13 AUGUST 1991

SURVEYOR 8000 RANGE

P8001 to FCP8010: 1 to 10 zone. Contained in a "single window" compact cabinet, complete with 3 Amp battery charger and space for 6Ah sealed lead acid batteries.

FCP8011 to FCP8030: 11 to 30 zone. Contained in a "two window" cabinet. It is recommended for most systems of this size that a remote charger and batteries be selected.

The Surveyor 8000 range of control panels have superceded the well established 3000 series and now meet the additional requirements of B.S.5839 part 4 and B.S.5839 part 1 installations.

The 8000 range has been designed to meet the exacting specifications for larger fire alarm systems that can require customised panel finishes, large zonal sounder loads, specialised switching, etc.

Many features are included in the 8000 range which are available only as additional features on other manufacturer's equipment e.g. zone isolate, zone test, low voltage battery protection.

IT IS RECOMMENDED THAT THIS EQUIPMENT BE INSTALLED ONLY BY A COMPETENT ENGINEER WHO IS FAMILIAR WITH IT AND CAN INSTALL TO THE RELEVANT SECTIONS OF THE CURRENT IEE REGULATIONS AND ALSO CURRENT BRITISH STANDARD FOR FIRE ALARMS (AT PRESENT B.S. 5839 1988 PARTS 1 AND 4).

Contents

12.0 Zones Sounders

13.0 Panel of 10 Zones Or More

14.0 Volt Drop

1.0 Front Panel Indications & Controls

LEDs visible through display window

Zonal Fire
Zonal Fault
Common Fire
System Fault
Test Mode Selected
Supply Healthy
Auxiliaries Isolated
Zone Open/Isolate

Fault indications visible inside the cabinet.

Short and open common sounder faults
PSU (power supply unit) fault
Battery fault
Voltage fault
Earth fault
Zonal sounder faults, open and closed, only fitted when additional sounder circuits are supplied.

1.2 Control Switches

Switches visible throughout display window:-

Stop Alarms: Will silence sounders when a Fire Zone has been activated or Sound Alarms has been operated.

Sound Alarms: All fire alarm sounders will operate irrespective of a fire condition.

System Reset: Fire zones can be reset by this switch only after depressing the "Stop Alarm" switch.

Silence Tone: Will silence the internal fault sounder except when a zone is in alarm.

The following are engineer's switches & should only be used by an authorised person.

Activate Engineers Test: With this depressed, any "zone test" switch can be selected.

Zone Test (individual): Any zone can be independantly tested in conjunction with above See paragraph 8.4.

Zone Isolate (individual): Any zone can be isolated so as not to cause an alarm.

Isolate Auxiliaries: Can be used to prevent operation during test, or alarm, of an automatic dialler, door retainers, etc. which are controlled via the aux relays.

Control Switches on Common Mother Card PCB:

Battery Start: When mains supply is not available, connect batteries, depress switch on right hand edge of PCB (near transformer), panel will now operate.

Tone Buzzer Volume: Location adjacent to buzzer. Turn clockwise to reduce volume.

2.0 Operation (User's Instructions).

2.1 Standby

In the alert condition, the only indication visible is the green Supply Healthy LED.

2.2 Fire Detected

Should a smoke detector, heat detector or break glass call point operate on one of the zones, then the following will occur:-

COMMON FIRE LED illuminates (pulsing)
FIRE ZONE LED illuminates (pulsing)
Internal sounder operates (unmutable)
Sounder Circuits - All fire alarm sounders will operate e.g. bells or electronic sounders.
Auxiliary Circuits - Any auxiliary equipment will operate such as door retainers will release, automatic diallers will operate, smoke dispersal windows will open, etc.
With the panel door open, the panel controls can be operated in the following sequence:-
To silence sounders - Press "Stop Alarms". This will silence all sounders, but does not mute the internal tone sounder. The LED indicating zone of operation will steady. Before reseting the control panel, the source of the fire alarm should be identified. An indication will be seen on the side of each smoke or heat detector in alarm. Pressing the "Reset" button will extinguish this indicator.

System Reset:- This will cancel the internal sounder and restore the panel to standby state. If panel reverts to an alarm condition, then one of the detectors or call points remains in an alarm.

Should further fire signals be detected on another zone before reseting the first zone, then the sounders will reactivate.
The original fire zone LEDs will remain steady whilst the new fire zone LED's will pulse.

2.3 Evacuate Controls

The Sound Alarms switch will initiate operation of all sounders on the fire alarm system. The sounders can only be silenced by depressing the "Stop Alarm" button. Evacuate does not produce any visual LED indications.

2.4 Fault Detected

Should a fault develop on the system, the "System Fault" LED will illuminate and the internal fault sounder will be heard. An additional LED will illuminate to give indication of the circuit at fault. An approved fire alarm engineer will be required to deal with most faults.
Should the "Supply Healthy" be extinguished, check that the electricity supply to the control panel has not been switched off or a supply fuse blown.

3.0 Fault Indications

Any of the following faults will be accompanied by "System Fault" indication and an interval mutable buzzer sounding intermittantly.

3.1 Zone Fault

Should a fault occur on any zone, then the relevant LED will illuminate.
There are two fault modes :-
Short Circuit Fault - Zone Fault LED steady
Open Circuit Fault - Zone Fault LED steady and the "Zone Open" LED illuminated.

3.2 Common Sounder Faults 1 & 2

Four indications - two for each sounder output.

o = open circuit fault
s = closed circuit fault

3.3 Zonal Sounder Faults

Zonal sounder faults are only fitted in conjunction with extra bell circuits . These must be specified when ordering the control panel.

3.4 Supply Faults

Under the above heading are a group of four indications all associated with the power supply as follows:-

a) PSU - Power Supply Unit which monitors the supply input and correct functioning of the power supply/battery charger.

b) Battery - Monitors contintinuity ot the batteries. If a battery lead becomes detached or one of the batteries develops an open circuit fault then this will be detected.

c) Voltage - Monitors panel voltage, especially under mains fail conditions. The fault will operate if the voltage drifts outside a "window" of 23.5V - 30V

d) Earth Fault indicates a fault to either side of the 24v DC supply. It does not monitor the mains supply to earth.

N.B. All the above individual LED indications are steady with the SYSTEM FAULT illuminating and internal buzzer pulsing.

4.0 Low Voltage Battery Protection

Low voltage protection of the batteries will occur when, after long standby period, due to loss of mains supply etc., the batteries have discharged below 22.5 volts.
The total panel load is removed by the automatic operation of a relay, ensuring no further drain on the battery capacity occurs.

Sealed lead acid batteries will deteriorate rapidly if left with a load on them and will experience deep discharge from which they may never recover.Low voltage battery protection will prevent this, ensuring the batteries will recover once the mains supply is restored.

N.B. If both the mains supply and batteries have been disconnected leaving the panel non-functional, then if just the batteries are available to power the panel, the "start up" switch must be operated. This is located on the right had side of the common mothercard, see drawing HSN\300\02.

Installation

5.1 Cabling It is recommended that 1.5mm (MICC or Pirelli FP200) be used on all circuits except where heavy sounder loads and/or exceptionally long sounder circuits are incorporated, then suitably sized cables should be chosen to avoid excessive volt drop.
N.B. Meggers or similar high voltage test instruments must not be used while the control panel or any device containing electronic components is connected.

5.2 Mounting The Control Panel

Remove front plate and battery cover by unscrewing the four screws. It necessary, the whole of the electronics can be removed by carefully unplugging the various connectors and fixing screws. If care is taken by ensuring that all PCBs are suitably protected during affixing of the cabinet to the wall, then the electronics can be left in situe.
Securely mount the cabinet to the wall by means of the four fixing holes provided.
Replace any PCBs removed, ensuring correct location of all plugs and sockets.

5.3 Zone Wiring

The detection zone of the Surveyor 8000 series has been designed to comply with the requirements of B.S. 5839 parts 1 and 4 1988, which asks for both open and short circuit fault indications. If this facility is not required then panels can be provided such that a short circuit will cause the sounders to operate as previously accepted by British Standard B.S. 3116 part 4 1974 and B.S. 5839 part 1 1980. Alternatively a 330 ohm resistor can be connected into the zone terminals as shown on drawing HSM/8000/06.

Upto 30 detection devices may be connected onto any zone although, to aleviate excessive search time, we recommend that no more than 20 devices are fitted.

The Surveyor 8000 is designed for the Nittan range of detectors, although it is suitable for most modern makes providing that the device presents a resistance of 470 ohms across the line when in alarm. For example, an old type break glass contact will require the fitting of a 470 ohm resistor in series with its contacts.

This becomes important when installing a new control panel into an existing system.
The installer must assure himself that only compatable equipment is fitted.
All detection devices are to be connected in parallel across the zone, which constitutes a continuous pair of wires, with no branches or spurs. The end of line monitoring resistor, which is 4K7, should be placed at the far end of the zone in the last detector as shown on drawing no HSM/8000/03.
The total loop resistance of the zone cabling, less the end of line resistor, should not exceed 200 ohms. If using 1.5mm mineral insulated cable, this represents an approximate distance of 5000 metres to the end of line!

5.4 Sounder Circuits

Two sounder circuits are normally provided, although each are monitored for both open and closed circuit faults. Each circuit must be wired in parallel without branches or spurs and an 4K7 end of line resistor connected across the last sounder (see Drawing HSM/8000/04.
All sounders must be polarised. Each sounder zone is not to exceed 2 amps, with a total panel load of not more than 2.5 amps.

Recommended Sounders:

	Type	db @ 1M	Current	Max per panel recommended of any one type.
Bell	T6D/24LC	96	27mA	74
Bell	T8D/24	98	55mA	36
Elec.Sounder	Banshee LF	103	17mA	117
Elec.Sounder	Bedlam	113	30mA	66
Elec.Sounder	W1B or WS2	100	15mA	133

It is not recommended to mix sounders of different tones on a fire system. The above sounders are available from the Company upon request.

5.5 Additional Outputs Terminals

Refer to drawing HSM/8000/04 for location.

5.5.1 Repeater Panel Ouptuts (RP)

These zonal outputs are only for connection of repeater panels supplied or recommended by HAES Systems Limited.
See drawing HSM/8000/03/4
The repeater outputs have a common fuse rated at 2 amps.

5.5.2 Auxiliary Relays

Supplied are: Aux one output 24v DC changover.
+C - common
-NC - voltage disappears on alarm
-NO - voltage appears on alarm

Aux two: voltage free changeover
C - common
NC - normally closed, opening on alarm
NO - Normally open, closing on alarm.
Low voltage use only (50 volts max).

Both are fused at 1 amp.

5.5.3 Actuate Sounders (Act SNDRS + -)

This output is provided where class change or precinct operation is required. Connection should be as shown in drawing HSM/8000/06. The remote relay or switch can be pulsed or energised constantly depending upon individual requirements.
Energising the relay will cause the control panel alarm sounders to operate as they would in alarm. De-energising the relay will silence them immediately. No visual indication is given and the internal circuits will not latch. When the external switch or relay is de-operated, the Surveyor 8000 will revert to standby.

5.5.4 Remote Stop Alarm & Reset (REM SA- R-)

These are not normal functions fitted to a Repeater Panel, but can be incorporated upon request. Connections are shown on Drawing No. HSM/8000/04. These must not be used for any purpose but the authorised use of Stop Alarm and Reset.

5.5.5 Voltage Output (24v DC Output + -)

A 2 amp fused output is available to supply auxiliary circuits. This does not infer that upto 2 amps can be drawn from the panel for auxiliary circuits. The whole consumption of the fire alarm system must not exceed 2.5 amps with the sounders activated.
It is a recommendation that not more that 1 amp be used to supply a constant load. The system would not comply with the load requirements as detailed in British Standard B.S. 5839 part 4, should the supply be used for anything other than the direct use of the fire alarm.

5.5.6 Remote Charger I/P (24v DC +,-,CF,BF)

These terminals should only be used when the panel has been constructed for use with a remote power supply and battery charger (BCU8-24-50/10/20). 5 amp, 10 amp, 20 amp.
4 cables should connect the charger with the panel, which should be mounted as close as possible to each other The 24 volt supply pair should be a minimum of 2.5mm cable. The charger fault (CF) and battery fault (BF) are signal wires only and can be either 1 or 1.5mm cables.

5.6 Mains Supply

The supply voltage should be 240 volt 50Hz AC + 10% fed via an unswitched 2 amp fused spur.

5.7 Earthing

Good engineering practice and the IEE regulations should be observed to ensure adequate earthing. Metal screened cable (MICC,Pirelli FP200 etc.) should be earthed throughout the the system, ensuring no breaks occur through detectors, call points, sounders etc. Not only will this comply with regulations but will help in preventing spurious, induced voltages interfering with the panel.

5.8 Batteries

Only good quality sealed lead acid batteries should be used. Normally two 12 volt batteries, which can be supplied, should be connected to give a nominal 24 volt. The constant voltage charger is set at 27.6 volts + 0.2 volt DC.

6.0 Engineers Indications and Controls

These are mainly located in the front panel area entitled Engineers Use Only, although some indications will be seen on the LED display above this.

6.1 Faults Indication (Also explains in paragraph 3.0)

a) PSU - Mains, fuse or power supply failure.
b) Battery - Battery fault or fuse failure
c) Voltage - Over 30 volts,or under 23.5 volt indicates faul
d) Earth - Earth fault on either polarity of 24v DC supply
e) Sounder Faults - Indicate monitoring state of two standard bell circuits. S- short circuit fault. O- open circuit fault.
f) Zonal Sounder Faults - THESE WILL ONLY OPERATE IF ZONAL SOUNDERS ARE FITTED.
g) Test Mode Selected - One or more zones under test. See "controls" below.
h) Zone Open/Isolated - Open circuit fault or zone isolated. See below.
i) Auxiliaries Isolated - Indicates that relay outputs are isolated while system testing is in operation.

6.2 Engineering Controls

a) Isolate Auxiliaries - Two auxiliary relays provided to control external equipment.Can be isolated by depressing switch.
b) Activate Engineers Test - Depressing this switch will set the panel in Test Mode and will indicate accordingly The panel must not be left in Test Mode.

c) Test - A zone can be selected for test by changing the relevent DIL switch in the direction of the arrow. A test on that zone will not cause a full alarm, but will sound the alarms for only a short pulse. The panel will reset automatically after a period of approximately 10 seconds. The zonal test switch must not be left in its TEST position. The auxiliary relays will not operate when under test.

d) Isolate Zone - Should it be necessary to isolate the operation of any fire zone, this can be achieved by changing the relevant zone isolate switch in the direction of the arrow. Zone Fault, System Fault and Zone Isolated LEDs will illuminate. The warning tone can be muted. When isolated the zone is completely non-functional.

7.0 Short Circuit Zone Fault Monitoring

One of the features of British Standard B.S. 5839 part 1 1988 is that a short circuit across the detection zone should indicate as a fault and not as a fire, as previously acceptable.
The Surveyor 8000 is supplied with this facility as standard.
Any detection device installed on a fire zone should be compatable with the zone parameters and approved by the Company. The Nittan 2KC/NID58 range of detectors are recommended but other manufacturers' detectors may be suitable providing that they present a resistance greater than 100 ohms and less than 500 ohms when in alarm. Any simple switching device i.e. call point or simple heat detector, should have a 470 ohm resistor fitted. The correct positioning of this resistor should be noted from Drawing No. HSM/8000/07

7.1 Pre British Standard B.S. 5839 Part 1 1988

Prior to the introduction of this standard it was acceptable for a short circuit zone fault to sound the alarms as though a fire had occurred. To upgrade existing systems could prove expensive and so with the relevant authority's approval it may be possible to install a Surveyor 8000 which has been modified to pre B.S. 5839 part 1 1988 standards. Please specify when ordering.
Alternatively, it is possible to fit a 220 ohm resistor in the zone wiring as shown on drawing no. HSM/8000/06.

8.0 Detector Head Removal (HTM82)

The Health Technical Memo HTM 82 directive requests that removal of a detection device should not prevent the correct function of other detectors on that zone.
It is possible to meet these requirements by the additional use of the base, part no. 3RD-4-SD-2, which will accept the 2KC/HID58 range of detectors.

9.0 Testing

9.1 General

If unfamiliar with the equipment, it is better to commence testing with all external wiring omitted, with the exception of the mains supply. As the control panel is supplied with all end of line resistors fitted, then switching on the mains supply will only reveal Supply Healthy, System Fault and Battery Fault.

Connect the sealed lead acid batteries in series to give 24 volts and connect up the battery leads ensuring correct polarity. The only LED illuminated now should be the green Supply Healthy.
Should any faults occur then refer to paragraph 3.0

9.2 Detector Zone Test

Connect one zone at a time ensuring that all detectors are wired correctly and the end of line resistor 4K7 is fitted in the last detector. To test each Fire Zone, operate a detection device or short zone wiring by use of a test resistor 470 ohms. Both Zone and Common FIRE indications should pulse.

Press STOP ALARMS - Both LEDs will become steady.
Alarm a second zone - The new zone and common fire LEDs will pulse.
Press SYSTEM RESET - Both LEDs will extinguish
N.B. Tone buzzer will not mute when a FIRE signal is present. Repeat for all zones.
Short out zone wiring with a piece of wire - Zone & System Fault will illuminate, tone buzzer sounds.
Remove detector or open circuit zone - Zone & System Fault, together with ZONE Open will illuminate, tone buzzer sounds.

9.3 Sounder Test

Connect in the two (or more) sounder zones ensuring correct polarity of sounders and that the 4K7 resistor is at the end of line.
Depress "SOUND ALARMS" - all sounders should operate
Depress "STOP ALARMS" - all sounders should silence
Short out each pair of sounder wires - S (short) LED should illuminate, with tone buzzer.
Open circuit the sounders - O (open) LED should illuminate with zone buzzer.

Full Alarm Test:-

A full test should be made to ensure that all detectors and sounders operate on all zones.

9.4 Engineers Test

During commissioning or servicing, each FIRE zone can be tested individually whilst leaving the panel in an alert mode to protect the remainder of the alarm system. This is particularly useful when commissioning the system singlehanded, saving another engineer standing by to reset the control panel.

9.4.1 Select "Activate Engineers Test" and zonal TEST switches. - Zone Test and Test Mode Selected LEDs will illuminate.

9.4.2 Having set Test Mode, the premises can be walk tested, alarming each detection device in turn, waiting for a short 1 second pulse from the sounders, the control panel will attempt to reset some 10 seconds later. If the detectors are not clear of smoke, then the cycle will repeat itself until reset occurs.

It is recommended that only one zone at a time is tested so that one can identify that all detectors tested are on that zone. If a detector from another zone is tested in error, then a full alarm will occur.

9.4.3 When complete, ensure that all DIL switches and slide switches are returned to normal and that all warning LEDs are extinguished.

9.5 Fault Test

Test all fault functions by reproducing faults as follows:-

a) PSU - Remove 240v supply - "Supply Healthy" LED extinguishes, System Fault & PSU Fault LED illuminate.

b) Battery - Remove battery lead - System Fault pulses, Battery Fault illuminates.

c) Voltage - Disconnect batteries - Only test if an acurate digital voltmeter is available to reset voltage. A voltage fault will indicate if it is varied below 23.5 volts and above 30 volts. Reset charger voltage to 27.6 + 0.2 volts.

d) Earth - Short either side of 24v DC supply - System Fault pulses & Earth Fault illuminates.

e)	Sounder	- Open & Short both Sounder circuits	- System Fault pulses & relevant Open or Short circuit LED illuminates.
f)	Zone Open	- Remove smoke detector or open circuit zone wiring	- System Fault pulses. Zone Fault Zone Open/Isolated illuminates.
g)	Zone Short	- Short out zone wiring	- System Fault pulses, Zone Fault illuminates

9.6 Auxiliary Relay Test

Voltage Free Relay : With test meter on ohms scale, check, between common C and NC & NO, that relay changes when panel is alarmed.

Voltage Relay: With test meter on 30v DC range, check between C+, NC- & NO-, that voltage changes over on alarm.

Isolate: Repeat above with isolate switch operated. Observe that relay changeover does not occur.

9.7 Activate Sounders

Operate remote relay (wired as per drawing no: HSM8000\06) all sounders should operate. Panel will not alarm and no indication will be visible. Reinstate external relay, sounders will silence, panel reverts to standby.

9.7.1Precinct Control and Auxilliary Relay

Under normal conditions when Activate Sounders are operated, the auxiliary relays will also operate. This can cause a system "lock up" if used as part of a precinct system. To prevent this happening a diode must be removed as indicated on drawing HSM/8000/06.

10.0 Additional Facilities

Any additional facilities used should be tested, some of these are supplied as standard, while others are special to customers own request. Please ensure that these are working and are wired correctly.

10.1 Repeater Panels

Check that the relevant zone on the repeater panel illuminates when a zone on the main panel is alarmed. Induce a fault on the main panel and check that this indicates on the repeater as a common fault.

10.2 Check that remote "Stop Alarm" and "Remote Reset" function by alarming the main panel and then cancelling the alarm at the repeater panel.

11.0 Remote Battery Charger

In the event of a heavy alarm load, long system standby, or panels with more than 10 zones, it is recommended that a remote battery charger be used. This should preferably be installed as close as possible to the control panel so as to avoid unnecessary volt drop.

11.1 Charger Specification

To ensure compatibility of equipment, a charger from the BCU-8- range should be used.
The 5 & 10 amp chargers (BCU-8-24-50 & BCU-8-24-100) have space for sealed lead acid batteries whilst the 20 amp charge (BCU8-24-200) requires a seperate battery cabinet.

11.2 Wiring

A total of four cables should connect the charger to the panel. Two are the +ve and -ve supply and should be sized according to the length of the cable run and the load they are carrying. A minimum of 2.5mm cable is recommended. The other two cores are signal wires only and these can be either 1mm or 1.5mm

11.3 Auxiliary Standby Batteries

A seperate pack of 6AH batteries should be located within the control panel and will remain charged by the remote battery charger. Should a total loss of power occur from the remote charger, due to the cables being cut, then the integral batteries will maintain the system for a limited period.

12.0 Zoned Sounders

Provision has been made to supply a variety of zoned sounder permutations. These should be specified when ordering as it is not possible to add these on site. A maximum of 1/2 amp should be taken through each zone card sounder circuit, while observing the 2.5 amp maximum panel sounder load.
Typical examples are as follows:-

1. Common zoned sounders - additional sounder outputs can be added to each zone card. These sound whenever the common sounder outputs operate. This approach can be used to reduce cable runs depending on the building layout.

2. Zone of origin sounders - zonal sounder circuits to be fitted to each zone card. Any zone then alarming will cause the sounders on that zone to operate whilst all other zones pulse.

3. Zonal sounders - zonal sounder circuit fitted to each zone. Any zone then alarming would cause the sounders on that zone to operate. All other zonal sounders will remain silent.

4. Grouped sounder - various other permutations are available e.g. grouping a number of fire zones to operate one or more pairs of sounder zones whilst other zones remain silent or pulse etc.

13.0 Panel of 10 Zones Or More

Drawing No. HSM/8000/01 shows the appearance of the Surveyor range from 11 - 30 zone and 31-70 zones. Specification, Installation and Testing instructions remain generally as for the 1 - 10 zone, but additional features may be requested by the client. Normally larger panels require larger sounder outputs and so we recommend the use of a larger, remote power supply with any panel over 11 zones. Battery chargers are available in 5, 10 and 20 amp sizes, with batteries to suit.

14.0 Volt Drop

Consideration should be given to volt drop when designing a fire alarm system due to potentially long cable runs and heavy sounder loads.

Fire zones do not normally present volt drop problems as most modern smoke detectors do not consume more than a few micro amps. Even with a maximum of 20-30 detectors per zone, cable runs of several kilometres would not present a problem.

Given the resistance of the cable used, the length of the run and the current consumed, the approximate volt drop can easily be determined.

1. Cable resistance - all cable manufacturers will give the resistance of their cable, ususally in ohms/thousand metres. MICC is typically:

ohms/1000	conductor size
17	1.0mm
11.5	1.5mm
6.9	2.5mm

2. Length of cable - An assumption can be made here that all sounders are grouped together at the far end of the sounder run. This is rarely the case, but if calculated this way, it would present the worst volt drop expected.

For calculation purposes we must double the length of any cable as the current will pass down one core, through the sounders and back to the panel on the other core.

3. Current consumed by sounder load.
Simply multiply the number of sounders by the sounder manufacturer's stated current consumption. Please note that most manufacturers' figures are quoted at 24v DC. Most fire panels, including the Surveyor, charges the batteries @ 27.6v and therefore this voltage is present at the sounder output terminals. This additional current will increase the current pro-rata.

4. Example :- 600 Metres of 2.5mm MICC
Calculation 35 qty Bells (@ 30mA ea)
of volt drop Find volt drop at last bell, assuming all bells near far end of cable.

Resistance of cable run:

Ohms = Resistance/Thousand Metres
x linear cable run x 2 (return run)

Ohms (R) = 6.9 ohms/1000m x 600 x 2
R = 8.28 ohms

Current (I) = 35 x 0.03
= 1.05 amps

Volt drop = I x R
= 1.05 x 8.28
Approx. = 9 volts drop

As panel Operating Voltage = 27.6V:-

Available voltage at last bell = 27.6 - 9 = 19.6 Volts
The sound output of a 24v bell @ 19.6 volts would probably be too low to be acceptable.

As all bells in the calculation above were assumed to be at the end of the cable, this will give the worst condition of volt drop. If the bells are evenly distributed, then it can be assumed the effective load is halfway along the run. This greatly reduces the volt drop.

Resistance = 6.9/1000 x 300 x 2
= 4.1 ohms

Volt Drop = I x R
= 1.05 x 4.1
= 4.3V

Voltage at last bell = 23.3v. This would be acceptable.

The above results are only approximate due to the estimated position of the effective load.
A more accurate and lengthy method would be to calculate the volt drop between each and every sounder, reducing the number by one each time. The volt drop in each branch should be added to give the total.
Obviously this will take longer to calculate and rarely is the distance to the last sounder known, let alone the distance between sounders!

TECHNICAL SPECIFICATION - SURVEYOR 8000

Construction

Two tone grey.
Back box - platinum grey
Front - Papyrus white
18 swg mild steel

A lectronics are mounted on PCBs in a ther/daughter' board arrangement with plug in connections. All switches and indicators are soldered directly on to PCBs for greater reliability.

Switches are concealed behind a lockable door, indicators are viewed through a transparent panel.

Mounting

Surface mounting, direct on to wall via four fixing holes. Recess mounting with flush kit, on request.

Wiring

Provision for top and bottom entry cables 20mm knockouts. Terminal blocks for up to 4mm².

Dimensions

2 -10 zones	376 x 444 x 85mm
11-30 zones	636 x 444 x 85mm
31-70 zones	636 x 888 x 85mm

Application

On fire systems requiring BS. 5839 part 1 and 4 1988 installations. Replacement panels to non current B.S. can be supplied

Extendability

es can be extended simply by addition of extra zone PCB up to chassis limit.

Detection Circuit.

Two wire open circuit monitored by 4K7 end of line resistor. Short or open circuit indicates a fault. HTM 82 can be met. Suitable for "3 wire" operation. Can be adapted to old B.S. (Short circuit fault causes an alarm).

Fire Indication

Red zonal LED with common FIRE LED. Both pulse on initiation, becoming steady under 'Stop Alarm'. Panel buzzer sounds continuously.

Repeater Outputs

for approved equipment. Zonal fire indication and common fault. Buzzer sounds.

NOVEMBER 1990

Detector Indication

LED on smoke or heat detector will indicate operation. Remote LED indicators available.

Detector Type.

Current Hittan range of heat or smoke. Most other modern detectors upon HAES approval.

Scope.

Upto 30 devices whether smoke, heat or call point.

Cable Resistance of Detection Zone

Return loop resistance should not exceed 100 ohms.

Line Monitoring

End of line 470 ohm resistors supplied for both detector and sounder zones. To be fitted in last device on zone.

Fire Zone Polarity

The end of line resistor and all detection devices supplied by HAES are not polarity concious.

Zone Fault Indication

Zone faults viewed through transparent panel. Tone buzzer sounds. Common System Fault, Individual Fault, open or short circuit.

Alarm Sounder Circuit, Common.

Output: 24 Volts dc (27.6)
2.5 Amp shared between two outputs.
Monitored with 4K7 resistor. Sounders to be polarised.

Alarm Sounder Circuit, Zoned.

Fitted upon request to various permutations. ½ Amp per zonal card as standard Overall load remains @ 2.5 Amp

Heavy Alarm Loads.

Seperate Battery Chargers available 5,10 and 20 amps.

Sounders

Light current 24 volt dc bells or electronic sounders recommended. Must be polarised.

Stop Alarms

To silence sounders, depress "Stop Alarms" switch. Each subsequent zone alarming will resound the alarms.

Quiescent Load

Conmon equipment - 175 mA, plus
Zonal load - 25 mA per zone.

Sound Alarms

Depressing switch will cause only the sounders to operate. Press 'Stop Alarms' to cancel.

Reset

Panel will only reset if detectors are 'clear', if not, alarms will resound. Reset will only function after Stop Alarms.

Silence Tone

Depress switch, buzzer will resound should a fault re-occur. No silence tone with Fire condition.

Zone Isolate

Zonal isolate switch with two warning LEDs.

Engineers Test

Depress switch and select zone. Remote test and reset is achieved. Visual indication of test state.

Low Battery Protection

Upon supply failure batteries will discharge until 22 volts when automatic disconnection occurs. Auto reset upon mains restoration.

Auxiliary Relays

1 OFF Voltage changeover
1 OFF Voltage free changeover
Rated 1 amp 50v max.
Changeover on alarm. Return on reset. Isolatable.

Actuate Sounders

For precinct and class change. Requires switched supplie . Do not short out.

Fault Indications

Common system fault LED and buzzer
Individual faults : Zone (OC & SC)
Sounders (OC & SC), PSU, Battery Voltage, Earth, Test Mode Selected.

Auxiliary Equipment

24V dc output, Remote stop alarm & Reset. Remote Charger connections.

Adaptability

Supplied upto 70 zones. Additional sounder outputs. Zoned sounder permutation. Flush Kits in stainless steel and brass finish

Power Supply

Integral : 3 Amp constant voltage.
Set at 27.6 ± 0.2 volts.
Input : 240V ± 5% 50/60 Hz
Green supply healthy LED. Fused 2 amp quick blow. Suitable for sealed lead acid batteries only. Remote Power Supply/Charger: Available in 5,10 & 20 amp capacities for heavy alarm loads - and 11 zones or larger.

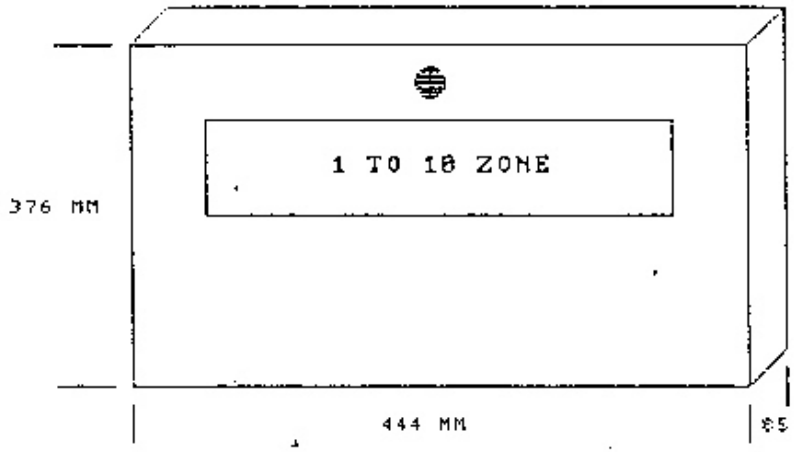
Batteries

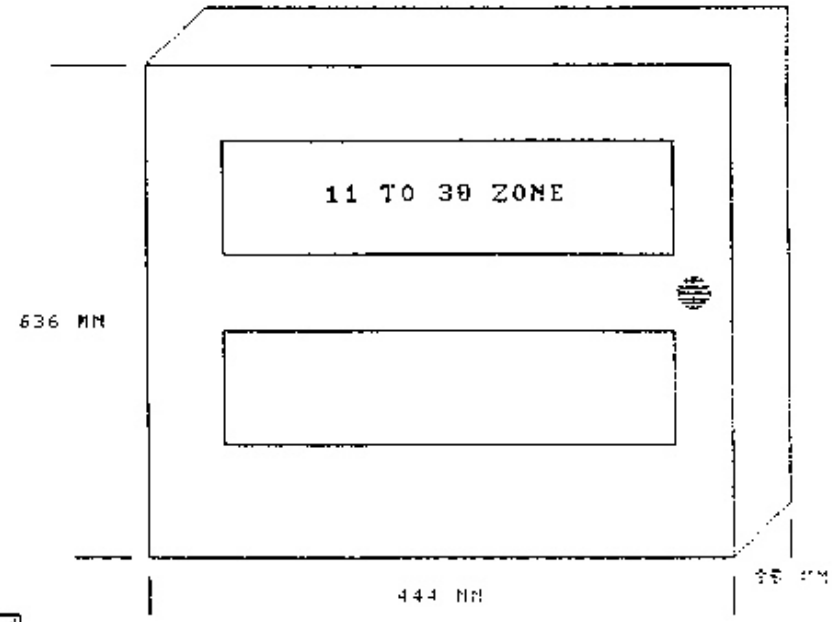
Sealed lead acid, maintenance free, cabinet space for upto 6Ah 24 Volt (2 X 12 Volt 6Ah in series). Heavy loads or longer standby will require larger remote mounted batteries.

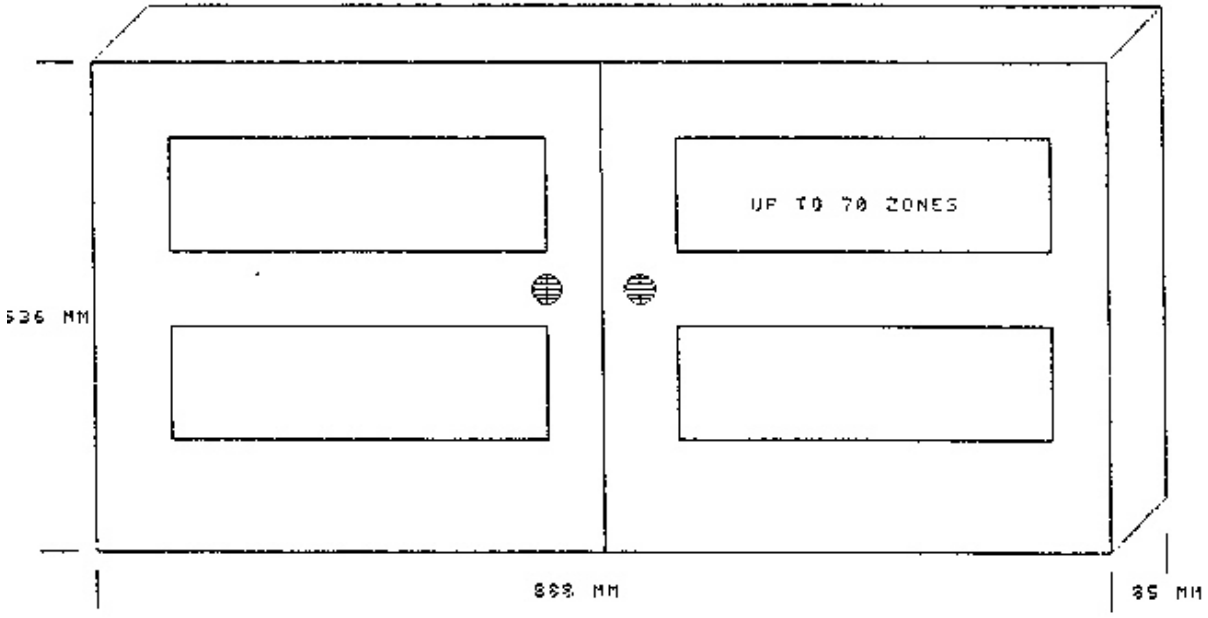
Fuses

All essential fuses are monitored. Labelled @ 1 and 2 amp, quick blow, 20mm Mains fuse, 2 amp 25mm.

THE SURVEYOR 8000 RANGE





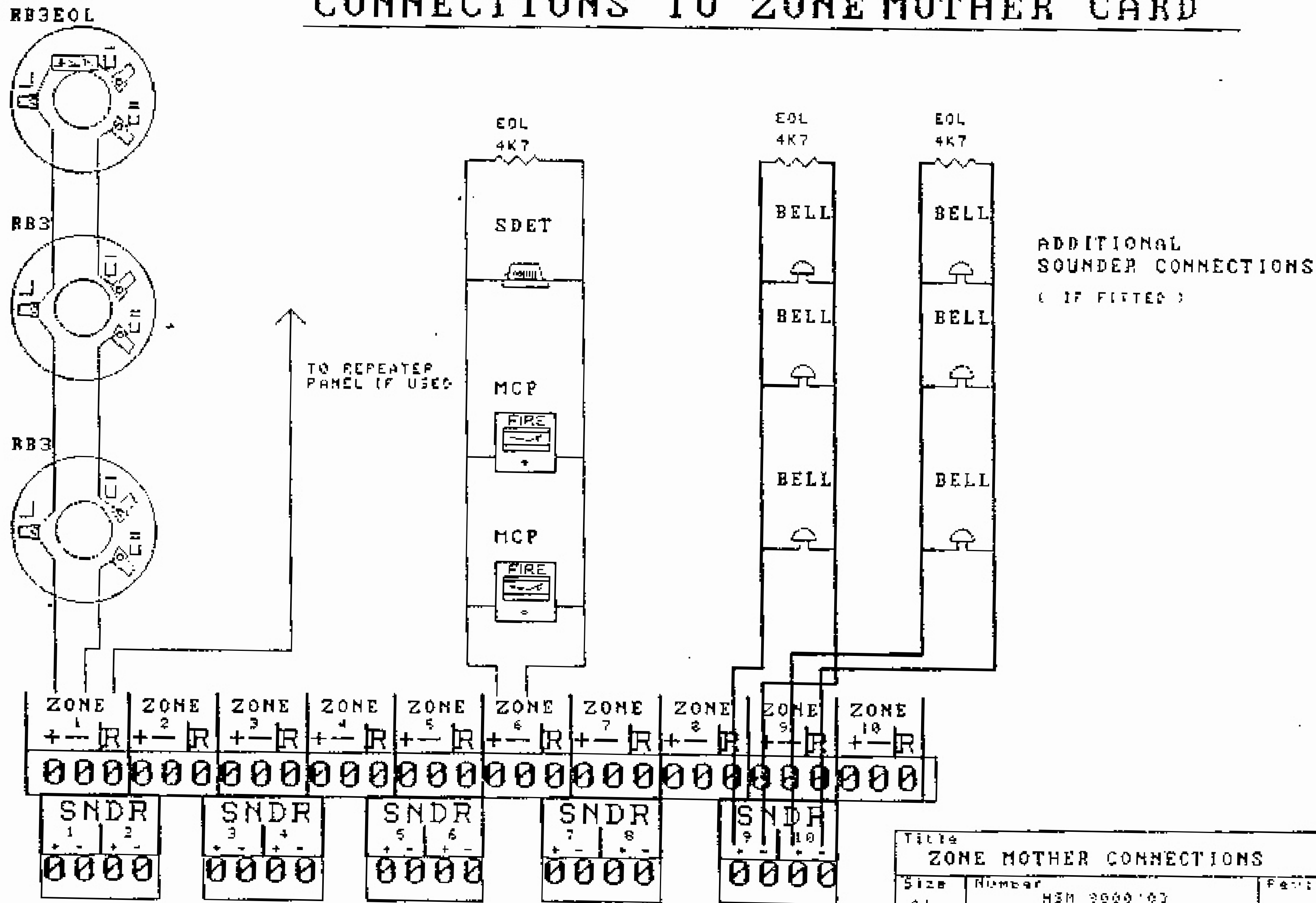


Title
CABINET DIMENSIONS

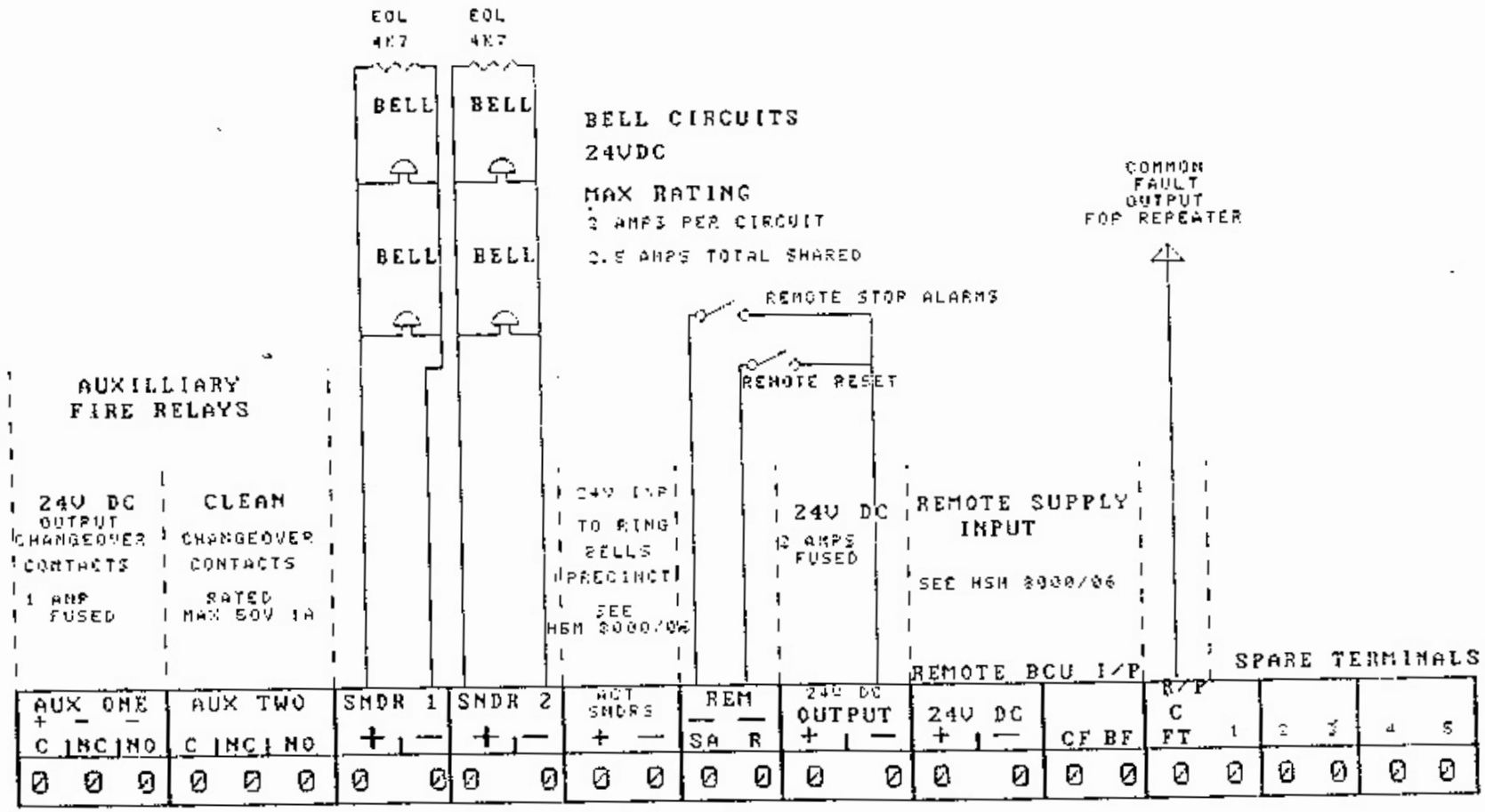
Size	Number	Revision
A4	HSM 8000/01	

Date: 10-DEC 1990 Sheet 1 of 1
File: 8000/1 Drawn By: MPC

CONNECTIONS TO ZONE MOTHER CARD



Title: ZONE MOTHER CONNECTIONS		
Size: A4	Number: HSM 9000'03	Revision
Date: 10-DEC 1995	Sheet 3 of 7	
File: 9000/1	Drawn By:	

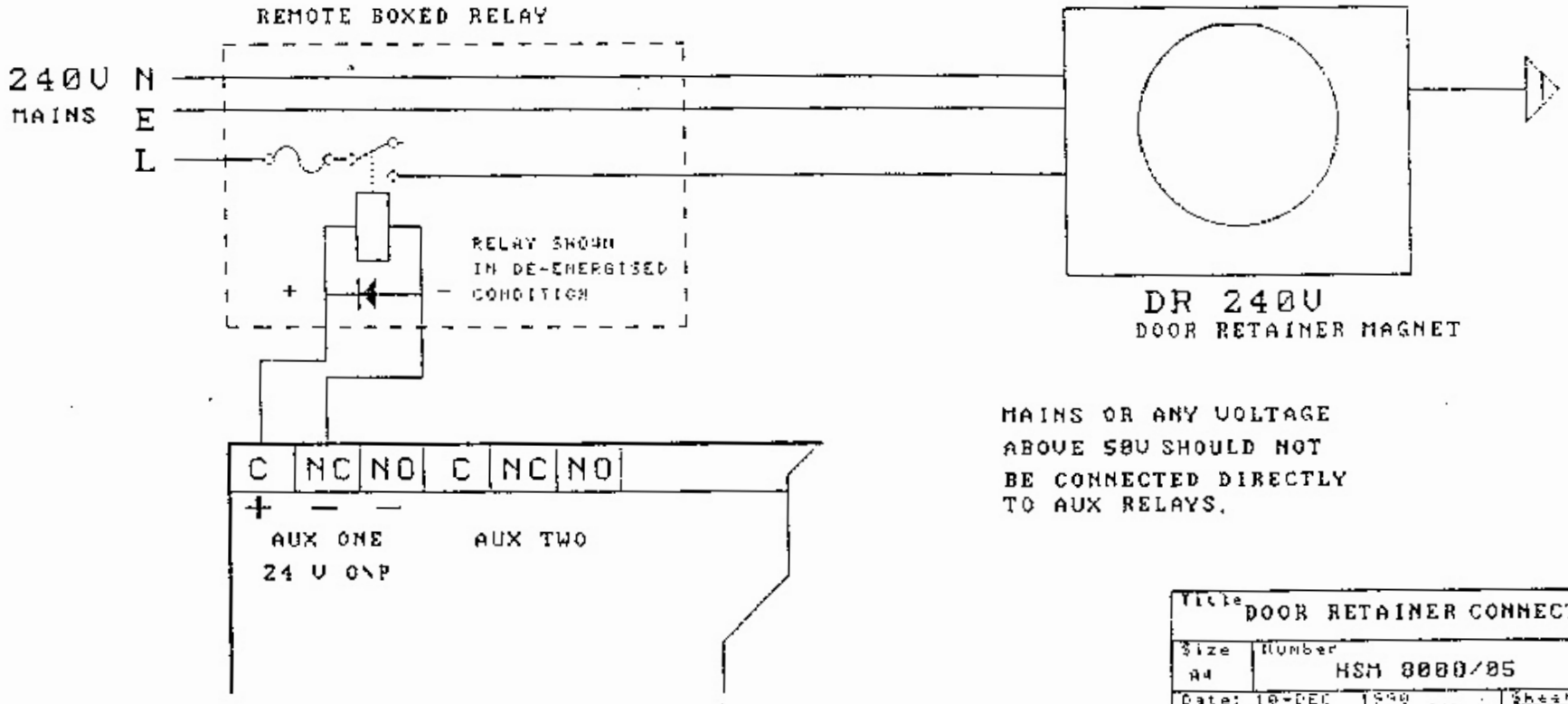


Title		
COMMON MOTHER CONNECTIONS		
Size A4	Number HSM 8000/04	Revision
Date: 14-OCT 1994	Sheet 4 of 4	
File: 8004/1	Drawn By: MPC	

CONNECTION OF DOOR RETAINERS

TO COMPLY WITH B.S.5839 PT4 1988 IT IS NOT RECCOMMENDED TO POWER DOOR RETAINERS OR OTHER PERMANENT CURRENT DRAWING DEVICES FROM THE FIRE ALARM BATTERY CHARGER.

WE WOULD RECCOMMEND THE FOLLOWING METHOD OF CONNECTING.



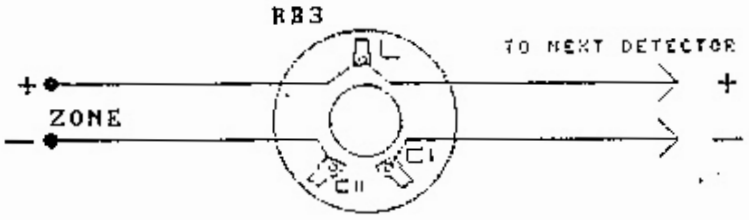
MAINS OR ANY VOLTAGE ABOVE 50V SHOULD NOT BE CONNECTED DIRECTLY TO AUX RELAYS.

Title: DOOR RETAINER CONNECTIONS		
Size: A4	Number: HSM 8000/85	Revision:
Date: 10-DEC 1990	Sheet: 5 of 7	
File: 8005.1	Drawn: EJT MED	

SMOKE AND HEAT DETECTORS

MID58-RB3 & ZKC-RB3

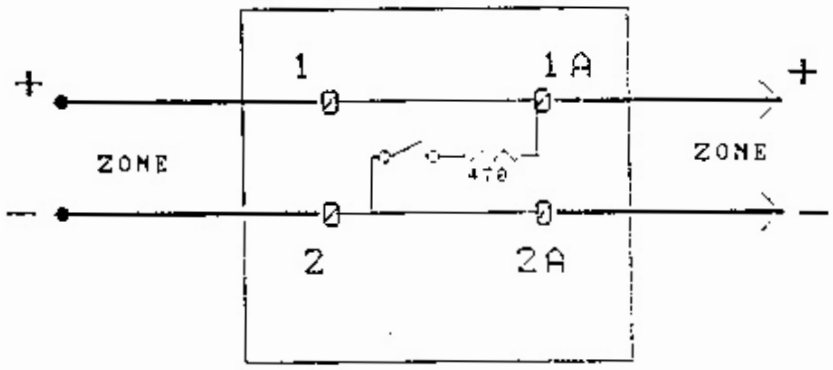
ALSO ZSA-70LS & TCA 70LS



NOTE:— WHEN USING TCA-70LS TYPE HEAT DETECTORS PLEASE ENSURE IT HAS BEEN MODIFIED BY HAES SYSTEMS BY ADDITION OF 100 OHM RESISTOR INTERNALY.

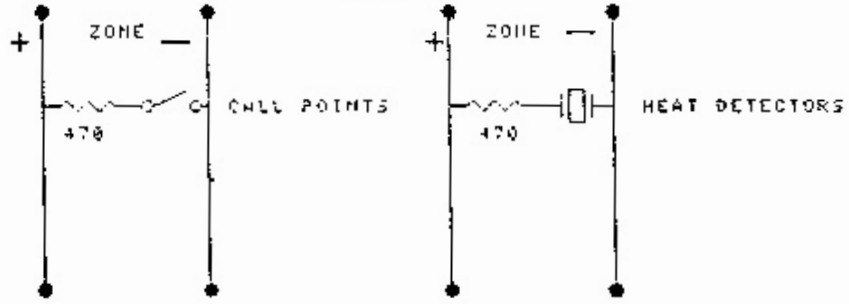
BREAK GLASS CALL POINT

(TYPE KR7 RANGE)



KR702E SHOWN

CONVERTING EXISTING DEVICES



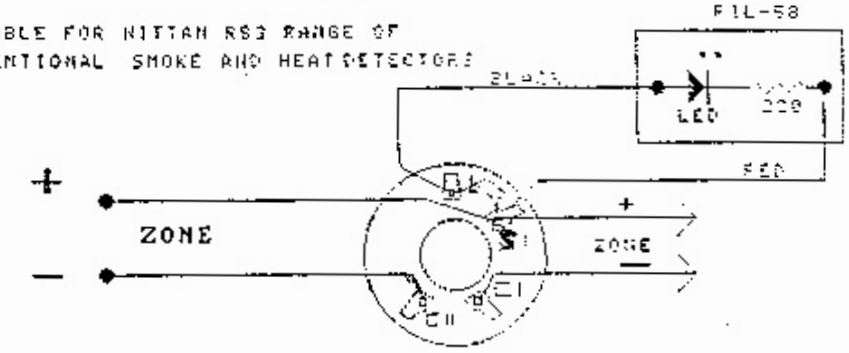
8000 RANGE CONTROL PANELS ARE SET FOR B.S.5839 1988 OPERATION AS STANDARD. I.E. SHORT CCT FAULT MONITORED.

SIMPLE SWITCHED DEVICES MAY BE CONVERTED TO OPERATE BY ADDITION OF 470 OHM RESISTOR AS SHOWN.

IF ANY DOUBT PLEASE CONTACT OUR TECHNICAL DEPARTMENT.

REMOTE INDICATOR

SUITABLE FOR NITTAN RS3 RANGE OF CONVENTIONAL SMOKE AND HEAT DETECTORS

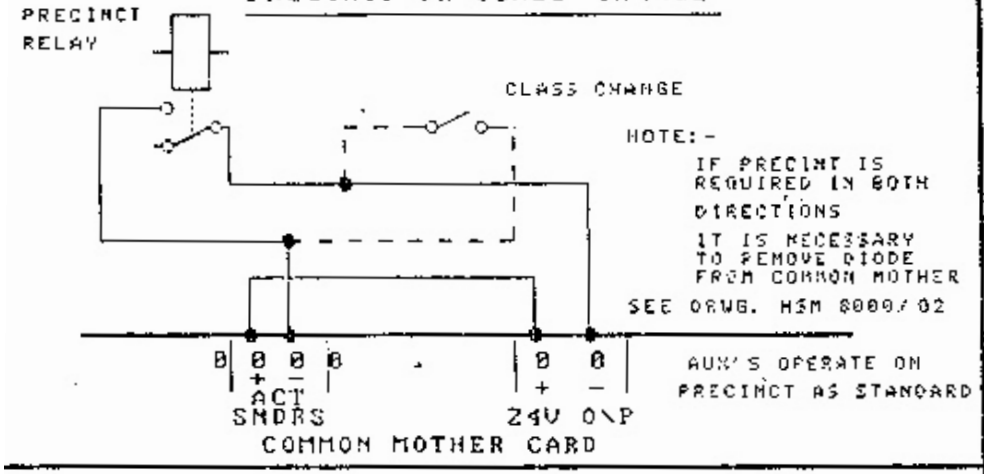


RS3R BASE WITH 220 OHM RESISTOR

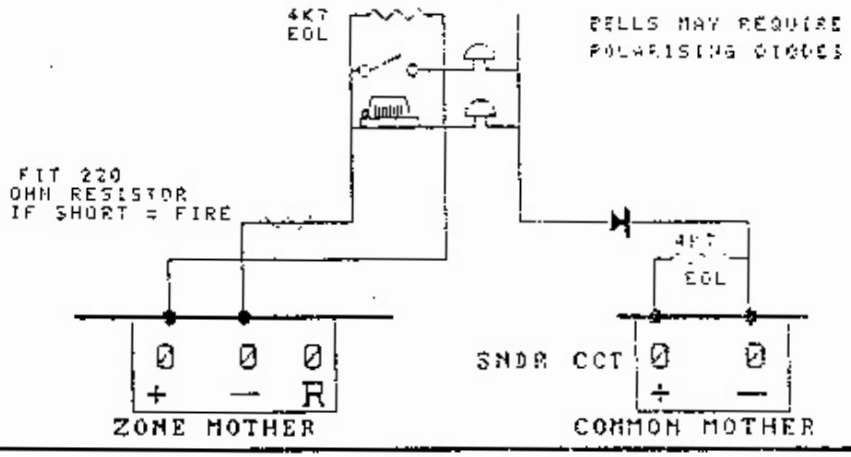
Title: SURVEYOR 8000 CONNECTIONS		
Size: A4	Number: HSM 8000/07	Revision:
Date: 10-DEC [illegible]	Sheet 1 of 1	
File: 8007	Drawn By: MED	

SURVEYOR 8000 CONNECTIONS

PRECINCT OR CLASS CHANGE

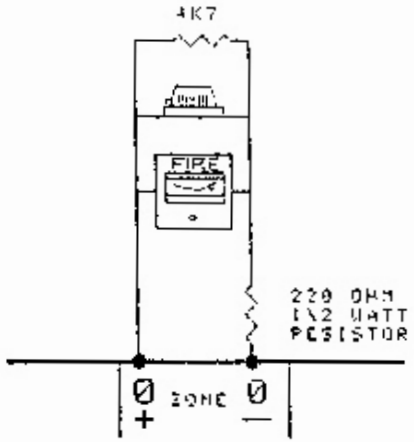


3 WIRE SYSTEM



NON B.S. ZONE

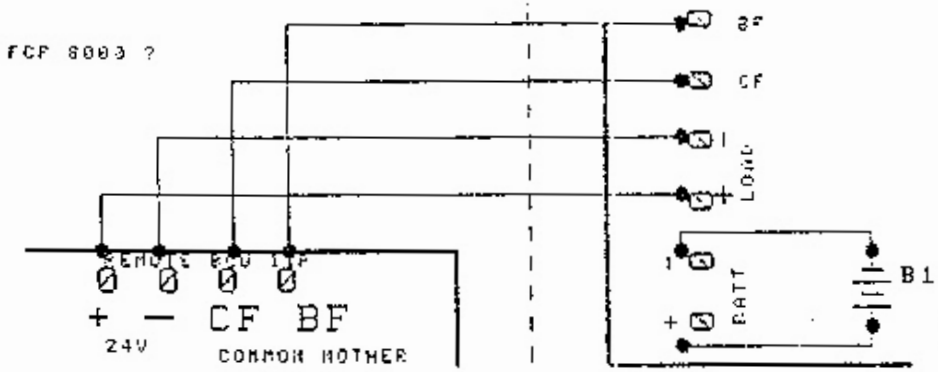
(SHORT CCT AS FIRE)



NO RESISTOR REQUIRED IN HEAT DETECTORS OR CALL POINTS

REMOTE PSU / CHARGER

BCU 8-24- ?



NOTE:- PANEL REQUIRES MODIFICATION FOR REMOTE CHARGER. PLEASE SPECIFY WHEN ORDERING.

Title: FCP 8000 CONNECTIONS		
Size: A4	Number: HSM 8000/06	Revision
Date: 10-[illegible] 1990	[illegible]	
File: 8006-1	[illegible]	