FCP 9012

FIRE ALARM CONTROL PANEL

INSTALLATION / DATA MANUAL

SURVEYOR 9012 RANGE

FCP 9012 (4 ZONE) extendable to 6, 8, 10 & 12 zones (9012/12)

Meets the requirements of BS 5839 Pt.1 & 4, including latest amendments specifying "detector head removal".

The Surveyor 9012 range of fire control panels are microprocessor controlled, giving many additional features and greater reliability that advanced electronics can offer.

it is strongly recommended that the equipment be installed, commissioned and serviced only by a suitable qualified fire alarm engineer.

Any installation must meet the current I.E.E. regulations and also BS 5839 Pt.1 & 4 1988 Fire Alarms in Buildings, where necessary.

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1.0 EQUIPMENT SUITABILITY

PANEL:	Surveyor FCP9012/4 - FCP9012/12 extendable from 4 zones to 12 zones.
BATTERIES:	Normally 2 off 6Ah 12V sealed lead acid, mounted intenally. Heavy loads or extended standby may require an external high current charger with larger batteries.
MANUAL CALL POINTS:	KR70 or any call point with 470ohm resistor fitted.
SOUNDERS:	Bells or electronic sounders, 24 Volt DC. Must be polarised and suppressed. Recommended type: Synchrobell T6D24, Banshee, Bedlam, etc.
AUXILIARY OUTPUTS.	Ensure no voltage in excess of 50V is applied to the change-over relay contacts. Only relay coils (100mA max) should be powered from each zonal output.
REPEATER PANELS:	FCRP 10 OR FCRP 20.

IMPORTANT
Detector Suitability

Most modern smoke and heat detectors are suitable for use on the FCP9012, but if the detector head removal indication is required, only the following smoke detectors have been tested and approved for use.

Detector	Max. combined Qty. per zone	Connection Drawing No.
Nittan 2KH, 2KC, NID58,2IC	40	9012/D01
Appollo Series 30	30	
Appollo Series 20	20	
Hakuto SIH-E	18	10991/1
Hakuto SLK-E	18	10991/1
Hakuto SIF-E	40	10991/1
Hakuto SIG-E	25	10991/1

It is recommended that a maximum limit of 20 detectors per zone is observed, rather than the greater quantities where shown.

Many smoke detector manufacturers are redesigning their products to comply with "head removal" requirements and so wiring configurations and equipment specification will vary beyond the control of this Company. In due course we will be able to approve more smoke detector types suitable for our equipment. We strongly recommend that we are consulted for the suitability of any detector not listed above.

2.0 TECHNICAL SPECIFICATION

SURVEYOR 9000 SERIES (4-12 Zones)
MICROPROCESSOR FIRE ALARM PANEL

DETECTION ZONES
4 Zones minimum, extendable to 12 zones by addition of double zone cards.
Zones monitored for open and closed circuit faults.
Up to 30 smoke/heat detectors per zone.
System integrity maintained with detector heads removed.
Suitable for current Nittan detectors and others.
Consult Company for detector compatibility.
Short circuit to "Fire" option switch.
Fire non latch switch.

ALARM OUTPUTS
One monitored alarm output per fire zone
(min 4) rated 1 amp each @ 24v dc.
Combined alarm load o/p 3 amp max.
Uprated alarm o/p, to special order.
Zonal repeater outputs 24v dc.
Zonal 24v dc output, for connection of aux relays.
Common aux o/p, changeover voltage free, rated 800mA.
Common Fire and Fault o/p 24v dc.
Bell walk test, 1 sec on 5 sec off.
Suitable for most polarised, suppressed, 24v dc sounders.

ADDITIONAL FEATURES
Class change sounding (precinct).
Zonal Engineers Test.
Low voltage battery protection relay.
Extension buzzer o/p.
Remote stop alarms and reset.

FRONT PANEL INDICATORS
Autoscroll Liquid Crystal Event Display backlit, indicates all Fire and Fault information.
Supply Healthy.
Common Fire bar LED.
Zonal Fire.
Zonal Fault o/c and s/c.
Common System Fault.
Zone Isolated.
Auxiliary relay o/ps isolated.
Engineers Test.
Detector removed (zonally indicated on LCD).
Auto reset warning.

FRONT PANEL CONTROLS
Evacuate.
Silence Alarms.
Reset.
Auxiliary Output Isolate.

INTERNAL INDICATIONS
Individual Zone Isolated.
Over/Under voltage.
Earth Fault.
Regulator fail.
Battery fail.
Zonal Sounder fault oc/sc.

INTERNAL CONTROL SWITCHES
Zonal Engineers Test.
Zonal isolate.
Zonal Fire latch/non latch.
Fault latch/non latch.
Short to "Fire" (Pre 1988 B.S. Systems).
Zone of origin sounders/ common sounders.
Sounder walk test.
Low battery protection start up switch.

POWER SUPPLY/CHARGER
Supply input 240v, 50HZ.
Regulated for sealed lead acid batteries.
Rated 27.6 volts 3 amp.
Suitable battery 6Ah 24 volt sealed lead acid, maintains system for 48hrs.
Uprated chargers to special order.
Panel quiescent current 120 mA.

GENERAL DATA
Two-tone graphite grey/papyrus white cabinet.
Dimensions:
444 wide x 376 high x 105 deep.
Construction: 18 swg mild steel.
Space for 2 x 6Ah 12 volt sealed lead acid batteries.
20mm knockouts and rear entry.
Flush kit available.
Less than 4 zones use FCP9002 or FCP9004.

3.0 FRONT PANEL INDICATIONS & CONTROLS

3.1. Indications

Fire LEDs - RED

Fault LEDs - AMBER

Front panel LED indicators viewed through the transparent window are as follows:-

Common Fire	- Rectangular block. Indicates any fire condition and "Evacuate" signal.
Zonal Fire	- Individual. 5mm dia. Indicates area of alarm.
Liquid Crystal Display	- Text indicates all Fire. Fault and conditions that require attention. More than one fire or fault existing will cause the text to scroll. The display is back lit unless panel is on standby batteries. Normal display "System Active x zones". will dim briefly approx every 20 seconds due to automatic battery checking.
Supply Healthy	- Green. indicates supply to panel is present.
System Fault	- Indicates panel fault. together with individual L.E.D. either externally or internally.
Zone Isolated	- Common indicator. Any zone temporarily isolated.
Aux.Isolated	- Common or zonal aux relays isolated.
Engineers Test	- Only used during commissioning or service to test individual zones.
Detector Removed	- Indicates a smoke or heat detector removed from its socket.
Auto Reset Warning	- Indicates external interference received by the microprocessor.

3.2 Control Switches

The four control switches on the panel front are protected from misuse by the lockable door.

a) Evacuate – All fire alarm sounders will operate irrespective of a fire conditon being present.

b) Silence Sounders – Will silence sounders when Evacuate has been operated or Fire Zones activated. Also silences the fault tone.

c) Reset – Fire Zones can be reset by this switch only after operating the silence sounders switch. Also performs an LED indicator test, resets the engineering functions of Bell Test, Engineers Zone Test and ARM.

d) Aux. Isolated – Push on, Push off. Prevents operation of external devices such as 999 dialler, door closers, heating and ventilation shut down etc.. while a fire alarm test is in progress.

4. USERS INSTRUCTIONS.

4.1 Panel Buzzer

a) Pulsed single tone – Indicates a fault present. Silenced by pressing the "SILENCE" button. If fault clears and reoccurs or a new fault appears, then the buzzer will resound.

b) Pulsed two tone – Indicates Fire. Cannot be silenced until panel is reset. This is a British Standards requirement. This becomes continuous when alarms are silenced.

4.2 Normal Standby State

Visible will be the green "Supply Healthy" LED and the Liquid Crystal Display (LCD) indicating the number of zones available for use in the panel.

4.3 Fire Detected

Should a fire be detected on any of the zones the following will occur.

Common Fire	– LED on, steady
Zonal Fire	– LED on, pulsing
Internal Sounder	– Dual tone (unmutable)
Sounder Circuits	– All sounders will operate, either common or zonally depending upon engineering option selected.

To silence sounders, open locked cabinet door. Switches can only be operated in the following sequence

a) Silence – Cancels all alarm system sounders but not the internal buzzer. Zonal Fire LED will becme steady.

b) Reset – Cancels Fire LEDs and internal sounders. Performs lamp test and restores panel to standby. If system realarms, then a fire detector remains activated and should be investigated.

Should a fire signal be detected in a new zone after silencing the sounders, then the sounders will reactivate. The initial zone fire LED will remain steady whilst any new fire zone LEDs pulse.

4.4 Evacuate Control

The Evacuate button will initiate operation of all sounders on the system, over-riding any zonal alarms already sounding. The sounders can only be silenced as described in 4.3 (a)(b). The common, red, rectangular LED is illuminated together with LCD text.

4.5 Fault Detected

Should any fault be detected on the system, the System Fault LED will illuminate and the pulsed, internal fault sounder will operate. Some faults can be investigated by the user, as follows:-

a) "Supply Healthy" extinguished, LCD text – "Mains Fail".
Check electricity supply to the panel has not been switched off due to other work in the premises or a supply fuse blown.

b) "Detector Removed" indicates the removal of a smoke or heat detector from its base, possibly by unauthorised personnel. A visual check of the premises should reveal this. Replacement of detector will extinguish the warning.

c) "Auto Reset Warning" depressing Reset switch will extinguish LED. Only if this fault frequently reoccurs should an engineer be called. Isolated auxillaries may be lost if the ARW is illuminated.

5.0 FAULT INDICATION

5.1 Common "System Fault"

This is always accompanied by another LED either on the panel front or internally, specifying the particular fault. The LCD text will also display the fault. More than 1 fault or fire will scroll the text.
N.B. An apparent external circuit fault could be caused by the failure of one of the many panel fuses, most of which are monitored.

5.2 Zone Fault

Should a fault develop on a fire zone, then the relevant amber LED will light on the front panel.
Short circuit fault - LEDs flash : Internal fault buzzer sounds.
Open circuit fault - LEDs steady : Internal fault buzzer sounds.

An Engineering Option (para.7) can be chosen which allows a short on a fire zone to be detected as a Fire (for older systems not governed by B.S. 5839 1988). In this case only an open circuit will indicate as a fault.

5.3 Bell Fault

A bell (or sounder) fault will cause the System Fault and fault tone to operate. Individual bell fault LEDs will be found internally, the first 4 zones on the door PCB and the remainder on the individual zone cards.
Short Circuit fault - LEDs flash
Open Circuit fault - LEDs steady

5.4 Power Supply Faults

a) Supply Healthy - Green LED extinguishes
b) Battery Fault - Red LED steady
c) Regulator Fail - Red LED steady
d) Over/Under Volts - Red LED steady
e) Earth Fault - Red LED steady
f) Charger Fault - LCD display only

The above fault LEDs are located on the inside of the lid mounted PCB. These faults are accompanied by "System Fault" & fault tone operating.

5.5 ARW (Automatic Reset Warning)

The ARW LED is mounted on the front panel and indicates that the internal micro-processor has been automatically reset. The WATCHDOG circuit has re-started the microprocessor as a result of a failure, which may have been caused by an external induced voltage spike etc. In such cases operation of the panel is not affected and the ARW LEDs can be extinguished by depressing the "Reset" button. Should the fault reoccur on a regular basis then the problem should be investigated.
N.B. Any auxillary relay which has been isolated may be lost if the ARW is illuminated.

6. Installation

6.1 Cabling

It is recommended that a minimum of 1.5mm MICC or Pirelli FP200 cable be used on all circuits. 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 instruments must not be used while the control panel or any device containing electronic components is connected.

6.2 Mounting The Control Panel

It is recommended that both PCBs be removed before installation to prevent damage. Any components remaining in the back box should be suitably protected from physical damage, brick dust or swarf. Securely mount the back box to the wall by means of the 4 fixing holes provided. Replace PCBs and connect ribbon cable. The connection of any cables or circuits into the control panel should only be undertaken by a qualified Engineer.

6.3 Zone Wiring

Up to a total of 30 detection devices (heat, optical, ionisation smoke break glass etc.) may be connected to each zone. To reduce search time in an emergency, it is recommend that no more than 20 devices are fitted.

Each zone can be wired to detect the removal of up to 30 of Nittan's latest range of detectors whilst maintaining integrity of the system. For this function it is necessary to fit a diode as shown on drawing

Other manufacturer's detectors may be installed subject to the approval of HARS SYSTEMS Ltd. Each manufacturer's detector, having slightly different parameters, will therefore require different connection methods. For a current list of acceptable detectors see paragraph 1.0.
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 monitoring resistor, of value 4K7 should be placed at the end of the zone in the last detector, as shown on drawing no. 9012/D01.

Zones can be set to comply with the current B.S. 5839 1988 requirements for open or closed circuit fault indication as well as smoke or heat detector head removal. Existing fire systems may not be adaptable to this B.S., in which case, subject to the relevant authority's approval, the control panel may be set to the earlier B.S. 3116 standards, which accepted that a short circuit fault could cause an alarm condition.
For further details see para 5.0 Engineering Indications and Options.

6.4 Sounder Circuits.

A minimum of four sounder circuits are provided (i.e.one for each fire detection zone), each being monitored for open or closed circuit faults. The sounders circuits can be selected for common operation, or alternatively, the zone of origin will sound constantly, while other sounder zones pulse.
The sounders must be wired in parallel without spurs ensuring that the load per sounder circuit does not exceed 1 Amp with a total system sounder load not exceeding 2.5 Amps.
All sounders must be 24v DC polarized.
Monitoring is through a 4K7 resistor fitted in the last sounder of each zone.

6.5 Additional Output Terminals.

Terminals are provided for the following. Connection details are shown on drawing nos. 9012/D01 and 9012/D02

Zonal Fire	–	Suitable for LED repeater panels etc.
Common Fire	–	Suitable for LED repeater panels etc.
Common Fault	–	Suitable for LED repeater panels etc.
Zonal Aux.	–	24V DC output to switch zonal relays.
Remote Reset	–	Push to make switch to reset panel.
Remote Stop Alarm	–	Push to make switch to silence alarms.
Class Change or Precinct	–	Activates sounders only from a remote switch or relay.
Remote Fault Sounder	–	Terminals on lid PCB, rated 800 mA
Common Voltage-Free Aux.	–	Changeover contacts, rated 800 mA
EXT 28V O/P	–	2 off 28V DC output supply, rated at 800mA
Aux. Power Terminals	–	+ ve, - ve and fault inputs for remote charger option.

6.6 Main Electricity Supply

The panel supply voltage should be 240 Volts 50 Hz AC fed via an unswitched, fused spur, painted red and labelled :-

FIRE ALARM DO NOT SWITCH OFF

7.0 ENGINEERING OPTIONS also see drawing 9012/D03

Switches:- DIL. Tactile. Potentiometers and Push Button.

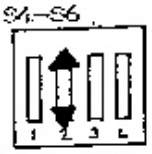
This control panel has many engineering functions that allow greater flexibility in system design. They are accessed through switches mounted on both main PCBs and extension zone cards.

7.1 Controls on PC 9012/2/BC

For identification purposes this PCB has the front panel LEDs mounted it and is fixed to the inner hinged front plate.

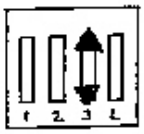
Bell Test – Tactile button. Press on. push Reset switch to cancel.
S3 – Sounders pulse every 5 seconds for walk test.

COMMON/ZONAL – DIL switch 2: up (off)-common sounders
SOUNDERS down (on)-zone of origin sounders are
No PULSE constant. remaining sounder zones pulse.
S4–S6



NB 1 is spare

SHORT CIRCUIT
ZONE FAULT AS FIRE

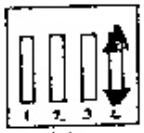


DIL Switch 3: up. (off)-short circuit on zone gives zone fault
down. (on)-short circuit on zone gives Fire condition.

SHORT DET
S4–S6

Where it is not viable to upgrade the detection zones of a pre BS5839 1988 system. then "Short to Fire" can be used.

LATCHING FAULT



S4–S6

DIL Switch 4 up (off)-non-latching fault
down (on)-fault latches. useful for intermittant faults.

Remember to switch off when not required. as a fault you have just cleared will still show!

ZONE ISOLATE

S15–S18

DIL Switch 1–4 (zones 1–4 only)
up (off)-Zone normal operation
down (on)-zone isolated

Zones 5 – 12-isolate switch on zone cards. (see 7.2)

FIRE LATCH

S11-S14

DIL Switch 1-4 (zones 1-4 only)
up (off)-Fire Zones non-latching
down (on)-Fire Zones latching.

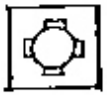
Non-latching zones can be selected if a remote control panel is to be connected onto a zone in this panel and "latch up" is not required. If "precinct" is used, only the bells on this panel will sound, but if connection is made to a non-latching zone, all other facilities will operate. i.e. repeater output, zone and common aux's etc.

Zones 5-12. Fire Latch on zone cards (see 7.2)

ENGINEERS TEST
ZONE TEST

S19-S22

Tactile button Zones 1-4



Press to select, push "Reset" to cancel. Select one zone at a time. Activate alarm on selected zone, sounders operate briefly, panel automatically resets ready for the next detector activation. A brief sounder pulse assures operator that panel has reset.
Zone 5-12 on zone test is found (see 7.2)

CONTRAST ADJ (LCD)

R99

Potentiometer - Rotate clockwise to increase LCD contrast.

VOLUME (FAULT TONE)

R3

Potentiometer - Rotate clockwise to increase volume.
N.B. Fire Tone Volume Preset.

7.2 Controls on PC 9012/3/BC

Each PCB contains two fire zones & two bell zones. Zones from 5-12 inclusive have the following switch operations.

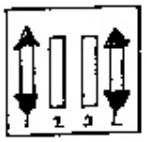
Zone 'A' will be the odd number zones (i.e. 5.7.9 & 11) and zone 'B' the even (i.e. 6.8.10 and 12).

ZONE TEST

S3

Push button - Press on, push "Reset" to cancel. Operation as S19-S22 above.

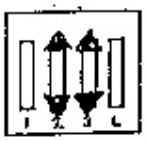
ZONE ISOLATE



DIL Switch OFF - zone in normal operation
ON - zone isolated

1 - odd zones
4 - even zones

FIRE LATCH



DIL Switch OFF - Fire zones non-latching
ON - Fire zones latching

2 - odd zones
3 - even zones

7.3 Controls on PC 9012/1/BC

The PCB is mounted in the panel back box. All external circuit connections are made onto this board.

Battery Start

Switch located on top right hand corner. The panel has a low voltage cutout relay, mounted adjacently. This relay will automatically disconnect the batteries when, following a mains failure, the batteries have discharged to a level of 19 volts. This prevents damage that will occur to batteries should they be discharged for long periods. Automatic reconnection will occur when the mains supply is restored. Should, at anytime, the mains not be available and the panel be required to operate on suitably charged batteries, i.e. commissioning, then the Battery Start override switch may be pressed.

Panel Voltage (28V Adj)

Potentiometer located on right hand side of panel.

Used to set the panel and battery charging voltage. Disconnect batteries, place accurate volt meter across battery leads and adjust to 27.6V + 0.2 volt.

8.0 SHORT CIRCUIT ZONE FAULT

8.1 BS 5839 Pt 1 1988 Systems.

For systems to conform to this latest British Standard, a short circuit across any part of the detection zone will cause a zone fault to be indicated and not an alarm condition, as previously allowed.

All detection devices on the fire zones should be compatable with the zone parameters and approved by the company. To meet this particular requirement the Nittan NID 58/2KC range of detectors are recommended, but other manufacturer's detectors may be suitable, providing in alarm they present a resistance greater than 150 ohms and less than 500 ohms The preferred resistor of value 470 ohms should be added to any device or switch that would normally present a short circuit to the zone (e.g. break glass call points, pressure switches etc.).

8.2. Pre - BS5839 Pt. 1 1988 Systems.

Prior to the introduction of this latest BS. it was acceptable for a short circuit across the zone wiring to initiate an alarm condition. Set DIL switch SHORT DET. as in 5.1 above. to the ON position.

9. DETECTION HEAD REMOVAL

The latest amendments to BS 5839 1988 Pt.1 requires that removal of a detection device shall not interfere with the integrity of the manual call points.

This can be achieved by

a) Installing all the manual call points on that zone first and then secondly connecting in the smoke detectors.

b) Using separate zones for call points and detectors.

c) End of Line monitoring units.

d) Using a Surveyor 9000 series panel with integral " Head Removal " monitoring and wiring fire zones as normal.

a) and b) above require almost twice the cable length necessary.

b) would also require a panel of twice the number of zones.

c) some manufacturers use expensive "End of Line Monitoring" units together with special diode arrangements in the detector bases. This unit works effectively. but increases the overall panel cost.

d) is the most cost effective method of head removal monitoring with the circuits being integral with the panel. A monitoring diode (or 2 with some detectors) may still be required with each detector base. Using a Surveyor FCP9012 the integrity of the fire zone can be maintained by installing these diodes in the configurations shown in drawing 9012/D01.

It is possible to remove upto 30 Nittan 2JKH/2IC detector heads. whilst maintaining integrity.

Other detectors may be suitable subject to approval of the Company's Technical Department.

10. TESTING

10.1 General

If unfamiliar with the equipment, it is advisable to commence testing with only the mains supply and batteries connected.

The panel is supplied with all end of line devices fitted, so that on power up, panel will be in a standby condition.

When initially powered it will be noticed that the Auto Reset Warning (ARW) is illumated. This indication is normal and can be removedd by pressing the Reset switch.

10.2 Detector Zone Testing

a) Fit the 15K ohm end of line resistor to the last device in each zone.

b) Fit the diodes required for "Head Removal" Drawing 9012/DO.....

c) Ensure all devices meet the 470 ohm "Short Circuit Zone Fault" requirements.

d) Connect zone wires into panel one pair at a time. Any zone fault indication should extinguish. If not, there is a fault on the zone, which should be investigated. When all fire zones are correctly connected operate a device on each zone. Cancel down by pressing "silence" alarms and "Reset".

e) Introduce a short onto each zone in turn and check for correct fault indication.

f) Introduce open circuits onto each zone and check for correct fault indication.

g) Remove all detectors from each zone in turn and check for correct head removal indication.

h) After connecting the sounder circuits every device should be tested using the Engineers Test facility:-

Select zone by pressing the relevant Zone Test button (See 5.1 & 5.2)

Activation of any device on the chosen zone will cause a short pulse of the alarm sounders followed by an even shorter pulse, indicating that the zone and device have successfully reset. Only Test one fire zone at a time to confirm that the detectors are identified as being on that chosen zone. Any device tested which is not on that test zone will cause a full fire condition.

10.3 Sounder Test

Check:-

a) Polarity of all 24V DC sounders
b) 15K ohm end of line resistor fitted.
c) Check individual sounder zone load, max 1 amp.
d) Check overall sounder load max 2.5 Amps.
e) Short out each bell zone to check fault monitoring
f) Open circuit each bell zone to check fault monitoring.

When all sounders are connected, depressing the Bell Test Button (see 5.1) will pulse all sounders (approx 1 second on, 5 seconds off) thus alleviating undue annoyance to the occupants when a sounder walk test is carried out. The sounders will continue until Reset is pressed.

10.4 Full Alarm Test

For a full sounder test, alarm any of the detection devices. all sounders will operate.

Should the DIL switch "NOFLSE" be set ON then the zone of origin will ring constantly and remainder will pulse. To silence sounders press "Silence" and Reset.

10.5 Ancillary Functions

All additional functions should be checked in standby and alarm to ensure that the correct voltages and events happen in the correct sequences.

Ensure that the rating of each output does not exceed that stated in the Technical Specification para 2.0.

Any equipment which is not part of the fire alarm should not derive its power from the fire alarm, but should have an independent supply.

NB. 24V DC Door retainers should have their own supply.

10.6 Zone Auxiliary Output.

Please note that these are voltage outputs only, intended to energise the coil of external relays. Maximum output 50mA each.

10.7 Battery Charging Voltage

The charger has been designed for Sealed Lead Acid Batteries only and is set to 27.6 volts + 0.2 volts. Regularly check the charging voltage by disconnecting the batteries and with an accurate test meter connected across the battery leads, set the voltage adjustment potentiometer.

10.8 Fuses

All fuses are monitored except as below:

a) F2 - Clean Auxiliary changeover contact (would normally be monitored by "others" equipment).

b) F4 - 28V Supply Output

c) External Speaker (sounder) Front PCB

Fuses used: 3.0 amp, 1.0 amp, 800 mA, 200 mA. Fuseholders are correctly labelled. Various Panel monitoring circuits can be checked by removing fuses to open circuit the links.

11 FAULT FINDING

11.1 General

All faults will illuminate the System Fault LED with a dedicated fault LED. (Charger fault does not have a dedicated LED).

All faults are also displayed on the Liquid Crystal Display (LCD).

A general rule to fault finding is to remove all external cables, except the mains & battery supplies, insert all monitoring resistors back into the connector terminals as supplied. Persistant faults can be caused by cable cores shorting to earth. Not only will this indicate an earth fault, but if 2 or more cables are down then other faults will indicate & it is possible to cause permanent damage to the system. It is therefore important to thoroughly test all cables before initial connection.

Intermittant faults can be identified easily by selecting "Fault Latch", (see para 7.1).

Remember, if the fault still persists, check associated fuses and only then consult our Technical Department.

11.2 Zone Faults

Open - LED Constant.
Short - LED Pulses.

Remove zone wiring, fit EOL resistor in zone connectors, if zone clears then fault is on the zone wiring. Check systematically all cabling and detection device connectors.

If all zones show "OPEN " fault, check F6 zone fuse.

Detector Removed:

LED On - visual check for missing detector, or faulty installation of diodes.
LED Fails to indicate detector removal - Check polarity & correct fitting of diodes.

Permanent Fire Alarm:

Visually check all detectors and call points for fire condition.
Replace suspect device and reset panel.
Incorrect connection of polarised detection devices.

11.3 Sounder Fault

OPEN - LEDs constant.	Remove wiring from suspect sounder circuit & fit 4K7 EOL resistor into terminals. If fault clears check wiring.
SHORT - LEDs pulse	Check wiring & connection of sounders. Check all sounders are polarised.

11.4 Earth Fault

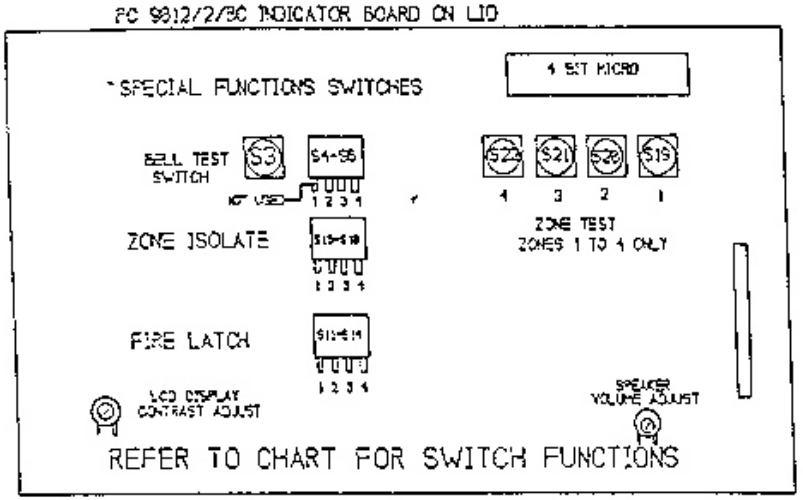
Either the positve or negative 24V DC supply to earth will indicate a fault.

Check by removing each cable in turn until the fault disappears. Also check to see if there is more than just one earth fault!

11.5 Power Supply and Charging Faults

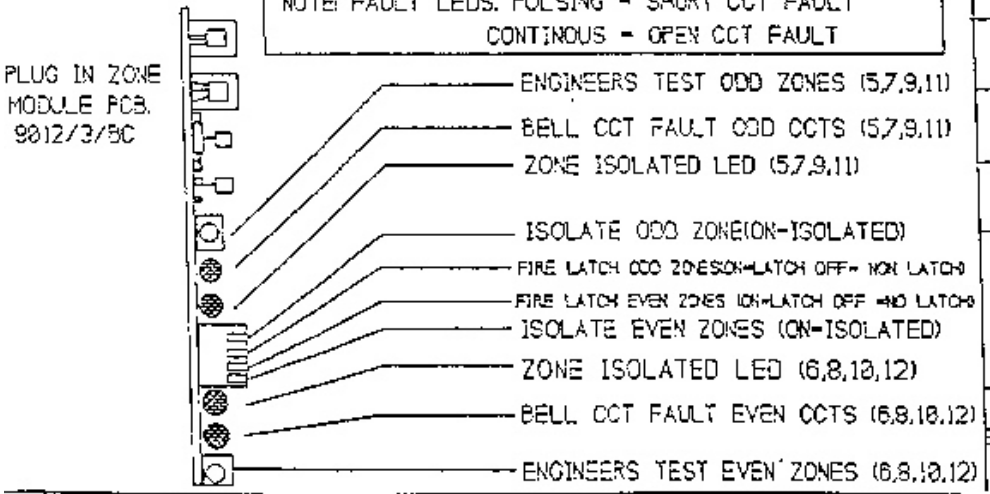
Supply Healthy Extinguished	- Check supply to panel & mains input fuse.
Charger Fault (internal LED)	- Check F1 Fuse Check battery charger output (with batteries removed) @ 27.6V.
Over/Under Volts (internal LED)	- Check battery charger output (with batteries removed) and set 27.6V
Regulator Fail (internal LED)	- If a high charging voltage is suspected the mains supply into the panel should be disconnected & a qualified engineer called.
11.6 Auto Reset Warning (ARW)	- This will indicate if both the panel supplies (mains and batteries) have both been reconnected. For additional information see 3.4.

9000-X SWITCH FUNCTIONS



SWITCH	FUNCTION	UP - OFF	DOWN - ON	NOTES
S1-S2	UNIT ADDRESS	N\A	N\A	NOT USED
S3	BELL TEST	N\A	PRESS FOR ON	SYSTEM RESET TO CANCEL
S4 (2)	NOPLSE	OFF	SELECTED	ZONE OF ORIGIN BELL OPERATION
S5 (3)	SHORT DET	OFF	SELECTED	SHORT AS FIRE PRE 1988 SYSTEMS
S6 (4)	FLT LATCH	OFF NON LATCHING	ON LATCHING	FAULT FINDING AID
S11	FIRE LATCH ZONE 1	OFF NON LATCHING	ON LATCHING	SELECT OFF FOR NON LATCHING FIRE ZONES NORMALLY ON
S12	FIRE LATCH ZONE 2			
S13	FIRE LATCH ZONE 3			
S14	FIRE LATCH ZONE 4			
S15	ISOLATE ZONE1	OFF NORMAL	ON ISOLATED	ISOLATES ZONE SELECTED
S16	ISOLATE ZONE2			
S17	ISOLATE ZONE3			
S18	ISOLATE ZONE4			
S19-S22	ENGINEERS TEST ZONES 1TO 4	N\A	PRESS FOR ON	SYSTEM RESET TO CANCEL

NOTE: FAULT LEDS. PULSING = SHORT CCT FAULT
CONTINOUS = OPEN CCT FAULT



HAES systems mfg
'Columbia House'
Packet Boat Lane, Cowley Peachey
Uxbridge, Middlesex, UB8 2JP
Telephone: Uxbridge (0895) 422066

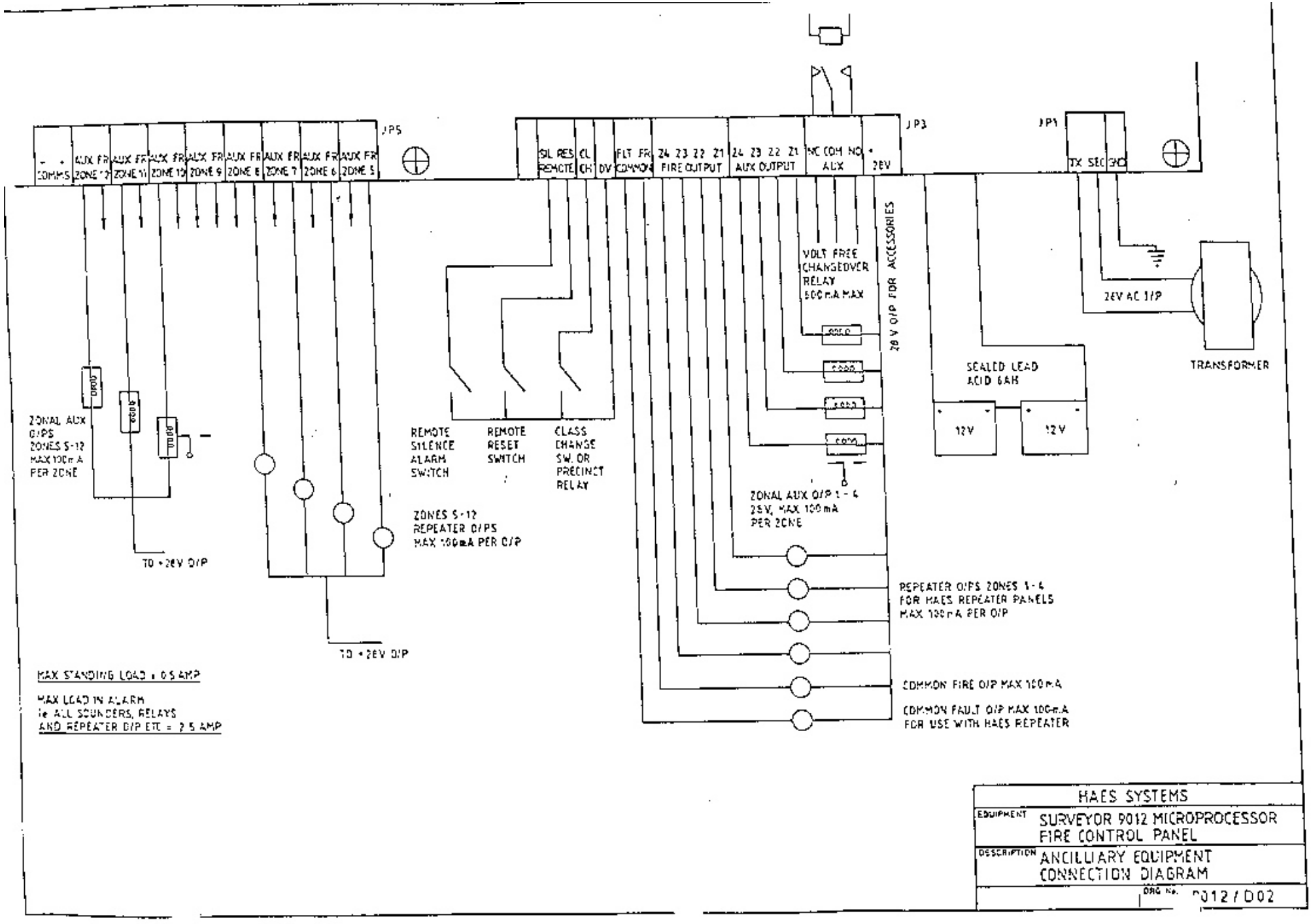
CUSTOMER CONNECTION DRAWING
9012/D03

EQUIPMENT
SURVEYOR 9012
MICROPROCESSOR
FIRE CONTROL PANEL

DESCRIPTION
ENGINEERING
SWITCH
FUNCTIONS

DRAWN
MRD

DATE
22.10.91



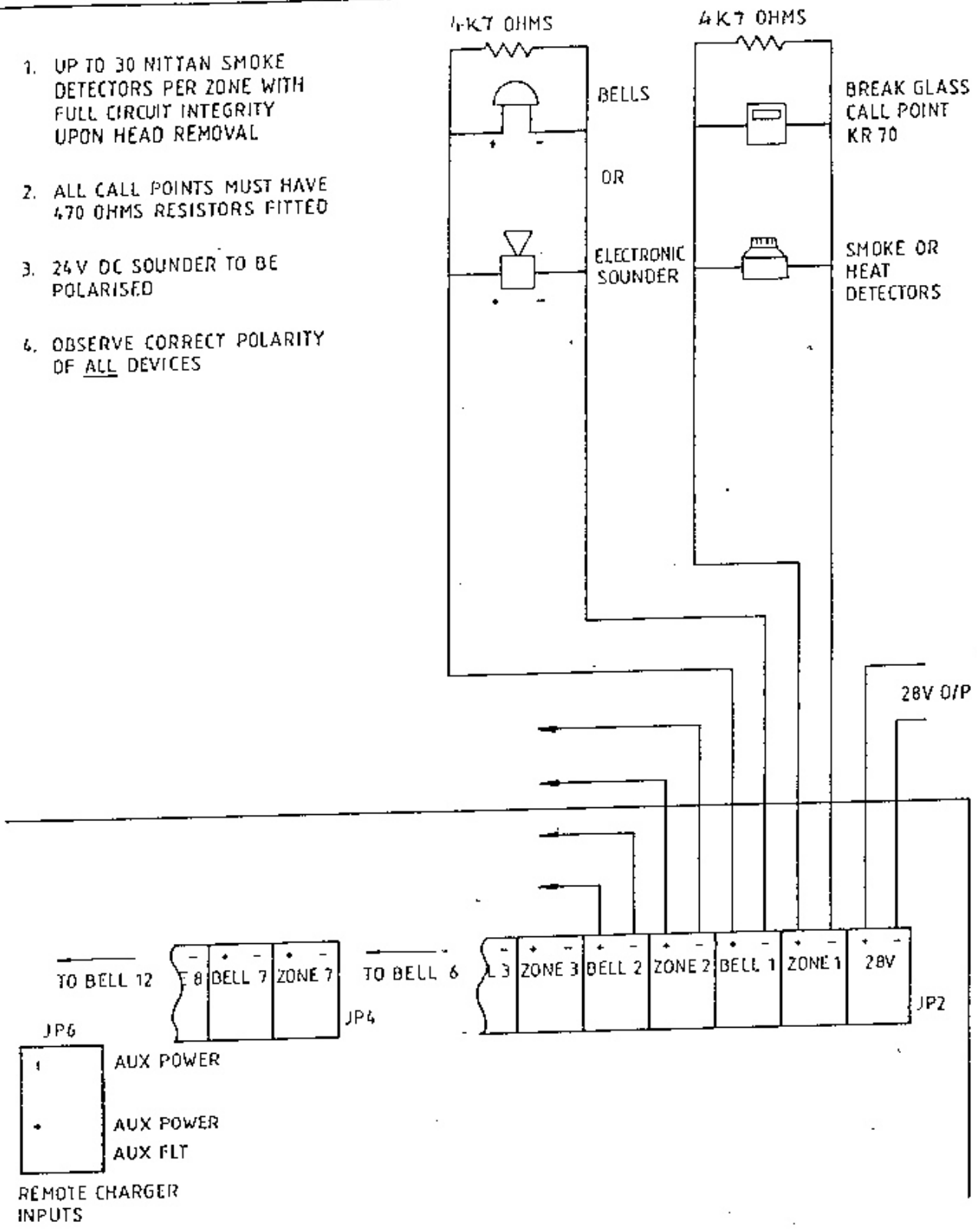
HAES SYSTEMS	
EQUIPMENT	SURVEYOR 9012 MICROPROCESSOR FIRE CONTROL PANEL
DESCRIPTION	ANCILLIARY EQUIPMENT CONNECTION DIAGRAM
DRG No.	9012/D02

1. UP TO 30 NITTAN SMOKE DETECTORS PER ZONE WITH FULL CIRCUIT INTEGRITY UPON HEAD REMOVAL

2. ALL CALL POINTS MUST HAVE 470 OHMS RESISTORS FITTED

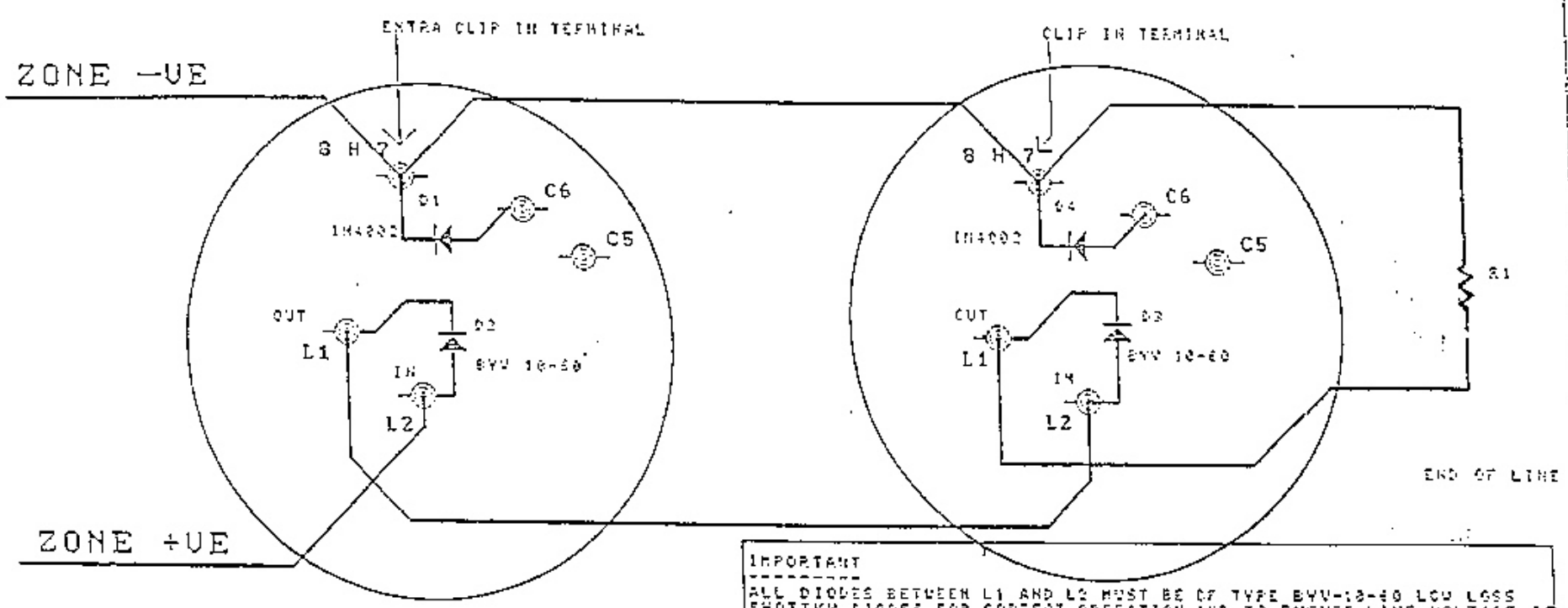
3. 24V DC SOUNDER TO BE POLARISED

4. OBSERVE CORRECT POLARITY OF ALL DEVICES



HAES SYSTEMS	
EQUIPMENT	SURVEYOR 9012 MICROPROCESSOR FIRE CONTROL PANEL
DESCRIPTION	FIRE AND SOUNDER ZONE DETAIL
ORG No.	9012/D02A

HEAD REMOVAL MONITORING CONNECTIONS
FOR 9000 SERIES CONTROL PANELS WITH HAKUTO RBF — RL/4HS BASES



CAUTION: -

OBSERVE CORRECT POLARITY CONNECTION ALSO ENSURE IN AND OUT OF ZONE POSITIVE IS CORRECT.

IMPORTANT

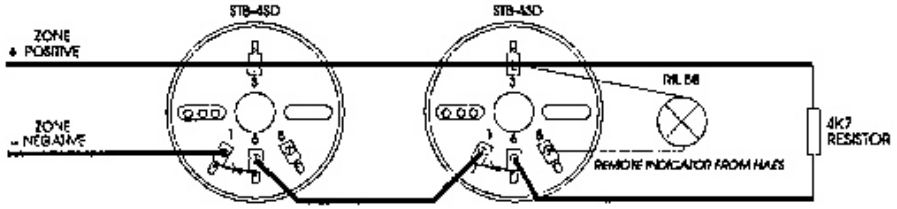
ALL DIODES BETWEEN L1 AND L2 MUST BE OF TYPE BYV-10-60 LOW LOSS SHOTTKY DIODES FOR CORRECT OPERATION AND TO ENSURE LINE VOLTAGE IS MAINTAINED. POLARISING DIODE 1N4002 OR EQUIVALENT CAN BE FITTED TO CLIP IN TERMINAL AS SUPPLIED BY HAKUTO LTD.

MAXIMUM HEADS REMOVED WITH COMPLETE FIRE DETECTION CAPABILITY IS 19.

Title: CONNECTIONS HAKUTO BASES		
Size: A4	Number: 10991/1	Revision:
Date: 10-SEP 1991	Sheet:	of 1
File: HAKUTO/1	Drawn:	MPD

Nittan *SENSORTEC (CONVENTIONAL)*

SUITABLE FOR CONTROL PANELS FROM 9000, 2000 & LEVEL SERIES

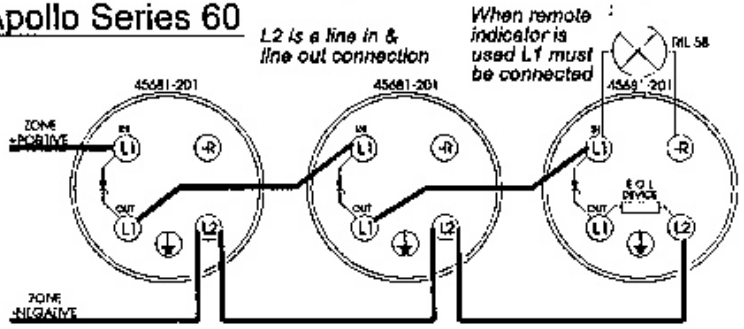


Zone Wiring Showing Head Removal Monitoring Diodes Fitted

Apollo Series 60

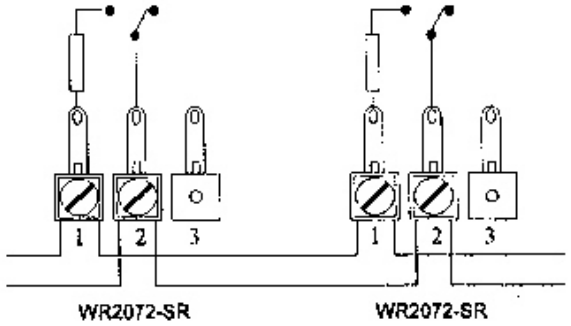
L2 is a line in & line out connection

When remote indicator is used L1 must be connected



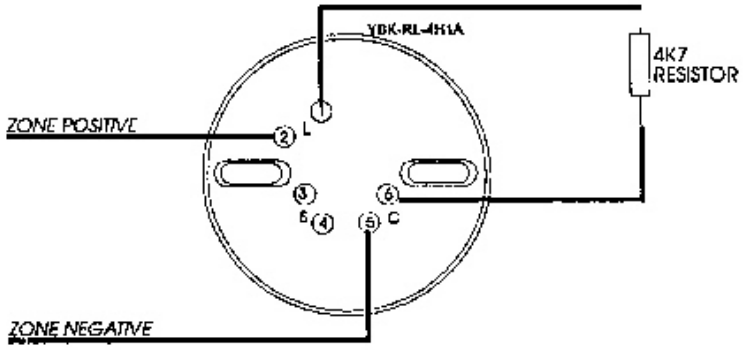
The Diode Shown across L1 IN & L1 OUT should be a Schottky BYV-10-50 or Equivalant.

Correct Polarity of all cables is important and should be as shown.



Standard Break Glass Call Point Connection Details With 470 OHM Resistor Fitted.

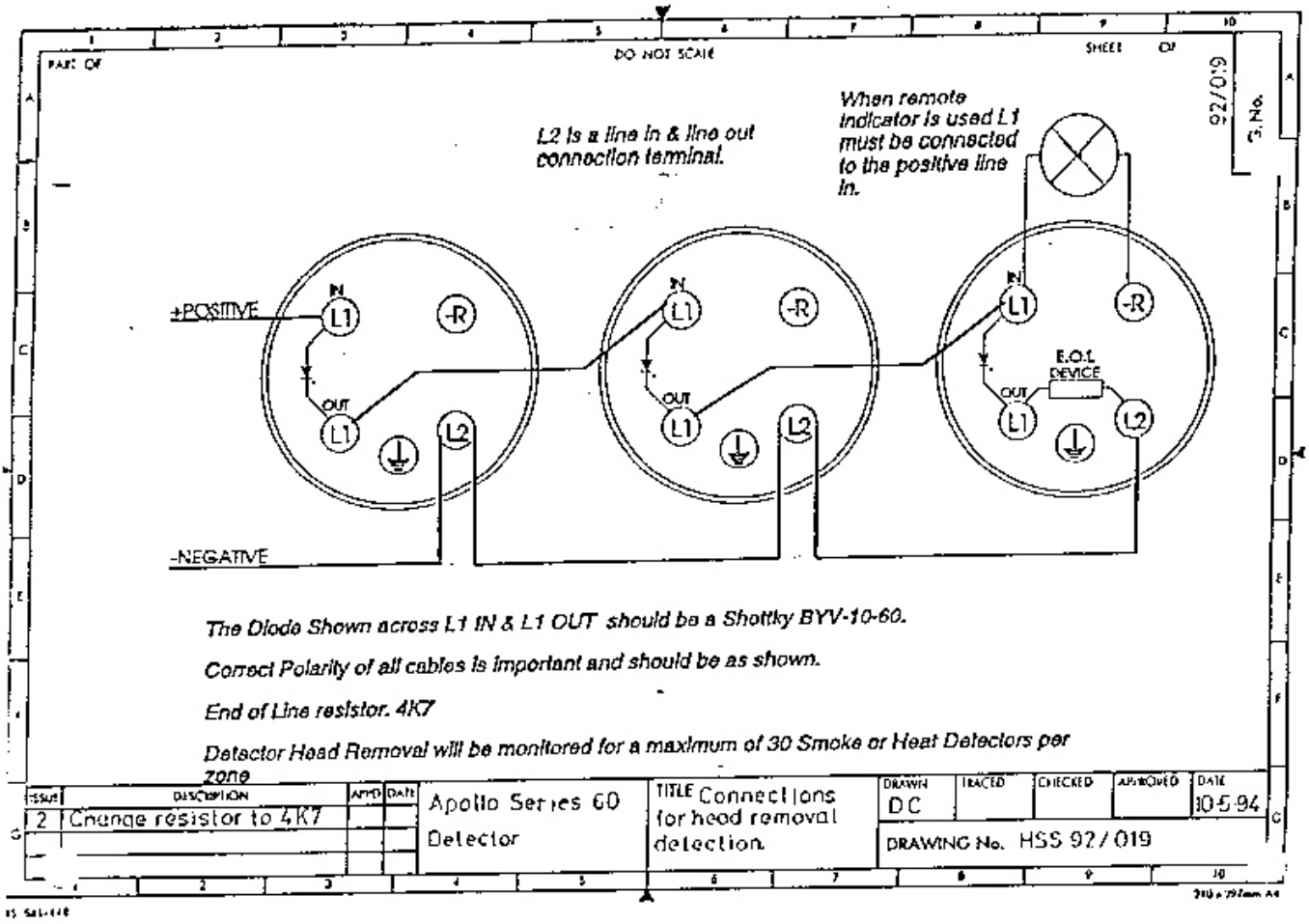
Hochiki

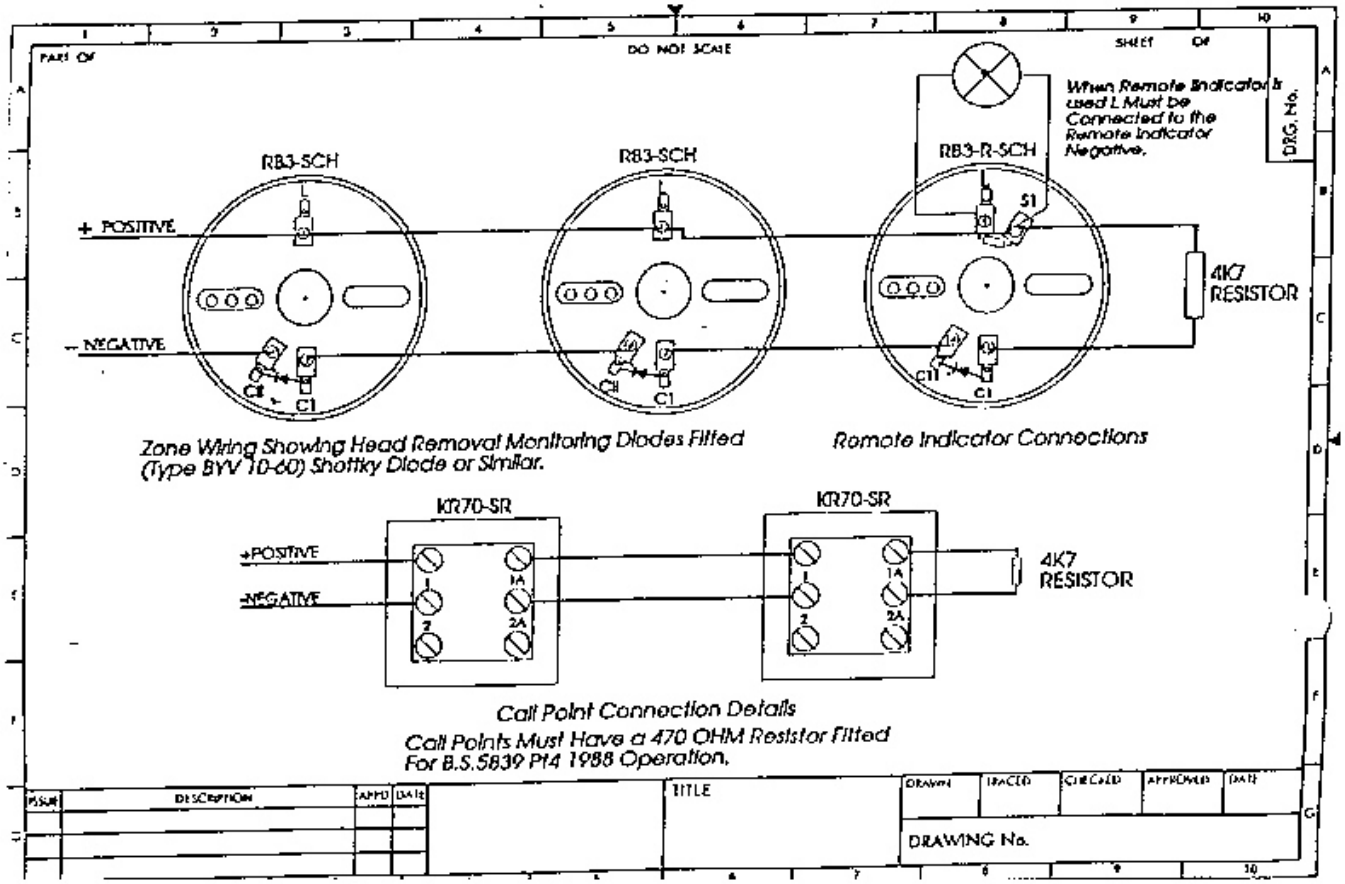


Hochiki "Sefelins" Base YBK-RL-4H1A Should Be Used To Achieve Head Removal Monitoring With Haes 2000 & LEVEL Series Control Panels.

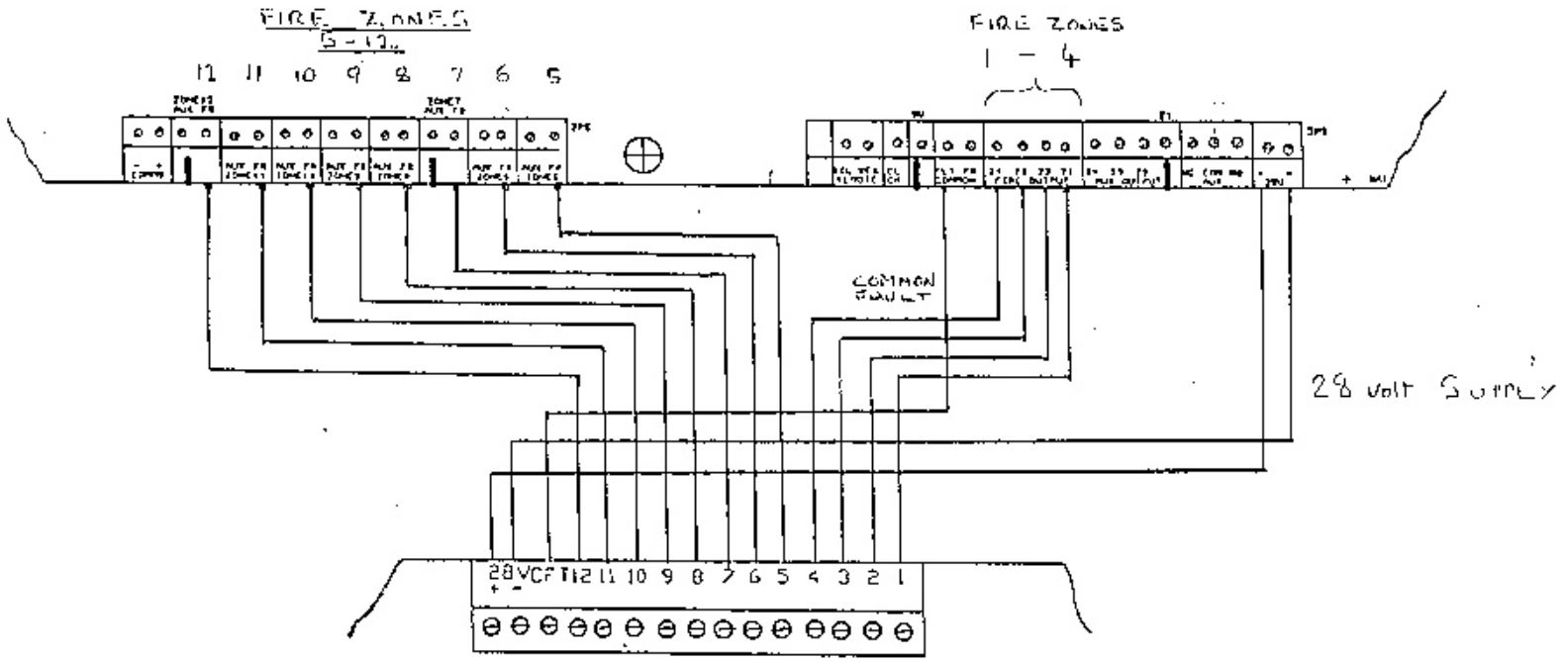
HAES SYSTEMS
Columbia House, Packet Boat Lane, Cowley Peachey
Uxbridge, Middlesex, UB8 2JP
Telephone: West Drayton (01895) 422066
Fax: (01895) 420603

Approved by	Date	Issue	Title/Description
	09-10-97	3	DETECTOR BASE CONNECTION DETAILS
DRAWING No	S1561-A		
Drawn by:	DC		


DO NOT SCALE
SHEET OF
92/019
L2 is a line in & line out connection terminal.
When remote indicator is used L1 must be connected to the positive line in.
+POSITIVE
-NEGATIVE
IN
OUT
L1
L2
-R
E.O.L DEVICE
The Diode Shown across L1 IN & L1 OUT should be a Shottky BYV-10-60.
Correct Polarity of all cables is important and should be as shown.
End of Line resistor. 4K7
Detector Head Removal will be monitored for a maximum of 30 Smoke or Heat Detectors per zone
ISSUE
DESCRIPTION
APPD
DATE
2 Change resistor to 4K7
Apollo Series 60 Detector
TITLE Connections for head removal detection.
DRAWN DC
TRACED
CHECKED
APPROVED
DATE 10-5-94
DRAWING No. HSS 92/019


DO NOT SCALE
SHEET OF
DRG. No.
When Remote Indicator is used L Must be Connected to the Remote Indicator Negative.
RB3-SCH
RB3-SCH
RB3-R-SCH
+ POSITIVE
- NEGATIVE
4K7 RESISTOR
Zone Wiring Showing Head Removal Monitoring Diodes Fitted (Type BYV 10-60) Shottky Diode or Similar.
Remote Indicator Connections
KR70-SR
KR70-SR
+POSITIVE
-NEGATIVE
4K7 RESISTOR
Call Point Connection Details
Call Points Must Have a 470 OHM Resistor Fitted For B.S.5839 Pt4 1988 Operation.
ISSUE
DESCRIPTION
APPD
DATE
TITLE
DRAWN
TRACED
CHECKED
APPROVED
DATE
DRAWING No.

FCP 9012 MAIN PCB



FCRP-12-2 REPEATER PCB

HAES systems "Columbia House", Packet Boat Lane, Cowley Peachey, Uxbridge, Middlesex UB8 2JP Telephone: West Drayton (0895) 422060 Fax: (0895) 420603	DRAWING No. HSM 1561 4-7-95 RRB	SURVEYOR FCP 9012 TO FCRP-12-2 REPEATER CONNECTIONS