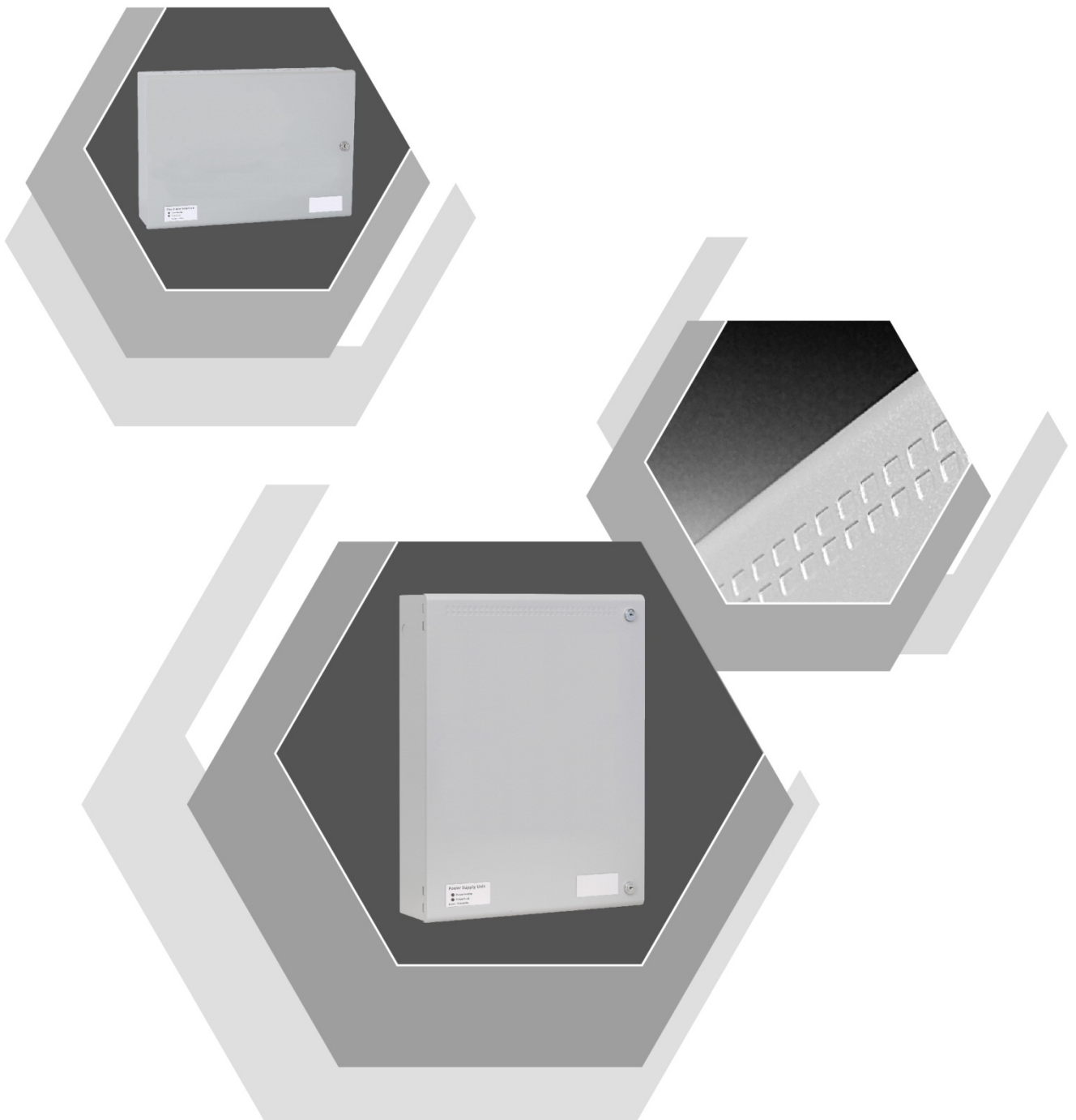


# K25800 & KD25800 Series

Fire Alarm Power Supplies

Installation, Commissioning and  
Operating Manual

Man-1152 Issue 05 July 2016



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## 1. General

The KD25800 and K25800 series are combined power supply and battery chargers designed to be used for fire alarm control and indicating equipment complying with EN54-2 and EN54-4.

To satisfy the requirement of clause 6.4 of EN54-4, for fire alarm Power Supply Equipment mounted in a separate enclosure to the Control and Indicating Equipment, a separate interface (RPSM2) needs to be fitted inside the PSE enclosure which provides two transmission paths between the PSE and the CIE to enable one transmission path to continue to operate in the event of failure of the other.

This board is fitted to models with the KD prefix to the part number. The D denoting that the dual output board is fitted.

## 2. Power Requirements

The KD25800 and K25800 series power supplies are designed to operate from mains power supplies of 115V AC or 230V AC.

The maximum input current is 5 Amps.

Mains frequency should be 50Hz or 60Hz.

### 2.1 Input/Output Electrical Ratings

Mains Input – 115V AC – 230V AC.

Load output voltage -19V DC minimum, 30V DC maximum.

Load output current – 10.25A maximum.

Maximum ripple voltage - 1 Volt.

I<sub>max a</sub> – Rated maximum output current which can be supplied continuously – 8A

I<sub>max b</sub> – Rated maximum output current which can be supplied while battery charging is not required – 10.25A

I<sub>min</sub> - Minimum output current for correct operation = 10mA

R<sub>i max</sub> – Maximum series resistance in battery charging circuit before a fault is indicated = 0.4 ohms.

Battery charging output voltage – 26.4 V DC (at 40 C) to 28.9 V DC (at -5 C)

Battery charging current - 2.25 Amps maximum.

Fault signals - Switched negative open collector (with respect to load positive) current limited 100mA max and common volt free relay contact.

Battery disconnected (Low battery shutoff voltage - 19 V (+/- 1 volt))

Mains fail

Battery voltage low/Battery connection high impedance. Low battery voltage = 21 V +/- 1 volt

Earth fault

Charger fault

### 2.2 Fuse Ratings

Input fuse - F5A 250V TD 20mm. (Replace only with a fuses of the same type).

Load fuse - Self-resetting Polyfuse 10 Amp rated. (Not replaceable).

RPSM2 fuses- FF very fast acting 12A, (Replace only with fuses of the same type).

### 2.3 Batteries

Rechargeable, sealed lead acid Yuasa NP\* or Powersonic\*. Maximum capacity 45 Ah.

Maximum current drawn from batteries when mains is disconnected – 11 Amps

Quiescent current in mains failure mode - 50 milliamps.

## 3. Installation

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

(i) Regulations for electrical equipment in buildings specific to the country of use

(ii) Codes of practice

(iii) Statutory requirements

(iv) Any instructions specifically advised by the manufacturer

Only fire rated and shielded cable should be used.

Note: For LPCB approved installations use only FP200\*, 1.5mm<sup>2</sup> 2 core cable.

### 3.1 Environmental Considerations

The KD25800 and K25800 series power supplies are mounted in steel enclosures with an ingress protection rating of IP30. The operating temperature range should not exceed -5°C to +40°C (±2°). Humidity levels should not exceed 95% (non-condensing).

### 3.2 Mounting

The unit should be mounted on a dry, flat surface and in a level position such that the enclosure is not distorted. Screws or bolts of a minimum of 5mm diameter and suitable 40mm long wall fixings must be used to mount the enclosure in all four mounting positions.

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

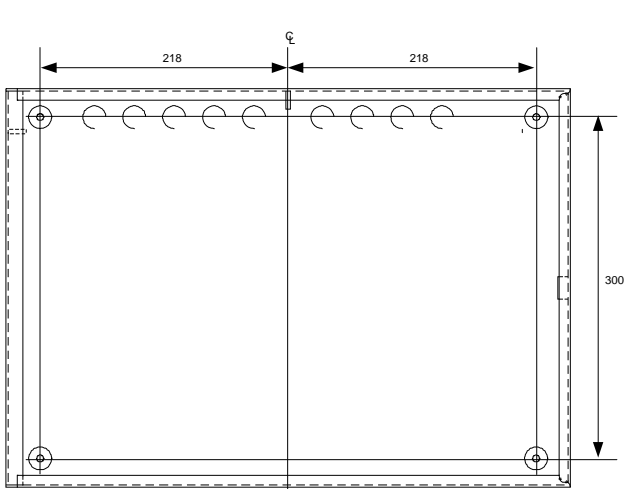
The unit should not be mounted in another enclosure or near sources of excessive heat.

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 unit.

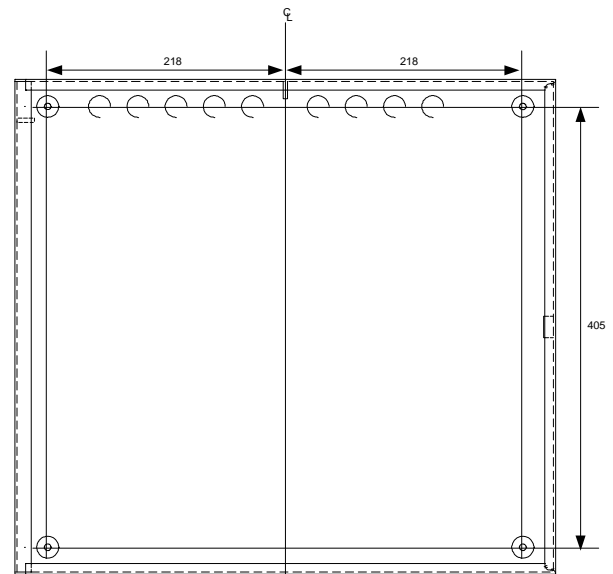
The equipment is of Class1 construction so must be permanently and reliably connected to the fixed earth of the installation.

The primary earth of the end use application must be permanently marked with the protective earth symbol (IEC415 No. 5017). A suitable primary disconnecting device must be provided in the end use application.

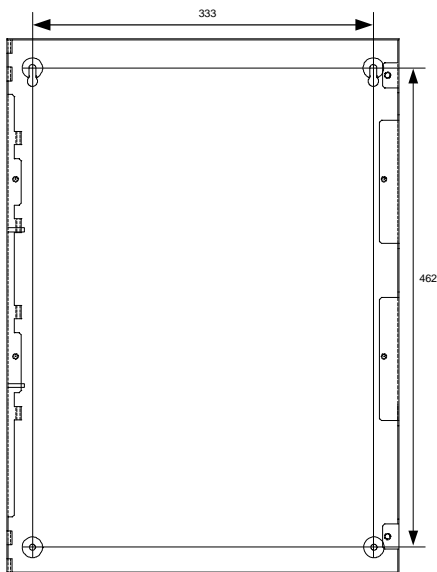
Battery and load connections must be considered for connection to SELV (safety extra low voltage) circuits only. The maximum leakage current of the completed and installed equipment must not exceed 3.5mA.



K25800 03/KD25800 03 FIXING CENTRES



K25800 15/KD25800 15 FIXING CENTRES

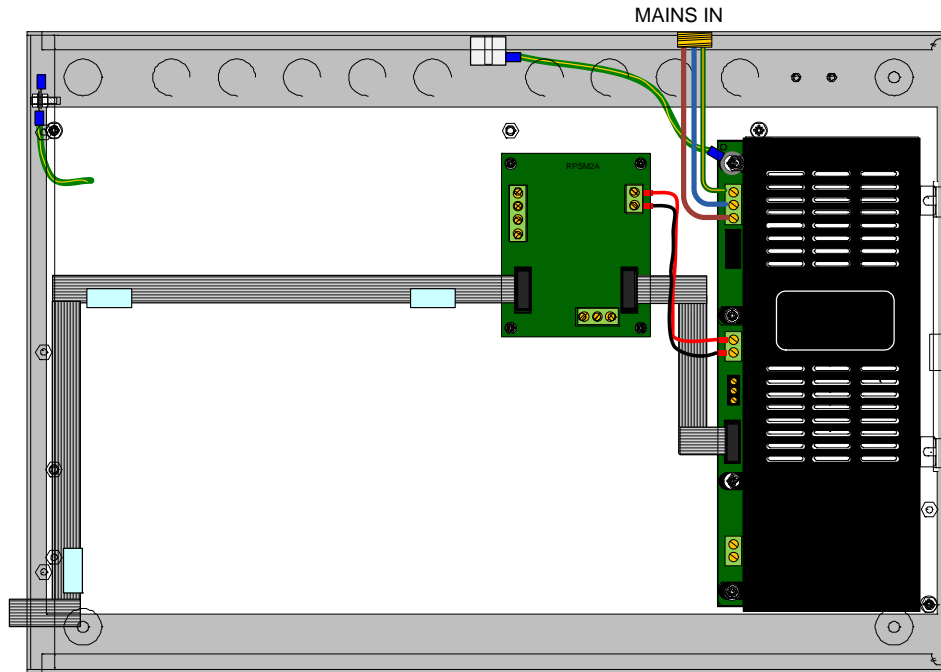


K25800 M3/KD25800 M3 AND K25800 D3/KD25800 D3 FIXING CENTRES

### 3.3 Connecting to the mains Input

**A minimum cable size of 1.0mm<sup>2</sup> must be used. Maximum cable size is 4.0mm<sup>2</sup>. The mains cable should be rated at 250V and fused via a 5A anti-surge fuse.**

Fit the mains cable via a suitable 94HB flame rated cable gland via a knockout close to the power supply unit. Connect the Neutral of the mains power supply to the terminal marked N, connect the Live of the mains power supply to the terminal marked L and connect the earth to the terminal marked E.



The mains wiring should be as short as is practical with no excess lengths or larger loops and be separated from all extra low voltage wiring such as 24V supply wiring and battery leads. Ensure that all wires are fitted into the terminals without any exposed lengths or strands which may give rise to exposure to electrical shock.

This equipment is designed to be operated from 230V 50Hz or 120V 60Hz mains supplies and is of class 1 construction. As such it **must** be connected to a protective earthing conductor in the fixed wiring of the installation.

A readily accessible, double pole disconnect device meeting the requirements of EN60950/IEC950 which disconnects live and neutral simultaneously must be incorporated in the fixed wiring as close to the unit as is practical.

If the earth terminal is the primary earth of the end use application then apply the earth symbol (IEC415 No.5017) next to this terminal. Ensure that all screws in the earth terminal block (including those that are not used) are tightened during installation.

## 4. Connecting to the Outputs

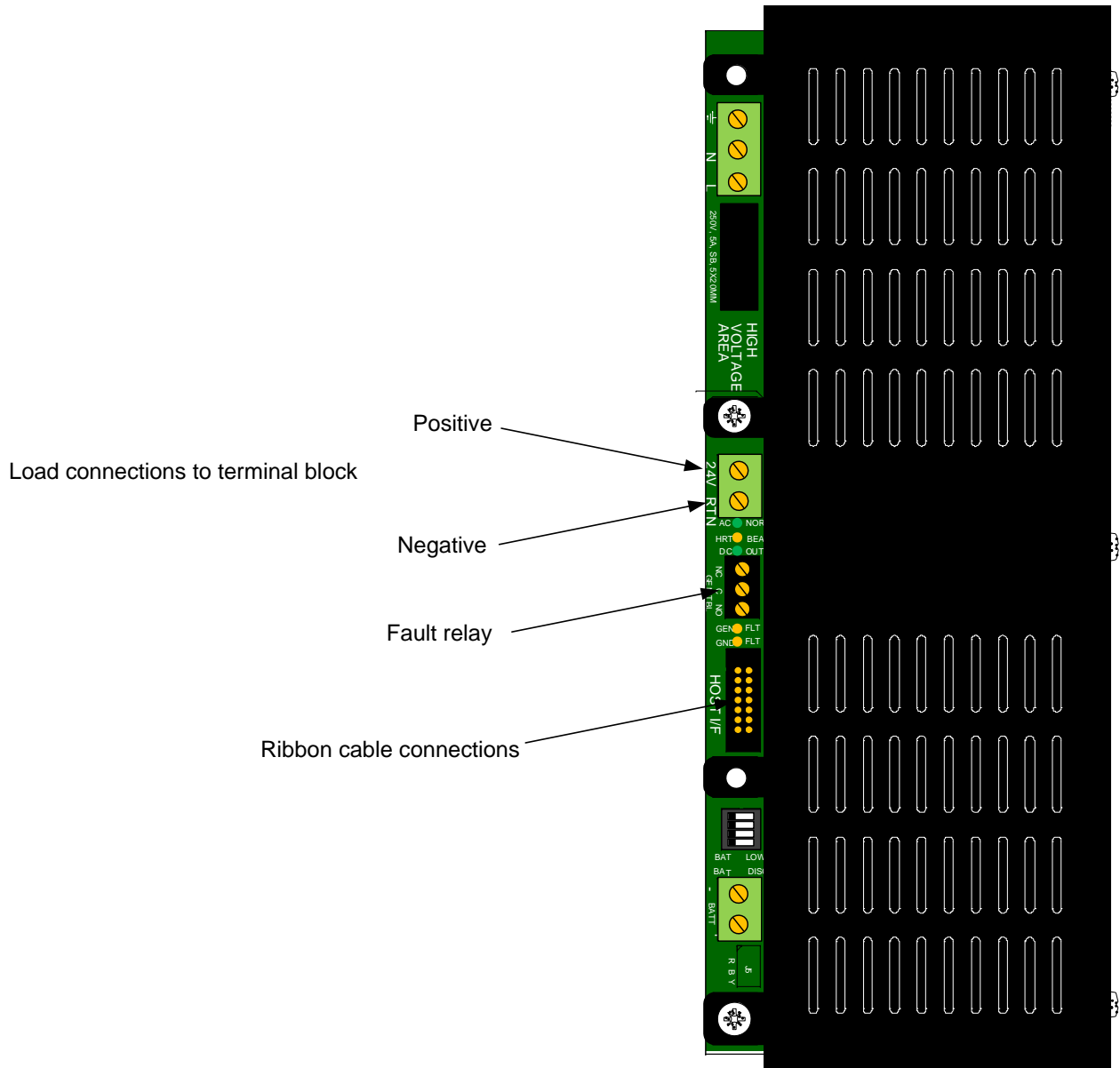
### 4.1 Load Connections (Terminal Block)

Two terminals are provided for connection of the load. +24V DC and DC RETURN.

The load should be connected using wire rated for at least 10 Amps continuous.

Care must be taken to connect the polarity of the load the correct way around, + on the PSU to + on the load, and - on the PSU to - on the load.

**Note: Maximum cable size is 2.5mm**



When supplying high load currents such as the K25800 series of power supplies are capable of, volt drop in cables should be considered.

Larger cables have less volt drop, so if long cables are being used to supply high currents then these should be larger such as 2.5mm<sup>2</sup>, rather than 1.0mm<sup>2</sup> or 1.5mm<sup>2</sup>.

As an example, the volt drop with an 8A load for 50 metres of 1.0mm<sup>2</sup> cable would be about 14 Volts, which means that there would be only about 10 Volts at the load end of the cable.

The volt drop with an 8A load for 50 metres of 2.5mm<sup>2</sup> cable would be about 6 Volts, which means there would be about 18 Volts at the load end of the cable.

**Cables and connectors should be suitably sized to ensure that the maximum current that can be supplied by the power supply can safely be passed to the load without any risk of overheating or damage.**

#### 4.2 Load Connections (Ribbon Cable)

An additional method of connecting to the power supply is via a 14-way ribbon cable.

The ribbon cable must not leave the enclosure

A standard latching ribbon cable header is provided on the board, which may be used to connect to the load, and fault signals. (See below.)

Pin 1 = Negative  
Pin 2 = Negative  
Pin 3 = Negative  
Pin 3 = Negative  
Pin 5 = Positive 24V  
Pin 6 = Positive 24V  
Pin 7 = Positive 24V  
Pin 8 = Positive 24V  
Pin 9 = Battery disconnected  
Pin 10 = Mains failed  
Pin 11 = Battery low/High impedance  
Pin 12 = Earth fault  
Pin 13 = Charger fault

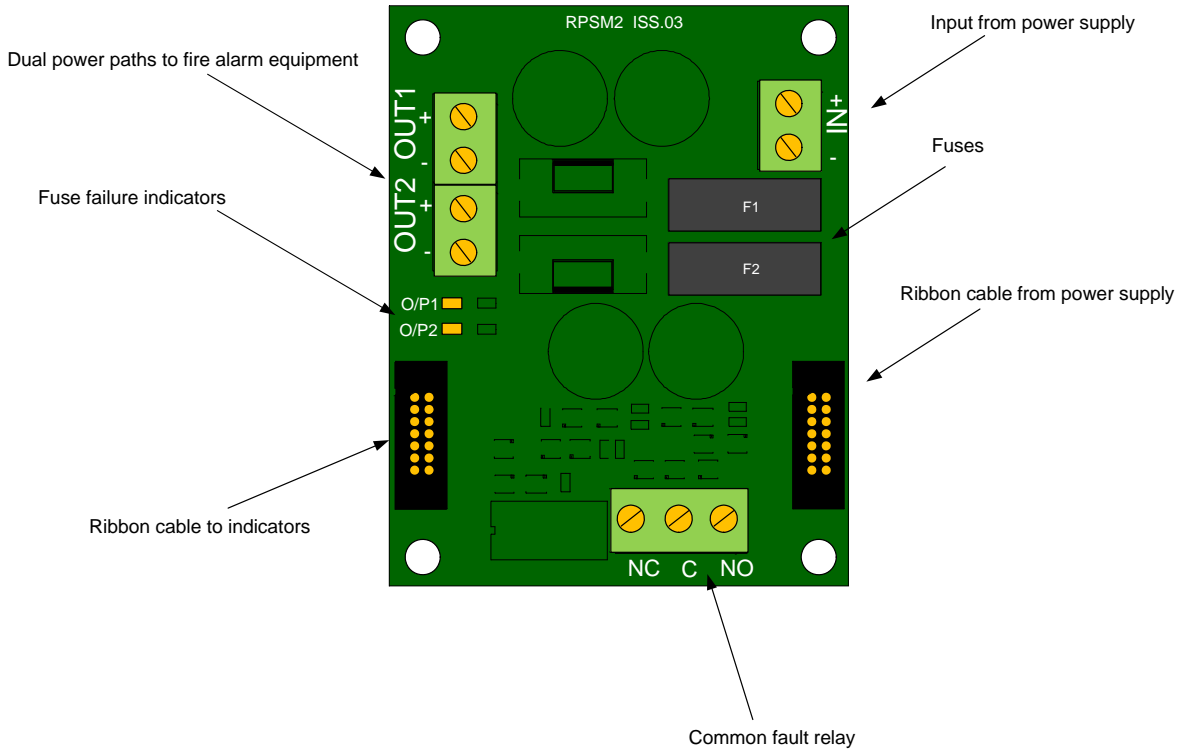
Note: pins 9 to 13 switches –ve with respect to Positive 24V and can supply a maximum of 100 milliamps per output.

**The ribbon cable should not be used alone for load power but always in conjunction with connections to the load terminals 24V DC and DC RTN as described in 3.4.1 above.**

### 4.3 Load connections (with optional dual transmission path PCB fitted)

When the power supply unit is being used to supply power to fire alarm control and indicating equipment, to comply with the requirements of EN54-4, there must be two transmission paths from the power supply to the control panel in order that a short or open circuit in one transmission path will enable the control panel to be supplied with power from the other.

This is facilitated by the RPSM2 PCB which is mounted in the enclosure as standard on KD25800 models. The RPSM2 PCB has a common fault relay which signals any of the faults associated with the power supply including failure of one of these transmission paths.



When connecting power to fire alarm control and indicating equipment, the connections OUT1 + and OUT1- should be connected to one power input of the control and indicating equipment and the connections OUT2 + and OUT2- should be connected to the other power input of the fire alarm control and indicating equipment.

Only fire alarm control and indicating equipment with two separated 24V DC inputs is compatible with these power supply units.

Care must be taken to connect the polarity correctly, + on the RPSM2 PCB to + on the control panel and - on the RPSM2 PCB to - on the control panel.

The total load over the two outputs should not exceed 8 Amps (I<sub>max a</sub>) or 10.25 Amps (I<sub>max b</sub>).

**Failure to connect the polarity correctly could result in damage to the control panel, the power supply or both.**

The common fault relay is normally energised and will operate to signal any fault associated with the power supply or total power failure.

The fuses on the RPSM2 PCB must be replaced only with the correct type as described in section 2.2 of this manual.



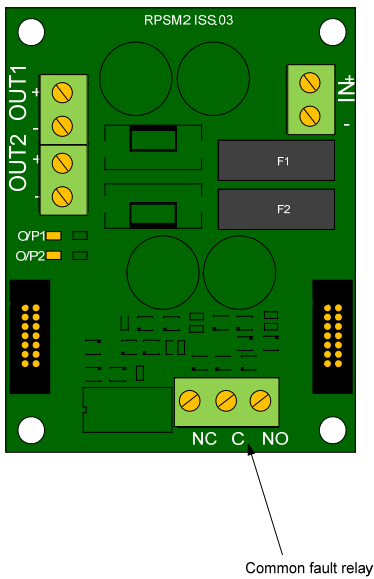
#### 4.4 Fault output contact connections

A volt free contact rated at 30V DC and 1 Amp (GEN FLT) is available for connection to other systems.

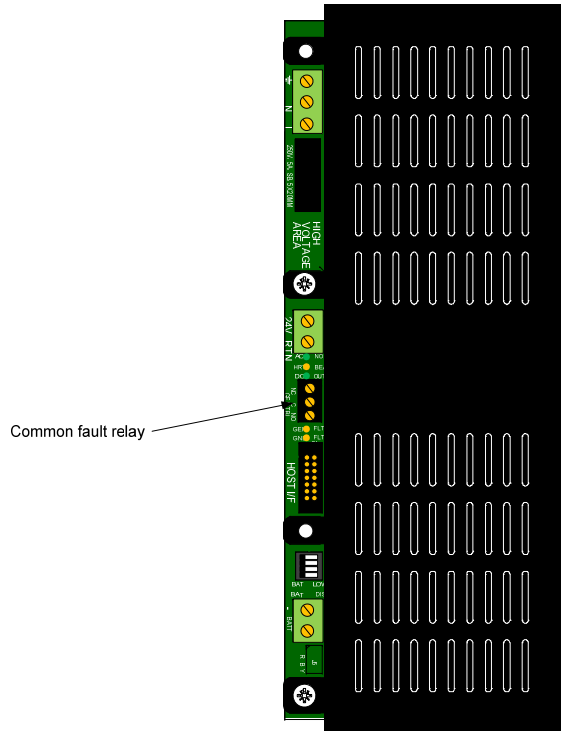
This contact will operate upon any of the fault conditions listed in section 4 as well as total power failure.

**The contact positions on the common fault relay terminals shown are with mains and battery connected and with no fault conditions on the power supply.**

KD25800 models



K25800 models



#### 4.5 Battery Connections

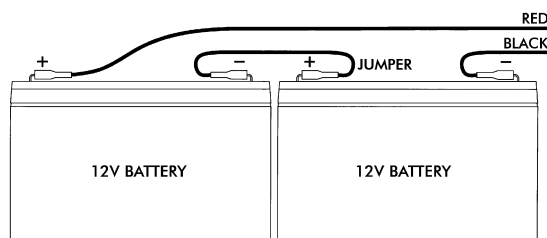
Batteries of even very small capacity are capable of delivering very high currents which can cause fire or injury. Battery connections must therefore be made using **extreme caution**.

As supplied, power supplies have battery leads already wired to the battery terminals on the circuit board. These leads are coloured red for + and black for – and are fitted with standard ¼ inch push on, spade connectors suitable for batteries of up to 12Ah capacity.

Larger capacity batteries have screw on terminals and the standard battery leads will need to be replaced with the ones supplied in the accessory pack. Take care that the red and black wires are connected to the correct terminals when replacing battery leads, a wrong connection can be dangerous and can cause damage.

As this is a 24-Volt system, there will be two 12 volt batteries which need to be connected in series. This is done using the jumper link provided.

To optimise the service life of the batteries, the battery charger output voltage varies with temperature. To enable optimum temperature compensation, the flying lead temperature sensor should be attached to one of the batteries as shown in the diagram in section 11 of this manual.



## 5. DIP switch settings

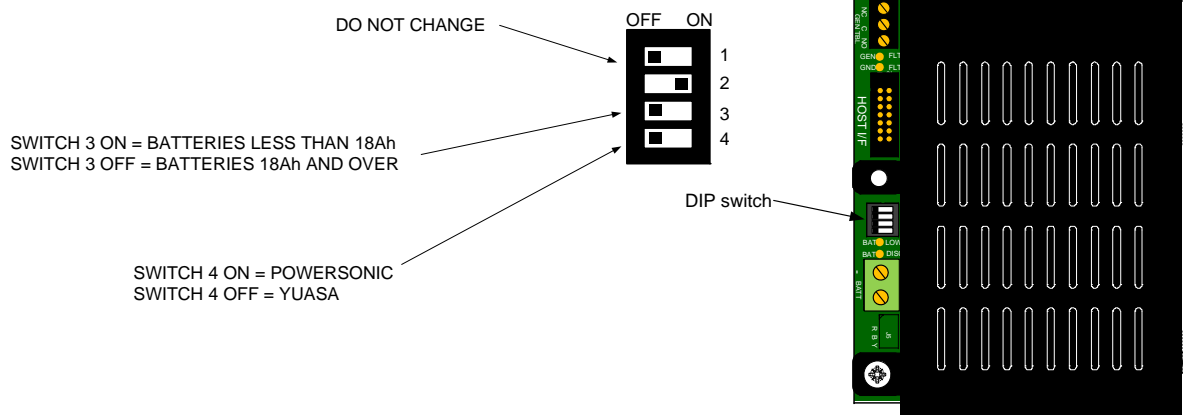
In order to correctly charge the batteries, the power supply must be matched to the manufacturer type and size of batteries that are connected to it.

This is done by setting the DIP switch located next to the battery connection.

Switch 4 defines the battery manufacturer (Yuasa or Powersonic).

Switch 3 sets the size of battery, ON for batteries smaller than 18Ah and OFF for batteries of 18Ah or larger.

The combination of switches 1 and 2 allow the power supply to be set to a special mode for factory testing or to disable battery monitoring functions.



### 5.1 Disabling battery disconnected indication

When the power supply is to be used without standby batteries, the battery disconnected warning indication and operation of the common fault relay may be disabled by setting switch 1 on the DIP switch to the ON position, switch 3 to the ON position and switch 4 to the OFF position.

### 5.2 Disabling the battery impedance test

It is possible to disable the battery impedance test and fault reporting by setting switch 1 to the ON position, switch 3 to the OFF position.

### 5.3 Disabling earth fault indication

In applications where the output cannot be isolated from earth, the earth fault warning indication and subsequent operation of the common fault relay may be disabled by setting switch 1 to the ON position, switch 2 to the OFF position, switch 3 to the ON position and switch 4 to the ON position. (August 2016 onwards).

**In order to comply with the requirements of EN54-4, switch 1 must be OFF and switch 2 must be ON. No other setting must be used when the power supply is being used to power fire alarm detection and control equipment.**

## 6. Indicators

The diagnostic indicators visible along the edge of the power supply indicate the status of the unit as follows:

AC Normal – Mains power is connected.

Heartbeat (flashing slowly) – The processor is functioning normally.

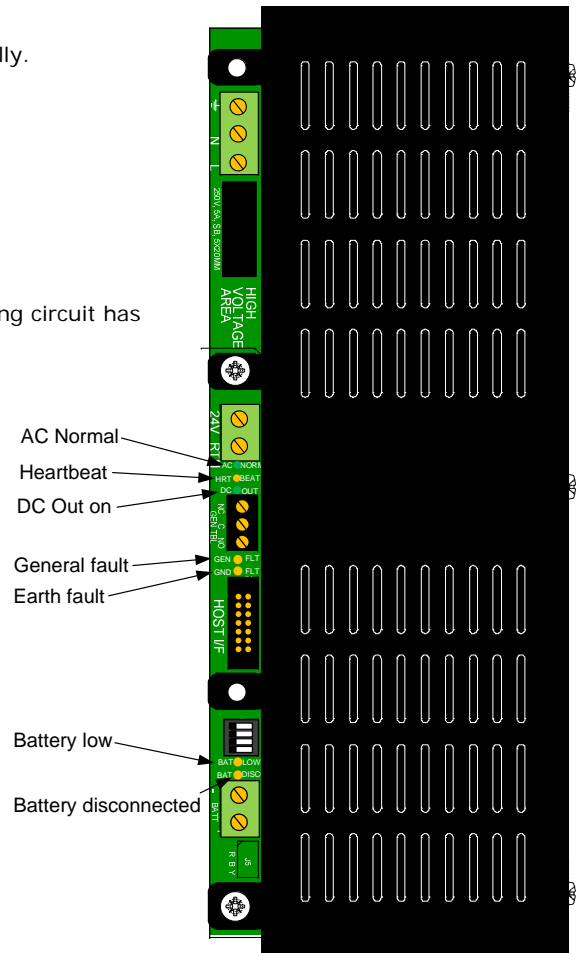
DC Out on – The 24V DC output is supplying power to the load.

General fault – The battery charge voltage is too high

Earth fault – The 24V DC supply is connected to earth.

Battery low – The battery voltage is below 21 Volts.

Battery disconnected – The battery is disconnected or the charging circuit has reached higher impedance than it should.



## 7. Commissioning

Once all connections have been made and checked for safety, ensure that batteries are correctly connected and switch on the mains power.

Check that the AC Normal LED is on.

Check that the Heartbeat LED is flashing slowly.

Check that power is being supplied to the load with a volt meter. A voltage of 24V +/- 1V should be read.

Remove the mains power and ensure that the batteries continue to supply power to the load.

With the mains removed, the AC Normal indicator should switch off after approximately 30 seconds.

Switch the mains back on and disconnect the battery. The load should continue to operate and the Battery disconnected LED should light.

**This completes the basic commissioning checks.**

## 8. Maintenance

The power supply requires no specific maintenance; however, sealed lead acid batteries have a limited lifespan and should be checked periodically in accordance with the manufacturer's recommendations and replaced as recommended below.

The only replaceable parts are the mains fuses and fuses on the dual power output board RPSM2 on KD25800 models. Should a fuse fail, the fuse **must only be replaced with fuses of the same type as originally fitted**. Spare fuses are supplied in the accessory pack. Care must be taken to select the correct one when replacing fuses. These are as follows:

Mains Input fuse – F5A 250V TD 20mm. (Replace only with fuses of the same type).

KD25800 series RPSM2 fuses- FF very fast acting 12A. (Replace only with fuses of the same type).

## 9. Standby batteries

Sealed lead acid batteries have an expected life of 3 to 5 years when operated at an ambient temperature of 20°C. Batteries operating in temperatures higher than 20°C will have a significantly reduced life of approximately 50% for every 10°C above 20°C.

This must be considered when determining the battery maintenance schedule and batteries consistently operating in higher ambient temperatures should be replaced more frequently.

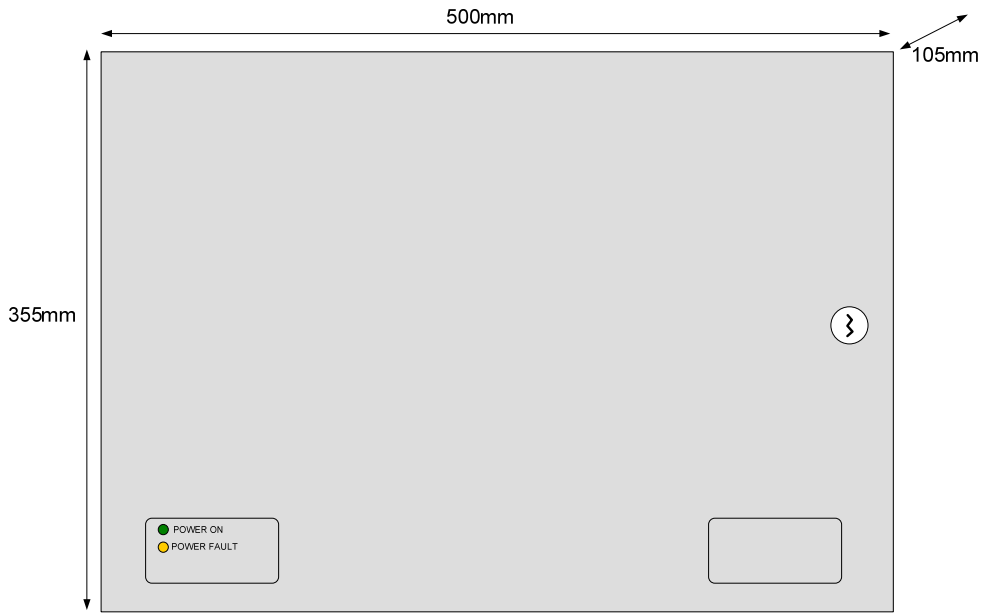
Batteries with a manufacturing date older than 6 months are not recommended for use with this equipment. Sealed lead acid batteries can liberate hydrogen during normal use. The KD25800 and K25800 series of power supplies have adequate ventilation to allow this hydrogen to disperse normally and safely therefore additional sealing or mounting inside a sealed enclosure is prohibited.

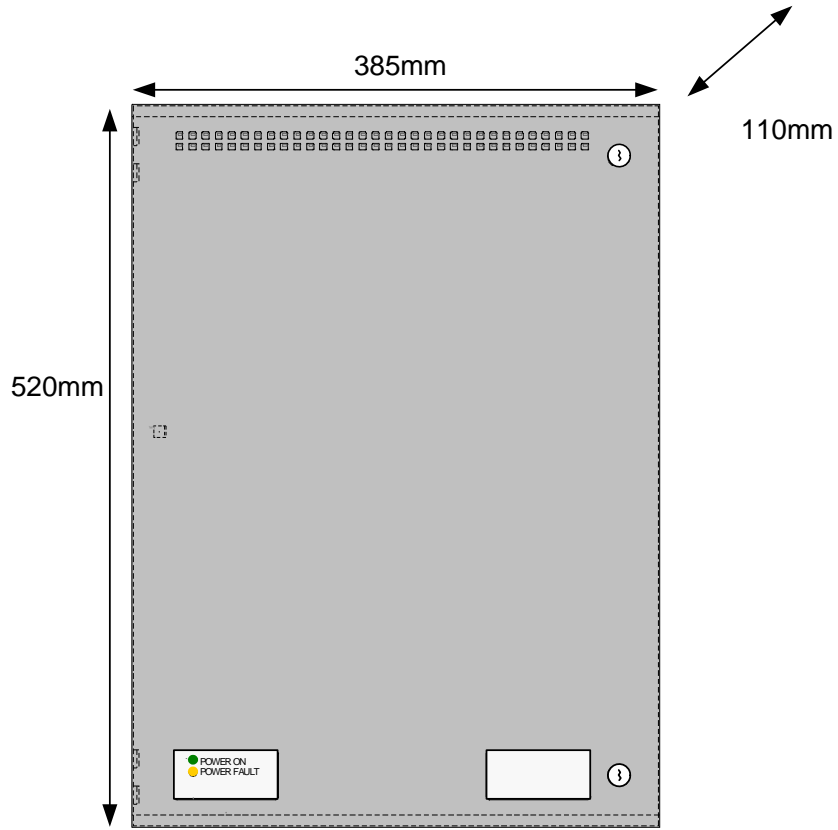
Batteries contain hazardous substances and must be returned to the supplier or manufacturer for disposal. Refer to battery manufacturers recommendations for further information.

### 9.1 Compatible batteries

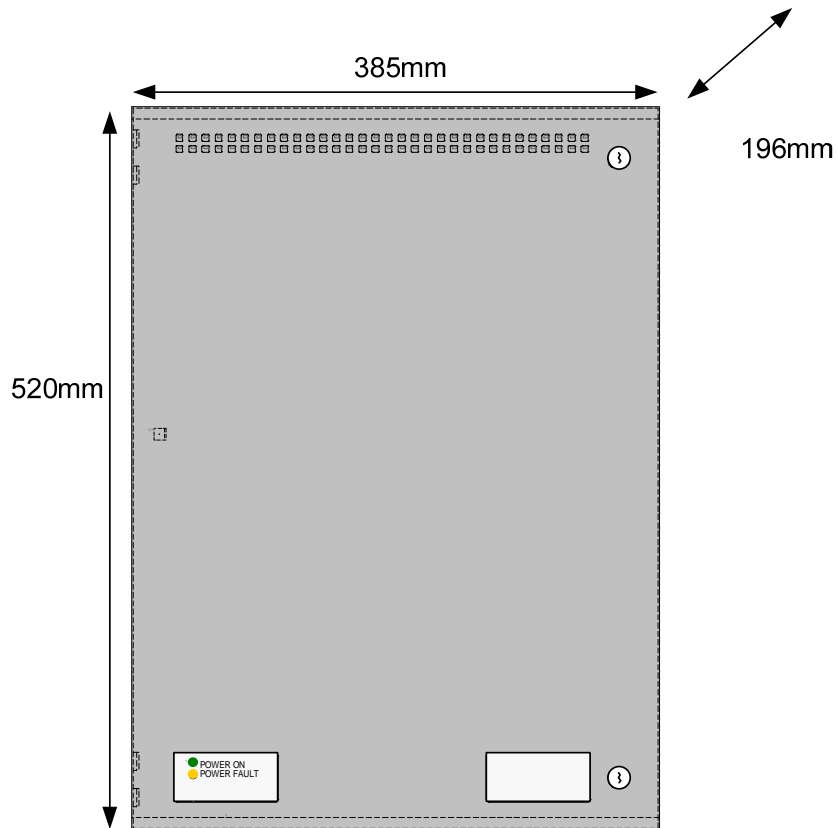
Model	Yuasa	Powersonic
K25800 03	NP4-12, NP7-12, NP12-12, NP-17-12, NP18-12B	PS-1242, PS-1270, PS-12120, PS-12170
K25800 15	NP4-12, NP7-12, NP12-12, NP-17-12, NP-24-12, NP18-12B, NP38-12I	PS-1242, PS-1270, PS-12120, PS-12170, PS-12260, PS-12450
K25800 M3	NP4-12, NP7-12, NP12-12, NP-17-12, NP18-12B*	PS-1242, PS-1270, PS-12120, PS-12170*
K25800 D3	NP4-12, NP7-12, NP12-12, NP-17-12, NP18-12B, NP-24-12, NP-38-12, NP38-12I	PS-1242, PS-1270, PS-12120, PS-12170, PS-12260, PS-12450
KD25800 03	NP4-12, NP7-12, NP12-12, NP-17-12, NP18-12B	PS-1242, PS-1270, PS-12120, PS-12170
KD25800 15	NP4-12, NP7-12, NP12-12, NP-17-12, NP18-12B, NP-24-12, NP38-12I*	PS-1242, PS-1270, PS-12120, PS-12170, PS-12260, PS-12450*
KD25800 M3	NP4-12, NP7-12, NP12-12, NP-17-12, NP18-12B	PS-1242, PS-1270, PS-12120, PS-12170
KD25800 D3	NP4-12, NP7-12, NP12-12, NP-17-12, NP18-12B, NP-24-12, NP-38-12, NP38-12I	PS-1242, PS-1270, PS-12120, PS-12170, PS-12260, PS-12450

## 10. Power Supply Unit Dimensional Drawings





K25800 M3 AND KD25800 M3

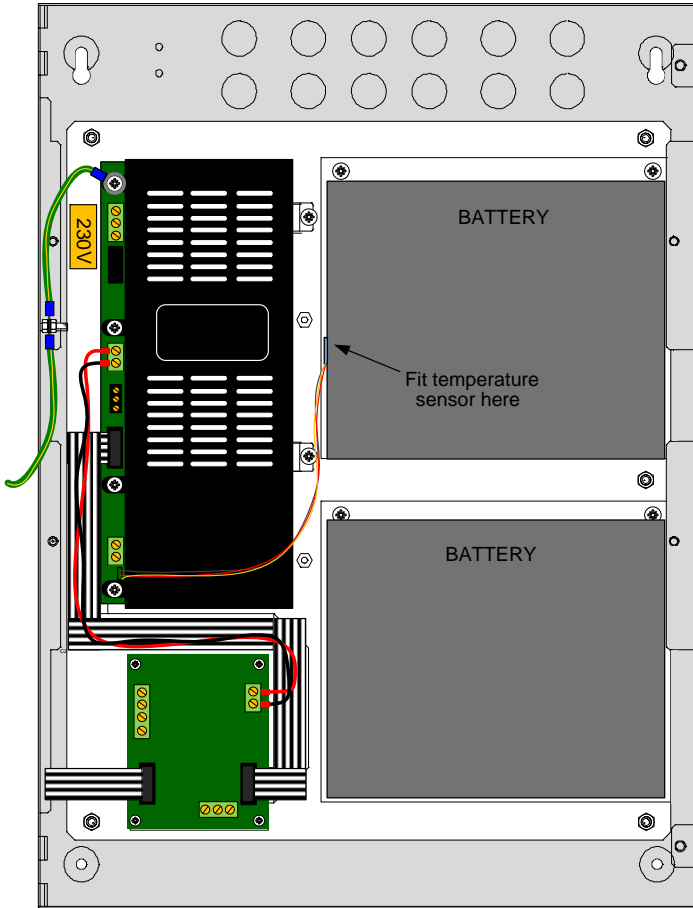


K25800 D3 AND KD25800 D3

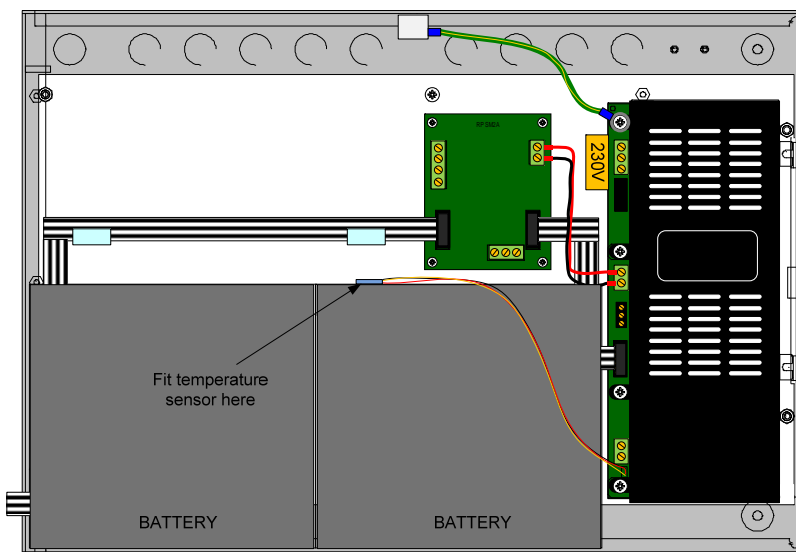
## 11. Temperature Sensor Mounting

To achieve correct battery charging temperature compensation (essential for correct maintenance of batteries) the flying lead thermistor must be affixed to one of the batteries using Scotch 27 Glass Cloth Electrical Tape or equivalent. A suitable piece of this tape is supplied holding the temperature sensor to the power supply chassis.

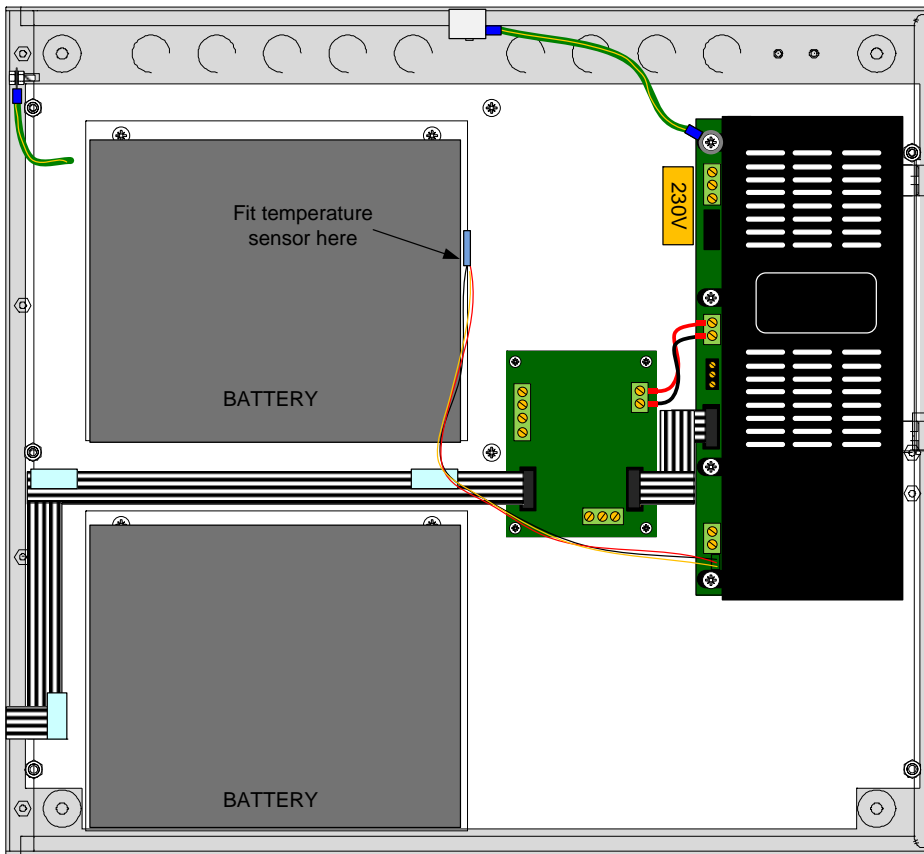
KD25800M3, K25800M3, KD25800D3 and K25800D3 sensor mounting position.



KD2580003 AND K2580003 sensor mounting position



KD2580014 and K2580015 sensor mounting position.





## 12. Cabling

Only fire rated and shielded cable should be used.

Note: For LPCB approved installations use only FP200\*, 1.5mm<sup>2</sup> 2 core cable.

### Mains

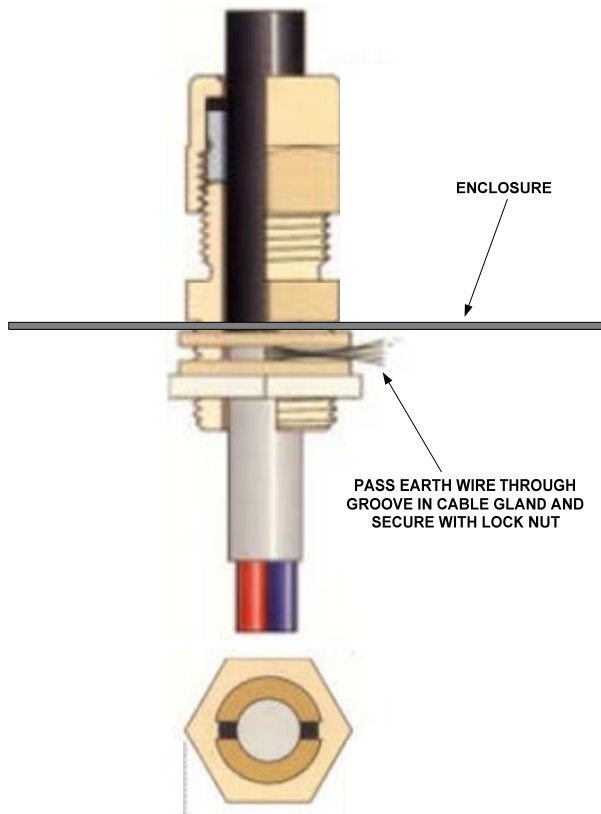
The Mains cable should be a minimum cable size of 1mm<sup>2</sup> and rated at 250V. A suitable primary disconnecting device must be provided in the end use application. Maximum cable size is limited to 4mm<sup>2</sup>.

Keep all mains wiring separate from the Extra Low Voltage (ELV) battery cables and power supply output cables

### Extra Low voltage wiring

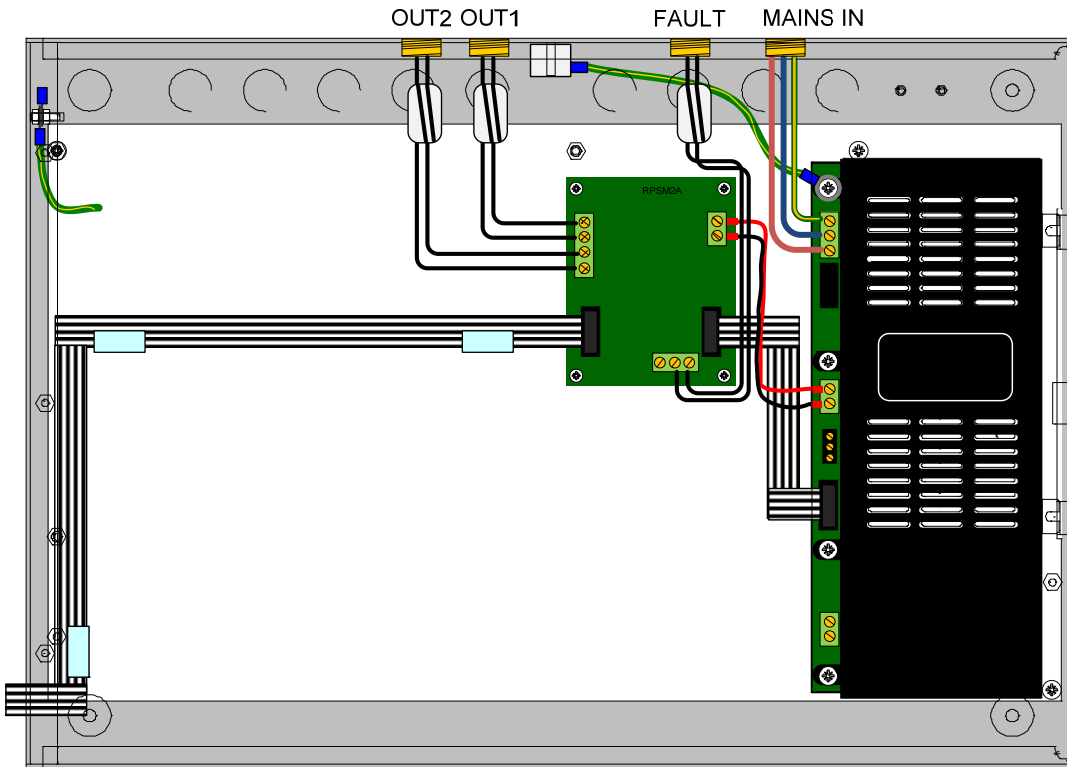
Cable for low voltage wiring should be a minimum size of 1.0mm<sup>2</sup> and rated for at least 30V DC. Keep all Extra Low voltage wiring separate from mains wiring.

All cable entries to the enclosure must be via suitable cable terminating kits such as Pirelli AXT20SK or equivalent. The earth or drain wire must be securely clamped to the cable gland as shown below or trapped between the lock nut and the enclosure with a cut washer.



Fit supplied ferrites by looping the cores of (not the outer sheath) the load output cables and cable connected to fault contact once through the ferrite as shown below.

**For versions fitted with dual power output**



**For versions not fitted with dual power output**

