1075 Saint John Street • Easton, PA 18042-6661
Phone 610.330.9000 • Fax 610.330.8510
www.hindlepowerinc.com

JF5029-00

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.

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

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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

This 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

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

8.1 - without de-rating: -18 ºC to +50 ºC (-1 ºF to 122 ºF)
8.2 - storage: -30 ºC to +70 ºC (-22 ºF to 158 ºF)
8.3 - relative humidity: RH 0% - 95% non-condensing
8.4 - elevation to: 1,000 meters (3,300 feet)

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9.0 - Construction

9.1 - Input (ac) and output (dc) terminals shall employ ZPS studs with solderless CU-AL compression lugs, accepting:

9.1.1 - #12-6 AWG (6A to 25 Adc ratings) on 10-32 stud
9.1.2 - #14-1/0 AWG (30-100 Adc ratings) on 1/4-20 stud

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 - External finish will be ANSI-61 gray, baked epoxy powder coat. Mounting bases may be galvanized steel.

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

The Human Machine Interface (HMI) 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 user's 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.

13.2 - Standard drawings, consisting of external outlines, internal layouts, electrical schematics, and point-to-point connection diagram will be featured in the manual listed in 13.1. No-cost downloadable prints of these "standard" drawings will be made available online.

13.3 - Customized record drawings will be supplied when requested.

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 in accordance with NEMA PE5-1996. This 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 *battery* terminals.

14.2 - Battery Eliminator filter, consisting of one or more capacitors installed within the battery charger enclosure. This 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 Alarm Relay PC Board (***optional for all AT10.1 models***) provides two (2) sets of Form-C contacts for each alarm function listed in Section 11.2, plus two (2) additional summary (common) alarm Form-C contacts.

14.3.1 - Barrier type terminals, for alarm contacts, accepting ring or spade lugs for #16-14 AWG

14.4 - Higher interrupting capacity circuit breakers:

		Output Current	
Classification	**Voltage**	**6-25 Adc**	**30-100 Adc**
Medium AIC	120/208/240 Vac	25 kAIC	20 kAIC
Medium AIC	380/416/480 Vsc	18 kAIC	20 kAIC
Medium AIC	125 Vdc	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 Vdc	10 kAIC	20 kAIC

14.5 - Copper ground bus bar, with one (1) solderless CU-AL compression terminal

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14.0 - Optional Accessories (*continued*)

14.6 - AC input lightning arrestor
14.7 - Fungus proofing
14.8 - Anti-static coating
14.9 - Remote temperature compensation probe
(with automatic probe failure detection and fail-safe control override)
14.10 - Forced load sharing interconnection cable
14.11 - DNP/Modbus communications
14.12 - Ground fault detection dc voltmeter
14.13 - AC input voltmeter
14.14 - AC input ammeter
14.15 - End of discharge alarm
14.16 - Battery discharge alarm
14.17 - Vent/Fan control contactor
14.18 - Rack/floor/wall-mount installation kits
14.19 - NEMA Type-2 drip shield accessory
14.20 - NEMA Type-4 (12/13) cabinet (housing standard NEMA-1 top-vented enclosure)
14.21 - Certified test data
14.22 - Customized record drawings
14.23 - Export packaging

15.0 - Charger Input Voltage - The battery charger shall accept single phase ac input power. (60 Hz as standard, or 50/60 Hz which must be specified)

15.1 - **Group 1** (60Hz)**:** 120/208/240 Vac (multi-tap), 480 Vac, 550 Vac, or 600 Vac
15.2 - **Group 1** (50/60Hz)**:** 120/220/240 Vac (multi-tap), 380 Vac, or 416 Vac
15.3 - **Group 2** (60Hz)**:** 120 Vac, 208 Vac, 240 Vac, 480 Vac, 550 Vac, or 600 Vac
15.4 - **Group 2** (50/60Hz)**:** 220 Vac, or 380 Vac, or 416 Vac

16.0 - Charger Output

16.1 - nominal DC voltage outputs (12V, 24V, 48V & 130V)
16.2 - rated 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 - The battery charger shall determine certain malfunctions, as part of an integral microprocessor-controlled self-diagnostic system, and indicate on the front panel. 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 "status" codes, preceded by the letter “A” are provided to indicate special operating conditions.

18.0 - Fail Safe Operation - The battery charger will feature 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.