



SONEIL INTERNATIONAL LIMITED

3-180 Advance Blvd., Brampton, Ontario, Canada L6T 4J4

Ph.: (905) 565-0360

Fax: (905) 799-6821

<http://www.soneil.com>

Specification of Soneil Battery Charger

MODEL: 2408SRF-B

24V / 4A LEAD ACID BATTERY CHARGER



General

The 2408SRF-B charger is a fully automatic high frequency switch mode 4 – stage battery charger with Battery de-sulfating mode, constant current, constant voltage and float voltage. It comes with a 100 - 240Vac input. The charger is double insulated (no AC connection to ground).

The 24V/4A battery charger can charge any gel, glass-matt (AGM), sealed, wet and any other type of lead acid batteries.

- Automatic Cut-off and then true Float. Can be left connected indefinitely without harming the battery.
- North American (UL & ULc) and European (CE) listed.
- Input 115/230 VAC - Suitable for U.S., Canada, Europe.
- Suitable for Off-board (external) & On-board (internal) Applications
- Increases battery life by de-sulfating the battery.
- Many advance features described in this spec.
- Very small size and very light weight

Explanation of the Features:

The advance technology of the OEM Battery Chargers supplied by Soneil is fundamentally different from other battery chargers. The conventional linear battery charger is an electrical device whereas the 2408SRF is a light weight sophisticated electronic device.

Switch-Mode Technology:

Most of the battery chargers use linear technology which convert the 115/230 VAC to 24 VDC at 60/50 Hz. This requires a large transformer which has the disadvantage of lower efficiency resulting in higher heat generation, larger size and weight.

Soneil's Battery Charger transforms the 115/230 VAC into 24 VDC at 100,000 Hz (3333 times faster than conventional charger) which requires a much smaller transformer and this results in a unit of smaller size, low weight and improved efficiency.

The 2408SRF Supercharger uses sophisticated electronic circuitry with microchips. All present day computers use switch-mode technology.

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1. Main product specification

Max. output power	Input voltage	Output voltage	Output current range	Voltage tolerance
120W	100 - 240Vac	+28.5V ~ 29.1V	4A	+/-0.3V

2. Environmental condition

No.	Item	Technical specification	Remark
1	Humidity	10~90%	With packing in box
2	Altitude	≤3000m	Works normally
3	Cooling	The battery charger is cooled by a 24VDC ball-bearing fan.	Working under full load

3. Electrical characteristics

3.1 Input characteristics

No.	Item	Technical specification	Remark
1	Input voltage range	100-240Vac	
2	AC input voltage frequency	50/60 Hz	
3	Max input current	3.5A	At 240Vac rated load input.

3.2 Output characteristics

No.	Item	Technical specification	Remark
1	Fast charge voltage	+28.5 ~ 29.1Vdc	
2	Floating voltage	+26.9 ~ 27.5Vdc	
3	Constant current	4.0A +/- 10%	
4	Switching current	About 1.0A – 1.5A	
5	Power efficiency	≥80 %	At 240Vac rated input voltage.

3.3 Protection features

- a) Short- circuit protection.
- b) Reverse polarity protection.
- c) Over- voltage protection.
- d) Over-current protection.
- e) Output DC present when AC is plugged and battery not connected (non-trigger charger).
- f) No current drain (when output is connected to battery, there is very minimal current flow from battery if AC is off).

3.4 Charging explanation

The charging curve is attached. The explanation of the charging curve is as following.

Stages	Condition	Mode*	Current	Voltage	LED Indication
Stage 1	Charging Pulse mode	Battery de-sulfating mode	4A Pulsing	0.5V to 5.0V	LED: Orange
Stage 2	Constant Current mode	CC mode	4A	5.0V to 28.8V	LED: Orange
Stage 3	Constant Voltage mode	CV mode	Reduces from 4 A***	Holds at 28.8V	LED: Orange
Stage 4	Standby Voltage mode	Standby CV mode	Reduces to battery self discharge current	Maintains 27.4V	LED: Green
	Recharging mode	CC mode	4A	27.4V	LED: Orange

*CC mode: Constant current charge

*CV mode: Constant voltage charge

***See Stage 3 description below

Note: All voltage tolerances are at +/-0.3V and current tolerances at +/- 10%.

Stage 3: Constant Voltage Mode (CV): LED Orange

In this stage the voltage of each cell in the battery is equalized. The charger holds the battery at 28.8V and the current slowly reduces. When the current reaches 0.3CC (CC=Constant Current), this point is called the Switching Point. The Switching Point is one of the greatest features of this battery charger whereby it can adjust current automatically according to battery capacity which other chargers are not able to adjust automatically.

If the battery voltage goes below 27.4V, the charger changes from any mode to Constant Current mode and restarts charging. The charging cycle will go through Stage 2 to Stage 4.

4. Safety & EMC

No.	Item		Standard (or test condition)	Remark
1	Electric strength test	Input-output	3000Vac /10mA /1 sec.	No breakdown
2	Isolation resistance	Input-ground	$\geq 10\text{Mohm}@500\text{Vdc}$	
		Output-ground	$\geq 10\text{Mohm}@500\text{Vdc}$	
3	Leakage current		$< 0.25\text{mA}$	Vin = 240Vac, 50 Hz.
4	Safety		Certified to cTUVus (UL / CSA 60950-1 latest std.), CE, GS & RoHS standard.	
5	EMC		Tested and certified to required standards.	

5. Environmental testing requirements

No.	Item	Technical specification	Remark
1	High temperature ambient operating	+45°C	Features ok
2	Low temperature ambient operating	0°C	Features ok
3	High temperature storage	+70°C	Works normally after recovery under normal temperature.
4	Low temperature storage	-20°C	Works normally after recovery under normal temperature.
5	Random vibration	5Hz to 55Hz, 1.5m, Acceleration 20m/s, 1 hour per each axis X/Y/Z	Pass functional test without any damages.
6	Thermal shock	-35°C to 75°C, < 3min transition, 2.5hours dwell, 200cycle	No abnormality detected
7	Drop test	Charger dropped from 1.0m height to a 10mm pine board repeatedly for 4 times on each side	No damage to the charger with charger functioning properly.
9	Humidity	Can operate at 10% - 90% RH	

6. Mechanical characteristics

6.1 Outline dimension: Length -6.9" (175 mm) Width -3.7" (94 mm) Height -1.9" (48 mm)

6.2 Input AC cord: Comes with IEC320-C14 length 1.5m.

6.3 Output DC wire: printed wire: +ve; no print wire: -ve; (or as indicated on the charger label)

DC wire length of 1.0 m.

7. Packing, transportation & storage

7.1 Packing:

Well packed and protected in a cardboard carton box.

7.2 Transportation:

Suitable for transportation by truck, ship and plane, the products should be shielded from sunshine and rain, and loaded and unloaded carefully.

7.3 Storage:

Products should be stored in an enclosed package when not in use. Storage temperature should be -20~70°C and relative humidity 10~90%. In the warehouse, there should not be harmful gas, inflammable, explosive products, and corrosive chemical products, and strong mechanical vibration, shock and strong magnetic field force.

The packed box should be above ground at least 20cm height, and 50cm away from wall, thermal source, and vent. Under this requirement, the product has 2 years of storage period, and should be rechecked when not in use for over 2 years.

8. Reliability requirements

8.1 MTBF (standard, environmental temperature, load requirement) $\geq 50K$ power on hours at tested value; testing condition: 25°C ambient temperature and at 80% of full load.

8.2 All chargers are burnt-in at an average DC load for a minimum of 4 hours with power on continuously.

9. Charger wiring

9.1 DC Printed wire: +ve

9.2 DC No Print wire: -ve

9.3 Or wire colors as specified on the charger label

10. Label

All Soneil chargers come with a label clearly indicating the model name, input, output, LED charging indication, cautions and safety approvals.

11. Charging Curve:

See separate attachment.

Note: Specification is subject to change without notice.

For more detail and accurate information on the charger contact Soneil by email or call via phone