

HELIOS

POWER SOLUTIONS

User's Manual

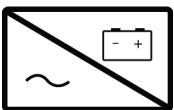
SR500HL Power Supply/ Float Charger for Lead Acid Batteries 500W



STANDARD FEATURES



3 Relay Alarms-Form C



Float Charger –Lead Acid Batteries

OPTIONAL FEATURES

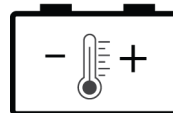


Comms:

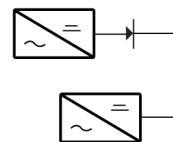
- RS232
- RS485
- Modbus RTU
- SNMP V1 & Webpages



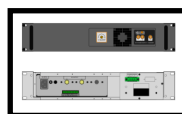
Customizable Digital I/O



Temperature Sensor on 1.7m lead with adhesive pad: -4mV / °C / cell ±10%



N+1 Redundancy



Rack Mounting



Internal Meter

7/07/2022

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1. SAFETY

The user is responsible for ensuring that input and output wiring segregation complies with local standards and that in the use of the equipment, access is confined to operators and service personnel. A low resistance earth connection is essential to ensure safety and additionally, satisfactory EMI suppression (see below).

HAZARDOUS VOLTAGES EXIST WITHIN A POWER SUPPLY ENCLOSURE AND ANY REPAIRS MUST BE CARRIED OUT BY A QUALIFIED SERVICEPERSON.

Electrical Strength Tests

Components within the power supply responsible for providing the safety barrier between input and output are constructed to provide electrical isolation as required by the relevant standard. However EMI filtering components could be damaged as result of excessively long high voltage tests between input, output and ground. Please contact our technicians for advice regarding electric strength tests.

Earth Leakage

Where fitted, EMC suppression circuits cause earth leakage currents which may be to a maximum of 3.5mA.

Ventilation

High operating temperature is a major cause of power supply failures, for example, a 10°C rise in the operating temperature of a component will halve its expected life. Therefore always ensure that there is adequate ventilation for the equipment. Batteries in particular suffer shortened lifetimes if subjected to high ambient temperatures.

Water / Dust

Every effort must be made in the installation to minimise the risk of ingress of water or dust. Water will almost always cause instant failure. The effects of dust are slower in causing failure of electronic equipment but all electrical equipment should be cleaned free of any dust accumulation at regular intervals.

Electromagnetic Interference (EMI)

Switching power supplies and converters inherently generate electrical noise. All wiring should be as short as practicable and segregated from all equipment wiring which is sensitive to EMI. Residual noise can be reduced by looping DC wiring through ferrite cores (sleeves). These are most effective as close to the power supply as possible and as many turns of the wire taken through the core (+ and - in the same direction) as the core will accommodate.

External fuse protection

Fuses or circuit breakers must be used in all battery circuits to protect against short circuits. External fuses should be used for power supplies/chargers even though they are usually internally protected.

Connection polarity

It is critical to check the polarity carefully when connecting DC devices even with models which have non-destructive reverse polarity protection.

Glossary of terms used in our user manuals

PSU = power supply unit

BCT = battery condition test

ECB = electronic circuit breaker

ELVD = electronic low voltage disconnect

RPP = reverse polarity protection

EMI = electromagnetic interference

SNMP = Simple Network Management Protocol

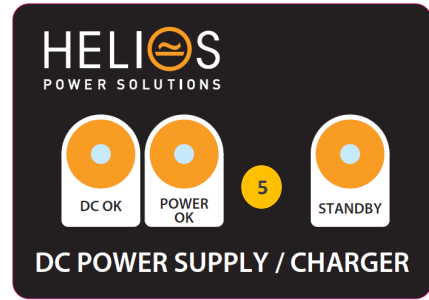
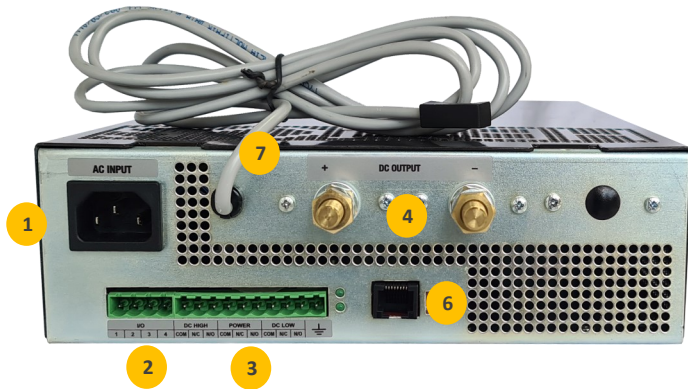
EMC = Electromagnetic compatibility

DOD = depth of discharge

2. INTRODUCTION:

The SR500HL range is designed for use as a reliable and stable AC to DC power supply, or float charger for lead acid batteries. Note that for float charging the output voltage must be set to approximately 15% above the nominal battery voltage models. This is done as the default voltage for the 12V model but must be specified at time of order for all higher voltage models.

3. FRONT & BACK PANEL LAYOUT



1. **AC INPUT IEC60320 - C13 10A**
2. **Digital Inputs (pins 1,2)/ Input or Output (pin 3)/ Return (pin 4) I/O terminals** are customizable and if used, the product will have a unique code.
3. **ALARMS RELAY FORM C:** Relay contacts shown in de-energised state (ie. When there is a fault condition). Alarm relays are energised when power supply is operating normally, eg. "Power" alarm relay is energised when input voltage present.
 - **DC HIGH:** DC Output High.
 - **POWER:** Loss of mains input power. This alarm has 30 seconds delay before activation upon mains failure. PSU fails
 - **DC LOW:** DC Output Low or Battery voltage low if used as a charger.
 - **Fan Fail/Stall:** There are two fans inside the SR500HL unit and will give an alarm with one or both of the fan is stalled or failed. When fan is stall/fail alarm occurs is display through the DC high alarm relay (DC high relay will toggle every 5 seconds) and slow flashing of the POWER OK LED. If a fan fail/stall occurs at the same time as DC High, the relay will activate like normal, but every 5 seconds it will toggle showing fan fail/stall alarm.
4. **DC CONNECTIONS:** M8 brass stud (shown on the picture above), plug-in style phoenix socket & mating screw terminal and plug-in style Anderson connector options. Where screw/plug in terminals are fitted both terminals must be used if the power supply current exceeds 20A. This is to ensure that the current rating.



Plug-in style Phoenix DC Terminals



Plug-in style Anderson DC Terminals

4. LED INDICATIONS CODE

DC OK: DC output is present, either from PSU or battery

POWER OK: Mains fail and/ Or internal PSU fail.

STANDBY: Power supply unit off

| DC OK | POWER OK | STANDBY | Condition |
|-------|----------|---------|---|
| | | | System Normal: Input power on, Battery output levels ok |
| | | | DC Output Low: Input power on and battery has discharged to < Battery Low |
| | | | DC Output High: Input power on, Battery output high |
| | | | Mains fail: No mains and battery output levels low |
| | | | Fan fail/stall: Input power on and DC OK. The Power OK LED will slow flash during this 5 second period |
| | | | Fan fail/stall and DC High alarm on: DC OK LED will fast flash to show DC high alarm. Power OK LED will slow flash to show fan fail/stall |
| | | | PSU is in standby: Turns the output of the power supply off. If there is a battery connected, the DC OK LED remains on even though the power supply in turned off (except for -P versions with output diode) |
| | | | PSU is in standby and battery has discharged to < Battery Low |

LEGEND : =On =fast flash =slow flash =Off

5. ALARM TERMINAL LAYOUT

| I/O | | | | DC HIGH | | | POWER | | | DC LOW | | | |
|-----|---|---|---|---------|-----|-----|-------|-----|-----|--------|-----|-----|--|
| 1 | 2 | 3 | 4 | COM | N/C | N/O | COM | N/C | N/O | COM | N/C | N/O | |

Relay contacts shown in **de-energised** state (ie when there is a fault condition). Alarm relay are energised when power supply is operating normally. **DC OK** alarm indicates either DC low or DC high.

6. COMMS PORT

- RS232 (ASCII) <https://www.heliosps.com/sr-series-downloads/#rs232-rs485-commands-sr-series>
- RS485 (ASCII) <https://www.heliosps.com/sr-series-downloads/#rs232-rs485-commands-sr-series>
- Modbus RTU <https://www.heliosps.com/sr-series-downloads/#serial-modbus-rtu-sr-series>
- SNMP, Webpages <https://www.heliosps.com/sr-series-downloads/#snmp-sr-series>

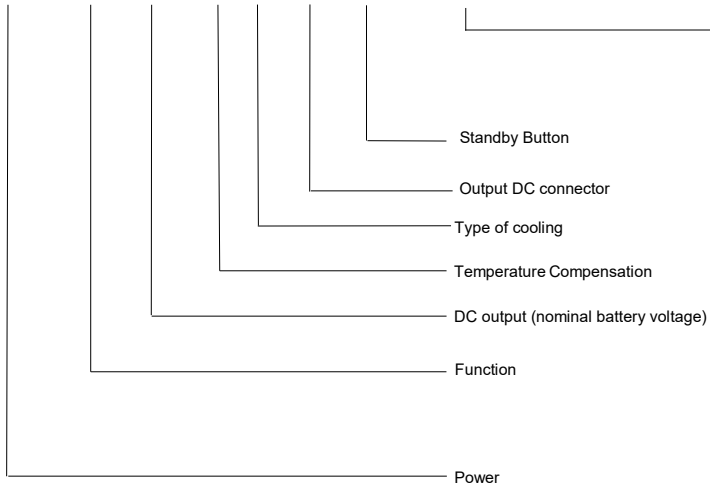
Note: A battery is required on the output for the communications to continue working in the event of an input/internal converter failure.

7. FG - FRAME GROUND

Where provided this terminal provides a connection to the metal case for earthing.

8. MODEL CODING AND OPTIONS

SR500HL 12 T F X L DC 485+



Options:

485 = RS485, **232** = RS232, **LAN+**=SNMP/Webpages, **485+**=Modbus RTU

DC = 90-135VDC input (blank = AC input) **U** = 110VAC optional input voltage

Turns output on/off

X = Pluggable connector **S**= Stud **A**= Anderson Connectors

F = Fan

T = Yes **Blank** = No

12, 24, 30, 36, 48VDC

HL = DC PSU/charger

HI = **No-Break™** DC UPS - 3 terminal output (separate battery output (See separate datasheet)

500W

9. N+1 REDUNDANCY

An external diode is required for N+1 redundancy or parallel applications. A diode and DC Power Supply can be installed in a 2U Rack as shown in the picture below. Please contact our sales technical engineers so we can configure a DC Power Solution according your specific requirements.



SR500-750HL unit with external diode into 2U Rack

10. CONNECTION NOTES

- The models with the screw/unpluggable connectors have two terminals per polarity, each one is rated at 20A and so when the load current exceeds 20A both terminals must be used.
- If used as a battery charger ensure that the battery polarity matches the power supply /charging output.
- Alarms can be tested by using an external variable voltage supply.

11. TECHNICAL SPECIFICATIONS

| | |
|-------------------------------|--|
| Output power | 500W (0-50°C) |
| Input Voltage | 180V - 264VAC 45-65Hz 88V - 132VAC 45-65Hz (Optional) |
| Output Voltages | 13.8V, 24, 30V, 36V, 48 V Other voltages by request |
| Voltage Adj. Range | 85% - 120% of Vnominal |
| Fusing/ protection | Input fuse and Varistor |
| Overcurrent protection | Constant current limit under overload and short circuit conditions |
| Isolation | Input – earth – 2.5KVdc Output – earth - 500Vdc |
| Efficiency | > 85% |
| Inrush Current | Soft start circuit |
| Operating temperature | -20 to 50 °C ambient at full load |
| Humidity | 0 - 95% relative humidity non - condensing |
| OVP | Over-voltage protection on output at 130% of nominal output voltage |
| Cooling | Dual Fan Cooled |
| LED Indication | Green: DC OK Green: Power OK Flash code for different operating states |
| Alarms Relay | Form C contacts changeover, rated 30VDC,2A/110VDC,0.3A/125VAC,0.5A 30VDC, 2A/110VDC, 0.3A, 125VAC, 0.5A DC High (Fan fail/stall (toggle every 5 sec)) POWER (mains fail, PSU fail) DC Low |
| Line Regulation | <0.2% over AC input range |
| Load Regulation | <0.4% open circuit to 100% load |
| Noise | <1% |

OPTIONS

| | |
|----------------------------------|---|
| Optional Input Voltage | 88 - 132 VAC 110VDC (88V – 135VDC) |
| Optional DC Input Voltage | Please note that an external fuse or MCB must be fitted on the output for short circuit protection. |
| Communication Port | RS232 (ASCII) RS485 (ASCII) Modbus RTU SNMP, Webpages |
| Digital Inputs/Outputs | Digital Input (pins 1,2) / Input or Output (pin 3) / Return (pin 4) |
| Temp. Compensation | Temperature sensor on 1.7m lead with adhesive pad: -4mV / °C / cell ±10% |
| Internal Meter | Internal V/I meter displaying PSU operating states and analogue |
| Mounting | Standalone 19" Rack Mount - Optional V/I meter for subrack : SR-Meter |
| N+1 Redundancy | Using 2 chargers each with its own battery & output diodes |
| Conformal Coating | For harsh environments |

PHYSICAL

| | |
|--------------------|--|
| AC input connector | IEC60320— C13 10A input socket (similar to PCs etc) |
| DC Connections | <ul style="list-style-type: none"> • M8 brass stud • Plug-in style phoenix socket & mating screw terminal • Anderson plug-in style connectors |
| Alarm connections | Plug in screw terminal block |
| Enclosure | Zinc plated & powder coated steel |
| Dimensions | 225W x 304D x 70H (± 1mm) |
| Weight | 3.85 Kg |

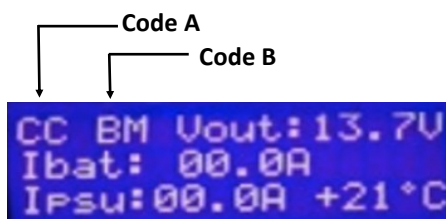
STANDARDS

| | |
|--------|----------------------------------|
| EMC | To CISPR 22 / EN55022 Class A |
| Safety | To IEC950 / EN60950 / AS/NZS3260 |

12. H-SERIES INTERNAL METER OPTION

SR500H & SR750H L & I models both have the internal meter option and the parameters displayed vary depending on the model.

The H-Series internal meter shows the status of the PSU and Battery (**just for HI models**) which has certain meanings. Check below each one of them to understand the information displayed.



H-Series internal meter example display

SR500/750HL model with Internal meter:

Code A:

- CC – charge cycle (normal operation)
- MF – mains fail (mains failure, system on battery power)
- OL – system overloaded, output voltage is below Vpres setting

Code B:

- M? – possible mains fail, ie. No mains detected but brown out timer not expired (30sec)
- BP – System OK
- BM – DC Low alarm
- BL – DC High alarm

Displayed values following Code B:

Vout = output voltage of PSU

Ibat = for HL models (2 terminal DC Power Supply) it will be always 0.

Ipsu = Total PSU output current

+20°C = temperature measured by temp. sensor





