

1 Introduction

The fire alarm control panel has been designed to comply with the requirements of BS 5839:Part 4:1988 for use in systems complying with the requirements of BS 5839:Part 1:1988 which are the *British Standards for fire detection and alarm systems in buildings*. These instructions should provide sufficient information to install the product and then check the performance of the installed system. It is however important that those responsible for the design, installation and commissioning of the system should have a good working knowledge of the requirements of installed systems, particularly BS 5839:Part 1:1988 Code of Practice for system design installation and servicing.

2 Fire Detection and Alarm System Design

The following design information is intended to provide guidance on aspects of system design, specifically related to the use of the control panel. Before designing any fire alarm system, reference should be made to the BS 5839 Part 1:1988 which is the Code normally applicable in the U.K., but this may be supplemented by additional requirements to suit individual user needs.

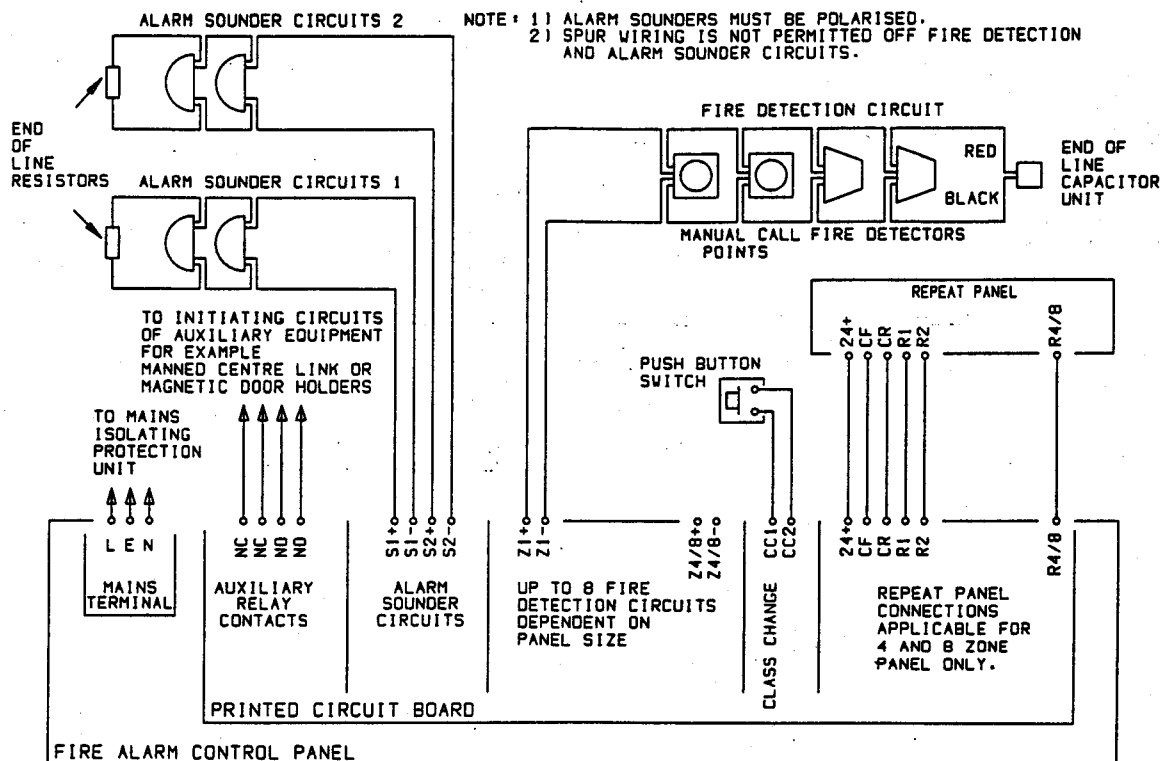


Figure 1 Typical Fire Detection & Alarm System Schematic

2.1 Mains Supply Connection

The mains supply to the Control Panel should be a 240Vac +/- 10% 50Hz single phase. Its connection to the panel should be made via a 3A fused spur unit reserved solely to feed the Control Panel.

2.2 Standby Supply

The Control Panel will provide a standby supply, under mains failure conditions, for a period of 72 hours followed by 30 minutes of full alarm load, with an average detector load of 1mA per zone and a total sounder load of 1A.

2.3 Fire Detection Circuits (Zone Circuits)

The control panel include fire detection circuits, also referred to as zone circuits, for the connection of fire detectors and manual call points. It is important to ensure that the detectors and call points used are compatible with the control panel. Only the recommended devices should be used. It is important that all call points are fitted with a 470 ohms series resistor. Failure to follow this recommendation may lead to inferior performance of the system.

Note: The maximum line loop resistance of a fire detection circuit should not exceed 100 Ohms.

The recommended devices for fire detection circuit are:

- GENT 7430 Ionisation smoke detector
- GENT 7440 Optical smoke detector
- GENT 7450 Fixed temperature heat detector
- GENT 7460 Rate of rise heat detector
- GENT 7470 High temperature heat detector
- GENT 7510 Duct detector 24Vd.c.
- GENT 7011 Beam detector
- GENT 1195-OR Manual call point

2.4 Monitoring Fire Detection Circuits

Effective monitoring of the fire detection circuits relies on the end-of-line capacitor unit being present. A capacitor unit must be fitted after the last detector or manual call point on a fire detection circuit. See figure 1. As the end-of-line capacitor unit is connected to prevent a fault condition being annunciated any fire detection circuits not being used should be terminated in, or adjacent to, the control panel with an end-of-line capacitor unit. The fire detection circuit wiring must be one continuous circuit with no spur circuits being permitted.

Notice: A fire detection circuit wiring must be one continuous circuit with no spur circuits being permitted.

Notice: The use of capacitor(s) and an associated monitoring circuit is the subject of British Patent 2101784. Foreign filing has also been undertaken.

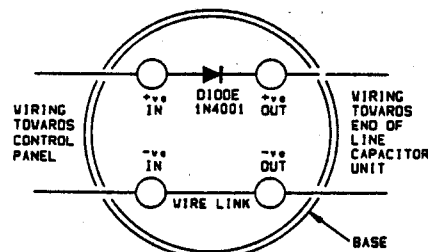


Figure 2

To permit the removal of a plug-in fire detector to be annunciated as an open-circuit fault but prevent subsequent detectors or call points from being disconnected, each fire detector base should be wired with a diode and a shorting link.

2.5 Alarm Sounder Circuits

To comply with the requirements of BS 5839: Part 1:1988, it is important that both alarm sounder circuits are used on all installations. Each alarm sounder circuit for the 1, 2 and 4 zone control panel is rated at 24V 750mA, with a maximum alarm sounder current of 1 A distributed between the two alarm sounder circuits. The 8 zone control panel has each alarm sounder circuit rated at 24V 1.5A, with a maximum alarm sounder current of 2A distributed between the two alarm sounder circuits.

The recommended devices for use in the system are:

- GENT 2511 Electronic Sounder 24V d.c.
- GENT 214 Electronic Bell

2.6 Monitoring of alarm sounder circuits

Each alarm sounder circuit is monitored for both short and open circuit wiring fault. This requires that the remote end of each alarm sounder circuit is fitted with a 22K Ohm end-of-line resistor. An alarm sounder circuit wiring must be one continuous circuit with no spur circuits being permitted. Also to allow the monitoring function to operate effectively, it is important that all sounders include a series blocking diode that will only allow current to flow through the sounders when the supply is polarised in accordance with the terminal markings on the control panel printed circuit board. For monitoring purposes, each alarm sounder circuit is fed with a reversed polarity supply which only permits current to flow through the end-of-line resistor.

2.7 Class Change Circuit

A pair of unmonitored terminals are provided to permit the system alarm sounders to be actuated from a remote position. It is considered that the major use for these will be for class change functions in schools and colleges. The wiring connecting these terminals to the normally open initiating contacts is not monitored for an open circuit fault condition.

2.8 Auxiliary Relay Contacts

A set of normally open contacts and an isolated set of normally closed contacts have been provided for triggering auxiliary circuits. These contacts are rated at 24V d.c. 1A for a resistive load. These contacts should not be used to switch voltages in excess of extra low voltage of 50V. Any auxiliary circuits should be powered from an independent power supply and should not use the power of the control panel as this may have a detrimental effect on battery standby capability of the control panel. For the 1 and 2 zone control panel, these contacts operate with system alarm sounders, whereas for the 4 and 8 zone panel the contacts operate with only the fire condition.

2.9 Repeat Panel Connections (Applicable for 4 & 8 Zone Control Panels Only)

The control panel includes terminals for the connection of a repeat panel to permit duplicate common fire and fault, together with associated fire zone indications. The 24V positive supply connection to the repeat panel is protected by a 1A fuse on the printed circuit board in the control panel. The power supply is not intended to be a source of power for other ancillary devices.

3 Installation Instructions

It is recommended that the installation be delayed until all building work has been completed in the vicinity of the control panel position. This will prevent the possibility of dirt degrading the performance or appearance of the control panel.

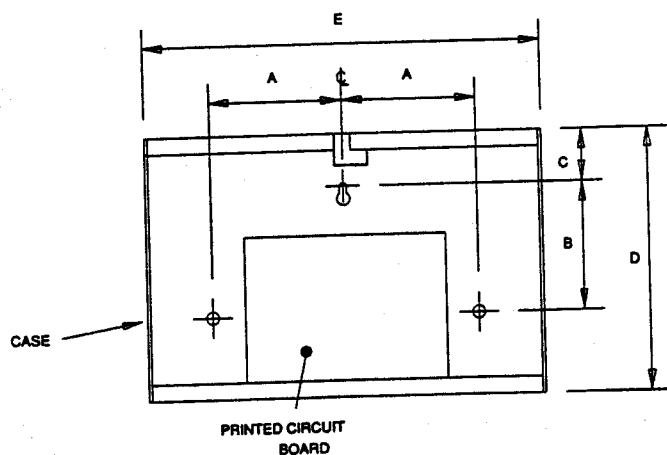
- Remove control panel from its packing but retain the carton for storage of spare parts and loose items.
- Open control panel front cover using the key provided and if necessary remove door by extracting the hinge fixing.
- Remove the inner cover of the control panel by removing its fasteners.
- Check the spares parts supplied with those listed in Table 1. If replacement parts are required at any time, only spares that are of the same specification should be used.

	Control Panel Sizes			
	1 Zone	2 Zone	4 Zone	8 Zone
Main Panel assembly	1	1	1	1
Batteries 12V	2	2	2	2
Instructions log book & Card	1	1	1	1
Keys(Pack of 2)	1	1	1	1
End-of-line Resistor 22k	2	2	2	2
End-of-line Capacitor Unit	1	2	4	8
End-of-line Label	3	4	6	10
Shorting Link	1	1	1	1
Fuse 800mA (Quick blow type)	1	1	1	-
Fuse 1A(Quick blow type)	-	-	1	1
Fuse 2.5A(Quick blow type)	1	1	-	-
Fuse 3.15A (Quick blow type)	1	1	1	1
Fuse 5A (Quick blow type)	-	-	1	1
Zone designation label	-	1	1	1
Battery wire link	1	1	1	1

Table 1 Part List

- Remove the appropriate knock outs on the control panel case for cable entry. The 4 or 8 zone control panel case has knockouts provided to allow rear cable entry.

- Hold the control panel on the wall in the desired mounting position and mark the positions of the fixing holes. See figure 3 for case fixing details.



	A	B	C	D	E	DEPTH
1 & 2 ZONE PANEL	100	150	40	250	330	80
4 & 8 ZONE PANEL	150	100	55	250	500	80

DIMENSIONS IN MM

Figure 3 Case Fixing Details

- Secure the control panel to the wall using suitable fixing such that adequate support is provided to the control panel assembly. A top centre keyhole fixing is provided on the case to allow the panel to be hooked whilst the bottom two fixing points are located.

- Terminate the cables into the appropriate terminal blocks on the printed circuit board.

Note: Each customer terminal on the printed circuit board would accept a maximum conductor size of 2.5mm square.

- If it is not intended that the system be commissioned at this stage, the inner cover and the front cover should be refitted and the system left without power.

- Store spare parts and loose components including the batteries inside the control panel carton and keep in a safe place until required

4 One Man Commissioning and Test

The total system should be tested in accordance with the commissioning requirements of *BS5839:Part 1:1988* or other standard specified by the system purchaser.

a) When the system is to be commissioned, the batteries should be connected as shown in *Figure 4* and the mains power supply connected. Ensure the batteries are securely fixed to the back of the case by using the sticky backed pads provided.

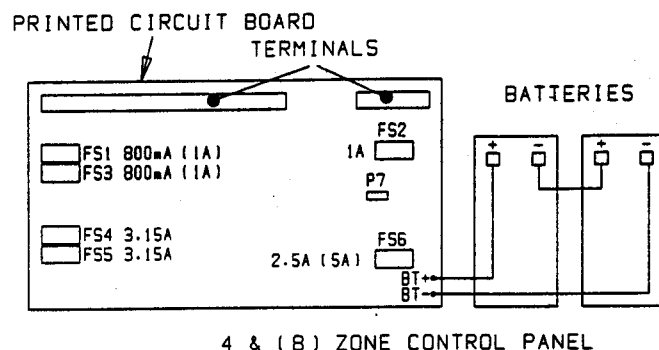
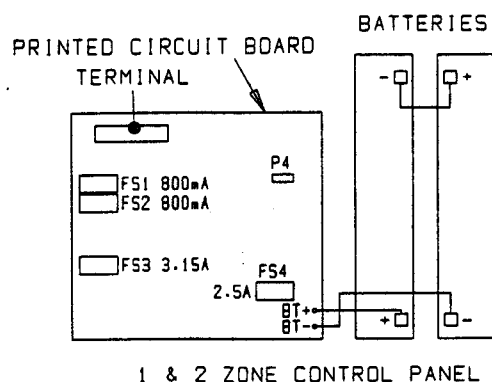


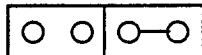
Figure 4 Fuses and Battery Connections

b) With the power supplied, the control panel should now be operational and the green power on lamp should be illuminated.

c) To facilitate commissioning and testing of this control panel, by one man servicing, a four way connector has been included on the printed circuit board designated P4 for the 1 and 2 zone control panels, and P7 for the 4 and 8 zone control panels. A small black shorting link is supplied to enable the control panel into either commissioning or test mode.

1 & 2 ZONE PANEL

Test Link Configuration

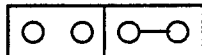


Commissioning Link Configuration



4 & 8 ZONE PANEL

Commissioning Link Configuration



Test Link Configuration



Figure 5 Commissioning and Test Mode Link Configurations

Commissioning mode

To enable the control panel into the commissioning mode, fit the shorting link across the two pins of connector P4 or P7 as shown in *Figure 5*. The fire detection circuit(s) will then appear disabled. However, in this mode any detector operated will be reset, automatically, after approximately seven seconds, without giving any indication on the control panel or starting the alarm sounders.

Testing mode

To enable the control panel into the test mode, fit the shorting link across the two pins of connector P4 or P7 as shown in *Figure 5*. The fire detection circuit(s) will then appear disabled. However, in this mode any detector or manual call point made active will cause system alarm sounders to signal for two seconds and subsequently a panel reset is performed automatically after approximately seven seconds.

d) After each zone circuit has been commissioned or tested it can be enabled separately to operate as normal, see 5.5.

Important: The shorting link **MUST BE REMOVED** from connector P4 or P7 to restore the control panel to the normal mode.

e) Write zone identification name onto the zone designation label, if provided, such that the name is adjacent to the respective zone Fire and Fault lamps on the inner cover of the control panel.

f) The label backing should then be peeled off and label stuck onto the inner cover to allow appropriate zone indicator lamps to appear through cutout of the label.

g) Arrangements should now be made to the ongoing maintenance of the installation as required by *BS5839:Part 1:1988*. GENT will provide a quotation for this service upon request.

Note: The batteries have a self-discharging characteristic during storage. For any panels that are not put into service within six months of the date of manufacture on the package the batteries should either:

- Be returned to their stockist for exchange.
- Returned to local GENT Service Centre or Agent for exchange.

Under normal operating conditions the batteries can have a useful life of up to 5 Years from the date of their manufacture. The **REPLACE BY DATE** shown on the battery label is calculated at 4 Years from manufacture and it is strongly recommended that the batteries are changed by this date.

5 Operating Instructions

The control panel provides system security by virtue of the lockable door and provides clear indication of the indicator lamps and easily readable instructions for the system operator.

The automatic functions of the control panel, includes the annunciation of fire and fault conditions of the fire detection and alarm system, without the need to operate any of the push buttons control. Silencing of alarm sounders and the fault buzzer, re-sounding of the alarm sounders and the operation of the test functions do require the operation of push buttons and these are protected against unauthorised actuation by the lockable hinged front cover of the control panel. Once this cover is lowered, all push buttons are exposed, as are the basic instructions required by the operator.

5.1 Fire condition

- Common fire lamps are on
- Appropriate zone fire lamps are on, if applicable
- Internal fire buzzer is actuated
- System alarm sounders are actuated
- Any auxiliary equipment is actuated
- Any automatic link to the Fire Brigade is initiated

Suggested action to silence alarms and reset the system:

a) Press **SILENCE ALARMS** push after emergency is over, notice the system alarm sounders are silenced and internal fire buzzer changes to fault/supervisory buzzer output. All other fire condition status remain active.

b) Press **RESET** push after the cause of the alarm has been investigated, ensure smoke and excess heat have had time to clear from automatic detectors and broken manual call point glasses have been replaced where necessary. All the control panel indications and outputs will return to their normal condition.

5.2 To Sound Alarms

If it is necessary to actuate the alarm sounders when there is no fire indicated, or to re-sound the alarm sounders after they have been cancelled during a fire condition, for this the **SOUND ALARMS** push should be pressed. The alarm sounders are then cancelled by pressing the **SILENCE ALARMS** push.

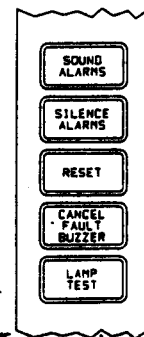


Figure 6 Push Button Controls

5.3 Fault Condition

- Common fault lamp is on
- Appropriate fault indicators are on
- Internal Fault/Supervisory Buzzer is actuated

Suggested action to rectify fault condition:

Press CANCEL FAULT BUZZER push after investigating fault, notice the buzzer is silenced but other indications remain active.

The fault lamps will be automatically extinguished once the fault condition is rectified. If the system detects a fire during a fault condition the fault indicators may be extinguished. Details of the indications relating to specific fault conditions are shown in Table 2. Multiple faults are simultaneously annunciated when this does not cause confusion. However, a mains failure condition overrides all other fault indications in order to preserve battery standby capacity.

5.4 To Test Lamps and Buzzer

Press LAMP TEST push, all lamps should be illuminated and the Fault/Supervisory Buzzer should sound for a period of approximately 2 seconds.

5.5 To Disable or Enable a Fire Detection Zone (Available with 4 or 8 zone control panel only)

This function may be used for system maintenance purpose or for the prevention of inadvertent alarms while there is general maintenance or building work being undertaken in areas protected by automatic fire detectors.

Zone Disable

a) Press SELECT ZONE push. This will cause one of the amber zone fault indicator lamps to be on steady. Repeatedly press the push until the new zone lamp associated with the zone to be disabled is on steady.

b) Press the DISABLE ZONE push until the steady indication disappears.

For any disabled zone(s) the indicator will pulse and the zone disabled warning lamp will be on. Also the fault/supervisory buzzer will be on and will not cancel until all zones are re-enabled.

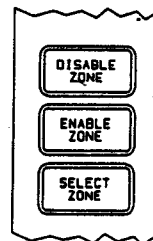


Figure 7 Zone Disable/Enable Controls

Zone Enable

a) Press the SELECT ZONE push until the appropriate zone indicator lamp is on steady.

b) Press the ENABLE ZONE push and the zone will be enabled. Repeatedly press the SELECT ZONE push until the steady indication disappears.

			Visual Indications				Warning	Audible			
Com. Fire red	Com. Fault amber	Zone Fire red	Zone Fault amber	Sounder /Earth Fault amber	Processor Fault amber	Power ON green	Zone Disabled amber	Buzzer sound	CONDITION ANNUNCIATED	PROBABLE CAUSES	
OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	Normal Condition	System is operating correctly	
ON	OFF	ON/ PUL	OFF	OFF	OFF	ON	OFF	ON	Fire Condition	An automatic fire detector or call point has operated	
OFF	OFF	OFF	ON& PUL	OFF	OFF	ON	ON	ON	Disabled Zone	Fire detection circuit has been disabled by Engineer to prevent inadvertent alarms.	
OFF	ON	OFF	ON	OFF	OFF	ON	OFF	ON	Zone Circuit Fault	A fire detector has been removed or detection circuit wiring has open or short circuited.	
OFF	ON	OFF	OFF	ON	OFF	ON	OFF	ON	Alarm Sounder Circuit Fault	An alarm sounder circuit wiring has open or short circuited or its protection fuse has ruptured.	
OFF	ON	OFF	OFF	ON& PUL	OFF	ON	OFF	ON	Earth Fault	A part of the system has an electrical leakage path to earth.	
OFF	ON& PUL	OFF	OFF	OFF	OFF	ON	OFF	ON& PUL	Battery Disconnection	The battery or its wiring has failed, or its protection fuse has ruptured.	
OFF	ON& PUL	OFF	OFF	OFF	OFF	OFF	OFF	ON& PUL	Mains Supply or Charger Fault	The Mains Supply to the panel is faulty or the Regulated Supply Fuse has ruptured or the Battery Charger has failed.	
OFF	ON& PUL	OFF	OFF	OFF	OFF	ON	OFF	ON& PUL	High Supply Fault	Regulated Supply voltage is incorrect.	
OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	ON	Processor Failure	The panels micro-computer has malfunctioned.	

(ON&PUL)=ON AND PULSING (ON/PUL)=ON OR PULSING-if it is a recently activated zone.

Note:The visual indications of zone fire and zone fault are not applicable to the 1 zone control panel.

The zone disable warning indications are only applicable to the 4 and 8 zone control panels .

(ON&PUL)=ON AND PULSING

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Note: The visual indications of zone fire and zone fault are not applicable to the 1 zone control panel.

The zone disable warning indications are only applicable to the 4 and 8 zone control panels.

Table 2 Control Panel Annunciation

6 Routine Testing

Daily

The British Standard Code of Practice for Fire Detection and Alarm Systems for buildings, BS 5839:Part 1:1988, states that the system should be inspected daily to ensure that it is indicating a normal condition and that any previously indicated Fault and Warning condition has received appropriate attention. It recommends entry into the log book provided of all system events for future reference.

Weekly

At weekly intervals a different fire detector or manual call point of the system should be tested. The test should be performed at regular time to avoid confusion between a test and a genuine alarm. This would also provide a regular reminder to those occupying the premises that there is a fire alarm system with a particular characteristic sound.

Quarterly

At quarterly intervals the system should be inspected and any work necessary should be performed by a trained engineer responsible for the system.

6.1 Log Book

To comply with the requirements of BS 5839:Part 1:1988 and to allow those concerned with the fire detection and alarm systems to monitor the long term performance of the system, it is important that a log is kept which includes all the events relating to the performance of the system.