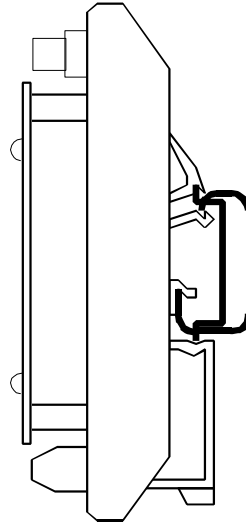
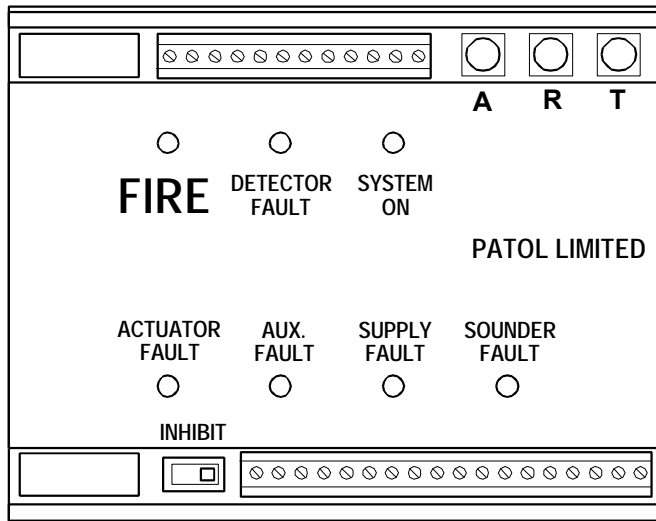


1200-HCM DIN RAIL MOUNTING FIRE SYSTEM MODULE Fire Detection & Extinguishant Control



The Patol 1200 Series of equipment is specifically designed for use by OEMs such that fire control functions may be integrated into multi-discipline system configurations and/or incorporated into special application control panels with a cohesive and rational approach.

The 1200-HCM is a DIN rail mounting control module providing the necessary functionality to realise a basic fire protection scheme with the minimum of additional components. The module accommodates a single detection (trigger) circuit, monitored sounder & extinguishant actuation outputs, an auxiliary fault monitoring circuit, and volt free fire contacts.

Connections are provided for user specified control panel fascia indicators and controls, together with a composite Fire/Warning/Reminder audible device. The primary features of the unit are:-

- .. **DIN Rail Mounting - OEM Designer's 'building block'**
- .. **Detection circuit - open & short circuit fault monitored.**
- .. **Sounder circuit - fuse protected - open & short circuit fault monitored.**
- .. **Actuator output - fuse protected - open circuit fault monitored.**
- .. **Fire contacts - two sets - volt free change over.**
- .. **Fascia annunciator connections - Fire, Common Fault, System On, Audible.**
- .. **Flashing Indicator / Audible annunciation sequences.**
- .. **Control switch connections - Sounder Activate, Lamp Test, Accept, Reset.**
- .. **Supply & Auxiliary fault signal inputs - Common fault (healthy) output.**
- .. **Extinguishant actuation inhibit switch.**
- .. **Module mounted diagnostic LEDs & control push-buttons.**

1200-HCM FIRE PROTECTION CONTROL MODULE

Application

The unit is primarily intended for use where there is a requirement to integrate a limited fire protection function into a larger control equipment scheme, or in specialist applications where parameters, such as environmental conditions, require a control cabinet design that is not readily accommodated by commercially available fire alarm panels.

The 1200-HCM is particularly suited for incorporation into control schemes where the protected aspect is all, or a portion, of that equipment its self.

The DIN rail mounting construction of the module permits design engineers to treat the unit, in respect of the internal configuration of industrial type control panels, in an identical manner to other DIN rail mounting devices such as relays, PLCs, process monitoring modules etc.

Similarly, the associated panel fascia mounted indicators and controls may be user chosen to meet any application specific requirements, and to provide a cohesive operator presentation in respect of other system control surface lamps and switches.

The unit operates from a nominal 24 Vdc supply and whilst the module may be readily employed in conjunction with a dedicated fire alarm PSU/Charger/Battery (suitable devices are available from Patol), the system can also be configured such that overall system supplies can be utilised. This at the designer's discretion based on the specification / requirement of any particular application.

The 1200-HCM operates with industry standard smoke/heat detectors, break glass units, sounders, beacons, extinguishant actuators, etc.

Whilst the unit is primarily intended for special fire protection applications that by their very nature are likely to be outside the scope of National Standards, the design of the the module in respect of it's monitoring specification and operation is such that schemes compliant with the principle requirements of

Configuration

Figure 1 shows a block schematic of a typical system which sub-divides into four principal aspects. - The 1200-HCM unit including it's integral diagnostic LEDs and maintenance controls, a display fascia fitted with user specified operational indicators and controls, an appropriate power supply, and the protection equipment (detectors, sounders, extinguishant mechanism, shutdown network etc.).

For clarity the diagram shows a simplified logical flow arrangement. The operational sequences of signals, indications and alarms are more refined than depicted and are defined in the text of the Operation section following.

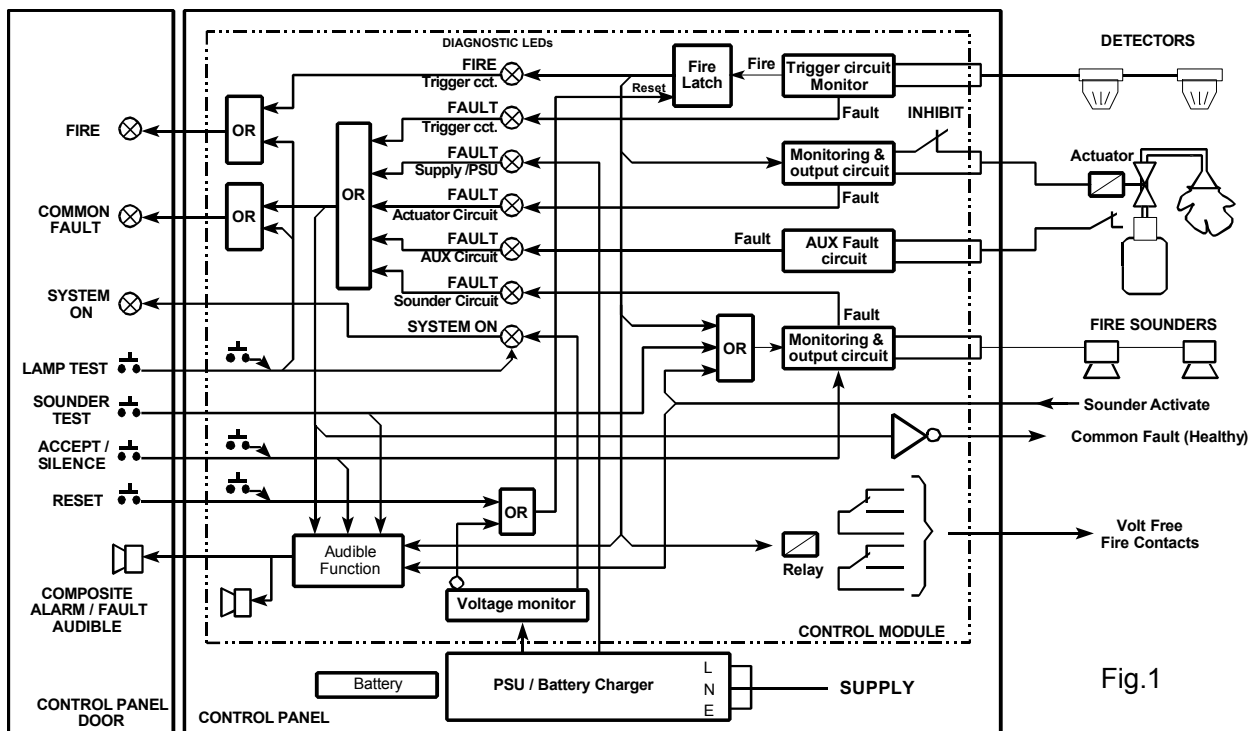


Fig.1

1200-HCM FIRE PROTECTION CONTROL MODULE

Operation

A primary feature of the unit is that flashing indicator, new fault notifications, & staged audible warning states are sequentially annunciated. The following details typical operation :-

FIRE ALARM

Fire Detection Initiated - Trigger Circuit I/P

- | | |
|----------------------------|------------|
| • Module Red Fire LED | Flashing |
| • Fire Lamp Output | Flashing |
| • Actuator Output | ON |
| • Fire Sounder Output | ON |
| • Fire Relay Contacts | Abnormal |
| • Module Audible | Continuous |
| • Composite Audible Output | Continuous |

Accept/Silence Operated

- | | |
|----------------------------|---------|
| • Module Red Fire LED | Steady |
| • Fire Lamp Output | Steady |
| • Fire Sounder Output | OFF |
| • Module Audible | Bleep ⌘ |
| • Composite Audible Output | Bleep ⌘ |
- (⌘ Non-Reset Fire Reminder)

Reset Operated - (Fire condition cleared)

- | | |
|----------------------------|--------------|
| • Trigger Circuit | 0V-Off (mom) |
| • Module Red Fire LED | OFF |
| • Fire Lamp Output | OFF |
| • Actuator Output | OFF |
| • Fire Relay Contacts | Normal |
| • Module Audible | OFF |
| • Composite Audible Output | OFF |

SOUNDER TEST / SOUNDER ACTIVATE

Both signals have the same effect which is :-

- | | |
|----------------------------|------------|
| • Fire Sounder Output | ON |
| • Module Audible | Continuous |
| • Composite Audible Output | Continuous |

ACTUATION INHIBIT (And Test Sequence)

Inhibit Switch Operated (Left hand position)

- | | |
|---------------------------|---------------|
| • Actuator Output Circuit | O/C-Inhibited |
| • Fault Warning | Initiated |
| • Actuator Fault LED | Flashing |

Fire Detection Activated or Simulated

- | | |
|----------------------------------|--------------|
| • Actuator Output | Remains Off |
| • Other Fire Alarm Functions | Initiated |
| • Actuation Signal Test | § O/P Relay |
| § - Actuator Fault LED - OFF | Relay O.K. |
| § - Act. Fault LED - ON/Flashing | Relay Failed |

Accept/Silence & Reset Operated

- | | |
|--------------------------|--------------|
| • Fire Alarm Functions | Normal / Off |
| • Actuator Fault Warning | Reinstated |

Inhibit Switch Normal (Right hand position)

- | | |
|-----------------|--------------|
| • Fault Warning | Normal / Off |
|-----------------|--------------|

FAULT WARNINGS

A Fault Warning is Initiated on any of :-

- | | |
|-------------------------------|------------------|
| • Detector | Removed |
| • Detector Cable | O/C or S/C fault |
| • Sounder Cable | O/C or S/C fault |
| • Sounder Circuit Fuse | Ruptured |
| • Actuator Device Element | O/C |
| • Actuator Cable | O/C fault |
| • Actuator Inhibit Switch | INHIBIT position |
| • Actuator Circuit Fuse | Ruptured |
| • AUX Fault Signal | Abnormal |
| • AUX Fault Signal Cable | O/C or S/C fault |
| • Supply/Charger Fault Signal | Abnormal |
| • Supply/Charger Signal Cable | O/C or S/C fault |

* **Module Diagnostic LED for each basic condition.**

First Fault Warning Initiated

- | | |
|------------------------------|----------|
| • Module Diagnostic LED* | Flashing |
| • Common Fault Lamp O/P | Flashing |
| • Common Fault (healthy) O/P | Abnormal |
| • Module Audible | Bleep |
| • Composite Audible Output | Bleep |

Accept/Silence Operated

- | | |
|----------------------------|--------|
| • Module Diagnostic LED* | Steady |
| • Common Fault Lamp O/P | Steady |
| • Module Audible | OFF |
| • Composite Audible Output | OFF |

New Fault Warning Initiated

- | | |
|--|----------------|
| • New Fault Diagnostic LED | Flashing |
| • <i>Original</i> Fault Diagnostic LED | Remains Steady |
| • Common Fault Lamp O/P | (Re)-Flashing |
| • Module Audible | Bleep |
| • Composite Audible Output | Bleep |

Accept/Silence - Steady Lamps / Audibles OFF

Faults Rectified - All LEDs, Lamps, O/Ps -**Normal**

SYSTEM ON (Supply Voltage Monitor)

Battery discharged monitor / Detector circuit voltage less than typical trigger device operating level.

Supply Voltage > 19.5 V (+/- 0.3 V)

- | | |
|----------------------------|----|
| • System On LED & Lamp O/P | ON |
|----------------------------|----|

Supply Voltage < 19.5 V (+/- 0.3 V)

- | | |
|--------------------------------|-------------|
| • System On LED & Lamp O/P | OFF |
| • Fire Latch & Trigger Circuit | Reset / OFF |

LAMP TEST

- | | |
|-----------------------------|-----------|
| • Module Fire/Fault LEDs | Steady ON |
| • Fire & Fault Lamp Outputs | Steady ON |

1200-HCM FIRE PROTECTION CONTROL MODULE

Connections

Electrical connections are made via compression leaf screw terminals:-

Detector (Trigger) Circuit (Terminals 29 & 30)

Trigger devices (n/o contacts, detectors etc) are wired in parallel. The circuit is open and short circuit fault monitored and must be terminated with a 4K7 End of Line (EOL) resistor. Detectors should be of a type that operate with a quiescent voltage in the range 17 - 28 Vdc and present a load resistance to the circuit on alarm, typically 270R - 1K0.

Contacts should have a series resistor (470R nom) in order to maintain s/c fault discrimination. The maximum total quiescent detector current should not exceed 1.5 mA in order to maintain o/c fault discrimination.

Actuator Circuit (Terminals 13 & 14)

The circuit is intended for use with a 6 mJ chemical protractor (0.9-1.6R resistance). The fault monitoring current is less than 7 mA including earth fault conditions.

Actuation current is approximately 1 A.

The circuit is fitted with a 500 mA fuse which will deliver sufficient firing energy prior to rupture.

Sounder Circuit (Terminals 1 & 2)

Sounder (beacon) devices should be polarised types of nominal 24 Vdc operation. The units should be wired in parallel and the circuit terminated with a 4K7 EOL. (Max load < 0.5 Adc)

Supply Fault Signal (Terminal 19)

The input signal may be directly connected to a PSU TTL output (Normal - High) where the TTL & PSU output 0 V are common.

It is recommended that the TTL device o/p is loaded with a 100R resistor in order to both monitor & protect the o/p device & TTL supply.

Volt free contacts may also be employed in conjunction with a 2K4 EOL.

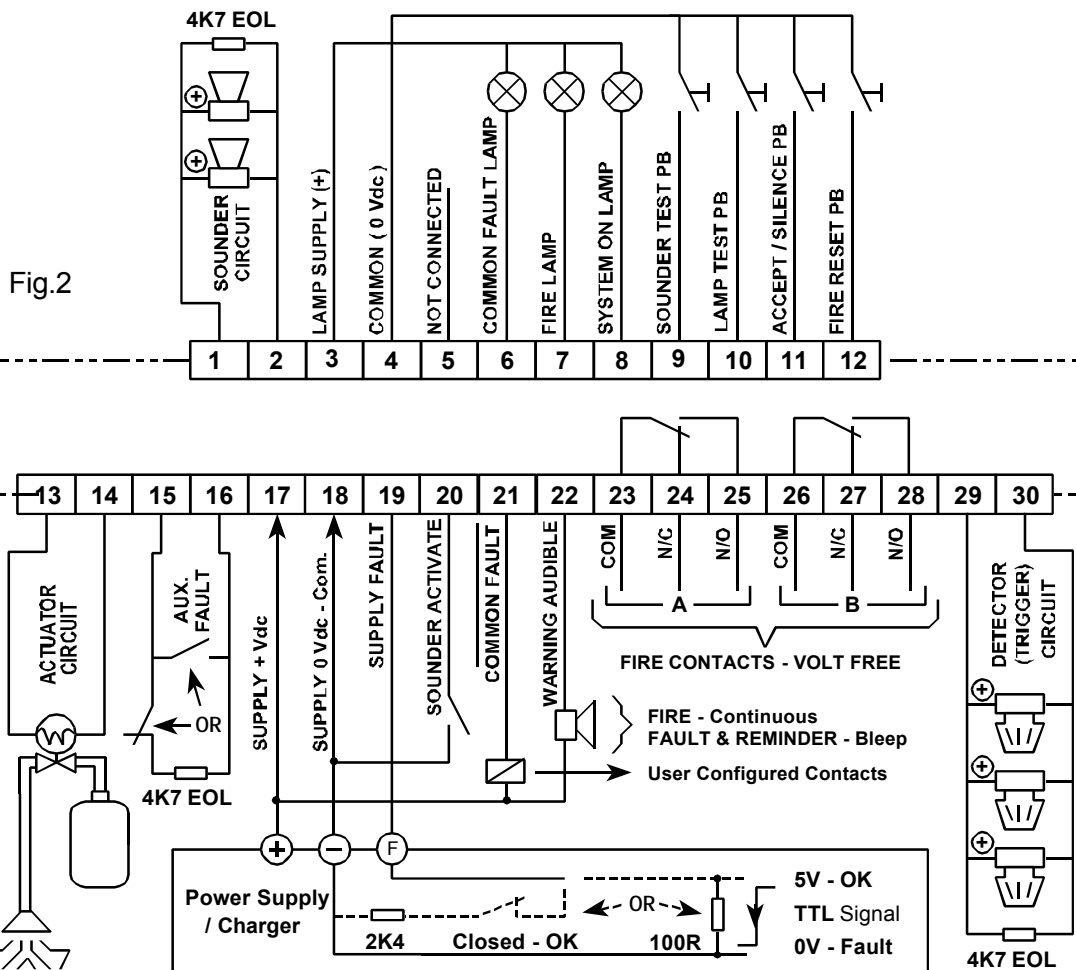
(n/c series contact - n/o shunt contact)

Common Signal (Terminal 21)

The output is an *open collector* type signal which is On (Low) in the Normal state, Off (Open) in the Fault state. The output may be employed with a normally energised relay coil, or to directly signal TTL etc.

General

Other connections should be self evident from Figure 2 following.



1200-HCM FIRE PROTECTION CONTROL MODULE

General Specification

Supply Voltage:- 21 - 29.5 Vdc
 Supply Current- 45 mA Quiescent @ 28 V
 (module only) 140 mA Max (Alarm & Test)
 Mounting:- DIN Rail - 35mm
 Asymmetric or Symmetric
 Connections:- Screw terminals
 Weight:- 0.5 Kg (nominal transport)
 Indications:- Fire - Red LED
 (Module LEDs) Detector Fault - Yellow LED
 Actuator Fault - Yellow LED
 Auxiliary Fault - Yellow LED
 Supply Fault - Yellow LED
 Sounder Fault - Yellow LED
 System On - Green LED
 Integral Controls:- Accept/Silence push-button
 Reset push-button
 Lamp Test push-button
 Actuation Inhibit switch
 Common Signal:- Healthy Output (Not Fault)
 50 mA low switch common +ve

Trigger circuit:- 0/C-S/C fault monitored 4K7 EOL
 Fault < 50R < Alarm < 1K6 (nom)
 Fault < 2mA < Normal (nom)
 Detector voltage 17 - 28 Vdc
 Sounder circuit:- 0/C-S/C fault monitored 4K7 EOL
 Reverse polarity relay switched
 Fuse protected 500 mA
 Actuator circuit:- Chemical protractor compatible
 O/C element/cct. fault monitored
 Monitoring current < 7 mA
 27R actuator current limit resistor
 Relay switched - 500 mA fuse
 Fire Contacts:- 2 off - volt free change over
 Rated 1 A - 30 V dc
 Control Inputs:- Accept / Silence
 Reset
 Lamp Test
 Sounder Test
 Switch Low - 0 Vdc common -ve
 Lamp Outputs:- Fire Indicator
 Common Fault Indicator
 System On Indicator
 100 mA low switch common +ve
 Audible Output:- Fire - Continuous signal
 Fault / Reminder - Pulsed signal
 50 mA low switch common +ve
 Supply Fault :- 0/C-S/C fault monitored
 (input signal) TTL (5V - 0V) signal compatible
 N/O or N/C contact with 2K4 EOL
 Auxiliary Fault:- N/O or N/C signal contact
 0/C-S/C fault monitored 4K7 EOL

