

JF5028-00

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STANDARD SAMPLE SPECIFICATION

SCR/SCRF Series Float Battery Charger (single or three phase input)

I. Scope

Provide a silicon-controlled rectifier (SCR) industrial-grade battery charger capable of recharging any stationery, secondary battery type. The charger is designed to operate automatically, and shall be a constant voltage device equipped to provide automatic current limiting. The battery charger shall be all solid state, employing integrated circuitry for maximum performance. The battery charger is designed, manufactured, and tested to NEMA standard PE 5-1983. Unless specially ordered, the charger is not listed to any UL, CSA, or CE standards.

II. Basic Design Features

- A. MTBF of 30,000 hours minimum (20 year life expectancy).
- B. Modular construction: control circuits and alarm assemblies shall be printed circuit boards that are modularized with plug and socket connections.
- C. Recessed front panels to protect all controls and meters.
- D. Color-Coded PVC wiring: test point identification and circuit symbol labeling of internal components (optional switchboard wiring with numbered wire markers may be specified).
- E. No transformer tap adjustments are to be required.
- F. Adjustments for all charger output settings, float and equalize voltages, current limit and alarm thresholds shall be via potentiometers. Float and equalize potentiometers shall be located on the front panel and shall employ lock nuts to mechanically maintain the settings once achieved.
- G. Internal Components shall be accessed through either a hinged or removable door in the front. Side or rear access shall not be necessary.
- H. Enclosures are to be equipped with knockouts for cable and conduit entry. Alarm and power connections shall be made via internal terminal blocks that are easy to access.

III. Environmental Specifications

- A. Operating temperature without de-rating: 32 °F to 122 °F / 0 °C to 50 °C)
- B. Operating Altitude: 3,300 feet without de-rating
- C. Relative Humidity: - 5% to 95% without condensation
- D. Audible Noise: less than 65 dBA at any point 5ft from any vertical surface of the enclosure, while operating at full load
- E. Ventilation: Convection cooled
Exceptions: output rating is 400Adc or more, or if rating is 125Adc or higher and in a Style-3 enclosure, then fan assisted convection cooling is required. Fan-equipped units must have an audible alarm, and remote alarm contacts for overheating notification.

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IV. Output Regulation

- A. Shall be +/- 0.5% of Vdc voltage setting maintained with input line variations of +/-10% voltage and/or +/-5% frequency, or load variations from no load to full load. A combination variation of line, plus load, plus temperature will allow for +/-1% regulation.

V. Transient Response and Recovery

- A. +/-5% maximum of Vdc voltage setting maintained with step load changes from 20% to 100% load with battery connected.
- B. Recovery to +/- 2.0% of Vdc voltage setting (typically 200msec).
- C. Recovery to steady state Vdc voltage setting (typically 500msec).
- D. Overshoot of Vdc voltage setting is not present at turn on due to “soft-start” feature.

VI. Transient Voltage Protection

- A. Shall employ MOV-type surge suppressors on ac input and dc output, capable of achieving the following withstand:
- | | |
|----------------------------|--|
| 1 - Vac withstand | 240 Vac or less = 1500 Vpk - 1.2 x 20 μsec pulse |
| | over 240 Vac = 3000 Vpk - 1.2 x 20 μsec pulse |
| 2 - Vdc withstand 4000 Vpk | 1.2 x 10 μsec pulse |

VII. Output Current Limit

- A. Shall be factory set at 110% of rating, and be adjustable from 90% to 120%.

VIII. Random Parallel Operation

- A. Feature allows for random parallel operation with other chargers with same output voltage, and similar regulation and current limit characteristics. Equal load sharing shall not be necessary.

IX. Output Electrical Noise

- A. Standard filtered models shall have output ripple voltage of **30mV** rms (or less) for 12-130 Vdc, or **200mV** rms (or less) for 260 Vdc. Electrical voice band noise is less than 32 dBnC, using "C-message weighting" network. Value measured with battery *connected*, that has an 8-hour Ampere-hour rating, equal to no less than four (4) times the charger's output current rating.
- B. Eliminator filtered models measured *without* battery. These shall have output ripple voltage of **30mV** rms (or 0.06%, whichever is greater) for 12-48 Vdc, **85mV** rms (or less) for 130 Vdc, or **200mV** rms (or less) for 260 Vdc. Electrical voice band noise is less than 32 dBnC, using "C-message weighting" network.
- C. Un-filtered model may have output ripple less than 10% rms (for single-phase input), and 3% rms (for 3-phase input) models. Value measured with battery *connected*.

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X. Standard Equipment to be provided with all Battery Chargers

- A. ac pilot lamp
- B. ac input circuit breaker, shall be UL-listed or recognized type
(2-pole for single-phase, 3-pole for three-phase)
- C. dc output fuse (fast-acting type rated for appropriate Vdc service)
- D. ac & dc surge suppressors (MOV type)
- E. dc output voltmeter and ammeter (2%, 3.5in panel type)
- F. manual switch for selection of float or equalize mode
- G. internally-mounted current limit adjustment potentiometer
- H. externally-mounted float and equalize potentiometers, with adjustment locking collar nuts
- I. dc output blocking diode
- J. dc output protection diode
- K. color-coded internal wiring
- L. ac input & dc output (I/O) power terminal blocks

XI. Charger Options

A - typical options

1 - **CASM**, *Combined Alarm Status Monitor*, includes,

- a. High - Low AC voltage alarm relay
- b. Hi Vdc voltage alarm relay
- c. Low Vdc voltage alarm relay
- d. Ground Detection alarm relay
- e. Charger Failure alarm relay
- f. Common alarm relay
- g. Relays have 1 set of isolated dry, form C contacts (SPDT), rating 125 Vac/Vdc @ 0.5A.
- h. Relays all have 15 second time delay except for Charger Failure which has a 30 second time delay. All time delays are fixed.
- i. Each alarm function is displayed via an LED on the charger's front panel.

2 - equalize timer options

- a. 0-72 hour manual equalize timer, specify either with or without indicating lamps.
- b. 0-72 Automatic equalize timer with float/equalize lamps and switches. Timer is enabled when ac input power fails for a period greater than 10 seconds.

3 - dc output circuit breaker (specify kAIC rating as required)

4 - forced load sharing

5 - high dc voltage charger shutdown

6 - filtered or filtered "eliminator" (see Section IX A & B)

7 - ac input lightning arrester

8 - SWC filter to IEEE - 472 / ANSI 37.90a

9 - ac input voltmeter and/or ac input ammeter

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B. additional optional accessories;

- 1 - special ac input, or dc output voltages
- 2 - special high AIC circuit breakers (ac or dc)
- 3 - meters (1% analog 3.5in, 0.1% digital, or switchboard type)
- 4 - common alarm buzzer
- 5 - engraved functional nameplates
- 6 - component fungus-proofing
- 7 - enclosure rodent or insect protection
- 8 - enclosure NEMA Type-2 drip shield(s)
- 9 - special or custom enclosures, both style and type (e.g. NEMA-4, NEMA-12, etc.)
- 10 - cabinet heaters
- 11 - special paint request
- 12 - switchboard insulation system (SIS) type wiring
- 13 - special packaging, export etc.