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STANDARD SAMPLE SPECIFICATION

AT10.1 Series Microprocessor-Controlled Float Battery Charger (single phase input)

A battery charger shall be furnished in accordance with the following specification:

1.0 - General

1.1 - The battery charger shall be sized to continuously carry the load demand as required in the plans, and have sufficient reserve capacity as deemed appropriate for the application.

1.2 - The battery charger shall provide a continuous regulated DC output derived from an AC source. The output shall be suitable to maintain the battery in a fully charged state, while supporting any additional DC loads as defined in the plans. The battery charger shall also have the ability to automatically or manually provide an equalizing charge as required for recharging the battery after discharge.

1.3 - The battery charger shall be of a design that employs microprocessor technology to control and define all critical operational, calibration, regulation and alarm functions.

2.0 - Operation

2.1 - Battery charger shall automatically determine the appropriate DC output, in terms of either voltage or current required for maintaining the battery and load either by pre-programming or in-field re-programming, via the touch panel controls.

2.2 - The battery charger shall automatically know and respond to any alarm options or remote sensing options installed according to the manufacturer's instructions without further operator action.

2.3 - The battery charger shall display, via a 1% digital display and associated LED indicators, all functions important to operation.

2.3.1 - During float operation, the digital display shall alternate between DC voltage and DC current indications as designated by the appropriate LED being lit for the respective indication.

2.3.2 - During equalize operation, the digital display shall alternate between DC voltage and DC current indications as designated by the appropriate LED being lit for the respective indication. If the unit is employing a timer, either automatic or manual the LED indicators shall indicate timer function while the Digital display indicates the hours remaining for equalize charge.

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2.4 - Error and message codes, indicating certain self-diagnostic anomalies and operating conditions shall be indicated by the digital display, as required.

3.0 - Protective Devices

3.1 - The charger shall employ a circuit breaker as standard for each AC input and DC output protection.

3.2 - AC input transient over voltage protection shall be accomplished via a MOV (metal-oxide varistor) on the AC input terminals.

3.3 - DC external transient over voltage protection shall be via a MOV (metal-oxide varistor) on the DC bus. This shall be located on the output terminals of the battery charger.

3.4 - The charger shall be protected against damage in the event that the battery is connected in reverse.

3.5 - Protection from oscillatory surges (SWC) as defined by ANSI C37.90-1978. Battery charger shall operate correctly during and after application of oscillatory surges.

3.6 - Output current limit shall be adjustable from 50% to 110% of rated output.

3.6.1 - The battery charger shall protect itself from a short circuit in the output side electronically so as to limit the current output. When the short is corrected the battery charger will automatically return to normal charger operation. During a short circuit of the output an error code shall be provided as indication. The error code shall be removed when the output voltage rises above 2.0VDC.

4.0 - Controls

4.1 - The following controls shall be located on the front panel, using touch sensitive switches to initiate all adjustments.

4.1.1 - Charge mode key (selects float or equalize mode)

4.1.2 - Equalization method key (selects timer method, manual, automatic, or manual timer)

4.1.3 - Edit/Enter key (initiates changes in AT10.1 parameters)

4.1.4 - Meter mode key (selects Volts, Amperes, hours, or alternating display)

4.1.5 - Up key (increases parameter value in Edit mode)

4.1.6 - Down key (decreases parameter value in Edit mode)

4.1.7 - AC circuit breaker

4.1.8 - DC circuit breaker

4.1.9 - Lamp test key

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5.0 - Indicators

5.1 - Standard front panel indicators shall include the following:

5.1.2 - Digital meter, 1% accuracy, 4-digit, 7-segment

5.1.2.1 - The digital meter shall indicate the following;

- DC Volts
- DC Amperes
- Equalize hours remaining
- Error and message codes

5.1.3 - DC Volts meter indicator (red LED)

5.1.4 - DC Amperes meter indicator (red LED)

5.1.5 - Equalize Hours Remaining indicator (red LED)

5.1.6 - AC on indicator (green LED)

5.1.7 - Float mode indicator (green LED)

5.1.8 - Equalize mode indicator (yellow LED)

5.1.9 - Manual equalize timer indicator (yellow LED)

5.1.10 - Manual equalize indicator (yellow LED)

5.1.11 - Automatic equalize indicator (yellow LED)

5.2 - Standard Front Panel Primary Alarm indicators shall include the following:

5.2.1 - High voltage DC alarm indicator (red LED)

5.2.2 - Low voltage DC alarm indicator (red LED)

5.2.3 - DC output failure alarm indicator (red LED)

5.2.4 - Positive ground fault indicator (red LED)

5.2.5 - Negative ground fault indicator (red LED)

5.2.6 - AC failure alarm indicator (red LED)

6.0 - Current limit shall be factory set at 110% of rating. This shall also be the limit available from the battery charger. Field adjustments may be made over a range from 50% to 110% of rating. The current limit shall be displayed directly in amperes and is adjustable in 0.01A increments (0.1A increments for charger ratings of 30A and higher).

7.0 - Parallel operation of 2 or more chargers with the same DC voltage rating shall be a standard feature of the filtered charger with random load sharing.

8.0 - Operating environment shall be 0-50 deg C, storage at -40 to 70 deg C, RH 5 - 95% non-condensing, elevation to 1,000 meters.

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9.0 - Construction

9.1 - Input and output shall employ 10-32 stud terminals with solderless compression terminals, Accepting:

#12-6 AWG. (6A to 25 Adc ratings)

#14-1/0 AWG. (30-100Adc ratings)

9.2 - Alarm function terminals - compression terminal block for #22-14 AWG.

9.3 - Enclosure shall be steel 18 GA for the outer skin, 16 GA for the door and 14-16 GA for the chassis. Shall employ adequate knock-outs for top, bottom, and right side conduit entry.

9.4 - Finish will be ANSI-61 gray, baked powder epoxy.

10.0 - Serviceability: The battery charger shall be serviceable by a technician using standard hand tools. Addition of any and all options including but not limited to filtering, alarm capabilities, battery eliminator, remote temperature compensation, and medium and high interrupting breakers, shall be able to be added in the field by the customer without any special training, using standard hand tools.

11.0 - Alarms, Self-Diagnostics and Error Codes

11.1 - The charger shall be capable of automatic self diagnostics, and indicate any anomaly by means of an error code on the digital display. Error and message code definitions shall be posted within the battery charger.

11.2 - Primary Alarms (*standard with all AT10.1 models*) shall provide an alarm sensing capability for all the following:

11.2.1 - High voltage DC alarm indicator (red LED)

11.2.2 - Low voltage DC alarm indicator (red LED)

11.2.3 - DC output failure alarm indicator (red LED)

11.2.4 - Positive ground fault indicator (red LED)

11.2.5 - Negative ground fault indicator (red LED)

11.2.6 - AC failure alarm indicator (red LED)

11.2.7 - Summary alarm contact (one Form-C)

12.0 - Control Panel shall be a touch sensitive type, permanently laminated for protection, thereby eliminating the need for engraved functional nameplates.

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13.0 - Documentation

13.1 - A standard drawings, consisting of an outline, internal layout, schematic and wiring diagram may be provided as needed.

13.2 - A manual, completely describing the installation, operation, and maintenance of the charger along with all accessories and options shall be included with charger. The charger shall have provision for storing the manual in a convenient permanent pocket.

14.0 - Optional Accessories

14.1 - DC output filter, consisting of one inductor and a one or two section capacitor capable of limiting the output ripple with battery connected to 30 mV rms when measured at the battery terminals in accordance with NEMA PE5 (output ripple may be 20% higher on units operating at 50 Hz).

14.2 - Battery Eliminator filter, consisting of one or more capacitors installed within the battery charger enclosure. The filter reduces the output ripple voltage to 30 mVrms for applications from 12 through 48 Vdc and 100 mV rms for 130 Vdc (output ripple may be 20% higher on units operating at 50 Hz). The ripple voltage is measured at the charger terminals.

14.3 - Auxiliary Relay PC Board (*optional for all AT10.1 models*) provides 2 sets of Form C contacts for each alarm function listed in Section 11.2, plus an additional summary alarm contact, Form C.

14.3.1 - Auxiliary alarm terminal block with barrier type terminals.

14.4 - Higher interrupting capacity circuit breakers:

Output Current

Classification	Voltage	6-25 A _{dc}	30-100A _{dc}
Medium AIC	120/208/240 Vac	25 kAIC	25 kAIC
Medium AIC	380/416/480 V _{sc}	18 kAIC	25 kAIC
Medium AIC	125 V _{dc}	10 kAIC	10 kAIC
High AIC	120/208/240 Vac	65 kAIC	65 kAIC
High AIC	380/416/480 Vac	25 kAIC	65 kAIC
High AIC	125 V _{dc}	10 kAIC	25 kAIC

14.5 - Ground pad with one (1) solderless compression terminal, for #14-#2 AWG.

14.6 - AC input lightning arrestor

14.7 - Remote temperature compensation probe, with automatic probe failure detection and fail-safe control override

14.8 - Rack/floor installation kit

14.9 - Drip shield assembly

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14.0 - Optional Accessories (continued)

- 14.10 - NEMA-4 enclosure
- 14.11 - NEMA-12 enclosure
- 14.12 - Fungus proofing
- 14.13 - Anti-static coating
- 14.14 - Export packaging
- 14.15 - Certified test data
- 14.16 – End of discharge alarm
- 14.17 – Fan control contactor

15.0 - Group 1: AC input voltage will be single phase and the charger may be user modified to accept 120 VAC, 208 VAC, or 240 VAC, without any special tools or training. 50Hz or 60Hz must be specified when ordering. 50Hz units will not have the 120 Vac option available.

15.0.1 - Group 1: 480 Vac may be specified as a special AC input, which requires the addition of the penthouse option and either medium or high AIC rated circuit breakers.

15.1 - Group 2: AC input voltage must be specified as 120 Vac, 208 Vac, 240 Vac, 380 Vac, 416 Vac or 480 VAC. 50 Hz or 60 Hz must be specified.

16.0 - Charger Output availability table:

- 16.1 - DC Voltage outputs (12V, 24V, 48V, 130V)
- 16.2 - DC current outputs (6A, 12A, 16A, 20A, 25A, 30A, 40A, 50A, 75A, 100A)
100 Adc output not available in 130 Vdc model

17.0 - Error codes as indicated on the front panel shall determine certain malfunctions as part of an integral microprocessor controlled self-diagnostic system. The error codes shall appear in the digital display as an alphanumeric indication beginning with the letter "E" followed by a number code, which reveals the problem being identified. Error code definitions shall be posted inside the access door to the charger and shall be listed in the manual. Certain codes, preceded by the letter "A" are provided to indicate special operating conditions.

18.0 - Fail Safe Operation featuring a separate circuit from the micro controller to detect a low dc voltage condition and enable the common alarm on the main board to change state. This uniquely protects the battery due a failure of the microprocessor.