

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

A1584 15 AMP POWER SUPPLY

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1. Introduction

Thank you for purchasing this 15A Power Supply Unit. This power supply is designed to the requirements of EN54-4. This power supply will provide the user with many years of reliable service.

NOTE: It is important to read this manual before commencing installation.

2. WARNING

IMPORTANT NOTE ON BATTERIES:

DANGER: *Batteries are electrically live at all times, take great care never to short circuit the battery terminals.*

WARNING: *Batteries are often heavy, take great care when lifting and transporting batteries. For weights above 24kg, lifting aids should be used.*

WARNING: *Do not attempt to remove the battery lid or tamper with the battery internal workings. Electrolyte is a highly corrosive substance and presents significant danger to yourself and to anything else it touches. In case of accidental skin or eye contact, flush the affected area with plenty of clean, fresh water and seek immediate medical attention.*

VRLA batteries are “low maintenance” requiring no electrolyte top-up or measurement of specific gravity. Always refer to the battery manufacturer’s data.

WARNING: *If required, clean the case of the battery with a cloth that has been soaked or dampened with distilled water. Do not use organic solvents (such as petrol, paint thinners, benzene or mineral spirits) and other materials can substantially weaken the case.*

WARNING: *Avoid charging the batteries in float/standby applications outside of the range quoted by the battery manufacturer.*

WARNING: *Do not incinerate batteries. If placed in a fire, the batteries may rupture, with the potential to release hazardous gases and electrolyte. VRLA batteries contain substances harmful to the environment. Exhausted batteries must be recycled. Return them to the battery manufacturer or take them to your Council tip for appropriate disposal.*

The volt-free contacts provided on the A1584 must not be used directly to switch any voltage which exceeds 60V a.c @ 0.5 Amps or 24VDC @ 1 Amp.

This equipment requires a 230V a.c supply. All installation work should be carried out in accordance with the recommendation of BS5839 Part 1 and the current edition of the IEE regulations by suitably qualified and trained personnel.

This power supply is suitable for indoor use only and must be installed in a dry and clean area.

This power supply must be earthed.

3. General Description

The A1584 15 Amp power supply has been designed to meet EN54-4.

The power supply requires a 230volt AC input and provides three separate outputs of 28volts DC, 5 volts DC and a temperature compensated 27.5 volt DC (float) output for battery charging. The 28volt output is derived from the DC output of the switchmode power supply, whilst the 5VDC output is derived via a regulator on the A1584 controller board. In the event of Mains failure, the power supply will automatically change over to the standby batteries.

The power supply has 9 LED status indicators to indicate what type of fault has occurred on the power supply.

The power supply consists of a steel mounting chassis with the A1584, a switchmode power supply and a fused mains input terminal block.

4. Specification

Mains Input	230 V a.c +10%, -6%
Frequency	50Hz
Maximum Input Power	532VA (power factor corrected)
Control Supply Output	Voltage 28VDC +/- 4% (current 10 amps max)
5/8 volt Supply Output ¹	5/8 VDC @ 3 Amps max
Battery Charger Output	27.5VDC (adjustable from 22.5V to 29V via VR1) temperature compensated (-10°C to +50°C).
Over current protection	Control Supply: Threshold @ >105% of rated output current (autorecovery). 5VDC output ¹ : Foldback limited. Battery Charger: 3 Amps.
Fuse Ratings	Mains: 5 Amp Antisurge (T) 5 x 20mm Battery: 15 Amps Fast Blow 32mm (1.25")
Battery Shut off Voltage	Less than 18Volts DC
Common Fault Output	Open collector output (active high) ²
Mains Fault Output	Open collector output (active high) ³

Note 1: The A1584 has a 5VDC output and its associated fault indication, labelled as 5/8V REG. It is possible to obtain an 8VDC output by replacing R27 with a 2k7 Ohm 1/4W resistor.

Note 2: When the respective fault is detected by the A1584 a delay of 3 seconds is initiated and if the fault still exists after this delay period the Common Fault output (CF) is activated.

Note 3: When a fault associated with the Mains input is detected by the A1584 a delay of 2 seconds is initiated and if the fault still exists after this delay period the Mains Fault output (MF) is activated.

5. Termination List

BATT+ Battery charger terminal 27.5volts, 2 amps max. two terminals, 2.5mm² cable max.

BATT- Common 0 volt terminal, two terminals, 2.5mm² cable max.

THERM Thermistor input, two terminals, 2.5mm² cable max.

Mains (LNE) 2.5mm² cable max.

29VDC INPUT

+ Two terminals, 2.5mm² cable max.

- Two terminals, 2.5mm² cable max.

OV Common 0 volt output, two terminals, 2.5mm² cable max.

28V Common 28 volt output @ 15 Amps max, two terminals, 2.5mm² cable max.

5V Common 5 volt output @ 3 Amp max, two terminals, 2.5mm² cable max.

CF Power supply Common fault output, open collector, one terminal, 2.5mm² cable max.

MF Mains Fault output, open collector, one terminal, 2.5mm² cable max.

P Common pole of the volt-free change over relay, one terminal, 2.5mm² cable max

C⁴ Normally closed during fault free condition, open circuit during fault detection, one terminal, 2.5mm² cable max.

O Normally open during fault free condition, closed when fault is detected. One terminal, 2.5mm² cable max.

NOTE4: Contacts is normally energised.

NOTE5: The volt-free SPCO relay has contacts which are rated to 1A @ 24VDC.

6. Adjustments and Indications

TABLE 1. Description of Fault Indicators and their functions on the A1584

INDICATOR	FUNCTION	COLOUR	COMMENTS
PROC	Processor Fault	Amber	Flashes whenever the processor fails to update the external hardware watchdog and whenever a memory error has been detected by the onboard processor.
BATT	Battery Fault	Amber	Flashes whenever the battery input has a short circuit, single battery connected, or battery voltage rises above 29.5VDC.
L/BATT	Low Battery Fault	Amber	Flashes whenever standby power (battery) falls below 19VDC.
CHARGE	Charger Fault	Amber	Flashes whenever battery is disconnected, battery voltage is above intended charge voltage.
EARTH	Earth Fault	Amber	Flashes whenever a earth fault is detected.
5/8V	Regulated 5/8V Fault	Amber	Flashes whenever 5VDC regulator output is above 9VDC and below 4VDC.
MAIN	Mains input fault	Amber	Flashes whenever the DC input from the switchmode unit falls below 28V DC or above 30VDC.
THERM	Thermistor Fault	Amber	Flashes whenever Thermistor input resistance falls outside its resistance range (800 Ohms to 52kOhms)
PSU OK	PSU Healthy	Green	Illuminates whenever unit is not displaying any detected faults. Turns off whenever charger is checking the presence of the battery.

TABLE2. Description of the User Controls and their function on the A1584

User Control	Designation/Location	Comments
EARTH CAP DISABLE	JP1	When link is removed the 10uF Earth Capacitor is disabled.
EARTH FAULT DISABLE	JP2	When link is removed Earth faults are disabled.
TEST LAMPS PROC FAULT RESET	SW1	When pressed all the amber fault LEDs illuminate except for PROC fault. Also clears the Memory Checksum Fault Flag and the PROC fault LED.
RESET PROC	SW2	Resets the on board processor
VSET	VR1	Manual adjustment for Battery Charge voltage.

7. Installation Procedure

WARNING: Please read this section completely before commencing installation.

Prior to commencing installation of the power supply, ensure that adequate precautions are taken against static damage to the sensitive electronic components on the A1584 board. You should discharge any static electricity that you may have accumulated by touching a convenient earthed object.

The power supply unit should be located in a clean, dry position which is not subject to shock or vibration and at least 2 metres away from Pager systems or other radio transmitting equipment. The maximum temperature range is -10°C to $+50^{\circ}\text{C}$ @ 20%-90% humidity. The p.s.u incorporates a switchmode power supply that has a thermostatically controlled cooling fan. Therefore, ensure that adequate ventilation is provided at all times over the temperature range stated.

Enclosure/Housing

This type of power supply can be housed within an R3 rack enclosure (forming part of a system) or a standalone enclosure which can incorporate 2 x 12V rechargeable Lead Acid Batteries. The power supply should be mounted on to a metal chassis or back plane using the 5 off M5 x 20mm bolts provided. Figure 1 provides information relating to the dimensions and location of the five fixing holes. Drill 5 off 5.5mm diameter fixing holes into the intended backplane/chassis using drill. Each of the five bolts should be spaced with the M5 x 6mm spacers provided.

Earthing Arrangement.

The Mains primary earth point must be connected to the Earth Stud on the p.s.u chassis. This can be achieved by terminating the earth lead with a ringed earth connector with an inner diameter of approximately 4mm. This should be secured to the chassis earth stud with the M3 nut and washer provided. Additional earth connections are also made to the power supply Mains Filter and to the Earth connection (FG) of the switchmode power supply.

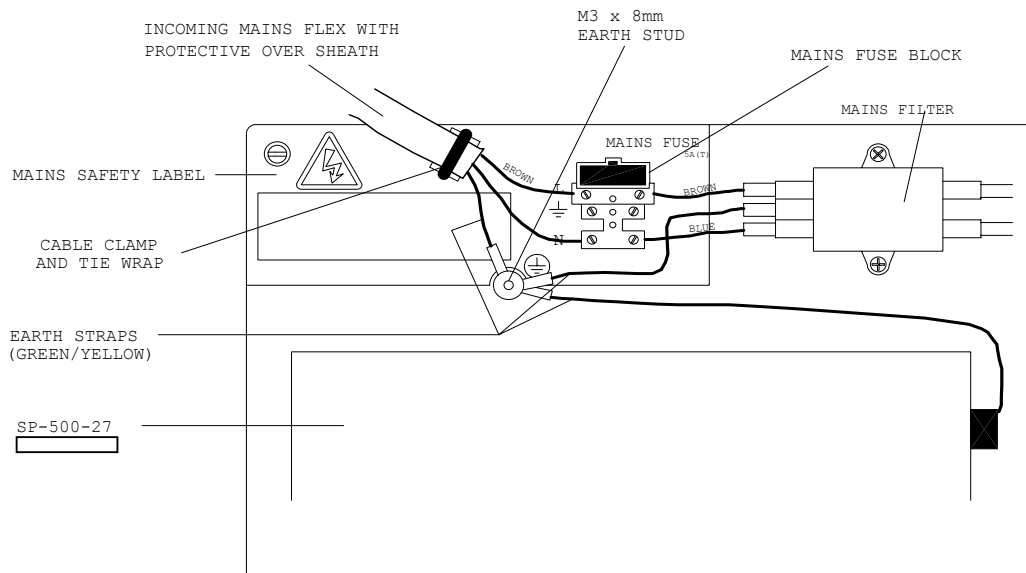


Figure2. Earthing arrangement for the 15Amp Power Supply Unit.

Cable Entries

Gland the installation wiring into the enclosure using the cable entry points as applicable. Connect the 230V a.c input to the Mains Terminal Block as shown in Figure 2. A Mains cable grip is provided on the p.s.u chassis which utilises a tie wrap arrangement.

8. Commissioning

The following procedure is to be followed to safe guard equipment and prevent personal injury. The equipment uses dangerous voltages and stores electrical energy, therefore commissioning and testing must be carried out by qualified personnel.

All electrical installation and testing must be carried out in line with BS7671: 1992.

Commissioning Procedure

1. Carry out visual inspection and carefully check for any damage, which may have occurred during transit.
2. Equipment should first be checked to ensure that any connections, which may have become loose during transit are tightened.
3. Ensure that all external cables to be connected to equipment are suitably rated. Also check that all cable glands are correctly earthed.

As a minimum:
 - i) Carry out a visual inspection of the installation for compliance to the regulations and is free of damage.
 - ii) Check the protective conductor continuity.
 - iii) Measure insulation resistance
 - iv) Verify the polarity of the conductors.
 - v) Measure the earth loop impedance.
 - vi) Test the operation of any ELCBs.
(refer to BS7671 for full details)
4. **Please note megger test equipment is not permitted to be used while connected to the power pack, otherwise will cause serious damage to internal components.**
5. As the equipment relies primarily on natural convection for cooling purposes, it is important that the enclosure is checked / sited in a position with a free flow of air. This also applies to equipment fitted with cooling fans.
6. Connect the A.C mains supply to the mains terminal, making sure to connect to the input voltage stated in manual. Connect the earth connection to the earth stud provided and check all other earth points are firmly connected.
7. Before connecting any other external connections remove the mains fuse. Switch on the A.C mains supply and check supply voltage and polarity are correct. Replace the fuse and check that the power supply unit indicates the correct indications as per the information contained in this document. Check power supply D.C output voltages are correct as per the information contained in this manual.
8. Caution to be exercised when connecting batteries, ensure correct polarity is observed, ensure correct battery type (2 x 12V sealed rechargeable lead acid) is used.

There are no user serviceable parts and no user functions. All maintenance and repair work must only be carried out by authorised and fully trained How Fire/C.E.L personnel.

The occurrence of a PSU fault should be indicated at access level 1 (applicable to Fire Alarm System applications). If a power supply fault is indicated then call the authorised Service/Maintenance Engineer.