

User's Manual

SR250HI Series - 250W DC UPS





No-Break[™] DC UPS

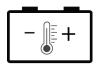
STANDARD FEATURES





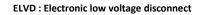


Float Charger –Lead Acid Batteries



Temperature Sensor on 1.7m lead with adhesive pad: -4mV / $^{\circ}C$ /cell $\pm10\%$





OPTIONAL FEATURES





Customizable Digital I/O

Modbus RTU

SNMP V1 & Webpages

Comms: • RS232

RS485



BCT: Battery Condition Test.



N+1 Redundancy

10/03/2022

QUALITY POWER SOLUTIONS BACKED UP BY REAL-WORLD ENGINEERING EXPERIENCE

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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.

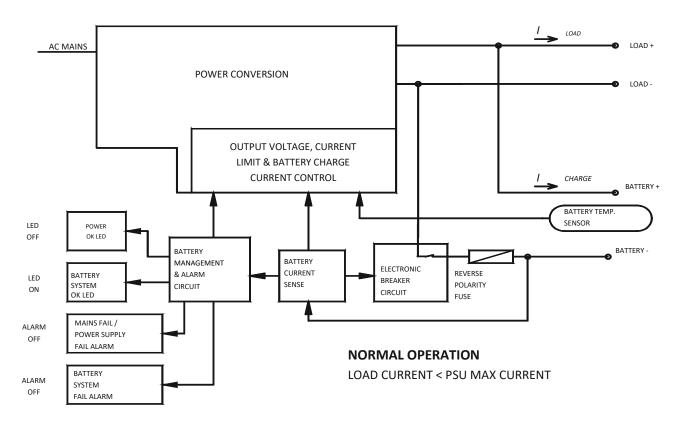
Glossary of terms used in our user manuals

BCT = battery condition test	ECB = electronic circuit breaker
RPP = reverse polarity protection	EMI = electromagnetic interference
EMC = Electromagnetic compatibility	DOD = depth of discharge
	RPP = reverse polarity protection

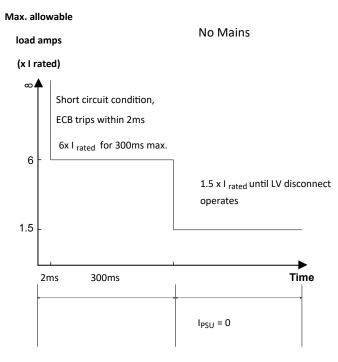
2. INTRODUCTION:

The **No-Break ™DC SR250Hi** switch mode power supply is designed to provide DC power to lead acid batteries for critical back up applications.No-Break [™] DC UPS systems maximise the integrity of standby battery installations, whilst optimising the life and availability of back up batteries.

3. SR250HI Series - SYSTEM BLOCK DIAGRAM



4. OPERATION OF ELECTRONIC CIRCUIT BREAKER (ECB) FOR PROTECTION OF BATTERY CIRCUIT & BATTERY



The ECB will operate on overcurrent as above & is also activated for the low voltage disconnect function on mains fail (no input power). It will reset when input power is restored, or can be manually reset by briefly shorting the **BAT-** and **LOAD-** terminals together when there is no input power.

5. BACK & FRONT 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

AUX : Activated by BCT (Battery Condition Test)

POWER (Mains Fail):

- Loss of mains input power. This alarm has 30 seconds delay before activation upon mains failure.
- PSU fails

BATTERY:

- Battery Low: 1.8V/cell (for 2V cells) operates only when no mains power present.
- Battery Missing or fault in battery circuit wiring (alarm does not activate for up to battery detection interval time.
- BCT fail
- 4. LOAD & BATTERY CONNECTION
- 5. Front Panel LEDS (For full list of LED flash codes please refer to the next page)

Battery OK: LED on: Battery present and above V batl

Power OK: LED on: Charger output present. LED off: no mains input or charger in standby mode

Standby: LED on: Charger in standby mode (no output from charger)

- 4. Comms Port (if installed) , for models with communications please refer to
- RS232 (ASCII) <u>https://www.heliosps.com/sr-series-downloads/#rs232-rs485-commands-sr-series</u>
- RS485 (ASCII) https://www.heliosps.com/sr-series-downloads/#rs232-rs485-commands-sr-series
- Modbus RTU <u>https://www.heliosps.com/sr-series-downloads/#serial-modbus-rtu-sr-series</u>
- SNMP, Webpages <u>https://www.heliosps.com/sr-series-downloads/#snmp-sr-series</u>

NOTES

Reverse polarity protection

If the battery is connected in reverse, the internal battery protection fuse may be ruptured and the unit should be returned to the manufacturer for repair. If the fuse is good, the voltage measured as at step 3 above should be exactly the same on both the load and battery outputs.

6. CONNECTION AND INITIAL TESTING

- 1. Check input and output voltages of system, ensure that they match the equipment. All loads should be isolated.
- 2. Check polarity of all wiring. Place temperature sensor probe near or on batteries.
- 3. Plug in ac input and turn power on. Both LEDs will light up after approx. 4 sec, "BATT OK" LED will go out after another 10 secs (since there is no battery connected). DC output voltage should appear at both load and battery outputs (ensure screws are tightened down on the connector block).
- 4. Turn off input power.
- 5. Connect battery.
- 6. Check that ELCB (internal electronic circuit breaker) closes by shorting together the BATTERY -ve and LOAD -ve terminals for about 2-3 sec. You will hear a relay operate and both LEDs will light up. If this does not happen, there is a fault in the wiring or the internal battery protection fuse is ruptured (see Note 2 below). The battery voltage will then appear at the load terminals and the "BATTERY OK" relay energises. The "POWER OK" LED stays on for about 30 seconds.
- 7. Connect load wiring to LOAD+ and LOAD- terminals. Check that the load does not exceed 110% of the unit. Any peak loads which are > 110% must be connected to the B+ and B-terminals.
- 8. Turn on ac power.
- 9. After the batteries are fully charged, check that the battery continues to power up the load when the input power is turned off.

7. LED INDICATION







O Off

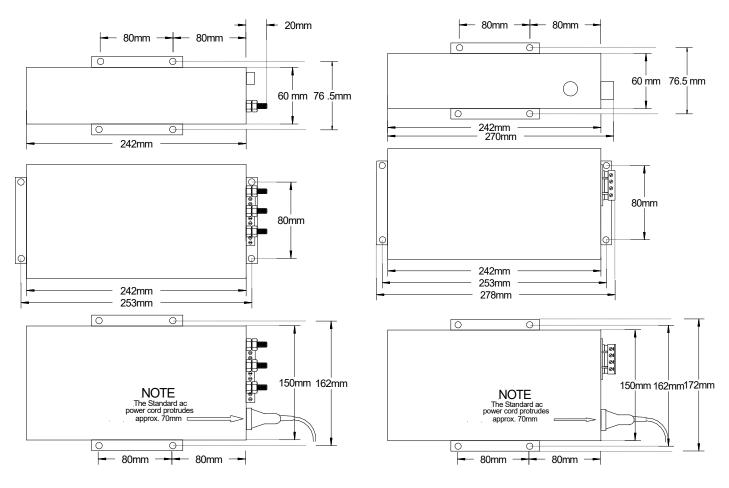
Power OK LED	Battery OK LED	Power Alarm	Battery Low Alarm	Condition
		Normal	Normal	System Normal: AC power is on, PSU output is OK, battery circuit is OK and battery voltage is > V Battery Low.
		Normal	Normal	Battery detection test imminent (LED begins flashing prior to test).
*	0	Normal	Alarm	 System AC power is on, PSU output is OK but either: 1. Internal battery fuse has opened (only if battery has been reverse polarity connected), <i>or</i> 2. Battery circuit open - battery missing, or fuse / circuit breaker / wiring fault.
0	*	Alarm	Normal	Either AC power has failed, <i>or</i> PSU has failed. Battery system is OK
0		Alarm	Alarm	AC Power is off / DC has failed and battery has discharged to \leq V Battery Low, unit will continue delivering battery current until low level initiates ELVD.
0	0	Alarm	Alarm	AC Power is off / DC has failed and ELVD has activated and disconnected battery from load. Residual current drain on battery following ELVD <1 mA.
		Normal	Normal	Battery Condition Test is in progress: LEDs flash alternately
*		Normal	Alarm	Battery Condition Unserviceable: failed to maintain terminal voltage during battery condition test

Please note that the last three conditions apply only if the battery condition test option is enabled.

8. SR250HI DC SETTINGS

Parameter	Nominal Voltage				Default	
Falameter	12V	24V	30V	36V	48V	Value
V out = Output voltage	13.8	27.6	34.5	41.4	55.2	2.3V/cell
V pres = Voltage threshold for battery detection & battery condition test (BCT). If voltage drops to this level during BCT then the test is aborted and a BATLOW alarm generated	12.2	24.4	30.5	36.6	48.8	2.03V/cell
V shutd = Output voltage of PSU during battery detec- tion & BCT	11.5	23	28.8	34.5	46	1.92V/cell
V batl = Battery voltage when BATLOW alarm generated during mains fail	11	22	27.6	33	44	1.84V/cell
V disco = Battery disconnect voltage during mains fail	10	20	25	30	40	1.66V/cell
Bccl = Maximum charge current as % of rated PSU rated current			100% * ⁴			
Comms = communications mode of PSU: F = continuous data	ata stream of	status M = resp	onds only to	request made b	y a control-	F
BatDetect = Battery detection interval time, active only when missing battery for up to this time)	nen no battery	/ charge curren	t is detected (the unit may n	ot detect a	60 min
BCT jumper: if fitted automatic BCT is enabled				Not fitted		
BCT = length of battery condition test				20 min		
Ret = retest option: N = after a failed BCT further scheduled be allowed	d BCTs are inh	ibited Y = after	a failed BCT f	urther schedule	ed BCTs will	Y
* ³ CC = Length of charge cycle in minutes/hours/days. ie. t	ime between	battery conditi	on tests			40m/23h/ 027d
* ³ MfiBCT = time before mains fail check during BCT. A main mains fail check will occur.	ins fail during	a BCT will stop	the BCT. If se	et longer than E	3CT time no	030 min

9. MOUNTING DETAILS



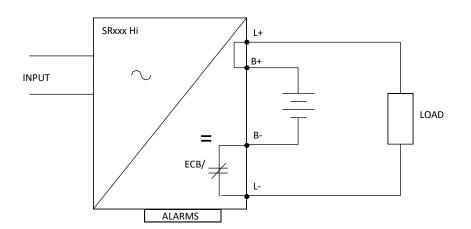
Stud terminal output

Screw terminal output

10. SR250HI CONNECTIONS - Typical Examples

• Standard *No-Break™DC* charger and battery bank

This is the basic connection which is most commonly used, and provides adequate protection for the majority of systems requiring DC back up in the event of a mains power failure.

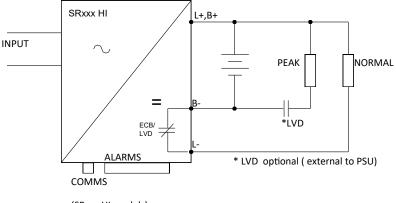


Alarms Available		
Input Fail	YES	
Battery Missing	YES	
Battery Low	YES	
Battery Condition Test Fail	YES	

Note: On stud connected output models the L+/B+ is one stud labelled "+ COMMON"

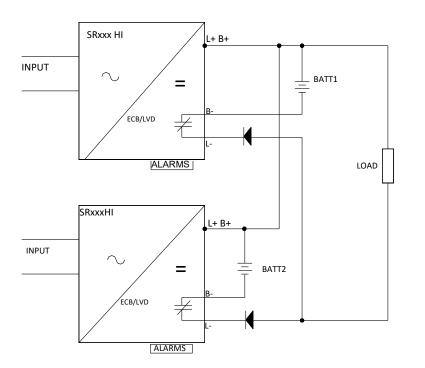
• Peak load connection using *No-Break™DC* charger

Peak loads which may exceed 1.5 x max. charger output can be connected to bypass the internal overcurrent trip circuit.



Alarms Available	
Input Fail	YES
Battery Missing	YES
Battery Low	YES
Battery Condition Test Fail	YES

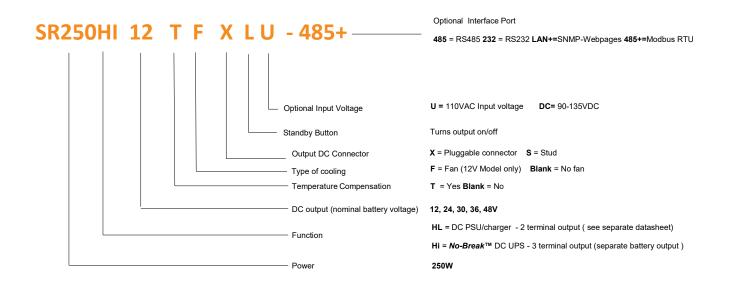
• N+1 connection using two complete No-Break[™]DC systems with each one capable of supplying the loads- positive common



Alarms available	
Power OK	YES
Battery missing	YES
Battery low	YES
Battery condition test fail *1	YES

*¹ interlock circuit required for automated BCT

11. MODEL CODING AND OPTIONS



12. TECHNICAL SPECIFICATIONS

input Voltage 1307/- 244VAC & SW-132VAC 45-65Hz Output Voltage AG, Range 252/43/24, 30/3 03/6 45/68 SW-120% Voltage AG, Range 255% - 120% of Vnominal Overcurrent protection Carstant current limit under overload and short circuit conditions Input - earth - 25/Vdc Output - earth - 50/Vdc Operating temperature -20 to 50 °C ambient at full load Humidity 0 - 95% relative humidity non - condensing Cooling Natural convection except for 12 V model (fan) LVD Low Voltage Disconnect UD Low Voltage Disconnect Red: Standby Frem: Ever OK Red: Standby Form C contacts 30/VDC.20/110/VDC.0.3A,125VAC, 0.5A Alarms Relay Form C contacts 30/VDC.20/110/VDC.0.3A,125VAC, 0.5A Alarms Relay Temperature sensor on 1.7m lead with adhesive pad: -4mV/ °C / cell ± 10% Battery Charge Current Limit Customizable on request. Reverse Polarity Detects for presence of battery on start up, then every 60 minutes when charge current <200mA Battery Crocal the sale of presence of battery on start up, then every 60 minutes when charge current <200mA Battery Crocal the reader (ECB) operates under the following conditions: - Low Battery Voltage drops	Output power	250W		
Output Valuages 129, 244, 389, 389, 48 VDC Oversame di Renge 139, 12,000 vincental Oversame protection Constant current limit under overload and short circuit conditions Input - earth - 500/dc Input - earth - 500/dc Efficiency > 855, 300 Operating temperature - 20 to 50 °C ambient at full load Numidity 0 - 95% relative humidity non - condensing Cooling Natural convection except for 12 V model (fan) LVD Low Volage Disconnect UD Correction Eart DK Green: Devor OK Red: Standby Form C contacts 30V0C_2A/110VDC, 03A,125V4C, 0.5A Alarms Relay POTVEX (main fails, 59 to fail) DVDVEX (main fails, 59 to fail) DATEER (Math missing, batilow, BCT Fail) Tempe Compensation Temperature sensor on 17m lead with adhesive pad: 4mV/*C / cell ± 10% Battery Forege Current Limit Customizable on request. Reverse Polarity Battery reverse connection will open internal fuse (and produce alarm) Battery Volct: Battery Volts: Battery Vo				
Vortage Adj. Bange 95% - 120% of Vorminal Overcurrent protection Constant current limit under overload and short circuit conditions Input - earth - 526Vdc Output - earth - 500Vdc Officiency > 85% Efficiency > 85% Operating temperature -20 to 50 °C ambient at full load Humidity 0 - 95% relative humidity non - condensing Cooling Natural convection except for 12 V model (fan) LVD Low Voltage Disconnect Greene: Power OK Red. Standby Amms Relay Form C contacts 3DVDC 2A/13DVDC.0.3A,125VAC, 0.5A Alarms Relay Form C contacts 3DVDC 2A/13DVDC.0.3A,125VAC, 0.5A Stand Circuit frad				
Ovectorent protection Constant current limit under overlead and short circuit conditions Isolation Output - earth - 25KVdc Output - earth - 25KVdc Output - earth - 50Mvdc Efficiency > 85K Operating temperature -20 to 50 °C ambient at full add Humidity 0 - 95K relative humidity non - condensing Cooling Nutral convection except for 12 V model (fan) VD Low Voltage Disconnect Green: Batt OK Green: Batt OK Green: Batt OK Green: Batt OK Green: Batt OK Green: Batt OK Aux Karkwed by BCT) POWER (main fails, PSU fails) PATTERY (batt missing, batt low, BCT fail) AUX Karkwed by BCT POWER (main fails, PSU fails) Battery Creent Limit Battery Charge Current Limit Gustimable on request. Reverse Polarity Battery treverse contextion will open internal fuse (and produce alarm) Battery Chreet Limit Defeets for presence of battery on start up, then every 60 minutes when charge current internal Greet: Battery Chreet Limit South and unut net excel 10% of atud current. Peak loads must be connected to B+ & B - terminals. (Not suitable for N+1 connection) Itery Chrent current <th></th> <th></th>				
Input – earth – 2.5KVdc Output – earth – 5000dc Efficiency 2858. Operating temperature 20 to 50 °C ambient at fulload Unidity 0 - 95% relative humidity non - condensing Cooling Natural convection except for 12 V model (fan) LVD Low Voltage Disconnect Green: Batt (K Green: Batt (K) Green: New CK Alarms Relay POWER (main fails, PSU fails) BATTERY (bit missing, batt low, BCT fail) Temp- Compensation Temperature sensor on 1.7m lead with adhesive pad: -4mV/*C / cell ± 10% Battery charge Current Limit Reverse Polarity Battery reverse connection will open internal fuse (and produce alarm) Bettery Group Contact 30VC 24/110Volops to 167V/cull Contract Contact Contact Contact Contact 30VC 24/110Volops to 167V/cull Battery Reverse Polarity Battery reverse connection will open internal fuse (and produce alarm) Bettery Group Contact Con				
Output - earth : 900vic Efficiency > 55% Operating temperature -20 to 50 °C ambient at full load Humidity 0 - 95% relative humidity non - condensing Cooling Natural convection except for 12 V model (fan) LVD Low Voltage Disconnect LED Indication Green: Batt OK Green: Batt OK Green: Dower OK Asst Standby Amms Relay Form C contacts 30VDC, 24/110VDC, 0.3A, 125VAC, 0.5A Aux (Activated by BCT) POWER (main fails, PSU fails) Battery Compensation Temperature sensor on 1.7n lead with adhesive pad: -4mV/°C / cell ± 10% Battery Charge Current Limit Customizable on request. Reverse Polarity Battery reverse connection will open internal fuse (and produce alarm) Battery Incut Protection Electronic circuit breaker (ECB) operates under the following conditions: Standby Mode Low Battery Volts: Battery Voltse drops to 1.67V/cell Line Regulation <0.2% over AC input range Noise <1% 0.04% open circuit volts And are splaintion <0.2% over AC input range Load Regulation <0.2% over AC input range Load Regulation Voles off-cast fing Actorectio		Input – earth – 2.5KVdc		
Efficiency > 85% Operating temperature -20 to 50 °C ambient at full load Humidity 0 -95% relative humidity non - condensing Cooling Natural convection except for 12 V model (fan) LVD Low Voltage Disconnect Green: But DK Green: But DK Green: But DK Green: But DK LED Indication Green: But DK Green: But DK Green: But DK Aarms Relay Form C contacts 30/0C.2A/110/DC.0.3A,125VAC, 0.5A Alarms Relay Form C contacts 30/0C.2A/110/DC.0.3A,125VAC, 0.5A Battery Charge Current Limit Customizable on request. Reverse Polarity Battery reverse contection will open internal fuse (and produce alarm) Battery Monitoring Deverse Polarity on Size top presence of battery on start up, then every 60 minutes when charge current <200mA Battery Volts: Battery Volts: Battery Volts: Battery Volts of rated current. Peak loads must be connected to B + & B - ternihals. (Not suitable for N+1 connection) Low Battery Volts: Battery Volts: Battery Volts of rated current. Peak loads must be connected to B + & B - ternihals. (Not suitabl	Isolation	Output conth E00V/dc		
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Humidity 0 - 95% relative humidity non - condensing Cooling Natural convection except for 12 V model (fan) LVD Low Voltage Disconnect EB Indication Green: Batt DK Green: Power OK Rest Standby Alarms Relay Form C contacts 30VC 2A/110VDC,0.3A,125VAC,0.5A Battery Undes Current Limit Customizable on request. Reverse Polarity Battery reverse connection will open internal fuse (and produce alarm) Battery Great Protection Electronic circuit breaker (ECB) operates under the following conditions: Lick Battery Volts: Battery Vo	•			
Cooling Natural convection except for 12 V model (fan) LVD Low Voltage Disconnect ED Indication Green: Batt OK Green: Power OK Red: Standby Alarms Relay Form C contacts 30VDC,2A/110VDC,0.3A,125VAC, 0.5A AUX (Activated by BCT) POWER (main fails, PSU fails) BATTERY (batt missing, batt low, BCT fail) Temperature sensor on 1.7m lead with adhesive pad: -4mV/°C / cell ± 10% Battery Charge Current Limit Customizable on request. Reverse Polarity Battery reverse connection will open internal fuse (and produce alarm) Battery Charge Current Limit Customizable on request. Reverse Polarity Battery reverse connection will open internal fuse (and produce alarm) Battery Grout Protection Electronic circuit breaker (ECB) operates under the following conditions: - Low Battery Volts: Battery Voltage drops to 1.67V/cell Overload: Max load must not exceed 110% of rated current. Peak loads must be connected to 8 + 8 be terminals. (Not suitable for N+1 connection) Standby Mode Turns off DC output of PSU & allows load to run off battery Line Regulation < 0.2% over AC input range Load Regulation < 0.4% open circuit to 100% load Noise < 1% output voltage Thermal Protection IEC60320-				
LVD Low Voltage Disconnect Green: Batt OK Green: Power OK Red: Standby Form C contacts 30/0C,2X/110VDC,0.3A,125VAC, 0.5A Alarms Relay AUX (Activated by BCT) POWER (main fails, PSU fails) BATTERY (batt missing, batt low, BCT fail) Temp. Compensation Temperature sensor on 1.7m lead with adhesive pad: -4mV/ *C / cell ± 10% Battery Charge Current Limit Customizable on request. Reverse Polarity Battery reverse connection will open internal fase (and produce alarm) Battery Monitoring Detects for presence of battery on start up, then every 60 minutes when charge current c 200mA Battery Circuit Protection Electronic circuit breaker (ECB) operates under the following conditions: -Low Battery Volts: Battery Volts: Battery Voltse drops to 1.67V/cell Overload: Max load must not exceed 110% of rated current. Peak loads must be connected to 8+ & B - terminals. (Not suitable for N+1 connection) Standby Mode Turns off DC output of PSU & allows load to run off battery Line Regulation < 0.4% open circuit to 100 % load Noise < 1% output voltage Thereal Protection Yes, self-resetting Hold-up Time 15-20 ms (non - max. Vin) without battery AC input connector IEC60320- C13 10A input socket (similar to PCs etc)	•			
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LED Indication Creent: Power OK Alarms Relay Form C contacts 30VDC.2A/110VDC,0.3A,125VAC, 0.5A Alarms Relay AUX (Activated by BCT) POWER (main fails, PSU fails) BATTERY (bast missing, batt low, BCT fail) Temp. Compensation Temperature sensor on 1.7m lead with adhesive pad: -4mV/*C / cell ± 10% Battery Charge Current Limit Customizable on request. Reverse Polarity Battery reverse connection will open internal fuse (and produce alarm) Battery Gruit Protection Detects for presence of battery on start up, then every 60 minutes when charge current < 200mA Battery Circuit Protection Electronic circuit breaker (ECB) operates under the following conditions: Connection Overload: Max load must not exceed 110% of rated current. Peak loads must be connected to B + & B - terminals. (Not suitable for N+1 connection) Standby Mode Turns off D coutput of FSU & allows load to run off battery Line Regulation <0.4% open circuit to 100 % load Noise <1% output voltage Thermal Protection ECG0320-C13 10A input socket (similar to PCs etc) Alarm connections Plug-in style socket & maing strew terminal block. (max. wire 2.5mm² / way) or M5 bras stad	LVD			
Red: Standby Form C contacts 30VDC,2A/110VDC,0.3A,125VAC, 0.5A Alarms Relay Form C contacts 30VDC,2A/110VDC,0.3A,125VAC, 0.5A Alarms Relay POWER (main fails, PSU fails) BATTERY (batt missing , batt low, BCT fail) Temp. Compensation Temperature sensor on 1.7m lead with adhesive pad: -4mV/ *C / cell ± 10% Battery Charge Current Limit Customizable on request. Reverse Polarity Battery reverse connection will open internal fuse (and produce alarm) Battery Monitoring Detects for presence of battery on start up, then every 60 minutes when charge current < 200mA Battery Circuit Protection Electronic circuit breaker (ECB) operates under the following conditions: Circuit Protection Coverload: Max load must not exceed 110% for fated current. Peak loads must be connected to B & & B - terminals. (Not suitable for N+1 connection) Standby Mode Tums off D C output of PSU & allows load to run off battery Line Regulation <0.2% over AC input range Alarm connector Yes, self -resetting Hold-up Time IEC60320 – C13 10A input socket (similar to PCs etc) C Connections Plug in style socket & main gscrew terminal block: (max. wire 2.5mm² / way) or M6 brass tad Alarm connections P				
Alarms Relay Form C contacts 30VDC,2A/110VDC,0.3A,125VAC, 0.5A Alarms Relay AUX (Activated by BCT) POWER (main fails, FSU fails) BATTERY (batt missing , batt low, BCT fail) Battery Compensation Temperature sensor on 1.7m lead with adhesive pad: -4mV/*C / cell ± 10% Battery Charge Current Limit Customizable on request. Reverse Polarity Battery reverse connection will open internal fuse (and produce alarm) Battery Monitoring Detects for presence of battery on start up, then every 60 minutes when charge current < 200mA Battery Grout Protection Electronic circuit breaker (ECB) operates under the following conditions: - Low Battery Volts: Battery Voltage drops to 1.67V/cell Overload: Max load must not exceed 110% of rated current. Peak loads must be connected to B+ & B - terminals. (Not suitable for N+1 connection) Standby Mode Turns off DC output of PSU & allows load to run off battery Line Regulation < 0.2% over AC input range Load Regulation < 0.4% open circuit to 100% load Noise 15 - 20 ms (nom - max. Vin) without battery AC input connector IEC60920-C13 10A input socket (similar to PCs etc) DC Connections Plug in style socket & mating screw terminal block: (max. wire 2.5mm² / way) or M6 brass stud Alarm connections Plug in screw terminal block <th></th> <th></th>				
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Reverse Polarity Battery reverse connection will open internal fuse (and produce alarm) Battery Monitoring Detects for presence of battery on start up, then every 60 minutes when charge current < 200mA	Temp. Compensation	Temperature sensor on 1.7m lead with adhesive pad: -4mV/ °C / cell \pm 10%		
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Line Regulation < 0.2% over AC input range Load Regulation < 0.4% open circuit to 100 % load Noise < 1% output voltage Thermal Protection Yes, self-resetting Hold-up Time 15 - 20 ms (nom - max. Vin) without battery AC input connector IEC60320 - C13 10A input socket (similar to PCs etc) DC Connections Plug-in style socket & mating screw terminal block: (max. wire 2.5mm² / way) or M6 brass stud Alarm connections Plug in screw terminal block Enclosure Zinc plated & powder coated steel Dimensions 242W x 150D x 61H (± 1mm)		Short Circuit: <2ms, backed up by fuse		
Load Regulation < 0.4% open circuit to 100 % load Noise < 1% output voltage Thermal Protection Yes, self-resetting Hold-up Time 15 - 20 ms (nom - max. Vin) without battery AC input connector IEC60320— C13 10A input socket (similar to PCs etc) DC Connections Plug-in style socket & mating screw terminal block: (max. wire 2.5mm² / way) or M6 brass stud Alarm connections Plug in screw terminal block Enclosure Zinc plated & powder coated steel Dimensions 242W x 150D x 61H (± 1mm)	Standby Mode	Turns off DC output of PSU & allows load to run off battery		
Noise < 1% output voltage Thermal Protection Yes, self-resetting Hold-up Time 15 - 20 ms (nom - max. Vin) without battery AC input connector IEC60320 C13 10A input socket (similar to PCs etc) DC Connections Plug-in style socket & mating screw terminal block: (max. wire 2.5mm² / way) or M6 brass stud Alarm connections Plug in screw terminal block Enclosure Zinc plated & powder coated steel Dimensions 242W x 150D x 61H (± 1mm)	Line Regulation	< 0.2% over AC input range		
Thermal Protection Yes, self-resetting Hold-up Time 15 - 20 ms (nom - max. Vin) without battery AC input connector IEC60320— C13 10A input socket (similar to PCs etc) DC Connections Plug-in style socket & mating screw terminal block: (max. wire 2.5mm² / way) or M6 brass stud Alarm connections Plug in screw terminal block Enclosure Zinc plated & powder coated steel Dimensions 242W x 150D x 61H (± 1mm)	Load Regulation	< 0.4% open circuit to 100 % load		
Hold-up Time 15 - 20 ms (nom - max. Vin) without battery AC input connector IEC60320— C13 10A input socket (similar to PCs etc) DC Connections Plug-in style socket & mating screw terminal block: (max. wire 2.5mm² / way) or M6 brass stud Alarm connections Plug in screw terminal block Enclosure Zinc plated & powder coated steel Dimensions 242W x 150D x 61H (± 1mm)	Noise	< 1% output voltage		
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DC Connections stud Alarm connections Plug in screw terminal block Enclosure Zinc plated & powder coated steel Dimensions 242W x 150D x 61H (± 1mm)	AC input connector	IEC60320— C13 10A input socket (similar to PCs etc)		
Enclosure Zinc plated & powder coated steel Dimensions 242W x 150D x 61H (± 1mm)	DC Connections	Plug-in style socket & mating screw terminal block: (max. wire 2.5mm ² / way) or M6 brass stud		
Dimensions 242W x 150D x 61H (± 1mm)	Alarm connections	Plug in screw terminal block		
	Enclosure	Zinc plated & powder coated steel		
Weight 1.8 Kg	Dimensions	242W x 150D x 61H (± 1mm)		
	Weight	1.8 Кg		

STANDARDS

EMC	To CISPR 22 / EN55022 class A
Safety	To IEC950 / EN60950 / AS/NZS3260

13. CUSTOMISED MODELS

HELIS POWER SOLUTIONS

Model code	BASE MODEL	SPECIAL FEATURES
CSR171	SR250HI24TFXL	BCT enabled 1hr/ 7days
CSR159	SR250HI12TFSL	BCT enabled 20mins/ 28days, V pres = 12V
CSR200	SR250HI12TFSL	No fan, rated output at 50degC = 210W

14. TERMS OF WARRANTY

Helios Power Solutions warrants this product for 24 months from date of shipment against material and workmanship defects. Liability under this warranty is limited to the replacement or repair of the defective product as long as the product has not been damaged through misapplication, negligence, or unauthorized modification or repair.