

## 1. OVERVIEW

- 1.1. DC power system with integrated battery charger, batteries, and distribution panel. Completely contained in one or more fully assembled, integrated, and tested industrial cabinets. The only field wiring required is the AC input to charger, the DC load connections at panel, and the communication wiring at the charger.

## 2. AGENCY STANDARDS AND CERTIFICATIONS

- 2.1. UL listed for the United States (UL<sub>US</sub>) and Canada (cUL) to UL 1012 and CSA 22.2 No. 107.1
- 2.2. EMC Standards: Emissions
  - 2.2.1. 47-CFR-15 (FCC Part 15) Class A
  - 2.2.2. EN 61000-6-4
- 2.3. EMC Standards: Immunity
  - 2.3.1. ANSI/IEEE C62.41 Category B
  - 2.3.2. IEC 61000-6-2 (heavy industrial)
  - 2.3.3. ANSI C37.90a
- 2.4. Seismic Standards
  - 2.4.1. Cabinet is Seismic Certified to IBC Standards

## 3. CHARGER

- 3.1. One or more battery chargers provide AC to DC power conversion to support continuous loads and battery chargers.
- 3.2. Input Supply
  - 3.2.1. The AC input voltage options include 120/208/240/400/480 VAC
  - 3.2.2. The AC input is single or three phase
  - 3.2.3. The AC input frequency range 50/60Hz
  - 3.2.4. UL 489 AC input breaker
- 3.3. DC Output
  - 3.3.1. The DC output voltage options include 24/48/120/240 VDC
  - 3.3.2. The DC output is sized to power the continuous loads and to recharge a fully discharged battery within a given time period
  - 3.3.3. Combined line and load regulation is  $\pm 0.5\%$  or better
  - 3.3.4. Charging control includes float charge mode, manual and automatic equalize charge modes and battery temperature compensation.
  - 3.3.5. Output is electronically current limited and protected
  - 3.3.6. UL 489 2-pole DC output breaker

## 4. BATTERIES

- 4.1. AGM Type VRLA batteries
- 4.2. 10-15 years in float service at 77°F
- 4.3. Meets capacity requirements of IEEE 485 for application load profile
- 4.4. Battery case is reinforced and meets safety requirements of UL 94 V-0
- 4.5. High temperature VRLA models are available

## 5. DC LOAD PANEL

- 5.1. Charger and battery feed distribution panel through bolt-on 2-pole branch rated breakers
- 5.2. Distribution breakers are 2-pole bolt-on type with UL489 rated for the maximum DC voltage of the system
- 5.3. Distribution breakers are rated for 14 kAIC minimum interrupt capacity

5.4. Buyer specifies number and amperage of distribution breakers

## **6. OPTIONAL ACCESSORIES**

6.1. Bulk Termination provides accommodation for landing of DC charger and battery connections in place of DC Load Panel

6.2. Low Voltage Load Disconnect

6.2.1. Disconnects battery discharge at an adjustable setpoint protecting battery from critical discharge levels

6.2.2. Automatically reconnects battery to the loads when the DC system voltage can support the loads

6.3. Inverter

6.3.1. Sine wave inverter rated 600W, 1100W, or 2000W at unity power factor converts system DC voltage to AC voltage for AC loads

## **7. USER INTERFACE**

7.1. The user interface includes a backlit LCD displaying plain language text, a multicolor LED panel showing system status, and a user control panel

7.2. Remote Interface

7.2.1. System status is also available via optional Modbus. Modbus RS485 and TCP/IP (ethernet) are available

7.2.2. System status is also available via optional DNP3. DNP3 RS485 and TCP/IP (ethernet) are available

7.2.3. Connection to the a setup utility is also available via RJ45 port or USB port. Provides remote system status, configuration, and adjustment

7.3. Configuration and Firmware Updates

7.3.1. The setup utility provides custom configuration and diagnostics software utility that runs on a Windows PC via a USB port or ethernet port. Use this software to configure the charging system or load new firmware.

7.4. System is equipped with a 1% accuracy meter for indicating DC output voltage and 1% accuracy meter for indicating DC output current

7.5. Optional data-logging regularly records alarms, input and output voltages, user adjustments, and all internal charger parameters

7.6. Battery Check

7.6.1. Periodically and automatically validates the battery's ability to power the connected system load at user-specified intervals and includes manual control on the front panel

## **8. INDICATIONS AND ALARMS**

8.1. Alarm Indication

8.1.1. Any alarm indication causes plain language text to appear on the LCD and changes the appropriate LED. Normal LED indication is green. Alarm LEDs are red. Warning LEDs are amber. Multiple alarms result in the relevant LEDs changing color and multiple alarm message screens on the LCD. Alarm status is also available via optional Modbus and DNP3 communications

8.2. Alarms must be available on up to 13 Form-C contacts. Standard Contacts rated 2A at 30VDC or 0.25A at 125VDC. 1 Form-C alarm is available rated 5A at 120VAC

8.3. Available alarms include:

8.3.1. AC Line Failure

- 8.3.2.High DC Voltage
- 8.3.3.Battery on Discharge
- 8.3.4.Low DC
- 8.3.5.Battery End Discharge
- 8.3.6.Charger Fail
- 8.3.7.Overvoltage Shutdown
- 8.3.8.Reverse Polarity
- 8.3.9.Invalid Settings
- 8.3.10. Incompatible Battery
- 8.3.11. Current Limiting
- 8.3.12. Low Current
- 8.3.13. Battery Check
- 8.3.14. Thermal Foldback
- 8.3.15. AC Breaker Open
- 8.3.16. DC Breaker Open
- 8.3.17. Ground Fault Positive
- 8.3.18. Ground Fault Negative
- 8.3.19. Temperature Probe Fault
- 8.3.20. DC Below Startup Voltage
- 8.3.21. Summary Alarms, user configured to sum various alarms to given Form-C contact

## **9. ENVIRONMENTAL**

- 9.1. Charger Operating temperature: -40°C to +50°C at full rated output, with overtemperature protection
- 9.2. Humidity: 5% to 95%, non-condensing
- 9.3. All circuit boards are conformal coated to resist effect of extreme humidity and corrosive environments
- 9.4. Altitude: 0-2000 meters; without derating

## **10. MECHANICAL**

- 10.1. Enclosure Material and Finish
  - 10.1.1.1. Cabinet Construction is CRS or optional stainless steel
  - 10.1.1.2. Cabinet Finish is ANSI 61 Gray powder-coat
- 10.2. Protection Ratings
  - 10.2.1. Cabinet to be NEMA 1 rated
  - 10.2.2. NEMA 3R cabinets are available
  - 10.2.3. Field Wiring Intended for permanent installation using hard-wired electrical conduit

## **11. STANDARD NAMEPLATE DATA**

- 11.1. The standard permanent adhesive nameplate contains the following data:
  - 11.1.1. Manufacturer name, address, and web site address
  - 11.1.2. Product description
  - 11.1.3. Model number
  - 11.1.4. Serial number
  - 11.1.5. Date of manufacture
  - 11.1.6. Input voltage rating
  - 11.1.7. Input frequency rating

- 11.1.8. Input current rating
- 11.1.9. Nominal output voltage rating
- 11.1.10. Output current rating
- 11.1.11. Applicable safety and EMC agency marks
- 11.1.12. Applicable IBC seismic certification

## **12. DRAWINGS AND DOCUMENTS**

### 12.1. User manual documentation includes:

- 12.1.1. Safety instructions
- 12.1.2. Model number breakout
- 12.1.3. Performance specifications
- 12.1.4. System overview
- 12.1.5. Mounting instructions
- 12.1.6. Wiring details
- 12.1.7. Operation procedures
- 12.1.8. Troubleshooting table
- 12.1.9. Detailed dimensional drawing
- 12.1.10. Wiring diagram

## **13. QUALITY ASSURANCE, INSPECTION, AND TEST**

### 13.1. The standard assembly process prescribes the tests and calibration that are performed on the product. These activities include, but are not limited to the following:

- 13.1.1. Insulation breakdown test using a “hipot” device to the standards prescribed in UL standards
- 13.1.2. Performance testing to ensure that the product meets its critical performance specifications
- 13.1.3. Calibration to the correct output, alarm and shutdown voltages
- 13.1.4. Correct function of alarms

## **14. WARRANTY**

- 14.1. Charger has 5-year standard warranty
- 14.2. System has 2-year standard warranty

## **15. CHANGES TO SPECIFICATION**

- 15.1. In order to meet evolving customer requirements, changes to the product and to this specification may be made without notice from time to time.

## **END OF SPECIFICATION**