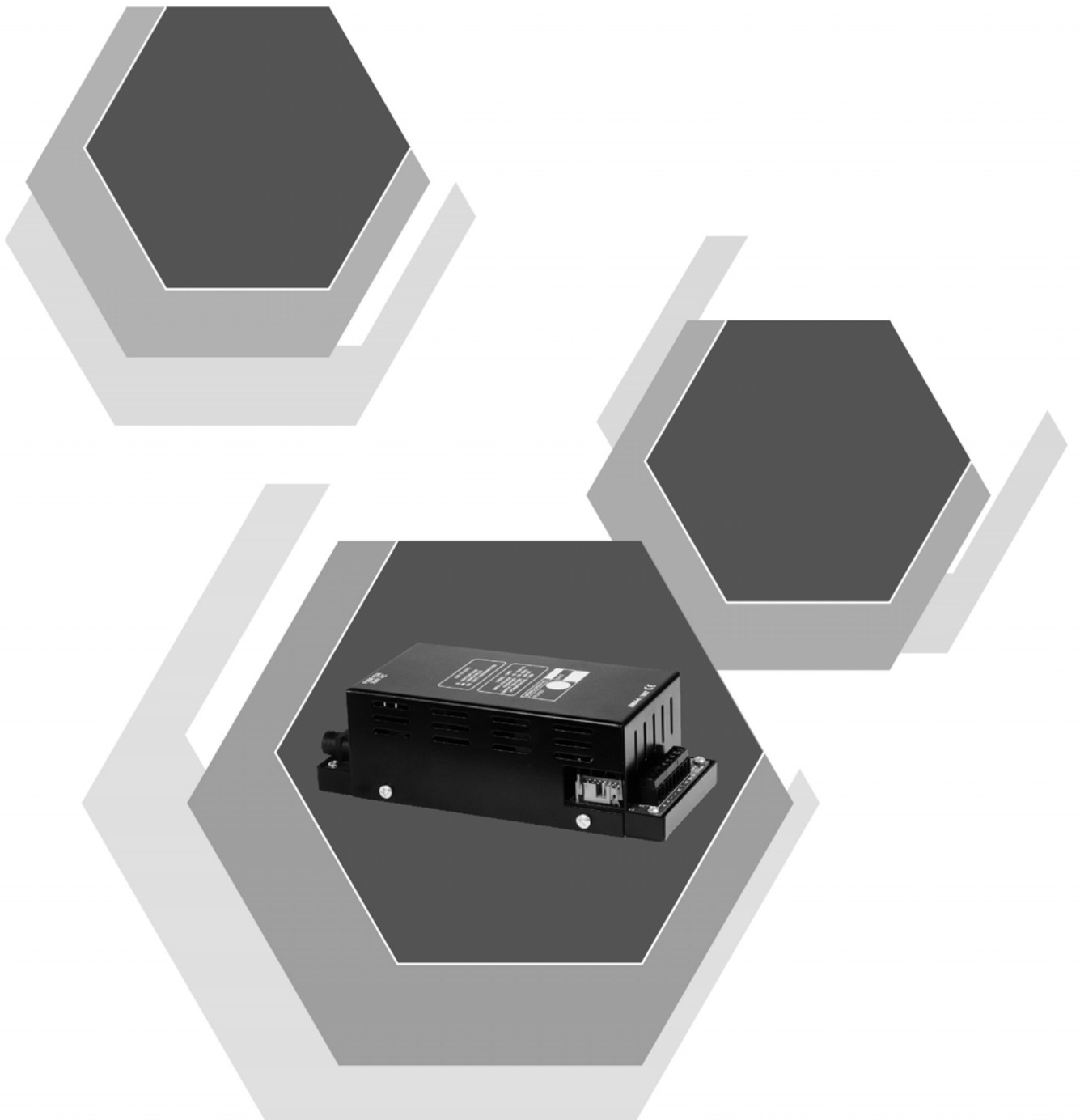


# S405 PSU

## 2.5 Amp Switching Power Supply

### Users Documentation

Man-1063 Issue 04 June 2013



## General description

The S405 is a combined power supply and battery charger designed to be used for fire alarm control and indicating equipment complying with EN54-2 and EN54-4.

When the S405 is supplied as a chassis mounting component it will need to be mounted inside an enclosure to meet the requirements of EN54-4. Suitable enclosures are separately available to accommodate varying sizes of standby batteries.

To satisfy the requirement of clause 6.4 of EN54-4, a separate interface needs to be fitted inside the PSE enclosure which allows the transmission paths to the control panel to be duplicated to enable one transmission path to continue to operate in the event of failure of the other.

## Power requirements

The S405 requires a mains power supply of between 98 and 253 V AC. Mains frequency 47 to 63 Hz.

## Input/output electrical ratings

<b>Input –</b>	min 98V AC 500mA, max 260 V AC 2 Amps
<b>Load output –</b>	19V DC min (battery at minimum) 28 V DC max (mains on) max current 1.8 Amps (2.5 Amps with fully charged battery).
<b>Battery charging output –</b>	26.4 V DC (at 40 C) 28.9 V DC (at –5 C) max current 0.7 Amps.
<b>Fault signals -</b>	switched negative (with respect to load positive).  Mains fail Battery disconnected Battery low (Low battery warning voltage – 21 V (+/- 1 volt)) Volt free changeover contact rated at 1Amp 30 Volts DC.

## Fuse ratings

<b>Input fuse -</b>	20mm glass, HRC, 250V, 2 Amp.
<b>Load fuse –</b>	self-resetting polyfuse 2.5 Amp rated. (not replaceable)

## Batteries

Rechargeable, sealed lead acid Yuasa or equivalent. Maximum capacity 7 Ah.

Quiescent current in mains failure mode – 30 mA max.

## Installation information

### Environmental considerations

The S405 PSU should be mounted in a steel enclosure with an ingress protection rating of IP40 minimum.

The maximum operating temperature range should not exceed –5 (+/-3) to +40 (+/-2) degrees centigrade.

Humidity levels should not exceed 96% (non-condensing).

### Mounting

The S405 may be mounted in any orientation taking into account the requirements of EN60950 regarding creepage, clearance, marking and segregation but should remain accessible for fuse replacement and to access screw terminal connections.

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.

### Connecting to the input

**Do not connect a mains supply unless the supply voltage matches that shown on the rating plate.**

Connect the Live, Neutral and Earth to the terminals on the circuit board as indicated on the PCB.

Ensure that all wires are fitted into the terminals without any exposed lengths or strands which may give rise to exposure to electrical shock.

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.

### Connecting to the outputs

#### Battery connections

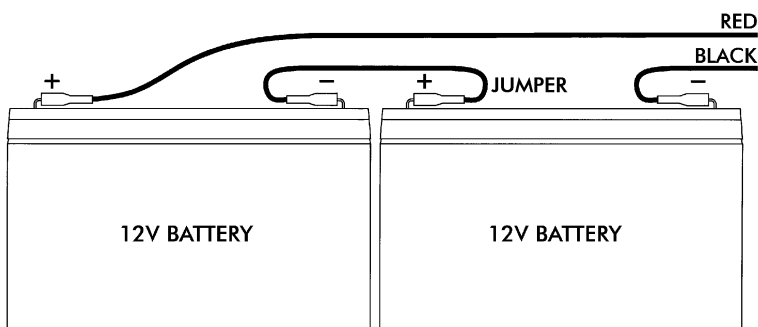
Batteries of even very small capacity are capable of delivering very high currents which can cause fire or injury. Battery connections must therefore be handled using extreme caution.

As supplied, the S405 PSU has battery leads already wired to the battery terminals on the circuit board. These leads are coloured red for + and black for - .

As this is a 24-Volt system, there will normally 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. The batteries should therefore be in the same enclosure and in close proximity to the power supply unit wherever possible.

The batteries must be connected as shown below.



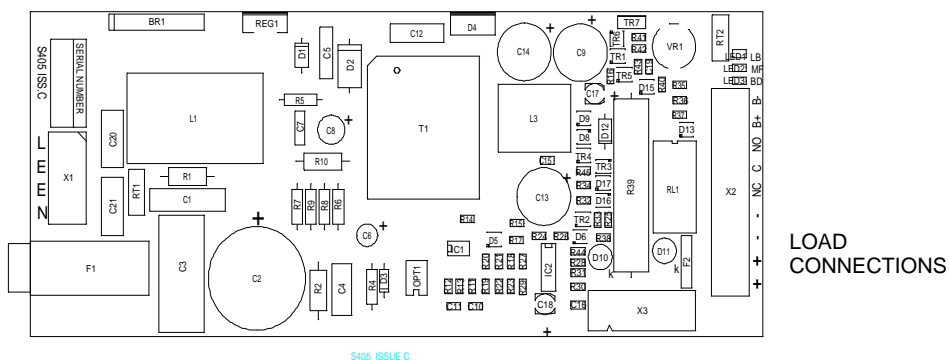
#### Load connections (terminal block)

Four terminals are provided for connection of the load. Two + terminals and two - terminals.

The load should be connected using wire rated for at least 2.5 Amps.

Maximum cable size should be 2.5mm<sup>2</sup>.

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.

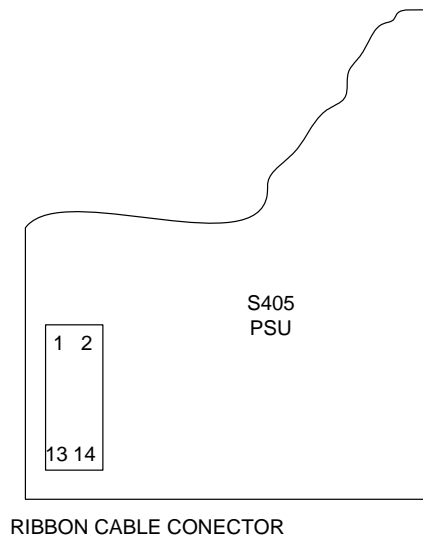


## Load connections (ribbon cable)

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

A standard latching ribbon cable header is provided on the board, which may be used to connect to the load, and fault signals, which are provided on the terminal block.

- 1 - NEGATIVE
- 2 - NEGATIVE
- 3 - NEGATIVE
- 4 - NEGATIVE
- 5 - POSITIVE
- 6 - POSITIVE
- 7 - POSITIVE
- 8 - POSITIVE
- 9 - BATTERY DISCONNECTED
- 10 - MAINS FAIL
- 11 - BATTERY LOW
- 12 - NOT USED
- 13 - NOT USED
- 14 - NOT USED



## Commissioning

Once all connections have been made and checked for safety, the mains power can be switched on. The load should now be supplied with power and the batteries should be taking a charge.

Check that the load is being supplied by observing the power on lamp on the load (control and indicating equipment). Remove the mains power and ensure that the batteries continue to supply power to the load.

With the mains removed, the MF LED should light after about 90 seconds and the fault contact should operate.

Switch the mains back on and disconnect the battery. The load should continue to operate, the BD LED should light after about 30 seconds and the fault contact should operate.

With the battery disconnected, measure the output voltage from the power supply battery terminals with a calibrated digital voltmeter. The voltage should be within 0.2 Volts of the value indicated on the voltage/temperature graph on page 7.

This completes the basic commissioning checks.

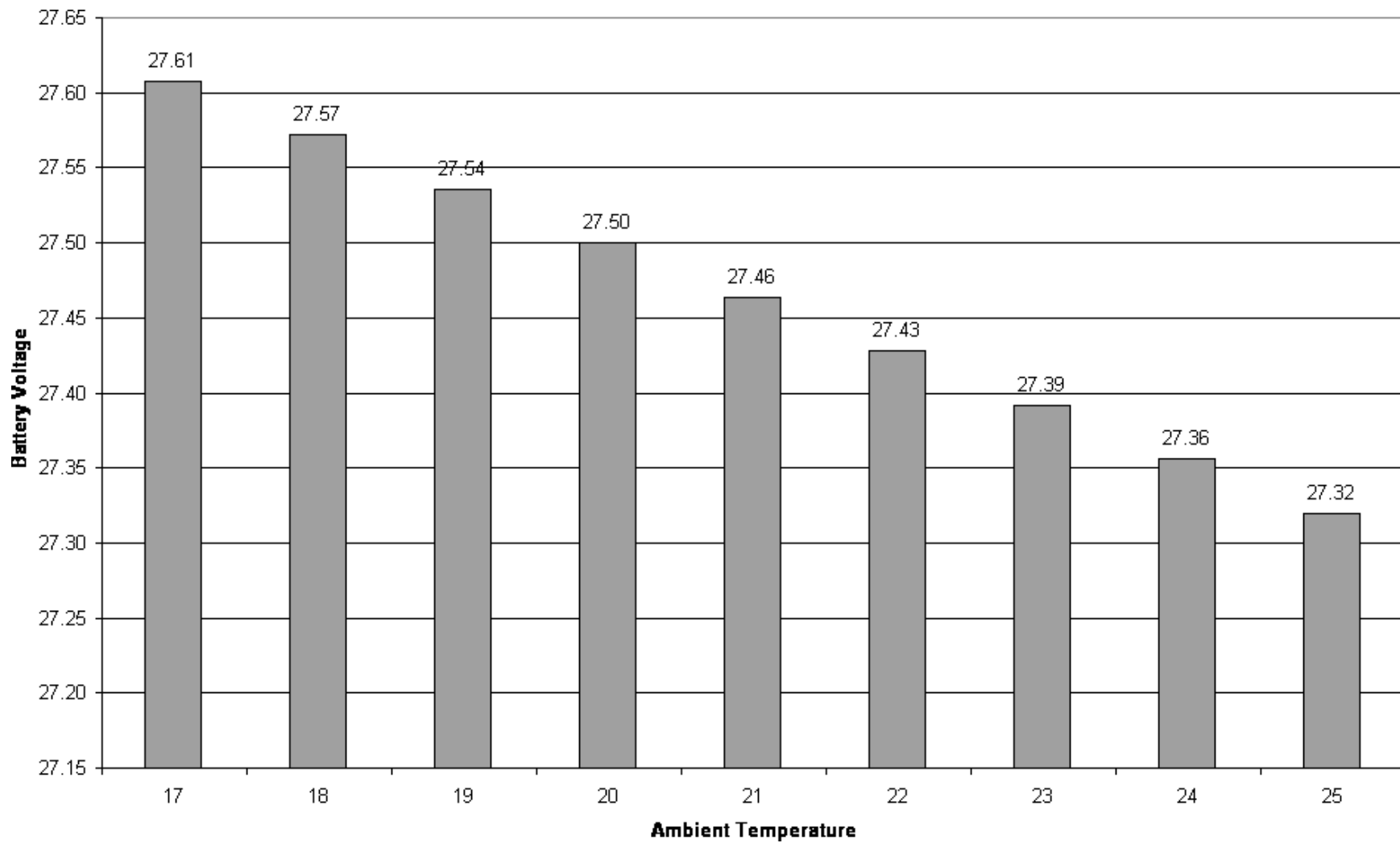
## Maintenance

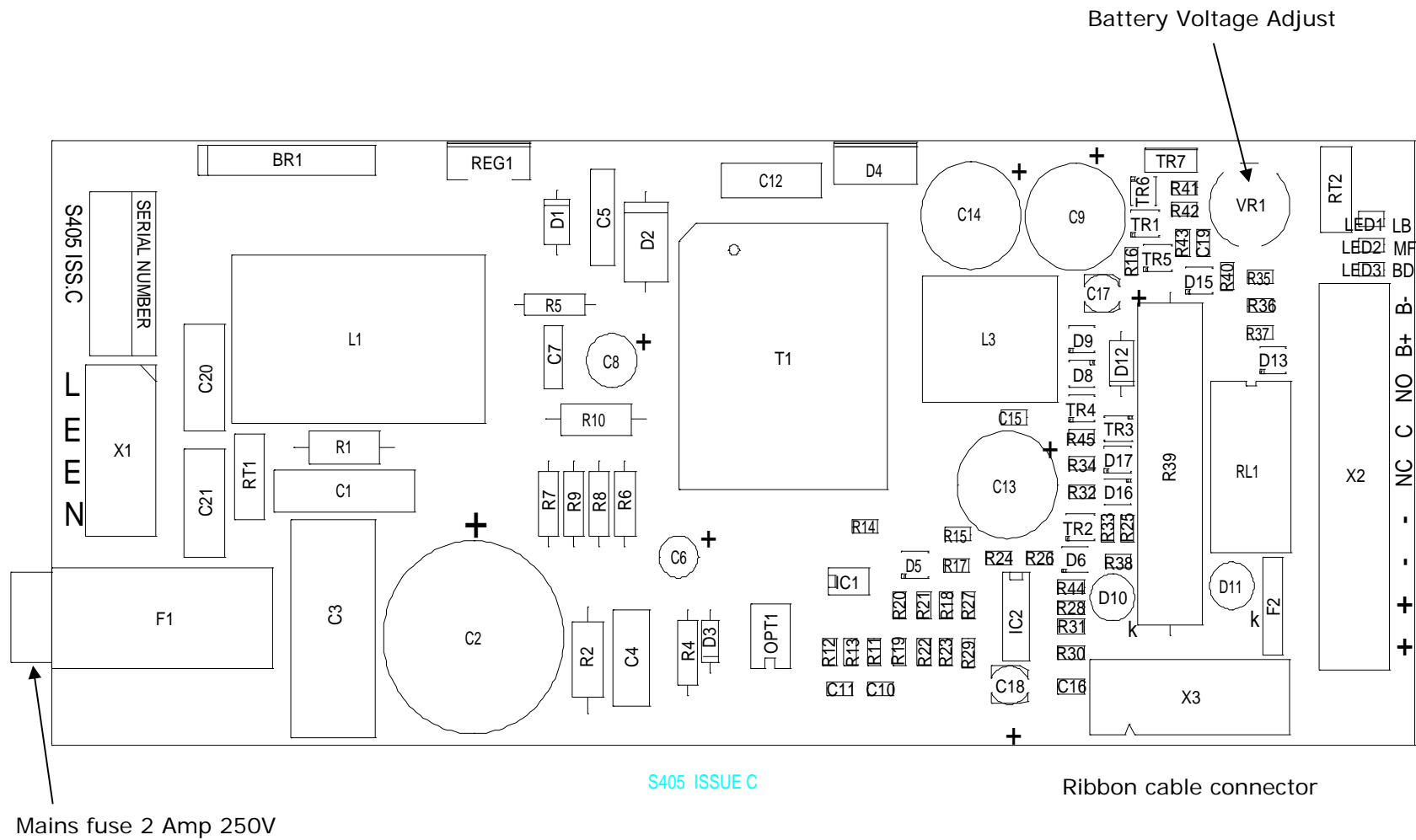
This equipment requires no maintenance, however, sealed lead acid batteries have a limited lifespan and should be checked in accordance with the manufacturers recommendations.

It is advisable to check the battery charger output voltage once per year to check that the output has not drifted.

To do this the batteries should be disconnected and the output voltage measured with a calibrated digital voltmeter. The voltage should be within 0.2 volts of the indicated voltage on the voltage/temperature graph below.

**REMOVING THE PSU COVER EXPOSES HIGH VOLTAGES AND SHOULD BE DONE WITH EXTREME CAUTION BY QUALIFIED PERSONNEL ONLY.**





## Dimensions

