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40902604 Battery Back Up EN54-4 Power Supply

Key Features

- Power Supply Units comply with the requirements of EN54-4:1997 +A1:2002 +A2:2006, EN55022 class B emissions limits & EN60950-1:2006 safety standards.
- IP30
- Stand alone, 24v, battery charger
- Battery Capacity: 3Ah
- Steel Enclosure
- Wall Mountable
- Rated for fire alarm use
- Cable entry knockouts
- Temperature varying charge for battery protection
- LED supply health and fault indication

Technical Specification

Input Supply 200-240V AC, 50/60Hz, Fuse T3.15H250
Output Voltage Max 28.5V DC, Min 19.7V DC at minimum battery voltage of 21Vwith mains disconnected (Output voltage is VBAT – 1.3V max. at Imax.a) Ripple 200mV max (Note: 1V p-p including switching frequency noise).
Charger Voltage 27.4V DC nominal at 20°C temperature compensated over the range -5°C to +40°C
Output Current (Imax.a = Imax.b) (Imin = 10mA)
2.0A continuous load, 1.0A battery charge
Dimensions Enclosure (H x W x D) 320 x 345 x 88mm 3Kg without batteries
Environment Indoor use
Operating Temperature -5ºC to +40ºC @ full load output
Relative Humidity 95% non-condensing (maximum)
Standby Battery and Internal Resistance 2 x 12V Sealed Lead-Acid Type (Yuasa or Powersonic recommended) 1.6Ω 1.2Ah minimum to 18/24Ah maximum 5
Fault Output Volt free change-over contacts rated 1A @ 30V dc
External Indication Green: Power indicator, Amber: Fault indicator
On board indication Mains Fail, Charger Fail, Battery open circuit, Battery Low & Heartbeat
Deep Discharge protection 19V

Installation instructions

1. Precautions: It is the responsibility of the installer to ensure suitability of this equipment for the purpose intended, to install it in accordance with EN54 Pt 2 & 4 1988 or local authority requirements and to ensure it is correctly commissioned and maintained by a qualified person.

WARNING: Always take full anti-static precautions when handling this electronic equipment. An ESD wrist strap, suitably grounded, should be worn at all times when handling PCBs. These wrist straps are designed to prevent the build-up of static charges, not only within a person's body, but on many other materials. All pcbs should be stored in static shielded bags for safe keeping, when not mounted in the cabinet.

ONLY apply the stated supply voltage to the input terminals marked L N
NEVER supply any high voltage directly to any PCBs contained in the power supply
NEVER mount batteries external to the cabinet
NEVER use unsuppressed or unpolarised coils
NEVER subject unit to liquids
NEVER use a megger or similar test equipment to check cables while they are connected to the Fire Alarm System or any other electronic equipment.
ENSURE swarf, brick dust, wire clipping etc. are not allowed to contaminate the PCBs as this can cause severe damage to the circuits.
ALWAYS isolate the mains supply before connecting or disconnecting the mains supply lead.

2. Mount the cabinet securely to a wall using the fixing holes provided.

3. Knockouts are provided but the cabinet can be drilled, with care, to accept additional cable entries.

4. Ensure all cables are routed neatly and so to avoid contact with any PCBs or components. All cables should be fastened securely into the terminals provided.

5. Connect 2 x 12vdc SLA batteries in series using the battery cables (including link cable) provided.

6. The minimum cable gland used to wire the equipment must have a minimum flame retardant of 94HB.

7. Mains cable min size 0.75mm

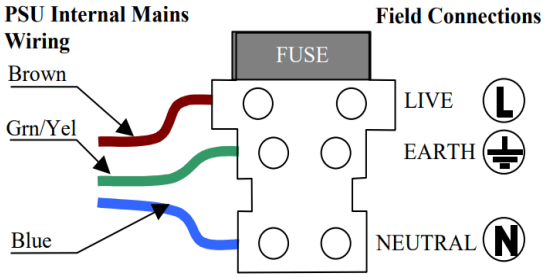
All system wiring should be installed to meet BS5839: Pt 1: 2002 and BS7671 (Wiring Regulations). Other national standards of installation should be used where applicable

Mounting

Secure the cabinet to the wall using the indented holes in the back box. Ensure that the cabinet is mounted level allowing easy access for service. Mount clear from sources of vibration or shock and ingress of water. External cables should be glanded via pre-formed knockouts at the top or bottom of the box as provided.

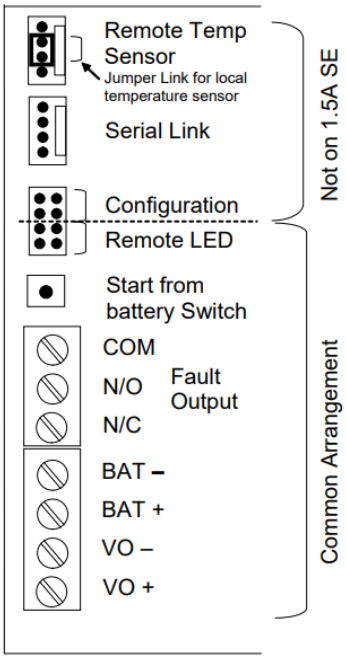
Mains connections

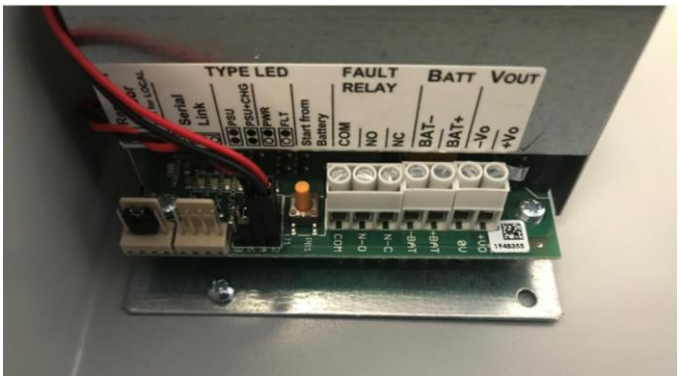
AC Mains Wiring The power supply is classified as Class1 equipment construction and must be earthed in accordance to EN60950 recommendations. Route the high voltage mains AC wiring into the enclosure using a suitable knockout and keeping the AC wiring away from any circuit boards and all other wiring. The panel must be connected to the supply earth through the power cable. The mains input connector is shown in the diagram below. Note the positions of the earth, neutral and live terminal connections. These are clearly marked on the label next to the connector. The connector block contains an integral fuse holder for a 20mm fuse. Secure the mains input wiring using a tie wrap as close to the terminal block as possible. The fuses are rated as follows: T 3.15A H 250V (for all models) Replace with correct rating and specification only. Connect the PSE to the mains supply via a readily accessible, disconnect device (Isolation Switch) and suitable earth fault protection incorporated in the building installation wiring.



Output Connections to Load

Connect the 28V output connections to the load via terminals VO+ & VO– respectively via appropriately rated cable for the output rating: A minimum 0.75 mm² NB Maximum cable size is limited to 2.5mm²





Maximum Cable Resistance: The voltage drop on the output circuit should be calculated to ensure that the minimum voltage at the end of the circuit exceeds the minimum required by the device at the minimum PSE output voltage.

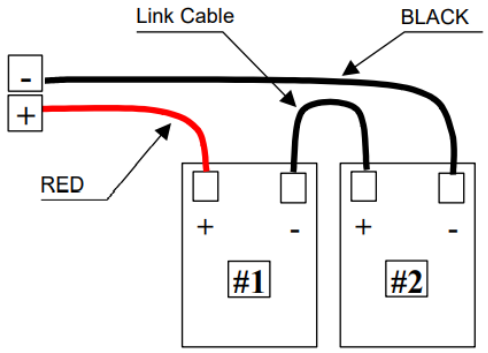
The voltage at the end of the circuit is given by:

Minimum Load Voltage = VOUT(MIN) – (ILOAD x RCABLE)

Minimum Output Voltage (VOUT(MIN)) is VBAT(MIN) – 0.5V = 20.5V
Load Current (ILOAD) is the sum of the loads presented by the devices.
Cable Resistance (RCABLE) is the sum of the cable resistance in both cores x cable length.
Cable Resistance (RCABLE) for 1.0mm2 is 0.036Ω / m Cable Resistance (RCABLE) for 1.5mm2 is 0.024Ω / m Cable Resistance (RCABLE) for 2.5mm2 is 0.015Ω / m

Output connections to the Batteries

The system is designed to charge 24V batteries or two 12V batteries connected in series. Refer to diagram. Use the short black connection link to connect the batteries. Use the Red & Black leads provided to connect the batteries to the BAT+ & BAT– terminals on the PSU. Take care to observe the correct polarity and ensure the battery leads do not become shorted together! Mount the batteries on the bottom of the enclosure.



Fault Output Connections

Power supply/charger fault outputs are provided for in the form of volt free changeover contacts designated COM, N/O & N/C. These are available via three terminal blocks screws – refer to diagram above. The “Fault” relay is held in a normally energised state. It will fail to safety (de-energise) under any power supply/charger “Fault” conditions.

Remote LED indication

A pin header, J1, provides a means for remote/ external indication of “Power” and “Fault” indications. The Green “Power” indicator will be ON continuously when the power supply is being supplied with mains power. The indicator will flash when the mains supply is off and the power supply is being powered from its battery source. The Amber “Fault” indicator will be ON continuously if any of the Fault conditions listed opposite are present: Note: Faults may not be indicated immediately. They will be indicated within the times permitted in EN54-4 (see opposite for nominal times)

Serial Communications

The unit can be connected to a compatible control panel or other peripheral module for communication of the PSE status and voltage / current measurements. A latching pin header, PL2, is provided. Information is provided with the unit / module where this compatible feature is provided.

Remote Temperature Sensor

Provision is made for the connection of a remote battery temperature sensor. This is for applications where the modules are installed in rack mount enclosures or in large enclosures and where the batteries are not located immediately next to the module. A latching pin header, PL3, is provided for connection of the temperature sensor – see opposite and below. If a remote temperature sensor is not used, ensure the jumper is fitted to the centre two pins.

Testing and maintenance

When all connections in the Installation section have been made and checked for correct wiring, switch on the mains power supply; the following conditions should occur:

1. The green "Power" LED should be ON, the "Fault" LED should be OFF.
2. The load should be supplied with power, check this with a voltmeter at the –VO & +VO terminals, the reading should be between 25 & 28.5 volts.
3. The batteries should be charging, check this by connecting a voltmeter across the –BAT & +BAT connections, depending on the state of discharge of the batteries, the voltage should be greater than 24 volts and for batteries approaching their full charge, the output voltage should be approximately 27.4 volts at an ambient temperature of 20°C
4. All on-board diagnostic LED indicators should be OFF, the "Heartbeat" indicator should be FLASHING.
5. The "Fault" relay should be energised. Check that there is a connection between common and normally open (N/O). This connection should indicate a short circuit when checked with a test meter on the continuity setting. The following table indicates the charger voltage against temperature when the batteries are fully charged.

Ambient Temperature ° C	Charger output voltage (minimum)	Charger output voltage (Nominal)	Charger output voltage (Maximum)
-5	27.90	28.10	28.32
0	27.72	27.96	28.20
5	27.54	27.80	28.08
10	27.36	27.66	27.96
15	27.24	27.50	27.78
20	27.12	27.36	27.60
25	27.00	27.20	27.42
30	26.88	27.06	27.24
35	26.76	26.90	27.06
40	26.64	26.76	26.88

Maintenance

Maintenance of the power supply and charger should be minimal. The batteries, however, do have a limited life span and a maintenance program should be in place to determine battery replacement schedules. It is recommended that the charger output should be checked on a yearly basis to ensure the charging characteristics have not drifted.

Standby Batteries Expected Life - 3-5 years at an ambient temperature of 20°C Replacement Schedule - As above. However, note that the expected battery life is shortened by an increase in ambient temperature. The life reduces by 50% for every 10°C rise above ambient. This should be taken into account when assessing battery replacement schedules. Refer to battery manufacturer manuals for further information. Yuasa recommend that batteries, up to 6 months old from date of manufacture, are 'top-charged' prior to installation. To perform the top-charging, use a separate supply and charge at 2.4V per cell (i.e. 14.4V per battery) for 20 hours prior to installing the batteries.

It is not recommended to use batteries that are older than 6 months from the date of manufacture on a new installation. It is quite normal for lead-acid batteries to vent hydrogen when being charged.

The panel is adequately ventilated to dissipate this hydrogen. DO NOT seal the enclosure or install in a sealed enclosure or cavity.

It is not recommended to use batteries that are older than 6 months from the date of manufacture on a new installation.

BATTERY DISPOSAL

Re-cycle all exhausted batteries. Return to the battery manufacturer or dispose of batteries in accordance with the applicable local legislation.