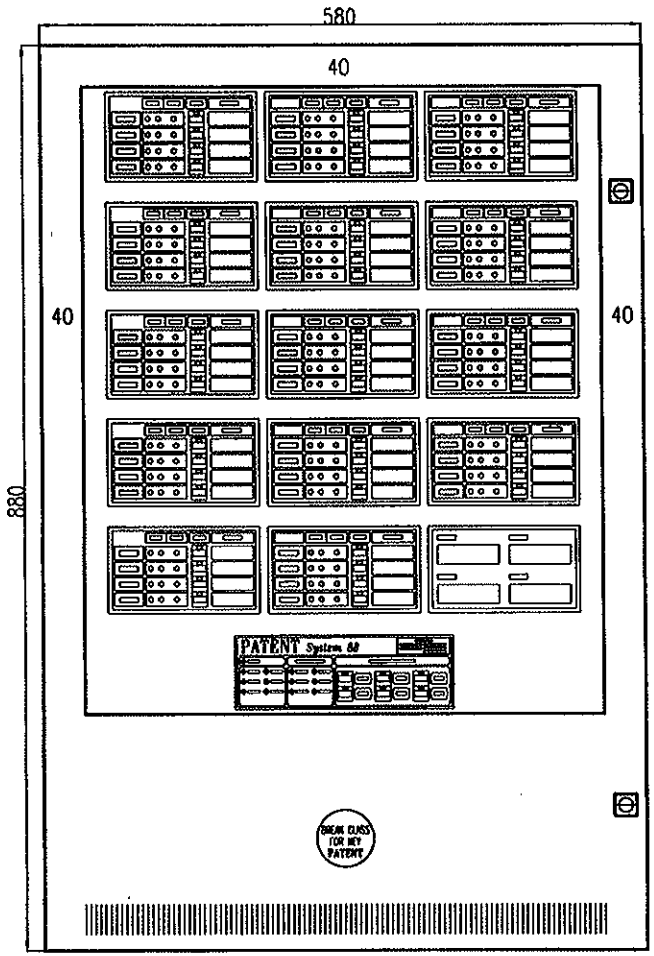


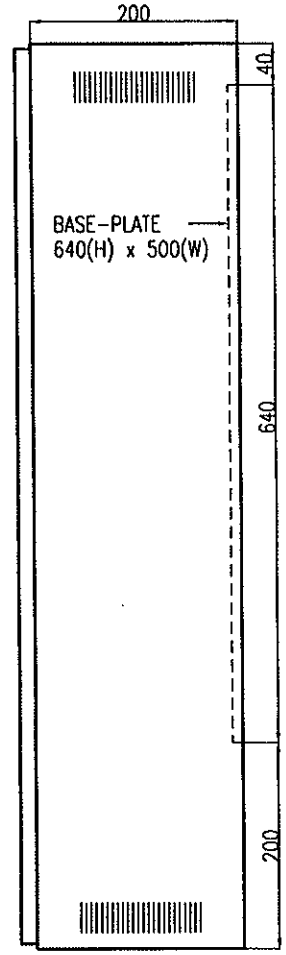
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

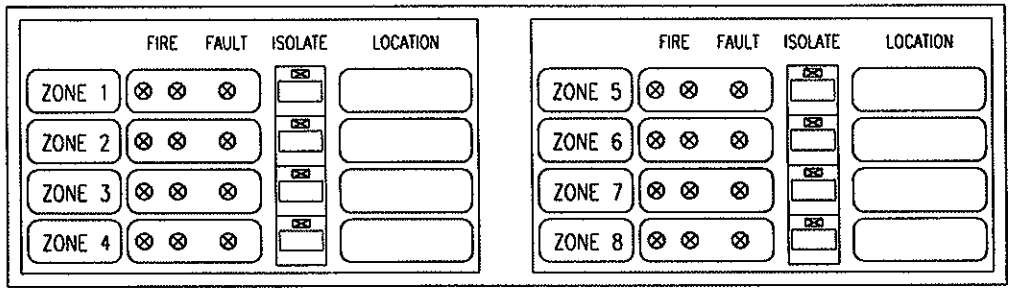
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-56M
DRAWING TITLE TYPICAL PANEL LAYOUT OF 56 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

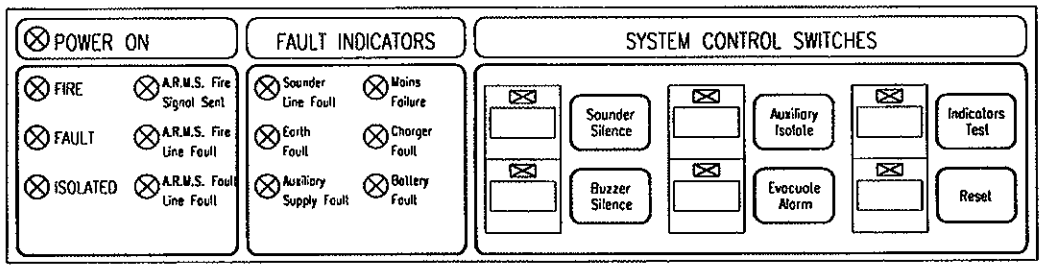


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

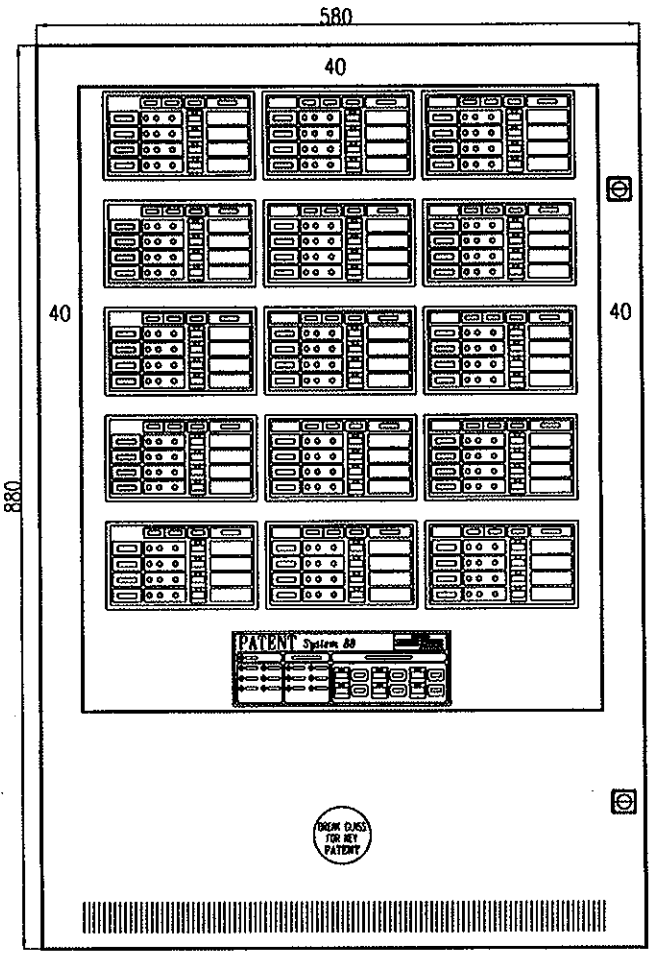


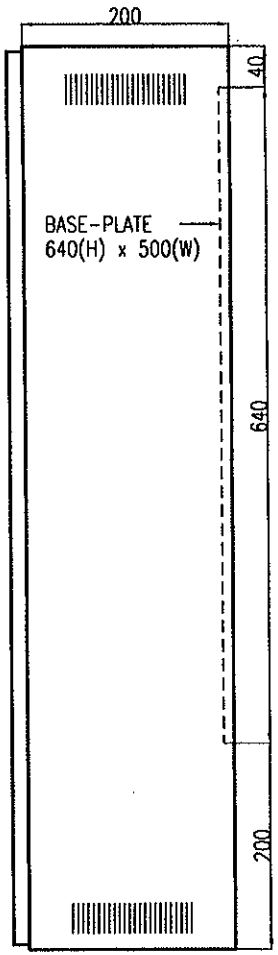
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

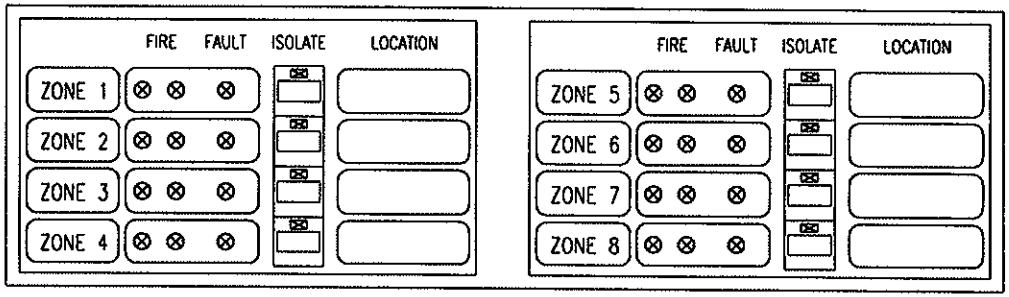
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-60M
DRAWING TITLE TYPICAL PANEL LAYOUT OF 60 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

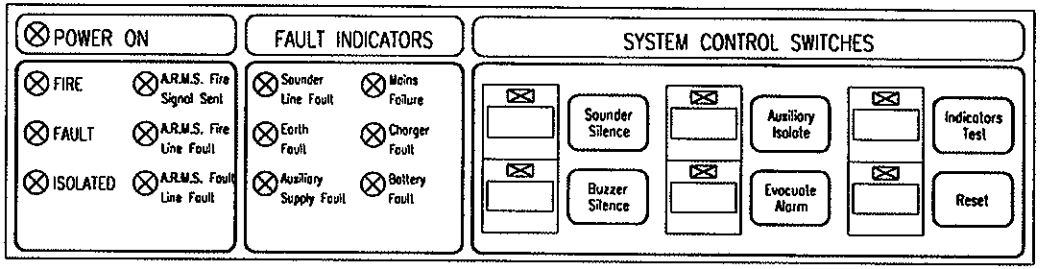


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

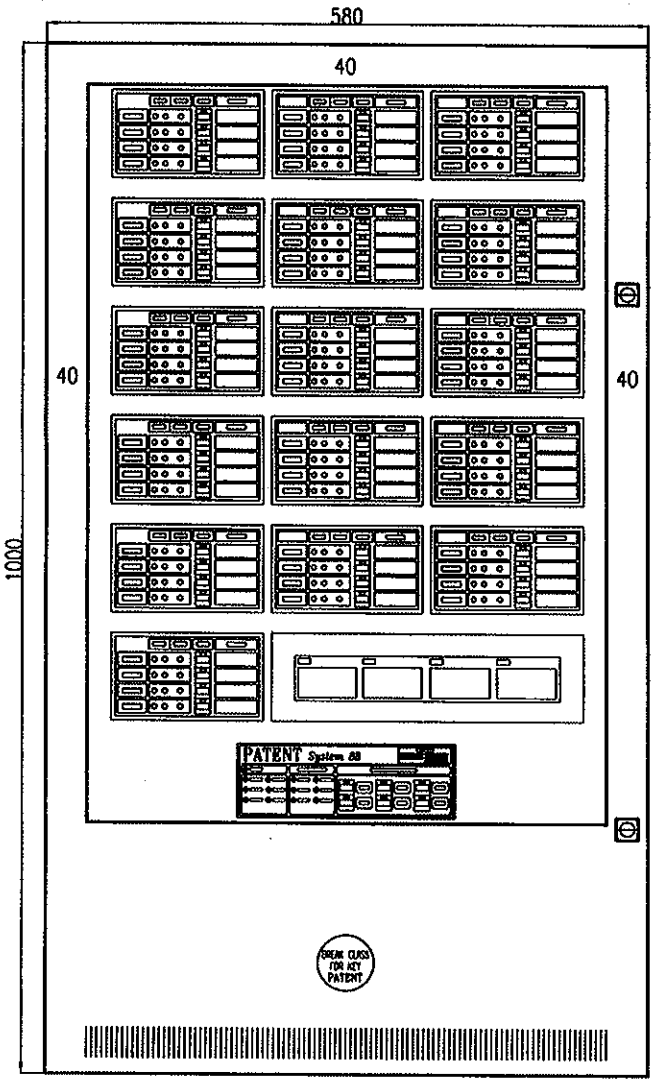


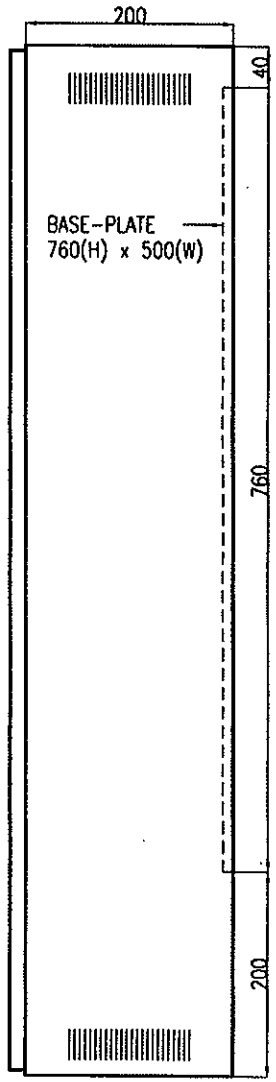
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

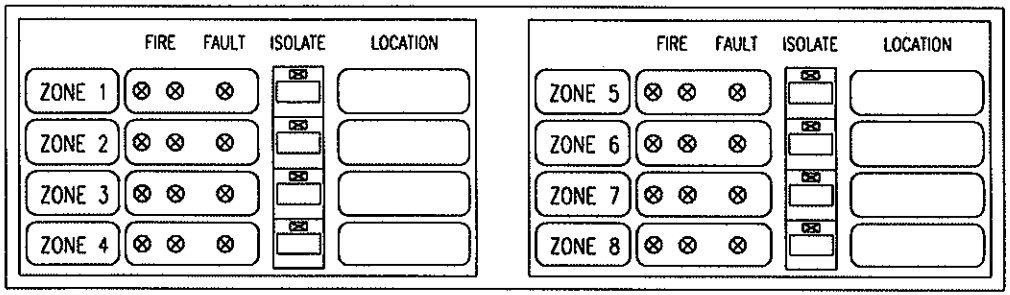
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-64M
DRAWING TITLE TYPICAL PANEL LAYOUT OF 64 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

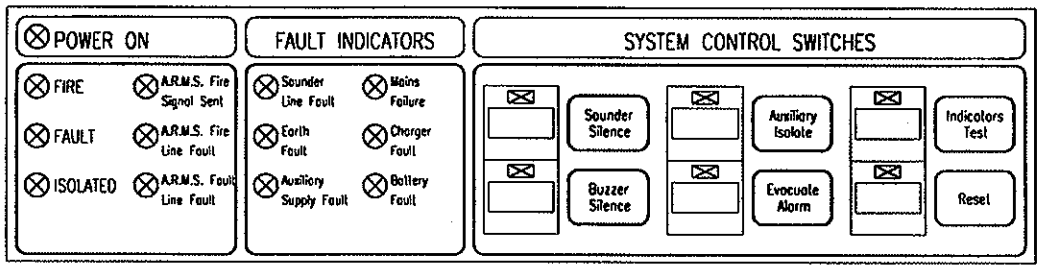


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

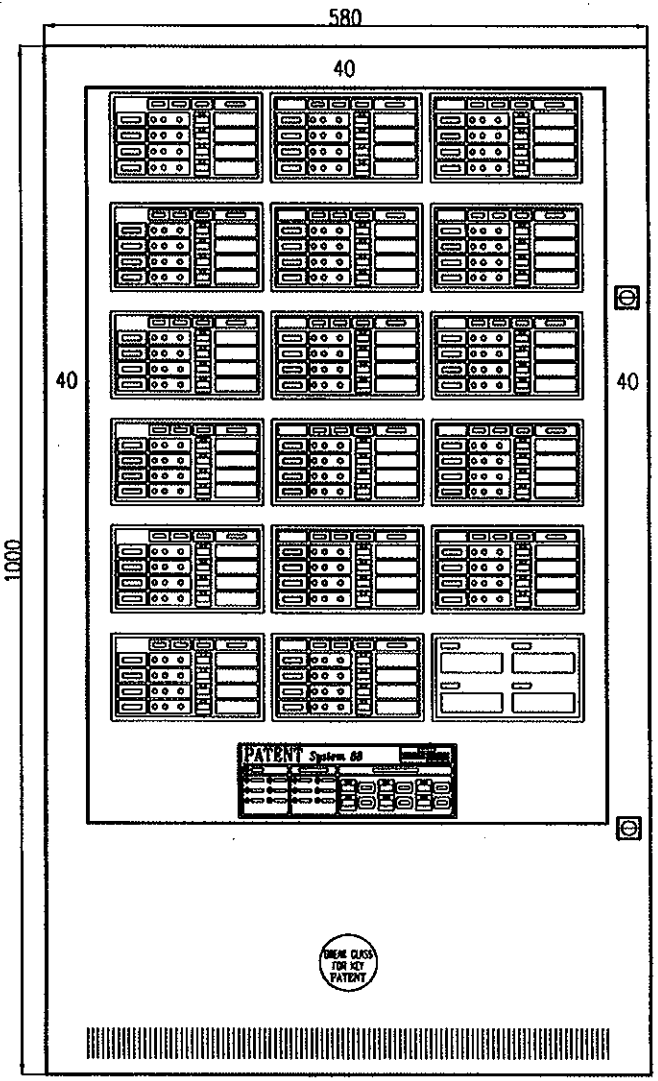


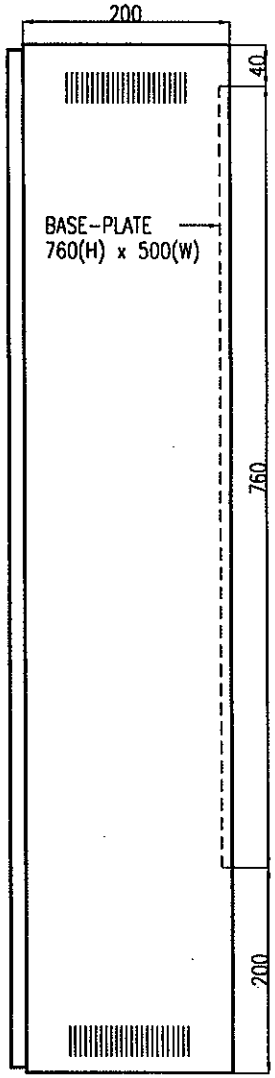
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

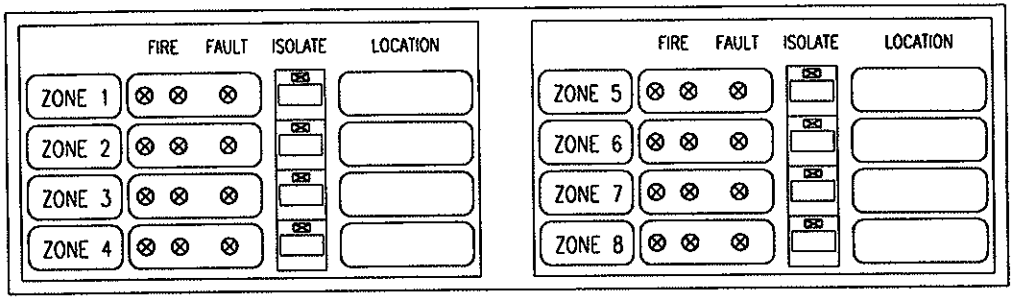
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-68M
DRAWING TITLE TYPICAL PANEL LAYOUT OF 68 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

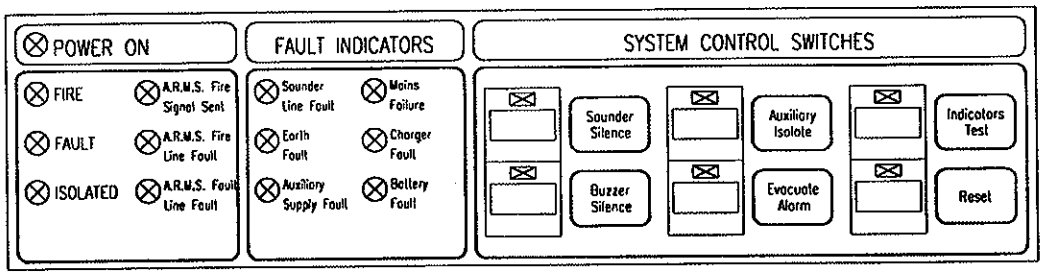


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

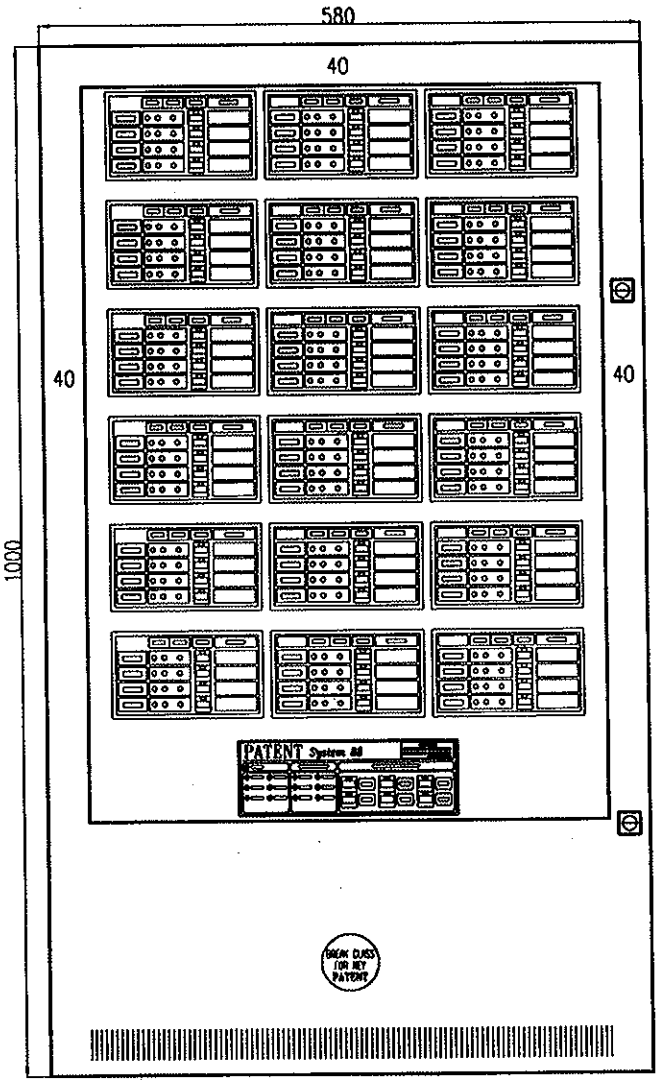


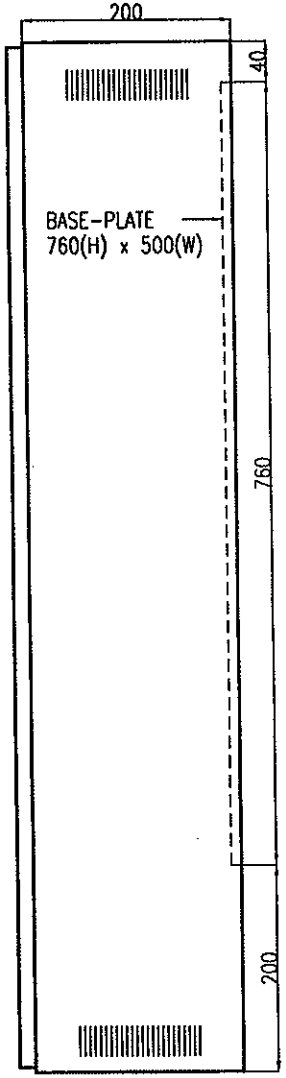
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-72M
DRAWING TITLE TYPICAL PANEL LAYOUT OF 72 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

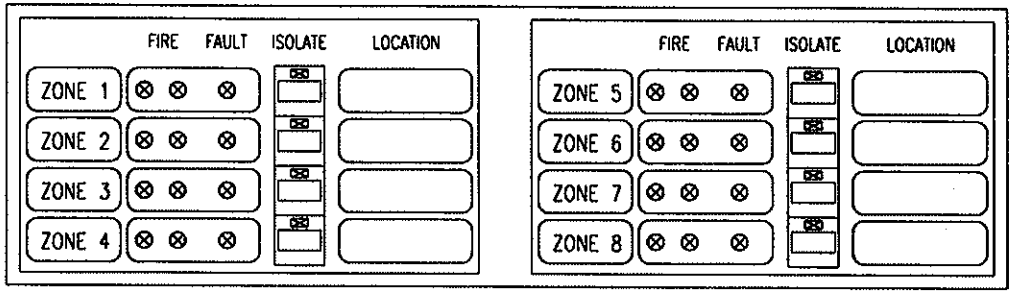
PATENT *System 88*

PANEL LAYOUT DIAGRAM OF Fire Alarm Panel (c/w LCD Display)

COMPLIES WITH

Singapore Standard	: SS CP10 : 1993
British Standard	: BS EN54-2 : 1998
	BS EN54-4 : 1998

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

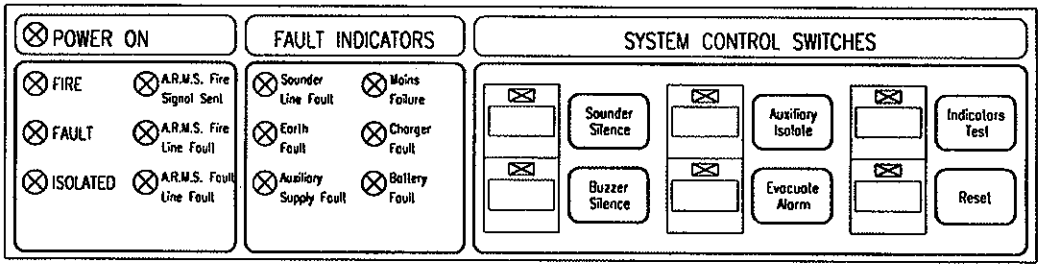


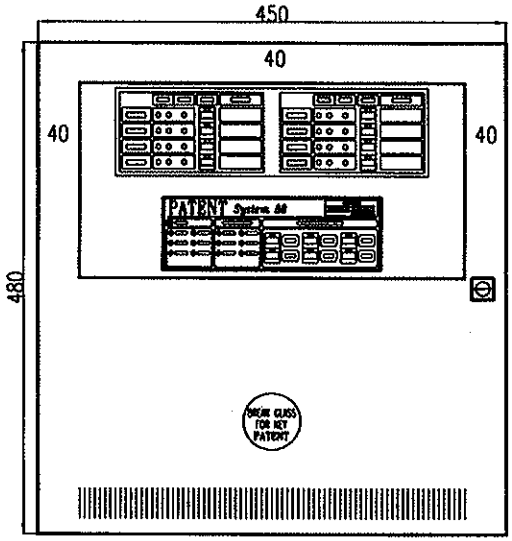
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

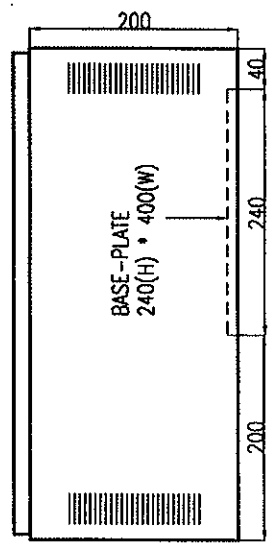
FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD







INDICATORS

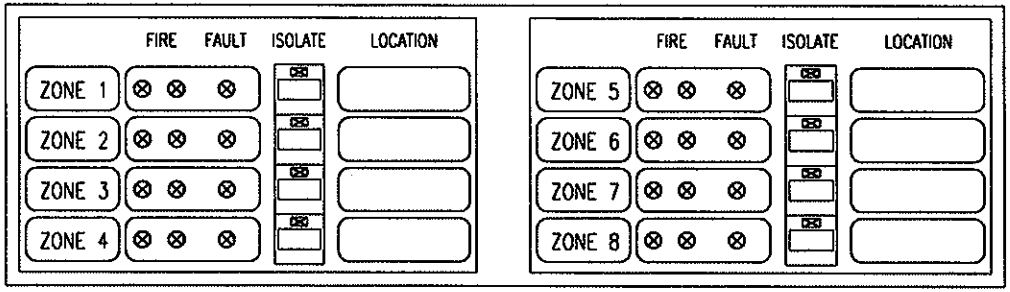
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-08M-88
DRAWING TITLE TYPICAL PANEL LAYOUT OF 8 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

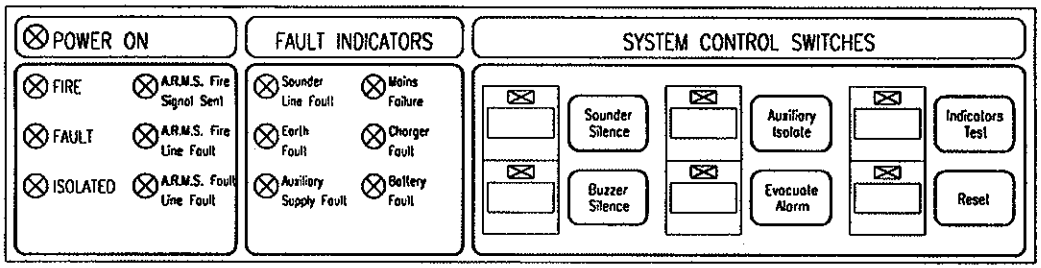


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

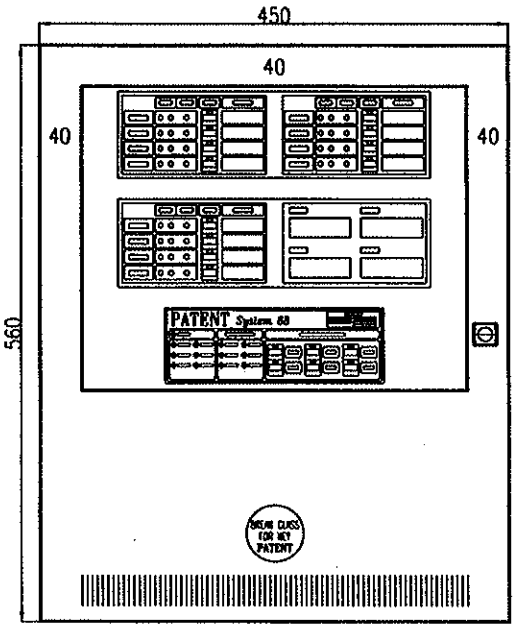


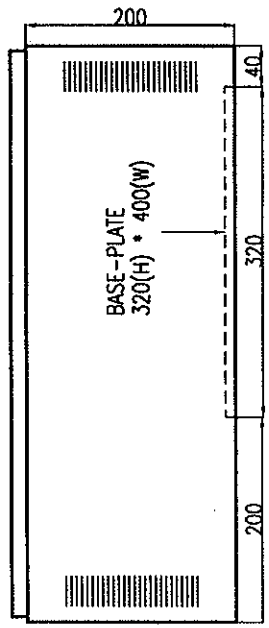
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

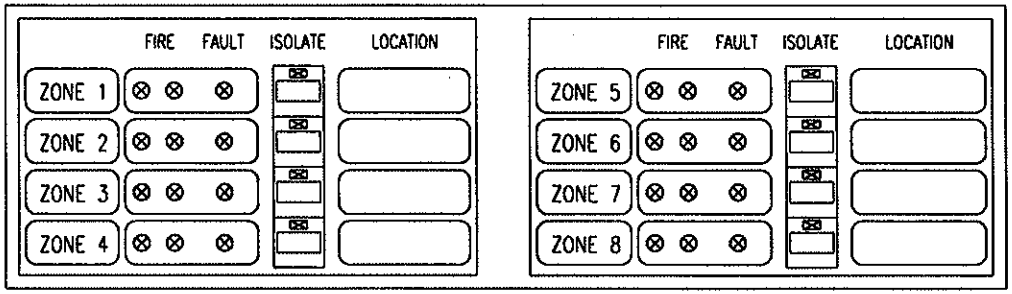
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY J C	DRAWING NO
	DESIGNED BY A M N	DATE 22 JAN 2002
	SCALE N.T.S	FILE P88-12M-BB
DRAWING TITLE TYPICAL PANEL LAYOUT OF 12 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

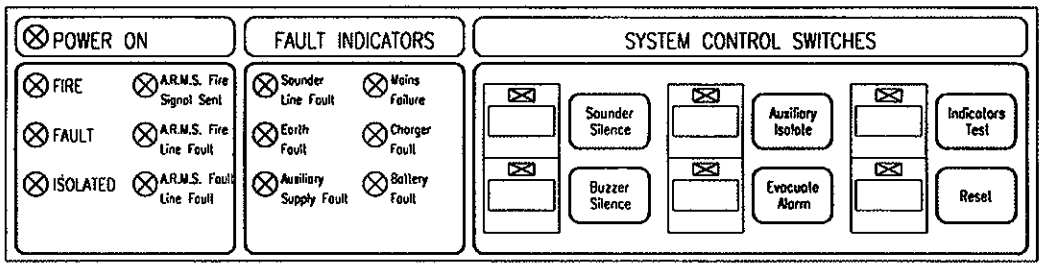


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

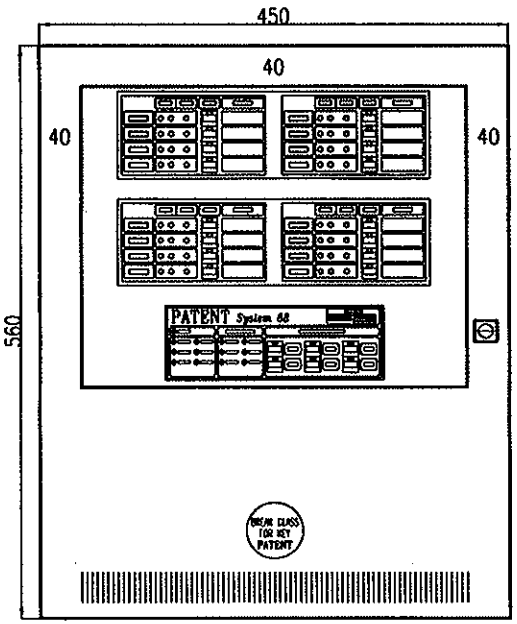


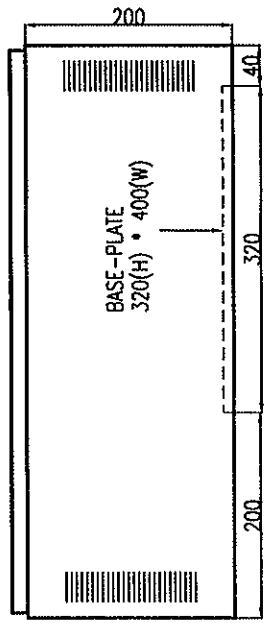
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

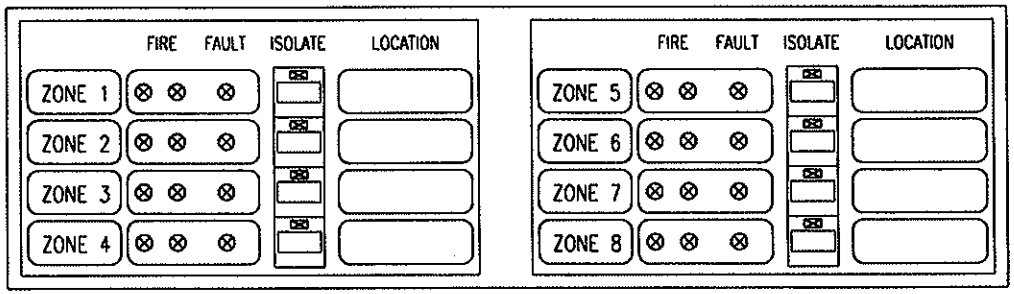
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-16M-BB
DRAWING TITLE TYPICAL PANEL LAYOUT OF 16 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

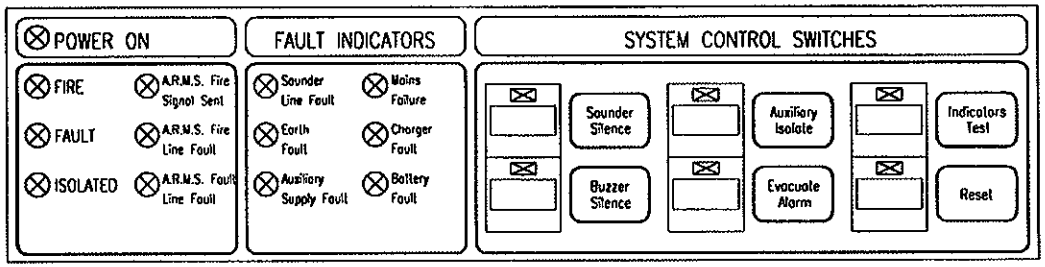


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

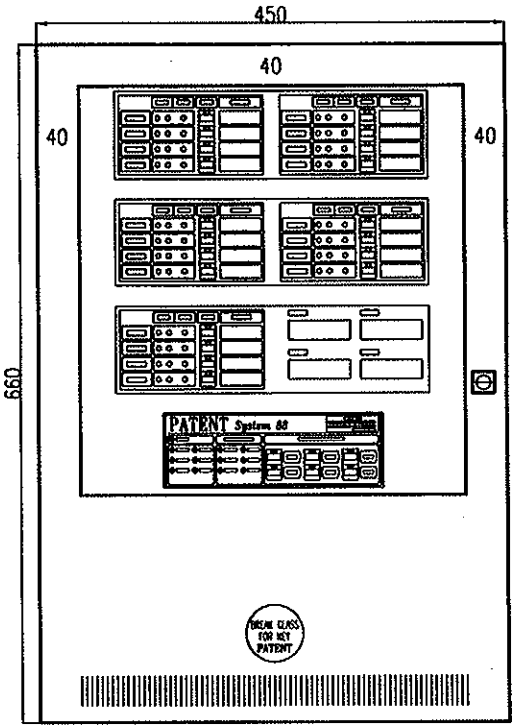


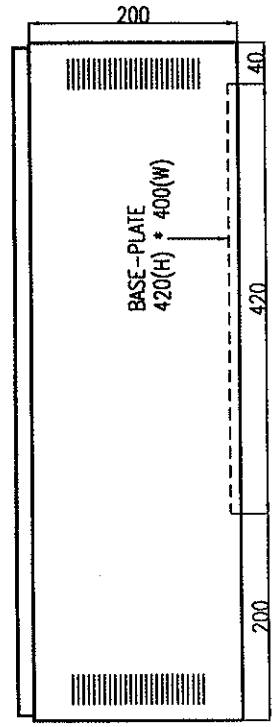
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

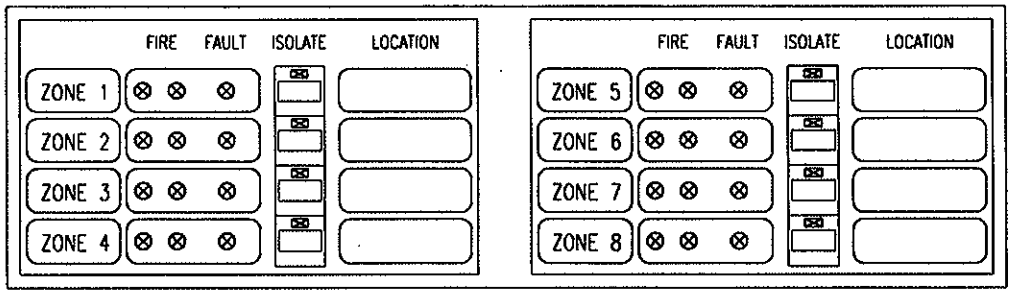
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY J C	DRAWING NO
	DESIGNED BY A M N	DATE 22 JAN 2002
	SCALE N.T.S	FILE P88-20M-88
DRAWING TITLE TYPICAL PANEL LAYOUT OF 20 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

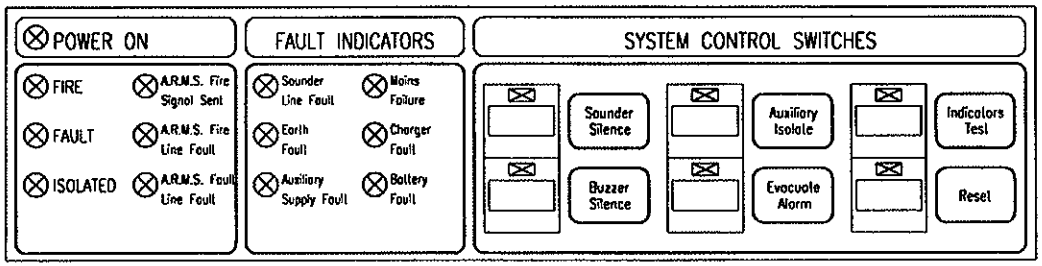


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

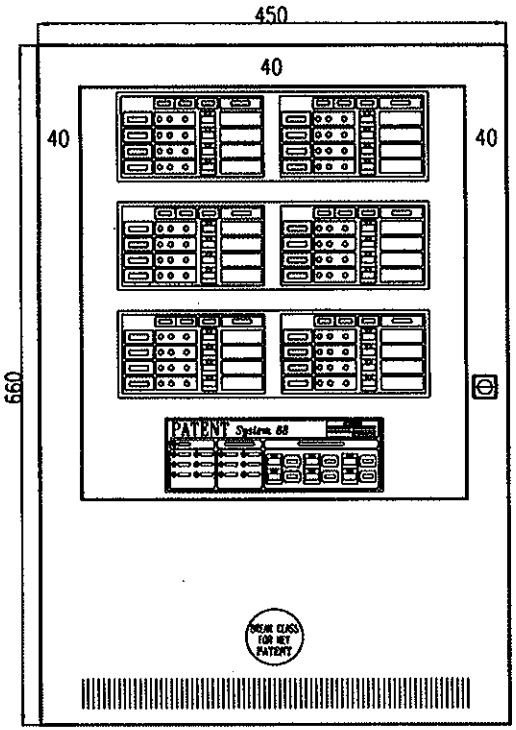


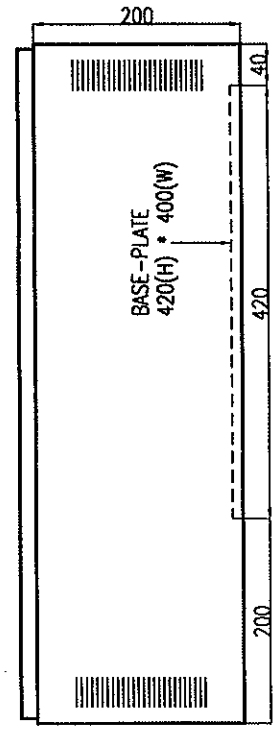
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

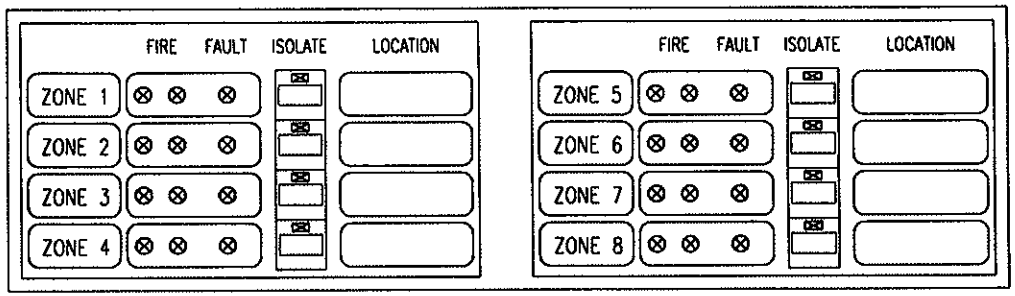
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-24M-BB
DRAWING TITLE TYPICAL PANEL LAYOUT OF 24 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

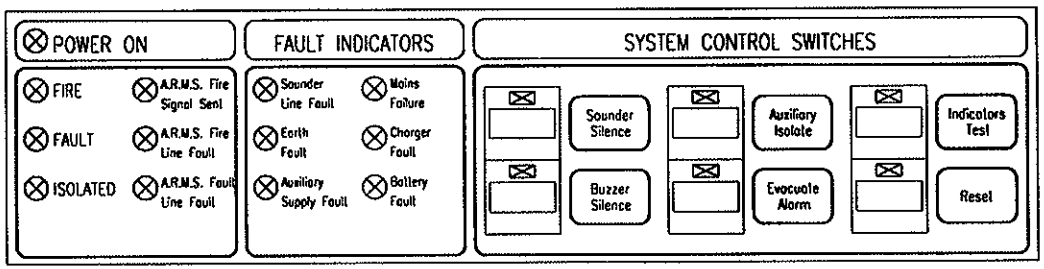


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

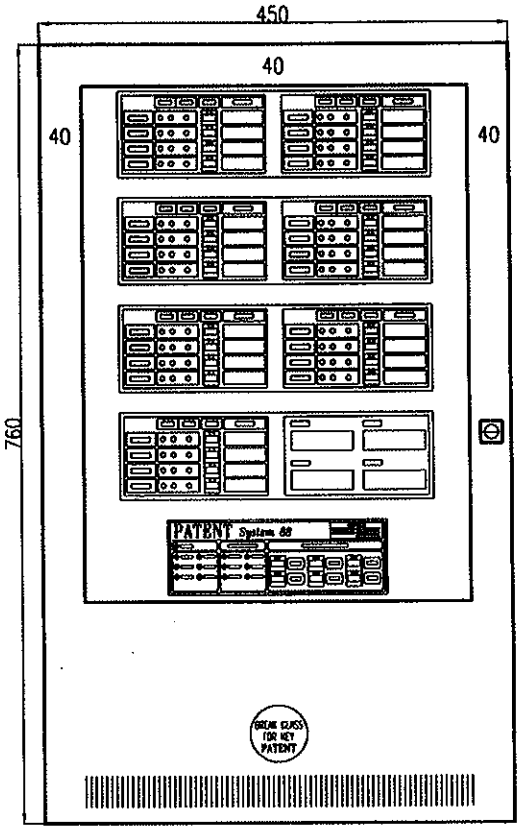


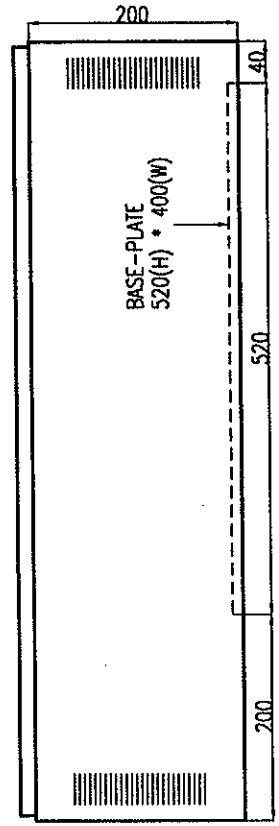
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

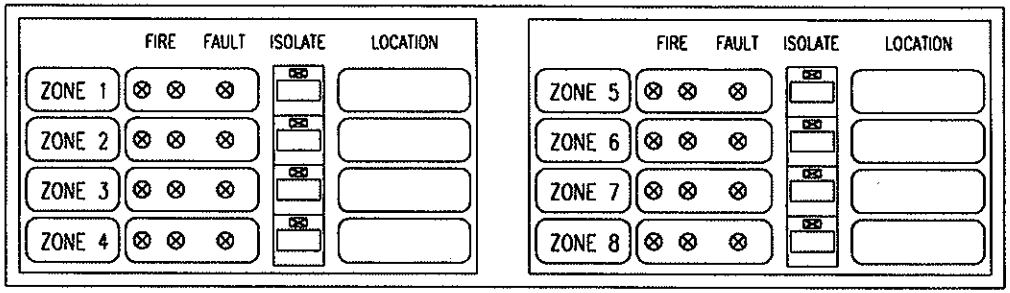
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY J C	DRAWING NO
	DESIGNED BY A M N	DATE 22 JAN 2002
	SCALE N.T.S	FILE P88-28M-88
DRAWING TITLE TYPICAL PANEL LAYOUT OF 28 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

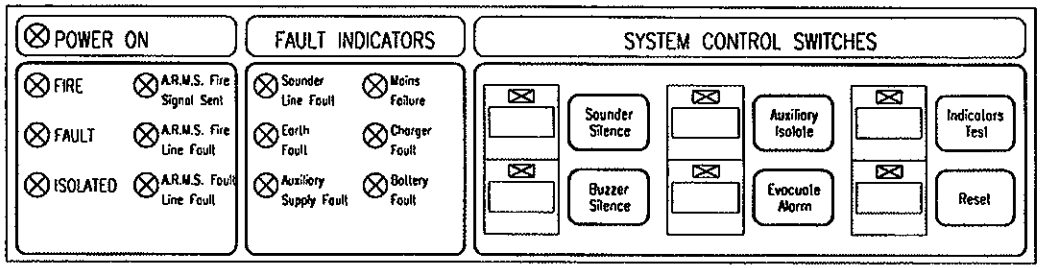


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

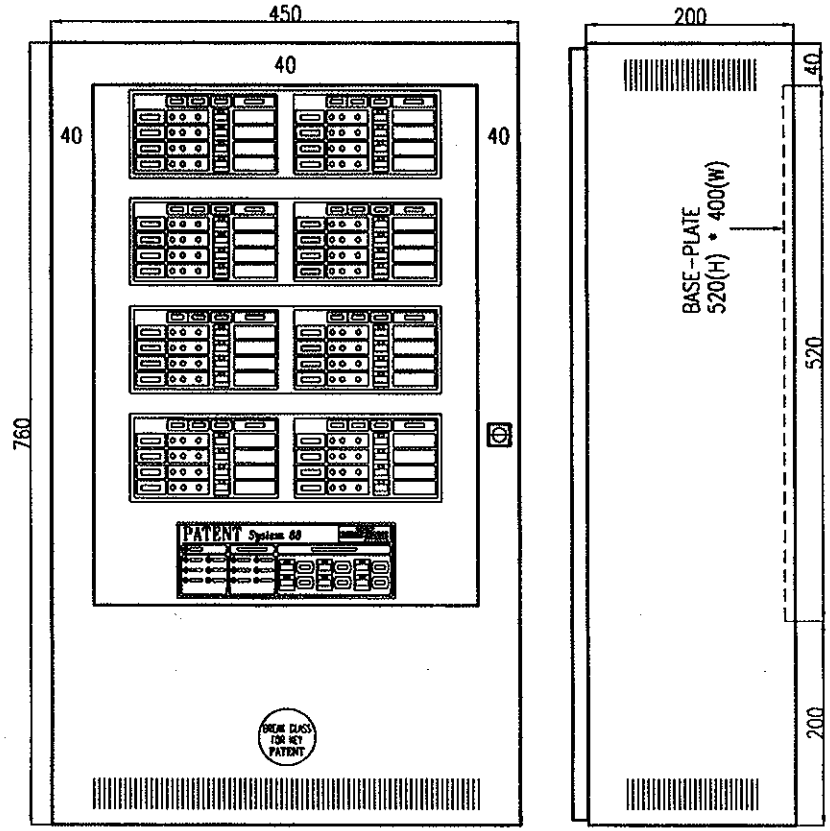


INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

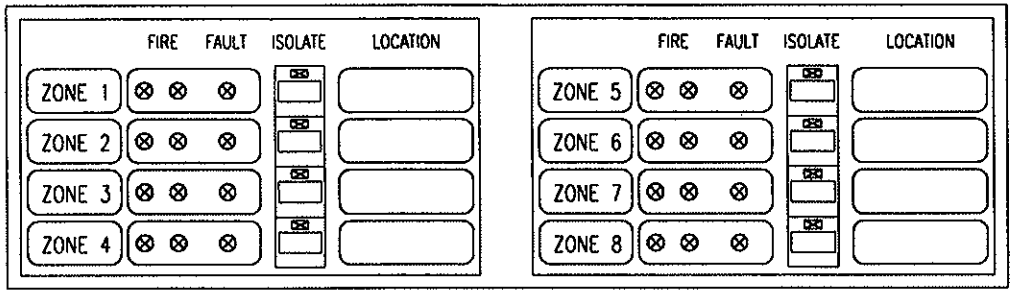
CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System



PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-32M-88
DRAWING TITLE TYPICAL PANEL LAYOUT OF 32 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

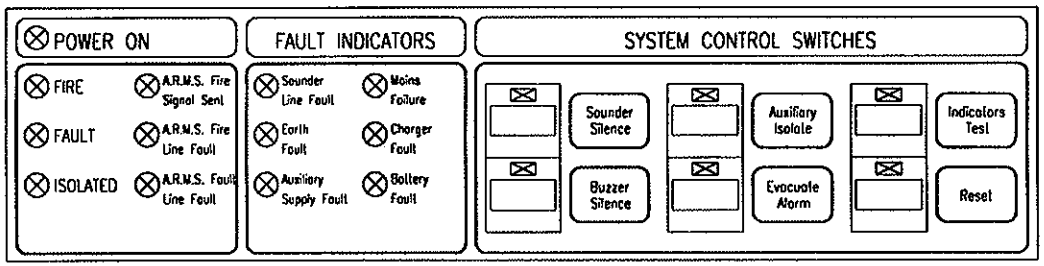


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

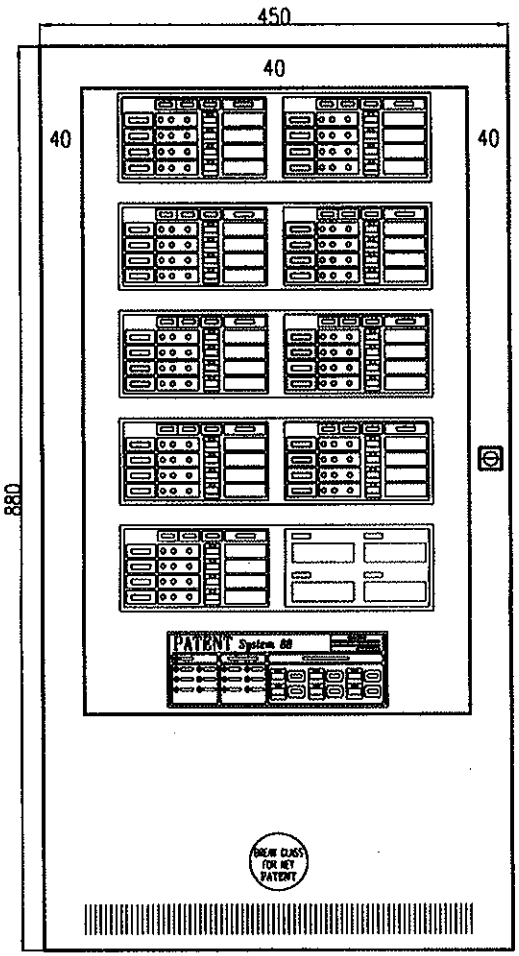


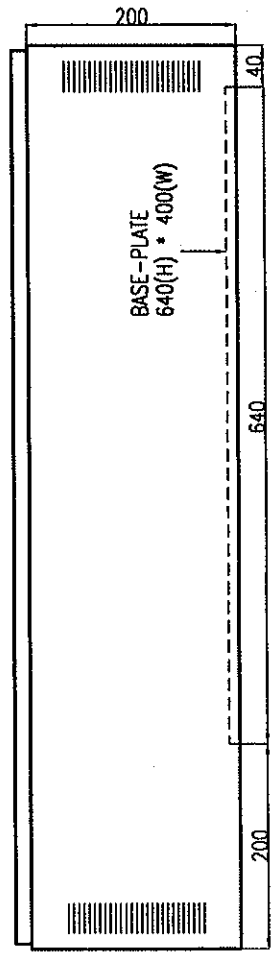
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

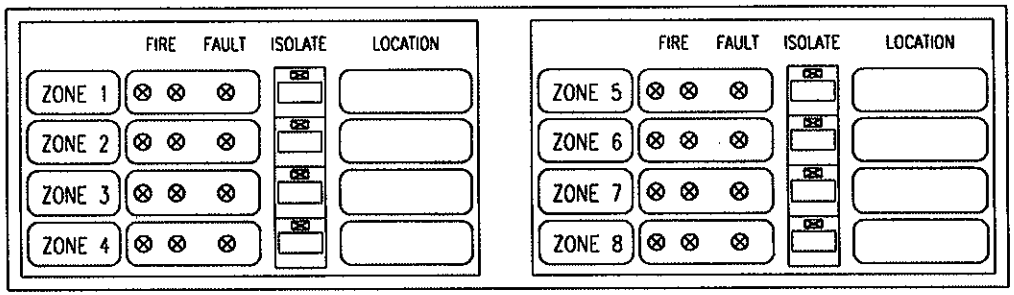
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY J C	DRAWING NO
	DESIGNED BY A M N	DATE 22 JAN 2002
	SCALE N.T.S	FILE P88-36M-88
DRAWING TITLE TYPICAL PANEL LAYOUT OF 36 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

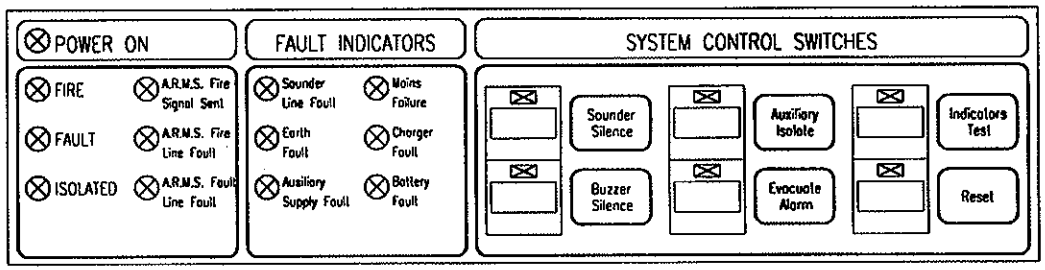


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

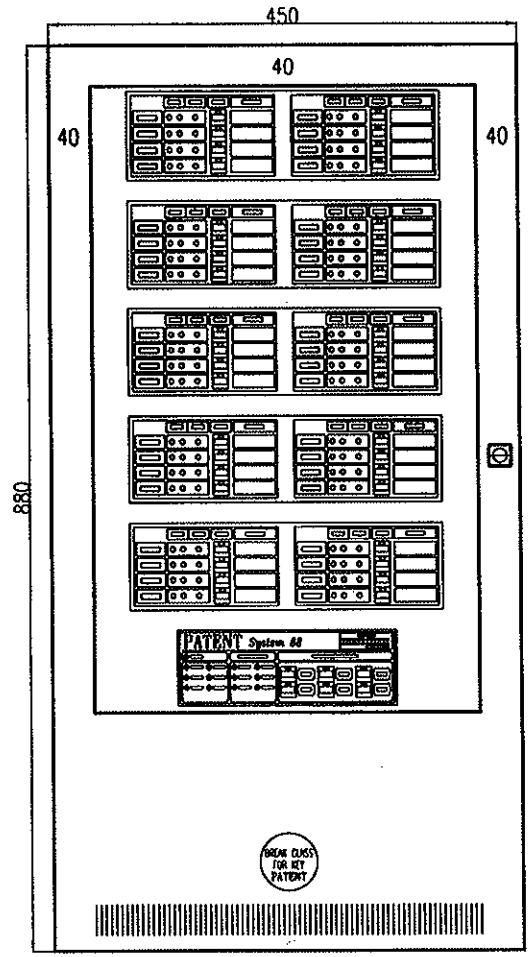


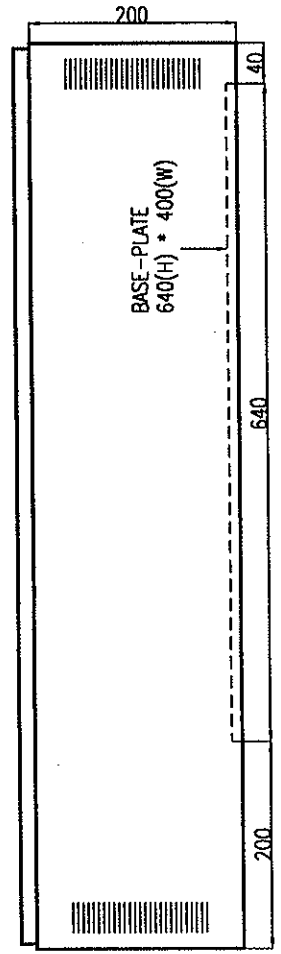
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-40M-BB
DRAWING TITLE TYPICAL PANEL LAYOUT OF 40 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

PATENT *System 88*

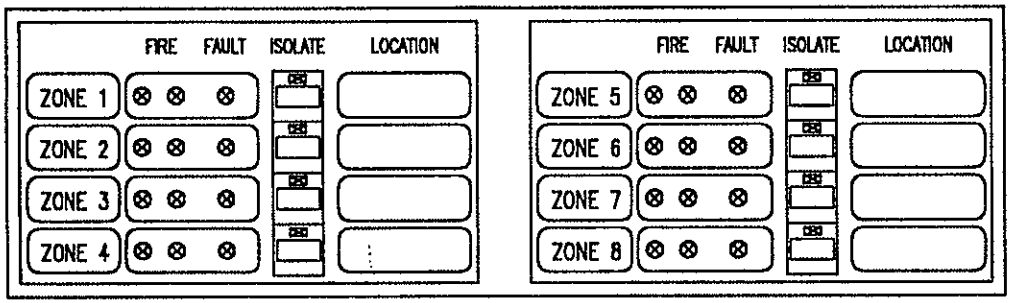
PANEL LAYOUT DIAGRAM OF Fire Alarm Panel

(For High-Amp Charger / Battery)

COMPLIES WITH

Singapore Standard	: SS CP10 : 1993
British Standard	: BS EN54-2 : 1998
	BS EN54-4 : 1998

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

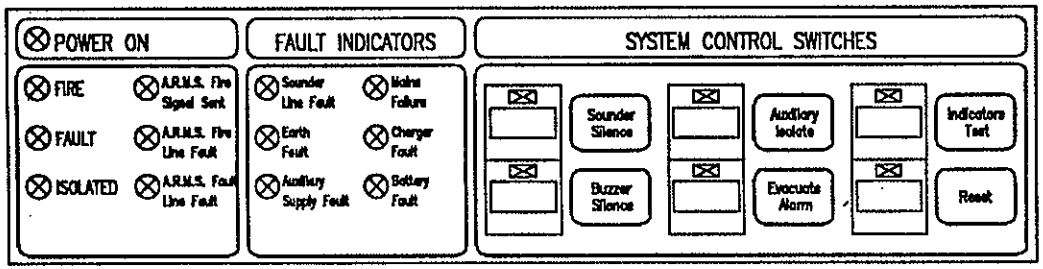


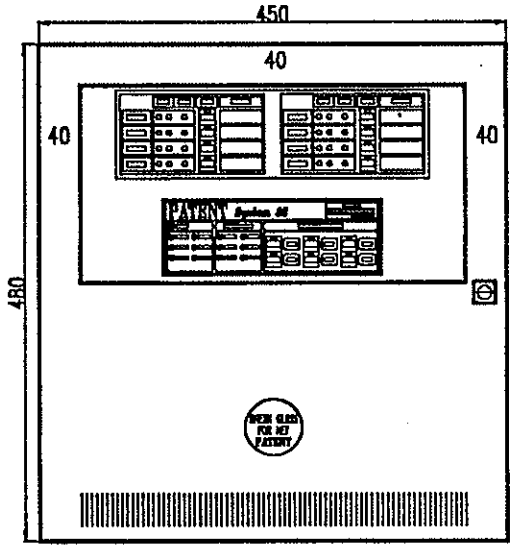
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

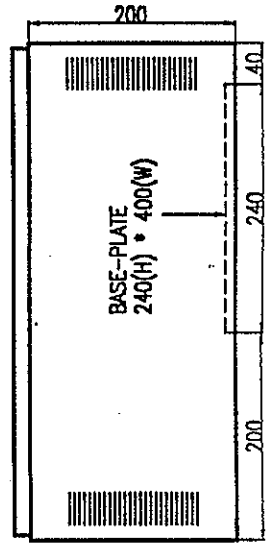
FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD







INDICATORS

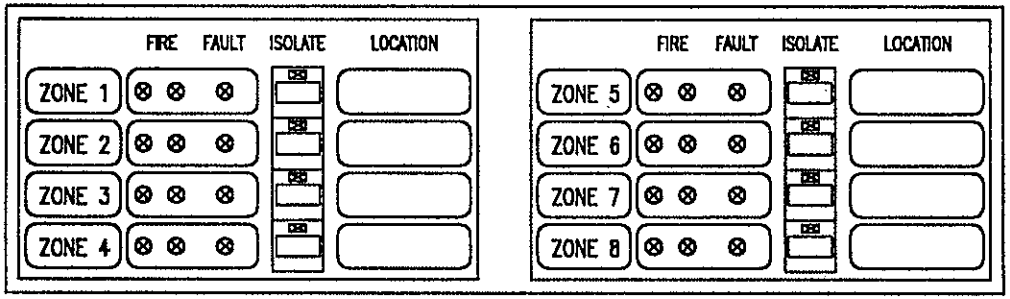
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-08M-88
DRAWING TITLE TYPICAL PANEL LAYOUT OF 8 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

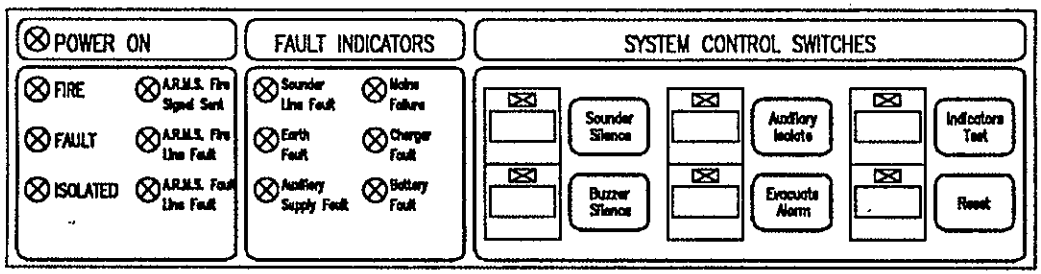


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

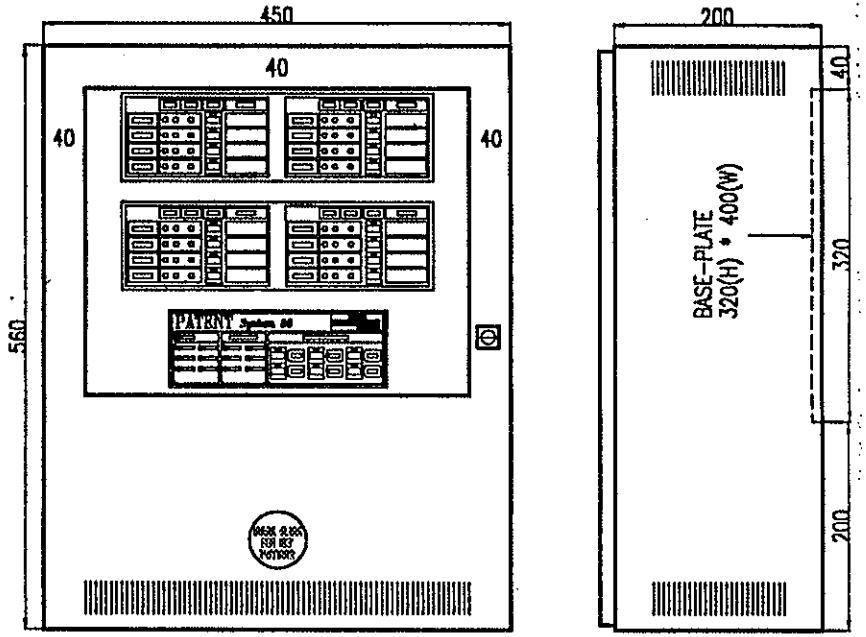


INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

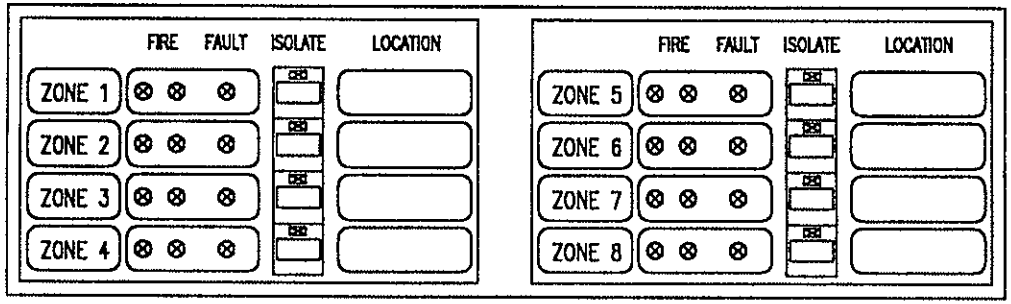
CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System



PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-16M-88
DRAWING TITLE TYPICAL PANEL LAYOUT OF 16 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

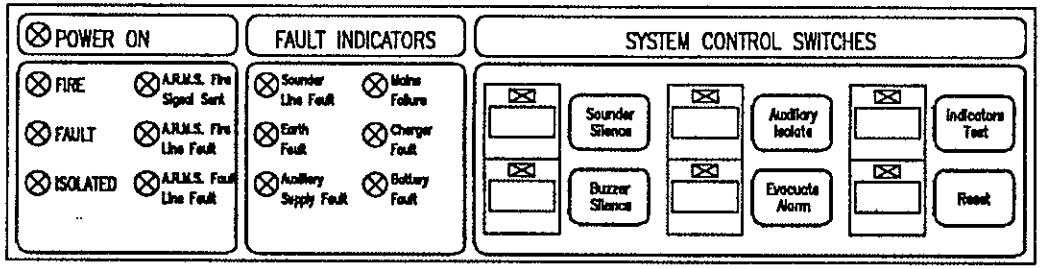


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

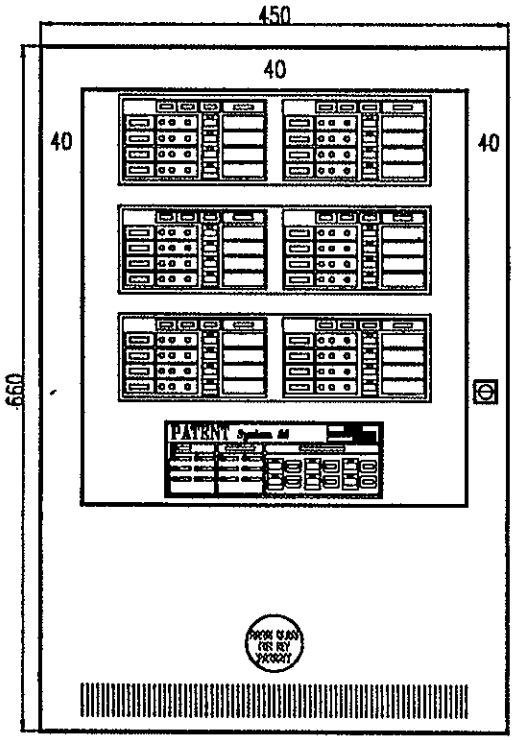


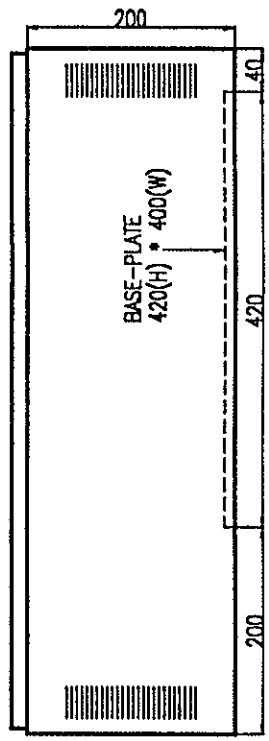
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

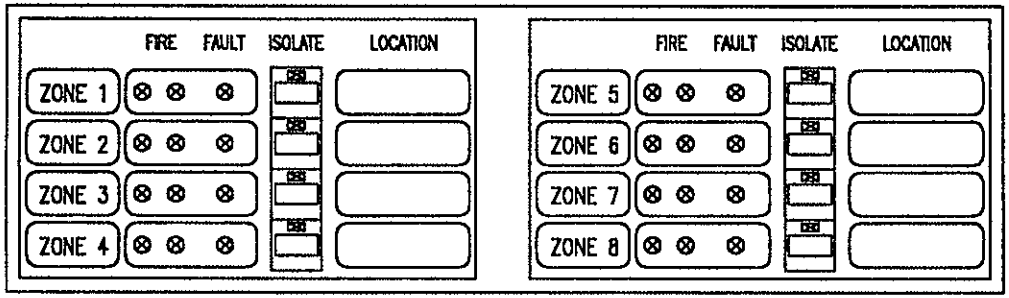
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-24M-88
DRAWING TITLE TYPICAL PANEL LAYOUT OF 24 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

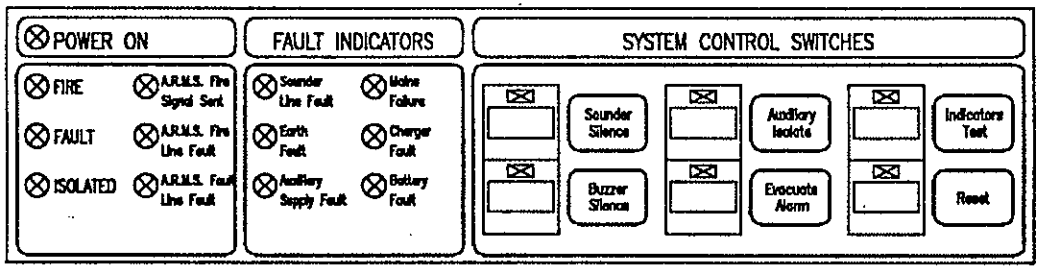


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

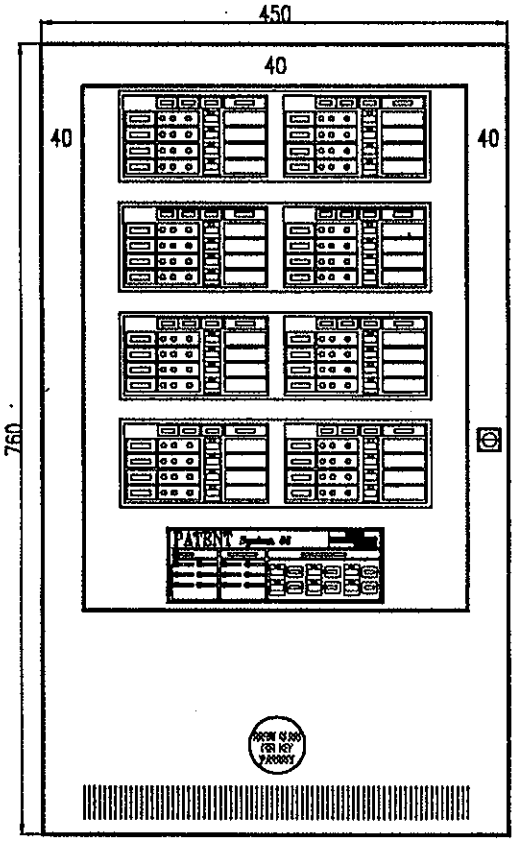


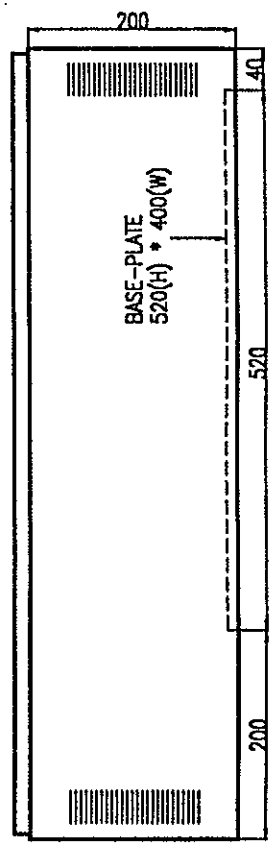
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

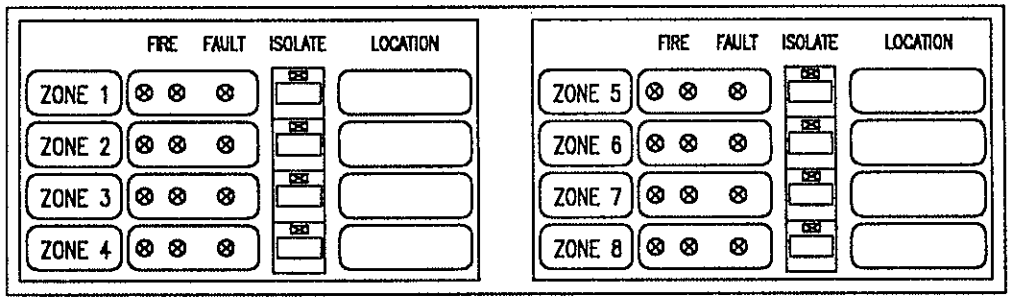
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-32M-88
DRAWING TITLE TYPICAL PANEL LAYOUT OF 32 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

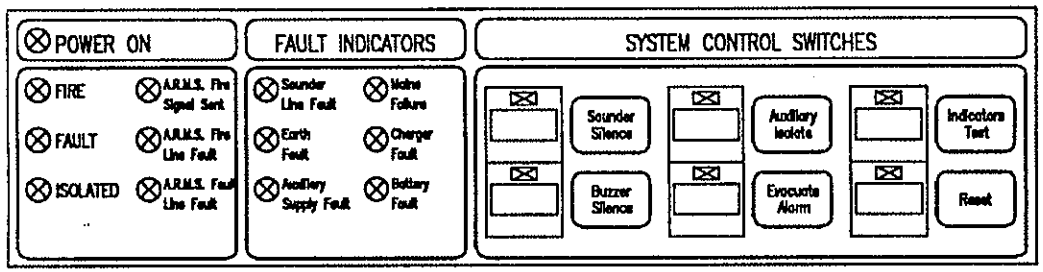


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

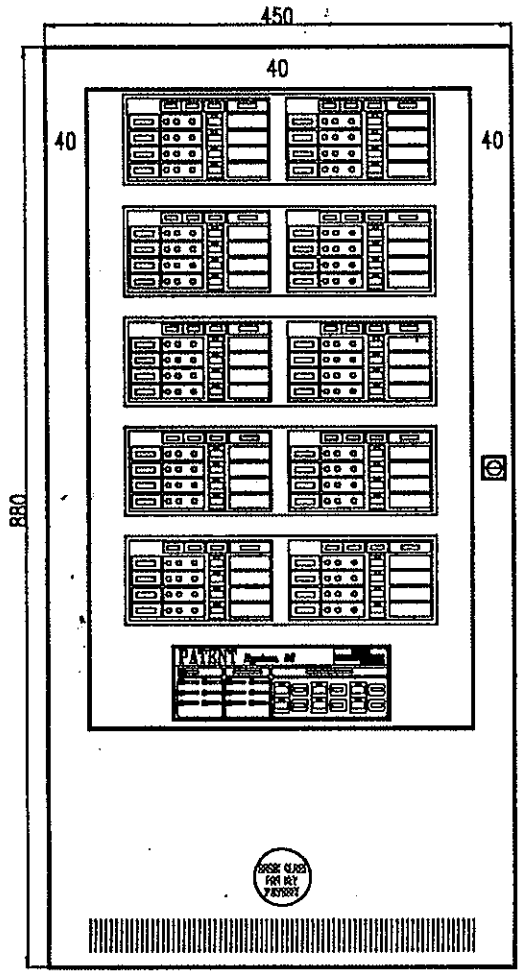


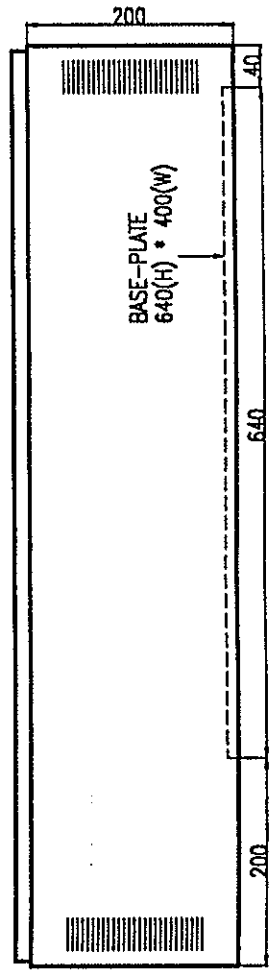
INDICATORS

FIRE (Red)	:	General FIRE Indicator: system in fire condition
FAULT (Amber)	:	General FAULT Indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO	
	DESIGNED BY A M N	DATE 2 JAN 2002	
	SCALE N.T.S	FILE P88-40M-88	
DRAWING TITLE TYPICAL PANEL LAYOUT OF 40 ZONES FIRE ALARM PANEL (MAIN)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278		

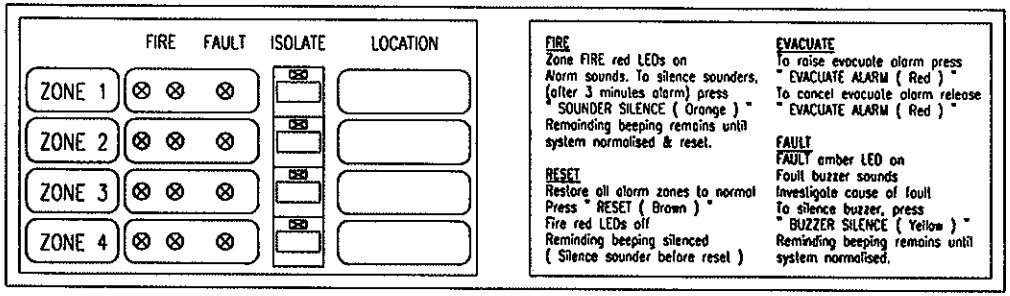
PATENT *System 88*

PANEL LAYOUT DIAGRAM OF Fire Alarm Panel (w/o A.R.M.S)

COMPLIES WITH

Singapore Standard	: SS CP10 : 1993
British Standard	: BS EN54-2 : 1998
	BS EN54-4 : 1998

'PATENT SYSTEM 88' ZONE INDICATOR BOARD



FIRE
Zone FIRE red LEDs on
Alarm sounds. To silence sounders, (after 3 minutes alarm) press " SOUNDER SILENCE (Orange) "
Remainding beeping remains until system normalised & reset.

RESET
Restore all alarm zones to normal
Press " RESET (Brown) "
Fire red LEDs off
Reminding beeping silenced
(Silence sounder before reset)

EVACUATE
To raise evacuate alarm press " EVACUATE ALARM (Red) "
To cancel evacuate alarm release " EVACUATE ALARM (Red) "

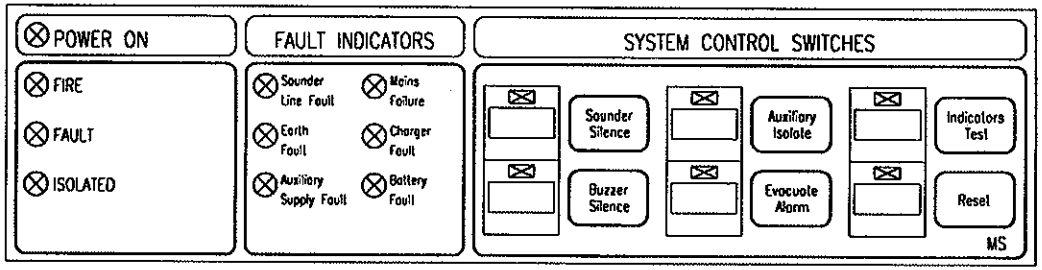
FAULT
FAULT amber LED on
Fault buzzer sounds
Investigate cause of fault
To silence buzzer, press " BUZZER SILENCE (Yellow) "
Reminding beeping remains until system normalised.

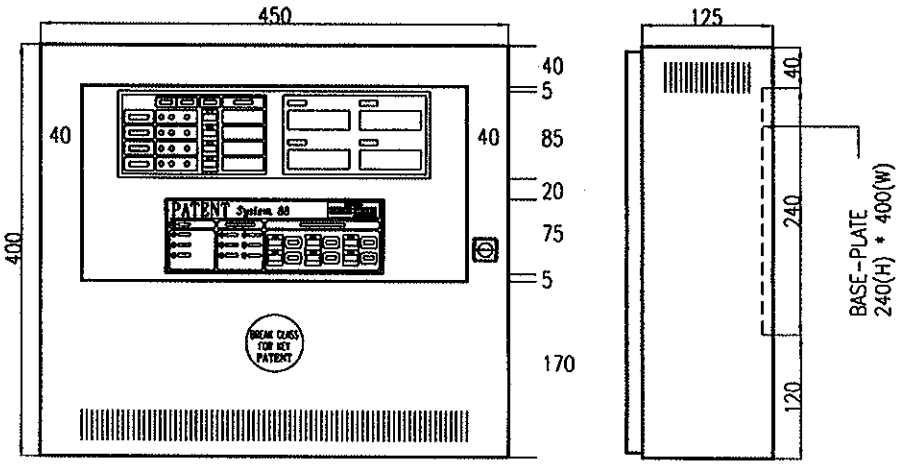
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD





INDICATORS

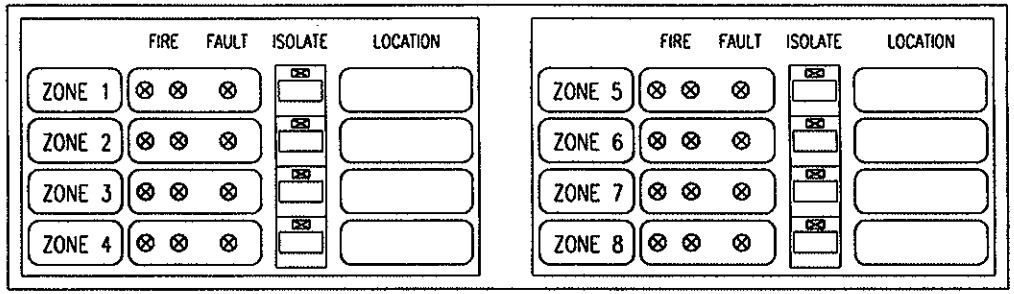
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-04-MS
DRAWING TITLE TYPICAL PANEL LAYOUT OF 4 ZONES FIRE ALARM PANEL (SUB C/W CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

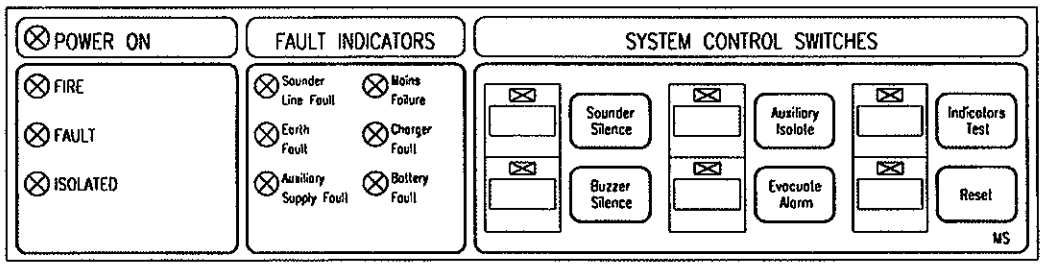


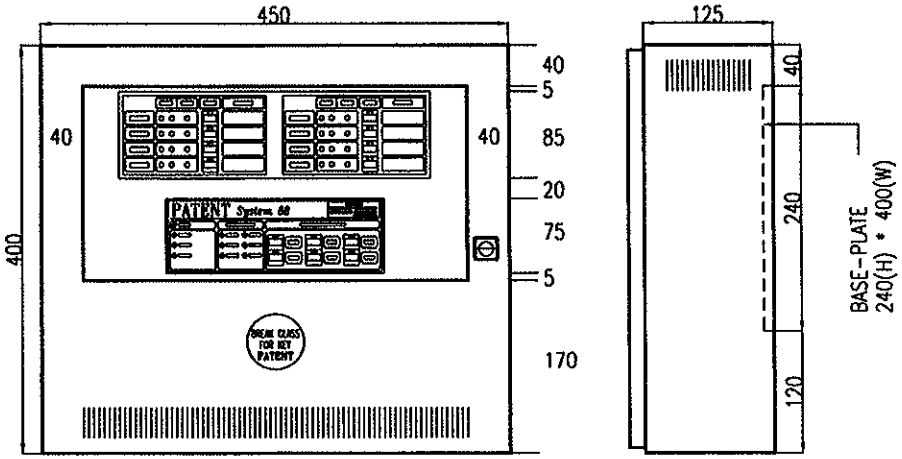
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD





INDICATORS

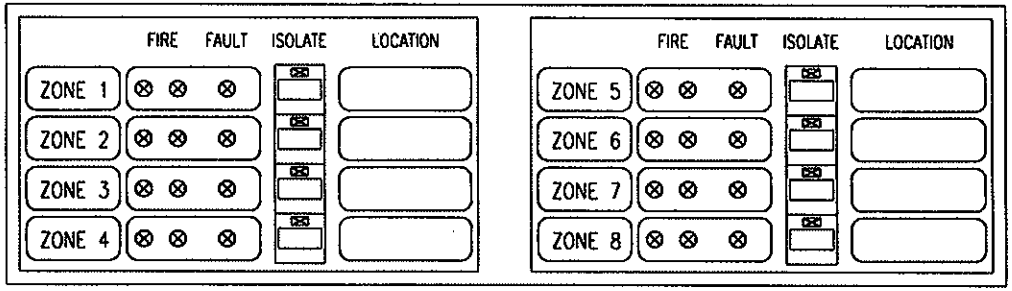
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-08-MS
DRAWING TITLE TYPICAL PANEL LAYOUT OF 8 ZONES FIRE ALARM PANEL (SUB C/W CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

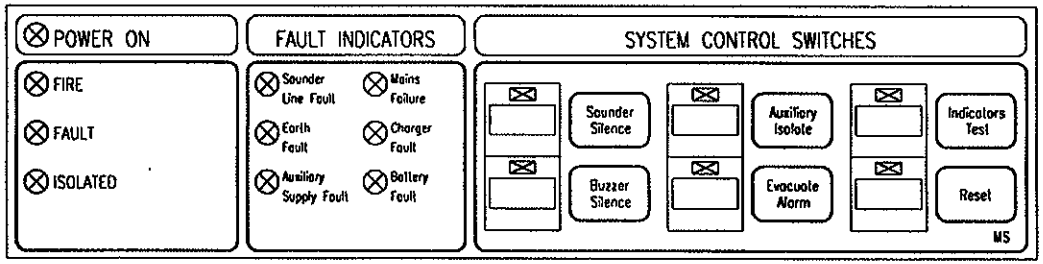


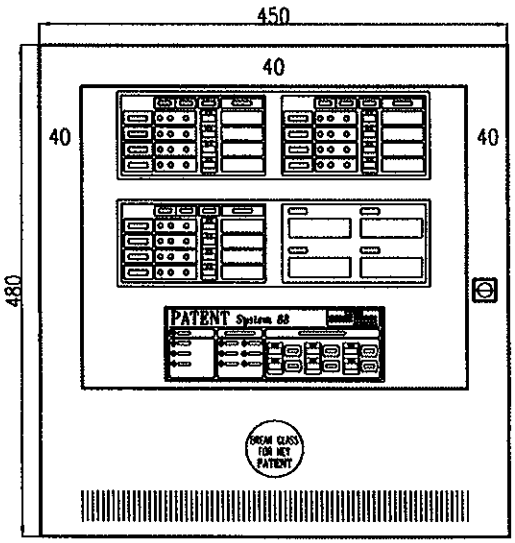
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

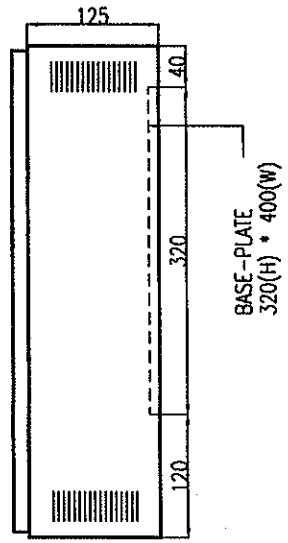
FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD







INDICATORS

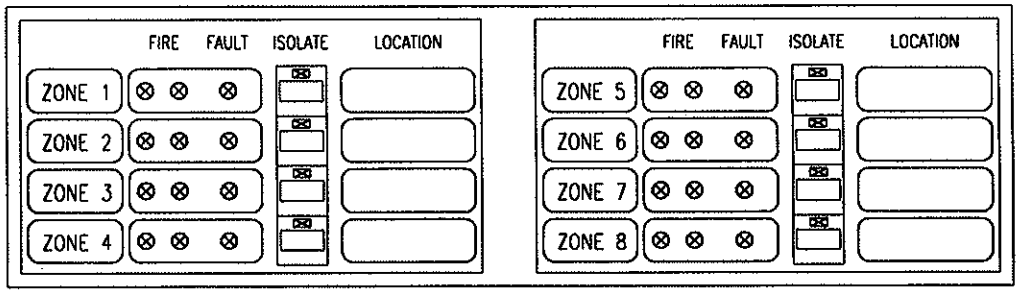
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-12-MS
DRAWING TITLE TYPICAL PANEL LAYOUT OF 12 ZONES FIRE ALARM PANEL (SUB C/W CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

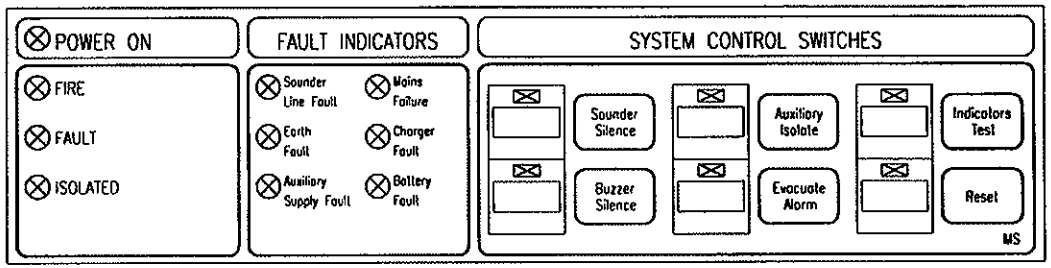


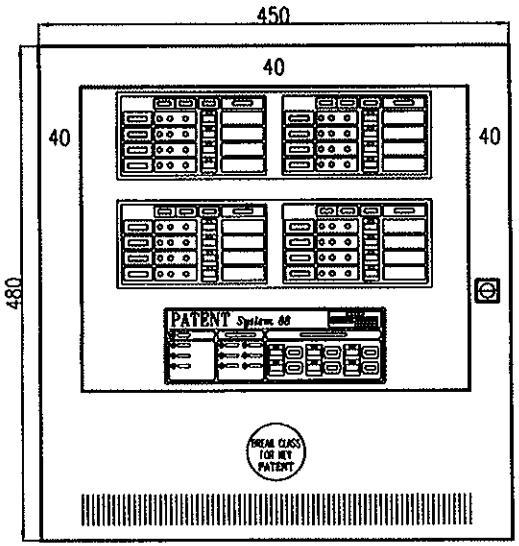
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

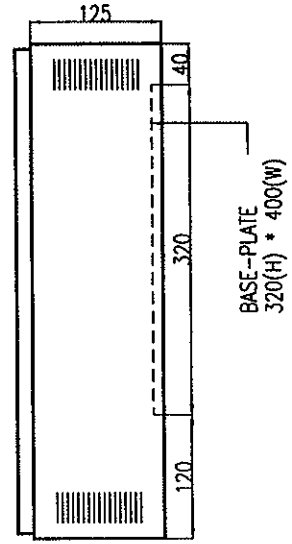
FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD







INDICATORS

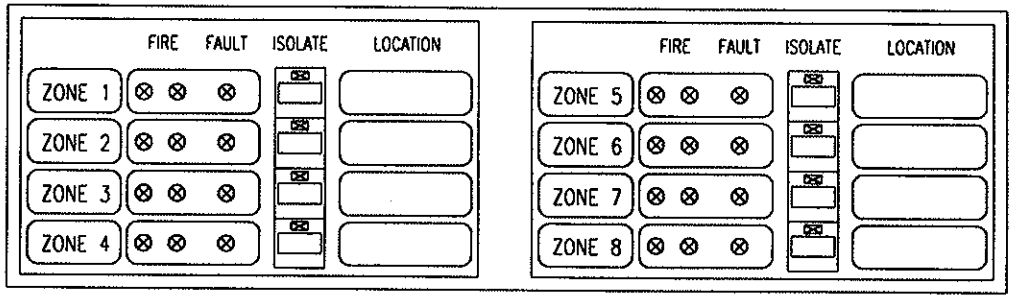
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-16-MS
DRAWING TITLE TYPICAL PANEL LAYOUT OF 16 ZONES FIRE ALARM PANEL (SUB C/W CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

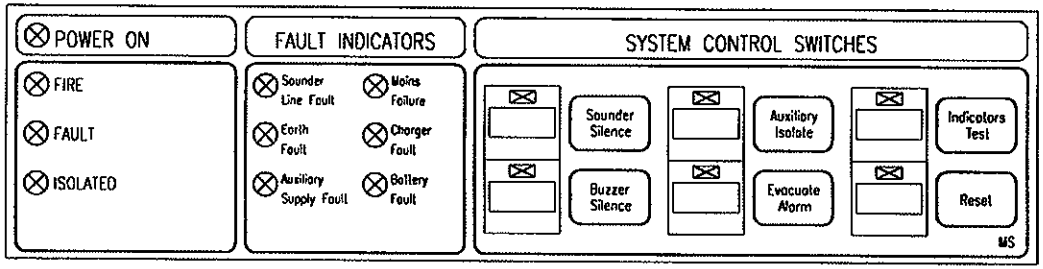


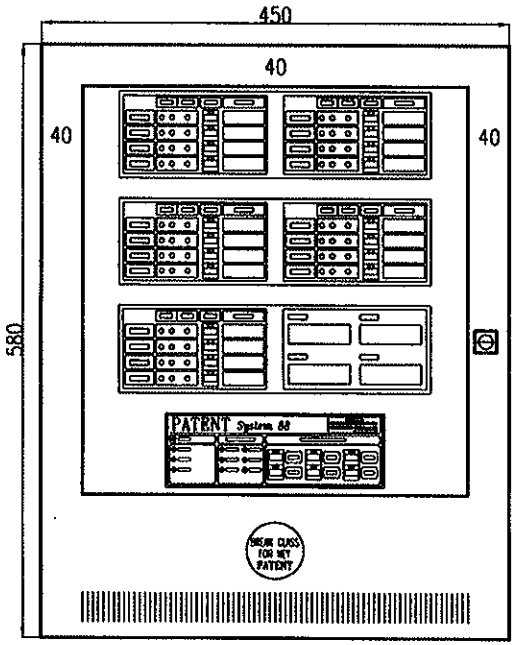
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

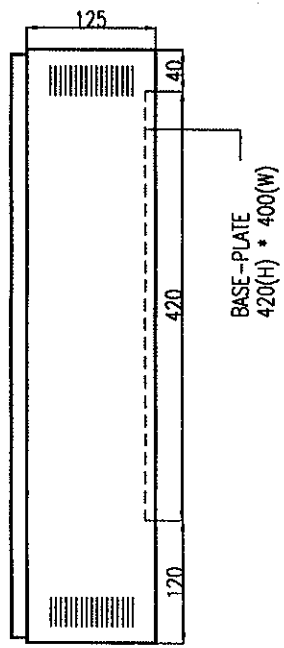
FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD







INDICATORS

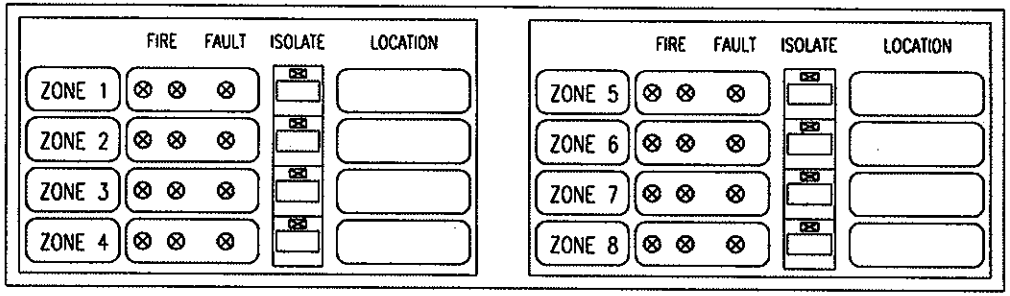
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-20-MS
DRAWING TITLE TYPICAL PANEL LAYOUT OF 20 ZONES FIRE ALARM PANEL (SUB C/W CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

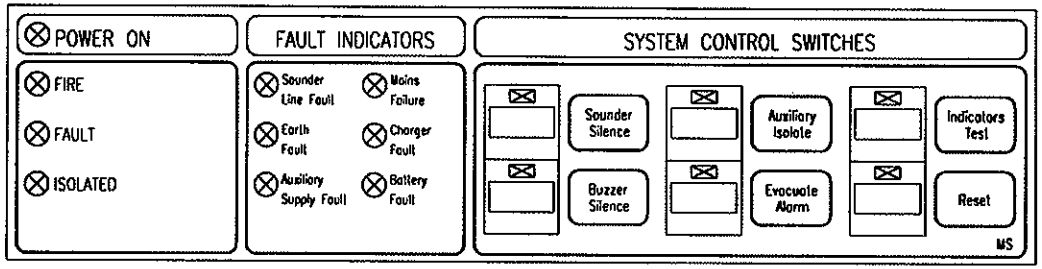


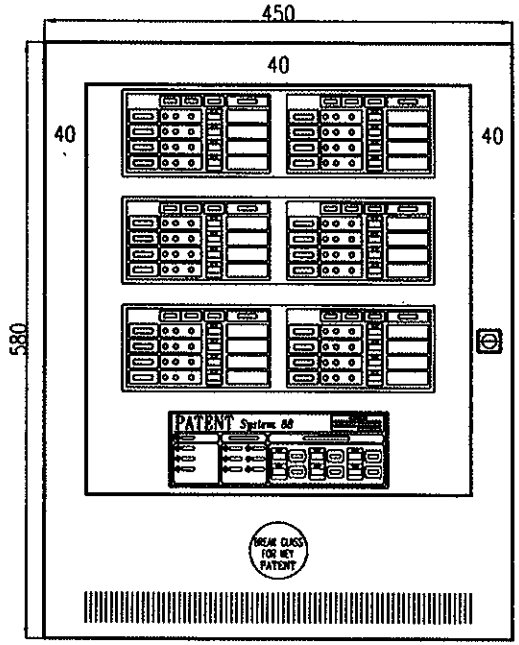
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

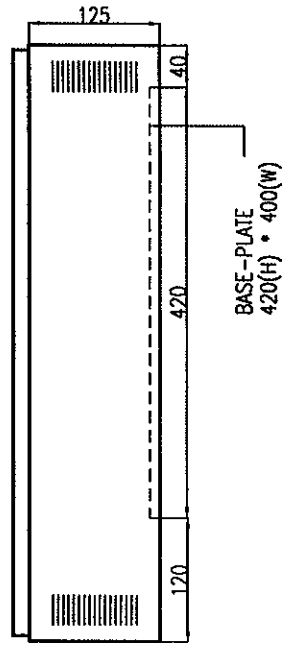
FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD







INDICATORS

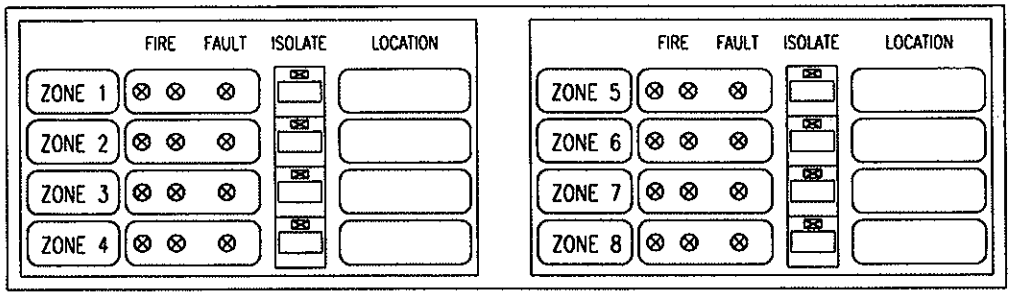
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-24-MS
DRAWING TITLE TYPICAL PANEL LAYOUT OF 24 ZONES FIRE ALARM PANEL (SUB C/W CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

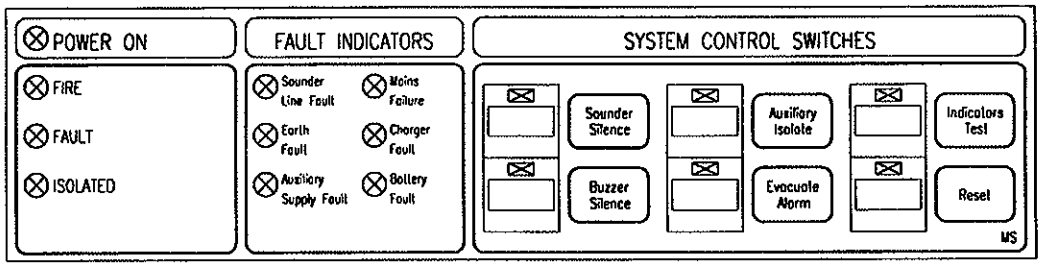


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

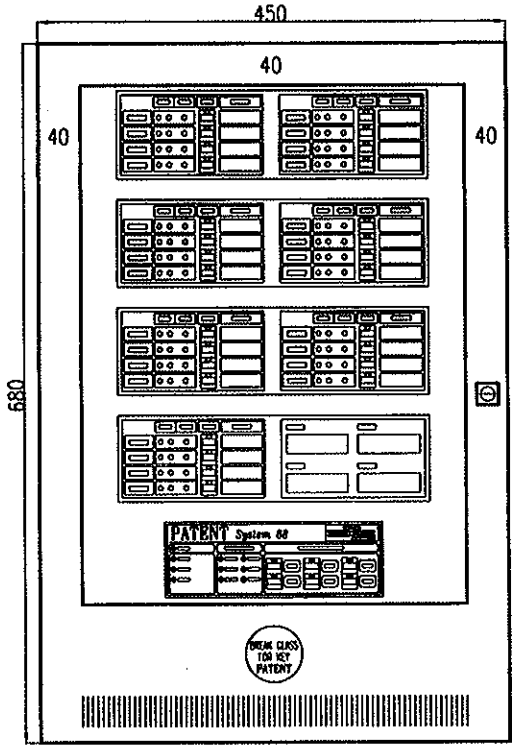


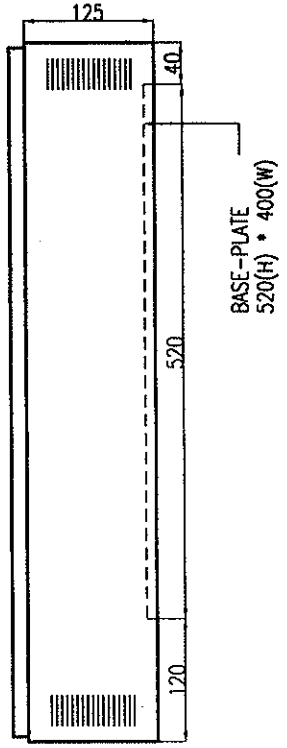
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

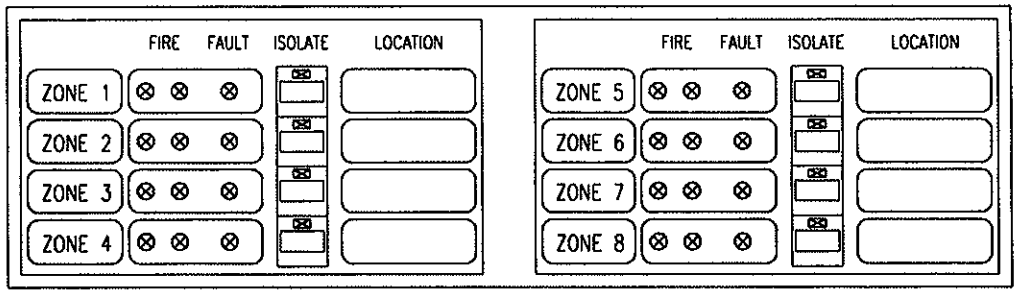
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-28-MS
DRAWING TITLE TYPICAL PANEL LAYOUT OF 28 ZONES FIRE ALARM PANEL (SUB C/W CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

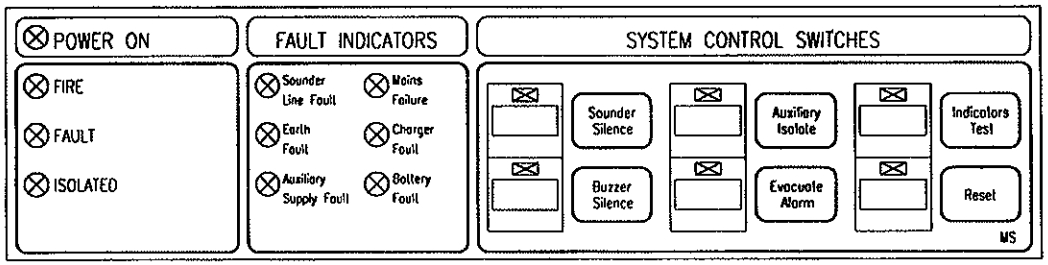


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

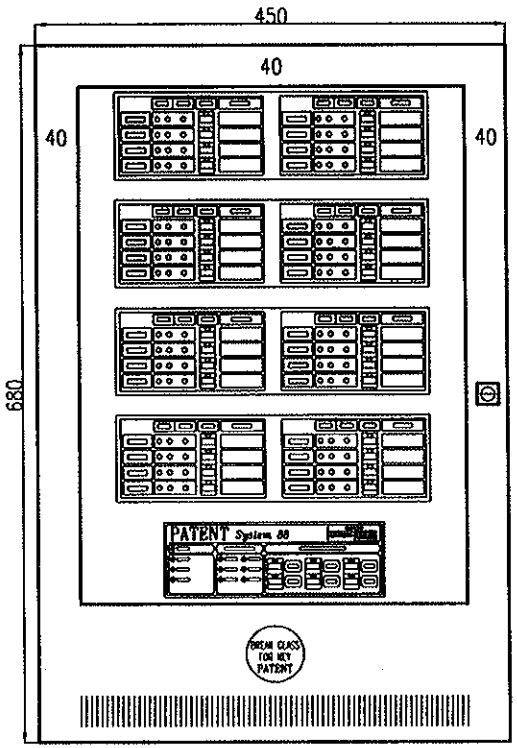


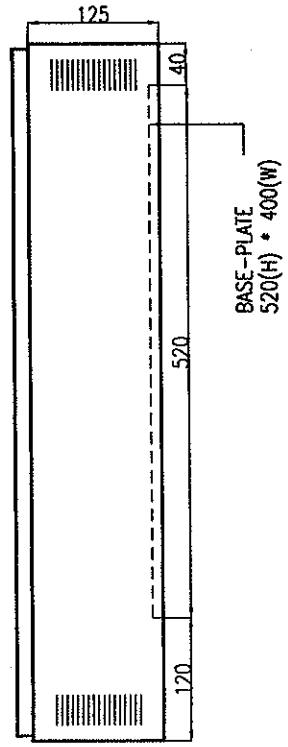
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

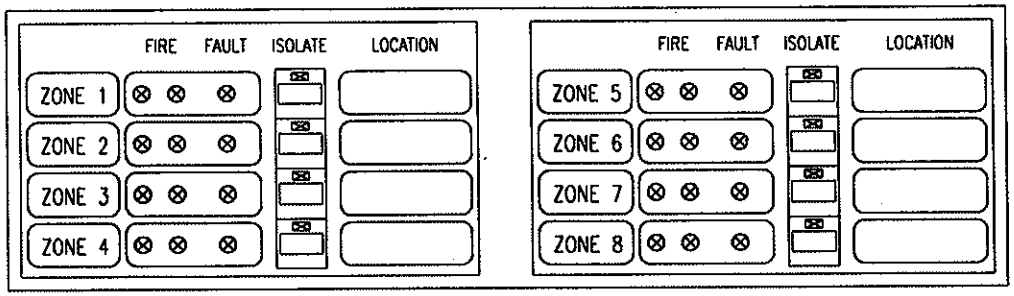
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-32-MS
DRAWING TITLE TYPICAL PANEL LAYOUT OF 32 ZONES FIRE ALARM PANEL (SUB C/W CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

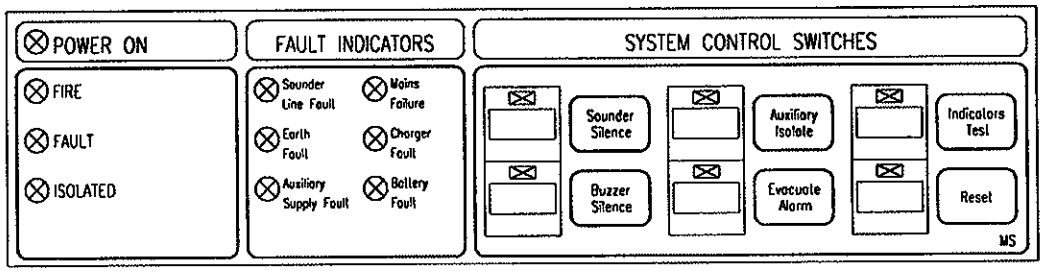


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

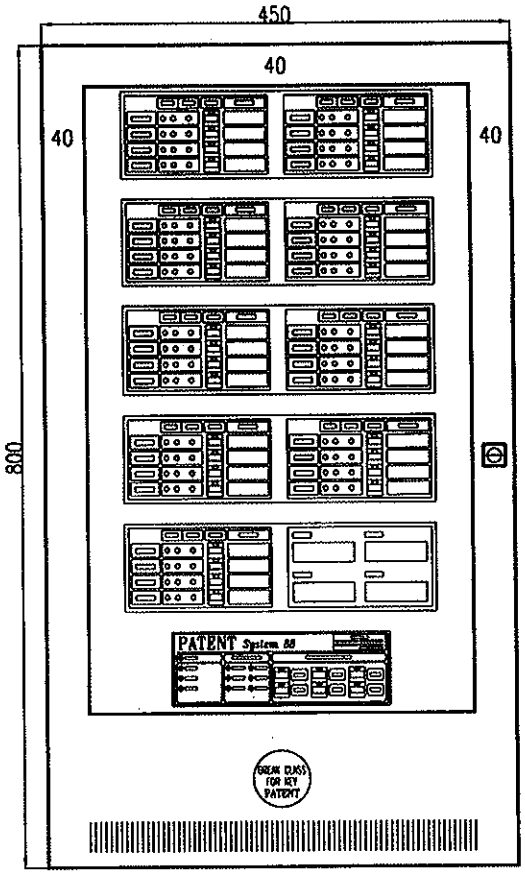


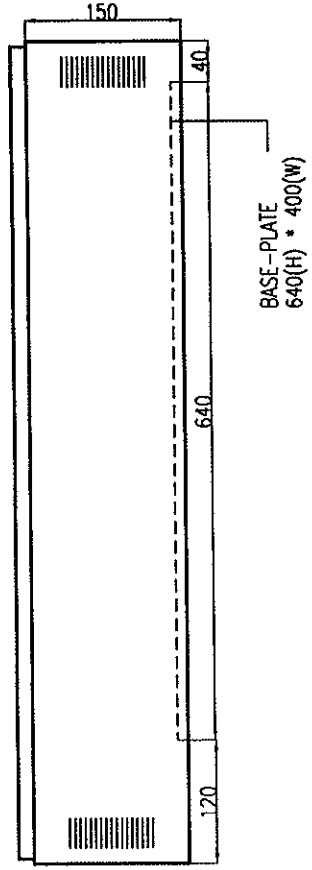
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

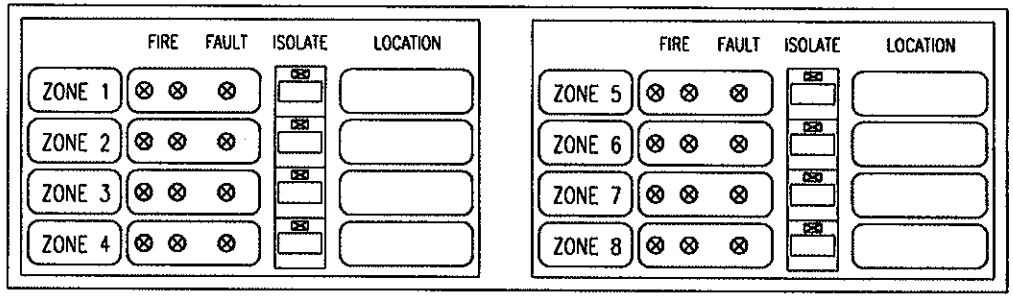
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N DESIGNED BY A M N SCALE N.T.S	DRAWING NO DATE 3 JAN 2002 FILE P88-36-MS
DRAWING TITLE TYPICAL PANEL LAYOUT OF 36 ZONES FIRE ALARM PANEL (SUB C/W CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

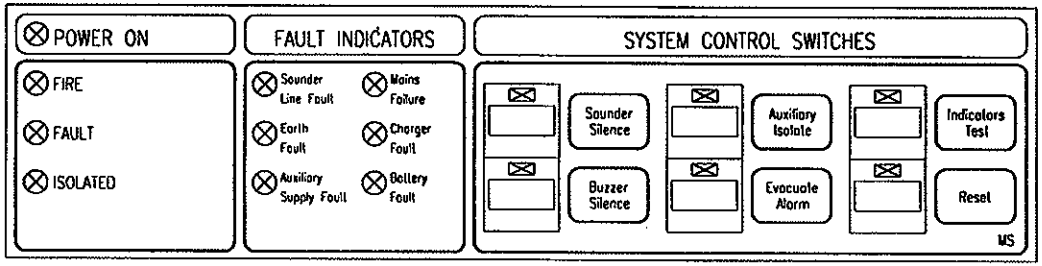


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

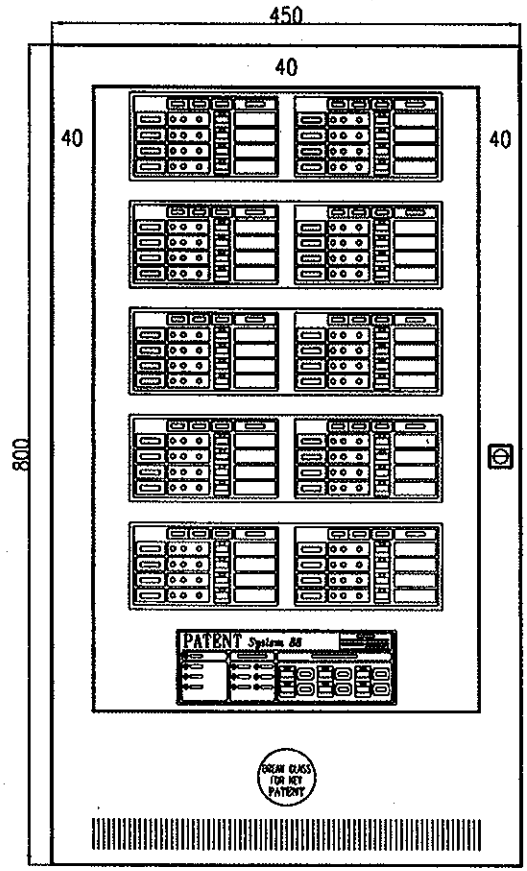


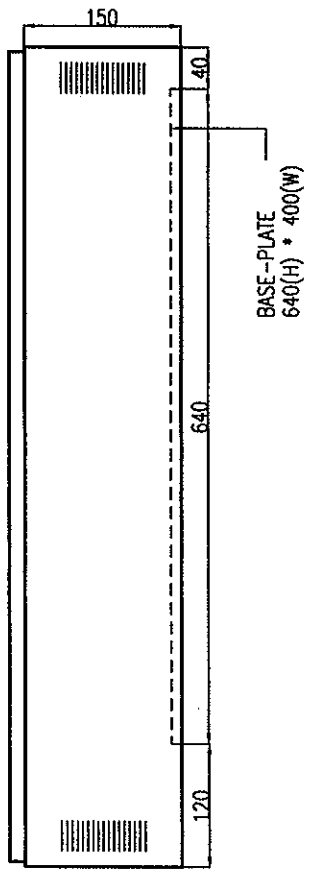
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-40-MS
DRAWING TITLE TYPICAL PANEL LAYOUT OF 40 ZONES FIRE ALARM PANEL (SUB C/W CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

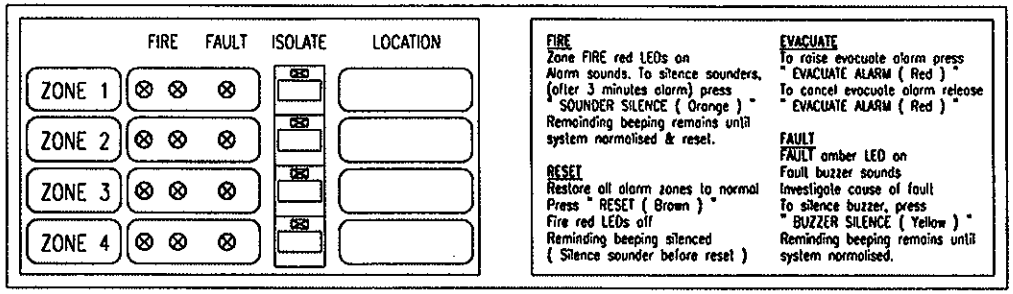
PATENT *System 88*

PANEL LAYOUT DIAGRAM OF Fire Alarm Panel (w/o Charger & A.R.M.S)

COMPLIES WITH

Singapore Standard	: SS CP10 : 1993
British Standard	: BS EN54-2 : 1998
	BS EN54-4 : 1998

'PATENT SYSTEM 88' ZONE INDICATOR BOARD



FIRE
Zone FIRE red LEDs on
Alarm sounds. To silence sounders, (after 3 minutes alarm) press " SOUNDER SILENCE (Orange) "
Remeinding beeping remains until system normalised & reset.

RESET
Restore all alarm zones to normal
Press " RESET (Brown) "
Fire red LEDs off
Reminding beeping silenced
(Silence sounder before reset)

EVACUATE
To raise evacuate alarm press " EVACUATE ALARM (Red) "
To cancel evacuate alarm release " EVACUATE ALARM (Red) "

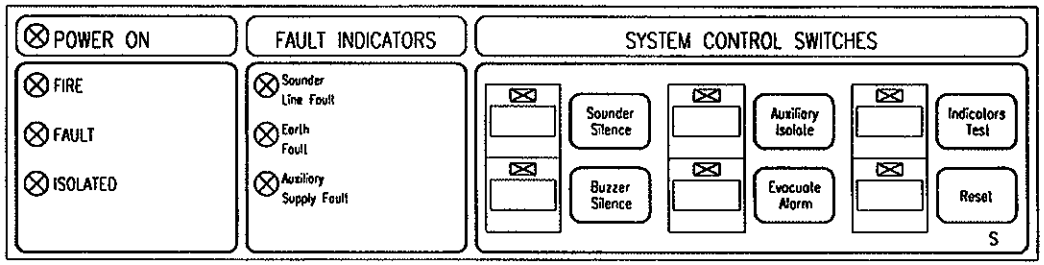
FAULT
FAULT amber LED on
Fault buzzer sounds
Investigate cause of fault
To silence buzzer, press " BUZZER SILENCE (Yellow) "
Reminding beeping remains until system normalised.

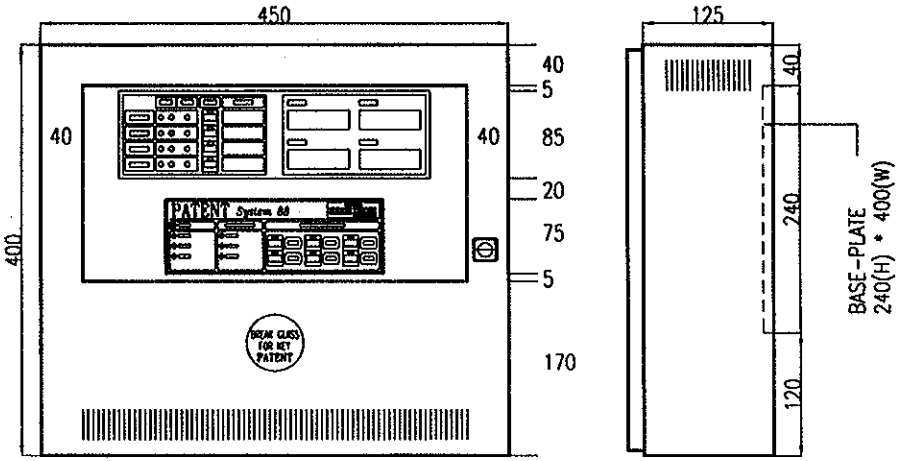
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD





INDICATORS

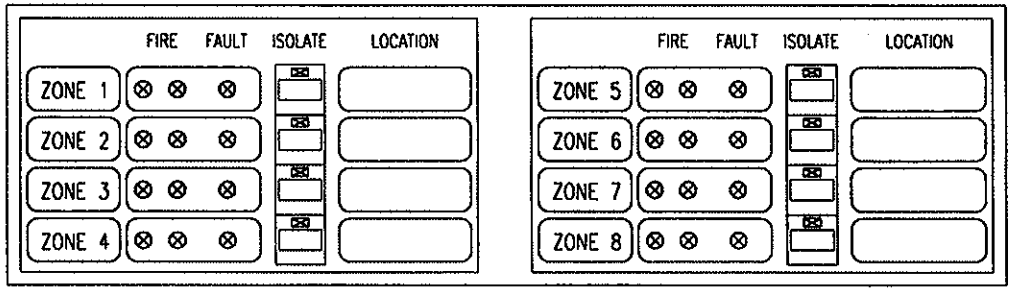
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-04-SUB
DRAWING TITLE TYPICAL PANEL LAYOUT OF 4 ZONES FIRE ALARM PANEL (SUB W/O CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

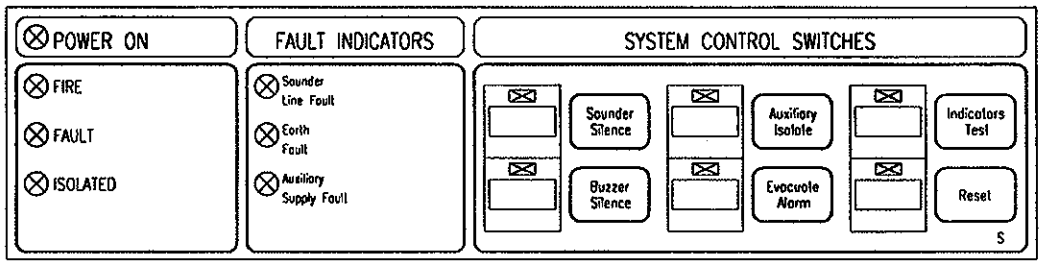


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

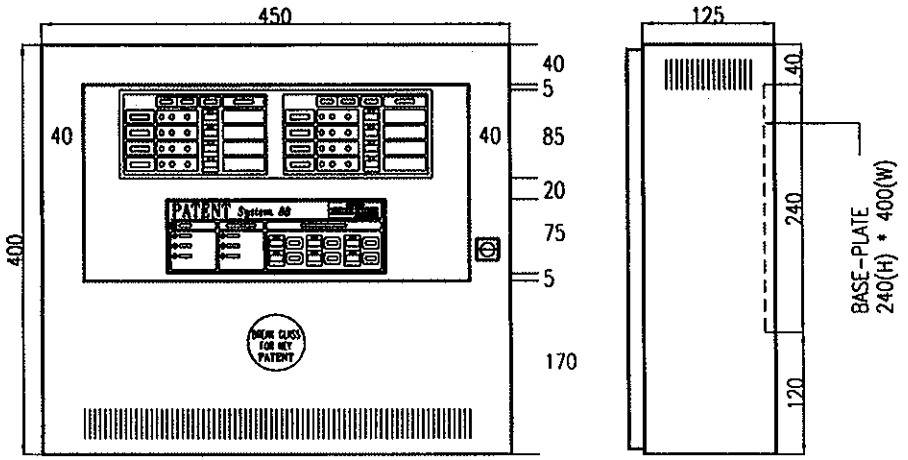


INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown

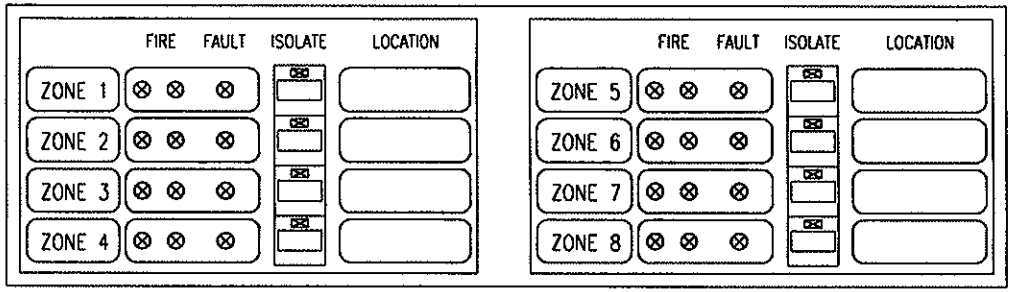
CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System



PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-08-SUB
DRAWING TITLE TYPICAL PANEL LAYOUT OF 8 ZONES FIRE ALARM PANEL (SUB W/O CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

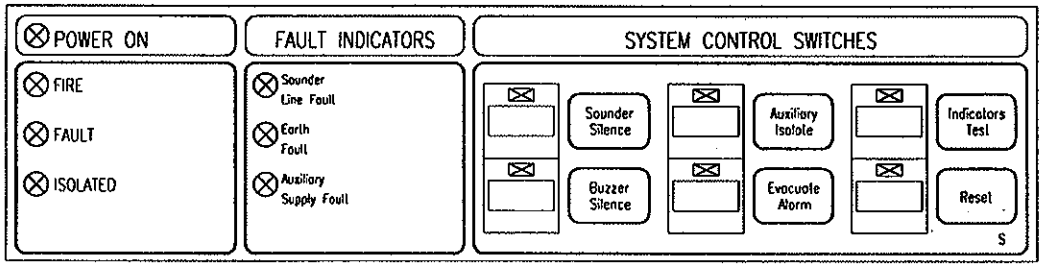


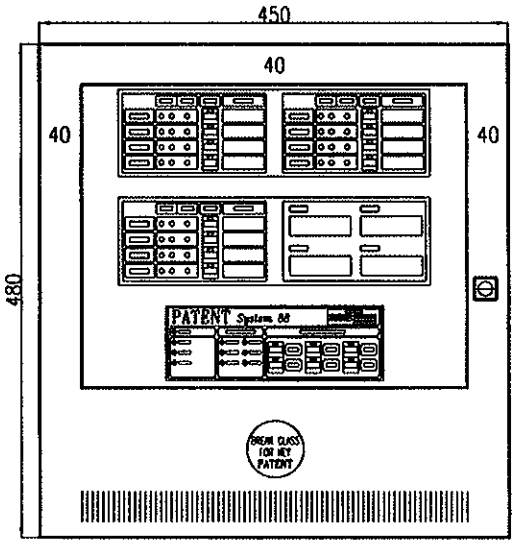
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

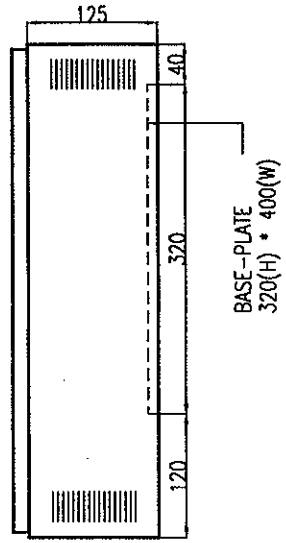
FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD







INDICATORS

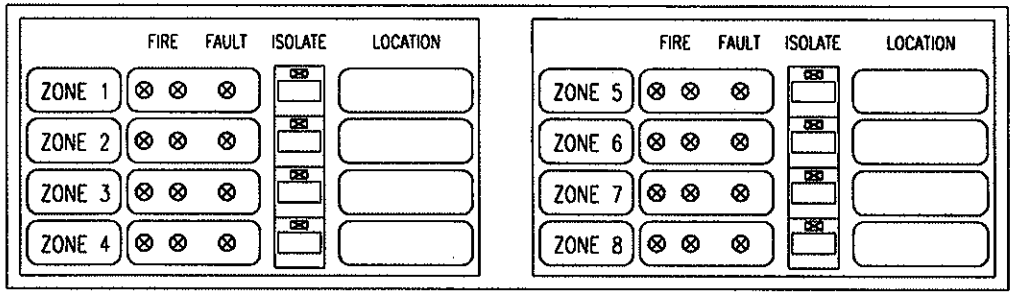
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-12-SUB
DRAWING TITLE TYPICAL PANEL LAYOUT OF 12 ZONES FIRE ALARM PANEL (SUB W/O CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

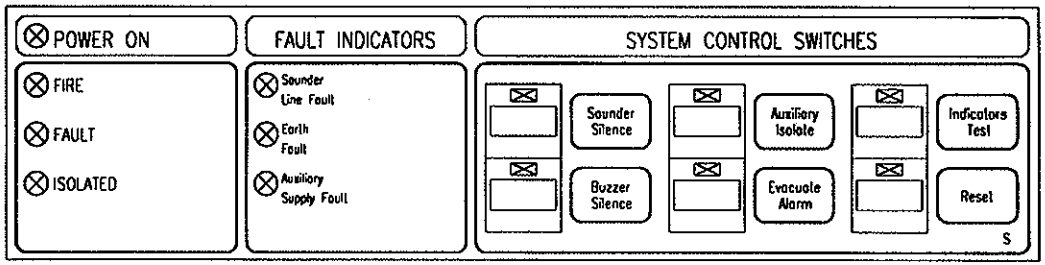


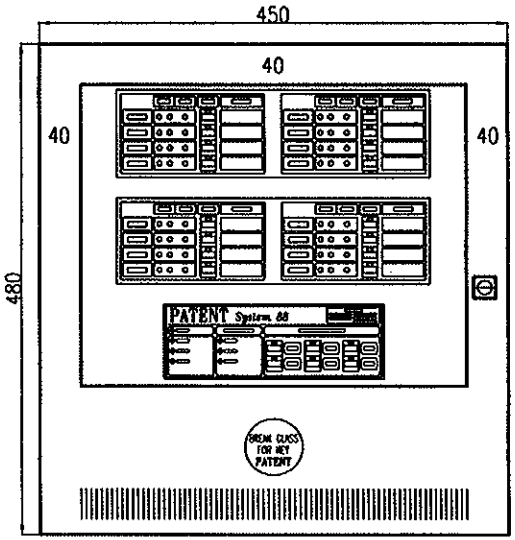
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

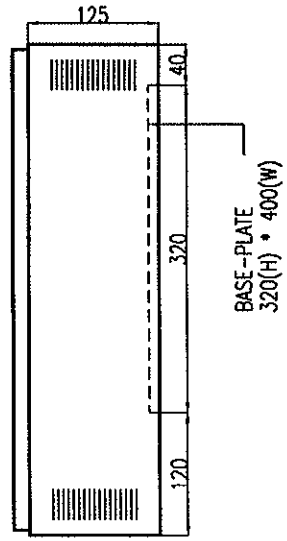
FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD







INDICATORS

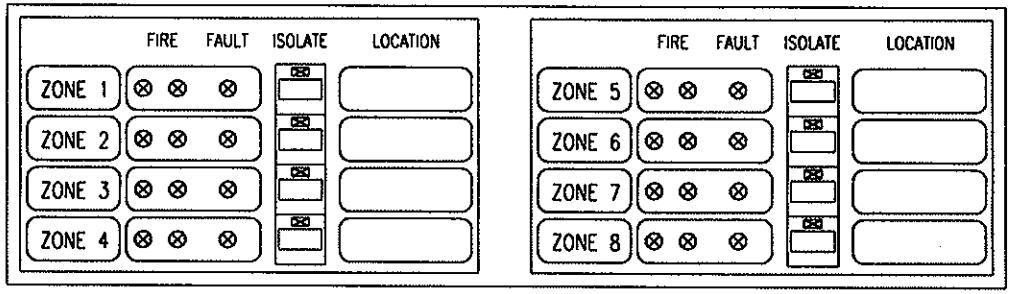
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-16-SUB
DRAWING TITLE TYPICAL PANEL LAYOUT OF 16 ZONES FIRE ALARM PANEL (SUB W/O CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

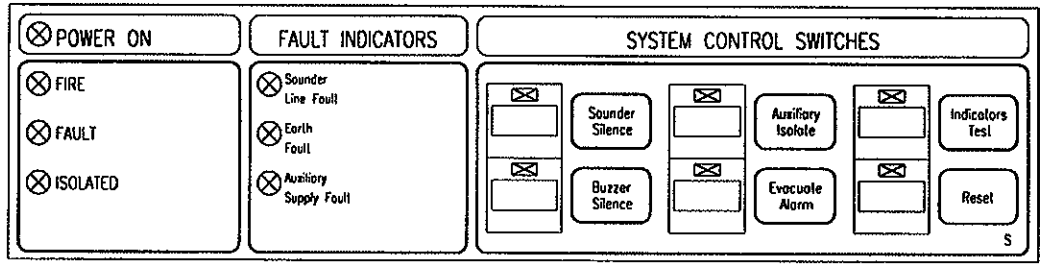


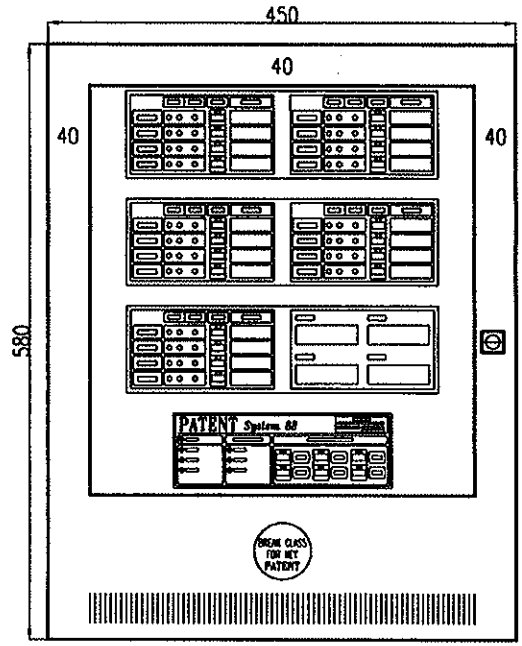
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

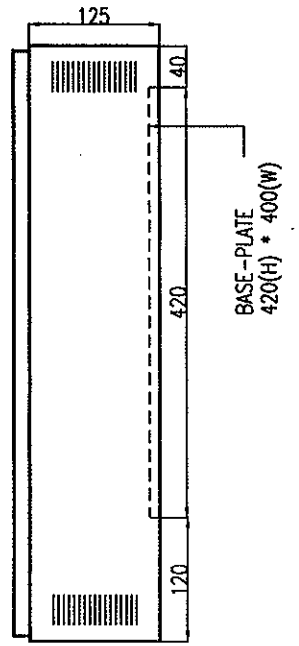
FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD







INDICATORS

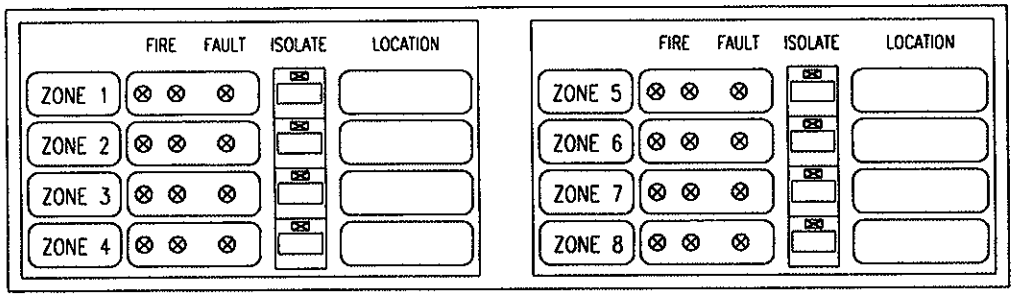
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-20-SUB
DRAWING TITLE TYPICAL PANEL LAYOUT OF 20 ZONES FIRE ALARM PANEL (SUB W/O CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

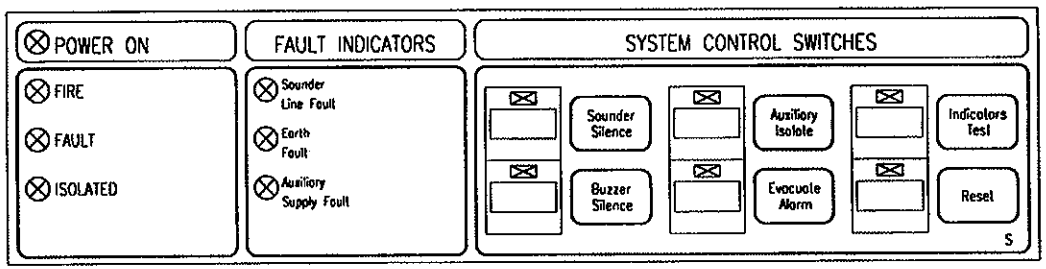


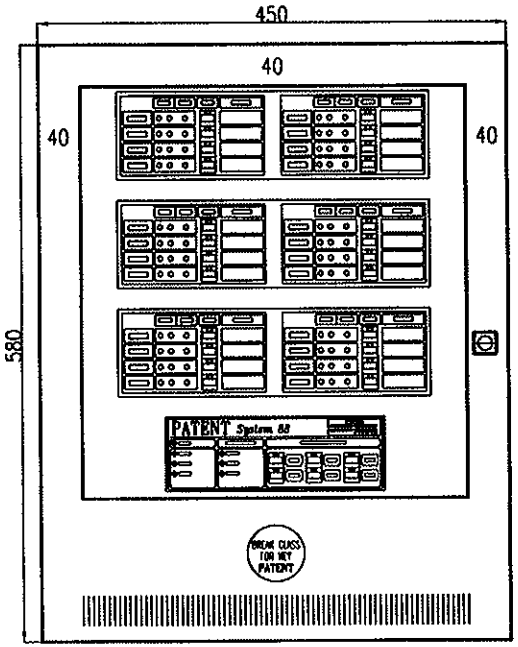
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

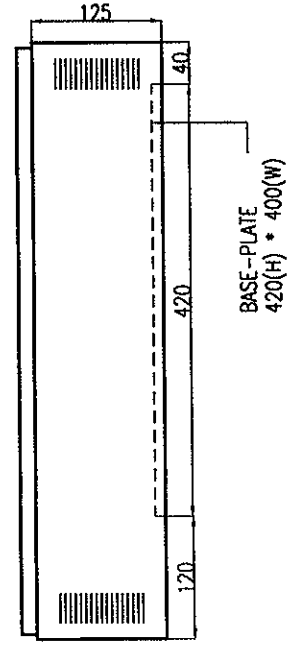
FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD







INDICATORS

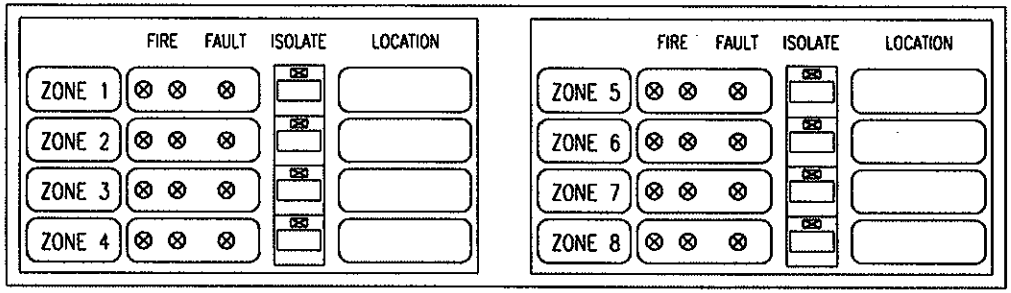
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-24-SUB
DRAWING TITLE TYPICAL PANEL LAYOUT OF 24 ZONES FIRE ALARM PANEL (SUB W/O CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

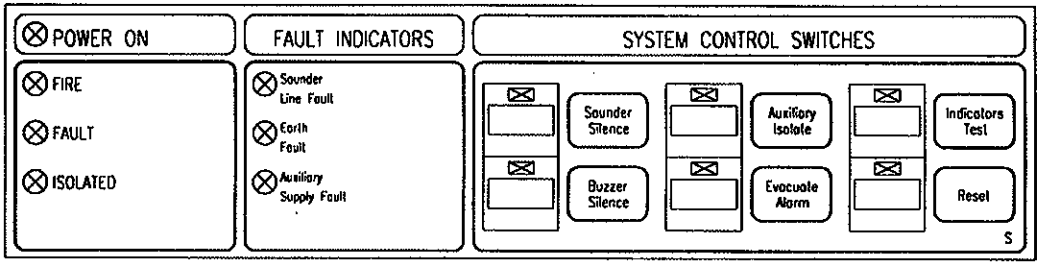


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

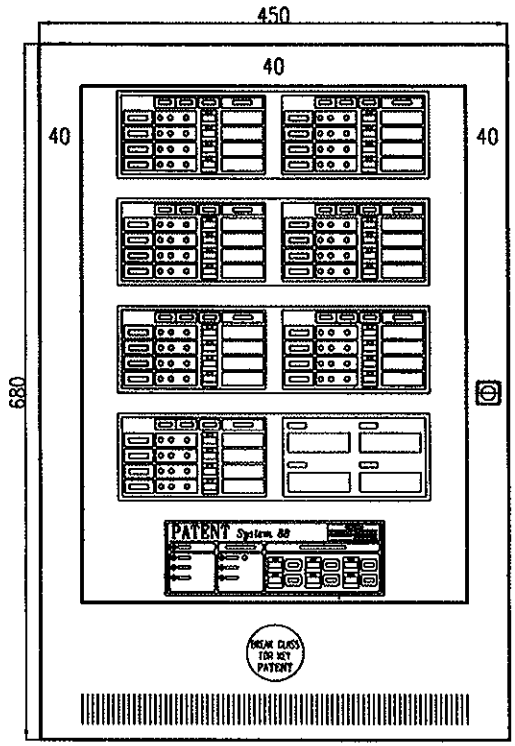


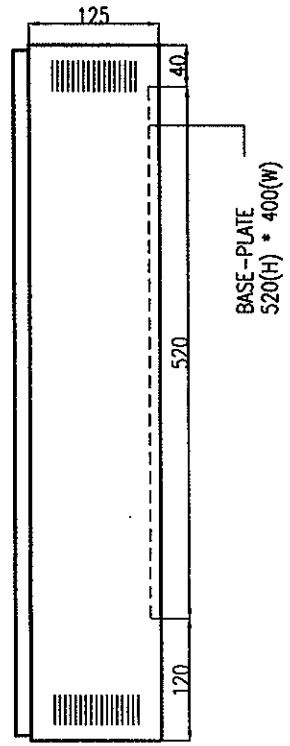
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown

CONTROLS

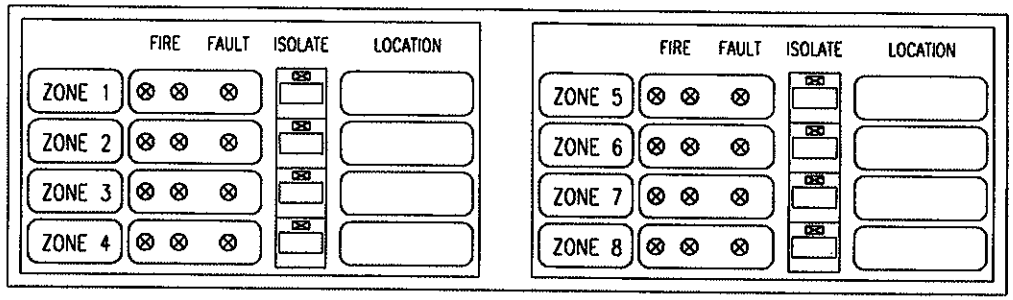
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-28-SUB
DRAWING TITLE TYPICAL PANEL LAYOUT OF 28 ZONES FIRE ALARM PANEL (SUB W/O CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

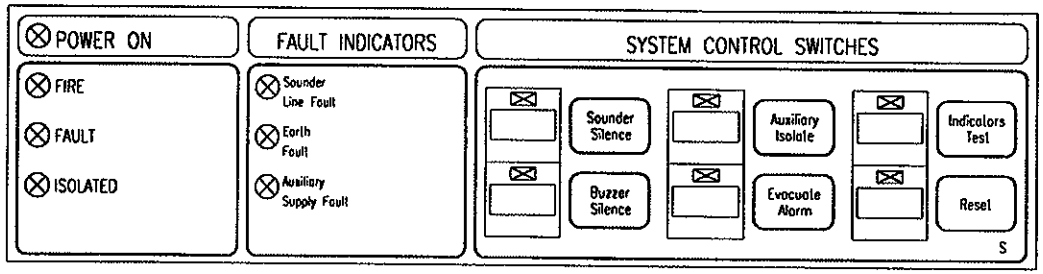


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

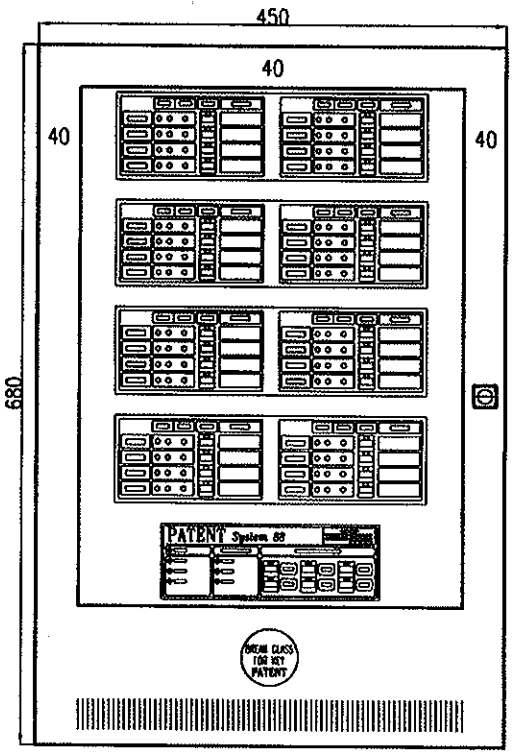


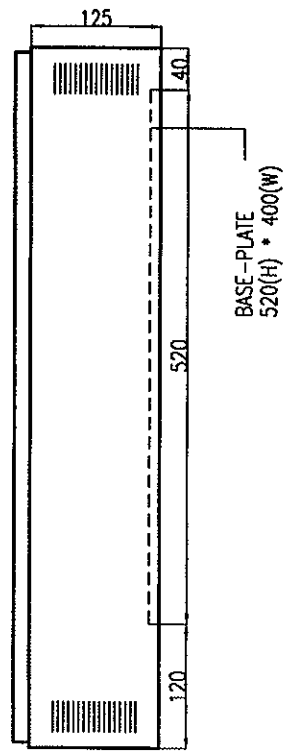
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown

CONTROLS

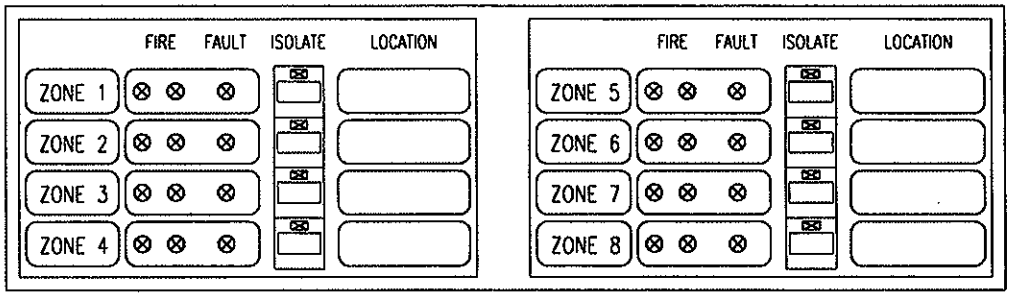
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-32-SUB
DRAWING TITLE TYPICAL PANEL LAYOUT OF 32 ZONES FIRE ALARM PANEL (SUB W/O CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

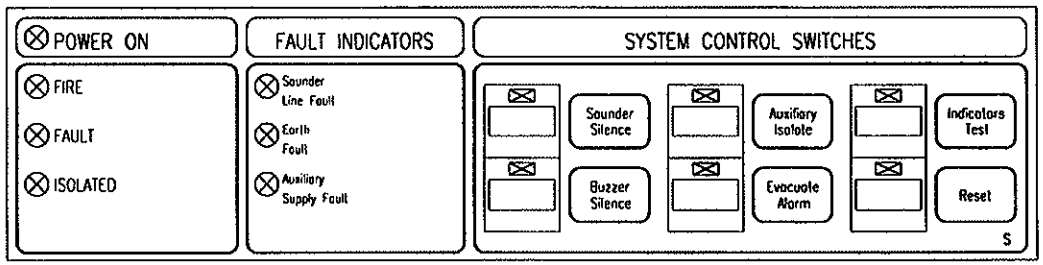


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

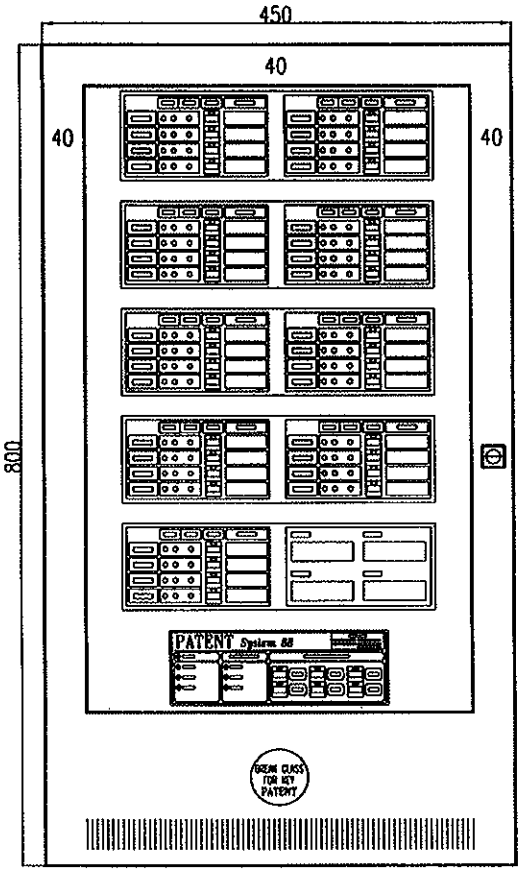


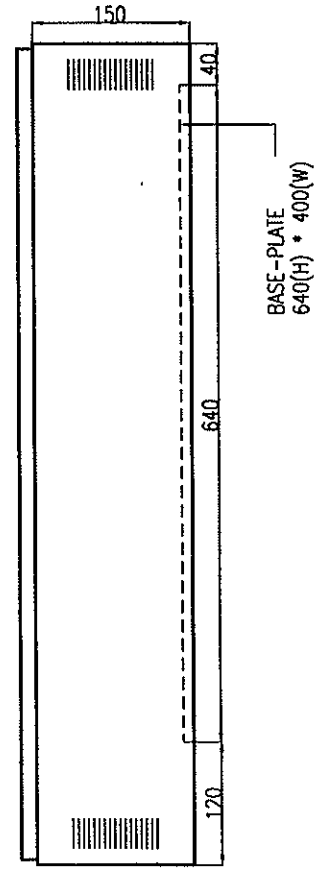
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown

CONTROLS

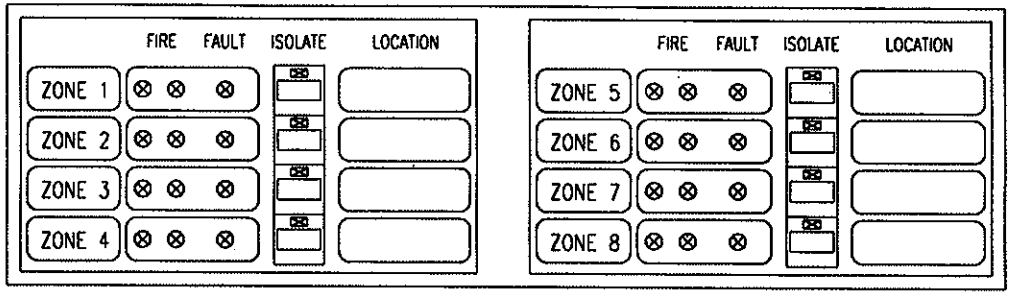
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-36-SUB
DRAWING TITLE TYPICAL PANEL LAYOUT OF 36 ZONES FIRE ALARM PANEL (SUB W/O CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

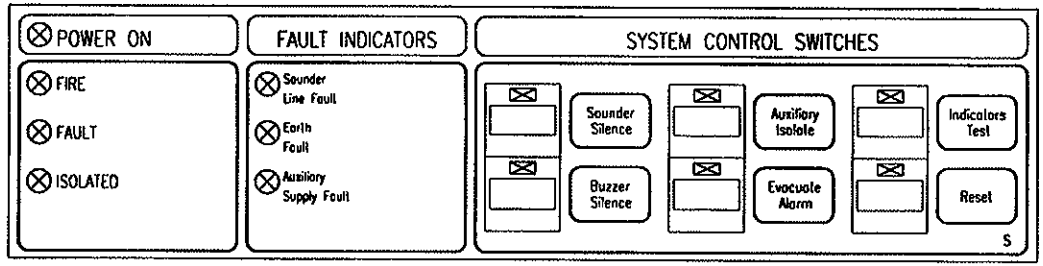


FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD

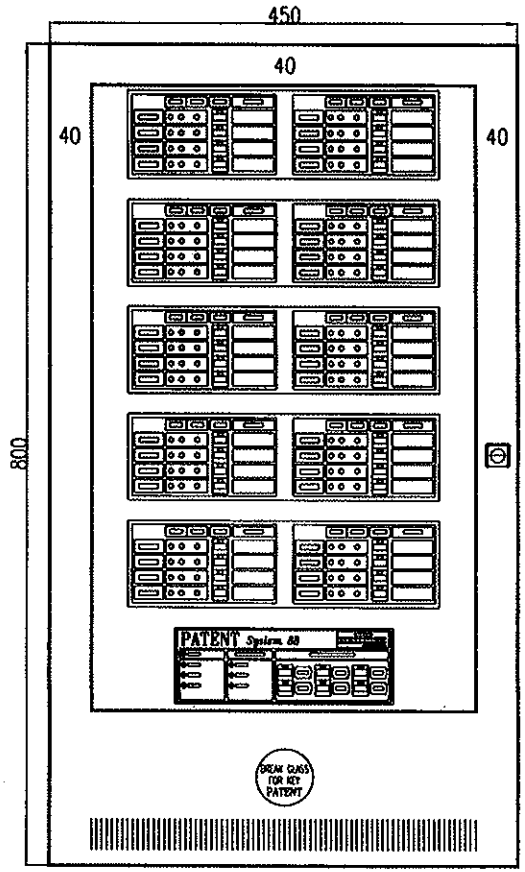


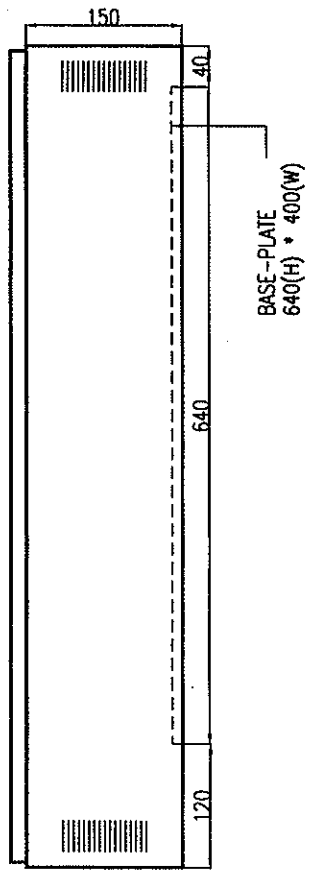
INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE P88-40-SUB
DRAWING TITLE TYPICAL PANEL LAYOUT OF 40 ZONES FIRE ALARM PANEL (SUB W/O CHARGER)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

PATENT *System 88*

PANEL LAYOUT DIAGRAM
OF
Fire Alarm Panel
(Weather - Proof)

COMPLIES WITH

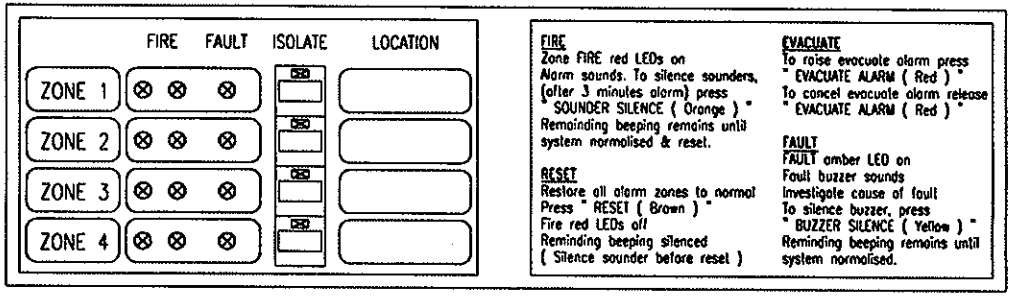
Singapore Standard	: SS CP10 : 1993
British Standard	: BS EN54-2 : 1998
	BS EN54-4 : 1998

PATENT *System 88*

Standard Panel Size and Weight (Water-Proof)

PANEL TYPE NO. OF ZONES	SIZE (mm)			BASE-PLATE SIZE	WEIGHT (Kg)
	H	W	D		
4 Zones 8 Zones	400	480	145	240(H) X 400(W)	11
12 Zones 16 Zones	480	480	145	320(H) X 400(W)	13
20 Zones 24 Zones	580	480	145	420(H) X 400(W)	16
28 Zones 32 Zones	680	480	145	520(H) X 400(W)	21
36 Zones 40 Zones	800	480	170	640(H) X 400(W)	26
44 Zones 48 Zones	750	580	220	510(H) X 500(W)	31

'PATENT SYSTEM 88' ZONE INDICATOR BOARD



FIRE
Zone FIRE red LEDs on
Alarm sounds. To silence sounders, (after 3 minutes alarm) press " SOUNDER SILENCE (Orange) "
Remainding beeping remains until system normalised & reset.

RESET
Restore all alarm zones to normal
Press " RESET (Brown) "
Fire red LEDs off
Reminding beeping silenced
(Silence sounder before reset)

EVACUATE
To raise evacuate alarm press " EVACUATE ALARM (Red) "
To cancel evacuate alarm release " EVACUATE ALARM (Red) "

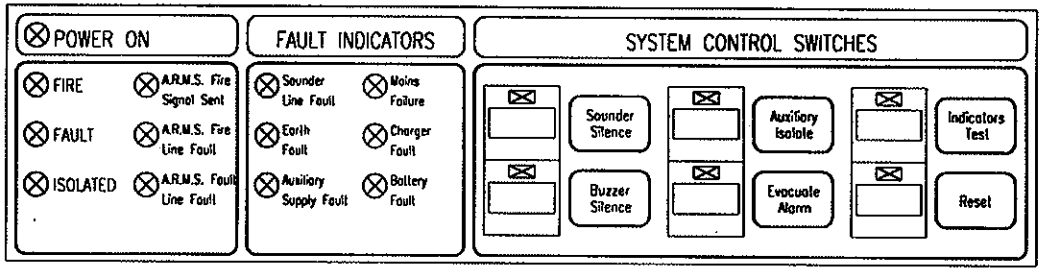
FAULT
FAULT amber LED on
Fault buzzer sounds
Investigate cause of fault
To silence buzzer, press " BUZZER SILENCE (Yellow) "
Reminding beeping remains until system normalised.

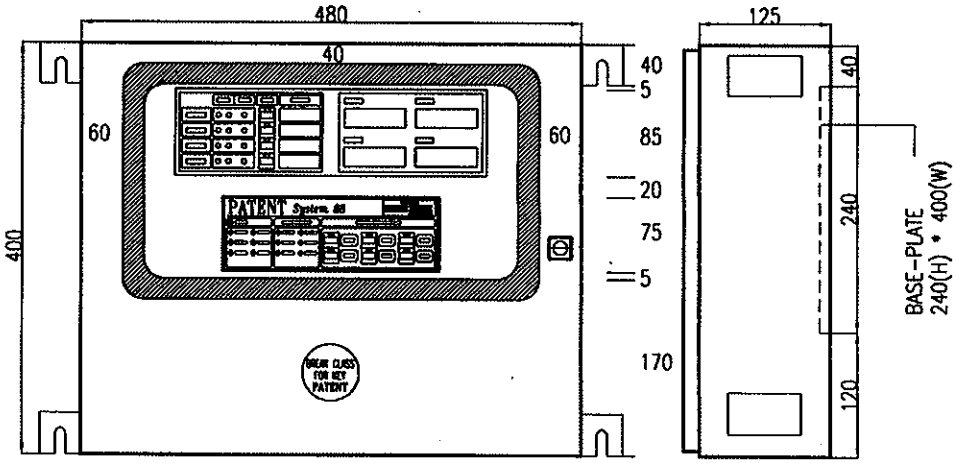
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD





INDICATORS

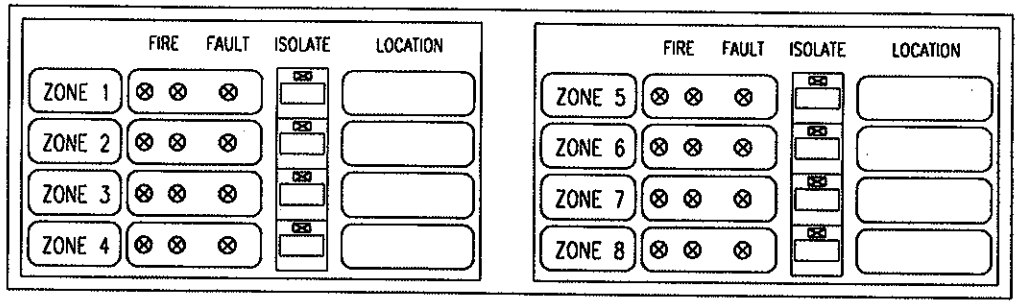
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-04M-WP
DRAWING TITLE TYPICAL PANEL LAYOUT OF 4 ZONES FIRE ALARM PANEL (MAIN) WATER-PROOF	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

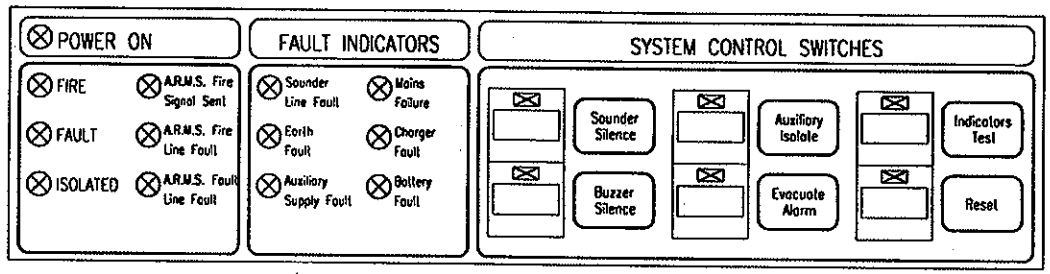


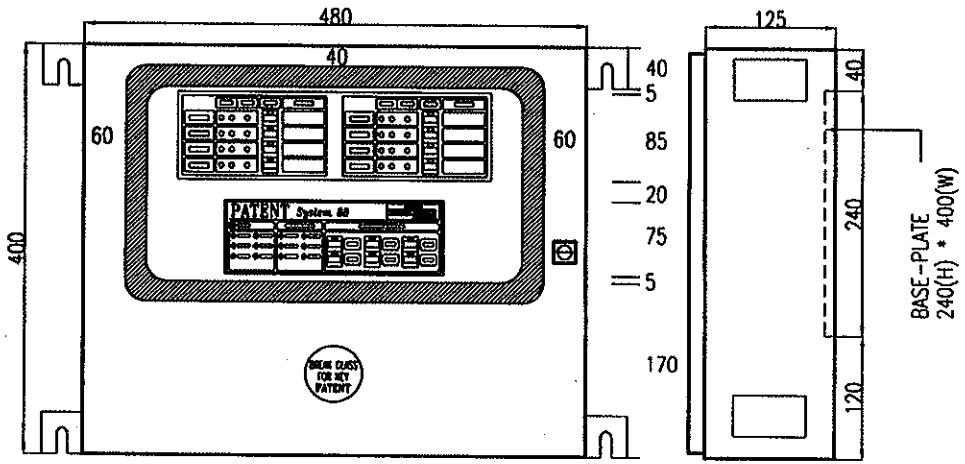
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD





INDICATORS

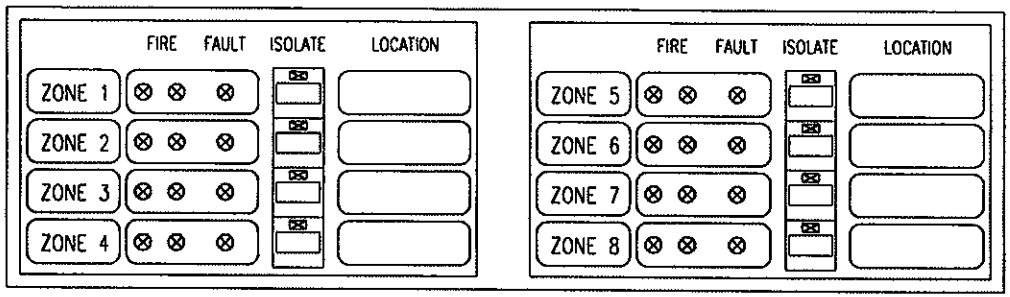
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-08M-WP
DRAWING TITLE TYPICAL PANEL LAYOUT OF 8 ZONES FIRE ALARM PANEL (MAIN) WATER-PROOF	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

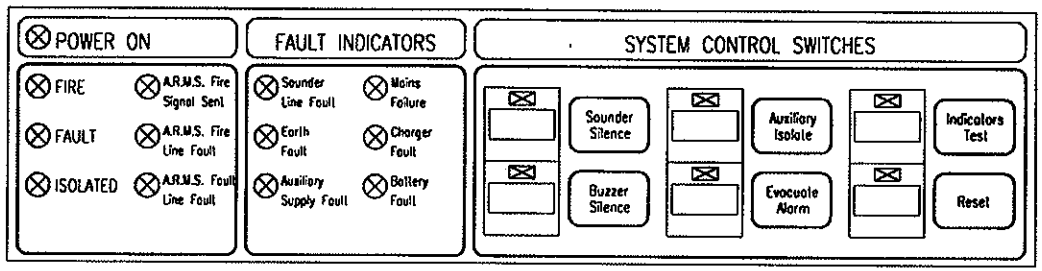


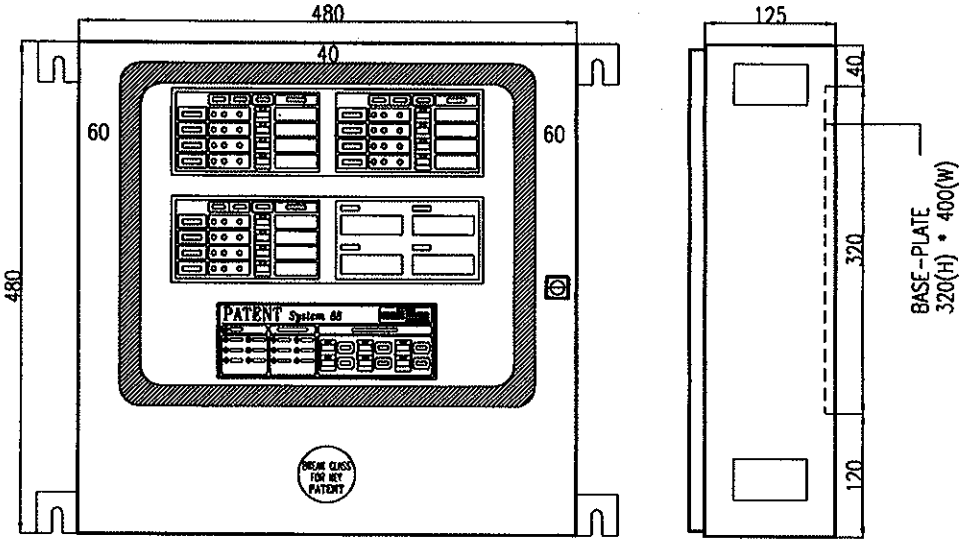
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD





INDICATORS

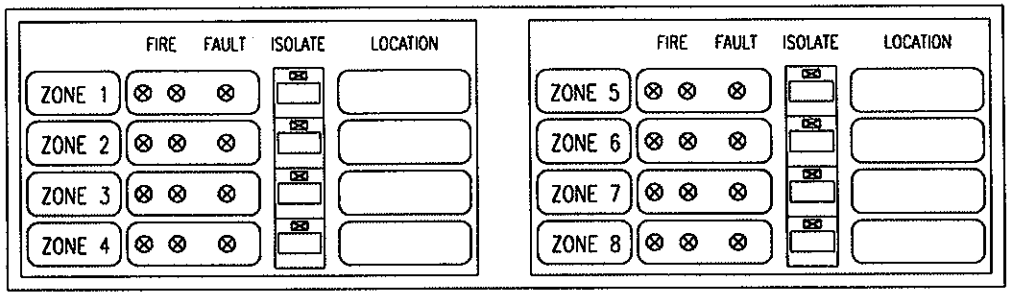
FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-12M-WP
DRAWING TITLE TYPICAL PANEL LAYOUT OF 12 ZONES FIRE ALARM PANEL (MAIN) WATER-PROOF	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR BOARD

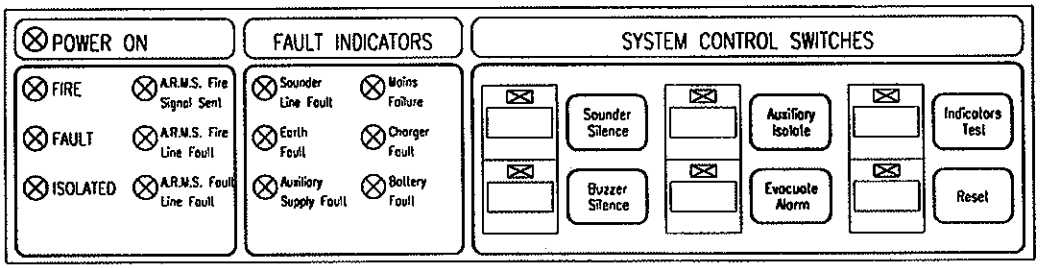


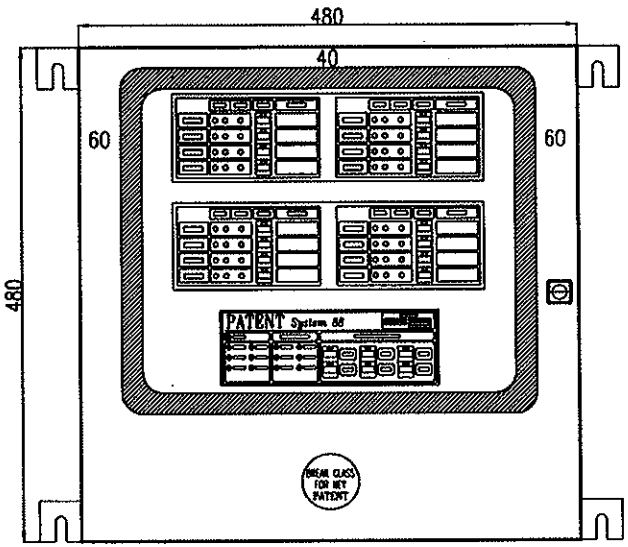
FIRE : INDICATE FIRE ALARM CONDITION (TWIN RED LED)

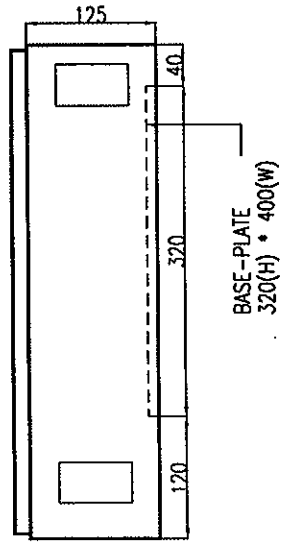
FAULT : INDICATE DETECTOR LINE OPEN/SHORT CONDITION (AMBER LED)

ISOLATE : INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)
(USUALLY FOR MAINTENANCE USE ONLY)

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD







INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
A.R.M.S Fire Signal Sent (Red)	:	Fire signal been sent to Alarm Remote Monitoring Station (ARMS)
A.R.M.S Fire Line Fault (Amber)	:	Fire signal to Alarm Remote Monitoring Station line open/short circuited
A.R.M.S Fault Line Fault (Amber)	:	Fault singal to Alarm Remote Monitoring Station line open/short circuited
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
AUXILIARY ISOLATE (GREEN)	:	Isolates auxiliary connection (except connection to monitoring station)
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 2 JAN 2002
	SCALE N.T.S	FILE P88-16M-WP
DRAWING TITLE TYPICAL PANEL LAYOUT OF 16 ZONES FIRE ALARM PANEL (MAIN) WATER-PROOF	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

PATENT *System 88*

PANEL LAYOUT DIAGRAM OF Fire Extinguishing Control Panel

COMPLIES WITH

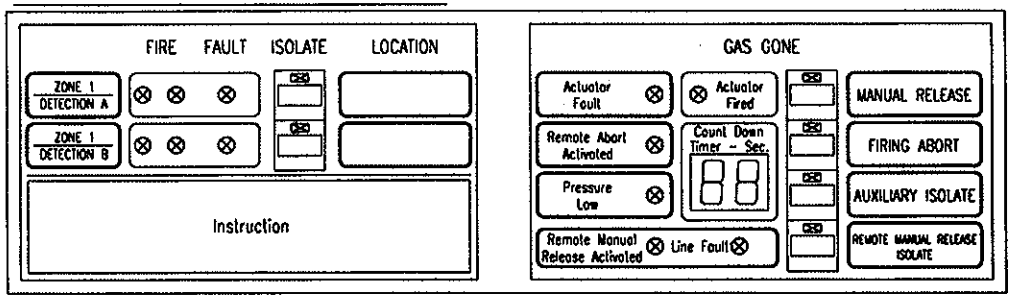
Singapore Standard	: SS CP10 : 1993
British Standard	: BS EN54-2 : 1998
	BS EN54-4 : 1998

PATENT *System 88*

Standard Panel Size and Weight (Gas Control Panel)

PANEL TYPE NO. OF ZONES	SIZE (mm) H	W	D	BASE-PLATE SIZE	WEIGHT (Kg)
INDIVIDUAL FIRING					
1 Zones (IND_FIRING)	400	450	145	240(H) X 400(W)	10
2 Zones (IND_FIRING)	520	450	145	360(H) X 400(W)	13
3 Zones (IND_FIRING)	650	450	145	490(H) X 400(W)	17
1 Zones (I-F) c/w LCD	480	450	145	320(H) X 400(W)	12
2 Zones (I-F) c/w LCD	580	450	145	420(H) X 400(W)	15
COMMON FIRING					
1 Zones / 2 Zones (COM_FIRING)	400	450	145	240(H) X 400(W)	10
3 Zones / 4 Zones (COM_FIRING)	480	450	145	320(H) X 400(W)	12

'PATENT SYSTEM 88' ZONE INDICATOR and GAS CONTROL BOARD



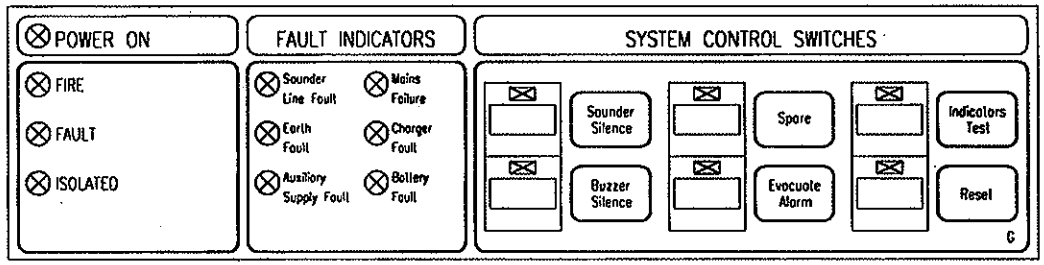
FIRING INDICATORS

ACTUATOR FAULT	:	Actuator Line Open / Faulty (AMBER)
REMOTE ABORT ACTIVATED	:	Gas Release inhibited at remote station (AMBER)
PRESSURE LOW	:	Storage pressure within cylinder is low (AMBER)
REMOTE MANUAL RELEASE ACTIVATED	:	Manual Release has been activated at remote station (RED)
ACTUATOR FIRED	:	Actuator has been fired (RED)
COUNT DOWN TIMER (Sec)	:	Display remaining time to activation of actuator (2 Digit Number)
LINE FAULT	:	Remote Release Line/Gas Gone Line Open/Short condition (AMBER)
GAS GONE	:	Gas has been releaseed (RED-Flashing)

FIRING CONTROLS

MANUAL RELEASE (RED)	:	Manually release Gas
FIRING ABORT (GREEN)	:	Abort firing Actuator
AUXILIARY ISOLATE (GREEN)	:	Isolate auxiliary connection (except connection to monitoring station)
REMOTE MANUAL RELEASE ISOLATE (GREEN)	:	Isolate Remote Manual Release Signal

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD



INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

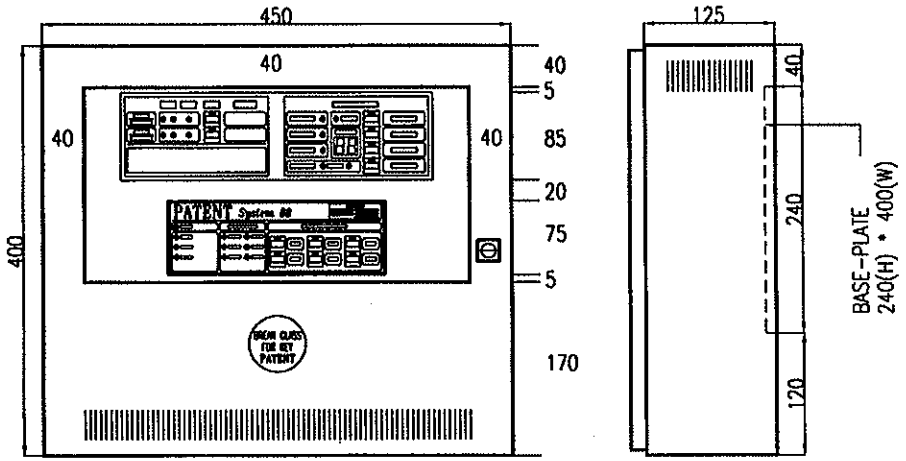
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
SPARE (GREEN)	:	Spare switch
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

DETECTION INDICATORS

FIRE	:	INDICATE FIRE ALARM CONDITION (TWIN RED LED)
FAULT	:	INDICATE DETECTOT LINE OPEN / SHORT CONDITION (AMBER LED)
ISOLATE	:	INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)

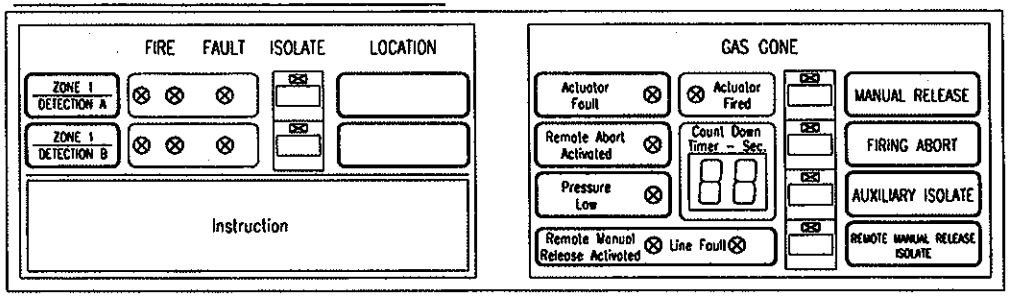
DETECTION CONTROLS

ISOLATE	:	ISOLATE DETECTION CIRCUIT (GREEN)



PROJECT TITLE: PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY: A M N	DRAWING NO:
	DESIGNED BY: A M N	DATE: 3 JAN 2002
	SCALE: N.T.S	FILE: G88-01
DRAWING TITLE: TYPICAL PANEL LAYOUT OF 1 ZONES GAS CONTROL PANEL	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR and GAS CONTROL BOARD



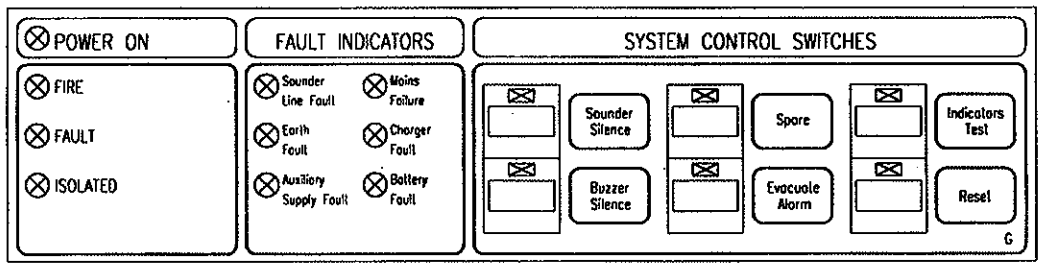
FIRING INDICATORS

ACTUATOR FAULT	:	Actuator Line Open / Faulty (AMBER)
REMOTE ABORT ACTIVATED	:	Gas Release inhibited at remote station (AMBER)
PRESSURE LOW	:	Storage pressure within cylinder is low (AMBER)
REMOTE MANUAL RELEASE ACTIVATED	:	Manual Release has been activated at remote station (RED)
ACTUATOR FIRED	:	Actuator has been fired (RED)
COUNT DOWN TIMER (Sec)	:	Display remaining time to activation of actuator (2 Digit Number)
LINE FAULT	:	Remote Release Line/Gas Gone Line Open/Short condition (AMBER)
GAS GONE	:	Gas has been releaseed (RED-Flashing)

FIRING CONTROLS

MANUAL RELEASE (RED)	:	Manually release Gas
FIRING ABORT (GREEN)	:	Abort firing Actuator
AUXILIARY ISOLATE (GREEN)	:	Isolate auxiliary connection (except connection to monitoring station)
REMOTE MANUAL RELEASE ISOLATE (GREEN)	:	Isolate Remote Manual Release Signal

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD



INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

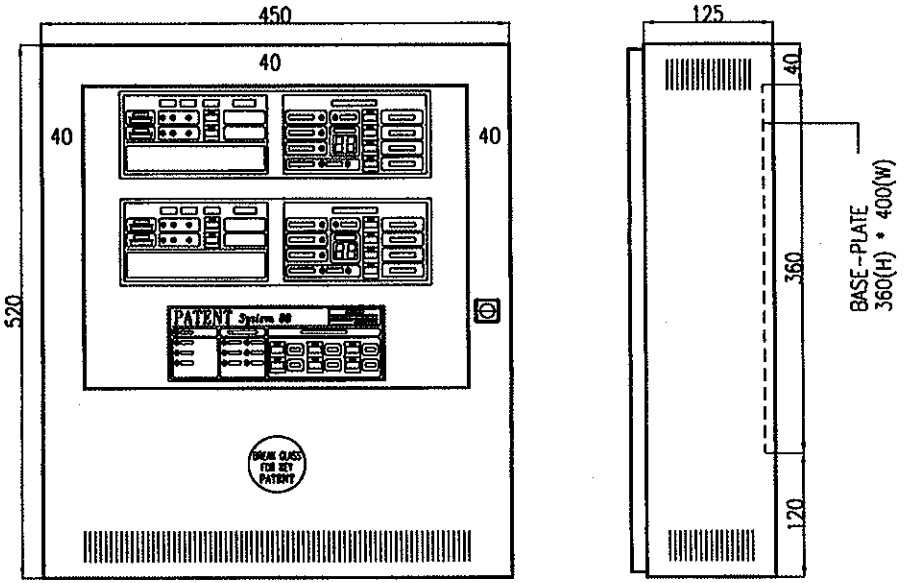
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
SPARE (GREEN)	:	Spare switch
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

DETECTION INDICATORS

FIRE	:	INDICATE FIRE ALARM CONDITION (TWIN RED LED)
FAULT	:	INDICATE DETECTOT LINE OPEN / SHORT CONDITION (AMBER LED)
ISOLATE	:	INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)

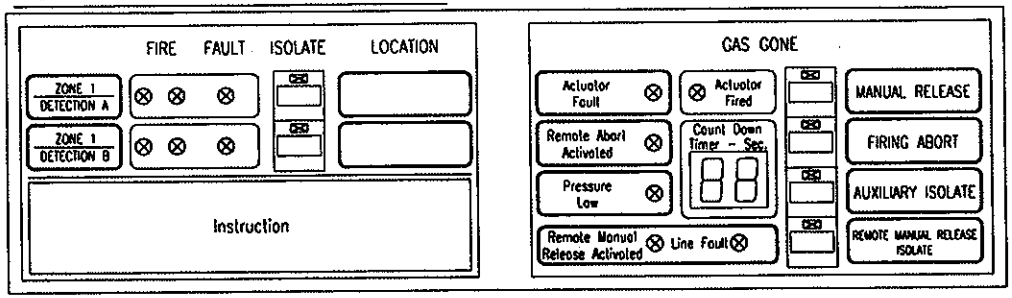
DETECTION CONTROLS

ISOLATE	:	ISOLATE DETECTION CIRCUIT (GREEN)



PROJECT TITLE: PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY: A M N	DRAWING NO:
	DESIGNED BY: A M N	DATE: 3 JAN 2002
	SCALE: N.T.S	FILE: G88-02-IF
DRAWING TITLE: TYPICAL PANEL LAYOUT OF 2 ZONES GAS CONTROL PANEL (INDIVIDUAL FIRING)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR and GAS CONTROL BOARD



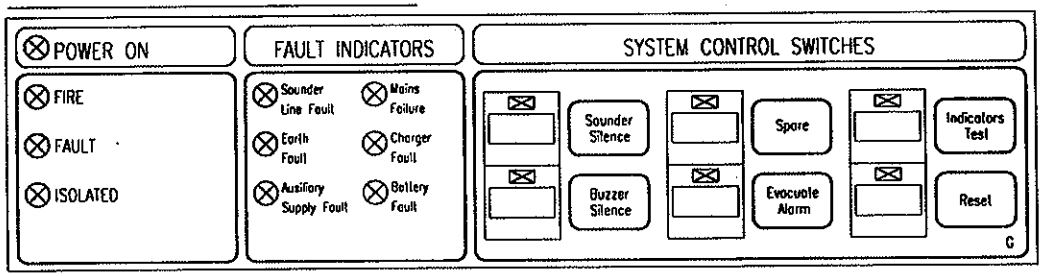
FIRING INDICATORS

ACTUATOR FAULT	:	Actuator Line Open / Faulty (AMBER)
REMOTE ABORT ACTIVATED	:	Gas Release inhibited at remote station (AMBER)
PRESSURE LOW	:	Storage pressure within cylinder is low (AMBER)
REMOTE MANUAL RELEASE ACTIVATED	:	Manual Release has been activated at remote station (RED)
ACTUATOR FIRED	:	Actuator has been fired (RED)
COUNT DOWN TIMER (Sec)	:	Display remaining time to activation of actuator (2 Digit Number)
LINE FAULT	:	Remote Release Line/Gas Gone Line Open/Short condition (AMBER)
GAS GONE	:	Gas has been releaseed (RED-Flashing)

FIRING CONTROLS

MANUAL RELEASE (RED)	:	Manually release Gas
FIRING ABORT (GREEN)	:	Abort firing Actuator
AUXILIARY ISOLATE (GREEN)	:	Isolate auxiliary connection (except connection to monitoring station)
REMOTE MANUAL RELEASE ISOLATE (GREEN)	:	Isolate Remote Manual Release Signal

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD



INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

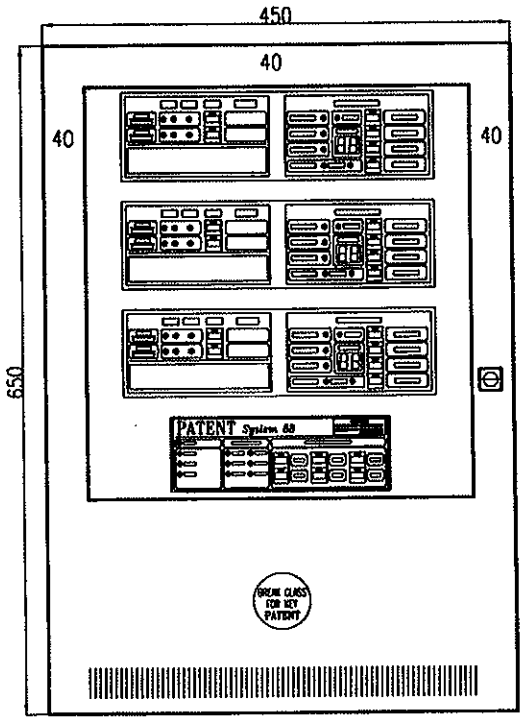
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
SPARE (GREEN)	:	Spare switch
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

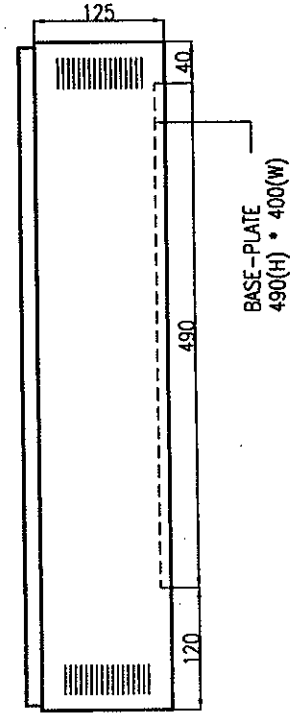
DETECTION INDICATORS

FIRE	:	INDICATE FIRE ALARM CONDITION (TWIN RED LED)
FAULT	:	INDICATE DETECTOT LINE OPEN / SHORT CONDITION (AMBER LED)
ISOLATE	:	INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)

DETECTION CONTROLS

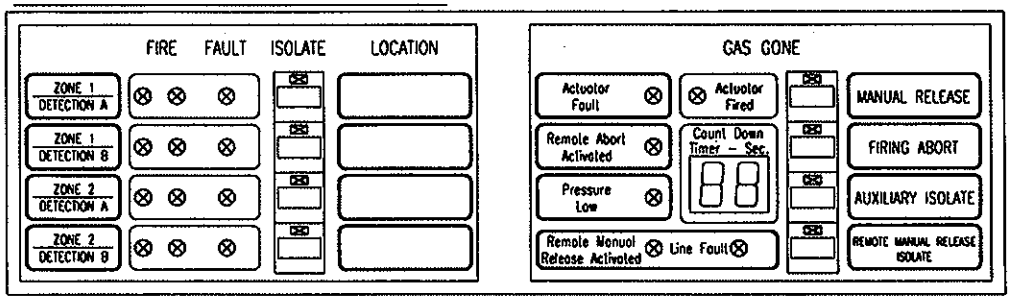
ISOLATE	:	ISOLATE DETECTION CIRCUIT (GREEN)





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO	
	DESIGNED BY A M N	DATE 3 JAN 2002	
	SCALE N.T.S	FILE G88-03-IF	
DRAWING TITLE TYPICAL PANEL LAYOUT OF 3 ZONES GAS CONTROL PANEL (INDIVIDUAL FIRING)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278		

'PATENT SYSTEM 88' ZONE INDICATOR and GAS CONTROL BOARD



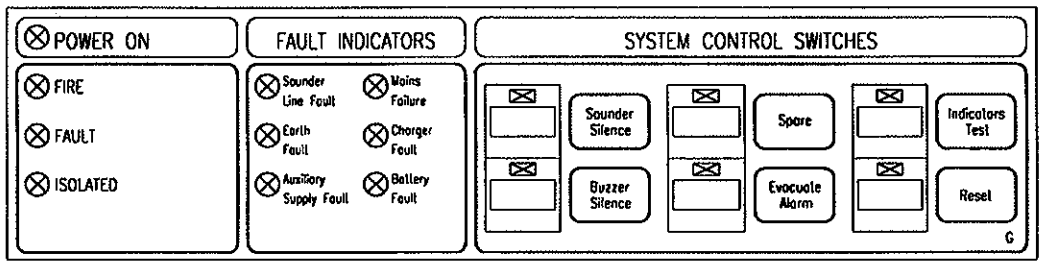
FIRING INDICATORS

ACTUATOR FAULT	:	Actuator Line Open / Faulty (AMBER)
REMOTE ABORT ACTIVATED	:	Gas Release inhibited at remote station (AMBER)
PRESSURE LOW	:	Storage pressure within cylinder is low (AMBER)
REMOTE MANUAL RELEASE ACTIVATED	:	Manual Release has been activated at remote station (RED)
ACTUATOR FIRED	:	Actuator has been fired (RED)
COUNT DOWN TIMER (Sec)	:	Display remaining time to activation of actuator (2 Digit Number)
LINE FAULT	:	Remote Release Line/Gas Gone Line Open/Short condition (AMBER)
GAS GONE	:	Gas has been releaseed (RED-Flashing)

FIRING CONTROLS

MANUAL RELEASE (RED)	:	Manually release Gas
FIRING ABORT (GREEN)	:	Abort firing Actuator
AUXILIARY ISOLATE (GREEN)	:	Isolate auxiliary connection (except connection to monitoring station)
REMOTE MANUAL RELEASE ISOLATE (GREEN)	:	Isolate Remote Manual Release Signal

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD



INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

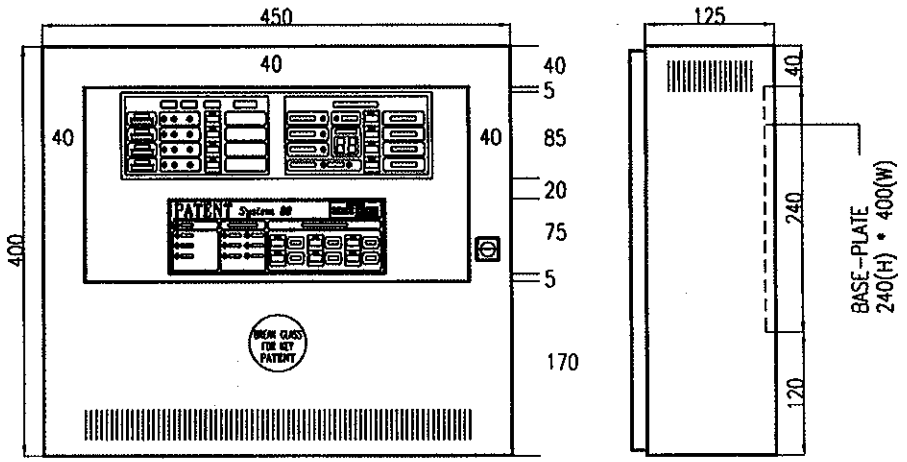
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
SPARE (GREEN)	:	Spare switch
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

DETECTION INDICATORS

FIRE	:	INDICATE FIRE ALARM CONDITION (TWIN RED LED)
FAULT	:	INDICATE DETECTOT LINE OPEN / SHORT CONDITION (AMBER LED)
ISOLATE	:	INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)

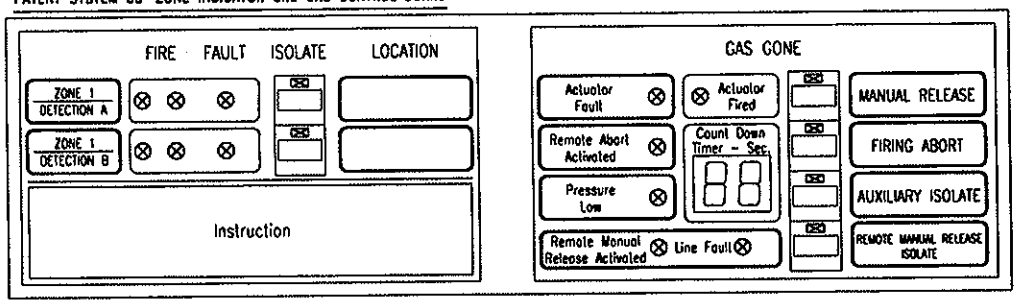
DETECTION CONTROLS

ISOLATE	:	ISOLATE DETECTION CIRCUIT (GREEN)



PROJECT TITLE: PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY: A M N	DRAWING NO:	
	DESIGNED BY: A M N	DATE: 3 JAN 2002	
	SCALE: N.T.S	FILE: G88-02-CF	
DRAWING TITLE: TYPICAL PANEL LAYOUT OF 2 ZONES GAS CONTROL PANEL (COMMON FIRING)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278		

'PATENT SYSTEM 88' ZONE INDICATOR and GAS CONTROL BOARD



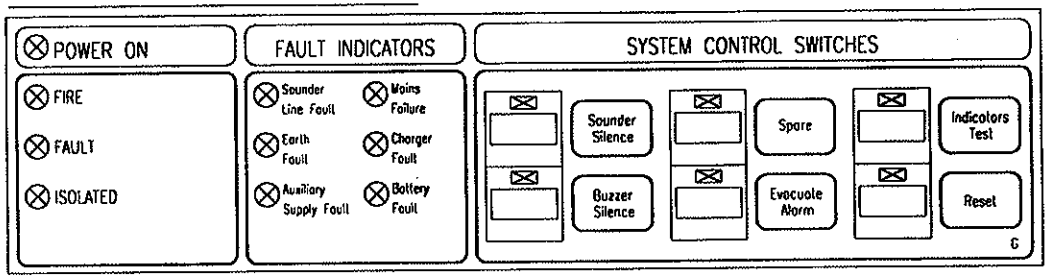
FIRING INDICATORS

ACTUATOR FAULT	:	Actuator Line Open / Faulty (AMBER)
REMOTE ABORT ACTIVATED	:	Gas Release inhibited at remote station (AMBER)
PRESSURE LOW	:	Storage pressure within cylinder is low (AMBER)
REMOTE MANUAL RELEASE ACTIVATED	:	Manual Release has been activated at remote station (RED)
ACTUATOR FIRED	:	Actuator has been fired (RED)
COUNT DOWN TIMER (Sec)	:	Display remaining time to activation of actuator (2 Digit Number)
LINE FAULT	:	Remote Release Line/Gas Gone Line Open/Short condition (AMBER)
GAS GONE	:	Gas has been releaseed (RED--Flashing)

FIRING CONTROLS

MANUAL RELEASE (RED)	:	Manually release Gas
FIRING ABORT (GREEN)	:	Abort firing Actuator
AUXILIARY ISOLATE (GREEN)	:	Isolate auxiliary connection (except connection to monitoring station)
REMOTE MANUAL RELEASE ISOLATE (GREEN)	:	Isolate Remote Manual Release Signal

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD



INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

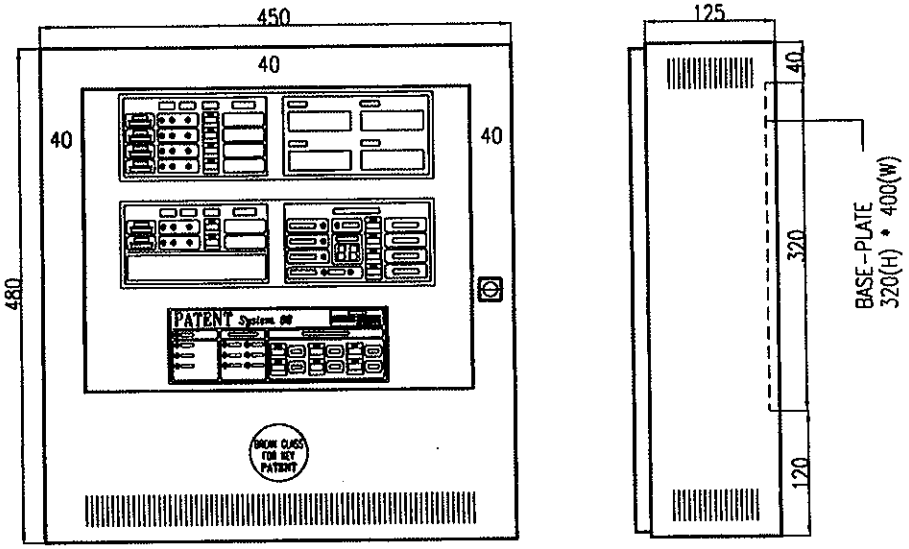
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
SPARE (GREEN)	:	Spare switch
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

DETECTION INDICATORS

FIRE	:	INDICATE FIRE ALARM CONDITION (TWIN RED LED)
FAULT	:	INDICATE DETECTOT LINE OPEN / SHORT CONDITION (AMBER LED)
ISOLATE	:	INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)

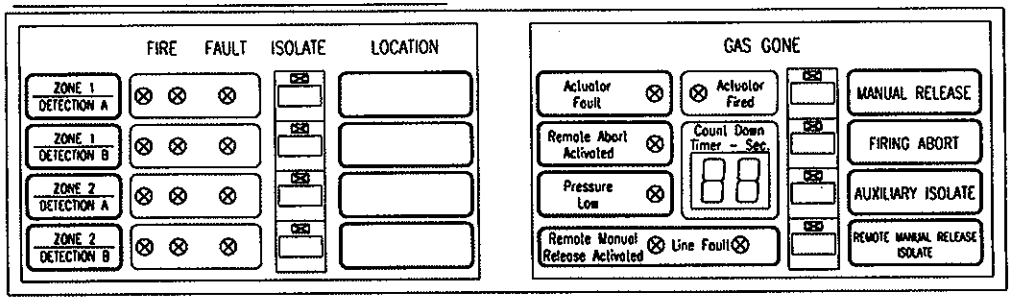
DETECTION CONTROLS

ISOLATE	:	ISOLATE DETECTION CIRCUIT (GREEN)



PROJECT TITLE: PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY: A M N	DRAWING NO:	
	DESIGNED BY: A M N	DATE: 3 JAN 2002	
	SCALE: N.T.S	FILE: G88-03-CF	
DRAWING TITLE: TYPICAL PANEL LAYOUT OF 3 ZONES GAS CONTROL PANEL (COMMON FIRING)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278		

'PATENT SYSTEM 88' ZONE INDICATOR and GAS CONTROL BOARD



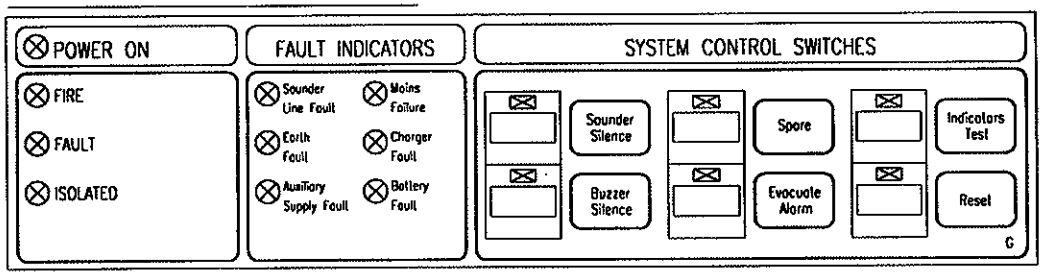
FIRING INDICATORS

ACTUATOR FAULT	:	Actuator Line Open / Faulty (AMBER)
REMOTE ABORT ACTIVATED	:	Gas Release inhibited at remote station (AMBER)
PRESSURE LOW	:	Storage pressure within cylinder is low (AMBER)
REMOTE MANUAL RELEASE ACTIVATED	:	Manual Release has been activated at remote station (RED)
ACTUATOR FIRED	:	Actuator has been fired (RED)
COUNT DOWN TIMER (Sec)	:	Display remaining time to activation of actuator (2 Digit Number)
LINE FAULT	:	Remote Release Line/Gas Gone Line Open/Short condition (AMBER)
GAS GONE	:	Gas has been releaseed (RED-Flashing)

FIRING CONTROLS

MANUAL RELEASE (RED)	:	Manually release Gas
FIRING ABORT (GREEN)	:	Abort firing Actuator
AUXILIARY ISOLATE (GREEN)	:	Isolate auxiliary connection (except connection to monitoring station)
REMOTE MANUAL RELEASE ISOLATE (GREEN)	:	Isolate Remote Manual Release Signal

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD



INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

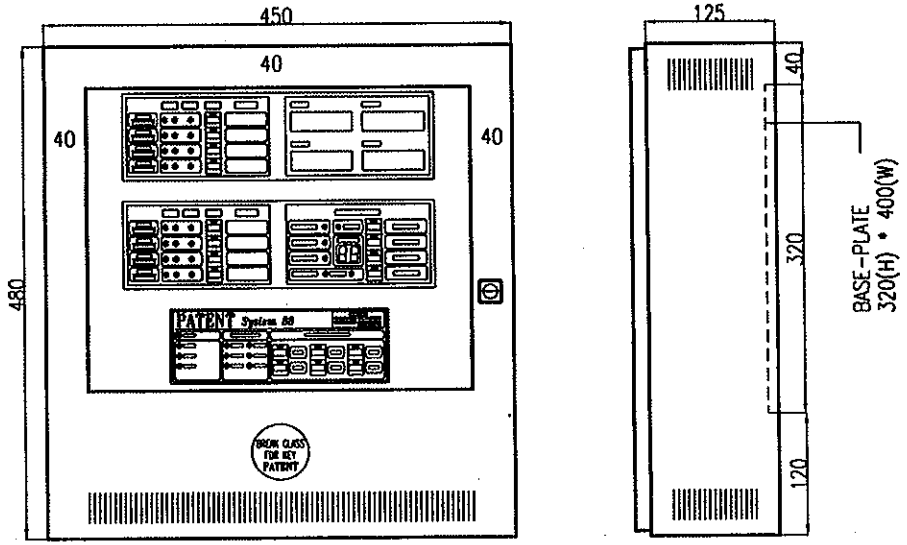
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
SPARE (GREEN)	:	Spare switch
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

DETECTION INDICATORS

FIRE	:	INDICATE FIRE ALARM CONDITION (TWIN RED LED)
FAULT	:	INDICATE DETECTOT LINE OPEN / SHORT CONDITION (AMBER LED)
ISOLATE	:	INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)

DETECTION CONTROLS

ISOLATE	:	ISOLATE DETECTION CIRCUIT (GREEN)



PROJECT TITLE: PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY: A M N	DRAWING NO:
	DESIGNED BY: A M N	DATE: 3 JAN 2002
	SCALE: N.T.S	FILE: G88-04-CF
DRAWING TITLE: TYPICAL PANEL LAYOUT OF 4 ZONES GAS CONTROL PANEL (COMMON FIRING)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

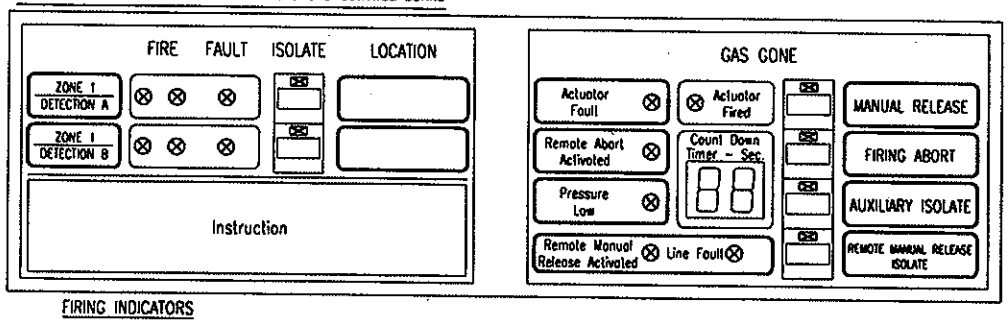
PATENT *System 88*

PANEL LAYOUT DIAGRAM OF Fire Extinguishing Control Panel (c/w LCD Display)

COMPLIES WITH

Singapore Standard	: SS CP10 : 1993
British Standard	: BS EN54-2 : 1998
	BS EN54-4 : 1998

'PATENT SYSTEM 88' ZONE INDICATOR and GAS CONTROL BOARD



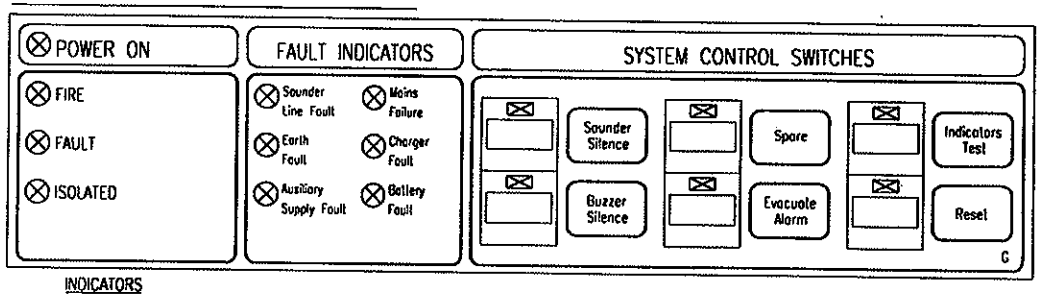
FIRING INDICATORS

ACTUATOR FAULT	:	Actuator Line Open / Faulty (AMBER)
REMOTE ABORT ACTIVATED	:	Gas Release inhibited at remote station (AMBER)
PRESSURE LOW	:	Storage pressure within cylinder is low (AMBER)
REMOTE MANUAL RELEASE ACTIVATED	:	Manual Release has been activated at remote station (RED)
ACTUATOR FIRED	:	Actuator has been fired (RED)
COUNT DOWN TIMER (Sec)	:	Display remaining time to activation of actuator (2 Digit Number)
LINE FAULT	:	Remote Release Line/Gas Gone Line Open/Short condition (AMBER)
GAS GONE	:	Gas has been releaseed (RED-Flashing)

FIRING CONTROLS

MANUAL RELEASE (RED)	:	Manually release Gas
FIRING ABORT (GREEN)	:	Abort firing Actuator
AUXILIARY ISOLATE (GREEN)	:	Isolate auxiliary connection (except connection to monitoring station)
REMOTE MANUAL RELEASE ISOLATE (GREEN)	:	Isolate Remote Manual Release Signal

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD



INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

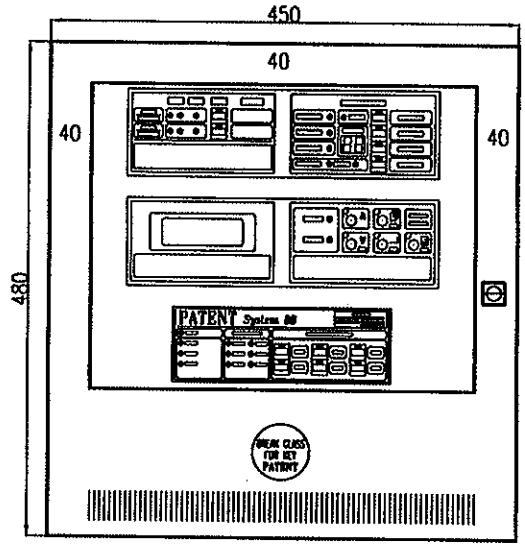
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
SPARE (GREEN)	:	Spare switch
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

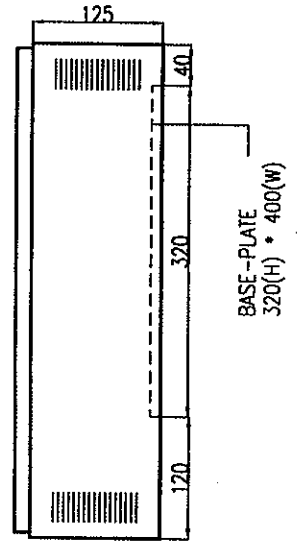
DETECTION INDICATORS

FIRE	:	INDICATE FIRE ALARM CONDITION (TWIN RED LED)
FAULT	:	INDICATE DETECTOT LINE OPEN / SHORT CONDITION (AMBER LED)
ISOLATE	:	INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)

DETECTION CONTROLS

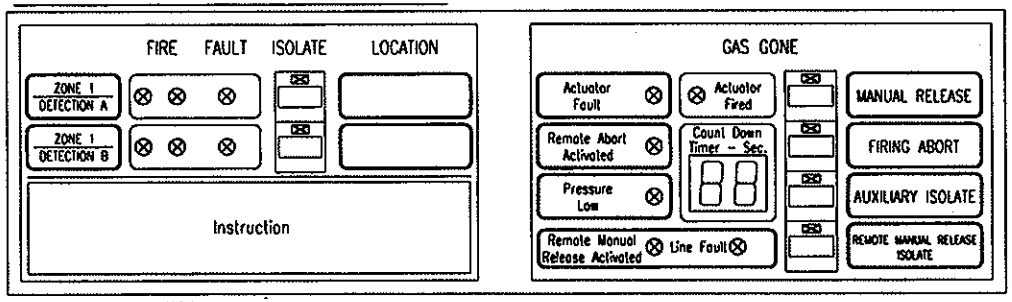
ISOLATE	:	ISOLATE DETECTION CIRCUIT (GREEN)





PROJECT TITLE: PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY: A M N	DRAWING NO:
	DESIGNED BY: A M N	DATE: 3 JAN 2002
	SCALE: N.T.S	FILE: G88-01-LCD
DRAWING TITLE: TYPICAL PANEL LAYOUT OF 1 ZONES GAS CONTROL PANEL (C/W LCD DISPLAY)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

'PATENT SYSTEM 88' ZONE INDICATOR and GAS CONTROL BOARD



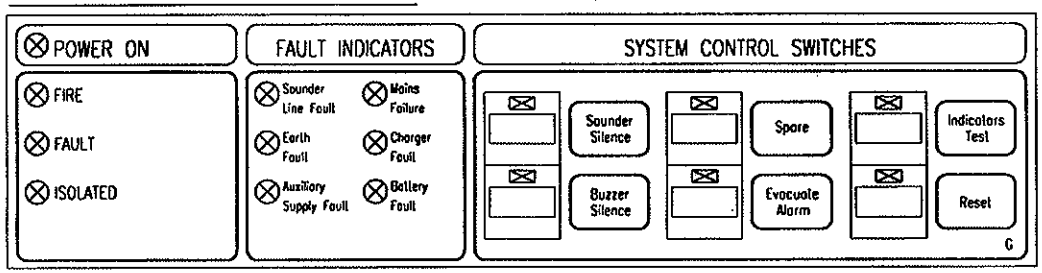
FIRING INDICATORS

ACTUATOR FAULT	:	Actuator Line Open / Foulty (AMBER)
REMOTE ABORT ACTIVATED	:	Gas Release inhibited at remote station (AMBER)
PRESSURE LOW	:	Storage pressure within cylinder is low (AMBER)
REMOTE MANUAL RELEASE ACTIVATED	:	Manual Release has been activated at remote station (RED)
ACTUATOR FIRED	:	Actuator has been fired (RED)
COUNT DOWN TIMER (Sec)	:	Display remaining time to activation of actuator (2 Digit Number)
LINE FAULT	:	Remote Release Line/Gas Gone Line Open/Short condition (AMBER)
GAS GONE	:	Gas has been releaseed (RED-Flashing)

FIRING CONTROLS

MANUAL RELEASE (RED)	:	Manually release Gas
FIRING ABORT (GREEN)	:	Abort firing Actuator
AUXILIARY ISOLATE (GREEN)	:	Isolate auxiliary connection (except connection to monitoring station)
REMOTE MANUAL RELEASE ISOLATE (GREEN)	:	Isolate Remote Manual Release Signal

CONTROLS INDICATORS AND SWITCHES FOR MAIN INDICATOR BOARD



INDICATORS

FIRE (Red)	:	General FIRE indicator: system in fire condition
FAULT (Amber)	:	General FAULT indicator: system in fault condition
ISOLATED (Amber)	:	General ISOLATED indicator: system in isolated condition
Sounder Fault (Amber)	:	Sounder Line/s open or short circuited
Earth Fault (Amber)	:	Charger output / Detector Lines / Sounder Lines shorted to earth / chassis
Auxiliary Supply Fault (Amber)	:	Auxiliary 24V DC supply Fuse blown
Mains Failure (Amber)	:	230V AC Mains supply failure
Charger Fault (Amber)	:	Blown fuse/Low/High Charger Voltage Output
Battery Fault (Amber)	:	Battery Disconnection, blown fuse/Low, High Battery Voltage Output

CONTROLS

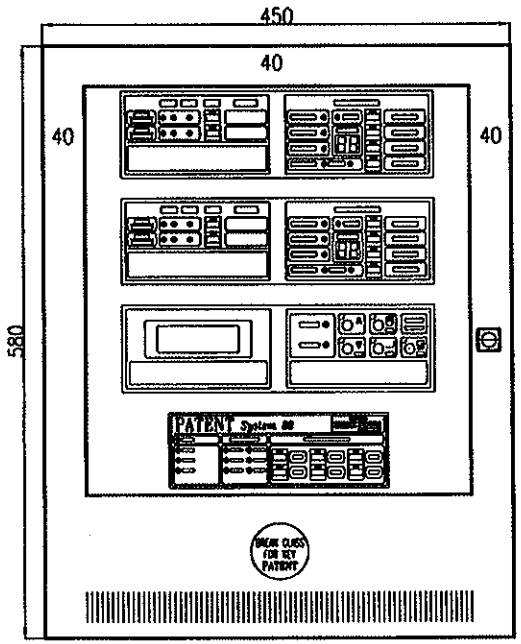
SOUNDER SILENCE (ORANGE)	:	Acknowledge Audio Fire Alarm (Subsequent alarm resound)
BUZZER SILENCE (YELLOW)	:	Acknowledge Audio Buzzer Warning (Subsequent fault resound)
SPARE (GREEN)	:	Spare switch
EVACUATE ALARM (RED)	:	Triggers immediate evacuation alarm
INDICATORS TEST (BLUE)	:	Tests working condition of audio buzzer and visual indicators
RESET (BROWN)	:	Resets System

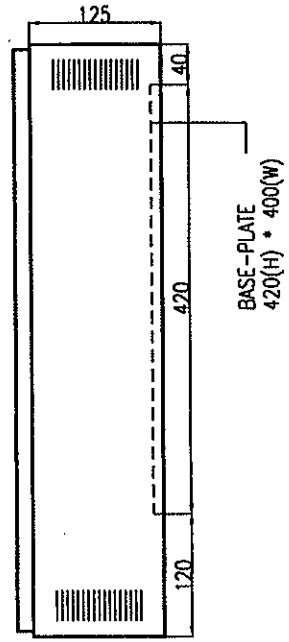
DETECTION INDICATORS

FIRE	:	INDICATE FIRE ALARM CONDITION (TWIN RED LED)
FAULT	:	INDICATE DETECTOT LINE OPEN / SHORT CONDITION (AMBER LED)
ISOLATE	:	INDICATE CIRCUIT ISOLATED CONDITION (AMBER LED) (AUDIO & VISUAL)

DETECTION CONTROLS

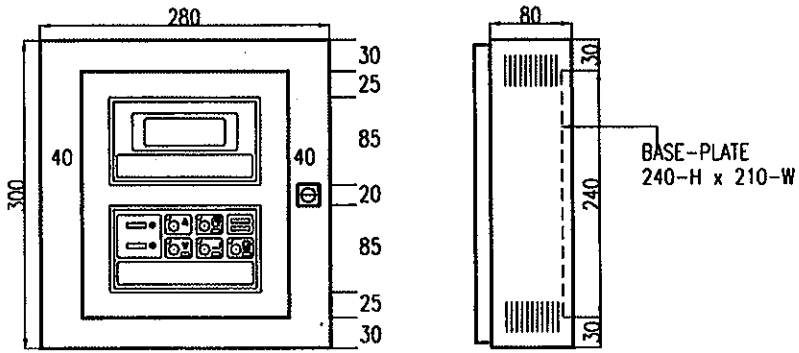
ISOLATE : ISOLATE DETECTION CIRCUIT (GREEN)





PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 3 JAN 2002
	SCALE N.T.S	FILE G88-02-IF-LCD
DRAWING TITLE TYPICAL PANEL LAYOUT OF 2 ZONES GAS CONTROL PANEL (INDIVIDUAL FIRING C/W LCD DISPLAY)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

PANEL LAYOUT DIAGRAM OF Repeater Panel (LCD Type)



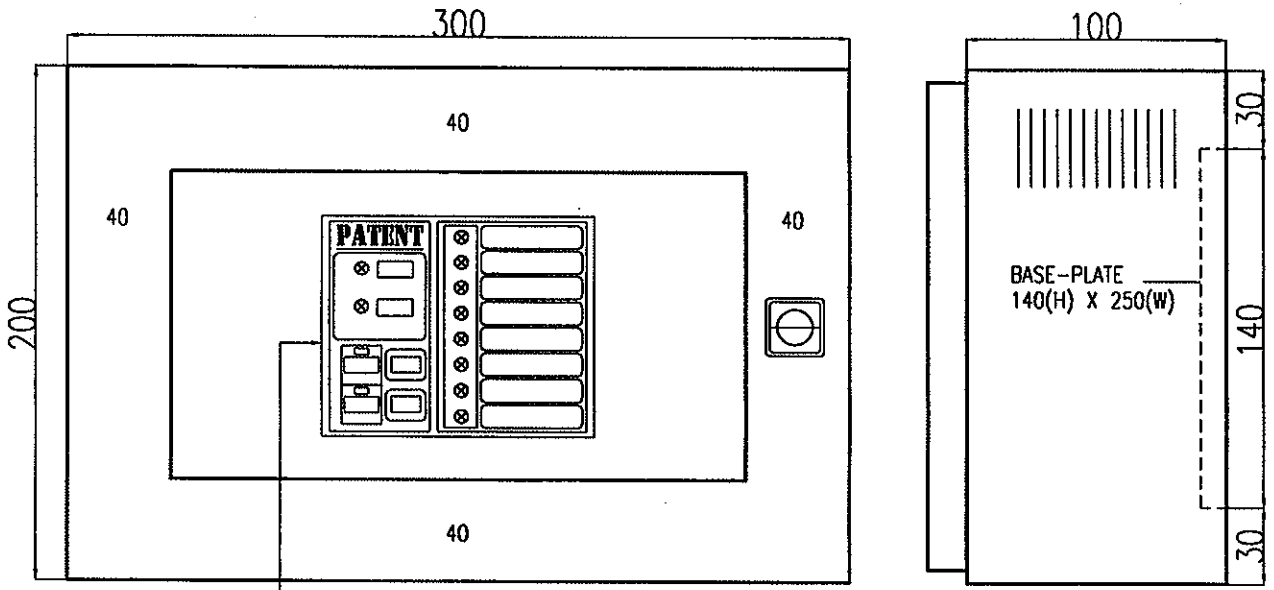
PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 30 AUG 2001
	SCALE N.T.S	FILE P88-SP-LCD
DRAWING TITLE LCD DISPLAY REPEATER PANEL	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:273227B	

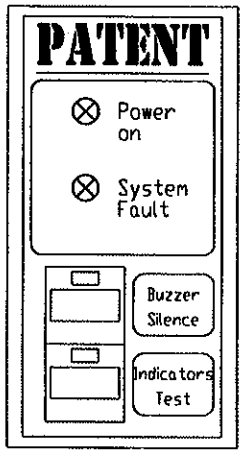
PANEL LAYOUT DIAGRAM OF Repeater Panel (LED Type)

PATENT *System 88*

Standard Panel Size and Weight (Repeater Panel)

PANEL TYPE NO. OF ZONES	SIZE (mm)			BASE-PLATE SIZE	WEIGHT (Kg)
	H	W	D		
4 Zones 8 Zones 12 Zones 16 Zones	200	300	120	140(H) X 250(W)	
20 Zones 24 Zones	220	350	120	160(H) X 300(W)	
28 Zones 32 Zones	300	300	120	240(H) X 250(W)	
36 Zones 40 Zones	300	350	120	240(H) X 300(W)	





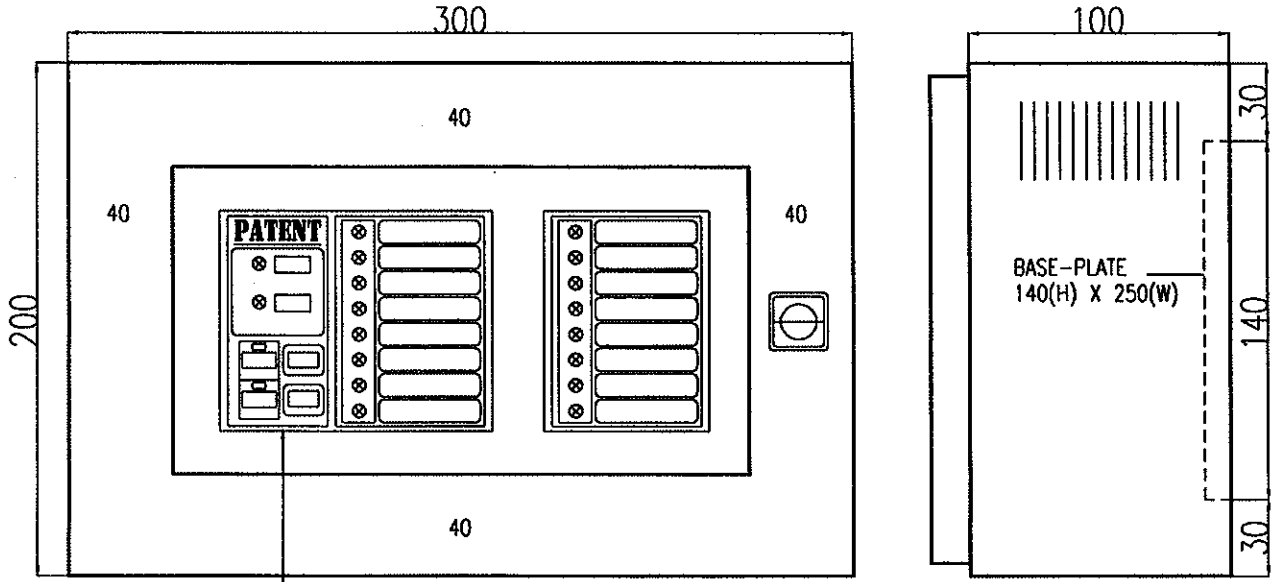
INDICATORS

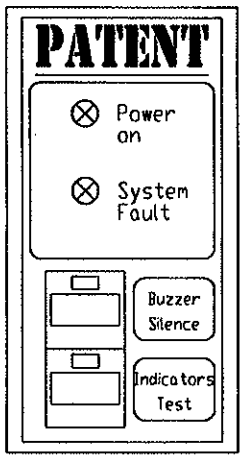
POWER ON : System Energised
SYSTEM FAULT : Foult in the Main Fire Alarm Panel

CONTROLS

BUZZER SILENCE (YELLOW) : Acknowledge Audio Warning (Subsequent resound)
INDICATORS TEST (BLUE) : Tests working condition of audio buzzer and visual indicators

PROJECT TITLE PROPOSED REPEATER PANEL FOR	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 4 JAN 2001
	SCALE N.T.S	FILE P88-08-REP
DRAWING TITLE 8 ZONES REPEATER PANEL	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	





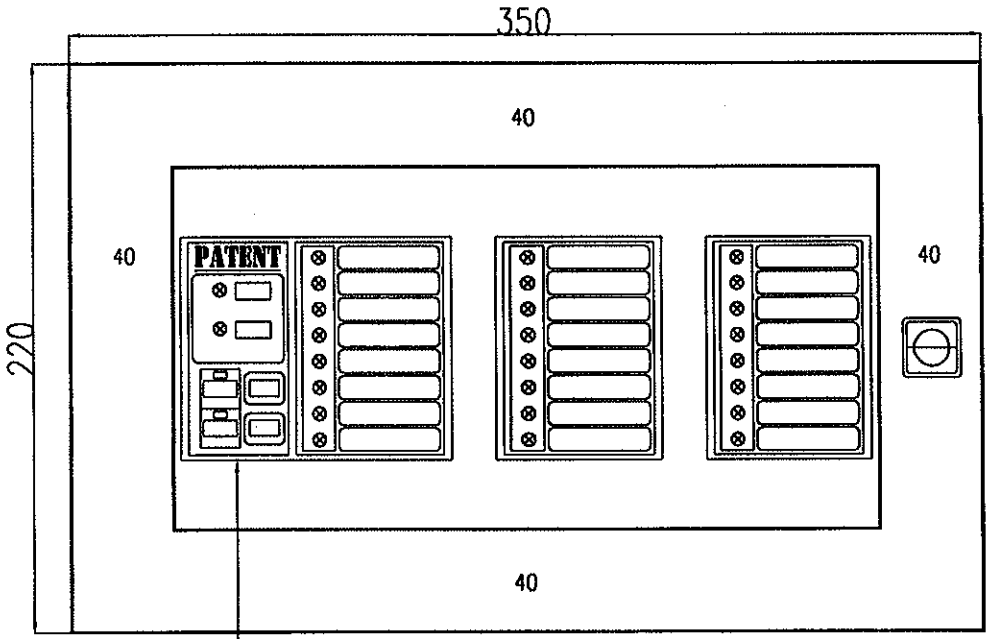
INDICATORS

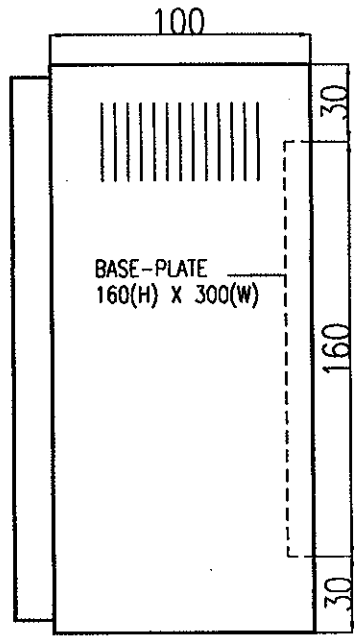
POWER ON : System Energised
SYSTEM FAULT : Fault in the Main Fire Alarm Panel

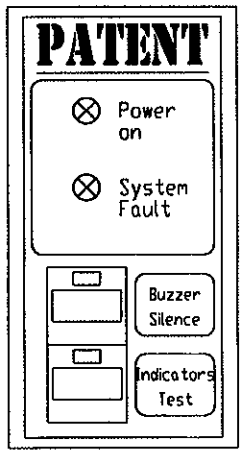
CONTROLS

BUZZER SILENCE (YELLOW) : Acknowledge Audio Warning (Subsequent resound)
INDICATORS TEST (BLUE) : Tests working condition of audio buzzer and visual indicators

PROJECT TITLE PROPOSED REPEATER PANEL FOR	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 4 JAN 2001
	SCALE N.T.S	FILE P88-16-REP
DRAWING TITLE 16 ZONES REPEATER PANEL	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	







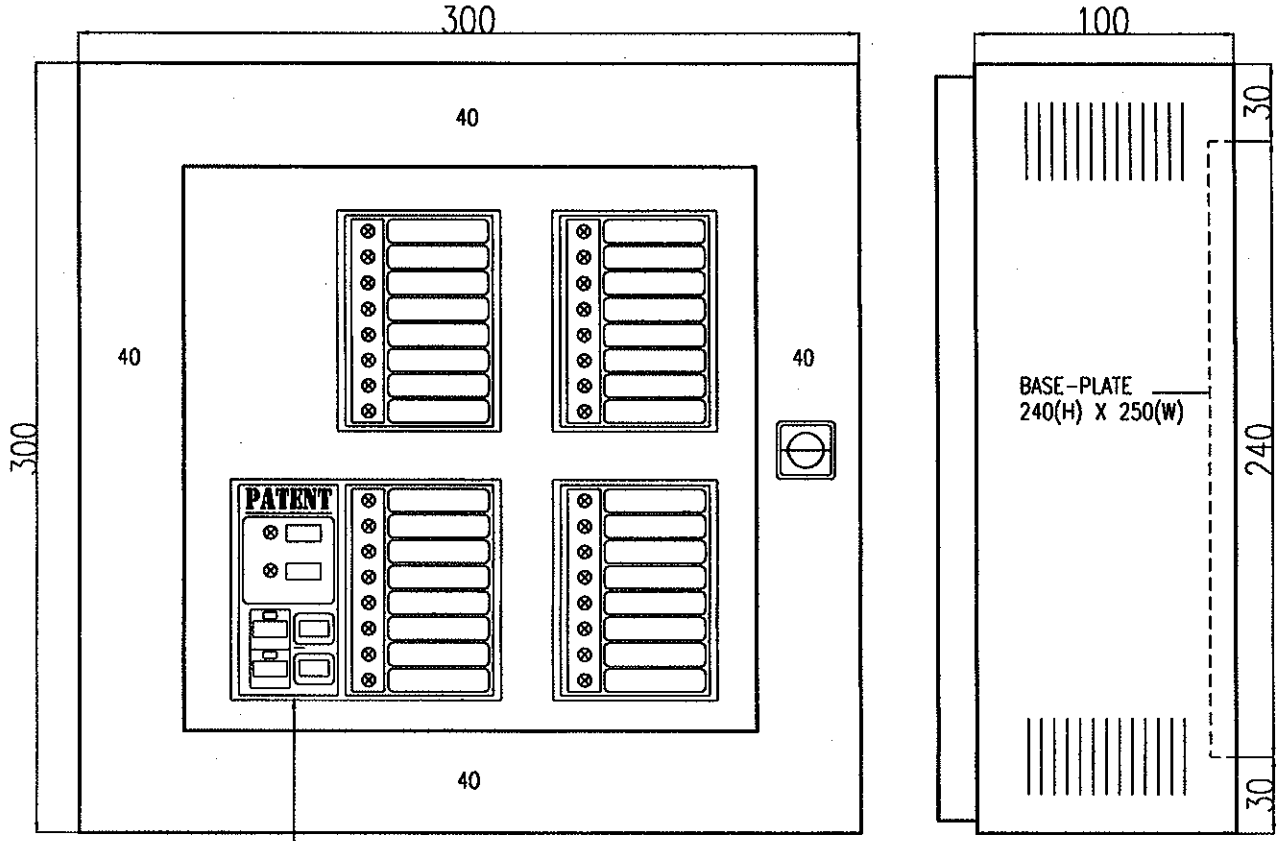
INDICATORS

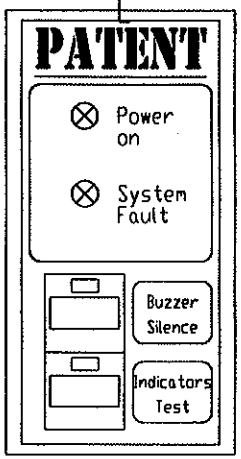
POWER ON : System Energised
SYSTEM FAULT : Fault in the Main Fire Alarm Panel

CONTROLS

BUZZER SILENCE (YELLOW) : Acknowledge Audio Warning (Subsequent resound)
INDICATORS TEST (BLUE) : Tests working condition of audio buzzer and visual indicators

PROJECT TITLE PROPOSED REPEATER PANEL FOR	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 4 JAN 2001
	SCALE N.T.S	FILE P88-24-REP
DRAWING TITLE 24 ZONES REPEATER PANEL	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	





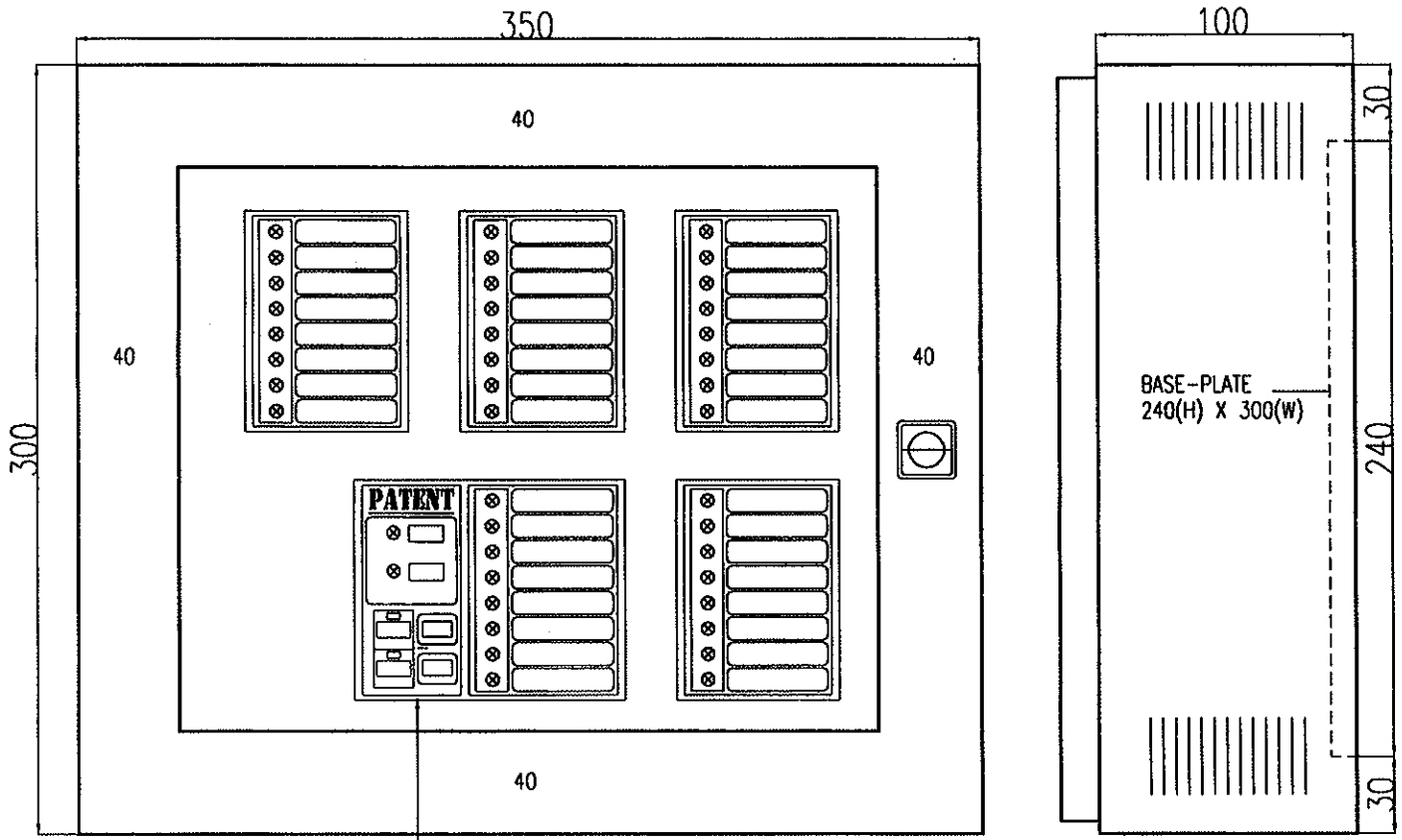
INDICATORS

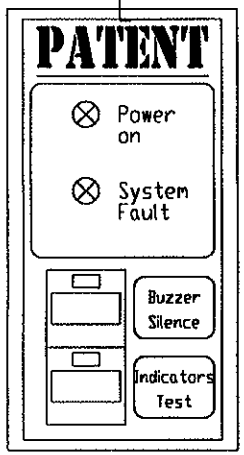
POWER ON : System Energised
SYSTEM FAULT : Fault in the Main Fire Alarm Panel

CONTROLS

BUZZER SILENCE (YELLOW) : Acknowledge Audio Warning (Subsequent resound)
INDICATORS TEST (BLUE) : Tests working condition of audio buzzer and visual indicators

PROJECT TITLE PROPOSED REPEATER PANEL FOR	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 4 JAN 2001
	SCALE N.T.S	FILE P88-32-REP
DRAWING TITLE 32 ZONES REPEATER PANEL	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	





INDICATORS

POWER ON : System Energised
SYSTEM FAULT : Fault in the Main Fire Alarm Panel

CONTROLS

BUZZER SILENCE (YELLOW) : Acknowledge Audio Warning (Subsequent resound)
INDICATORS TEST (BLUE) : Tests working condition of audio buzzer and visual indicators

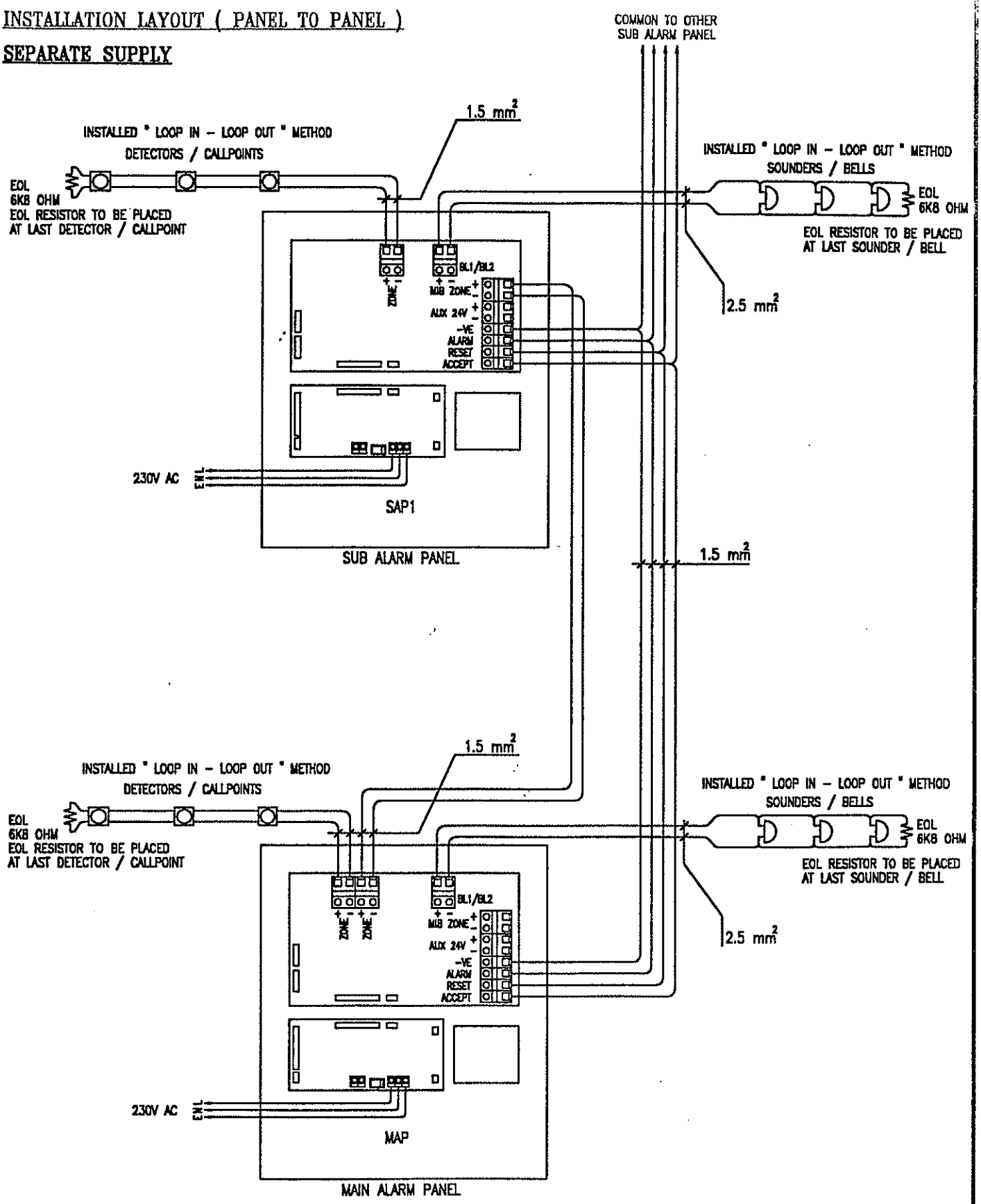
PROJECT TITLE PROPOSED REPEATER PANEL FOR	DRAWN BY A M N	DRAWING NO
	DESIGNED BY A M N	DATE 4 JAN 2001
	SCALE N.T.S	FILE P88-40-REP
DRAWING TITLE 40 ZONES REPEATER PANEL	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

CONVENTIONAL PANELS ACCESSORY CARDS

PATENT

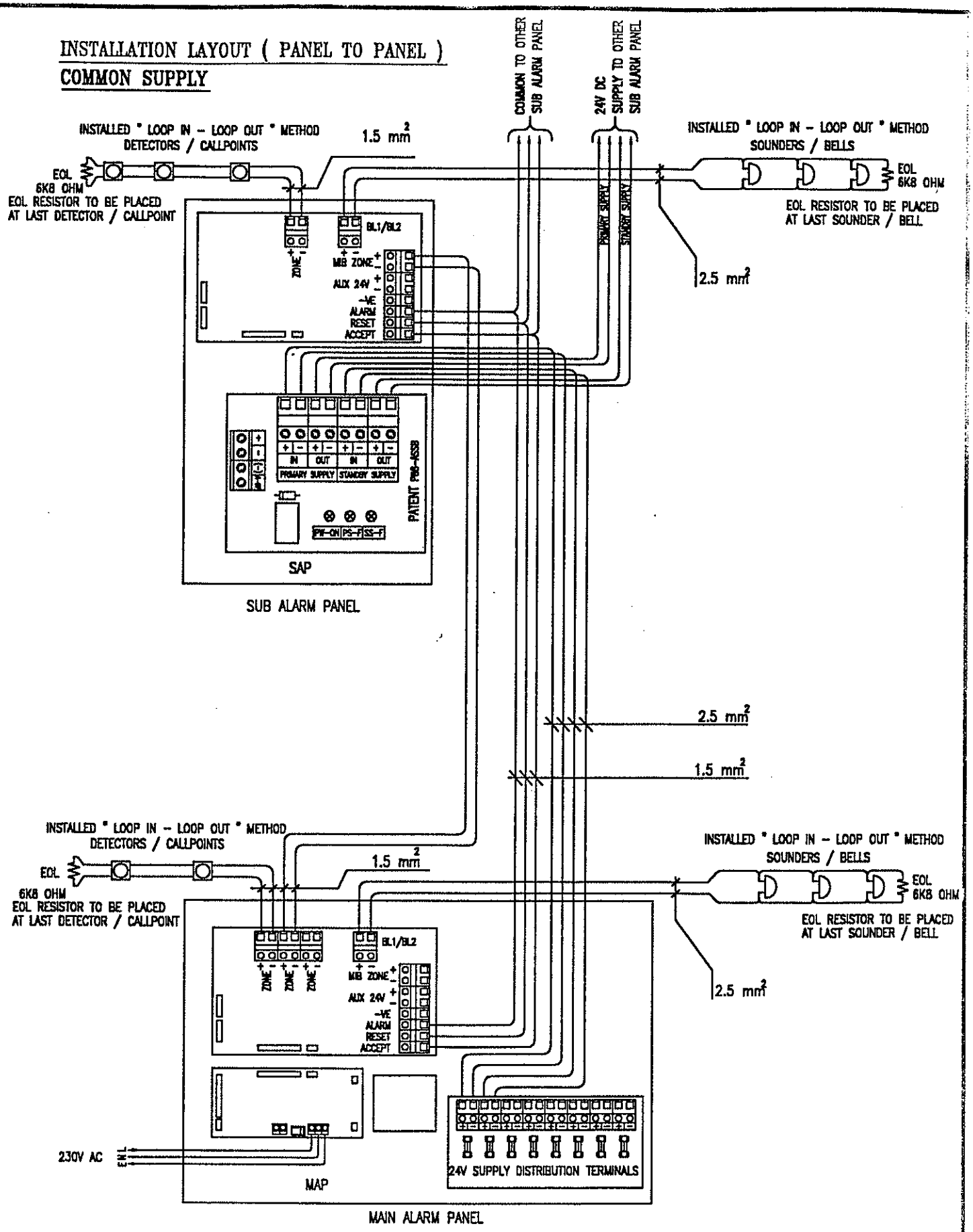
INSTALLATION LAYOUT (PANEL TO PANEL)

SEPARATE SUPPLY



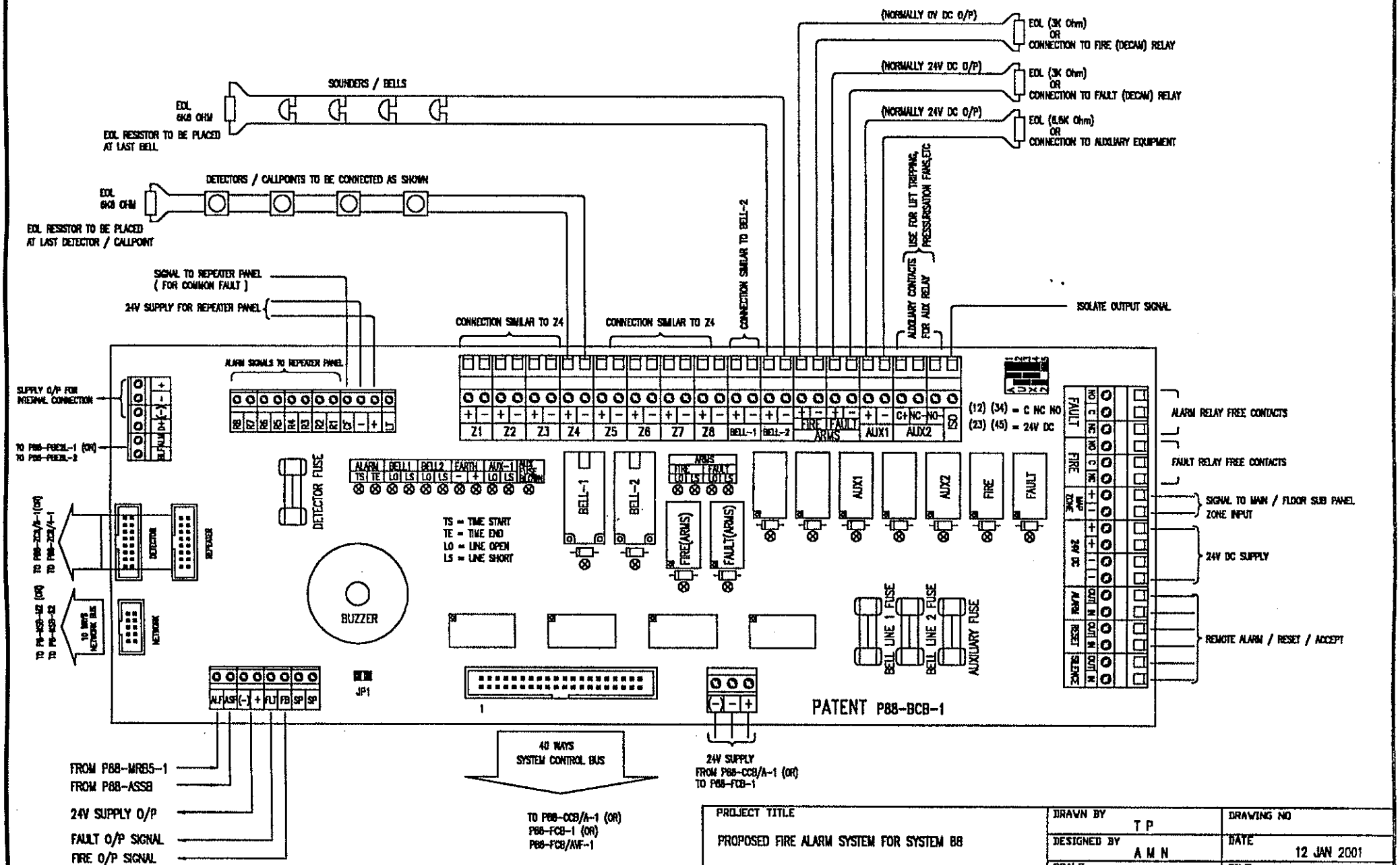
FILE NAME	: \TIL\P88\NET-IND-0
DATE	: 13 MAR 2002
REV.	: 00

INSTALLATION LAYOUT (PANEL TO PANEL)
COMMON SUPPLY



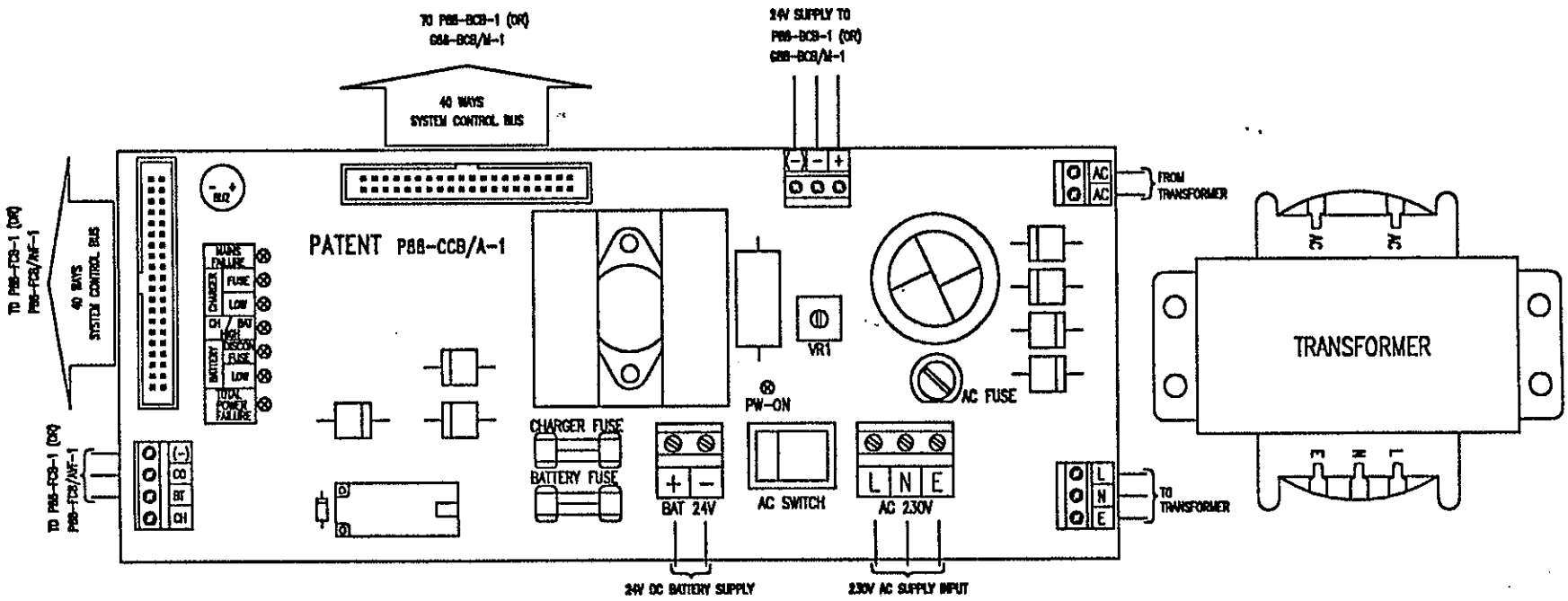
FILE NAME	: TIL\P88\NET-COM-AS-0
DATE	: 13 MAR 2002
REV.	: 00

TYPICAL INS .TION LAYOUT FOR BASE CONTROL BOARD (P B-1)



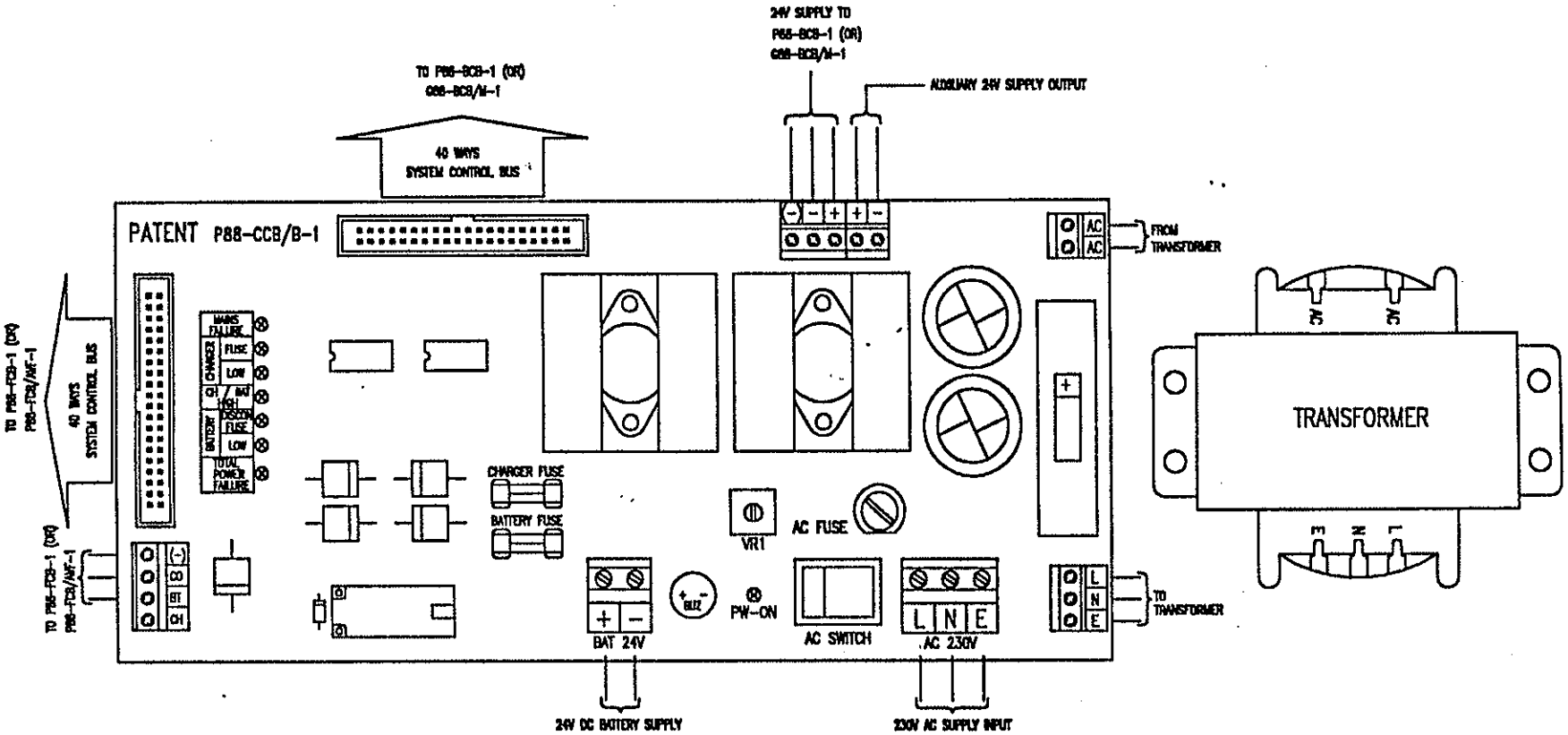
PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY T P	DRAWING NO
	DESIGNED BY A M N	DATE 12 JAN 2001
	SCALE N.T.S	FILE P88-BCB-1-TIL
DRAWING TITLE INSTALLATION LAYOUT OF BASE CONTROL BOARD (P88-BCB-1)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

TYPICAL INSTALLATION LAYOUT FOR CHARGER CONTROL BOARD (TYPE A)



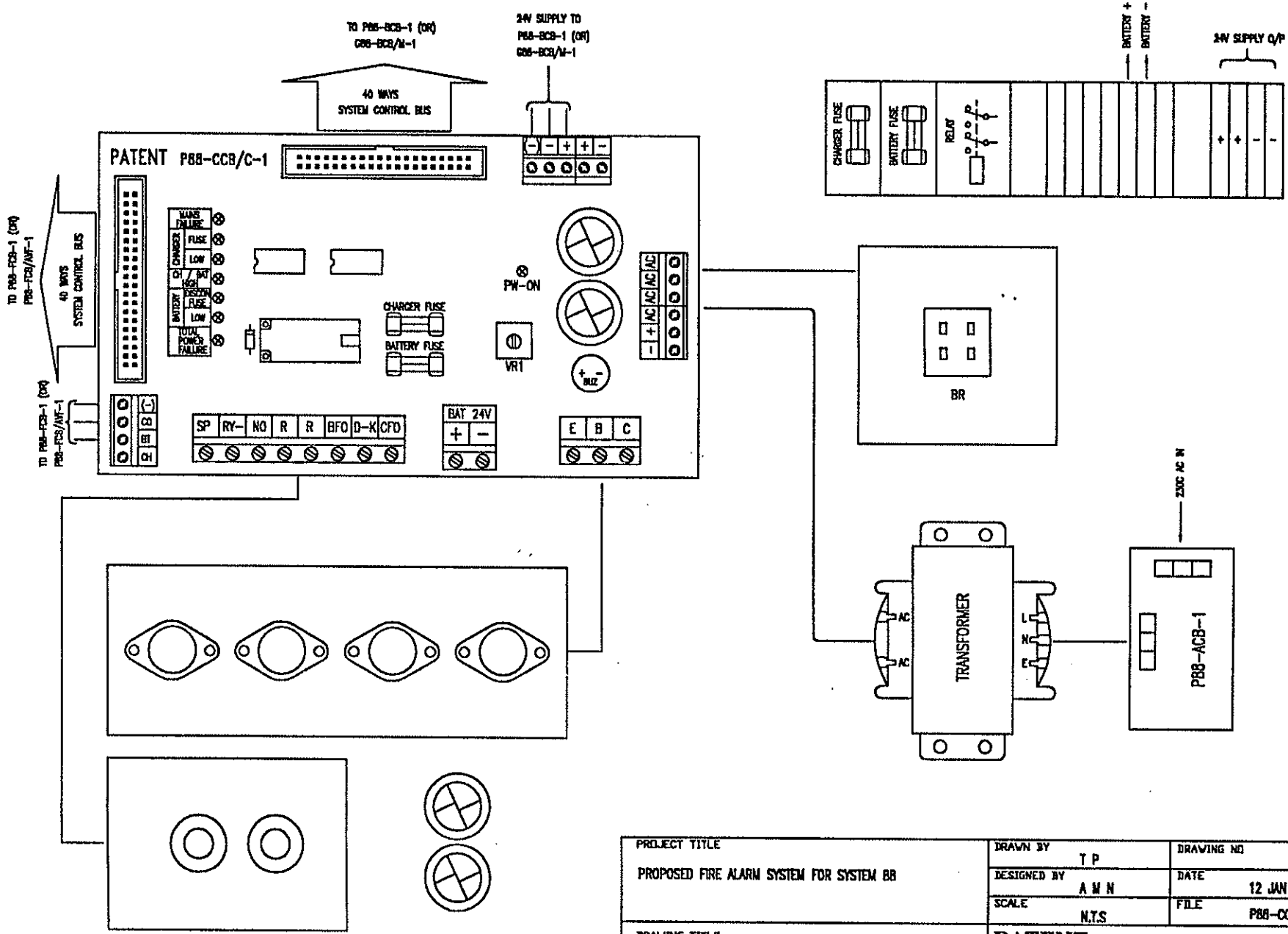
PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY T P	DRAWING NO
	DESIGNED BY A M N	DATE 12 JAN 2001
	SCALE N.T.S	FILE P88-CCB-A1-TIL
DRAWING TITLE INSTALLATION LAYOUT OF CHARGER CONTROL BOARD (TYPE A) (P88-CCB/A-1)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 150455 TEL: 2732277 FAX:2732278	

TYPICAL INSTALLATION LAYOUT FOR CHARGER CONTROL BOARD (TYPE B)



PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY T P	DRAWING NO
	DESIGNED BY A M N	DATE 12 JAN 2001
	SCALE N.T.S	FILE P88-CCB-B1-TIL
DRAWING TITLE INSTALLATION LAYOUT OF CHARGER CONTROL BOARD (TYPE B) (P88-CCB/B-1)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

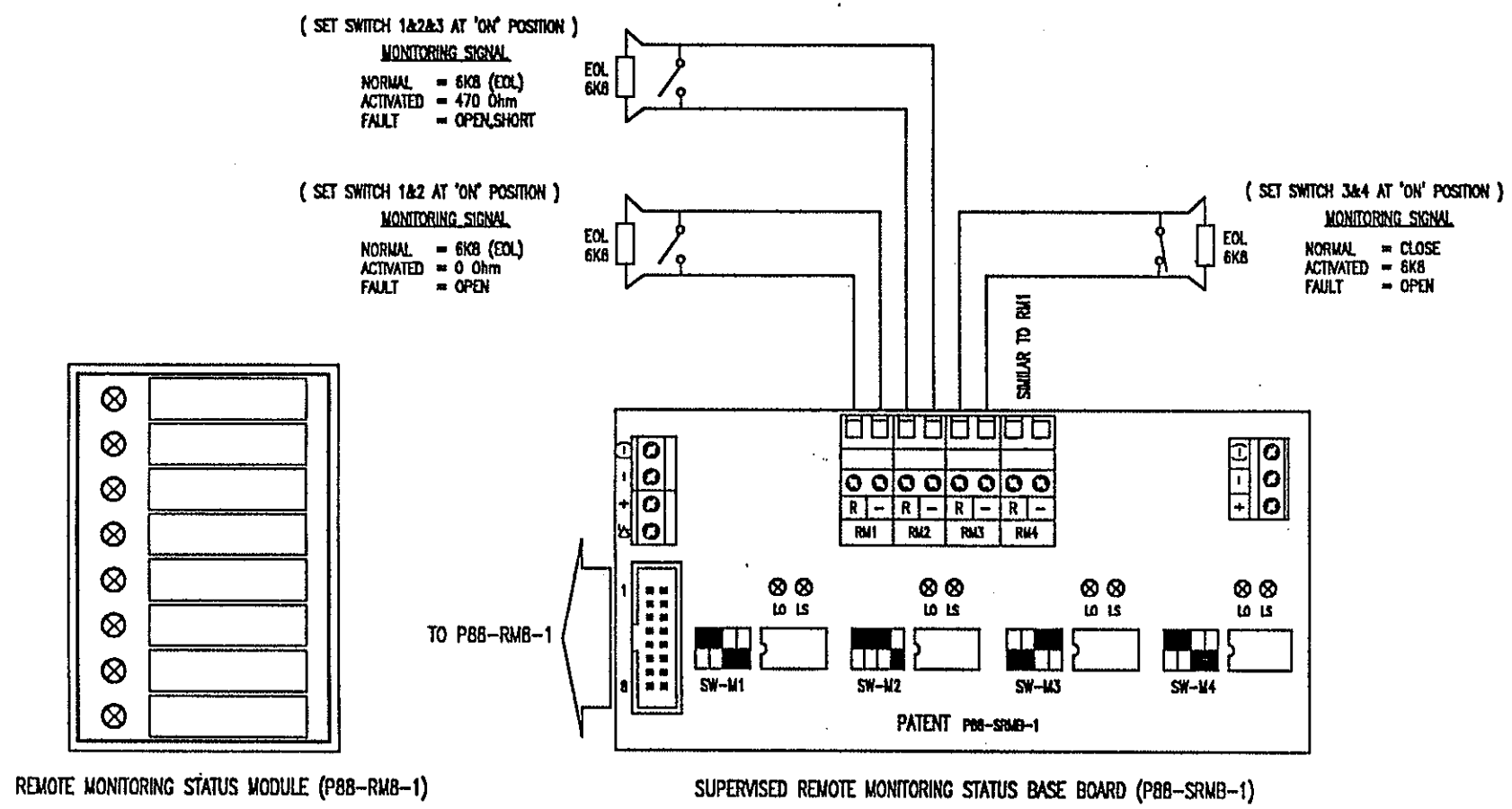
TYPICAL INSTALLATION LAYOUT FOR CHARGER CONTROL BOARD (TYPE C)



PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY T P	DRAWING NO
	DESIGNED BY A M N	DATE 12 JAN 2001
	SCALE N.T.S	FILE P88-CCB-C1-TL
DRAWING TITLE INSTALLATION LAYOUT OF CHARGER CONTROL BOARD (TYPE C) (P88-CCB/C-1)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

INSTALLATION LAYOUT DIAGRAM FOR SUPERVISED REMOTE MONITORING BASE BOARD

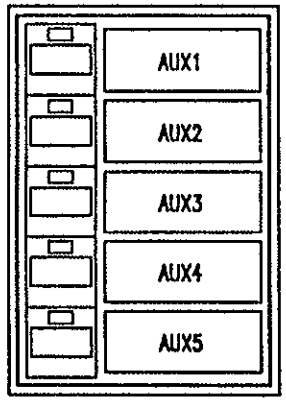
(MODEL NO : P88-SRMB-1)



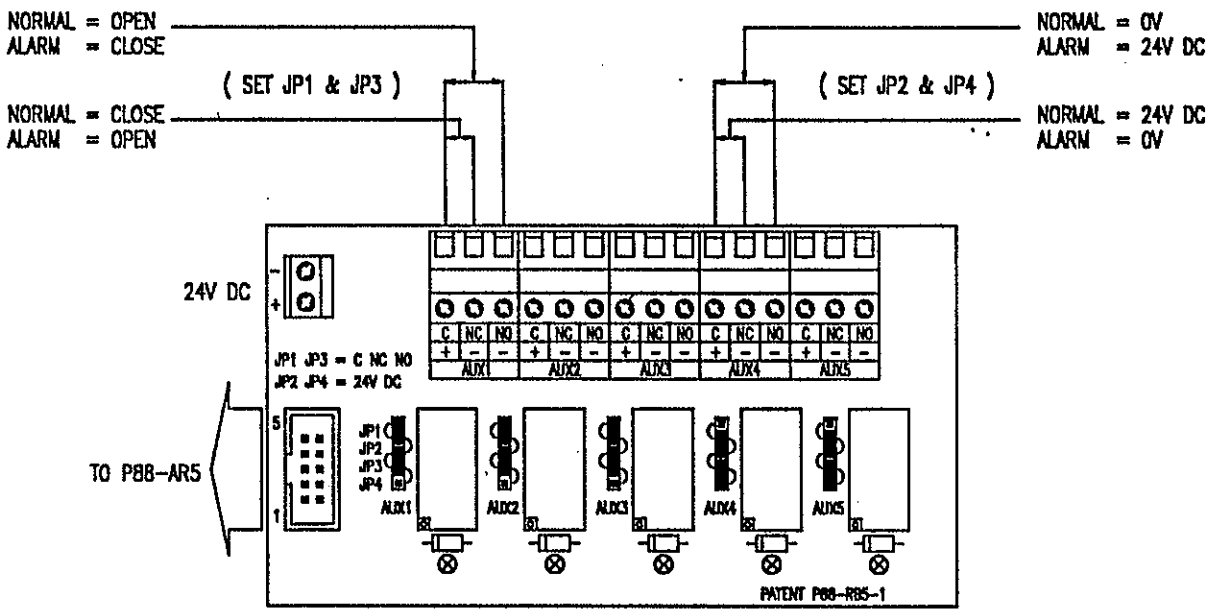
REMOTE MONITORING STATUS MODULE (P88-RMB-1)

SUPERVISED REMOTE MONITORING STATUS BASE BOARD (P88-SRMB-1)

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY T P	DRAWING NO
	DESIGNED BY A M N	DATE 10 JAN 2001
	SCALE N.T.S	FILE P88-SRMB-1-TH.
DRAWING TITLE INSTALLATION LAYOUT DIAGRAM OF SUPERVISED REMOTE MONITORING BOARD (P88-SRMB-1)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 150455 TEL: 2732277 FAX:2732278	



AUXILIARY RELAY CONTROL SWITCHES MODULE (P88-AR5)

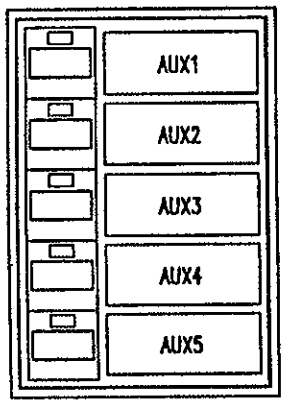


AUXILIARY RELAY BOARD (P88-RB5-1)

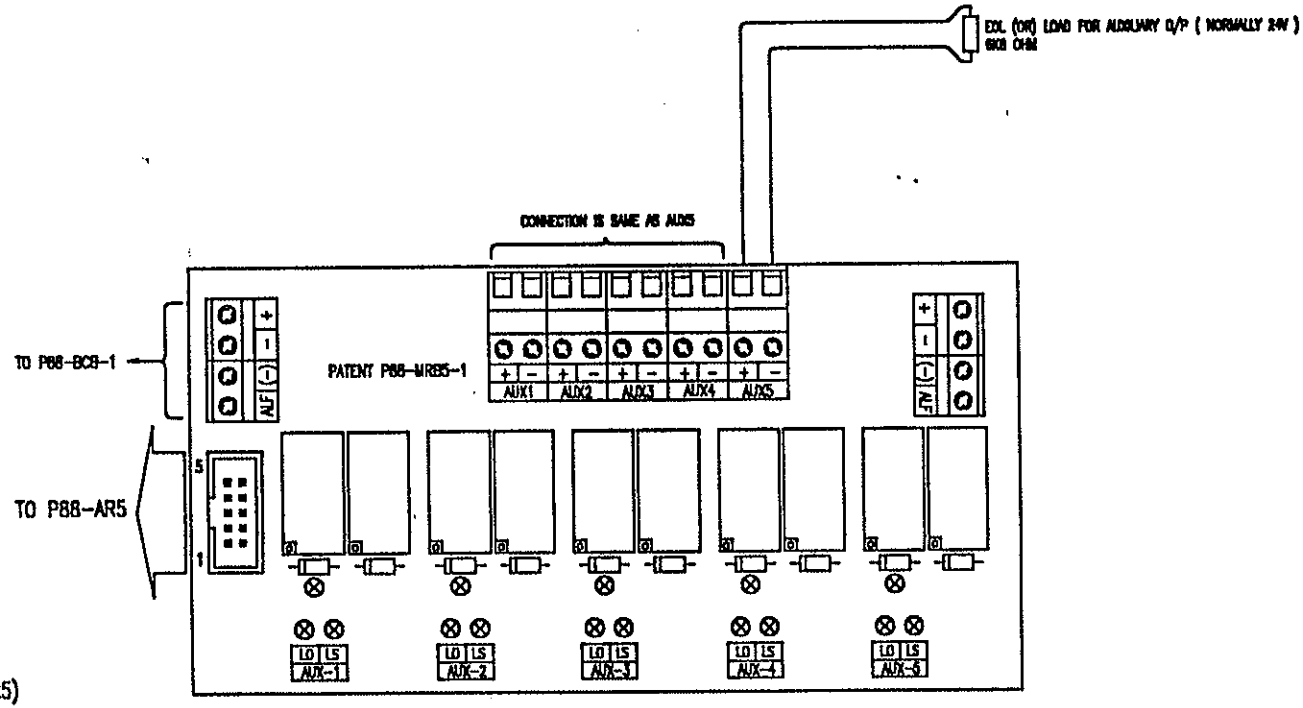
PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY T P	DRAWING NO
	DESIGNED BY A M N	DATE 10 JAN 2001
	SCALE AS SHOWN	FILE P88-RB5-1-TL
DRAWING TITLE AUXILIARY RELAY BOARD INSTALLATION LAYOUT DIAGRAM	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

INSTALLATION LAYOUT DIAGRAM FOR MONITORED AUXILIARY OUTPUT BOARD

(MODEL : P88-MRB5-1)

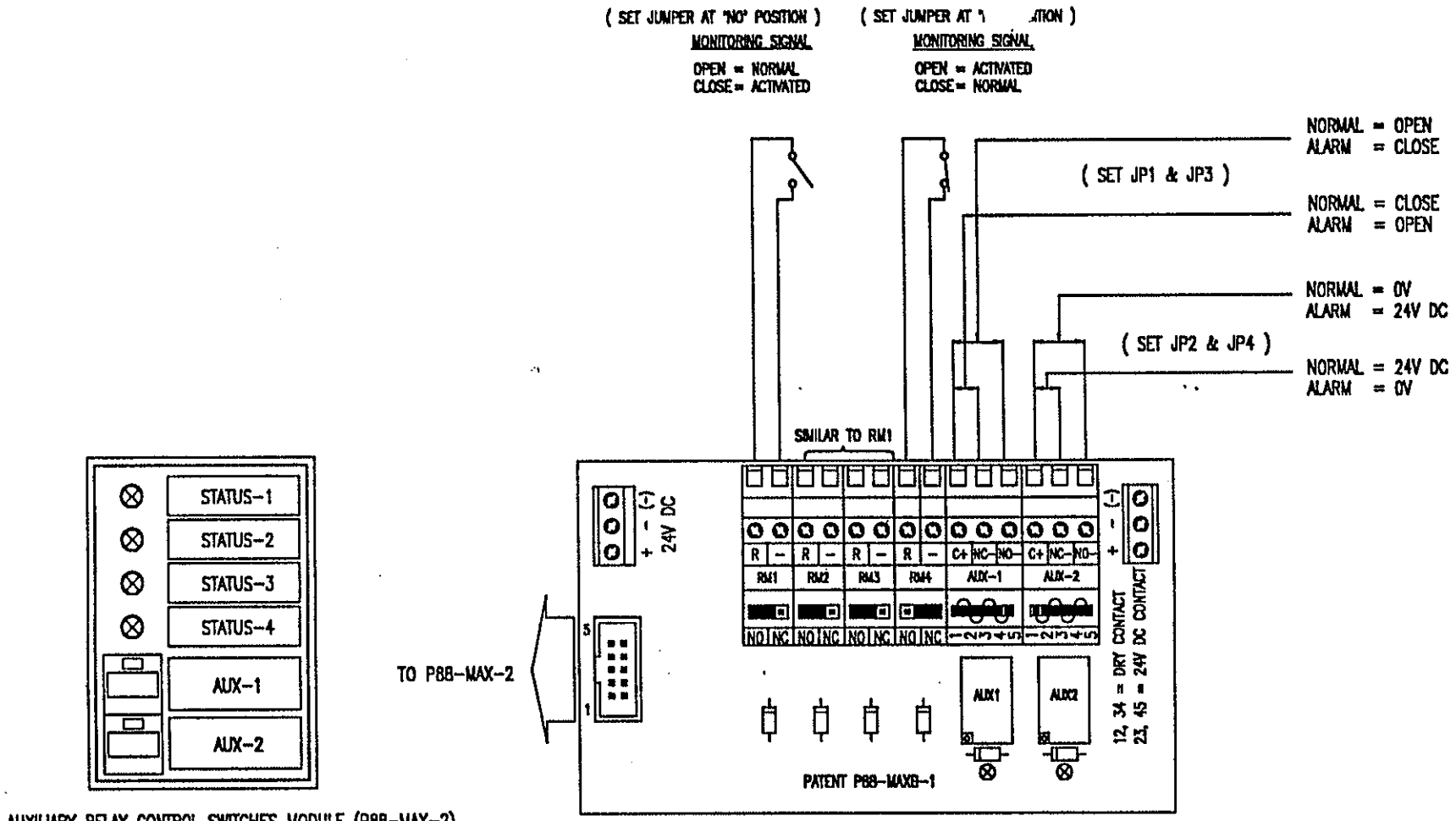


AUXILIARY RELAY CONTROL SWITCHES MODULE (P88-AR5)



AUXILIARY RELAY BOARD (P88-MRB5-1)

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY T P	DRAWING NO
	DESIGNED BY A M N	DATE 10 JAN 2001
	SCALE AS SHOWN	FILE P88-MRB5-1-TIL
DRAWING TITLE INSTALLATION LAYOUT DIAGRAM OF MONITORED AUXILIARY RELAY BOARD (P88-MRB5-1)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	



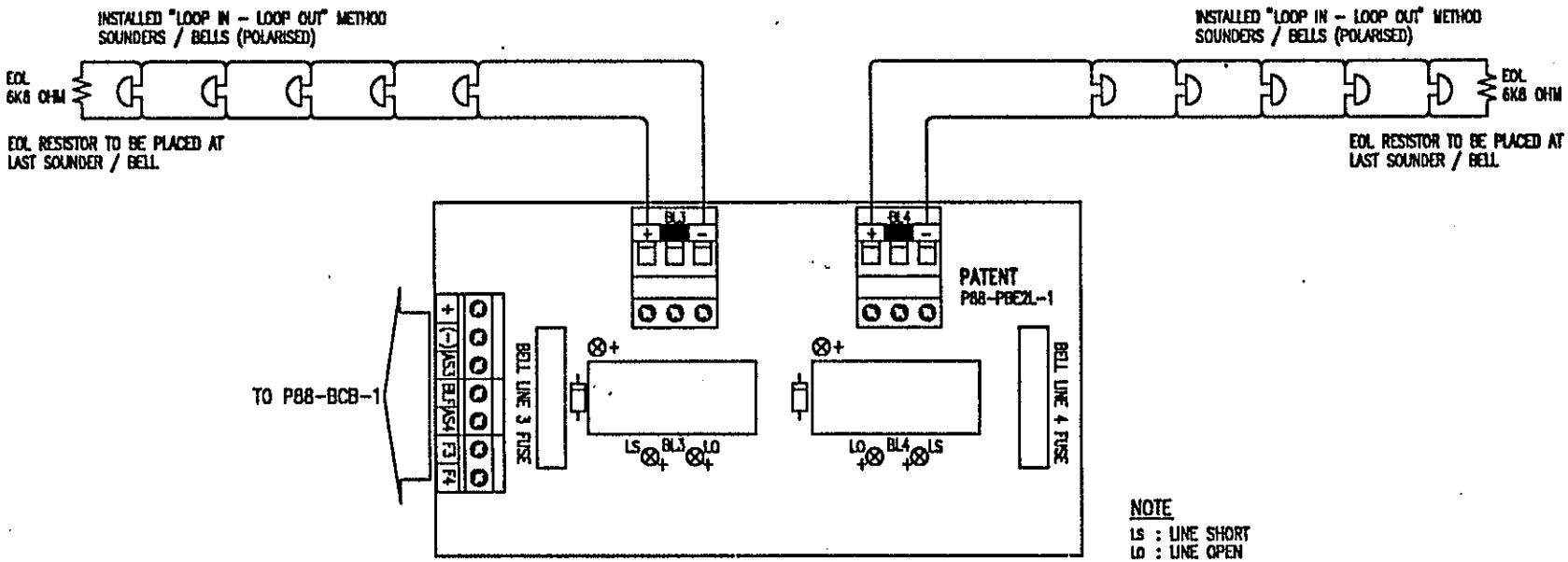
AUXILIARY RELAY CONTROL SWITCHES MODULE (P88-MAX-2)

AUXILIARY RELAY BOARD (P88-MAXB-1)

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY T P	DRAWING NO
	DESIGNED BY A M N	DATE 10 JAN 2001
	SCALE AS SHOWN	FILE P88-MAXB-1-TIL
DRAWING TITLE MIXED MONITORING STATUS & AUXILIARY BASE BOARD INSTALLATION LAYOUT DIAGRAM	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

INSTALLATION LAYOUT OF 2 WAYS BELL / SOUNDER SUPERVISORY BOARD

(MODEL NO. P88-PBE2L-1)



NOTE
LS : LINE SHORT
LO : LINE OPEN

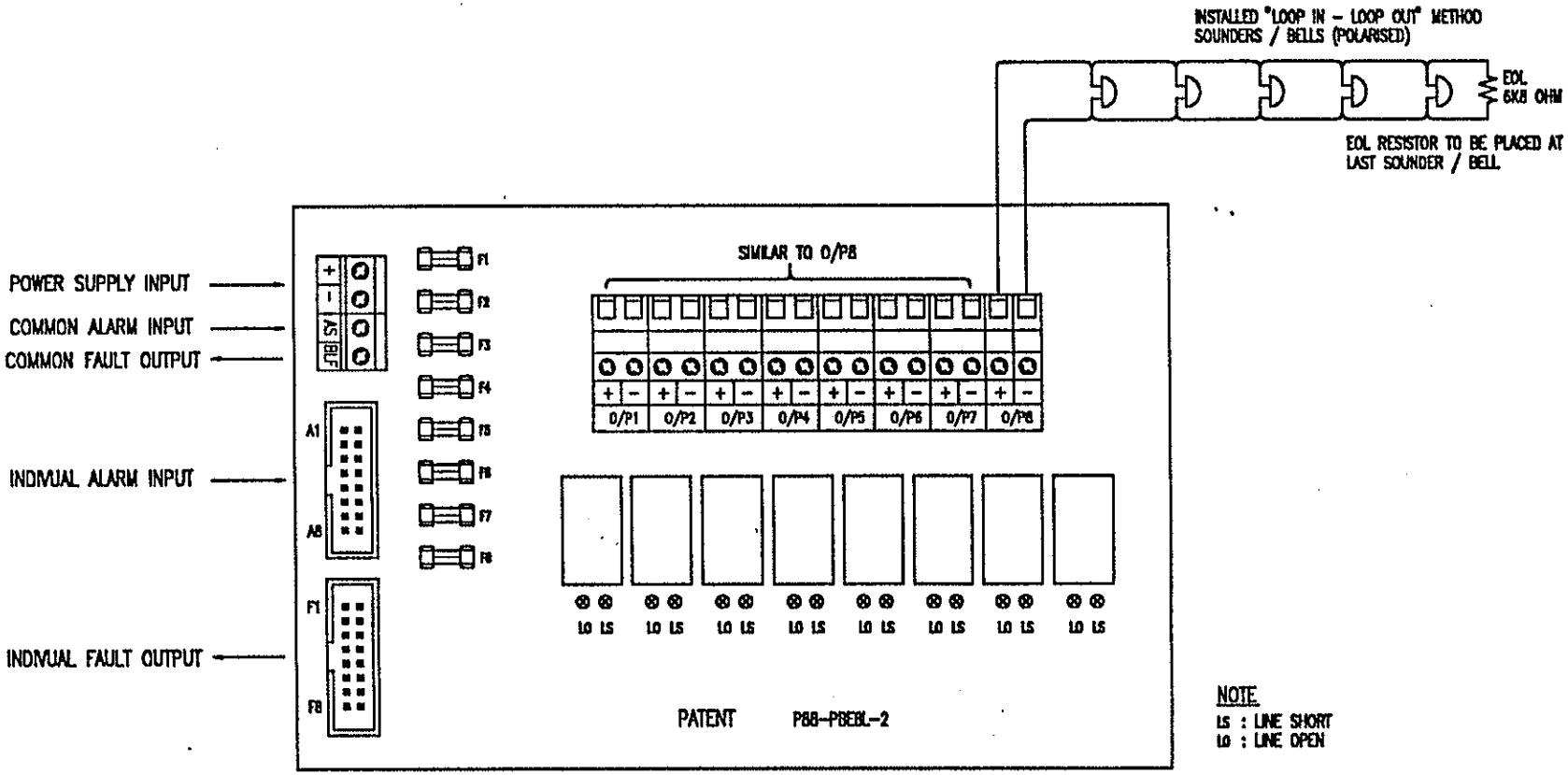
AT ALARM CONDICTION

OUTPUT VOLTAGE	:	24 VDC
CURRENT RATING	:	2 AMP
BELL LINE MORNITORING	:	LINE OPEN , LINE SHORT &
	:	FUSE BLOWN

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY TP	DRAWING NO
	DESIGNED BY AMN	DATE 10 JAN 2001
	SCALE N.T.S	FILE P88-PBE2L-1-TL
DRAWING TITLE INSTALLATION LAYOUT OF 2 WAYS BELL SUPERVISORY BOARD (P88-PBE2L-1)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

INSTALLATION LAYOUT OF 8 WAYS BELL / SOUNDER SUPERVISORY BOARD

(MODEL NO. P88-PBE8L-2)

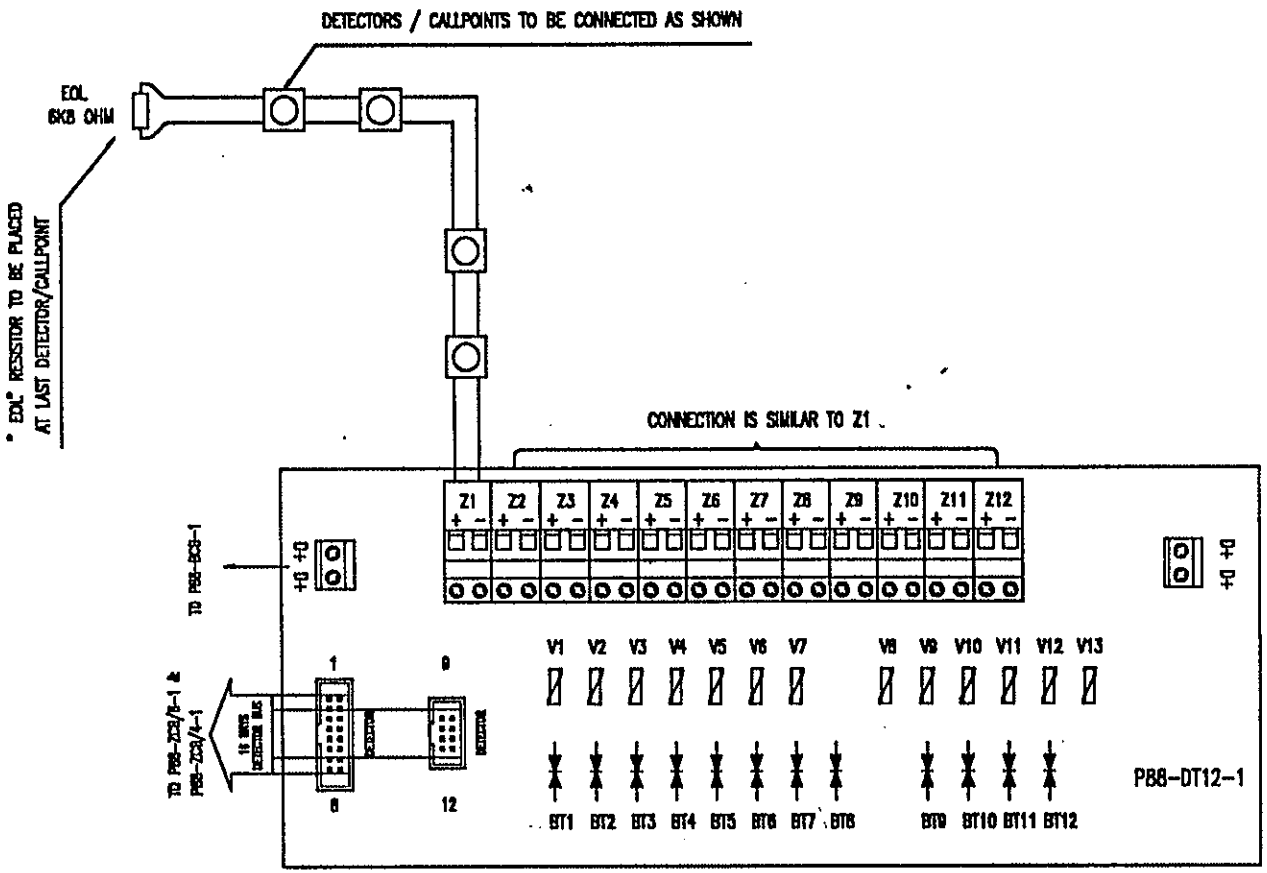


AT ALARM CONDICTION

OUTPUT VOLTAGE	:	24 VDC
CURRENT RATING	:	2 AMP
BELL LINE MORNITORING	:	LINE OPEN , LINE SHORT &
	:	FUSE BLOWN

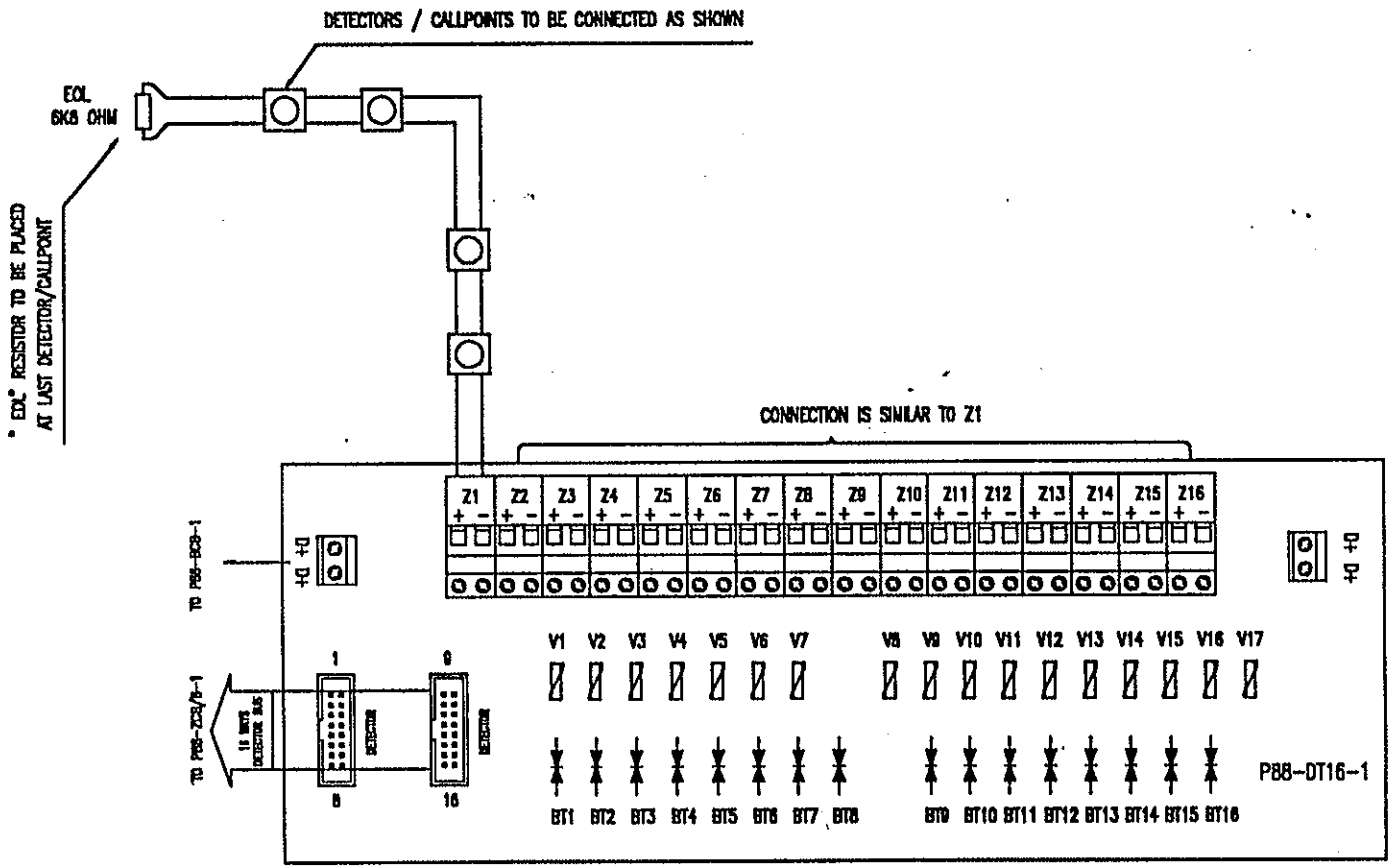
PROJECT TITLE: PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY: TP	DRAWING NO
	DESIGNED BY: AWN	DATE: 10 JAN 2001
	SCALE: N.T.S	FILE: P88-PBE8L-2-TIL
DRAWING TITLE: INSTALLATION LAYOUT OF 8 WAYS BELL SUPERVISORY BOARD	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 158455 TEL: 2732277 FAX:2732278	

TYPICAL INSTALLATION LAYOUT FOR CLASS B WIRING SYSTEM



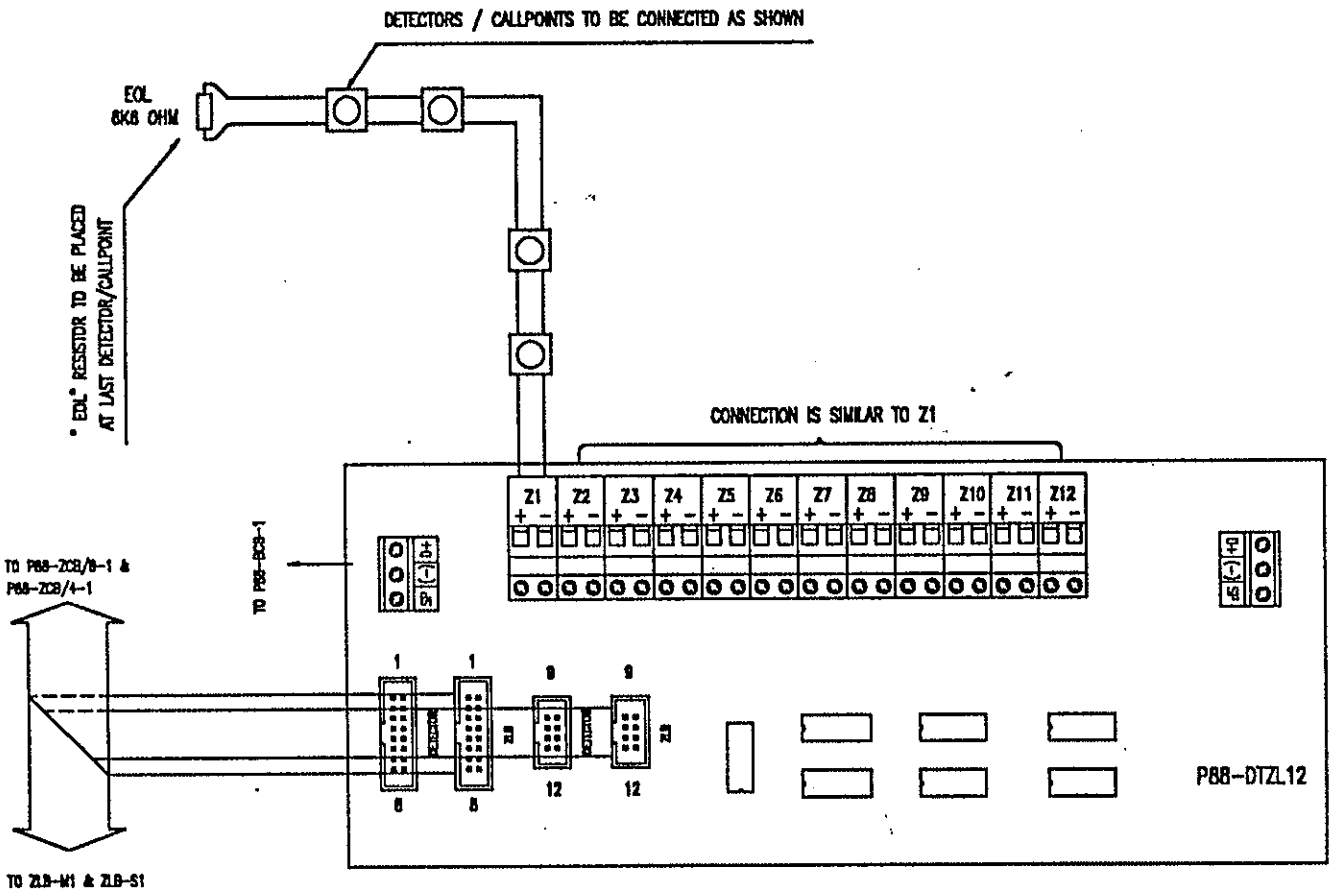
PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY T P	DRAWING NO
	DESIGNED BY A M N	DATE 10 JAN 2001
	SCALE N.T.S	FILE P88-DT12-1-TIL
DRAWING TITLE INSTALLATION LAYOUT OF DETECTION ZONE BOARD (CONNECTION DIAGRAM OF DETECTORS TO P88-DT12-1 BOARD)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 150455 TEL: 2732277 FAX:2732278	

TYPICAL INSTALLATION LAYOUT FOR CLASS B WIRING SYSTEM



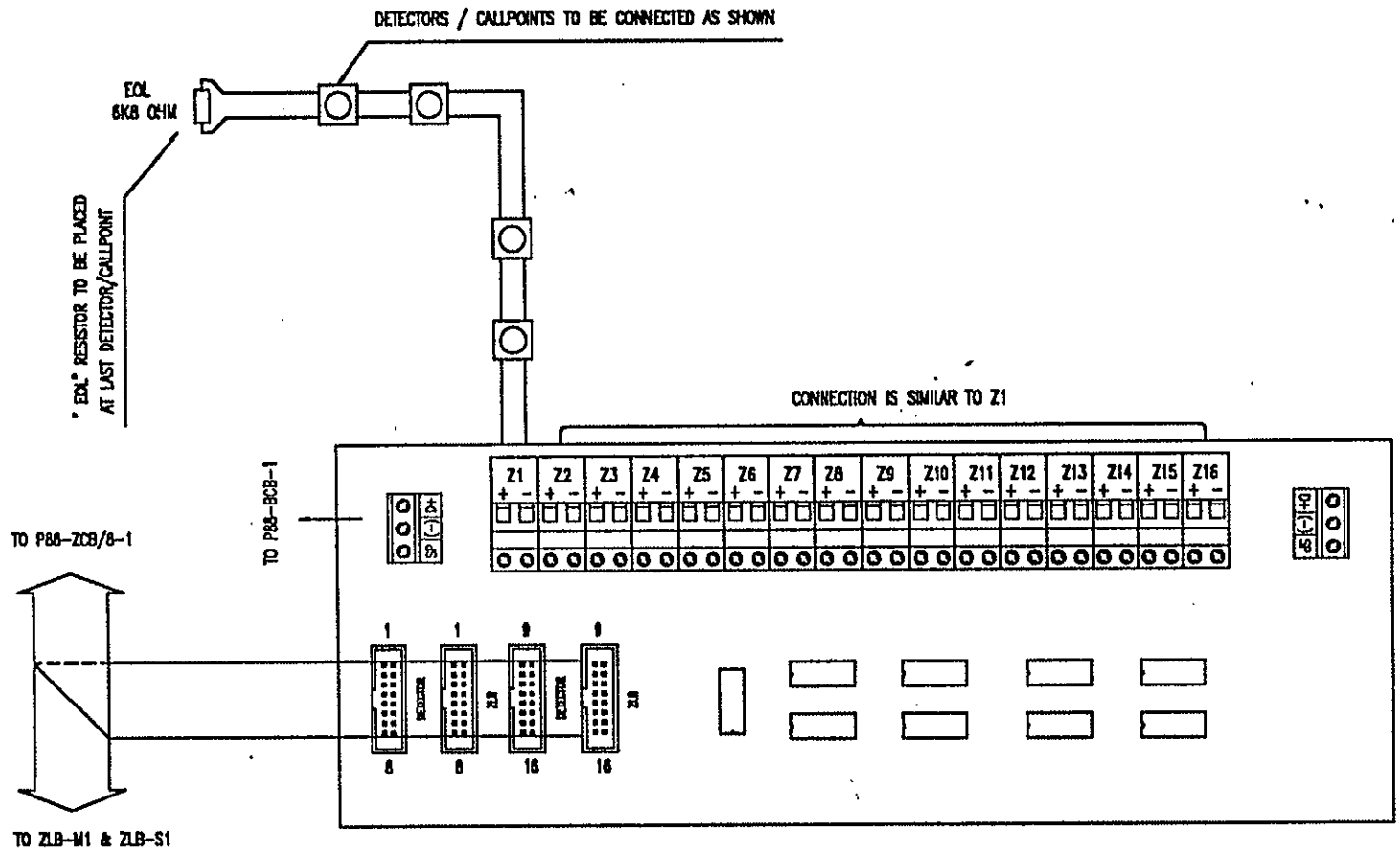
PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY T P	DRAWING NO
	DESIGNED BY A M N	DATE 10 JAN 2001
	SCALE N.T.S	FILE P88-DT16-1-TIL
DRAWING TITLE INSTALLATION LAYOUT OF DETECTION ZONE BOARD (CONNECTION DIAGRAM OF DETECTORS TO P88-DT16-1 BOARD)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

TYPICAL INSTALLATION LAYOUT FOR CLASS B WIRING SYSTEM



PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY T P	DRAWING NO
	DESIGNED BY A M N	DATE 10 JAN 2001
	SCALE N.T.S	FILE P88-DTZL12-TL
DRAWING TITLE INSTALLATION LAYOUT OF DETECTION ZONE BOARD WITH REPEATER OUTPUT (P88-DTZL12)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

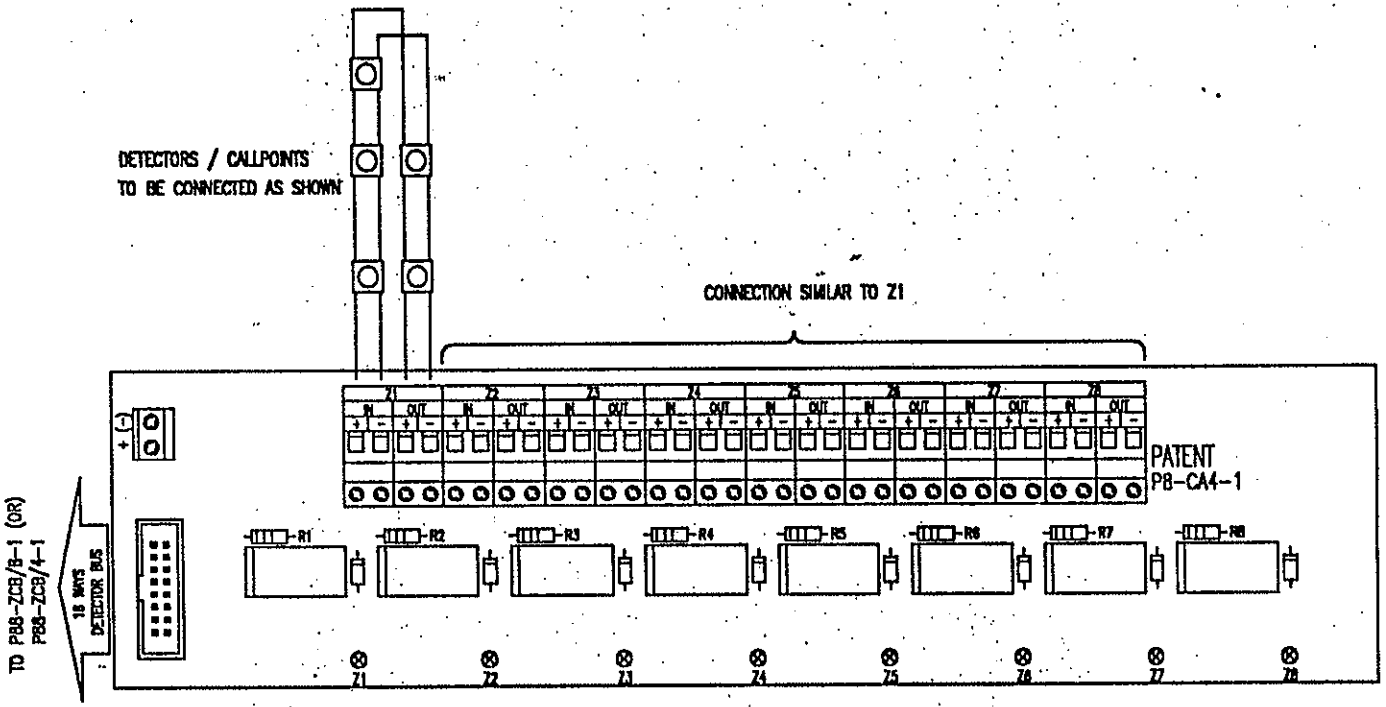
TYPICAL INSTALLATION LAYOUT FOR CLASS B WIRING SYSTEM



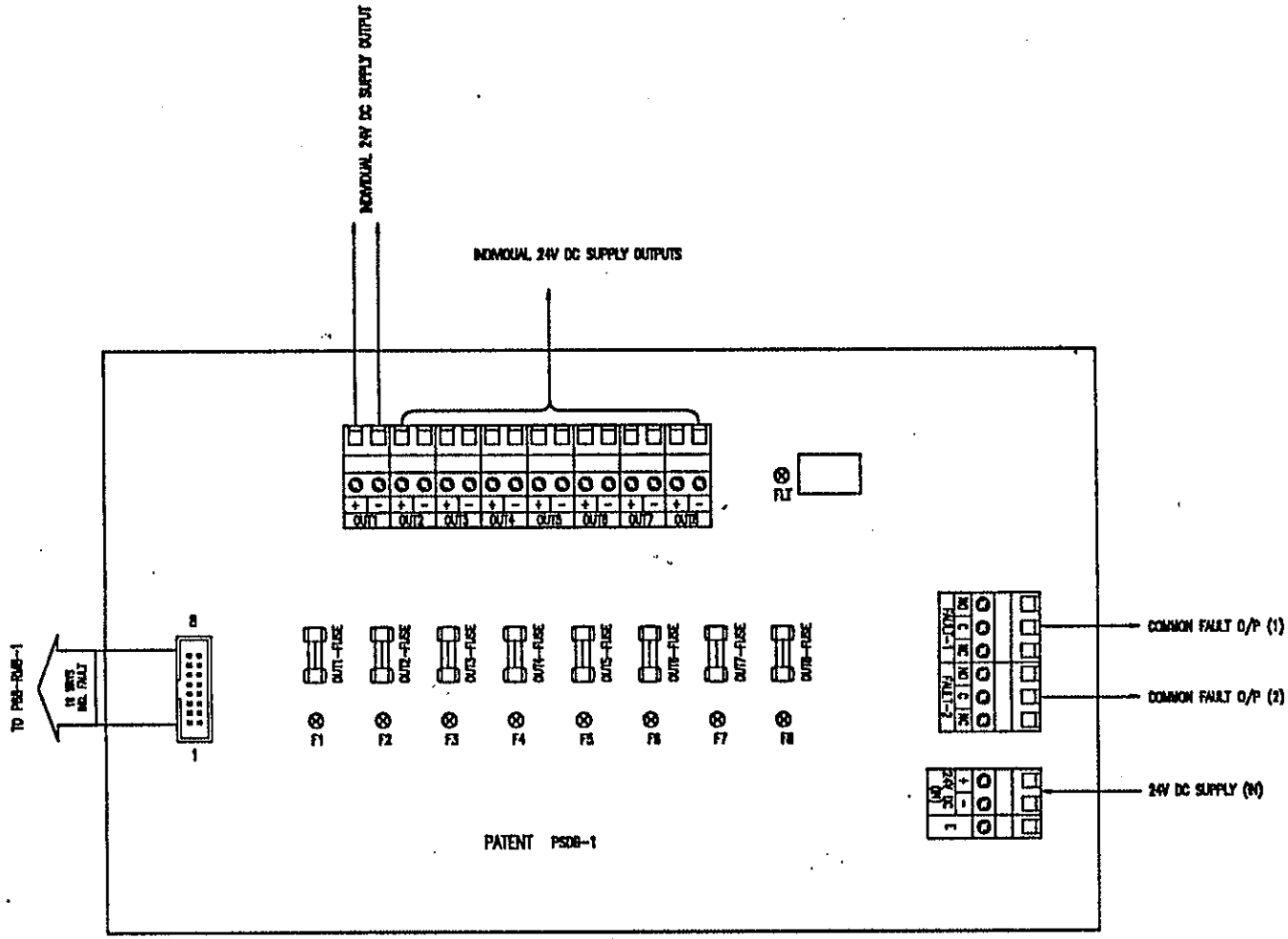
PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY T P	DRAWING NO
	DESIGNED BY A M N	DATE 10 JAN 2001
	SCALE N.T.S	FILE P88-DTZL16-1-TIL
DRAWING TITLE INSTALLATION LAYOUT OF 16 DETECTION ZONE BOARD WITH REPEATER OUTPUT (P88-DTZL16-1)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

INSTALLATION LAYOUT FOR CLASS 'A' 4 WIRES SYSTEM

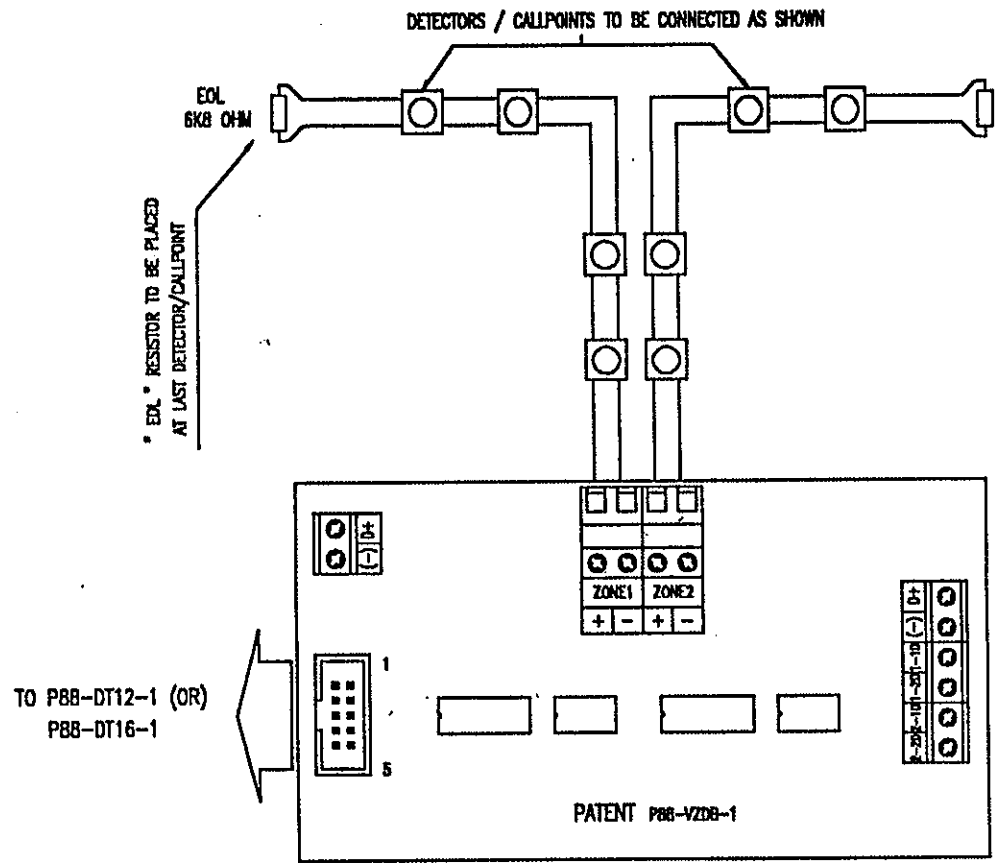
(MODEL NO. P8-CA4-1)



PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY TP	DRAWING NO
	DESIGNED BY AMN	DATE 12 JAN 2001
	SCALE N.T.S	FILE P88-CA4-1-TL
DRAWING TITLE INSTALLATION LAYOUT FOR CLASS 'A' 4 WIRE SYSTEM (P8-CA4-1)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 150455 TEL: 2732277 FAX:2732278	

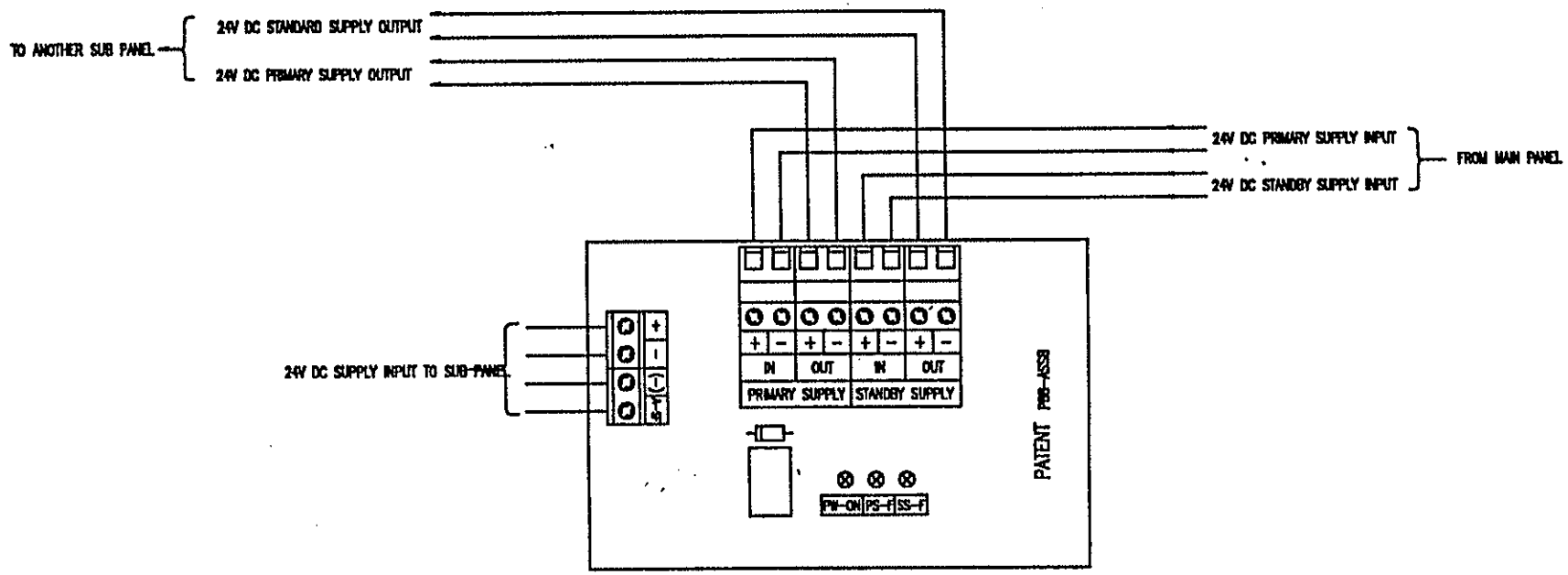


PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY T P	DRAWING NO
	DESIGNED BY A M N	DATE 10 JAN 2001
	SCALE N.T.S	FILE P88-PSDB-1-TL
DRAWING TITLE INSTALLATION LAYOUT DIAGRAM OF POWER SUPPLY DISTRIBUTION BOARD (PSDB-1)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	



VOTING ZONE DETECTION BOARD (P88-VZDB-1)

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY T P	DRAWING NO
	DESIGNED BY A M N	DATE 10 JAN 2001
	SCALE N.T.S	FILE P88-VZDB-1-TL
DRAWING TITLE INSTALLATION LAYOUT DIAGRAM OF VOTING ZONE DETECTION BOARD	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 150455 TEL: 2732277 FAX:2732278	

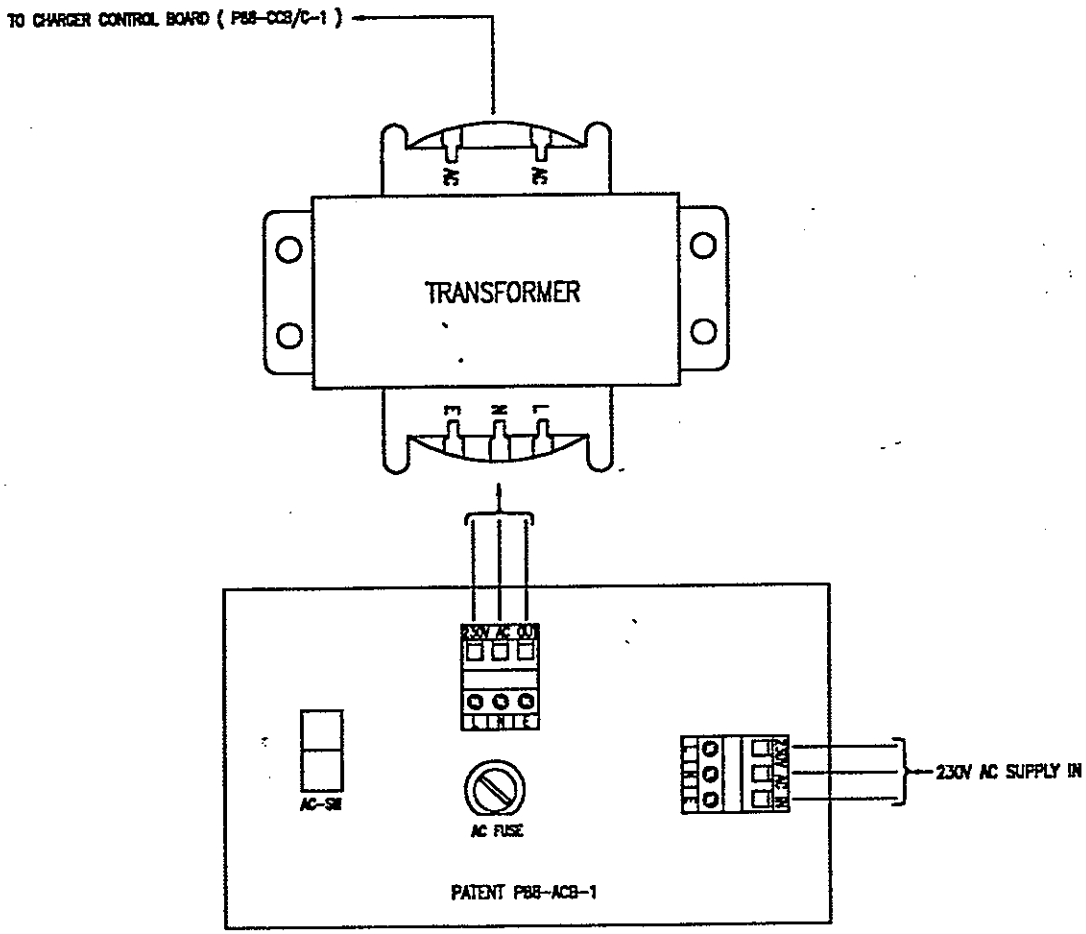


AUXILIARY SUPPLY SWITCHING BOARD (P88-ASSB)

PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR SYSTEM 88	DRAWN BY T P	DRAWING NO
	DESIGNED BY A M N	DATE 10 JAN 2001
	SCALE AS SHOWN	FILE P88-ASSB-TL
DRAWING TITLE AUXILIARY SUPPLY SWITCHING BOARD (P88-ASSB) INSTALLATION LAYOUT DIAGRAM	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

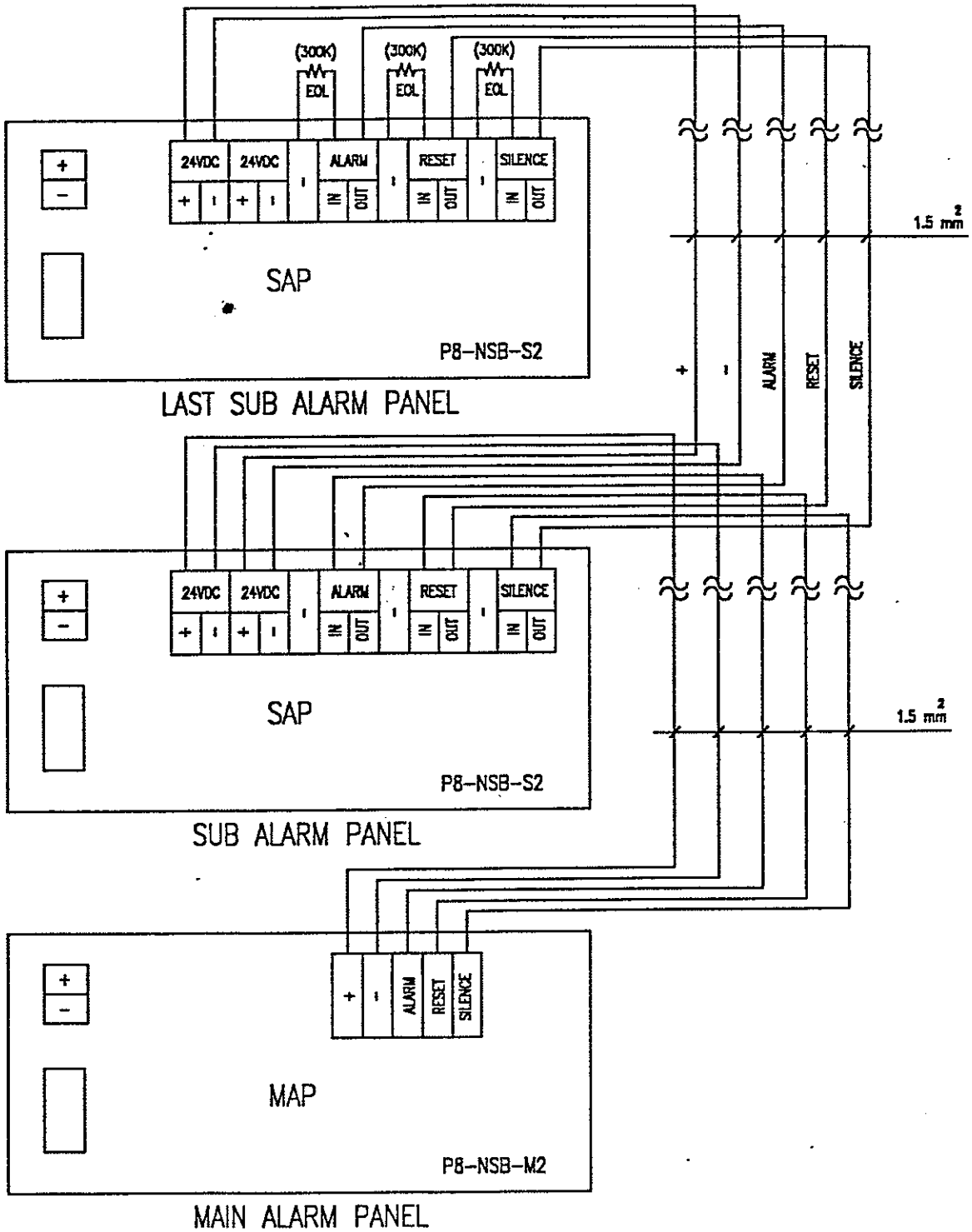
INSTALLATION LAYOUT FOR AC SWITCH BOARD

(MODEL NO. P88-ACB-1)



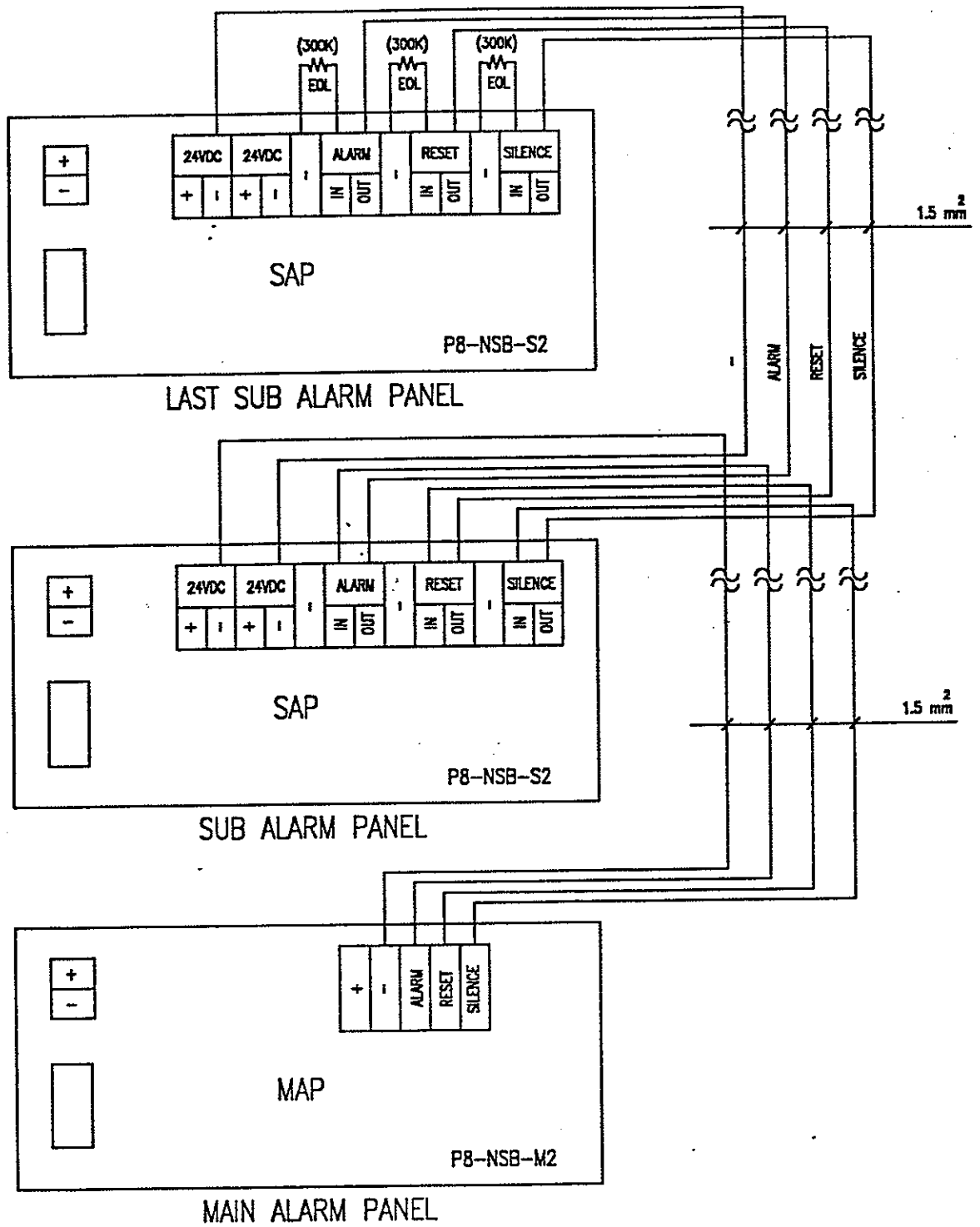
PROJECT TITLE: PROPOSED FIRE ALARM SYSTEM FOR PATENT SYSTEM 88	DRAWN BY: TP	DRAWING NO:
	DESIGNED BY: AWN	DATE: 12 JAN 2001
	SCALE: N.T.S.	FILE: P88-ACB-1-TIL
DRAWING TITLE: TYPICAL INSTALLATION LAYOUT DIAGRAM FOR AC SWITCH BOARD (P88-ACB-1)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

WIRING DIAGRAM FOR PANEL TO PANEL NETWORK LINES
(COMMON SUPPLY)



PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR PATENT SYSTEM 88	DRAWN BY TP	DRAWING NO.
	DESIGNED BY AWN	DATE 12 JAN 2001
	SCALE N.T.S.	FILE P88-NET-COM
DRAWING TITLE NETWORKING DIAGRAM OF SUB ALARM PANEL TO MAIN ALARM PANEL WITH NETWORK SUPERVISORY CARD (COMMON SUPPLY)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

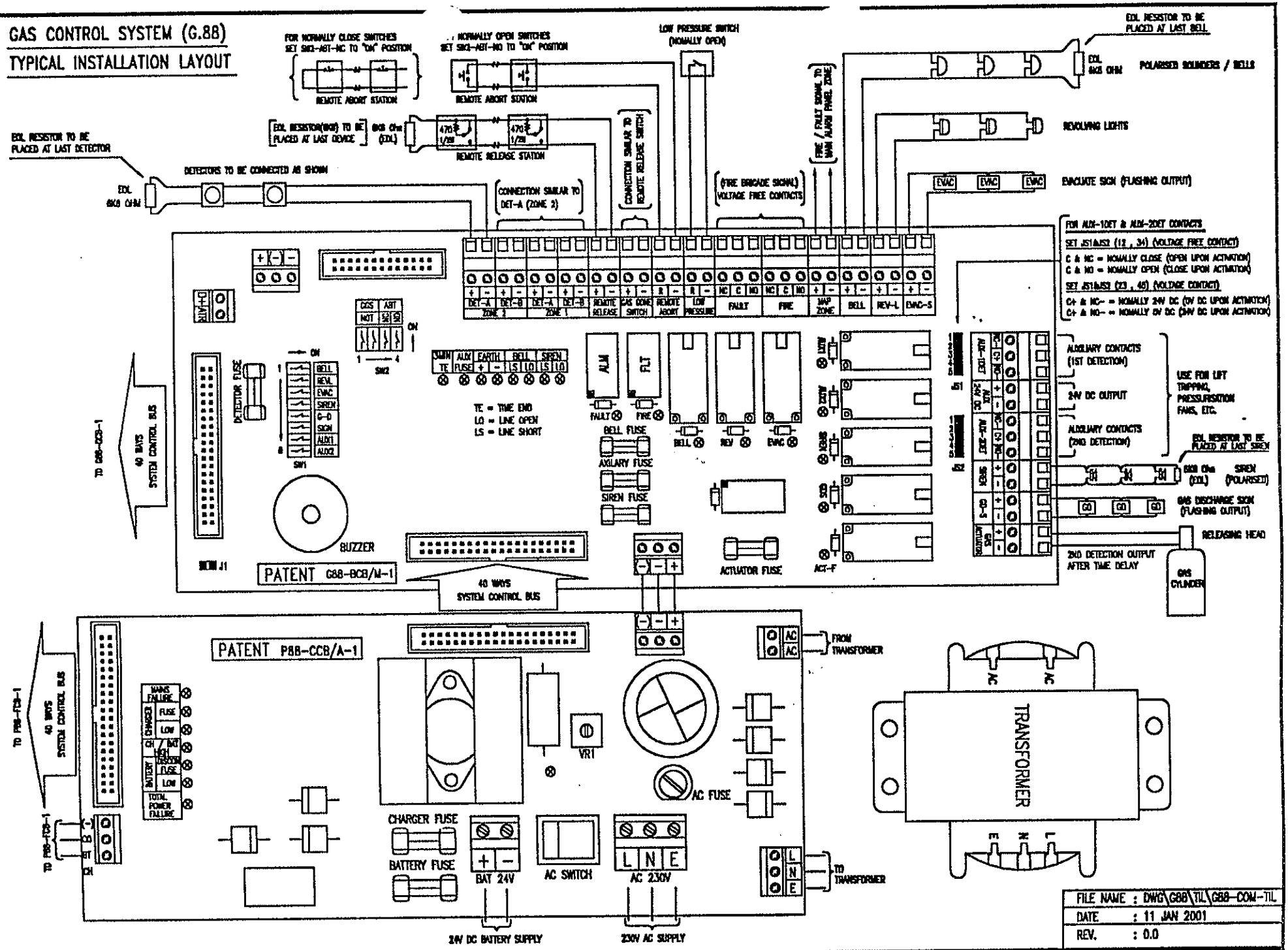
WIRING DIAGRAM FOR PANEL TO PANEL NETWORK LINES
(INDIVIDUAL SUPPLY)



PROJECT TITLE PROPOSED FIRE ALARM SYSTEM FOR PATENT SYSTEM 88	TP	
	DESIGNED BY AMN	DATE 12 JAN 2001
	SCALE N.T.S.	FILE P88-NET-IND
DRAWING TITLE NETWORKING DIAGRAM OF SUB ALARM PANEL TO MAIN ALARM PANEL WITH NETWORK SUPERVISORY CARD (INDIVIDUAL SUPPLY)	PATENT ENGINEERING CO. PTE LTD BLK 1001, JALAN BUKIT MERAH, #05-11, SINGAPORE 159455 TEL: 2732277 FAX:2732278	

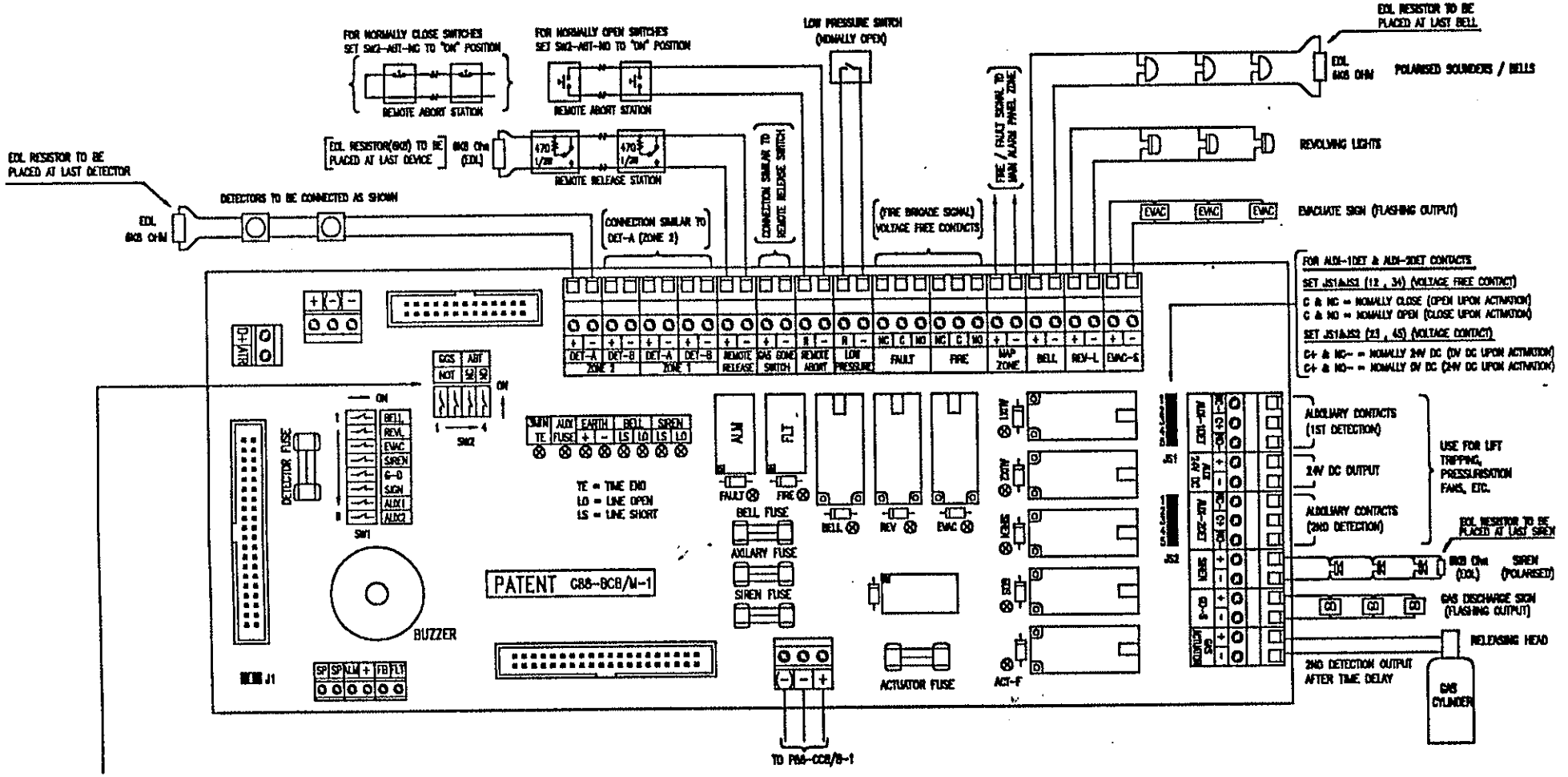
GAS CONTROL SYSTEM (G.88)

TYPICAL INSTALLATION LAYOUT



GAS CONTROL SYSTEM

TYPICAL INSTALLATION LAYOUT



Switch Setting for " SW2 "

GGS ABT

ON 1 2 — If Gas Gone Switch is not monitored, setting shall be #1-ON & #2-ON .

ON 1 2 — If Gas Gone Switch is monitored, setting shall be #1-OFF & #2-OFF .

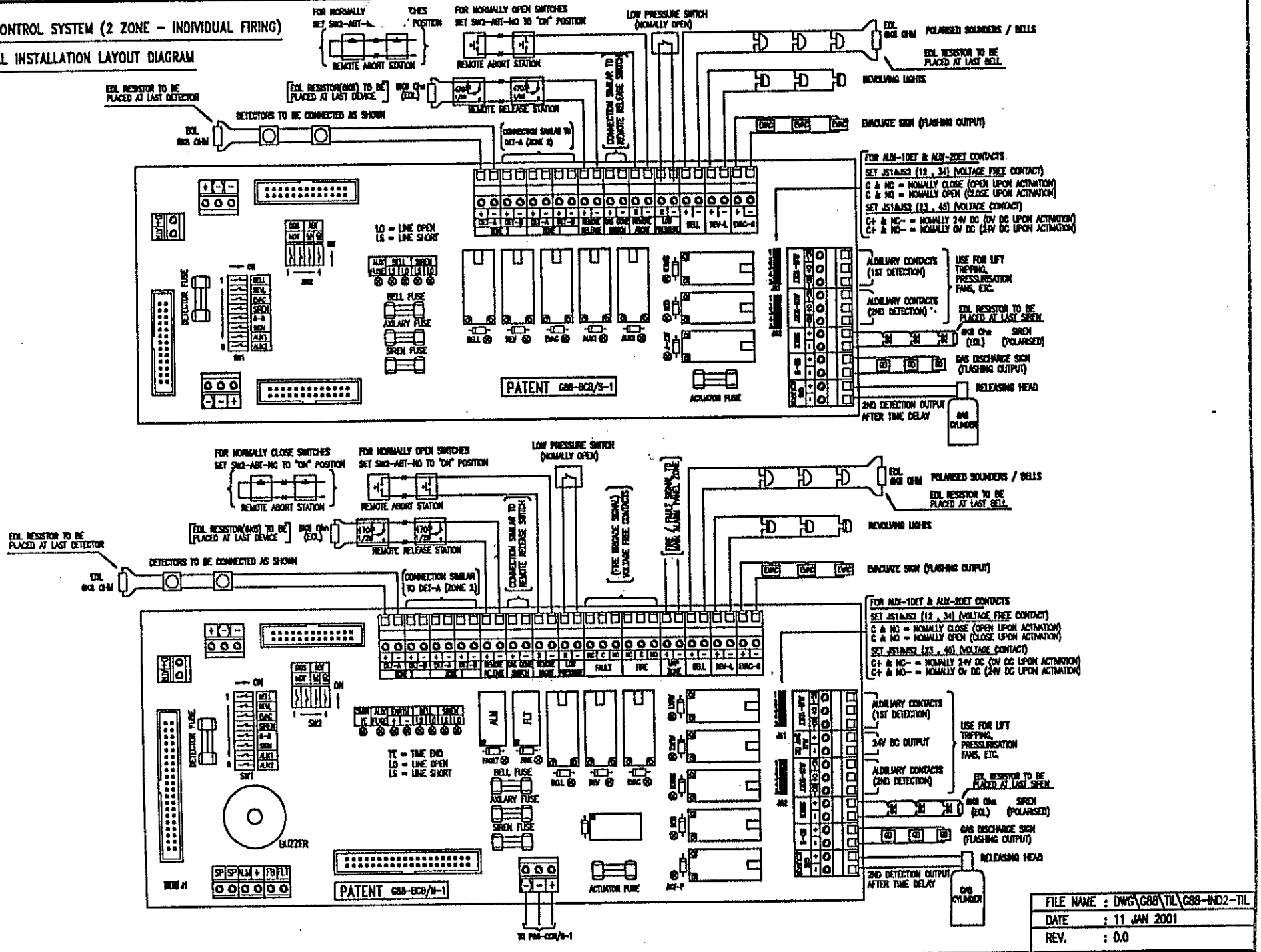
ON 3 4 — If Remote Abort Line is normally OPEN, setting shall be #3-OFF & #4-ON .

ON 3 4 — If Remote Abort Line is normally CLOSE, setting shall be #3-ON & #4-OFF .

FILE NAME	: DWG\G88\TIL\G88-BCB-M1-TIL
DATE	: 11 JAN 2001
REV.	: 0.0

GAS CONTROL SYSTEM (2 ZONE - INDIVIDUAL FIRING)

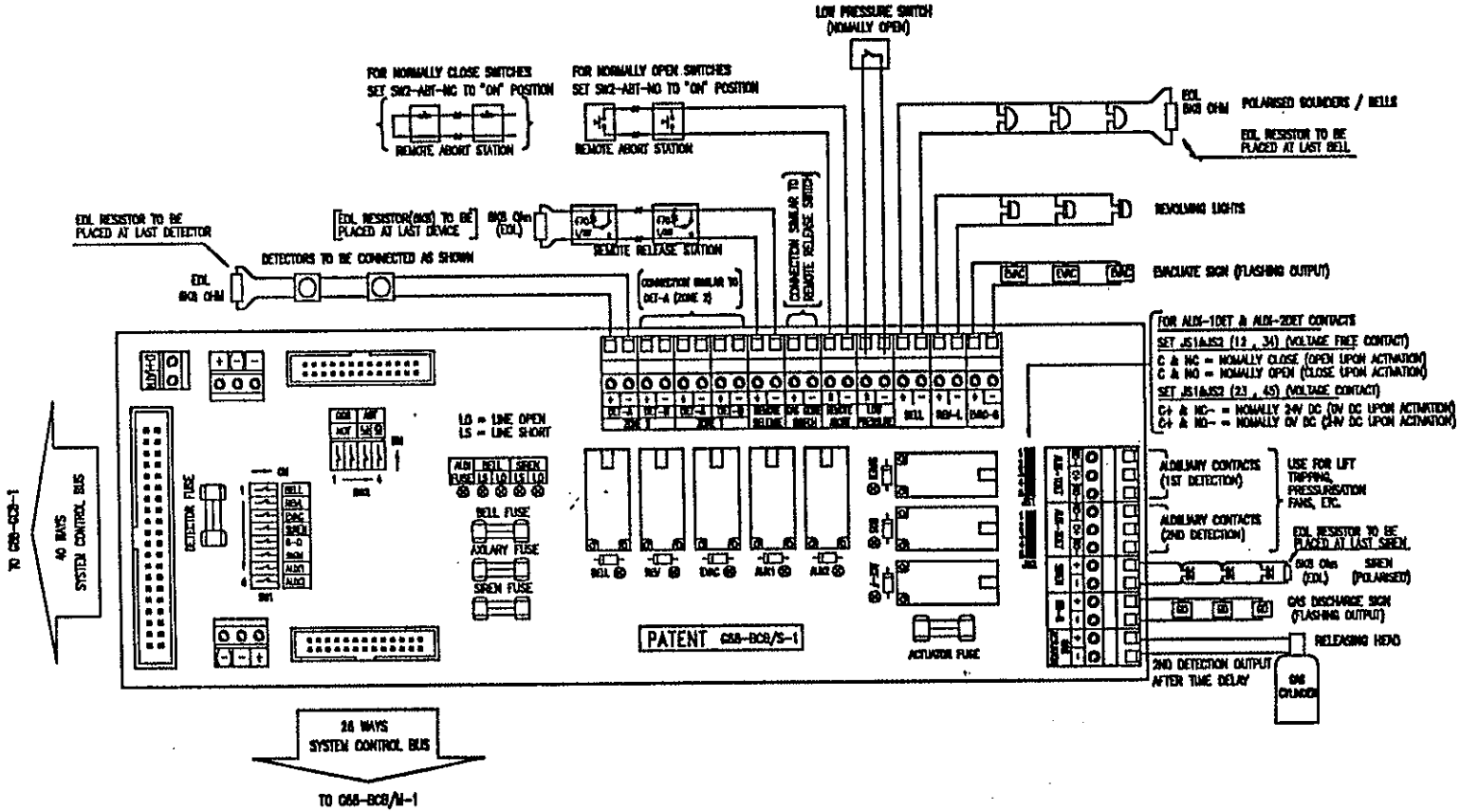
TYPICAL INSTALLATION LAYOUT DIAGRAM



FILE NAME	: DWG\G88\TIL\G88-IND2-TIL
DATE	: 11 JAN 2001
REV.	: 0.0

GAS CONTROL SYSTEM TYPICAL INSTALLATION LAYOUT DIAGRAM

(G88-BCB/S-1)



FILE NAME	: DWG\G88\TIL\G88-BCB-S1-TIL
DATE	: 11 JAN 2001
REV.	: 0.0

CONVENTIONAL DEVICES

DATASHEETS

PATENT

HOCHIKI

Combined Type Heat Detector : DCD

Features

1. Enhanced performance
   - Early detection of sudden heat build-up and high ambient temperature
   - Dual protection by incorporating 'Rate of Rise' and 'Fixed Temperature' function
2. Modern low profile design
3. Twin LED indicator lamp
4. Low current consumption
5. Wide application
   - The DCD has the widest possible installation applicability as it designed to sense heat in a vertical or horizontal position

Applications

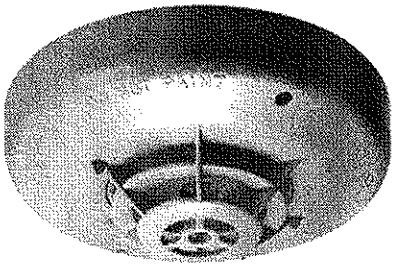
The DCD Combined Heat Detector is suited of installation where high heat output or rapid heat build up under fire condition are expected. It is also applicable to environments where smoke detectors are unsuitable because of the presence of steam or cooking fumes such as in a kitchen or boiler room. Consideration should be given to the maximum normal operating temperature before deciding on the most appropriate DCD detector for the application.

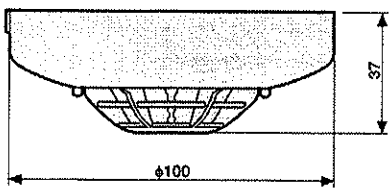
Specifications

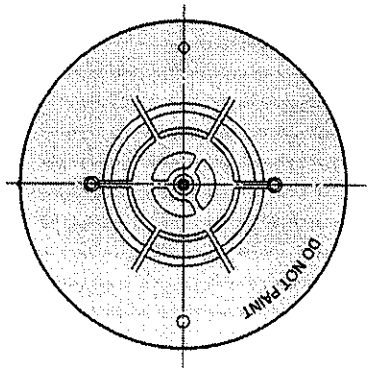
	DCD-R1E 90°C	DCD-1E 60°C	DCD-2E 60°C	DCD-135 135°F	DCD-190 190°F
Applicable Standard Response Grade	EN54 Pt5 Range 1	EN54 Pt5 Grade 1	EN54 Pt5 Grade 2	UL521 Ordinary	UL521 High
Rated Voltage	DC24V				
Working Voltage Range	DC 15V ~ 30V				
Current Consumption	50μA at 30V	35μA at 30V	35μA at 30V	50μA at 30V	50μA at 30V
Maximum Switching Current	40mA	40mA	40mA	150mA	150mA
Heat Sensing Current	Thermistor				
Alarming Fixed Temperature Range	80°C	58°C	62°C	135°F	190°F
Operating Ambient Temperature Range	-10°C ~ +50°C (14°F ~ 122°F)				
Storage Temperature Range	-30°C ~ +70°C (-22°F ~ 158°F)				
Allowable Ambient Humidity (at 40°C)	95% RH Non-Condensing				
Dimensions (incl, Base)	ø 100mm X 37mm (100mm X 45mm)				
Weight (incl, Base)	70g (115g)				
Color	Ivory White				
Made	JAPAN				

Compatible Bases

YBN-R/4, YBN-R/4C, YBN-R/4SK, YBK-R/5, YBK-R/5SK, YBK-R/5ZD, YBK-R/5R2
YBO-R/5, YBO-R/5SK, YBO-R/5ZD, YBO-R/5R2, YBO-R/4A, YBO-R/4C
Ask Hochiki for another combination







HOCHIKI CORPORATION

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Tokyo 141-8660, Japan
Tel : 81-(3)-3444-4116 Fax : 81-(3)-3444-4167
URL : www.hochiki.co.jp

HOCHIKI

Fixed-Temperature Heat Detector : DFJ

Feature

1. Enhanced performance
   - The new DFJ incorporates the use of thermistor and linearising circuits to provide an accurate linear response heat detector
2. Modern low profile design
3. Twin LED indicator lamp
4. Low current consumption
5. Wide application
   - The DFJ has has the widest possible installation applicability as it is designed to sense heat in a vertical or horizontal position

Applications

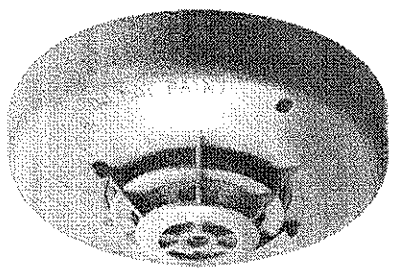
The DFJ Fixed Temperature Heat Detector is suited for installation where high heat output fires are expected or in areas where ambient condition would not allow the use of other detection methods (e.g. the presence of steam or cooking fumes such as in a boiler room or kitchen). Consideration should be given to the maximum normal operating temperature before deciding on the most appropriate DFJ detector for the application.

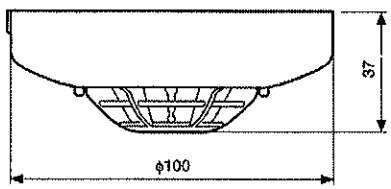
Specifications

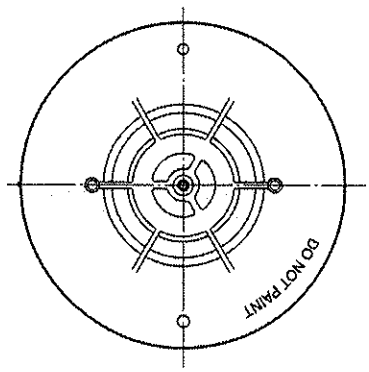
Applicable Standard Response Grade	DFJ-60E EN54 Pt5 Grade 1	DFJ-90E EN54 Pt5 Grade 1
Rated Voltage	DC24V	
Working Voltage Range	DC 15V ~ 30V	
Current Consumption	35μA at 30V	50μA at 30V
Maximum Switching Current	40mA	40mA
Heat Sensing Current	Thermistor	
Alarming Fixed Temperature Range	62°C	80°C
Operating Ambient Temperature Range	-10°C ~ +50°C (14°F ~ 122°F)	
Storage Temperature Range	-30°C ~ +70°C (-22°F ~ 158°F)	
Allowable Ambient Humidity (at 40 C)	95% RH Non-Condensing	
Dimensions (incl, Base)ø	ø100mm X 37mm (ø100mm X 45mm)	
Weight (incl, Base)	70g (115g)	
Color	Ivory White	
Made	JAPAN	

Compatible Bases

YBN-R/4, YBN-R/4C, YBN-R/4SK, YBK-R/5, YBK-R/5SK, YBK-R/5ZD, YBK-R/5R2
YBO-R/5, YBO-R/4A, YBO-R/4C, YBO-R/5SK, YBO-R/5ZD, YBO-R/5R2
Ask Hochiki for another combination







HOCHIKI CORPORATION

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Tel : 81-(3)-3444-4116 Fax : 81-(3)-3444-4167
URL : www.hochiki.co.jp

HOCHIKI

IONISATION SMOKE DETECTOR : SIJ

Features

1. Enhanced performance
   - The SIJ exceptional capabilities results from incorporating a single radioactive source and dual chambers for stable operation even under extreme environmental conditions (including atmospheric changes)
2. Modern low profile design
3. Twin LED indicator lamp
4. Low current consumption
5. Improved noise immunity
6. Custom designed steel mesh

Application

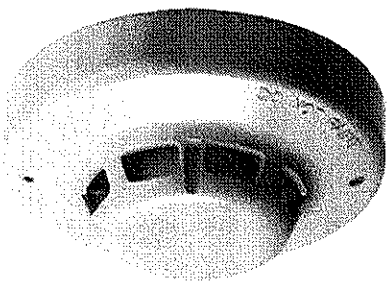
The SIJ Ionisation smoke detector has a responsive and highly stabile operation that gives it an extremely wide range of uses. The SIJ can be used in areas where early warning of trouble from super-heating or flaming combustibles is expected.

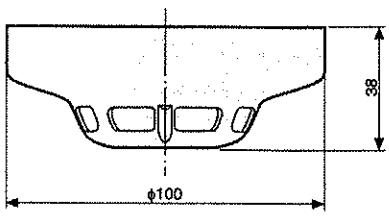
Specifications

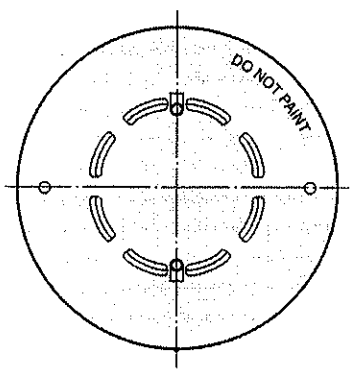
	SIJ-E	SIJ-24
Applicable Standard	EN54 Pt7	UL268
Rated Voltage	DC24V	
Working Voltage Range	DC 15V ~ 30V	
Current Consumption	25μA at 24V	25μA at 24V
Maximum Switching Current	40mA	80mA
Radioactive Source	Am^{241} 18.5kBq	
Operating Ambient Temperature Range	-10°C ~ +50°C (14°F ~ 122°F)	
Storage Temperature Range	-20°C ~ +60 C (-4°F ~ 140°F)	
Allowable Ambient Humidity (at 40°C)	95% RH Non-Condensing	
Dimension (incl. Base)	ø100mm X 38mm (ø100mm X 46mm)	
Weight (incl, Base)	85g (130g)	
Color	Ivory	
Made	USA	

Compatible Bases

YBN-R/4, YBN-R/4SK, YBK-R/5, YBK-R/5SK, YBK-R/5ZD, YBK-R/5R2, YBO-R/5, YBO-R/5SK, YBO-R/5ZD, YBO-R/5R2, YBO-R/4A, YBO-R/4C.
Ask Hochiki for another combination







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HOCHIKI

PHOTOELECTRIC SMOKE DETECTOR : SLR

Features

1. Unique 'Flat Response Technology'
   - This advance technology enables the SLR to be equally sensitive to a much wider range of combustible materials
   - Replaces Ionisation detectors in the majority of applications, thereby providing simpler solution for system designer
2. Modern low profile design
3. Twin LED indicator lamp
4. Low current consumption
5. Improved noise immunity
6. Custom designed steel mesh

Application

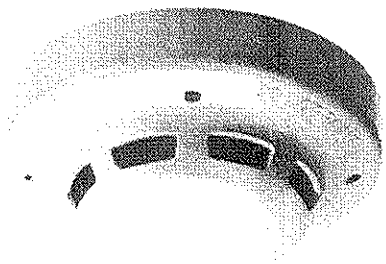
The Hochiki SLR Photoelectric smoke detector is particularly suited to detecting optically dense smoke typical of fire involving material such as soft furnishing, plastic, foam or other similar materials which tend to smolder and produce large visible smoke particles. Equipped with the latest "Flat Response Technology", the SLR allows fast response to flaming fires as well as smoldering fires while eliminating false alarms. It can be installed in areas where traditionally both photoelectric and Ionisation detectors have been used

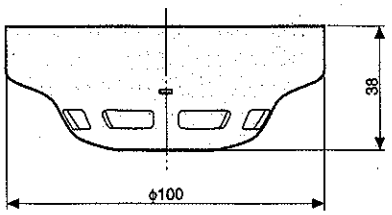
Specifications

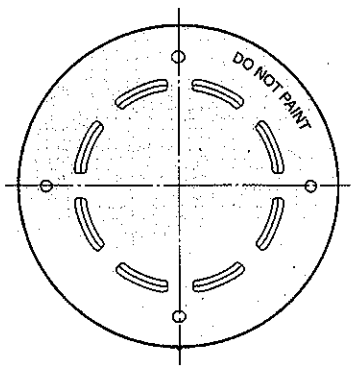
	SLR-E	SLR-24
Applicable Standard	EN54 Pt7	UL268
Rated Voltage	DC24V	
Working Voltage Range	DC 15V ~ 30V	
Current Consumption	35μA at 30V	45μA at 30V
Maximum Switching Current	40mA	150mA
Light Source	Infrared Led	
Operating Ambient Temperature Range	-10°C ~ +50°C (14°F ~ 122°F)	
Storage Temperature Range	-20°C ~ +60°C (-4°F ~ 140°F)	
Allowable Ambient Humidity (at 40°C)	95% RH Non-Condensing	
Dimensions (incl, Base)	ø100mm X 38mm (ø100mm X 46mm)	
Weight (incl, Base)	95g (140g)	
Color	Ivory	
Made	U.K. JAPAN	USA

Compatible Bases

YBN-R/4, YBN-R/4C, YBN-R/4SK, YBK-R/5, YBK-R/5SK, YBK-R/5ZD, YBK-R/5R2, YBO-R/5, YBO-R/5SK, YBO-R/5ZD, YBO-R/5R2, YBO-R/4A, YBO-R/4C
Ask Hochiki for another combination.







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HOCHIKI

CONVENTIONAL COMMON MOUNTING BASE : YBN/YBO/YBF/NS

Detector base

Model	Made	Applicable Standard	Remarks
YBN-R/4 *	U.K.	LPCB	Electronics free mounting base
YBN-R/4C *	JAPAN	GB4715, GB4716/LPC	Electronics free mounting base
YBN-R/4SK *	U.K.	LPCB	Electronics free mounting base with schottky line continuity
YBO-R/4A *	JAPAN	AS1603	Mounting base with remote indicator output
YBO-R/4C *	JAPAN	GB4715,GB4716	Mounting base with remote indicator output
YBO-R/5 *	U.K.	LPCB	Mounting base with remote indicator output
YBO-R/5SK *	U.K.	LPCB	Schottky line continuity base (safeline) with remote indicator output
YBO-R/5ZD *	U.K.	LPCB	Zener line continulty base (liveline) with remote indicator output
YBO-R/5R2 *	U.K.	LPCB	Relay base with remote indicator output
NS4-100 *	U.S.A.	UL521,UL268	Electronics free mounting base
NS4-220 *	U.S.A.	UL521,UL268	Mounting base with remote indicator output
YBF-RL/4H5	Japan	LPCB	Base with LED and remote indicator output

* *These bases are suitable for use with the NS Series Detector Model : SLR, SIJ, DCD and DFJ*

Features

Hochiki advanced technology in the field of smoke and heat detection has solved yet another problem, that is having to change the base every time you wish to change the type of detector head you are using in your detector system layout. The development of these common mounting bases allow complete compatibility of all Hochiki NS series conventional detector heads, thus saving you the time, manpower and cost in whatever changes you wish to make. But this is just one of several outstanding benefits which are listed below.

1. These common mounting bases have a mounting pitch ranging from 48 to 72mm, allowing for easy installation on any kind of outlet box. In addition, they are lightweight and very thin, minimizing their protrusion from the ceiling once installed.
2. The solder-less lugs enables quick and easy wiring, while the bayonet slots permits immediate connection and disconnection of detectors and their bases.
3. The Hochiki NS series conventional bases are designed with features to allow Line Continuity, Relay and Remote Indicator functions.
4. This conventional range also offers two options for Line Continuity; Schottky (Safeline) and Zener (Liveline), to maintain line continuity once a detector has been removed from the base, thus allowing other call points and detectors to continue operations.

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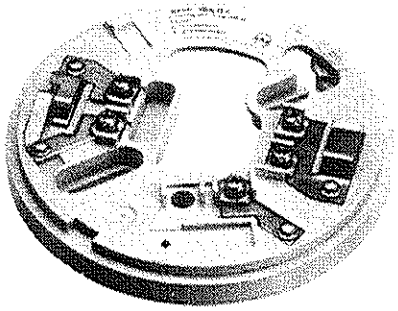
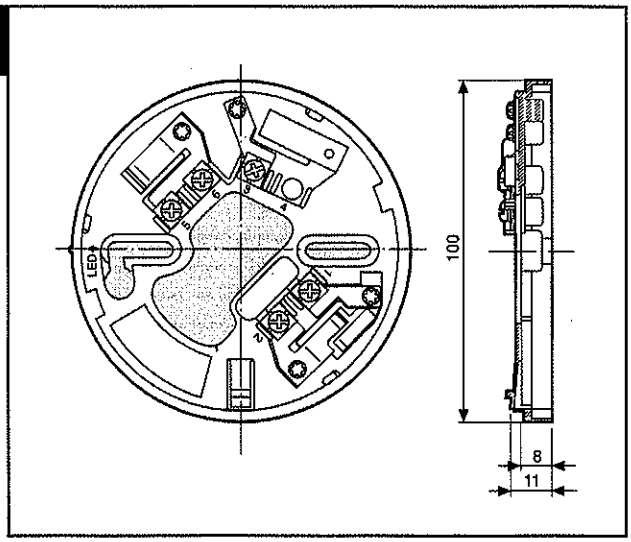
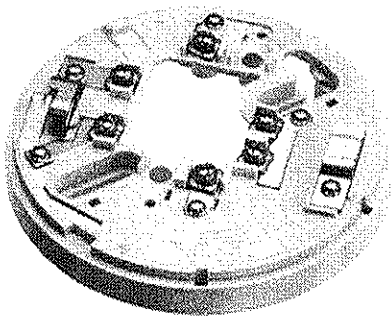
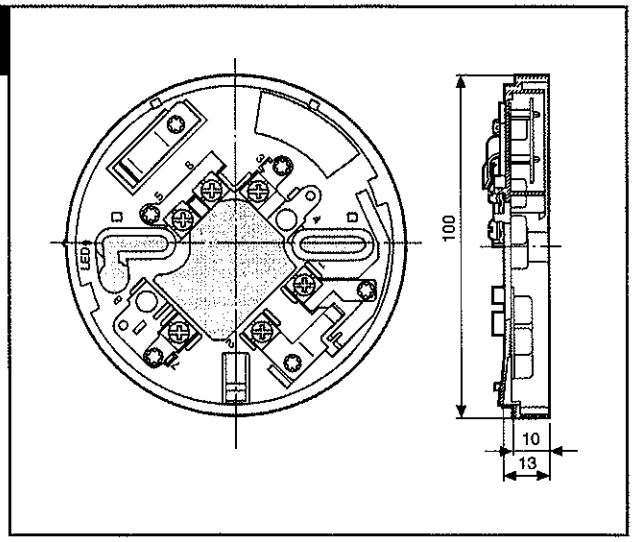
Model YBN-R/*, NS4-*



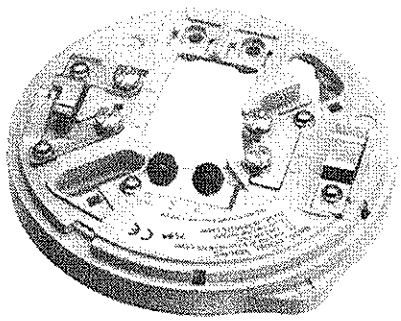


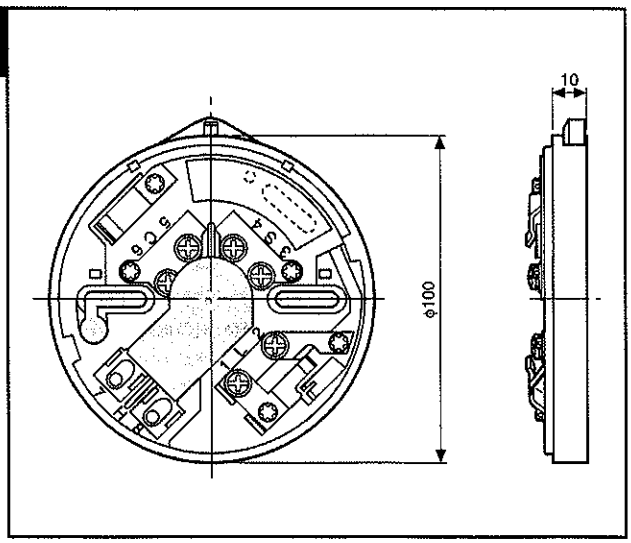
Model YBO-R/*





Model YBF-RL





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HOCHIKI

Projected Beam Smoke Detector : SPB

Features

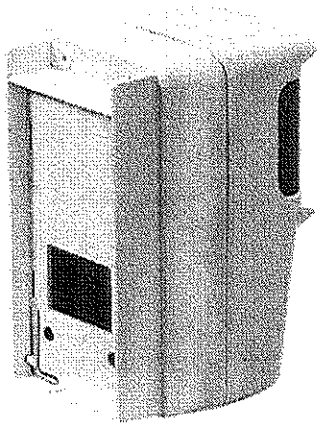
1. Compact light weight design with good look
2. Versatile application
   - Suitable for both industrial use and areas where architectural considerations are paramount
3. Large coverage
   - Designed for detection of smoke in large areas where conventional spot detection is impractical or more costly
   - 5 to 100m in range and very low stand-by current consumption
4. Easy installation and operation
   - Direct wall mounting reduces the effects of vibration associated with brackets used on other beam detectors
   - Simple commissioning
5. Self diagnostic feature
   - Automatic compensation adjustment for contamination and changes in atmospheric conditions

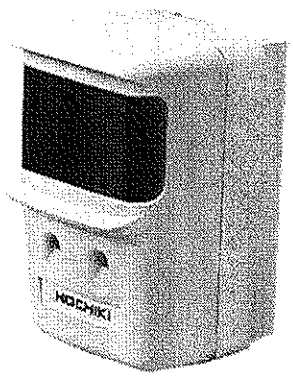
Principle of Operation

The SPB Projected Beam Smoke Detector consists of an emitter and a receiver which are position separately and facing each other at a specified distance.
In the event of fire, the generated smoke decreases the amount of light incident on the receiver. The receiver will sense such a decrease in light quantity, thereby identifying the occurrence of fire. An important feature of the detector is that it monitors the protected area of space linearly. This enables the detector to identify a fire before it spreads.
The initial beam comparison with the reference shows the occurrence of a fire, a fire signal is immediately generated. A fault signal occurs if the axix of a beam is completely obstructed.
The built-in microcomputer also functions to compensate for a change of value with time caused by contamination of the optics. When this ability to compensate reaches its limit, the microcomputer automatically generates a fault signal.

Applications

The beam type detector is applicable to buildings with high ceilings, large open areas or potentially hazardous places. Typical areas of use include :
(a) gymnasiums, lecture halls, theatres
(b) workshops, warehouses, vehicle bases
(c) underground tunnels, caves
(d) substations, electrical rooms, and chemical warehouses.





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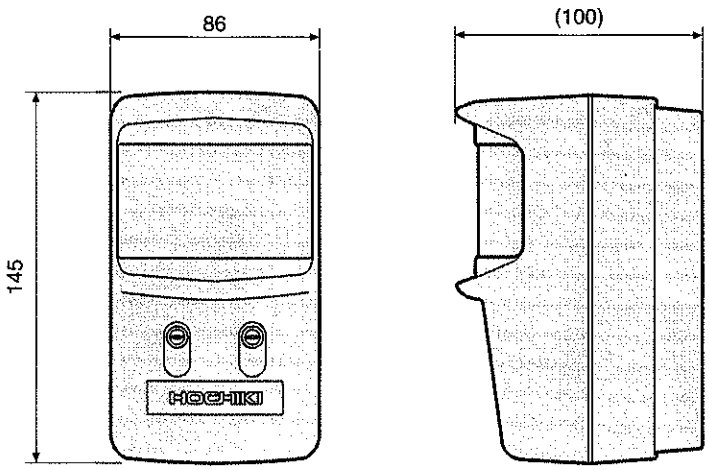
HOCHIKI

Specifications

	SPB-E	SPB-24N
Rated Voltage	DC24V	
Working Voltage Range	DC 15V ~ 33V, Peak 42V	
Current Consumption	250μA at 24V (Average)	
Current in Alarm	25mA	
Beam Length	5m ~ 100m	10m ~ 100m (32.8ft ~ 328.0ft)
Sensitivity Setting	25, 50, 70%/span	25, 50, 70%/span
Output Signals	Fire Alarm : Normally Open Contact Fault Alarm : Normally Closed Contact	
Operating Ambient Temperature Range	-10°C ~ +50°C (14°F ~ 122°F)	
Storage Temperature Range	-30°C ~ +70°C (-22°F ~ 158°F)	
Allowable Ambient Humidity (at 40°C)	95% RH Non-Condensing	
Dimensions	86mm X 100mm X 145mm	
Weight	Emitter : Approximately 400g Receiver : Approximately 500g	
Color	Off White	
Applicable Standard	BS-5839-Pt5 VdS Test Program	UL-268
Made	JAPAN	



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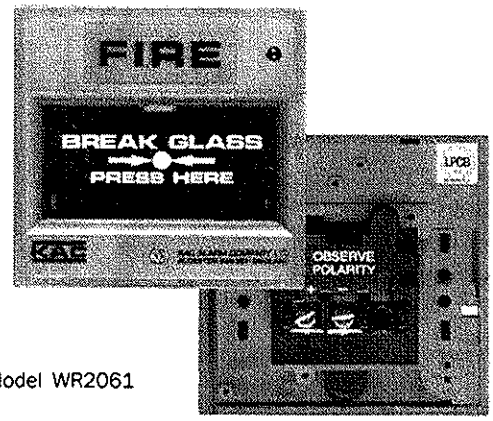
INDOOR CLASS 2000 CALL POINT MODELS WR2001, WR2012, WR2061, WR2072 AND WR2101,

AND THEIR DERIVATIVES



LED Model WR2061

Models of CLASS 2000 are traditional and conventional; Traditional in that the installer terminals are of the traditional style, on the rear of the call point, Conventional in that the call points are for conventional rather than analogue/addressable applications.

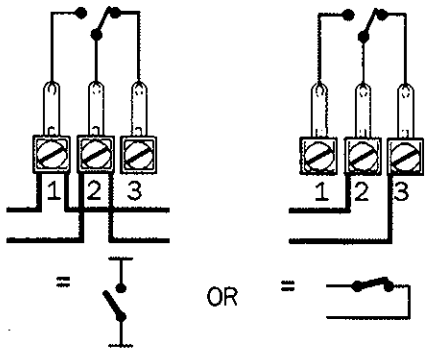
ELECTRICAL CONFIGURATIONS

These five models differ with regard to their electrical configurations.

In model reference WR2001, the first of the four numeric digits, 2, identifies the model as being of CLASS 2000. The remaining three digits refer to the actual electrical configuration.

CONFIGURATION "001" - Single Pole Changeover

Model Example: WR2001

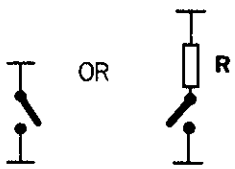


CONFIGURATION "012" - The Retrofit

Model Example: WR2012

THE RETROFIT can be used in a basic normally open system or in a normally open system requiring either a 470Ω or a 680Ω monitoring resistor.

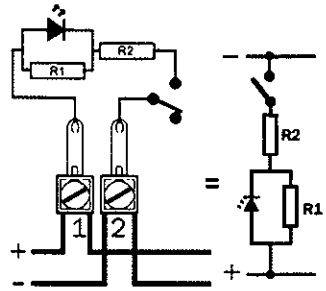
THE RETROFIT is fitted with both 470 and 680 ohm 1.0 Watt carbon film resistors. The terminal cover is supplied loose; this enables the engineer to cut off and discard the unwanted components before fitting the cover and installing the call point.



WHERE 'R' IS 470Ω OR 680Ω

CONFIGURATION "061+END CODE" - LED Model

Model Example: WR2061-120-470



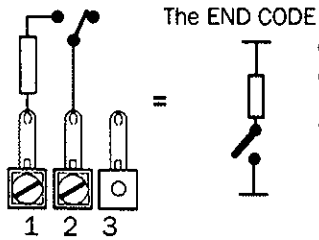
The red LED is fitted adjacent to the Function Marking (FIRE) as in the model illustrated top left.

The END CODE is used to denote the values, in ohms, of the 0.5 Watt resistors R1 and R2.

In the model example WR2061-120-470, R1 is 120Ω and R2 is 470Ω. R2 is current limiting and R1 is to ensure that the call point functions if the LED fails to open circuit.

CONFIGURATION "072+END CODE" - With Monitoring Resistor

Model Example: WR2072-470

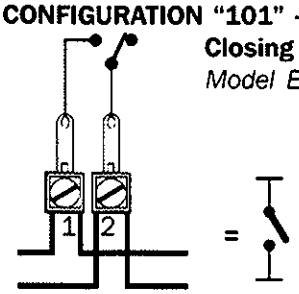


The END CODE is used to denote the value of the 1.0 Watt resistor in ohms.

In the model example WR2072-470, the 1.0 Watt monitoring resistor is 470Ω.

CONFIGURATION "101" - Normally Open Only, Closing on Alarm.

Model Example: WR2101



A MEMBER OF BFP A

CERTIFICATE NO. FM 20416

KAC

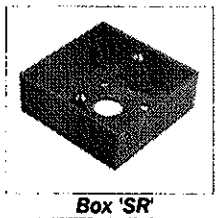
QUALITY SYSTEMS CERTIFICATE No. 166 ASSESSED TO ISO9002

Document Ref
LIT:115
June 1998

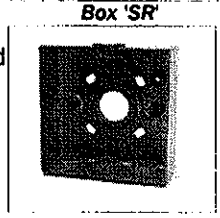
SURFACE MOUNTING

A CLASS 2000 call point front may be surface mounted on either:
A SURFACE MOUNTING BOX or
A CALL POINT PATTRESS

REFERENCES
Adding '/SR' adds a Red Surface Mounting Box - example WR2001/SR.
Adding '/MR' adds a Red Metal Mounting Box - example WR2001/MR.
Adding '/PTR' adds a Red Pattress - example WR2001/PTR.
References in other colours are provided in the Table at the bottom of the facing page.



Box 'SR'



Box 'MR'
Both classes of boxes are provided with a 20mmØ entry hole in the rear, and fixing holes compatible with a small circular U.K. BESA Box.

PLASTIC BOX 'SR' (Surface Red) is manufactured in the same material as the call point. Box SR has plain sides but cable entry holes are easily cut using the Hole Cutting Template provided on the pack box.

METAL BOX 'MR' (Metal Red) is pressure die-cast in zinc based alloy and epoxy powder coated to match the call point colour. Four 20mmØ cable entry holes are provided, these being fitted with plastic hole stoppers.

THE CALL POINT PATTRESS is an alternative to a surface mounting box and is more fully described in Literature Item LIT:120.
The call point Pattress is designed for use with installation cable types, such as flameproof cables complying with BS7629, that enter the device directly, without bulky termination glands. A Pattress is 23mm deep, compared to the 32mm depth of a surface mounting box and is manufactured in the same material as the call point. Thinned wall sections are provided that the installer can easily cut away to provide the required cable entry ways.

FLUSH MOUNTING

IN A FLUSH INSTALLATION a call point such as WR2001 can be **directly** fitted to the General Purpose Installation (GPI) boxes of many territories of the world, such as the one illustrated at the top of the facing page. Such a call point can be **indirectly** fitted to many other types of GPI boxes by the use of various TERMINAL TRAYS and BEZELS.

TERMINAL TRAYS

ETT/1 - Without "Grip Forks".

ETT/2- With "Grip Forks" compatible with a 60mmØ box as used in France.

These can be fitted to the GPI boxes of many territories of the World that are of approximately the same dimensions as the GPI box of the UK that is used for a single gang socket outlet.

ETT/3 + BEZEL 3

Terminal tray ETT/3 is designed to fit to the relatively large GPI boxes as used in Italy, South Africa, Australia, the USA and Canada. Additionally, ETT/3 can be fitted to the rectangular backbox of a no longer manufactured Gent call point. As ETT/3 is larger than a CLASS 2000 call point front, a BEZEL 3 must be used in all cases.
References: **BZB/3 - Black** **BZR/3 - Red**

ETT/3 + BEZEL 3 PRODUCT PACKS

SINGLE PRODUCT PACKS TB16 & TB17

TB16 - provides Black Bezel BZB/3
TB17 - provides Red Bezel BZR/3
Each contains 1 - ETT/3 and 1 - BEZEL 3, along with various fixing screws including 4 - 4BA x 5/8" cheese head screws compatible with the rectangular call point backbox referred to above.

MULTI PRODUCT PACKS TB18 & TB19

TB18 - provides Black Bezel BZB/3
TB19 - provides Red Bezel BZR/3
Each comprises twin packs; 1 pack containing 10 - ETT/3 and 1 pack containing 10 - BEZELS 3. This arrangement is so that the pack containing the bezels can be placed on one side until they are required, along with the appropriate call point fronts. The 4BA cheese head screws are not provided and if required should be ordered separately - Order Code SC053 for a pack of 100 screws.

BEZELS 1 and BEZELS 2

As can be seen from the illustration at the top of the facing page, a bezel is not routinely required when a call point front is fitted on such a flush mounted GPI Box. In order to meet a variety of special needs, BEZELS 1 and BEZELS 2 are manufactured. These are made in red or black PC/ABS, matt finish.

BEZELS 1 extend 9mm beyond the extremity of the call point and distance the call point 5.5mm from the wall surface.
References: **BZB/1 - Black** **BZR/1 - Red**

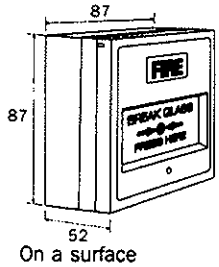
BEZELS 2 are designed for use with ETT/1 and ETT/2 over which they fit, for solely cosmetic purposes. They can however, be used to overcome certain installation problems. They extend 9mm beyond the extremity of the call point and distance the call point 13mm from the wall surface, so freeing space in the mounting box in a flush installation.
References: **BZB/2 - Black** **BZR/2 - Red**

MECHANICAL DATA

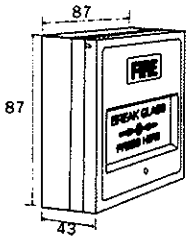
MATERIALS
Plastic components are injection moulded in engineering grades of thermoplastic. The principal visible parts are self extinguishing V-0 to U.L. 94, a Polycarbonate ABS blend referred to as PC/ABS.

MECHANICAL DATA ..... continued

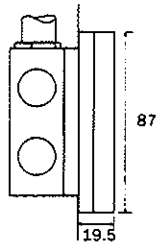
EXTERNAL DIMENSIONS IN MM



On a surface mounting box



On a call point pattress



On a flush fitted GPI box

ELECTRICAL DATA

MAXIMUM CURRENTS AND CONTACT RESISTANCE: The internal connections of models of configuration "001", single pole changeover and "101", normally open only, limit current carrying capacity to 3.0 Amps. The internal components of the other models dictate maximum current and voltage. The contacts of the switch are of fine silver; their maximum contact resistance is 0.2Ω measured as required by BS5839:Part 2:1983, Clause 8.

FIRE ALARM MODELS are not Approvals Listed for use at voltages greater than 50 Volts.

SPECIAL APPLICATION MODELS of model configuration "001" are intended primarily for use with voltages of the order of 230Volts 50Hz. However, as these models are electrically identical to fire alarm model WR2001 they can be used on voltages down to 12 Volts DC.

SPECIAL APPLICATION CALL POINTS

In model reference WR2001, the "**R**" denotes **R**ed. KAC literature item LIT:105 illustrates a selection of call points in colours other than red, for other emergency switching applications. These "Special Application" models are manufactured in "001" configuration (single pole changeover) as standard, in other configurations to special order. Instead of an "R", the second letter of the model reference would be the initial letter of the colour; WW2001 - **W**hite, WY2001 - **Y**ellow, etc.



A Special Application Model

TABLE OF SPECIAL APPLICATION MODEL REFERENCES

WHITE	YELLOW	BLUE	GREEN
Call Point Only			
WW2001	**WY2001**	**WB2001**	**WG2001**
Call Point complete with Surface Plastic Mounting Box			
WW2001/SW	**WY2001/SY**	**WB2001/SB**	**WG2001/SG**
Call Point complete with Surface Metal Mounting Box			
WW2001/MW	**WY2001/MY**	**WB2001/MB**	**WG2001/MG**
Call Point complete with Pattress			
WW2001/PTW	**WY2001/PTY**	**WB2001/PTB**	**WG2001/PTG**

APPROVALS

The following are among the products listed by the Loss Prevention Certification Board (LPCB) as complying with BS5839:Part 2:1983.

WR2001 & WR2001/SR, WR2012 & WR2012/SR, WR2061 & WR2061/SR, WR2072 & WR2072/SR, WR2101 & WR2101/SR.
Also Listed are metal red box 'MR', bezels BZR/1 and BZR/2, red spacer piece M141W and continuity link KL1.

ACCESSORIES

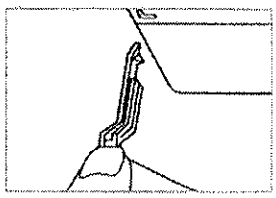
REPLACEMENT GLASS

Reference of one glass: KG1
These are supplied in packs of 5,10, 25 & 50.
Example: 4 Packs of 25 KG1 = 100 pieces.
Orders must specify pack size.



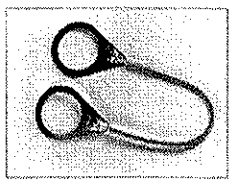
SPARE TEST KEYS

Reference: M008
Supplied in packs of 10.
Example: 4 packs of 10 M008 = 40 test keys.



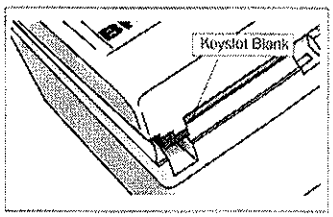
CONTINUITY LINK

Reference: KL1
Supplied in packs of 5.
Example: 4 packs of 5 KL1 = 20 links.
The continuity link provides the means to electrically bond two 20mmØ cable entries.



KEY SLOT BLANK

Reference: add '/B'
Example: WR2001/SR/B
A call point fitted with a transparent hinged cover and a breakable cover seal can still be operated using a test key. Fitting a key slot blank prevents this by blanking off the test key facility.



ACCESSORIES.....continued

TRANSPARENT HINGED COVER

Reference: M298

All CLASS 2000 Models can be fitted with a Transparent Hinged Cover which provides additional protection against accidental operation. The cover must be raised before the call point can be operated.



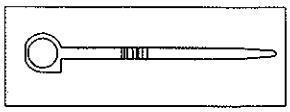
A call point fitted with a transparent hinged cover

IMPORTANT NOTE:
All CLASS 2000 call points are equipped to receive a Hinged Cover which is supplied separately and is fitted by the Installer. Previously, a Hinged Cover was a 'Factory Fit' accessory.

BREAKABLE COVER SEAL

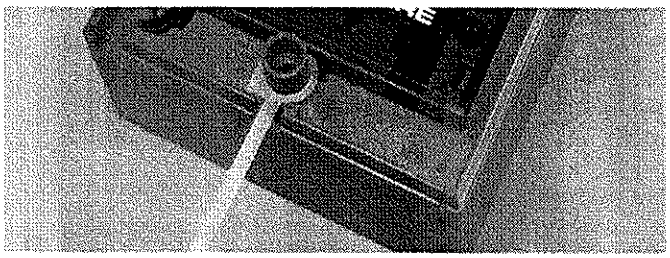
Reference: M355

Supplied in packs of 5.
Example: 4 packs of 5 M355 = 20 seals.

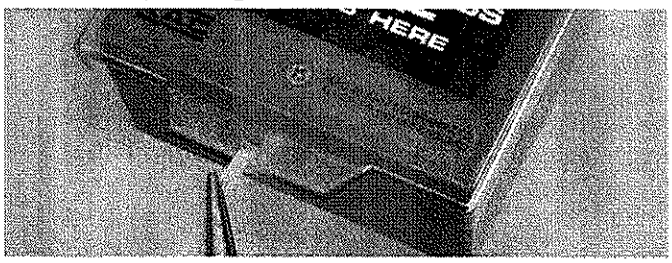


A hinged cover fitted with a seal M355 can only be lifted by breaking the seal. M355 can be used with the previous model of transparent hinged cover for which old seal M96 was produced but M96 cannot be used with new cover M298.

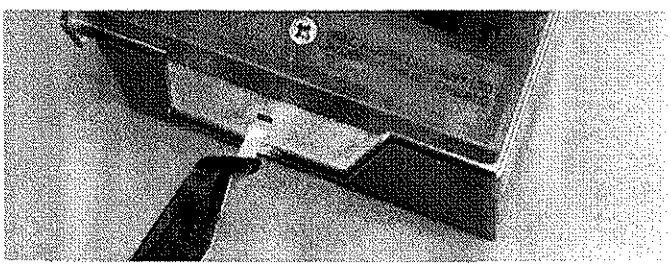
One end of the thermoplastic seal is held captive as shown.



The other end passes through the toothed hole in the cover and is pulled tight.



The seal is then trimmed.



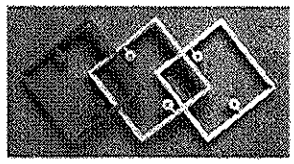
The cover may now only be lifted by breaking the seal; an additional guard against improper use.

REPLACEMENT LIDS

Replacement lids can be supplied in the event of damage or an alternative function marking requirement.
Orders must specify that the lids are for indoor models, and the function marking required.

SPACER PIECES

References:
M141W - Red
M142W - White
M143W - Yellow
M144W - Blue
M145W - Green



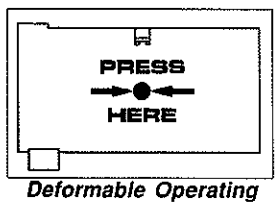
Spacer pieces fit to the front of surface plastic boxes adding 10mm to the overall depth of the box. The need for longer fixing screws should be noted - see items SC011 and SC012 following.

Overlength Screw, as required for fixing call point to box when a spacer piece is used - M3.5 x 40 countersunk slot steel black phosphate finish.
100 Pack - Ref: SC011
500 Pack - Ref: SC012

NO GLASS "RESETTABLE" CALL POINTS by fitting DEFORMABLE OPERATING ELEMENT

Reference: WF1

A call point can be made resettable by fitting a DEFORMABLE OPERATING ELEMENT in place of the usual BREAKABLE GLASS OPERATING ELEMENT. The addition of "/F" to the model reference, example WR2001/SR/F, describes such a call point. Alternatively, a DEFORMABLE OPERATING ELEMENT can be supplied separately, reference WF1.



Deformable Operating Element Ref: WF1.

OPERATING, TESTING and RESETTING: Pressing the Deformable Operating Element causes it to flex and release the switch. Inserting the test key resets the call point.

Non Compliance with BS5839:Part 2:1983

Section 5 of BS5839:Part 2:1983 requires that the "frangible element shall break" when the call point is operated. A Resettable call point cannot therefore comply with this Standard.

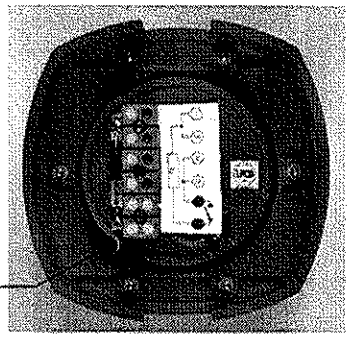
WATERPROOF CLASS 4000 CALL POINT MODELS WR4001, WR4061, AND WR4072,

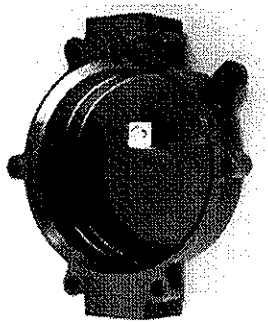
AND THEIR DERIVATIVES.



These call points provide a terminal enclosure sealed to IP67 and employ a sealed switch which also has a rating of IP67.

The 'O' Ring that effects the seal between the backbox and the waterproof cover.





ELECTRICAL CONFIGURATIONS

These three models differ with regard to their electrical configurations. In model reference WR4001, the first of the four digits identify the model as being of CLASS 4000, the remaining three digits refer to the actual electrical configuration as detailed below.

THE WATERPROOF COVER

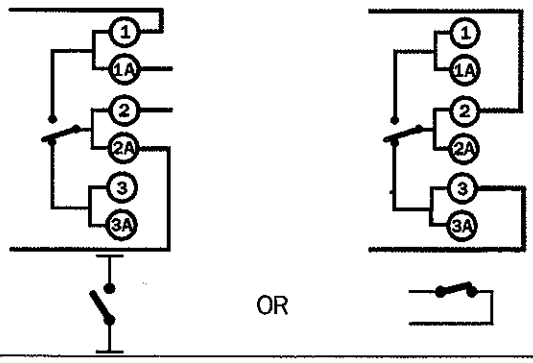
In this inside view, the flying leads of the sealed switch are seen entering the terminal enclosure; the entry hole is sealed with two part epoxy resin. The 2.5 Watt resistor (Model WR4072) can be seen fitted to the non-user side of the terminal block.

THE BACKBOX

This is provided with two 20mmØ threaded cable entry holes; one is fitted with a removable stopper.

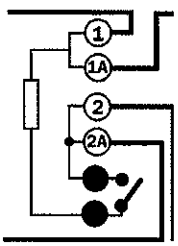
CONFIGURATION "001" - Single Pole Changeover

Model Example: WR4001



CONFIGURATION "072+END CODE" - With Monitoring Resistor

Model Example: WR4072-470



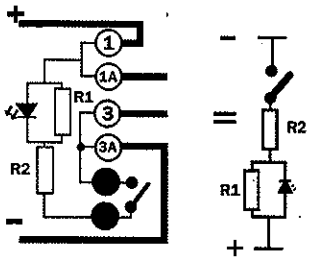
The END CODE is used to denote the value of the 2.5 Watt resistor in ohms.

In the model example WR4072-470, the 2.5 Watt monitoring resistor is 470Ω.

CONFIGURATION "061+END CODE" - LED Model

Model Example: WR4061-120-470

The red LED is fitted adjacent to the function marking (FIRE). The END CODE is used to denote the values, in ohms, of the 0.5 Watt resistors R1 and R2.

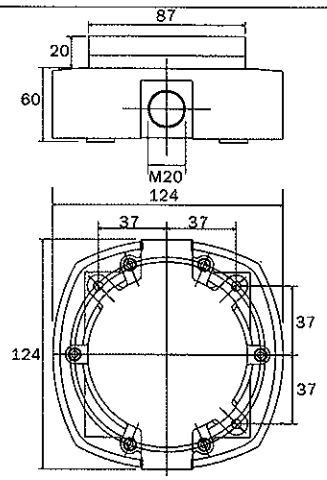


In the model example WR4061-120-470, R1 is 120Ω and R2 is 470Ω. R2 is current limiting and R1 is to ensure that the call point functions if the LED fails to open circuit.

MECHANICAL DATA

Nominal dimensions of CLASS 4000 call points in millimetres.

The diagram right shows the locations of the three 5mmØ fixing holes.



A MEMBER OF BFPSA British Fire Protection Systems Association

CERTIFICATE NO. FM 20416

KAC

QUALITY SYSTEMS CERTIFICATE No. 166 ASSESSED TO ISO9002

Document Ref
LIT:127
June 1998

MATERIALS

Plastic components are injection moulded in engineering grades of thermoplastic. The backbox for all models is of 15% glass reinforced nylon 6. Except for fire alarm models, the principal visible parts are self extinguishing V-0 to U.L. 94; a Poycarbonate ABS blend referred to as PC/ABS. Because of use on red BASEEFA certified models, fire alarm models are self extinguishing modified polyphenylene oxide (Noryl SE100).

ELECTRICAL DATA

Switch Data	Maximum Currents
50 VDC Resistive	1.0 A
30 VDC Resistive	5.0 A
30 VDC Inductive	3.0 A
230 VAC	5.0 A

FIRE ALARM MODELS are not Approvals Listed for use at voltages greater than 50 Volts. The contacts of the switch are of fine silver with switching capability as tabulated right. On some models, internal components further limit maximum current and voltage. Maximum switch contact resistance is 0.15Ω measured as required by BS5839:Part 2:1983, Clause 8.

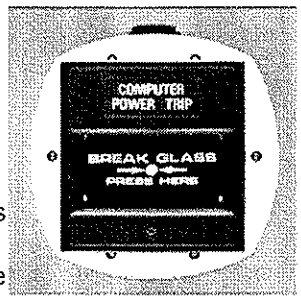
Special application call points of model configuration "001", example WW4001, are intended primarily for use with voltages of the order of 230Volts 50Hz. However, as these models are electrically identical to fire alarm model WR4001 they can be used on voltages down to 12 Volts DC.

APPROVALS

The following are among the products listed by the Loss Prevention Certification Board (LPCB) as complying with BS5839:Part 2:1983.

WR4001 WR4072 WR4061

SPECIAL APPLICATION CALL POINTS



Special Application Model;
WW-B4001 COMPUTER POWER TRIP

CLASS 4000 call points are manufactured in White and Yellow for non fire alarm "Special Applications". KAC literature item LIT:105 illustrates a selection of these. Demand does not justify the manufacture of Blue and Green models, but White models can be provided with alternatively Blue or Green lids. The table at the foot of this page illustrates their model references. These Special Application models are manufactured in "001" configuration (single pole changeover) as standard, all other configurations to special order.

TABLE OF SPECIAL APPLICATION MODEL REFERENCES

COLOURS	WHITE	YELLOW	WHITE WITH BLUE LID	WHITE WITH GREEN LID
REFERENCES	WW4001	WY4001	WW-B4001	WW-G4001

ACCESSORIES

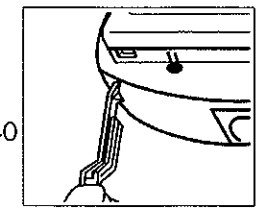
REPLACEMENT GLASS



Replacement Glass KG1.

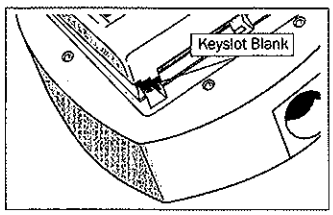
Reference of one glass: KG1
These are supplied in packs of 5,10, 25 & 50.
Example: 4 Packs of 25 KG1 = 100 pieces.
Orders must specify pack size.

SPARE TEST KEYS



Reference of one key: M008
Supplied in packs of 10.
Example: 4 packs of 10 M008 = 40 test keys.

KEY SLOT BLANK

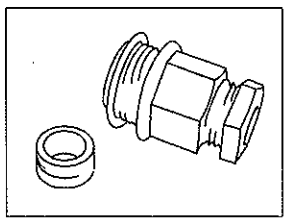


Reference add '/B'
Example: WY4001/B
A call point fitted with a transparent hinged cover and a breakable cover seal can still be operated using a test key. Fitting a key slot blank prevents this by blanking off the test key facility.

REPLACEMENT 'O' RINGS

Reference: M063
Supplied in packs of 5.
Example: 4 packs of 5 M063 = 20 'O' rings.
If the front is removed from a special environment call point after it has been in service, the 'O' ring should be replaced.

CABLE GLANDS



Reference: CG1
A nylon compression gland having M20 male thread suitable for use with the cable entry of class 4000 call points. Suitable for cables between 4 and 10.5mm ∅.

REPLACEMENT LIDS

Replacement lids can be supplied in the event of damage or an alternative function marking requirement.
Orders must specify the Lids are for CLASS 4000 Models and the function marking required.

ACCESSORIES ..... continued

TRANSPARENT HINGED COVER

Reference: M298
All CLASS 4000 models can be fitted with a transparent hinged cover which provides additional protection against accidental operation. The cover must be raised before the call point can be operated.

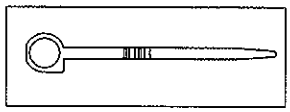


A call point fitted with a Transparent Hinged Cover

IMPORTANT NOTE:
All CLASS 4000 call points are equipped to receive a hinged cover which is supplied separately and is fitted by the Installer. Previously, a hinged cover was a 'Factory Fit' accessory.

BREAKABLE COVER SEAL

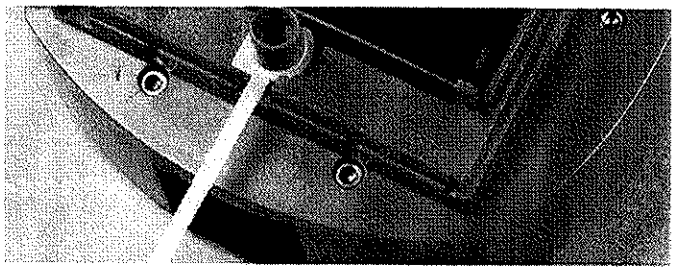
Reference: M355
Supplied in packs of 5.
Example: 4 packs of 5 M355 = 20 seals.



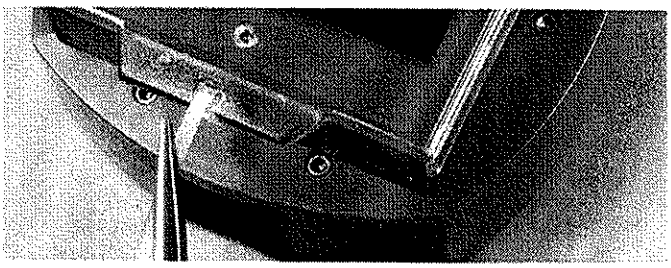
A hinged cover fitted with a seal M355 can only be lifted by breaking the seal. M355 can be used with the previous model of transparent hinged cover for which old seal M96 was produced but M96 cannot be used with new cover M298.

OPERATION OF HINGED COVER SEAL

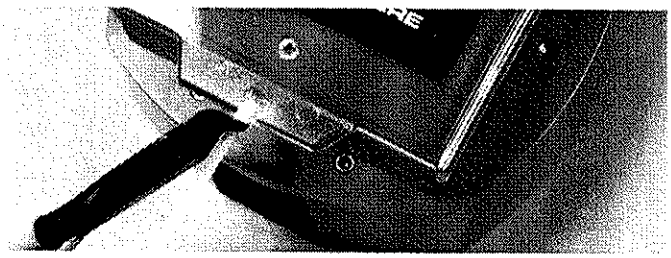
One end of the thermoplastic seal is held captive as shown.



The other end passes through the toothed hole in the cover and pulled tight.



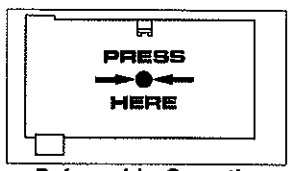
The seal is then trimmed.



The cover may now only be lifted by breaking the seal; an additional guard against improper use.

NO GLASS "RESETTABLE" CALL POINTS by fitting DEFORMABLE OPERATING ELEMENT

Reference: WF1



Deformable Operating Element Ref: WF1.

A call point can be made resettable by fitting a DEFORMABLE OPERATING ELEMENT in place of the usual BREAKABLE GLASS OPERATING ELEMENT. The addition of "/F" to the model reference, example WR4001/F, describes such a call point. Alternatively, a DEFORMABLE OPERATING ELEMENT can be supplied separately, reference WF1.

OPERATING, TESTING and RESETTING: Pressing the deformable operating element causes it to flex and release the switch. Inserting the test key resets the call point.

Non Compliance with BS5839:Part 2:1983
Section 5 of BS5839:Part 2:1983 requires that the "frangible element shall break" when the call point is operated. A Resettable call point cannot therefore comply with this Standard.

wheelock INC.

FIRE ALARM SYSTEMS

CSFM: 7135-0785:113

SERIES MB MOTOR BELLS

Description

Wheelock's Series MB motor bells provide a better engineered motor bell for fire and life safety alarm systems. A number of improvements have been built into the Wheelock Series MB bells line, including higher dBA, low current draw, built-in trimplate for semi-flush mounting, low frequency aluminum shells, and low RFI noise. The motor for Series MB bells is a durable, high torque, permanent magnet motor selected for its high performance and long life.

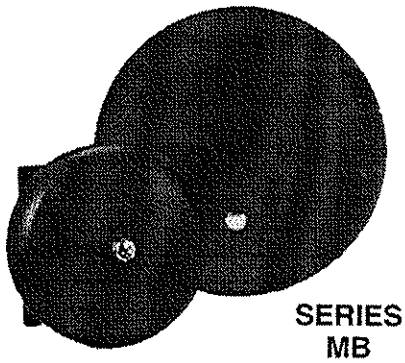
These DC vibrating Series MB motor bells are offered in 6" and 10" shell sizes in both 12 and 24 VDC models.

Series RSP/SRP retrofit plates are used for combination signaling using the MB Motor Bell and visual strobe signals. These 15, 15/75, 30, 75 and 110 candela strobe plates are designed for nericans with Disabilities Act (ADA) applications while meeting or exceeding the latest requirements of NFPA 72 (the National Fire Alarm Code), ANSI 117.1 (the American National Standard for Accessible and Usable Buildings and Facilities), and UL Standard 1971 (Signaling Devices for the Hearing Impaired). These new strobe products, when properly specified and installed in accordance with NFPA/ANSI Standards, can provide the Equivalent Facilitation allowed under ADA Accessibility Guidelines (ADAAG General Section 2.2) by meeting or exceeding the illumination which results from ADA's strobe intensity guidelines of 75 candela at 50 feet. This is an illumination of 0.030 lumens per square foot (footcandles).

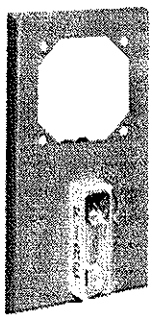
By specifying and installing Series SRP synchronized strobe plates, along with Wheelock SM/DSM Sync Modules, ***synchronized strobe flash is achieved.*** Synchronized strobes can eliminate possible restrictions on the number of strobes in the field of view. **Wheelock's synchronized strobes offer an easy way to comply with ADA recommendations concerning photosensitive epilepsy.**

eatures

- **Approvals include: Underwriters Laboratories (UL), Factory Mutual (FM), California State Fire Marshal (CSFM), New York (MEA) and Chicago (BFP) OSHA 29 CFR Part 1910 on all models.**
- High sound output with low current draw.
- Low frequency aluminum shells for better audibility through walls, doors, and other structures.



SERIES MB



RSP/SRP with Vertical



RSP/SRP with Horizontal

Remote Strobe Mounting Plates

- Both 6" and 10" shell sizes in 12 or 24 VDC models.
- Integral RFI suppression to minimize induced noise on the alarm lines.
- Mounting options for surface, semi-flush, outdoor, and concealed conduit installation.
- Built-in trimplate makes semi-flush mounting simpler and less expensive.
- Screw terminals permit fast in-out field wiring of 12 to 18 AWG wire.
- Polarized for DC supervision of alarm lines.
- Operate on filtered or unfiltered DC.
- For combined audible (bell) and visual signaling convenient retrofit plate assemblies are available with 15, 15/75, 30, 75 and 110 candela strobes (Refer to Fire Alarm Signals Catalog for strobe specifications and technical information).

Architects and Engineers Specifications

The alarm signals shall be Wheelock Series MB vibrating Motor Bells or approved equal. They shall be UL Listed for Fire Protective Service. Shells shall be aluminum in 6" (or 10") diameter. Sound output at 10 feet shall be 92 dBA. The bells shall incorporate a permanent magnet motor and suppression to minimize RFI. They shall include a built-in trimplate for semi-flush mounting to standard 4" square backboxes, or surface mounting to Wheelock's indoor BB backbox or outdoor WBB backbox.

For strobe bell applications retrofit plates Series RSP/SRP 15 cd, 15/75 cd, 30 cd, 75 cd or 110 cd intensity strobes shall be used. All bell models shall be polarized for line supervision and shall have screw terminals for in-out field wiring of 12 to 18 AWG wire. Operating voltage shall be nominal 24 VDC or 12 VDC. Finish on all models shall be red enamel.

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Ordering Information

Model Number	Order Code	Shell Size	Input Voltage (VDC)	Input Current	dBA @ 10 Ft.	Mounting* Options
DC VIBRATING MOTOR BELLS						
MB-G6-12-R	3942	6"	12	0.060	92	D, E, J, K, R, S
MB-G6-24-R	3941	6"	24	0.030		
MB-G10-12-R	3944	10"	12	0.060		
MB-G10-24-R	3943	10"	24	0.030		

Notes:
1. Typical dBA at 10 ft. is measured in an anechoic chamber.
2. For bells all 12 VDC models are UL rated for 9.0 to 15.6 VDC and all 24 VDC models for 18.0 to 31.0 VDC.

STROBE RETROFIT PLATES TO BE USED WITH MOTOR BELLS FOR COMBINATION SIGNALING

Model Number	Order Code	Nominal Voltage (VDC)	Strobe Candela (CD)	Average Current* (Amps)	Mounting Options**
RSP-2415-HFR	6650	24	15	.074	E,Q,Z
RSP-241575-VFR	6651	24	15/75	.100	E,Q,Z
RSP-2430-HFR	6652	24	30	.124	E,Q,Z
RSP-2475-HFR	6653	24	75	.211	E,Q,Z
RSP-24110-HFR	6680	24	110	.239	E,Q,Z
RSP-1215-HFR	6654	12	15	.155	E,Q,Z
RSP-121575-VFR	6655	12	15/75	.210	E,Q,Z
RSP-1230-HFR	6656	12	30	.227	E,Q,Z
SRP-2415-HFR(1)	**6657**	24	15	.096	E,Q,Z
SRP-241575-VFR(1)	**6658**	24	15/75	.138	E,Q,Z
SRP-2475-HFR(1)	**6659**	24	75	.200	E,Q,Z
SRP-24110-HFR(1)	**6685**	24	110	.239	E,Q,Z
SYNC MODULE					
SM-12/24-R(2)	6369	12		.014	E,N
		24		.025	E,N
DSM-12/24-R(2)	6374	12		.020	W
		24		.038	W

* Average current per actual Wheelock Product Testing @ 24 VDC Nominal Voltage. For rated average peak and inrush current across the listed voltage range for both filtered DC and full-wave rectangle (FWA) see the installation instructions or the current Wheelock 'Alarm Signals' catalog.
** Refer to Data Sheet S7000 for mounting options.

( ) DENOTES SPECIAL NOTES
1. SR denotes Synchronized models and require the use of a SM or DSM Sync Module. (For more detail refer to data sheet S3000).
2. SM Sync Module is rated for 3.0 amperes at 12 or 24 VDC. DSM Sync Module is rated for 3.0 amperes per circuit. The maximum number of interconnected DSM modules is twenty. (Refer to Data Sheet S3000.)

Wiring

Fig. 1 (Bell Models)

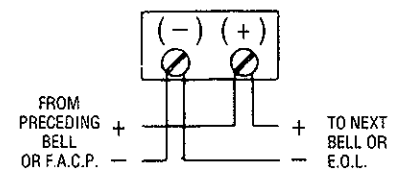
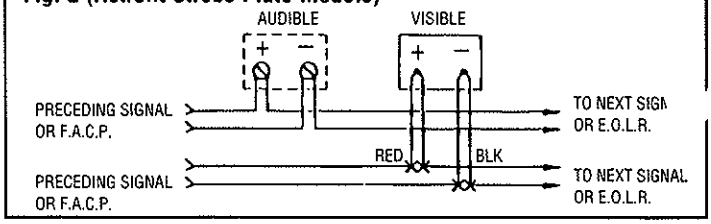


Fig. 2 (Retrofit Strobe Plate Models)



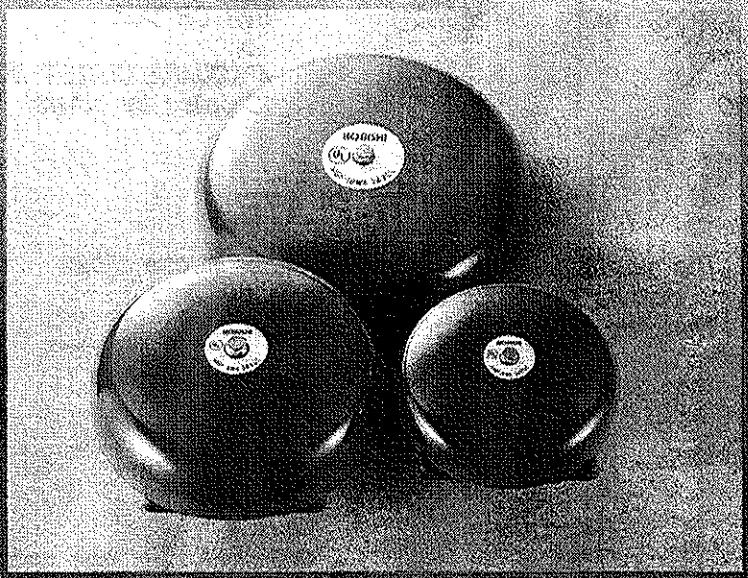
⚠ WARNING: PLEASE READ THESE SPECIFICATIONS AND INSTALLATION INSTRUCTIONS CAREFULLY BEFORE USING, SPECIFYING OR APPLYING THIS PRODUCT. FAILURE TO COMPLY WITH ANY OF THESE INSTRUCTIONS, CAUTIONS AND WARNINGS COULD RESULT IN IMPROPER APPLICATION, INTALLATION AND/OR OPERATION OF THESE PRODUCTS IN AN EMERGENCY SITUATION, WHICH COULD RESULT IN PROPERTY DAMAGE, AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.

Wheelock products must be used within their published specifications and must be PROPERLY specified, applied, installed, operated, maintained and operationally tested in accordance with their installation instructions at the time of installation and at least twice a year or more often and in accordance with local, state and federal codes, regulations and laws. Specification, application, installation, operation, maintenance and testing must be performed by qualified personnel for proper operation in accordance with all of the latest National Fire Protection Association (NFPA), Underwriters' Laboratories (UL), National Electrical Code (NEC), Occupational Safety and Health Administration (OSHA), local, state, county, province, district, federal and other applicable building and fire standards, guidelines, regulations, laws and codes including, but not limited to, all appendices and amendments and the requirements of the local authority having jurisdiction (AHJ).

Due to continuous development of our products, specifications and offerings are subject to change without notice in accordance with Wheelock, Inc. standard terms and conditions.

Distributed By:

MOTOR DRIVEN
FIRE ALARM BELL
MBF-WA Series
(AMERICAN STANDARD BELL)



NEW DESIGN CONCEPT RAISES THE STANDARD FOR FIRE BELLS

FM 486N LISTED UL

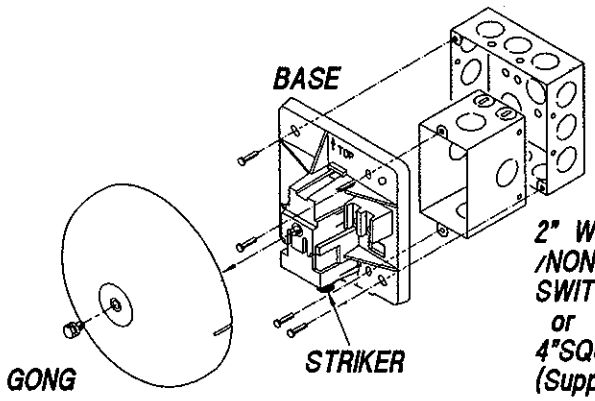
Audible Signal Appliance for Fire Alarm Service

SUPPRESSED & POLARIZED

FEATURES :

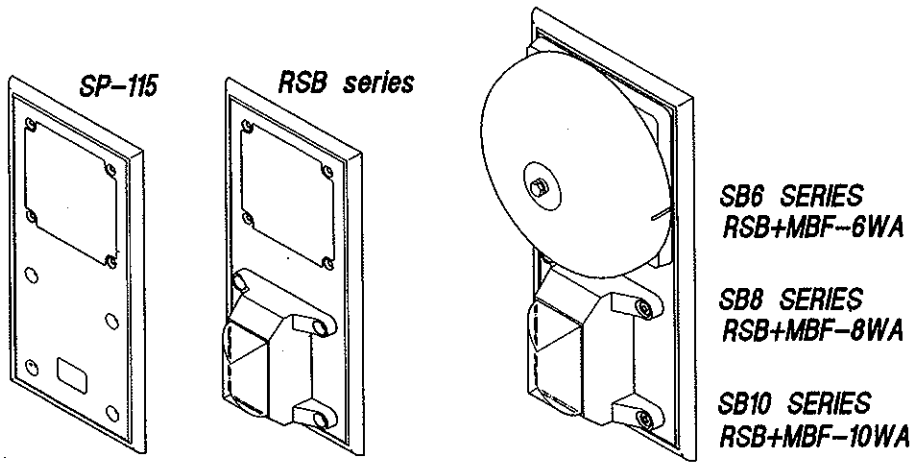
The MBF-Bell with a low starting voltage and low current consumption which withstands long and continuous sounding.
Concept of the new design changes the standard for the fire bell installations and costs.

INSTALLATION



RETROFIT PLATE

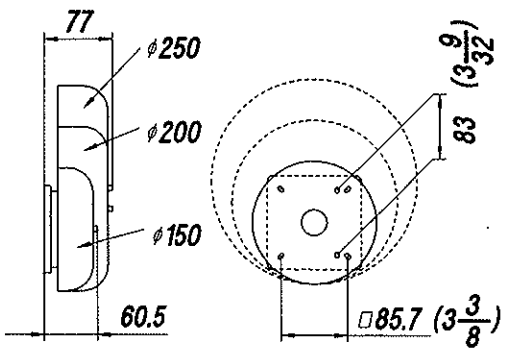
The retrofit plate SP-115 or RSB series strobe allows to operate bell/strobe combination in the field. The plate available in red or white color.



RATING

Model Number	MBF-6WA	MBF-8WA	MBF-10WA
Gong Size	6inch	8inch	10inch
Rated Voltage	24VDC		
Rated Current	25mA	35mA	35mA
Starting Voltage	16VDC		
Operating Voltage Range	19.2 ~ 28.8VDC		
UL dB Rating	85dB		88dB
Indoor Measurement	86~91dB	88~94dB	89~95dB

DIMENSIONS : mm (inch)



* Design and specifications are subject to change without notice.

PATENT Engineering Co Pte Ltd
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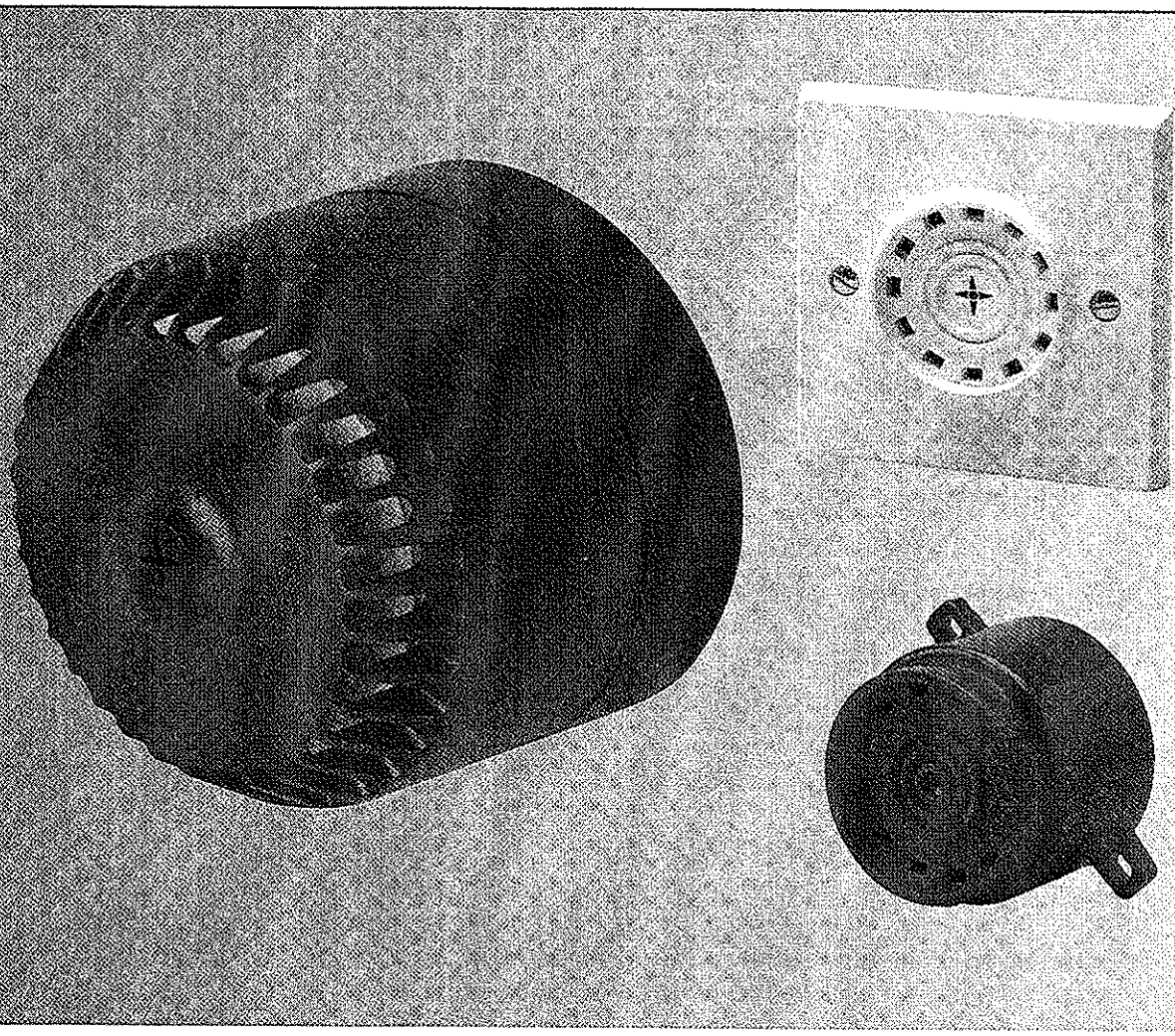
Singapore 159455
Tel 2732277 Fax 2732278

ELECTRONIC SOUNDERS



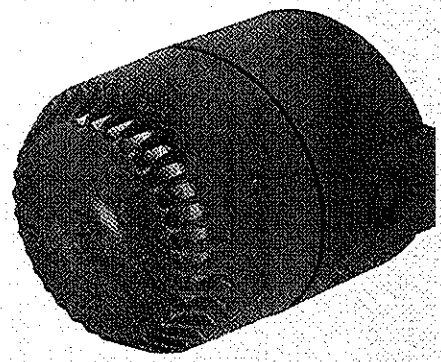
A range of Electronic Sounders designed for use within fire alarm systems, intruder alarm systems and industrial signalling systems. Designed for reliability in operation the range comprises several different models; Roshni, a wall mounting sounder for signalling indoors or outdoors within open areas, corridors and passages; Askari Compact, for use in hotel bedrooms and other areas where unobtrusive installation is important; Askari Panel, for panel mounting and use in industrial instrumentation and control centre applications; Askari Flange, for surface mounting within cabinets and machines for industrial control transport and vending machine applications.

- 24 SIGNAL TONES AVAILABLE
- EVERY SOUNDER SUITABLE FOR 12V D.C. & 24V D.C. SYSTEMS, NO ADJUSTMENT REQUIRED
- HIGH SOUND OUTPUT WITH LOW CURRENT CONSUMPTION
- AUTOMATIC SYNCHRONISATION
- VOLUME CONTROL AS STANDARD
- ALL SOUNDERS WEATHER RESISTANT TO IP65
- ALL SOUNDERS AVAILABLE IN RED OR WHITE ABS MOULDING

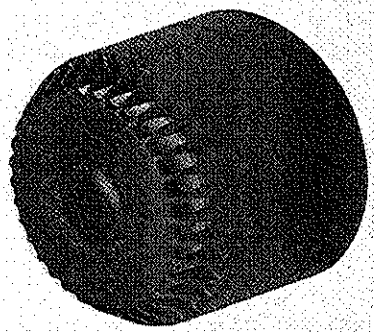
Fulleon Synchrobell

ROSHNI

The Roshni is widely accepted as a favourite choice amongst specifiers, installers and distributors of electronic sounders within systems, and it has set the standard in what it provides



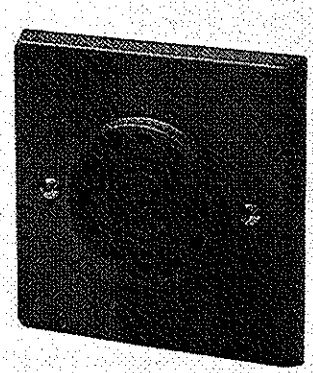
- This highly durable value-for-money, high sound output unit is designed to be a mainstay component in any alarm system installation.
- Automatic synchronisation provides enhanced signal clarification on multi-sounder systems, which is a standard feature for the Roshni, as with all sounders in the range.
- Every Roshni can provide 24 different tones (see Tones table), switch selectable during installation. Each is supplied pre-set to one of the 24 tones, according to order, the default option being tone no. 3 for use in fire alarm systems complying to BS5839, Part 1:1988.
- A second tone is available if a third wire is installed in the sounder circuit (see Tones table).
- Flush or surface cabling is accommodated through a choice of a shallow or deep base. The sounder fixes to the base with a twist bayonet action.



- A mains operated version, 110/240V A.C. (50Hz), is available.
- A lockable base version is available, the sounder body being secured to the base with a screw which can only be unfastened using a special tool.
- An anti-tamper version, with anti-tamper switch, is available (only with the shallow base).
- See also general technical specification.

ASKARI COMPACT

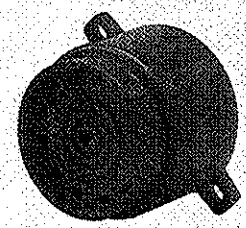
The Askari Compact meets growing demand for local room sounders, which are a particular trend with users and specifiers of systems designed to protect hotel bedrooms. Askari Compact is the ideal sounder to meet the requirements of BS5839, Part 1, with regard to sound output in sleeping risks.



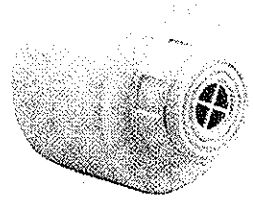
- Ultra-slim profile designed for unobtrusive installation.
- The unit is supplied pre-set to any 24 different tones (see Tones table).
- A second tone is available if a third wire is installed in the sounder circuit (see Tones table).
- Flush or surface cabling is accommodated through choice of standard single-gang flush or surface wall boxes (minimum wall box depth of 36mm to allow wiring termination clearance)
- See also general technical specification.

ASKARI FLANGE

The Askari Flange sounder is designed for applications where an alarm signal is required from within cabinets or machines. Applications are diverse, from Pedestrian Crossing sound signals to Consumer Vending Machine security alarms.



- Two protruding flanges securely fix the body to a surface.
- As for the Askari Panel sounder, the unit is pre-set to any of 24 different tones and a second tone is available if a third wire is installed in the sounder circuit.
- See also general technical specification.



ASKARI PANEL

The Askari Panel sounder meets the requirements of industry for instrumentation and control centre alarms, being designed for easy mounting onto control panel fronts.

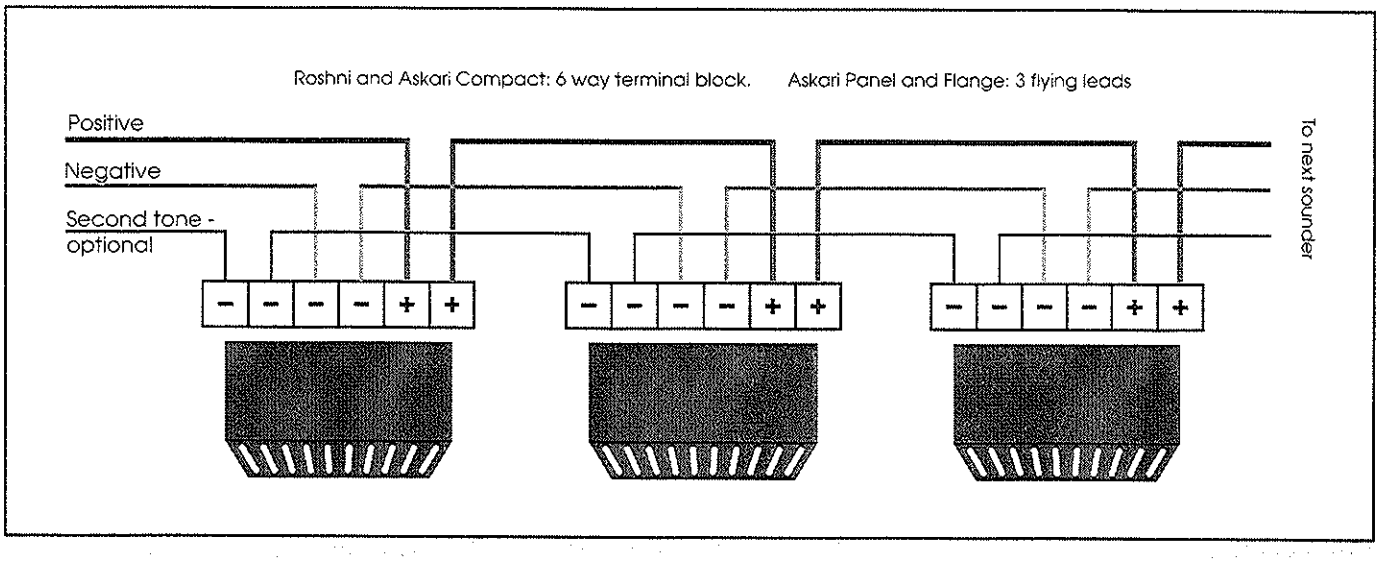
- The screw-on top clamps the sounder body to a panel surface, when the neck of the sounder protrudes through a suitably sized panel aperture.
- The unit is supplied pre-set to any of 24 different tones (see Tones table).
- A second tone is available if a third wire is installed in the sounder circuit.
- See also general technical specification.

TECHNICAL SPECIFICATIONS

MODEL		Roshni Shallow	Roshni Deep	Askari Compact	Askari Panel	Askari Flange
Operation		Continuously rated				
Operating Voltage Range		9 - 28V D.C.				
Sound Output dBA at 1 metre (tone 3)*	12V D.C.	103	103	99	99	99
	24V D.C.	105	105	101	101	101
Current Consumption (tone 3)*	12V D.C.	8mA				
	24V D.C.	18mA				
Starting Current		30mA for 2 milliseconds				
Staring Time		1.5 milliseconds				
Automatic Synchronisation		Synchronised phase start				
Frequency Stability		+/- 0.15%				
Operating Temperature Range		-40°C to +80°C				
Line Monitoring Method		Polarised input				
Construction		ABS plastic case, red or white				
Ingress Protection		IP65				
Dimensions		93mm dia. x 75mm depth	93mm dia. x 105mm depth	85.75mm^2 x 36mm depth	50mm dia. x 44mm depth	52mm dia. x 43mm depth
Weight		290g	311g	109g	85g	95g

*See Tones table

WIRING



TONES TABLE

No.	Tones	2nd Tone	Code 12345	Description	Typical current (mA)		Typical Sound Output ±2dBA at 1m	
					12V	24V	12V	24V
1	Alternating Tones 800/970 at 2 Hz	14	11111		9	18	96	104
2	Sweeping 800/970 Hz at 7 Hz	14	11110	Fast Sweep (LF)	9	18	100	105
3	Sweeping 800/970 Hz at 1 Hz	14	11101	Medium Sweep (LF)	8	18	103	105
4	Continuous at 2850 Hz	14	11100		14	29	110	116
5	Sweeping 2400-2850 Hz at 7 Hz	4	11011	Fast Sweep	10	23	104	114
6	Sweeping 2400-2850 Hz at 1 Hz	4	11010		10	23	100	113
7	Slow Whoop	14	11001	Slow Whoop	7	15	99	103
8	Sweep 1200-500 Hz at 1 Hz	14	11000	Din Tone	8	16	95	103
9	Alternating Tones 2400/2850 2 Hz	4	10111		12	27	107	113
10	Intermittent Tone of 970 Hz at 1Hz	14	10110	Back-up Alarm (LF)	5	12	99	106
11	Alternating Tones 800/970 Hz at 1Hz	14	10101		9	18	97	105
12	Intermittent Tone at 2850 Hz at 1Hz	4	10100	Back-up Alarm (HF)	8	20	100	116
13	970 Hz at 1/4 sec. on 1 sec. off	14	10011		3	7	99	102
14	Continuous at 970 Hz	14	10010		9	20	99	107
15	554 for 100 ms and 440 Hz for 400ms	14	10001	French Fire Sound	5	12	92	97
16	Intermittent 660 Hz 150ms On/150 ms Off	16	10000	Swedish Fire Alarm	4	9	80	87
17	Intermittent 660 Hz 1.8s On/1.8s Off	17	01111	Swedish Fire Alarm	5	12	82	91
18	Intermittent 660 Hz 6.5s On/13s Off	18	01110	Swedish Fire Alarm	4	10	82	90
19	Continuous 660 Hz	19	01101	Swedish Fire Alarm	6	14	82	90
20	Alternating 554/440 Hz at 1 Hz	20	01100	Swedish Fire Alarm	6	13	90	95
21	Intermittent 660 Hz at 1 Hz	21	01011	Swedish Fire Alarm	4	9	80	87
22	Intermittent 2850 Hz 150 ms On/100 ms Off	14	01010	Pelican Crossing	9	19	108	113
23	Sweep 800-970 Hz at 50 Hz	14	01001	Low Frequency Buzz	9	18	99	105
24	Sweep 2400-2850 Hz at 50 Hz	4	01000	High Frequency Buzz	12	22	106	112
25	Intermittent 970Hz 500ms On/500ms Off	25	00111	ISO 8201 Low Frequency	9	29	99	107
26	Intermittent 2850Hz 500ms On/500ms Off	26	00110	ISO 8201 High Frequency	14	29	110	116

NOTE: International Emergency Signals available on request.

Volume Control as standard.
All the units have two inputs and two outputs.
dBA figures are for Roshni.
Askari models are 4dBA less.

ORDERING CODES

- - / - / - / - - / - - -

- L - Lockable base required
- A - Anti-tamper switch required
- M - Mains operation, 110/240V 50Hz A.C.
- nn - Tone number
- S or D - Shallow or Deep base (Roshni only)
- R or W - Red or White ABS moulding
- RO - Roshni
- AC - Askari Compact
- AP - Askari Panel
- AF - Askari Flange

EXAMPLES

RO/R/S/3
Roshni, red moulding, shallow base, Tone 3.

AC/W/5
Askari Compact, white moulding, Tone 5.

We reserve the right to change, without notice, the specification of these products from that detailed.

PATENT Engineering Co Pte Ltd
Blk 1001 Jalan Bukit Merah #05-11
Singapore 159455
Tel 2732277 Fax 2732278

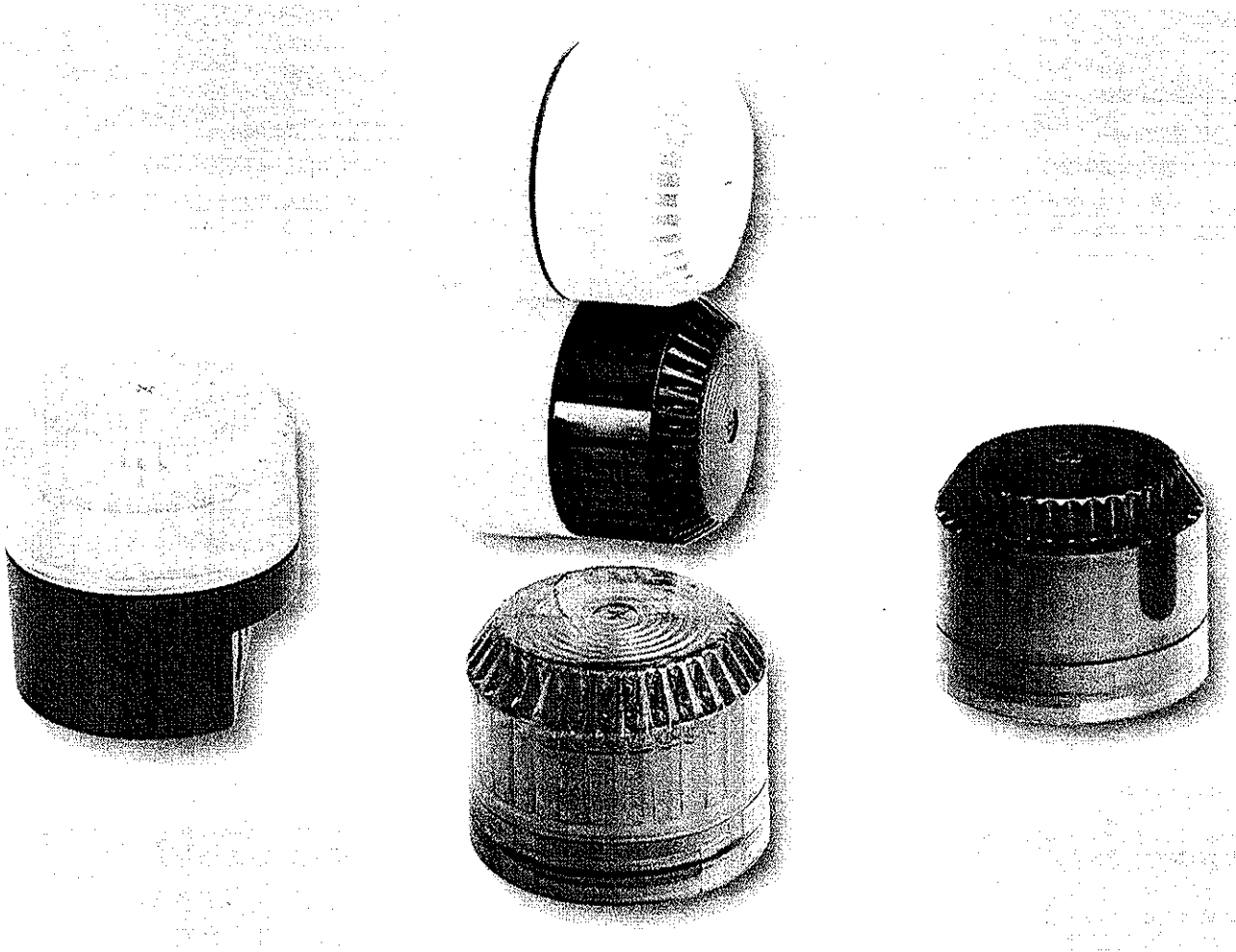
BFPSA
THE BRITISH FIRE PROTECTION SYSTEMS ASSOCIATION LTD.

THE QUEENS AWARD FOR EXPORT ACHIEVEMENT

Xenon Beacons

NEW PRODUCT
Available from August 1998

INTELLIGENT XENON BEACONS



This highly innovative new range of Xenon Beacons have been designed to overcome common problems encountered with conventional Xenon Beacons such as switch on current surges, increased current consumption when battery voltages are higher than 24V DC and the need to stock different versions for different voltages.

All DC versions have Surge Current Suppression (SCS) circuitry to eliminate the need for heavy duty power supplies to stop fuses blowing.

The 5 watt version also includes Active Current Management (ACM) which ensures that the current consumption reduces as the supply voltage increases. Three different flash frequencies are also user selectable.

With total base compatibility with other products in the range and a robust polycarbonate lens, these products offer total flexibility and are suitable for installation both inside and outside.

- **NO SWITCH ON CURRENT SURGE**
- **NO MORE BLOWING FUSES**
- **SELECTABLE FLASH FREQUENCY (5 WATT ONLY)**
- **ACM (ACTIVE CURRENT MANAGEMENT) CIRCUITRY TO REDUCE CURRENT CONSUMPTION**
- **BUILT IN TERMINAL BLOCK WHICH WILL SAVE EXPENSE OF EXTERNAL TERMINAL BOXES**
- **IP65 WHEN USED WITH A DEEP OR 'U' BASE**
- **CHOICE OF CLEAR, RED, AMBER, BLUE OR GREEN LENSES**

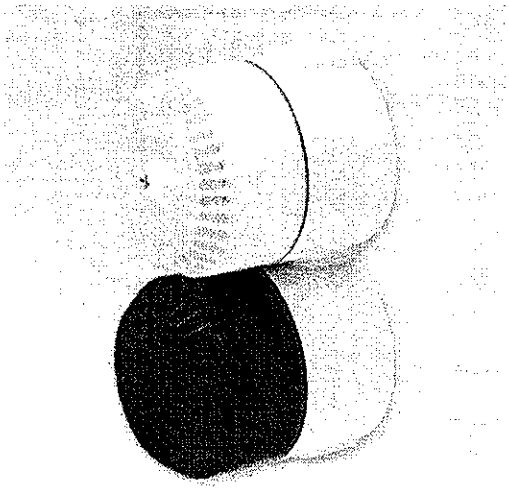
XENON BEACONS

The Xenon Beacons have been designed to complement other products in the range both technically and aesthetically. The beacons will mount neatly onto a Squashni base sounder to provide a low profile sounder/beacon. Similarly the beacon can be supplied coupled to a Roshni electronic sounder to provide a high output audio visual unit.

The beacons have a built in terminal block for ease of installation and utilise the same range of bayonet fitting bases as other products in the range. (The mains beacon is supplied with a lockable or 'U' base only.)

A range of lens colours is available which must be specified when ordering as they are not interchangeable.

Beacons for use in hazardous areas are also available, for the full specification and details please see separate Hazardous Area brochure reference FS0012.



Audio-visual unit (AV)

SPECIFICATION

Model	24V 1W	24V 2W	12V 1W	12V 2W	Multi Voltage 5W	Mains AC
Operation	Continuously Rated					
Operating Voltage Range	20 - 30V DC	20 - 30V DC	10 - 15V DC	10 - 15V DC	10 - 30V DC	220 - 240V AC
Average Current Consumption	40mA @ 24V	90mA @ 24V	90mA @ 12V	200mA @ 12V	156 - 400mA @ 24V depending on selected flash frequency	12mA
Power Rating	1.0 W	2.1 W	1.0 W	2.4 W	5 W (at 1Hz)	2.9 W
Selectable Flash Rate	1Hz	1Hz	1Hz	1Hz	0.75Hz 1Hz 2Hz	1Hz
Flash Energy	0.7 J	1.45 J	0.7 J	1.45 J	3.6 J	2.0 J
Operating Temperature	-20°C to +55°C					-10°C to +55°C
Line Monitoring Method	Polarised Input					N/A
Construction	Polycarbonate					
Ingress Protection	IP54 (shallow base), IP65 (deep or 'U' base)					IP65
Base Options	Shallow, Deep, Deep lockable, 'U', 'U' lockable					Deep or 'U' Lockable
Lens Colours	Red, Amber, Green, Blue, Clear					
Dimensions	93mm dia. x 72mm high (shallow base) 93mm dia. x 100mm high (deep or 'U' base)					93mm dia. x 100mm high
Weight	0.25kg (deep or 'U' base), 0.23kg (shallow base)					0.25kg

ORDERING CODES

- - / - / - - / - / - / - -

Voltage: 12 = 12V DC, 24 = 24V DC, MV = Multi Voltage, AC = Mains
Power (Watt): 1 = 1 Watt, 2 = 2 Watt, 5 = 5 Watt
Base Colour: R = Red, W = White (Deep or 'U' Base colour)
Base Type: DB = Deep, SB = Shallow, UB = 'U', DL = Deep lockable, UL = 'U' lockable
Lens Colour: R = Red, A = Amber, G = Green, B = Blue, C = Clear
Xenon Beacon: IB = Intelligent Beacon, XB = Mains Xenon Beacon

EXAMPLE: IB/R/UB/R/5/MV

Intelligent Xenon Beacon/Red Lens/'U' Base/Red/5W/Multi Voltage.

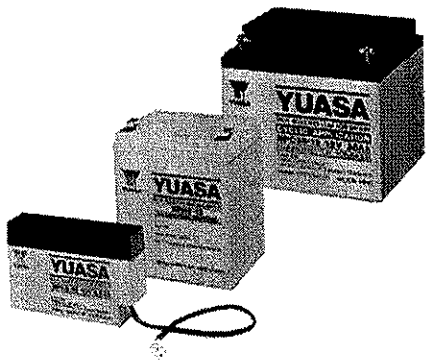
We reserve the right to change, without notice, the specification of these products from that detailed.

YUASA

NP/NPH/NPC SERIES

MAINTENANCE-FREE VALVE REGULATED LEAD-ACID BATTERIES





YUASA CORPORATION
JAPAN

Yuasa NP, NPH, NPC Series

Utilising the latest advanced design Oxygen Recombination technology, Yuasa have applied their 75 years experience in the lead acid battery field to produce a new generation of Valve Regulated Lead Acid batteries.

GENERAL FEATURES

- Sealed Construction
- Electrolyte Suspension System
- Gas Recombination
- Maintenance Free Operation
- Operation in any Orientation
- Low Pressure Venting System
- Heavy Duty Grids
- Long Service Life
- Low Self Discharge—Long Shelf Life
- Wide Operating Temperature Range



NP SERIES (FOR GENERAL APPLICATION)

SPECIAL FEATURE: Many models are available in a wide range of sizes.
This ensures that all general applications are covered by various ranges of capacity.

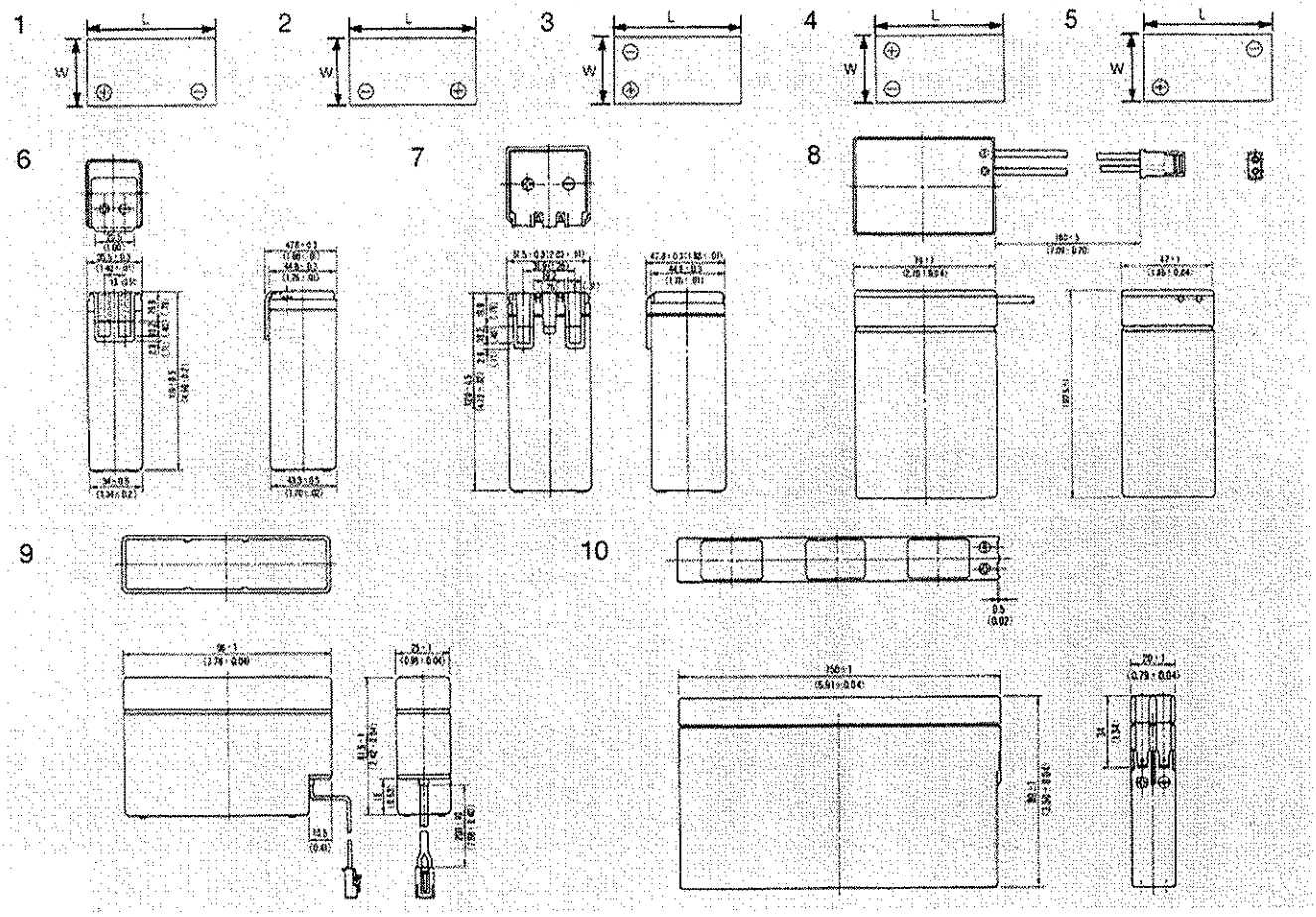
• Specifications

NP Model	Volts	Rated Capacity (20 hr rate) (Ah)*1	Approx. Dimensions						Approx. Weight		Layout	Terminals
			Length		Width		Overall height incl. terminals					
			mm	(in.)	mm	(in.)	mm	(in.)	kg	(lbs.)		
NP3-4	4	3.0	90.5	(3.56)	34	(1.34)	64	(2.52)	0.43	(0.95)	1	A
NP4.2-4H		4.2*2	47.8	(1.88)	35.5	(1.40)	119	(4.69)	0.56	(1.23)	6	—
NP10-4		10.0	102	(4.02)	50	(1.97)	98	(3.86)	1.35	(2.97)	1	D
NP1-6	6	1.0	51	(2.01)	42.5	(1.67)	54.5	(2.15)	0.25	(0.55)	5	A
NP1.2-6		1.2	97	(3.82)	25	(0.98)	54.5	(2.15)	0.30	(0.66)	1	A
NP2.6-6		2.6	134	(5.28)	34	(1.33)	64.0	(2.52)	0.56	(1.23)	1	A
NP3-6		3.0	134	(5.28)	34	(1.33)	64.0	(2.52)	0.65	(1.43)	1	A
NP4-6		4.0	70	(2.76)	47	(1.85)	105.5	(4.15)	0.85	(1.87)	5	A
NP4-6W		4.0	70	(2.76)	47	(1.85)	102.5	(4.04)	0.85	(1.87)	8	H
NP4.2-6H		4.2*2	47.8	(1.88)	51.5	(2.03)	120	(4.72)	0.80	(1.76)	7	—
NP7-6		7.0	151	(5.94)	34	(1.34)	97.5	(3.84)	1.35	(2.97)	1	A
NP8-6		8.0	151	(5.94)	50	(1.97)	97.5	(3.84)	1.80	(3.96)	1	A
NP10-6		10.0	151	(5.94)	50	(1.97)	97.5	(3.84)	2.00	(4.41)	1	A
NP0.8-12	12	0.8	96	(3.78)	25	(0.98)	61.5	(2.42)	0.35	(0.77)	9	I
NP1.2-12		1.2	97	(3.82)	48	(1.89)	54.5	(2.15)	0.57	(1.26)	3	A
NP1.9-12		1.9	178	(7.01)	34	(1.34)	64	(2.52)	0.83	(1.83)	1	A
NP2.3-12		2.3	178	(7.01)	34	(1.34)	64	(2.52)	0.94	(2.07)	1	A
NP2-12		2.0	150	(5.91)	20	(0.79)	89	(3.50)	0.70	(1.54)	10	B
NP2.6-12		2.6	134	(5.28)	67	(2.64)	64	(2.52)	1.12	(2.47)	3	A
NP4-12		4.0	90	(3.54)	70	(2.76)	106	(4.17)	1.70	(3.74)	1	A
NP7-12		7.0	151	(5.94)	65	(2.56)	97.5	(3.84)	2.65	(5.84)	4	A
NP12-12		12.0	151	(5.94)	98	(3.86)	97.5	(3.84)	4.00	(8.81)	4	D
NP24-12		24.0	175	(6.89)	166	(6.54)	125	(4.92)	8.65	(19.05)	2	C
NP24-12B		24.0	175	(6.89)	166	(6.54)	125	(4.92)	8.65	(19.05)	2	E
NP38-12		38.0	197	(7.76)	165	(6.50)	170	(6.69)	13.80	(30.40)	2	F
NP65-12		65.0	350	(13.78)	166	(6.54)	174	(6.85)	22.80	(50.22)	2	G

*1. Final Voltage: 1.75 V/cell, Temperature: 25°C (77°F)
*2. Capacity: 10 hr rate

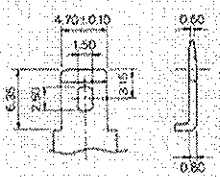
Layout

Sizes in mm (inch)



Terminals

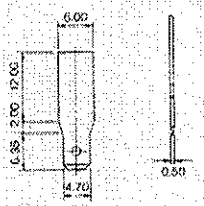
A



mm	inch
6.35	0.250
4.70	0.185
3.15	0.124
2.50	0.098
1.50	0.059
0.80	0.031
0.50	0.020
0.10	0.004

Faston tab: 187

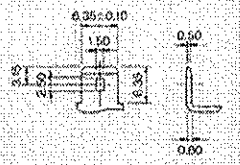
B



mm	inch
12.00	0.472
6.35	0.250
6.00	0.236
4.70	0.185
2.00	0.079
0.50	0.020

Faston tab: 187

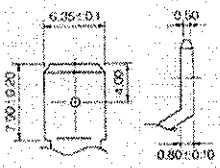
C



mm	inch
6.35	0.250
3.15	0.124
2.50	0.098
1.50	0.059
0.80	0.031
0.50	0.020

Faston tab: 250

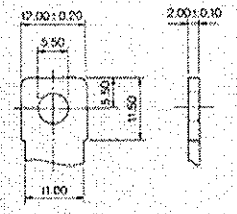
D



mm	inch
7.90	0.310
6.35	0.250
4.00	0.160
0.80	0.031
0.50	0.020

Faston tab: 250

E

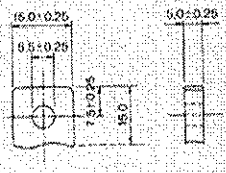


mm	inch
12.00	0.472
11.50	0.453
11.00	0.433
5.50	0.216
2.00	0.079

•Bolt Type:M5
•Tightening Torque:1.96~2.94(Nm) (20~30kgf.cm)

Bolt fastened terminal

F

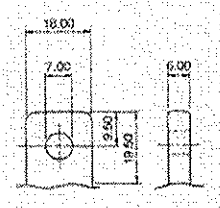


mm	inch
15.0	0.591
7.5	0.295
5.5	0.217
0.25	0.010

•Bolt Type:M5
•Tightening Torque:1.96~2.94(Nm)
(20~30kgf.cm)

Bolt fastened terminal

G

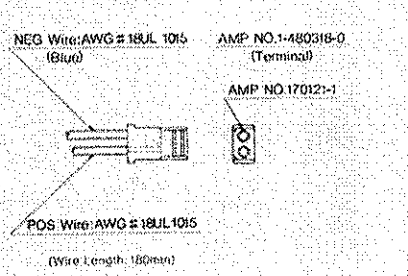


mm	inch
19.5	0.768
18.0	0.710
9.5	0.370
7.0	0.270
6.0	0.240

•Bolt Type:M6
•Tightening Torque:3.92~5.6(Nm)
(40~55kgf.cm)

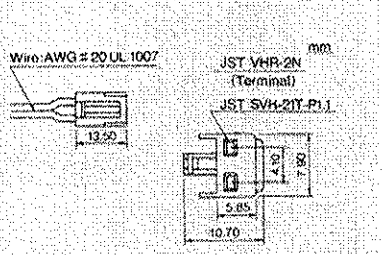
Bolt fastened terminal

H



AMP No. 1-480318-0

I



JST No. VHR-2N

CERTIFICATES OF ACCREDITATION AND APPROVAL

PATENT

CERTIFICATE OF CONFORMITY

PSB Corporation

PSB Product Listing Scheme*: Class 1A

This Certificate is issued to

Patent Engineering Co Pte Ltd
Block 1001 Jalan Bukit Merah #05-11
Singapore 159455

FOR

Product:	Fire Alarm Panel
Brand:	Patent
Model:	System 88
Country of Origin:	Singapore
Product Details:	Conventional 1 to 120 Zones Of Fire Alarm Panel Complete With Simulators (Break Glass, Alarm Bell, Strobe Light, Smoke & Heat Detectors)

which has complied with the requirements of the scheme and based on the following:

Standard(s)	Test Report(s)
BS EN 54-2 : 1998	30S0005554/A/GT/YCI
BS EN 54-4 : 1998	30S0005554/B/GT/YCI
SS CP 10 : 1993	EMC/R/02012, EMC/R/02291

Henry Heng
Chief Executive Officer

Certificate No:	Date of Original Issue:	Date of Last Revision:	Date of Expiry:
020707	02/02/1999	07/01/2002	28/02/2004

PSB TEST®

*** All products listed under Class 1A/1B must have this mark affixed/printed on them. Failure to comply with this requirement may result in revocation of this certificate**

This Certificate is part of a full report and should be read in conjunction with it. This Certificate remains the property of PSB Corporation Pte Ltd and shall be returned upon request. The use of this Certificate is subjected to the terms and conditions of the Product Listing Scheme. The manufacturer is solely responsible for compliance of any product that has the same designation as the product type-tested.

NOTE: Persons relying on this Certificate should verify its validity by checking PSB Corporation's website at www.psbtest.com.sg

Certificate of Approval

Awarded to

PATENT ENGINEERING CO. PTE LTD.
BLOCK 1001, JALAN BUKIT MERAH #05-11,
SINGAPORE 159455

Bureau Veritas Quality International certify that the Quality Management System of the above supplier has been assessed and found to be in accordance with the requirements of the quality standards detailed below

QUALITY STANDARDS

ISO 9001:1994

SCOPE OF SUPPLY

DESIGN, SUPPLY, MANUFACTURING OF FIRE ALARM SYSTEMS

Subject to the continued satisfactory operation of the supplier's Quality Management System, this Certificate is valid from:

19 November 1998

Date: **04 December 1998**

NATIONAL ACCREDITATION OF CERTIFICATION BODIES
Registration Number 008

For Bureau Veritas Quality International

Certificate No: **51988**

The use of Accreditation Mark indicates accreditation in respect of those activities covered by the accreditation certificate number 008

Certificate of Approval

Awarded to

PATENT SYSTEMS PTE LTD
BLOCK 1001, JALAN BUKIT MERAH, #05-11
SINGAPORE 159455

Bureau Veritas Quality International certify that the Quality Management System of the above supplier has been assessed and found to be in accordance with the requirements of the quality standards detailed below

QUALITY STANDARDS

ISO 9002:1994

SCOPE OF SUPPLY

SALES AND TRADING OF FIRE ALARM SYSTEMS

Subject to the continued satisfactory operation of the supplier's Quality Management System, this Certificate is valid from:

19 November 1998

Date: 07 **December 1998**

For Bureau Veritas Quality International

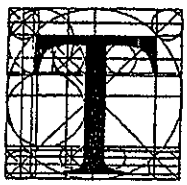
NATIONAL ACCREDITATION OF CERTIFICATION BODIES
Registration Number 008

Certificate No: **51987**

The use of Accreditation Mark indicates accreditation in respect of those activities covered by the accreditation certificate number 008

THE LOSS PREVENTION CERTIFICATION BOARD LIMITED

CERTIFICATE OF SUPPLIER QUALITY MANAGEMENT SYSTEM



This is to certify that

HOCHIKI CORPORATION.
246 Tsuruma, Machida-city, Tokyo 194-8577, Japan.

has complied with the requirements identified in

ISO 9001 : 1994

and is authorised to use the LPCB mark on stationery and publications related to the following products and/or services

Design and manufacture of fire alarm control and indicating equipment.

Certificate No. 470

Issued 4 August 1999

Valid Until 3 August 2002

Signed on behalf of the LPCB

A P JAMES

The use of the Accreditation Mark indicates accreditation in respect of those activities covered by the accreditation certificate number 007

THE LOSS PREVENTION CERTIFICATION BOARD LIMITED
Melrose Avenue, Borehamwood, Hertfordshire WD6 2BJ • Tel: 0181 236 9600 • Fax: 0181 236 9601 • E-mail: info@lpc.co.uk

This certificate remains the property of the LPCB and is issued subject to LPCB terms and conditions

Loss Prevention Certification Board

LPCB

CERTIFICATE OF QUALITY SYSTEM REGISTRATION

This is to certify

HOCHIKI CORPORATION.
141-1 Maehara, Ejiri, Kakuda-shi, Miyagi 981-15, Japan.

has complied with the requirements identified in

ISO 9002 : 1994

and is authorised to use the LPCB mark on stationery and publications related to the following products and/or services

Manufacture of point type smoke and heat detectors and optical beam smoke detectors.

Certificate No. 117 Issue 5

Issued 20 July 2001

Valid Until 31 December 2003

Signed on behalf of the LPCB

C JUDGE

LPCB is part of BRE Certification Ltd., Garston, Watford, WD25 9XX. Tel 01923 664100 Fax 01923 664603 www.breecertification.co.uk
This certificate remains the property of BRE Certification Ltd and is issued subject to terms and conditions and is maintained and held in force through regular surveillance activities.
To check the authenticity of this certificate, please visit our website or contact us.

Loss Prevention Certification Board

LPCB

CERTIFICATE OF PRODUCT CONFORMITY

This is to certify

HOCHIKI CORPORATION
141-1 Maehara, Ejiri, Kakuda-shi, Miyagi 981-15, Japan

has complied with the requirements identified in

BS 5839 : Part 5 - Specification for optical beam smoke detectors.

and is authorised to use the LPCB mark on

SPB-E, SPB-ET and SRA-ET beam detectors
(Refer to the attached Appendix for details)

Certificate No. 117d Issue 5

Issued 20 July 2001

Valid Until 19 July 2004

Signed on behalf of the LPCB

E MATTIE SULEIMAN
This Certificate is issued and held in force subject to the corresponding ISO 9000 Certificate being maintained.

LPCB is part of BRE Certification Ltd., Garston, Watford WD25 9XX. Tel 01923 664100 Fax 01923 664603 www.brecertification.co.uk
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Loss Prevention Certification Board

LPCB

APPENDIX TO CERTIFICATE OF PRODUCT CONFORMITY NO. 117d

HOCHIKI CORPORATION

LPCB Ref.No.	Product
117d/01	SPB-E optical beam smoke detector [1]
117d/02	SPB-ET optical beam smoke detector [2]
117d/03	SRA-ET optical beam smoke detector [3]

Notes:

1 *Certificated at a sensitivity setting of 25% and when installed as option 2 as specified DS020 issue 1.2.*

2 *Certificated at a sensitivity setting of 25% only and with SPB-ET2WI interface kit.*

3 *Certified at a sensitivity setting of 30% obstruction.*

Signed on behalf of the LPCB

E MATTIE SULEIMAN

Appendix Issue No. 1

Page 1 of 1

Issued 20 July 2001

Valid Until 19 July 2004

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and is maintained and held in force through regular surveillance activities.
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Loss Prevention Certification Board

LPCB

CERTIFICATE OF PRODUCT CONFORMITY

This is to certify

HOCHIKI CORPORATION.
141-1 Maehara, Ejiri, Kakuda-shi, Miyagi 981-15, Japan.

has complied with the requirements identified in

BS 5445: Part 8 - Specification for high temperature heat detectors.

and is authorised to use the LPCB mark on

DCC-R1EL, DCD-R1E, DFE-90E and DFJ-90E Detectors
(Please refer to the attached Appendix for details)

Certificate No. 117c Issue 6

Issued 20 July 2001

Valid Until 19 July 2004

Signed on behalf of the LPCB

E.MATTIE SULEIMAN

This Certificate is issued and held in force subject to the corresponding ISO 9000 Certificate being maintained.

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Loss Prevention Certification Board

LPCB

APPENDIX TO CERTIFICATE OF PRODUCT CONFORMITY NO. 117c

HOCHIKI CORPORATION

Notes Continued....

[3] Using: YBN-R/4†
YBO-R/5†
YBN-R/4C
YBO-R/4C

Note: † Bases manufactured by Hochiki Europe Ltd.
‡ Detector/base combinations meet the requirements of the standard in low power mode

Alternative Model Numbers and Labelling

Hochiki Corporation Model No.	Alternative Model No.	Labelled
DFJ-90E	23903-K072	Kidde Fire Protection
	F850384N	Chubb
DCD-RIE	23903-K075	Kidde Fire Protection
	F850382N	Chubb

Signed on behalf of the LPCB

E MATTIE SULEIMAN

Appendix Issue No. 11

Page 2 of 2

Issued 20 July 2001

Valid Until 19 July 2004

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Loss Prevention Certification Board

APPENDIX TO CERTIFICATE OF PRODUCT CONFORMITY NO. 117c

HOCHIKI CORPORATION

LPCB Ref.	Product
117c/01	DFE-90E range 1 fixed temperature heat detector[1]
117c/02	DCC-R1EL range 1 rate of rise heat detector[2]
117c/03	DCD-R1E range 1 conventional rate of rise high temperature heat detector[3]
117c/04	DFJ-90E range 1 conventional fixed temperature heat detector[3]

Notes: [1] Using:
- YBC-RL/4H5 base
- YBF-RL/4H5 base
- AMU-MB master addressable base
- AMU-B2 addressable base
- YBF-RL/3J slave base
- YCA-RL/3H2 addressable base† ‡
- YCA-RL/5H2 master addressable base† ‡
- YBK-RL/4H1A base†
- YBK-RL/4H2 base†

[2] Using:
- YBC-R/3 base
- YBF-RL/4H5 base
- YBF-RL/4 base†
- AMU-MB master addressable base
- AMU-B2 addressable base
- YBF-RL/3J slave base
- YCA-RL/3H2 addressable base† ‡
- YCA-RL/5H2 master addressable base† ‡
- YBK-RL/4H1A base†
- YBK-RL/4H2 base†

Signed on behalf of the LPCB

E MATTIE SULEIMAN

Appendix Issue No. 11

Issued 20 July 2001

Valid Until 19 July 2004

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To check the authenticity of this certificate, please visit our website or contact us.

Loss Prevention Certification Board

LPCB

CERTIFICATE OF PRODUCT CONFORMITY

This is to certify

HOCHIKI CORPORATION
141-1 Maehara, Ejiri, Kakuda-Shi, Miyagi 981-15, Japan.

has complied with the requirements identified in

BS 5445 : Part 5 : 1977 - Heat sensitive detectors - point detectors
Containing a static element.

and is authorised to use the LPCB mark on

ATD-E, ATG-E, ATG-E(NP), DFE-60E, DCC-1EL, DCC-2EL,
DCD-1E, DCD-2E and DFJ-60E Detectors
(Refer to the attached Appendix for details)

Certificate No. 117a Issue 6

Issued 20 July 2001

Valid Until 19 July 2004

Signed on behalf of the LPCB

E MATTIE SULEIMAN

This Certificate is issued and held in force subject to the corresponding ISO 9000 Certificate being maintained.

LPCB is part of BRE Certification Ltd., Garston, Watford WD25 9XX. Tel 01923 664100 Fax 01923 664603 www.brecertification.co.uk
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Loss Prevention Certification Board

LPCB

APPENDIX TO CERTIFICATE OF PRODUCT CONFORMITY NO. 117a

HOCHIKI CORPORATION

LPCB Ref.	Product
117a/02	DFE-60E grade 2 fixed temperature heat detector[1]
117a/03	DCC-1EL grade 1 rate of rise heat detector[2]
117a/04	DCC-2EL grade 2 rate of rise heat detector[2]
117a/05	ATD-E grade 1 analogue rate of rise heat sensor[3] *(also meets the requirements of BS 5445: Part 5 in low power mode)*
117a/06	ATG-E grade 1 fixed temperature heat detector[4,6]
117a/07	DCD-1E grade 1 conventional rate of rise heat detector[5]
117a/08	DCD-2E grade 2 conventional rate of rise heat detector[5]
117a/09	DFJ-60E grade 2 conventional fixed temperature heat detector[5]
117a/10	ATG-E (NP) grade 1 fixed temperature heat detector[4,6]

Notes:

[1] Using: YBC-RL/4H5 base
YBF-RL/4H5 base
AMU-MB master addressable base
AMU-B2 addressable base
YBF-RL/3J slave base
YCA-RL/3H2 addressable base
YCA-RL/5H2 master addressable base
YBK-RL/4H1A base†
YBK-RL/4H2 base†

[2] Using: YBC-R/3 base
YBF-RL/4 base†
YBF-RL/4H5 base
AMU-MB master addressable base
AMU-B2 addressable base
YBF-RL/3J slave base
YCA-RL/3H2 addressable base†
YCA-RL/5H2 master addressable base†
YBK-RL/4H1A base†
YBK-RL/4H2 base†

Signed on behalf of the LPCB

E MATTIE-SULEIMAN

Appendix Issue No. 17

Page 1 of 2

Issued 20 July 2001

Valid Until 19 July 2004

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Loss Prevention Certification Board

LPCB

APPENDIX TO CERTIFICATE OF PRODUCT CONFORMITY NO. 117a

HOCHIKI CORPORATION

Notes Continued....

[3] Using:- YBJ-RL/2NA base
[4] Using: YBN-R/2NA base†
YBN-R/3 base†
[5] Using: YBN-R/4 base†
YBO-R/5 base†
YBO-R/4C base
YBN-R/4C base
[6] Using: YBO-R/SCI isolator base†

Note: † Bases manufactured by Hochiki Europe Ltd.

ALTERNATIVE MODEL NUMBERS AND LABELLING

LPCB Ref No.	Model No.	Alternative Model Number	Labelled
117a/06	ATG-E	23903-K021 F850346N	Kidde Fire Protection Chubb
117a/07	DCD-1E	23903-K073 F850380N	Kidde Fire Protection Chubb
117a/08	DCD-2E	23903-K074 F850381N	Kidde Fire Protection Chubb
117a/09	DFJ-60E	23903-K071 F850383N	Kidde Fire Protection Chubb

Signed on behalf of the LPCB

E MATTIE-SULEIMAN

Appendix Issue No. 17

Page 2 of 2

Issued 20 July 2001

Valid Until 19 July 2004

Loss Prevention Certification Board

LPCB

CERTIFICATE OF PRODUCT CONFORMITY

This is to certify

HOCHIKI CORPORATION.
141-1 Maehara, Ejiri, Kakuda-shi, Miyagi 981-15, Japan.

has complied with the requirements identified in

BS 5445 : Part 7 -Specification for point type smoke detectors using scattered light, transmitted light or ionisation.

and is authorised to use the LPCB mark on

AIC-E, AIE-E, ALB-E, ALE-E, ALG-E, SIH-E, SIJ-E, SLK-E, SLR-E and SLR-E (J) Detectors.
(Please refer to the attached Appendix for details)

Certificate No. 117b Issue 5

Issued 20 July 2001

Valid Until 19 July 2004

Signed on behalf of the LPCB

E MATTIE SULEIMAN

This Certificate is issued and held in force subject to the corresponding ISO 9000 Certificate being maintained.

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To check the authenticity of this certificate, please visit our website or contact us.

Loss Prevention Certification Board

LPCB

APPENDIX TO CERTIFICATE OF PRODUCT CONFORMITY NO. 117b

HOCHIKI CORPORATION

LPCB Ref.	Product
117b/01	SLK-E photoelectric smoke detector[1,2]
117b/02	SIH-E ionisation smoke detector[2]
117b/03	ALB-E analogue photoelectric smoke detector[3]
117b/04	ALE-E analogue photoelectric smoke sensor[4] *(also meets the requirements of BS 5445 : Part 7 in low power mode)*
117b/05	AIC-E analogue ionisation smoke sensor[4] *(meets the requirements of BS 5445 : Part 7 at one sensitivity setting only and in low power mode)*
117b/06	ALG-E analogue photoelectric smoke sensor[5, 8]
117b/07	AIE-E analogue ionisation smoke sensor[5, 8]
117b/08	SLR-E conventional optical smoke detector[6]
117b/09	SII-E conventional ionisation smoke detector[6]
117b/10	SLR-E (J) conventional photoelectric smoke detector[7]

Notes: [1] Using: YBF-RL/4H5 base

[2] Using: YBF-RL/4H5 base
YBF-RL/4 base†
AMU-MB master addressable base
AMU-B2 addressable base
YBF-RL/3J slave base
YCA-RL/3H2 addressable base† ‡
YCA-RL/5H2 addressable base† ‡
YBK-RL/4H1A base†
YBK-RL/4H2 base†

Signed on behalf of the LPCB

E MATTIE SULEIMAN

Appendix Issue No. 15

Page 1 of 2

Issued 20 July 2001

Valid Until 19 July 2004

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Loss Prevention Certification Board

LPCB

APPENDIX TO CERTIFICATE OF PRODUCT CONFORMITY NO. 117e

HOCHIKI CORPORATION

LPCB Ref.No.	Product
117e/01	SRA-ET optical beam smoke detector. *Note: Approved at a sensitivity setting of 30% obstruction.*

Signed on behalf of the LPCB

E MATTIE SULEIMAN

Appendix Issue No. 1

Page 1 of 1

Issued 20 July 2001

Valid Until 19 July 2004

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and is maintained and held in force through regular surveillance activities.
To check the authenticity of this certificate, please visit our website or contact us.

Loss Prevention Certification Board

LPCB

CERTIFICATE OF PRODUCT APPROVAL

This is to certify

HOCHIKI CORPORATION.
141-1 Maehara, Ejiri, Kakuda-Shi, Miyagi 981-15, Japan.

has complied with the requirements identified in

prEN 54 : Part 12 (Draft 8 21/1/97)E : Smoke Detectors
- Line detectors using an optical light beam.

and is authorised to use the LPCB mark on

SRA-ET optical beam smoke detector
(Please refer to the attached Appendix for details)

Certificate No. 117e Issue 2

Issued 20 July 2001

Valid Until 19 July 2004

Signed on behalf of the LPCB

E MATTIE SULEIMAN

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LPCB LOSS PREVENTION CERTIFICATION BOARD

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To check the authenticity of this certificate, please visit our website or contact us.

THE LOSS PREVENTION CERTIFICATION BOARD LIMITED

CERTIFICATE OF SUPPLIER QUALITY MANAGEMENT SYSTEM

This is to certify that

KAC ALARM COMPANY LIMITED
KAC House, Tything Road, Arden Forest Industrial Estate,
Alcester, Warwickshire B49 6EP

has complied with the requirements identified in

ISO 9002 : 1994

and is authorised to use the LPCB mark on stationery and publications related to the following products and/or services

Manufacture of manual call points.

Also at : 17 Trescott Road, Trafford Park Smallwood,
Redditch, Worcestershire B98 7AH.

Certificate No. 166 Issue 6

Issued 13 July 1999

Valid Until 12 July 2002

The use of the Accreditation Mark indicates accreditation in respect of those activities covered by the accreditation certificate number 007

Signed on behalf of the LPCB

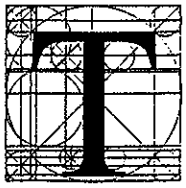
A P JAMES

THE LOSS PREVENTION CERTIFICATION BOARD LIMITED
Melrose Avenue, Boreham wood, Hertfordshire WD6 2BJ • Tel: 0181 236 9600 • Fax: 0181 236 9601 • E-mail: info@lpc.co.uk

This certificate remains the property of the LPCB and is issued subject to LPCB terms and conditions

THE LOSS PREVENTION CERTIFICATION BOARD LIMITED

CERTIFICATE OF PRODUCT CONFORMITY



This is to certify that

KAC ALARM COMPANY LIMITED.
KAC House, Tything Road, Arden Forest Industrial Estate,
Alcester, Warwickshire B49 6EP.

has complied with the requirements identified in

BS 5839 : Part 2 : 1983 - Specification for manual call points.

and is authorised to use the LPCB mark on

SEE APPENDIX

Certificate No.	166a Issue 5
Issued	13 July 1999
Valid Until	12 July 2002

Signed on behalf of the LPCB

A P JAMES

This Certificate is issued and held in force subject to the corresponding ISO 9000 certificate being maintained.

THE LOSS PREVENTION CERTIFICATION BOARD LIMITED.
Melrose Avenue, Borehamwood, Hertfordshire WD6 2BJ • Tel: 0181 236 9600 • Fax: 0181 236 9601
E-mail:info@lpc.co.uk • Web: http://www.lpc.co.uk

This certificate remains the property of the LPCB and is issued subject to LPCB terms and conditions

THE LOSS PREVENTION CERTIFICATION BOARD LIMITED

APPENDIX

Appendix to LPCB Certificate No: 166a. KAC Alarm Co. Appendix Issue No: 11

LPCB Ref.	Products
166a/01	KR1 indoor manual call point flush mounted (single pole changeover)
166a/02	KR72 indoor manual call point, flush mounted with series monitoring resistor
166a/03	KSR1 outdoor manual call point (single pole changeover)
166a/04	KSR72 outdoor manual call point with series monitoring resistor
World series Manual Call Points	
166a/06	WR2001 indoor manual call point, flush mounted (single pole changeover)
166a/07	WR2012 indoor manual call point, flush mounted
166a/08	WR2004 indoor manual call point, flush mounted
166a/09	WR2061 indoor manual call point, flush mounted
166a/10	WR2072 indoor manual call point, flush mounted
166a/11	WR3001 indoor manual call point, flush mounted (single pole changeover)
166a/12	WR4001 outdoor manual call point (single pole changeover)
166a/13	WR4072 outdoor manual call point with series monitoring resistor
166a/14	WR2101 indoor manual call point, flush mounted (single pole changeover)
166a/15	WR3061 indoor manual call point, flush mounted
166a/16	WR3072 indoor manual call point, flush mounted
166a/17	WR3101 indoor manual call point, flush mounted (single pole changeover)
166a/18	WR4061 outdoor manual call point series and LED shunt resistor
166a/19	WRZ2/4001 outdoor manual call point (single pole changeover)
166a/20	WRZ2/4002 outdoor manual call point (end-of-line resistor)
166a/21	WRZ2/4010 outdoor manual call point (series monitoring and end-of-line resistors)

Signed on behalf of the LPCB Issued: 25 May 1999

A P JAMES.....Valid Until: 12 July 2002

THE LOSS PREVENTION CERTIFICATION BOARD LIMITED

Melrose Avenue, Borehamwood, Hertfordshire WD6 2BJ.

THE LOSS PREVENTION CERTIFICATION BOARD LIMITED

APPENDIX

Appendix to LPCB Certificate No: 166a. KAC Alarm Co. Appendix Issue No: 11

LPCB Ref.	Products (Continued)
166a/22	WRZ2/4072 outdoor manual call point (series monitoring resistor)
166a/23	WRD/4001 outdoor manual call point (single pole changeover)
166a/24	WRD/4002 outdoor manual call point (end-of-line resistor)
166a/25	WRD/4010 outdoor manual call point (series monitoring and end-of-line resistors)
166a/26	WRD/4072 outdoor manual call point (series monitoring resistor)
166a/27	WR3631 indoor manual call point (SR3T-P mounting box)
166a/28	WR4061-R1-R2 outdoor manual call point (2.5W resistors)
166a/29	WR4031 outdoor manual call point (0.6W resistors)
166a/30	WR7/2001 Rainproof manual callpoint (single pole changeover) surface mounted
166a/31	WR7/2004 Rainproof manual callpoint (series monitoring resistor) surface mounted
166a/32	WR7/2012 Rainproof manual callpoint (2-series monitoring resistors) surface mounted
166a/33	WR7/2061 Rainproof manual callpoint (series monitoring resistor and LED) surface mounted
166a/34	WR7/2072 Rainproof manual callpoint (series monitoring resistor) surface mounted
166a/35	WR7/2101 Rainproof manual callpoint (single pole - close on alarm) surface mounted
166a/36	WR7/3001 Rainproof manual callpoint (single pole changeover) surface mounted
166a/37	WR7/3061 Rainproof manual callpoint (series monitoring resistor and LED) surface mounted
166a/38	WR7/3072 Rainproof manual callpoint (series monitoring resistor) surface mounted
166a/39	WR7/3101 Rainproof manual callpoint (single pole - close on alarm) surface mounted

Signed on behalf of the LPCB Issued: 25 May 1999

A P JAMES..... Valid Until: 12 July 2002

THE LOSS PREVENTION CERTIFICATION BOARD LIMITED

Melrose Avenue, Borehamwood. Hertfordshire WD6 2BJ.

THE LOSS PREVENTION CERTIFICATION BOARD LIMITED

APPENDIX

Appendix to LPCB Certificate No: 166a. KAC Alarm Co. Appendix Issue No: 11

Accessories for Indoor Manual Call Points

/SR	Surface mounted (plastic mounting box)
/SR2T-P	Surface mounted (plastic mounting box)(1)
/SR3T-P	Surface mounted (plastic mounting box)(1)
/SR4T-P	Surface mounted (plastic mounting box)(1)
/MR	Surface mounted (metal mounting box)
/ETT	European terminal tray ETT1(1), ETT2(1) and ETT3(2)
/G	Grip forks(2)
/L	Earth continuity link (KL1)
BZR/1	Bezel(2)
BZR/2	Bezel Type 2(2)
BZR/3	Bezel Type 3(2)
M141	Spacer piece(2)
PTR	Pattress with no terminals[2]
PTRE	Pattress with earth terminals[2]
PTR2T	Pattress with 2 terminals[2]
PTR2TE	Patrress with 2 terminals plus earth terminal[2]
PTR3T	Pattress with 3 terminals[2]
PTR3TE	Pattress with 3 terminals plus earth terminals[2]

(1) For use with World Series class 3000 products
(2) For use with World Series

Alternative Model Numbers and Labelling

KAC Model Number	Equivalent Model Number	Labelled
WR3631 (SR3T-P mounting box)	DM 1101 (DMZ1191 mounting box)	Cerberus AG.
WR2061	CP200	Thorn Security
WR2061	CP210	Thorn Security
WR4061	CP230	Thorn Security
WR4061-R1-R2	CP220 Ex	Thorn Security
WR4031	CP540Ex	Thorn Security

Signed on behalf of the LPCB Issued: 25 May 1999

A P JAMES..... Valid Until: 12 July 2002

THE LOSS PREVENTION CERTIFICATION BOARD LIMITED
Melrose Avenue, Borehamwood, Hertfordshire WD6 2BJ.

THE LOSS PREVENTION CERTIFICATION BOARD LIMITED

APPENDIX

Appendix to LPCB Certificate No: 166a, KAC Alarm Co. Appendix Issue No: 11

World Series Manual Call points are approved with the following switch combinations:

	Otehall 382430	Otehall 95/89S	Otehall 382431	Honeywell V5T010TB3X144	Honeywell V5T020TBX145	Burgess XG3	Burgess GA43
WR2001 WR7/2001	☐			☐		☐	
WR2101 WR7/2101		☐	☐		☐		☐
WR2004 WR7/2004	☐			☐		☐	
WR2012 WR7/2012		☐	☐		☐		☐
WR2061 WR7/2061		☐	☐		☐		☐
WR2072 WR7/2072		☐	☐		☐		☐
WR3001 WR7/3001	☐			☐		☐	
WR3061 WR7/3061		☐	☐		☐		☐
WR3072 WR7/3072		☐	☐		☐		☐
WR3101 WR7/3101		☐	☐		☐		☐
WR3631		☐	☐		☐		☐

Manual Call points are approved in the following materials:

Cycoloy C2800
Cycoloy C2950
Bayblend FR110
Bayblend FR1441
Noryl SE100

Signed on behalf of the LPCB Issued: 25 May 1999

A P JAMES..... Valid Until: 12 July 2002

THE LOSS PREVENTION CERTIFICATION BOARD LIMITED
Melrose Avenue, Borehamwood, Hertfordshire WD6 2BJ.

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Melville, New York • 631 271-6200
Santa Clara, California • (408) 985-2
Research Triangle Park,
North Carolina • (919) 549-1400
Camas, Washington • (360) 817-5500

Underwriters Laboratories Inc.

KOBISHI ELECTRIC CO LTD
MR TAKATOSHI HAYASHI, CHIEF ENGR
1805-1 KAMIYA
KOUNOSU-SHI
SAITAMA-KEN 365-0027 JAPAN

RE: Project Number(s) - 01RS51444

Your most recent listing is shown below. Please review this information and report any inaccuracies to the UL Engineering staff member who handled your project.

For information on placing an order for UL Listing Cards in a 3 x 5 inch format, please refer to the enclosed ordering information.

ULSZ
Audible Signal Appliances

February 26, 2001

KOBISHI ELECTRIC CO LTD
1805-1 KAMIYA KOUNOSU-SHI, SAITAMA-KEN 365-0027 JAPAN

S6251

Bell strobes, Models MSB-63S/L, -64, -64S/L -64V, with optional mounting plate, for indoor use only.
Bells, vibrating type, Models EXB-6, -8, -10 with or without one or more of the following suffixes A, C, P, V, followed by 2 or 4, with or without suffix W; Model MSB followed by -6, -8 or -10, followed by B or G, may be followed by one or more suffixes C, P, V, followed by 4. Models with the letter G in the model code are for indoor use only. May be employed outdoors when used with BBX-1 or BBX-4 back box.
Models MBL-8, -10, provided with Model BBX-1 or BBX-4 back box, for outdoor use.
Horns, Model BZ-51-A4, for indoor use only.
Models BZ-52VL4, BZ-52VT, BZ-54VL4, BZ-54VT.
Model ESZ-31 piezo sounder, for indoor use only.
Models HP-11, HP-11A audible signal device, for indoor use only.
Models SSX-61UL, SSX-61-612UL, SSX-61-624UL audible signal appliances. Suitable for outdoor use.
Motor driven bells, Models MBA-6, -8, -10, MBF-6WA, -8WA, -10WA, -10WAL for outdoor use when used with Model BBX-4 back box.

LOOK FOR LISTING MARK ON PRODUCT

A not-for-profit organization dedicated to public safety and committed to quality service

Underwriters Laboratories Inc.®

WHEELOCK INC
MS G SORRENTINO, AGENCY ADMINISTER
273 BRANCHPORT AVE
LONG BRANCH NJ 07740

Your most recent listing is shown below. Please review this information and report any inaccuracies to the UL Engineering staff member who handled your Assignment.

ULSZ July 11, 1995
Audible Signal Appliances

WHEELOCK INC , LONG BRANCH NJ 07740 **E5946 (N)**
(A card)

Bells. Models 42PT-12, -24, 43T-12, -24, -115AC, 46T-12, -24. For use outdoors when employed with Model WBB back box.

Motor Bells. Models MB-G6-12, MB-G10-12, MB-G6-24, MB-G10-24 followed by suffix, R, S, W or X. Suitable for outdoor use with a WBB back box, may be employed with SB or SBL back box suitable for indoor use only.

Strobe/bells. Series 43T, 46T, MBS followed by suffixes designating bell size, bell voltage, lens color, intensity, strobe voltage, lens orientation, lettering and package color. Example Model code: 46T-G6-24-WS-24-HF-R. For indoor use.

Chimes: For private mode only (d). Models CH-BF1, -BF2, CF1, CF2, DF1, DF2.

Strobe Chimes: For private mode only (d). Models CH-BF1, -BF2, CF1, CF2, DF1 and DF2, followed by A, B, G, R or W, followed by H, M or S, followed by 12 or 24, followed by any three alpha/numeric characters indicating lens orientation, lens lettering and lens color.

Sync strobe chimes: For private mode only (d). Model CH followed by B, C or D, followed by F1, followed by SHPW or SL, followed by 24, followed by any three alpha/numeric characters indicating lens orientation, lens lettering and lens color.

Incandescent chimes for private mode only (d). Models CH-BF1-VL-24, CH-CF1-VL-24, CH-DF1-VL-24 may be followed by suffixes designating lens color, lens orientation, lettering and package color. Example Model code: CH-BF1-VL-24-WHF-R.

Replaces E5946A dated April 27, 1995. (Cont. on B card)
366510001 Underwriters Laboratories Inc.® BIL/0063516
175

For information on placing an order for UL Listing Cards in a 3 x 5 inch card format, please refer to the enclosed ordering information.

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FAX No. (708) 272–8129

1285 Walt Whitman Road
Melville, L.I., New York 11747–3081, USA
516/271–6200
Telex No. 6852015
FAX No. (516) 271–6259

1655 Scott Blvd.
Santa Clara, California 95050–4169, USA
408/985–2400
FAX No. (408) 296–3256

12 Laboratory Drive
P.O. Box 13995
Research Triangle Park,
North Carolina 27709–3995, US
919/549–1400
Telex No. 4937928
FAX No. (919) 549–1842

PROJECT REFERENCES

LOCAL AND OVERSEAS

PATENT

LOCAL PROJECT REFERENCES

A) PRIVATE DEVELOPMENTS

A1) OFFICES / FACTORIES / MULTI-USAGE BUILDINGS

- ACS Computer
- Adaptec Manufacturing
- AIP Module 'E'
- AM Paint Specialists
- Ascent Equipment
- Atlantis Shipyard
- Automobile Megamart
- BBR Construction System
- Cathay Bowling at Ang Mo Kio Branch
- Ching May Furniture Centre
- Chye Hin Hardware
- Compact Metal Industries
- Delta Technology
- ECO Building
- EICO Tech Manufacturing Co Pte Ltd
- First Engineering Ltd
- Gliderol Door Singapore Pte Ltd
- GN Packaging Ind Pte Ltd
- Hiap Aik Logistics
- Hoya Magnetic
- Hup Aik Huat Trading Pte Ltd
- JIT Electronics Ltd
- KDI Precast
- Kim Teck Leong Ship Supply Pte Ltd
- Lee Metal
- Liang Huat Aluminium Ltd
- Lux Asia (S) Pte Ltd
- Metform Industries
- Natsteel Ltd
- Ng Teow Yhee & Sons (S) Pte Ltd
- Noel Gifts International Ltd
- Orchard Building
- Ossia International Ltd
- P & W C Aircraft Services (SEA) Pte Ltd
- Rheem (FE) Pte Ltd
- Rhone Poulenc Rorer Mfg
- Scezan Pte Ltd
- Sembawang Kimtrans
- ST Computer Systems Ltd
- Steady Piling Engrg Pte Ltd
- Supercontinental
- Taiyo Technology Singapore Pte Ltd
- Tay Miang Huat
- Techno Pacific
- Teck Wah Paper Products
- Tee Hai Chem Pte Ltd
- Thoven Food Industry Pte Ltd
- Trans-Island Bus Services Ltd
- Twinwood Engineering Pte Ltd
- Vicom Pte Ltd (Bukit Batok)
- Yeow Kwang Timber Pte Ltd
- Yokogawa (Bedok)

PATENT

LOCAL PROJECT REFERENCES

A) PRIVATE DEVELOPMENTS

A2) SHOPPING / ENTERTAINMENT CENTRES

- Balmoral Crescent
- Bukit Panjang Plaza
- Bukit Timah Plaza
- Fortune Centre
- Grandlink Square
- Hougang Green
- Hougang Shopping Centre
- Jalan Sultan Centre
- Katong Mall
- Loyang Point
- Merchant Square
- Mustafa Centre
- Orchard Entertainment Centre
- Tampines Mall

A3) HOTELS / BOARDING HOUSES

- Beach Hotel
- Bencoolen Hotel
- Chinatown Hotel
- Geylang Lor 10 (Hotel 88)
- Gulliemard Road
- Hamilton Hotel
- Hotel 81
- Hyatt Regency Singapore (A & A Works)
- Jalan Yasin / Lorong Sarina
- Kerbau Hotel
- King's Hotel
- Peninsula Hotel
- Plaza Hotel
- Stamford Inn
- Tai Hoe Hotel
- The Royal Peacock Hotel

PATENT

LOCAL PROJECT REFERENCES

A) PRIVATE DEVELOPMENTS

A4) RESIDENTIAL BUILDINGS / CONDOMINIUMS

- Anchorage
- Anderson
- Ardmore Park
- Aspen Heights
- Bishan 8
- Butterworth Gardens
- Castle Green
- Casuarina Cove
- Changi Green
- East Point Green
- East Vale
- Eastwood
- Garden Ville
- Guilin View
- Heritage
- High Oak
- Hill Brookes
- Hill View Green
- Hillside
- Horizon Tower
- Jalan Chempaka Kuning Cluster Housings
- Mount Sinai
- Nassim Woods
- NorthVale
- Oleander Towers
- Paterson Edge
- Pine Vale
- Regent Heights
- Regent Hill
- Richmond Park
- Seasons Park
- Shelford View
- Sims Ville
- St Thomas Walk
- Tanjong Ria
- Trellis Tower
- Westmere
- Wilby

PATENT

LOCAL PROJECT REFERENCES

A) PRIVATE DEVELOPMENTS

A5) HOSPITALS / HEALTHCARE INSTITUTIONS

- Choa Chu Kang Polyclinic
- Home for the aged – Bukit Batok
- Home for the aged – Marsiling
- Home for the aged – Tampines
- Home for the disabled adults – Henderson
- Lions Nursing Home – Bedok
- Mount Elizabeth
- NUH – Radio Therapy Centre
- Nursing Home at Lentor Ave
- Nursing Home at Pasir Ris
- St Luke's Hospital
- Tan Tock Seng Hosiptal (Partial)
- Yishun Polyclinic

A6) PLACES OF WORSHIP

- Chinese Temple along Jalan Bukit Merah
- Chinese Temple at Bangkit Road
- Chinese Temple at Bishan Road
- Church at Kaypoh Road
- Khalsa Association
- Kwang Chee Tng
- Man Fatt Lam Buddhist Temple
- Paya Lebar Methodist Church
- Presbyterian Church at Zion Road
- Sai Ba Ba Temple
- Sikh Temple at Yishun Ring
- Singapore Soka Association
- Singapore Soka Association – Jurong West
- Trustee Por Emmanuel Evangelical Free Church Ltd

LOCAL PROJECT REFERENCES

A) PRIVATE DEVELOPMENTS

A7) PETROCHEMICAL PLANTS

- Dupont Pulau Sakra (Partial)
- Philips Petroleum Phase I & II
- Polystyrene plant Pulau Seraya
- Singapore Aromatics Company
- Singapore Refining Company (Partial)
- Dupont at Tuas Crescent (Partial)

A8) STORAGE / WAREHOUSES

- AEI Warehousing & Distribution (S) Pte Ltd
- Concord Express (S) Pte Ltd
- Davis Warehouse
- EAC Logistics
- Freight Links Express Pte Ltd (Changi South)
- Freight Links Express Pte Ltd (Penjuru)
- Kian Ann Warehouse
- Robinson Warehouse
- Schenker Singapore (Pte) Ltd
- U Freight Singapore Pte Ltd

LOCAL PROJECT REFERENCES

B) GOVERNMENT ORGANISATIONS / STATUTORY

B1) HOUSING & DEVELOPMENT BOARD (HDB)

- Ang Mo Kio N5 C24
- Bedok N7 C7A
- Bishan West N4 C31
- Bukit Batok N2 C15
- Bukit Merah RC 30
- Bukit Merah RC 57
- Bukit Panjang N4 C5
- Bukit Panjang N5 C5
- Bukit Panjang N6 C7
- Choa Chu Kang N6 C14
- Choa Chu Kang N6 C7
- Geylang RC9
- Henderson Hill C1 & 3
- Hougang N1 C11
- Hougang N4 C6
- Hougang N9 C8
- Jurong East N2 C16
- Jurong West N2 C6
- Jurong West N6 C10
- Jurong West N6 C12
- Jurong West N6 C15
- Jurong West N6 C17
- Jurong West N6 C20
- Jurong West N6 C30
- Jurong West N6 C6 & 7
- Jurong West N6 C9
- Kallang Basin N3 C1
- Marsiling Ind Est Rd 3
- Pasir Ris N4 C4
- Punggol East C1 & 2
- Queenstown N6 C6
- Sembawang N3 C15
- Sembawang N4 C1
- Sembawang N4 C3
- Sembawang N4 C8
- Sembawang N5 C5
- Sengkang C25
- Sengkang N1 C11
- Sengkang N1 C16
- Sengkang N1 C2
- Sengkang N1 C4
- Sengkang N2 C12
- Sengkang N2 C15
- Sengkang N2 C27
- Sengkang N2 C9
- Sengkang N6 C23
- Serangoon N5 C15
- Serangoon North N5 C17
- Tampines N3 C15
- Tampines N7 C5
- Tampines N7 C6
- Tampines N8 C4
- Tanglin Halt Blk 37B
- Toa Payoh C15
- Woodlands N3 C5
- Woodlands N5 C14
- Woodlands N5 C15
- Woodlands N5 C7
- Woodlands N6 C5
- Woodlands N7 C12
- Woodlands Town N5 C5
- Yishun Town N2 C18

LOCAL PROJECT REFERENCES

B) GOVERNMENT ORGANISATIONS / STATUTORY

B2) PUBLIC WORKS DEPARTMENT (PWD)

PRIMARY SCHOOLS

- Aljunied
- Bedok South
- Bendemeer
- Blangah Rise
- Braddell
- Bukit Panjang
- Bukit View
- Cambridge
- Choa Chu Kang
- Commonwealth
- De La Salle
- First Toa Payoh
- Keppel
- Lian Hua
- Loyang
- Macpherson
- Maris Stella High School
- Marymount Convent
- Naval Base
- Pasir Ris
- Pearl's Hill
- Siling
- South View
- Swiss Cottage
- Tai Chong
- Tanglin
- Temasek
- West Lake
- Woodlands
- Woodlands Drive
- Zhong Hua

SECONDARY SCHOOLS

- Ang Mo Kio
- Anglo Chinese
- Balestier Hill
- Beatty
- Bendemeer
- Braddell
- CHIJ
- Chung Cheng High
- Delta
- Deyi
- EastView
- Fuchun
- Hai Sing High
- Manjusri
- Mei Chin
- Nanyang Girls
- Outram
- Peicai
- Ping Yi
- Presbyterian
- Queenstown
- Queensway
- Raffles Institution
- River Valley High
- Riverside
- Sembawang
- Sengkang
- Serangoon Gardens
- Shuqun
- St Patrick's
- St Margaret
- Tanjong Katong

PATENT

LOCAL PROJECT REFERENCES

B) GOVERNMENT ORGANISATIONS / STATUTORY

B2) PUBLIC WORKS DEPARTMENT (PWD)

OTHERS PWD PREMISES

- Allanbrooke Rd / Serapong Course at Sentosa
- Ang Mo Kio Police Station
- Ang Mo Kio Small Claim Court
- Bedok North Sport Council
- Bedok Police Station
- Bedok RTC
- Botanic Gardens
- Changi Airport Control Tower
- Changi Fishery
- Custom Port Headquarters
- Fire Safety Bureau
- Hill Street Archive and Oral History Department
- Istana Villa
- Jalan Awan Centre
- Joo Chiat Complex
- Jurong Boy's Complex
- Kaki Bukit DRC
- Lloyds Leas Camp
- Marine Parade Library
- Muslim Registry of Marriages
- National Kidney Foundation
- National Library
- Outram Road
- Parliament House
- Queenstown Remand Prison
- Sculpture Square Development
- SCV Jalan Ahmad Ibahim
- Selarang DRC
- Sembawang DRC
- Serangoon North Wet Market
- SLF Auditorium
- Tampines Safra
- Tanah Merah Prison
- Tanglin Police Station
- Toa Payoh Bus Interchange
- Yio Chu Kang Swimming Complex

PATENT

LOCAL PROJECT REFERENCES

B) GOVERNMENT ORGANISATIONS / STATUTORY

OTHER INSTITUTIONS OF LEARNING

- Anderson Junior College
- Anglo Chinese Junior College
- Assumption English School
- Assumption Vocational Institute
- Childcare at Loyang Rise
- Computer Centerat at NUS
- Facility of Islamic Studies
- ITE Tampines
- Japanese School
- New French School
- NUS Childcare
- NUS Temasek Hall
- Red Swastika School
- Singapore Institute of Management
- Singapore Polytechnic (Partial)
- Tanglin Trust School
- Townsville Institution
- United World College

URBAN REDEVELOPMENT AUTHORITY (URA)

- Arab Street Conservation
- Bussorah Street Conservation
- Little India Conservation

COMMUNITY CENTRES

- Bishan
- Chai Chee
- Hong Kah
- Jalan Besar
- Kebun Baru
- Kolam Ayer
- Leng Kee
- Nee Soon
- Radin Mas
- Tanglin
- Teck Chee
- Thomson
- Toa Payoh
- Whampoa

SINGAPORE POWER

- Aljunied Substation
- Ayer Rajah Substation
- Changi Substation
- Jurong Island Substation
- Kampong Java Substation
- Labrador Substation
- Lower Seletar Pumping Station
- Tengah Airbase PH-S Substation
- West Coast Substation
- Senoko Power Station

LOCAL PROJECT REFERENCES

B) GOVERNMENT ORGANISATIONS / STATUTORY

TELECOMMUNICATIONS AUTHORITY OF SINGAPORE (TAS)

- Amakeng Exchange
- Ayer Rajah Exchange
- Bukit Timah Satellite
- Bukit Timah's Exchange
- Geylang Exchange
- Hill Street Exchange
- Jurong West Exchange
- Kim Chuan Exchange
- People Park's Centre

MINISTRY OF DEFENCE / LAND ESTATES ORGANISATION (MINDEF/LEO)

- Bukit Gombak Camp
- Clementi Camp
- Kranji Camp
- Lorong Gambas
- Mandai Camp 2
- Nee Soon Camp
- Paya Lebar Airbase
- Pulau Tekong Camp 1 (Partial)
- Selarang Camp
- Sembawang Airbase
- Sembawang Camp
- Stagmont Camp
- Sungei Gedong Camp
- Tengah Air Base
- Tuas Naval Base

JURONG TOWN CORPORATION (JTC)

- Amenity Centre at Jurong Pier Road
- Ang Mo Kio Tech Place I
- Ang Mo Kio Tech Place II
- Ayer Rajah Blk 26
- Ayer Rajah Blk 71
- Ayer Rajah Crescent
- Bedok North Ave 4
- Boon Keng Blk 104 and 106
- Bukit Merah Blk 1003
- Chai Chee Blk 512
- Kaki Bukit Blk 10
- Kallang Avd Blk 19,21,25
- Kallang Place Blk 164
- Kallang Way Blk 164
- Kampong Ubi Blk 3022
- Kampong Ubi Blk 3023
- Loyang Way 1
- Pandan Loop
- Telok Blangah Blk 1090
- Tuas Link 1
- Woodlands Ave 9

PATENT

OVERSEAS PROJECT REFERENCES

BRUNEI

- 8 Blocks of Light Industrial Building
- Administration Building
- Asian E C Management
- Dewau Perhiasan Di-rate Puspa
- Gurkha Reserve Unit 4
- Indoor Stadium
- Jerudong Park Hotel
- Kiarong Mosque
- Muara Camp
- National Archives
- NCC Building
- RBPC No 6
- River View Plaza
- Royal Regalia
- Temburong PWD Offices
- Vocational School – Lambak Kanan

CAMBODIA

- Hotel Le Royal (Phonm Penh)
- Grand Hotel D'Angkor (Siem Reap)

CHINA

- Seagate in Wuxi Province
- Siemens Factory

INDONESIA

- Batam Industrial Park
- Batam Telephone Exchange –BATAM
- Century Plaza – JAKARTA
- King's Plaza – JAKARTA
- Maria Cove – BATAM
- Marina City – BATAM
- Mustikaratu – JAKARTA
- Nan Tonga Beach Hotel – BATAM
- Tabel Hospital – JAKARTA
- Bintan Club Med Resort – BINTAN
- Lagoi Bay Hotel – BINTAN

PHILIPINES

- Subic Bay

VIETNAM

- Garden Plaza
- West Lake International Hotel
- Hanoi Tower Centre
- Lien Westlake Hotel
- Ho Chi
- Mei Linh Point