

P4500 SERIES Battery Charger specification

1.0 Scope of supply

This specification gives the minimum requirements for the supply of a stationary battery charger.

2.0 Standards

UL1012:	Power Units Other Than Class 2
CSA-C22.2 No.107.1:	General Use power Supplies
NEMA PE 5:	Utility Type Battery Charger
IEEE 946:	IEEE Recommended Practice for the Design of DC Auxiliary Power Systems for Generating Stations
EN61000-4-4:	IEC Electrical Fast Transient/Burst
ANSI/IEEE C37.90.1:	Surge Withstand capability NEMA PE5

Rectifier/Battery charger

General

- a) The battery charger is to be certified to UL and CSA specifications.
- b) The charger is to be suitable for all types of standby applications and to be capable of supplying the load while recharging the batteries within 8 hours to a fully charged condition.
- c) The battery charger is to be a microprocessor controlled constant voltage, current limiting, using solid state SCR technology, designed to float / equalize batteries. 6 pulse controlled SCR must be used in 3 phase chargers to reduce Harmonics content on the input line. Timer and control to be static.
- d) Operating temperature 0°C to +50°C, indoors.
- e) Relative humidity 95% without condensation
- f) Operating altitude to 3300 feet with no de-rating
- g) Natural convection cooled except units with output greater than 130ADC

3.2 Output voltage

Output voltage to be temperature compensated. Minimum allowed voltage is 105VDC and the maximum allowed voltage is 140 VDC.
Equalize circuit must be embedded as such it can be activated or deactivated as per the battery specifications:

Equalize commands and timing must be available via the RS232/485 Modbus communication port and must also be available in manual mode.

Automatic equalization activation modes must be based on: Time, low voltage, charger start, AC fail, with an adjustable delay of up to 40 hours, current limit, with an adjustable delay of up to 40 hours.

Automatic equalization termination modes must be based on: Voltage, time and/or battery voltage event(s), post-gazing point voltage or current. All automatic modes must be protected by a timer. Charger shall be equipped with automatic antidepressant equalize mode for Ni-Cd batteries.

3.3 DC regulation

Static regulation is to be (+/-) 0.5% RMS voltage from 0 to 100 % full load having a (+/-) 10 % input voltage variation and +/- 5% frequency.

3.4 Output current

Charger shall be capable of providing 110 % of rated output current on a permanent basis and factory preset to 100%.

3.5 Ripple voltage

Ripple is to be limited to 1% or less of nominal RMS DC output voltage, when connected to a resistive load. The battery charger must operate without being connected to a battery.

3.6 Metering and monitoring system

Local Access: All voltage and current readings as well as all alarms and controls status shall be accessed and displayed on an interactive LCD display and protected by multilevel passwords. In case of AC Fail, LCD display must be operational.

AC on Green LED;

Common alarm Red LED;

Simultaneous display of output current and voltage.

Battery Charge/discharge ammeter

0-100 Hour automatic/manual equalize timer with elapsed and remaining equalize time indication

Remote Access: 2 way real time Read / Write RS232 communication port shall be supplied to access all setup and status parameters through MODICON MODBUS protocol. ; All parameters, readings must be available through the RS232/485 Modbus communication port. A common alarm form c contact must be provided with the RS232/485.

Monitoring System: Each alarm must be displayed on an LCD display. Memory chip must keep up to 150 events in memory, with a date and time stamp.

Minimum alarm available for activation shall be:

1. Rectifier failure
2. AC fail
3. High DC volts
4. Low DC volts
5. Positive ground fault
6. Negative ground fault
7. End of discharge
8. High volts shutdown
9. Equalization
10. High ripple
11. Low & High Frequency alarm and shutdown
12. High & Low Temperature alarm and shutdown
13. Rectifier high current
14. Rectifier High volt
15. Rectifier low volt

Charger shall be also equipped with:

- Battery monitor alarm
- Periodical battery capacity tester

3.7 Protection

- AC and DC surge suppression as per ANSI 37.90

- AC Lightning arrester as per ANSI/IEEE C62.11
- AC input circuit breaker c/w with a cycling high DC volts and Open circuit form C contact.
- Two (2)-pole DC output circuit breaker.
- Two (2)-pole battery maintenance disconnect switch.
- 2 Pole Circuit Breaker Distribution Panel c/w 1 main circuit breaker

All circuit breakers are to be coordinated with the AC input, battery and rectifier short circuit capabilities.

3.8 Redundant chargers design requirements:

Charging system shall have two identical chargers. Both chargers shall be of identical design and rating. Forced current sharing must be provided with no common circuit or control wiring between chargers to prevent One Common Point Failure.

4.0 Enclosure

The enclosure is to be ventilated with an NEMA 1 rating and rodent protected.

- a) The paint color is to be ASA 61 Gray
- b) Cable entry is to be from either the cabinet top or bottom

5.0 Manuals & Drawings

The DC Battery Charger shall come complete with installation, operation and maintenance manuals. As built drawings, individual test report and complete bill of materials shall also be provided.

6.0 Spare Parts

Vendor shall submit schedule for two (2) years operation spares and one (1) spare set for commissioning and start up. This schedule must contain the individual description and price.

7.0 Warranty

- a) Battery charging system minimum acceptable warranty: 18 months from shipment or 12 months from commissioning whichever occurs first.