

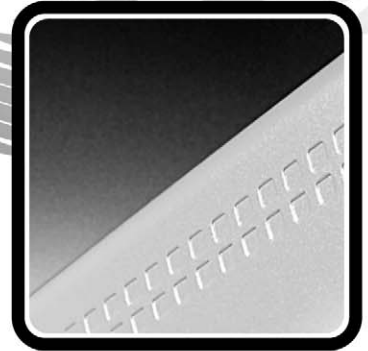
# Sigma CP-R

## Repeater Panel

(K01020M2, K01040M2, K01080M2  
E01020L2, E01040L2, E01080L2)

## Operation and Maintenance Manual

Man-1093 Issue 03 October 2009



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## 1. Introduction

The SIGMA CP-R Repeater is compatible with all Sigma CP control panels which have PCB parts numbers with an alpha suffix (e.g.S4XXA or S4XXB) and will not work with boards that do not have a suffix to their part number.

Repeaters are available with 2, 4 or 8 zones and in mains powered (K versions) or 24V powered (E versions).

Mains powered repeaters require only a two core data cable from the main control panel. 24V DC versions may be connected to the main panel using a 4-core cable when power is supplied from the main panel.

Up to 7 repeaters can be connected to a control panel and each is allocated an address from 1 to 7 using a binary coded DIL switch.

The total length of the data cable from the main panel to the last repeater must **not** exceed 1200 metres.

## 2. Safety and mounting

Suppliers of articles for use at work are required under section 6 of the Health and Safety at Work act 1974 to ensure as reasonably as is practical that the article will be safe and without risk to health when properly used.

An article is not regarded as properly used if it is used 'without regard to any relevant information or advice' relating to its use made available by the supplier.

This product should be installed, commissioned and maintained by trained service personnel in accordance with the following:

- (i) IEE regulations for electrical equipment in buildings
- (ii) Codes of practice
- (iii) Statutory requirements
- (iv) Any instructions specifically advised by the manufacturer

According to the provisions of the Act you are therefore requested to take such steps as are necessary to ensure that you make any appropriate information about this product available to anyone concerned with its use.

Mains powered versions of this equipment are designed to be operated from 230V 50Hz mains supplies and are of class 1 construction. As such they **must** be connected to a protective earthing conductor in the fixed wiring of the installation and a readily accessible double pole disconnect device meeting the requirements of EN60950/IEC950 which disconnects live and neutral simultaneously shall be incorporated in the fixed wiring.

Switch disconnect devices such as MK Sentry 63A or similar are suitable for this.

**Failure to ensure that all conductive accessible parts of mains powered versions equipment are adequately bonded to the protective earth will render the equipment unsafe.**

Sigma CP-R repeater panels are designed for indoor use only at temperatures between -5°C and +40°C and with a maximum relative humidity of 95%.

The IP rating for the enclosure is IP30.

Operation outside of these limits may render the equipment unsafe.

### Mounting

The control panel should be mounted on a dry, flat surface, at eye height to the display and in a level position such that the enclosure is not distorted.

Screws or bolts of a minimum of 5mm diameter must be used to mount the enclosure in all three mounting positions.

It should be positioned in an accessible place as agreed with the end user.

Suitable fixings should be used at all fixing points such that the control panel is securely mounted and is not liable to move once fixed.

The control panel should not be mounted in another enclosure or near sources of excessive heat.

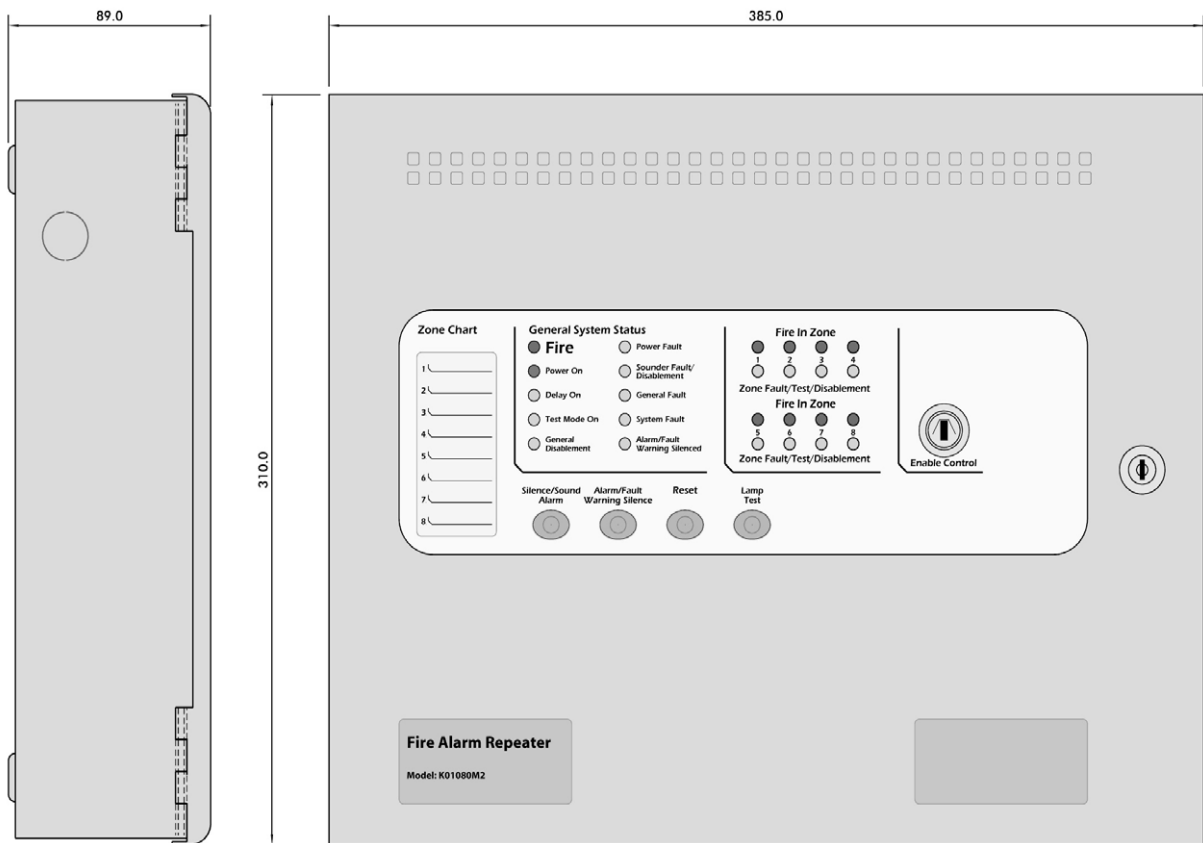
Cables should be connected using suitable metal cable glands fitted to the knockouts provided. If additional cable entry points are required, all swarf and debris caused by drilling of additional cable entries must be cleared before power is applied to the panel.

## 3. Technical specification

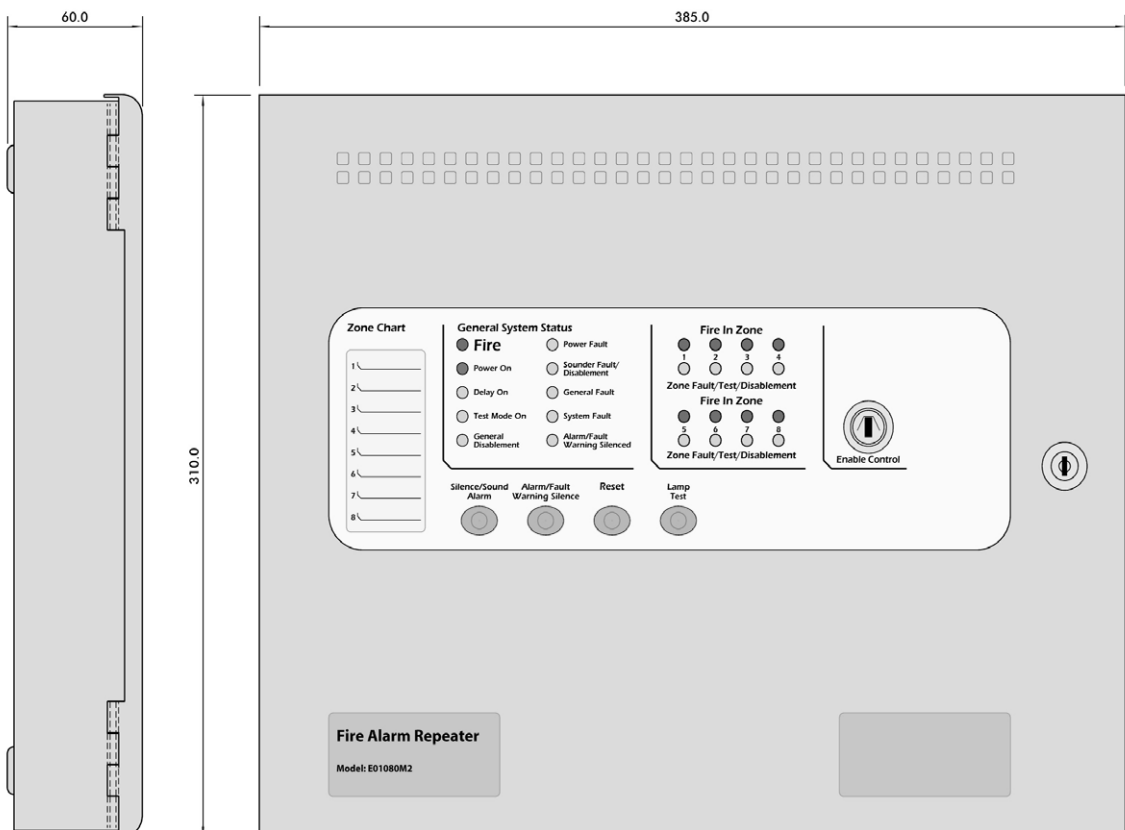
*Table 1 - Electrical specifications*

Mains supply	230V AC +10% - 15% (30 Watts maximum)	
Mains supply fuse	1.6Amp 250V T2A L250V	<i>Replace only with similar type</i>
Power supply rating	1 Amps total including battery charge 28V +/- 2V	
Maximum ripple current	200 millivolts	
Battery type (Yuasa NP)	Two 12 Volt sealed lead acid (2.3Ah minimum)	
Battery charge voltage	27.6VDC nominal (temperature compensated)	
Battery charge current	0.6A maximum	
Battery fuse	20mm, 3.15A glass	<i>Replace only with the same type</i>
Maximum current draw from batteries	0.11 Amps	<i>With main power source disconnected</i>
Mains failed current consumption	75 milliamps	<i>All mains versions In standby mode</i>
Mains failed current consumption	110 milliamps maximum	<i>In full alarm</i>
Fault relay contact rating	30VDC 1A Amp maximum for each	<i>Maximum ratings not to be exceeded</i>
Fire relay contact rating	30VDC 1A Amp maximum for each	<i>Maximum ratings not to be exceeded</i>
Local fire relay contact rating	30VDC 1A Amp maximum for each	<i>Maximum ratings not to be exceeded</i>
Terminal capacity	0.5mm <sup>2</sup> to 2.5mm <sup>2</sup> solid or stranded wire	
Cabling - power	FP200 or equivalent	<i>Metal cable glands must be used</i>
Cabling - communication	RS485 data cable or FP200	<i>Maximum total cable distance 1200 metres</i>

## 4. Control panel fascia



### 230V AC versions



### Removing the fascia

With so few connections it will not normally be necessary to remove the fascia but it can be removed for easier access if required. The lid can also be removed by opening the panel and pulling out the two hinge pins on the left hand side.

Before the fascia can be removed on mains powered versions, it will be necessary to remove mains and battery power and disconnect the red, green/yellow and black wires. This is easily done by unplugging the 3 way terminal block.

The fascia of the repeater panel is held in place by two screws. Undo the two screws and lift the fascia gently away from the box towards you.

With the fascia removed there is much more room inside the panel for making off and dressing cables.

When cabling work is complete the fascia can be re-fitted with the two screws and the three way terminal block can be plugged back onto the PCB.

## 5. Connecting to the circuit board

All connections for field wiring are to a single row of terminals along the top of the circuit board. Shielded fire alarm cable such as FP200 for power and RS485 data cable for comms and metal cable glands must be used for all connections to the panel. The resistance of any core of any cable must not exceed 25 ohms. The shield of the cable must be bonded securely to the enclosure via a metal gland.

Wiring should enter the enclosure at the top of the panel using the knockouts provided and be formed tidily to the appropriate terminals.

Terminals are capable of accepting wires of up to 2.5mm<sup>2</sup>.

Wiring must not go across the front of the circuit board. If cable entries need to be in positions other than at the knockouts provided, wiring must be fed behind and well away from the surface of the circuit board.

On K models, the space at the bottom of the enclosure is largely occupied by the standby batteries so this must be borne in mind when considering cable entries.

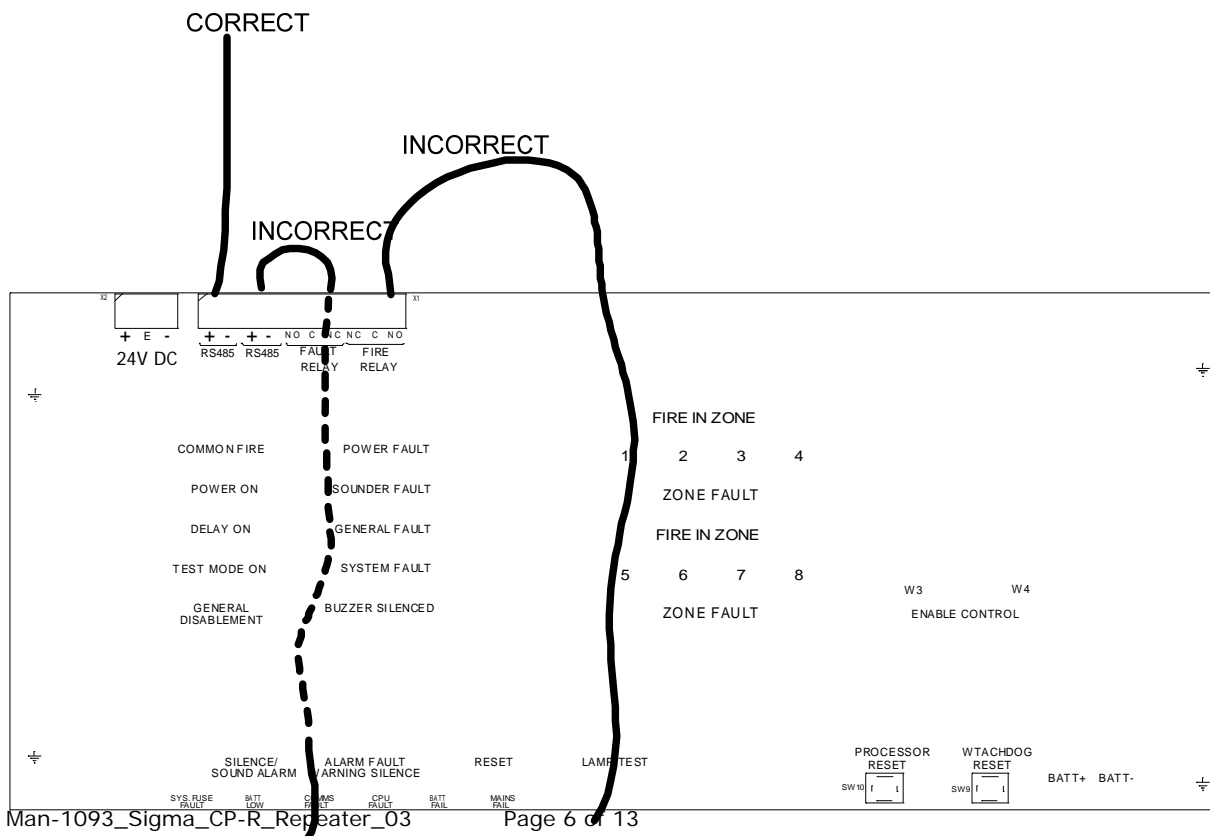


Figure 3- Wiring to the circuit board

## 6. Connection to relay contacts

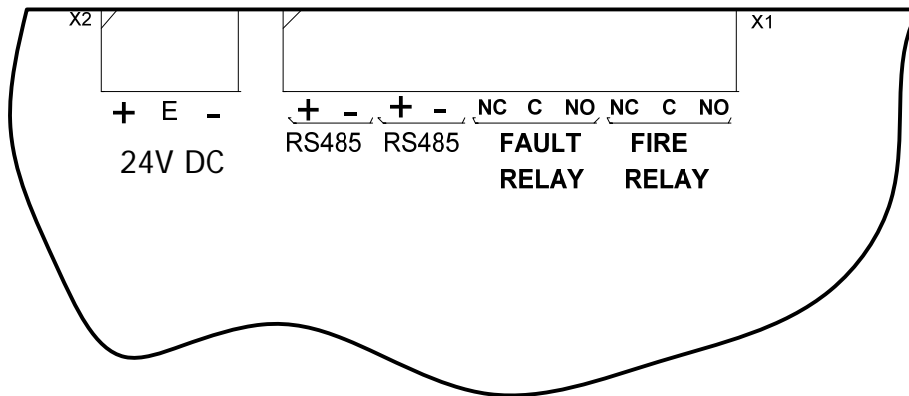
Volt free changeover relay contacts are provided for local control and signalling if required. These contacts are rated for switching signalling circuits only and the maximum ratings listed in table 1 on page 4 should not be exceeded under any circumstances.

### Fault relay

The fault relay is normally energised and will de-energise upon any fault condition including total loss of power.

### Fire relay

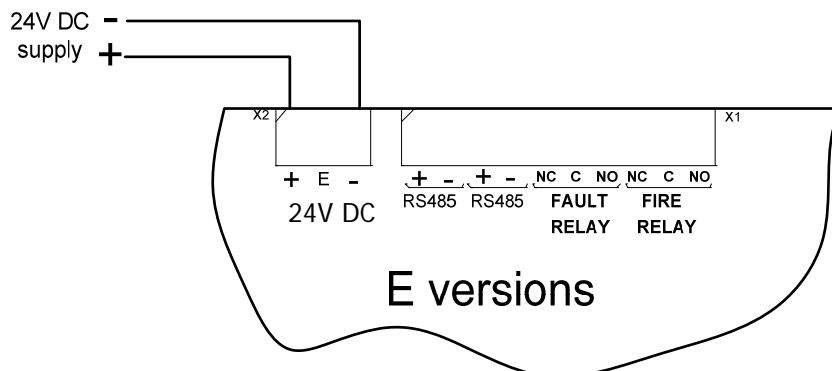
The fire relay will energise upon activation of a fire condition on any of the zones. The relay will remain activated until the control panel is reset. This relay will not operate upon activation of the remote AL input on the main control panel.



## 7. 24V Input

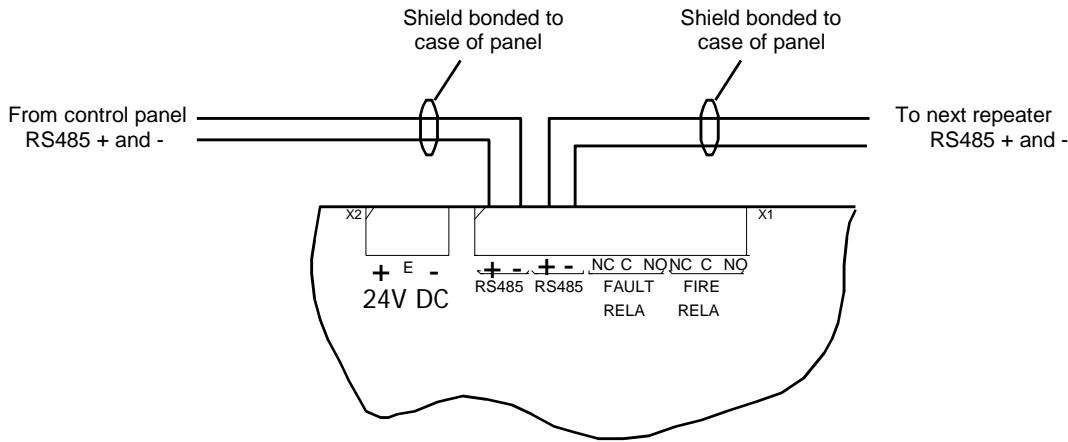
E versions of the repeater panel require a 24V DC supply. This can be from the main control panel or from another 24V DC source. If the supply is from a source other than the main panel, the power supply should include fault monitoring facilities which can warn at the power supply, of trouble to the fire alarm repeater supply.

**It is most important to connect the 24V supply with the correct polarity. Incorrect connections may cause damage.**



## 8. Connection to main panel and other repeater panels

K versions of the repeater panel require only two wires from the main control panel and two wires onto other repeater panels if fitted.



Wiring can be standard fire alarm cable such as FP200 or shielded data cable. In either case, the shield of the cable must be securely bonded to the panel case at both ends.

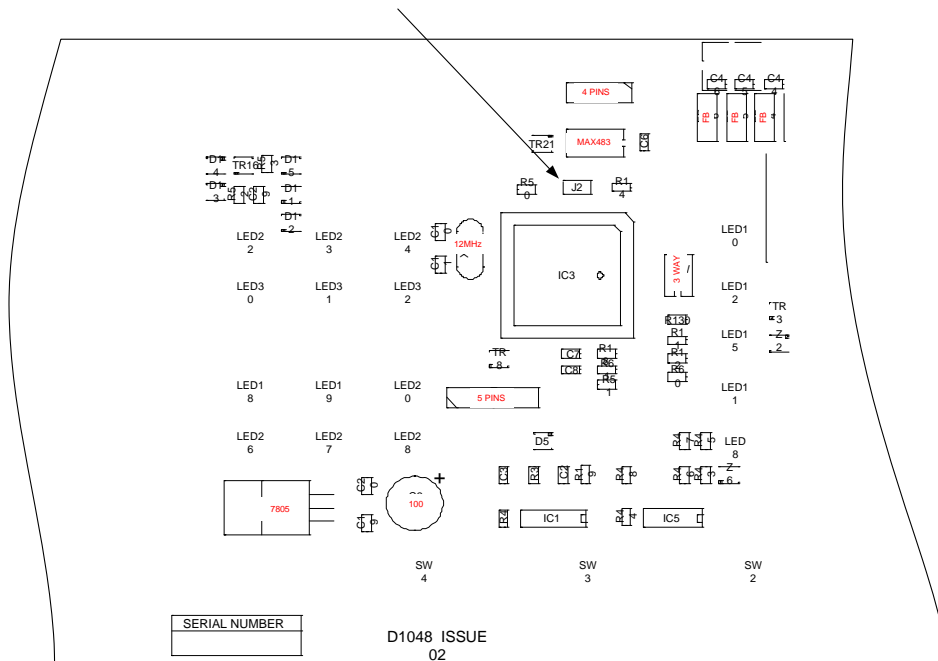
Each repeater must be allocated a unique address from one to 7 using the binary code DIL switch located on the back of the PCB and labelled SW7.



The jumper link J2 must be removed on all repeaters except if the repeater is the only or last one on the data connection.

After repeaters have been connected to the main panel, the main panel has to “learn” how many repeaters it has connected to it. This is necessary so that the main panel can announce a fault condition if one or more repeaters become disconnected.

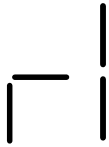
REMOVE JUMPER J2 IF REPEATER IS NOT THE FIRST OR ONLY ONE CONNECTED





To “teach” the main panel how many repeaters are connected, ensure that all repeaters have the data cable connected with the correct polarity and have been individually addressed. Check that all repeaters are supplied with power and that the green, power on LED is lit at each one.

With the panel in access level 1 (controls not enabled), press the processor reset switch on the main panel PCB. The main panel will display the address of the first repeater it finds on the seven segment LED display as show below.



This indicates repeater 1 (r1). To accept this repeater, the enter button on the main panel is pressed whereupon, if more repeaters are found, their addresses will be displayed and must be accepted by pressing the enter button once again. This is repeated until all of the repeaters are recognised by the main panel.

If a repeater panel becomes disconnected after it is “learned” by the main panel, the main panel will display a comms fault and the number of the repeater on the seven segment LED display. The repeater that has become disconnected from the main panel will also display a comms fault.

## 9. Panel operation

### 9.1 Normal condition

Under normal conditions, repeater panels will have only the green, *Power On* LED lit.

### 9.2 Fire condition

Upon receipt of a fire condition by activation of a detector or call point, the *Common Fire* indicator will light and the zonal *Fire* indicators will flash at around 2Hz.

The fire relay will also operate.

### 9.3 Silence/sound alarms

The *Silence/Sound alarm* button can only be operated at access level two which means that the *Enable Control* key must be operated.

To silence the sounders, operate the *Enable Control* key and press the *Silence/Sound alarm* button.

When the sounders have been silenced, the *Zone Fire* LEDs will change from flashing to a steady state.

Pressing the *Silence/Sound alarm* whilst the control panel is in the silenced condition will cause the sounders to operate again.

The sounders can be toggled on and off with the *Silence/Sound alarm* button as required.

### 9.4 Reset

To reset the panel, ensure the source of the activation has been cleared, operate the *Enable* key then press the *Reset* button.

### 9.5 Zone fault

Removal of a detector from its base or a fault on any of the zone wiring at the main panel will cause the *Fault* LED and *Zone Fault* LEDs to light indicating the zone in which the fault has occurred. This is duplicated at the repeater panels.

## 9.6 Sounder fault

A fault on the wiring to sounder circuits of the main panel will cause the *Fault* and *Sounder Fault* LEDs to light indicating a fault on the wiring to the sounder circuits.

## 9.7 Power fault

Failure of the repeaters mains power or disconnection of the standby battery will cause the *Fault* and *Power Fault* LEDs to light indicating an abnormality in the power supply to the repeater panel.

## 9.8 System fault

The *System Fault* LED will light if the system watchdog on the repeater has operated or the processor reset switch has been operated but the watchdog reset switch has not.

## 9.9 Lamp test

All LED indicators on the repeater can be tested at any time by pressing the *Lamp Test* button. The *Enable Control* key does not need to be operated to test the indicators.

## 9.10 Alarm/Fault warning silence

All buzzers (panels and repeaters) can be silenced at any time by pressing the Alarm/Fault warning silence button. The enable key does not need to be operated to silence the buzzers.

## 10. Watchdog reset

If for any reason the microprocessor in the panel fails to carry out its operation correctly it will attempt to restart itself. This process is called a “watchdog” and the panel must record and indicate these events.

If a watchdog event occurs, the panel will show the FAULT and SYSTEM FAULT LEDs on the front panel, the CPU fault LED inside the panel and the buzzer will sound. This fault can only be cleared by pressing the WATCHDOG RESET button on the PCB inside the panel. This is a serious failure and the control panel buzzer will continue to sound until the watchdog activation is reset.

## 11. Processor reset

Once started, the microprocessor controlling the panel should continue to run the panel continuously without interruption. If the microprocessor fails to run correctly it can be reset by pressing the PROCESSOR RESET button on the PCB inside the control panel.

This should not normally be necessary but should be done as a matter of course if the system is behaving abnormally. The system should resume normal operation within a couple of seconds of pressing the processor reset button.

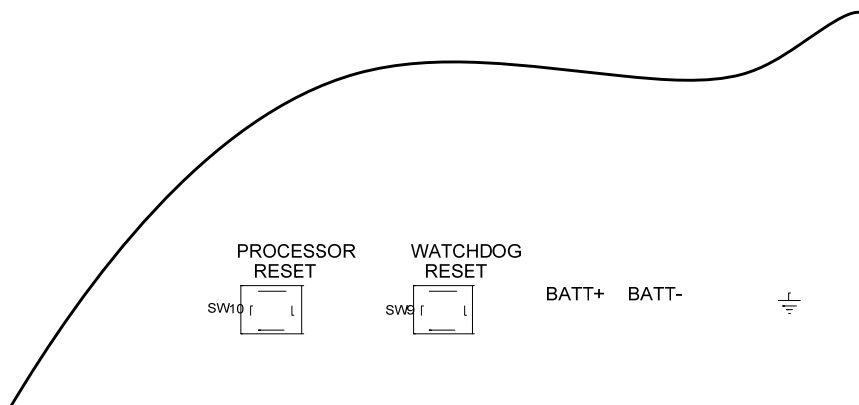
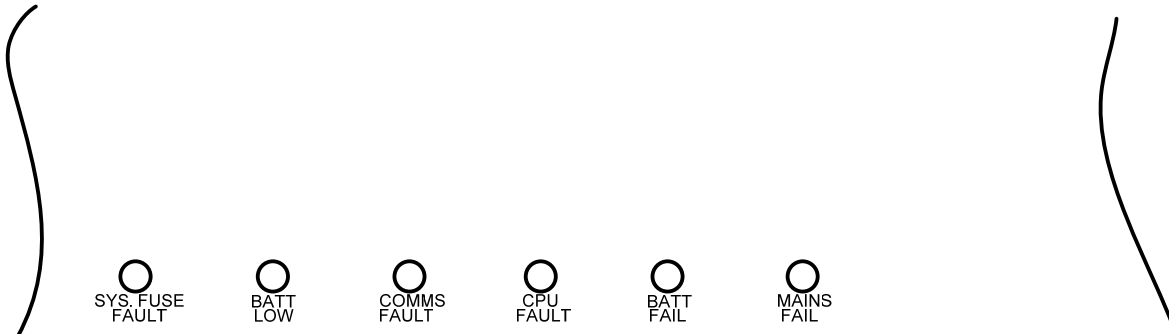


Figure 10 – Watchdog and processor reset switches

## 12. Internal indications – troubleshooting

To assist in identifying fault conditions which are not detailed on the front of the control panel, a number of internal indicators are visible with the front cover opened as follows:



### 12.1 Mains fail (K versions only)

Indicates that the 230V AC supply is not present and the system is running on standby batteries. If there is not a power cut, check the panels mains fuse.

### 12.2 Batt fail (K versions only)

Indicates that the standby battery has become disconnected or that the charging circuit of the control panel has failed. Check that both batteries are connected and linked together. Test battery. Disconnect battery and ensure that 28 Volts can be measured on battery charger leads.

### 12.3 CPU fault

Indicates that the central processor unit has failed to correctly execute code and has been re-started by the system watchdog. The watchdog reset switch must be pressed to clear the CPU fault condition.

Press watchdog reset. If system does not return to normal then the panel is probably damaged and needs the circuit board replacing. (See maintenance section 19).

### 12.4 Comms fault

Indicates that communication has been lost with a repeater panel or Ancillary board. Check for comms fault at all repeaters and ancillary boards to identify the source of the problem.

### 12.5 Batt low (K versions only)

Illuminates when the system is running on batteries and the battery voltage is between 21.5 V and 20.5 V (the minimum battery voltage).

### 12.6 Sys fuse fault

Indicates that the total power rating of the power supply has been exceeded and that the system fuse has come into operation. Remove and review all loads and re-connect one at a time until fuse trips to identify troublesome circuit.

### 13. Power supply (K versions only)

The control panel requires a 230V (+10%/-15%), 50/60Hz, AC mains power supply which connects to the fused terminal block labelled “230V”.

The fused terminal block contains a 20mm, 1 Amp, T2A L250V fuse which should only be replaced with a similar type.

The output voltage of the power supply is 28V DC +/- 2V and the total current rating including a maximum 0.6A for battery charging is 1 Amps. Fuse F12 mounted on the circuit board is a self-resetting electronic fuse rated at 1 Amp.

The incoming mains cable should be routed well away from other lower voltage wiring by a distance of at least 50mm.

Mains wiring should include an earth conductor which is securely bonded to the building earth and should enter the enclosure as close as possible to the mains terminal block. Mains wires should be kept very short inside the enclosure and secured together close to the mains terminal block with a cable tie.

The control panel can accept sealed lead acid rechargeable batteries of up to 2.6Ah maximum capacity.

The maximum current drawn from the batteries when the main power source is disconnected is 0.075 Amps.

Battery leads are supplied wired to the PCB along with a link to connect the two batteries (in series) in the accessory pack. The battery is fused by a 20mm, 3.15A T1 glass fuse which must only be replaced with one of the same type.

It is most important that the polarity of the batteries is carefully observed when connecting. Wrongly connected batteries could cause damage to the panel.

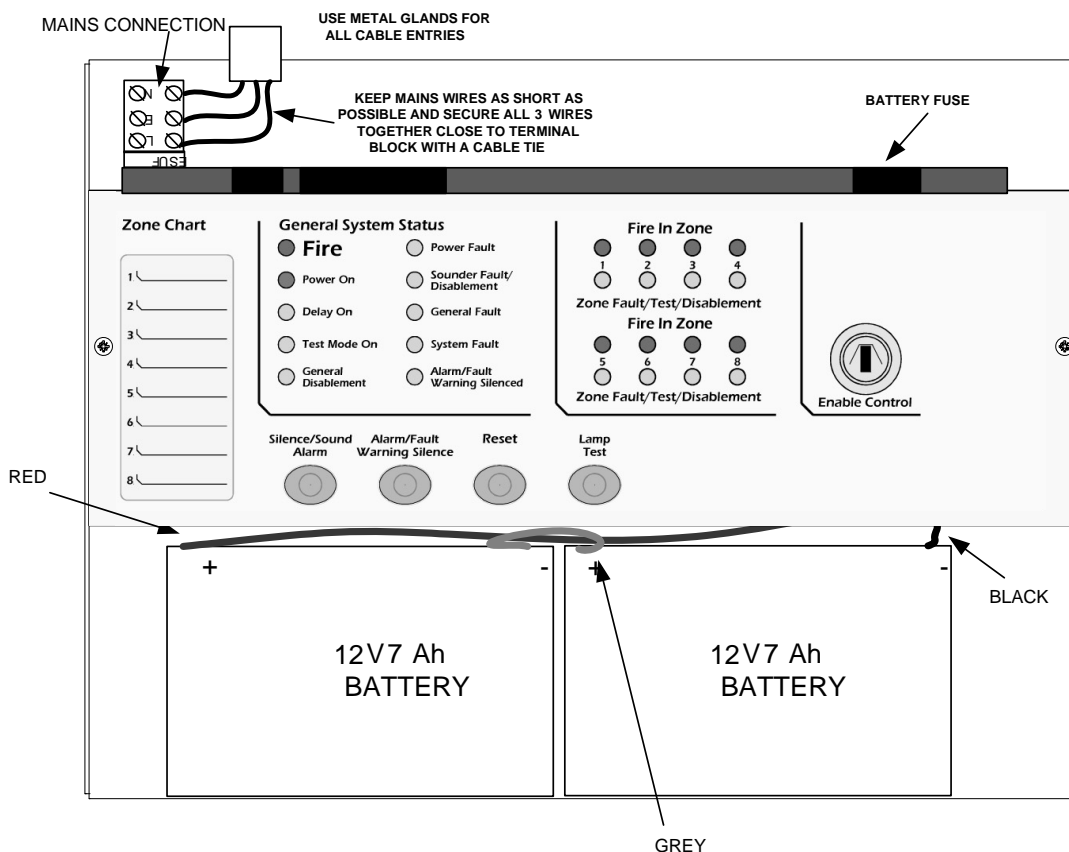


Figure 9 – Mains and battery connections

## 14. Maintenance

Sigma CP-R repeater panels do not require any specific maintenance but should the control panel become dirty it can be wiped over with a barely damp cloth. Detergents or solvents should not be used to clean the panel and care must be taken that water does not enter the enclosure.

The control panel contains sealed lead acid batteries to provide standby power in the event of mains failure.

These batteries have a life expectancy of around 4 years. It is recommended that these batteries be tested in accordance with the battery manufacturer's recommendations annually to determine their suitability for continued standby applications.

Routine testing of the fire alarm system in accordance with BS5839: Part 1: 2002 will identify any malfunction of the control panel and any malfunction should be reported to the fire alarm maintenance company immediately.

Should the control panel become faulty, after removing mains and battery or 24V DC supplies, the complete electronic assembly and front plate can be replaced.

The field wiring should be carefully labelled and removed from the terminals and the 3 way power terminal block should be unplugged from the PCB.

The PCB and plate can now be taken out of the panel by removing the 2 screws.

Fitting the new PCB is the reverse of the procedure for removing the board.