UMC SERIES

Operating and Service Instructions

UNIVERSAL MAINTENANCE CHARGER

120/208/240/480 Vac SINGLE PHASE INPUT
24/48/130 Vdc ADJUSTABLE OUTPUT

HINDLEPOWER

JA5041-01

QUICK STARTUP

TURN OFF ALL POWER AND TURN OFF UMC'S INPUT & OUTPUT CIRCUIT BREAKERS (CB1 & CB2)

1. Move input jumpers on I/O panel to match the required input voltage. See connection chart on wiring diagram inside enclosure.
2. Connect the input terminals (TB1-L1/L2) to available ac power.
3. See table/nameplate for input currents required.
4. If reduced input/output currents are required, adjust the Output Current Limit to minimum (counter-clockwise).
5. Connect cables to the dc bus or battery (properly rate wire size for the current required).
6. Select output voltage rating 130V, 48V or 24V using the Voltage Selector Switch on front panel.
7. Set Voltage Check switch to Charger Voltage (left position).
8. Turn on ac source and the ac input circuit breaker and adjust output voltage to desired set point. **DO NOT** turn on the dc output circuit breaker at this point. Monitor the output voltage on the dc voltmeter, and adjust the Output Voltage control slowly to the desired value. It may take several seconds for the output voltage to settle to the desired voltage.
9. Set Voltage Check switch to Battery Voltage (right position). Check for proper polarity and voltage.
10. Turn on the dc output circuit breaker; current will be displayed on the ac and dc ammeters.
11. Increase Current Limit Adjustment clockwise to obtain the desired output current. Monitor the ac input current on the ac ammeter in the lower right corner of the front panel. Do not allow the input current to exceed 66 Aac, as shown in the table below.

DC OUTPUT CURRENT	10A	20A	30A	55A
AC INPUT VOLTAGE	**AC INPUT CURRENT**			
120V	25A	48A	66A	**
208V	17A	24A	44A	60A
240V	15A	22A	35A	51A
480V	8A	15A	17A	26A

INPUT CURRENT TABLE

** Full output current at 120Vac input will cause the input current to exceed breaker rating.

IMPORTANT OPERATION NOTES

The battery charger's output voltage is capable of adjustment over 145Vdc. The output current limit needs to be ***reduced*** when operating at levels above 145Vdc.

Adjust the Output Current Limit of 50A units to 40A.

Adjust the Output Current Limit of 25A units to 22A.

⚠ WARNING WORKING WITH BATTERIES

Some reasons why someone would wish to overcharge a battery bank is when the battery's temperature is very low, or the electrolyte has stratified. Once charging takes place the batteries may start to heat, or electrolyte mixes and the batteries will start to show signs of gassing. The charger **WILL** need to be readjusted to a lower output voltage to prevent damage to the batteries.

NEVER LEAVE BATTERIES UNATTENDED DURING THIS KIND OF CHARGING!
NEVER LET THE INTERNAL PLATES OF THE BATTERY TO BE EXPOSED TO AIR!
FOLLOW ALL RECOMMENDED PROCEDURES PROVIDED BY THE BATTERY MANUFACTURER!

Battery banks greater than 130V can be charged. Connect to a portion of the bank at a time and move to the next portion until all the batteries are charged. This should only be done if there is no or little standing load while charging.

SPECIFICATIONS

REGULATION:	+ or - 0.5%	no-load to full-load
REGULATION:	+ or - 0.5%	for + or - 10% AC line variation
REGULATION:	+ or - 1%	for combined load, line & temperature variations
120-240Vac input protection		5 kAIC
480Vac input protection		200 kAIC
Ambient Temperature Range:		0 ºC to 40 ºC
Relative Humidity:		up to 95% without condensation
Altitude:		up to 1,000m above sea level

IMPORTANT SAFETY INSTRUCTIONS

1) Before using the battery charger, read all instructions and cautionary markings on: A) battery charger, B) battery, C) equipment connected to charger and battery

2) This manual contains important safety and operating instructions, and therefore should be filed for easy access.

3) Do not touch any uninsulated parts of the battery charger, especially the input and output connections, as there is the possibility of electric shock.

4) During normal operation, batteries may produce explosive gas. NEVER smoke, use an open flame, or create arcs in the vicinity of the battery charger or battery.

5) Maintain at least 1ft (0.3m) clearance from all obstructions on all sides of the battery charger.

6) Keep area in front of battery charger clear for at least 4ft (1.3m).

7) Connect or disconnect the battery only when the battery charger is off to prevent arcing or burning.

8) De-energize all ac and dc inputs to the battery charger before servicing.

9) Do not operate the battery charger if it has been damaged in any way. Refer to qualified service personnel only.

10) Do not disassemble the battery charger. Only qualified service personnel should attempt repairs. Incorrect reassembly may result in explosion, electrical shock, or fire.

11) Do not install the battery charger outdoors, or in wet or damp locations unless specifically ordered for that environment.

12) Remove all jewelry, watches, rings, etc. before proceeding with installation.

13) Check your ac input current resources before choosing input power and installing input cables.

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

TABLE OF CONTENTS

Page No.

UNIVERSAL MAINTENANCE CHARGER (UMC)
INSTALLATION AND OPERATION

1. BATTERY SAFETY NOTICE

⚠ WARNING *BATTERIES CONTAIN DANGEROUS CHEMICALS AND PRODUCE **HYDROGEN GAS** DURING CHARGING! THIS EQUIPMENT (UMC) SSHOULD BE CONNECTED AND DISCONNECTED WITH CARE. ALWAYS OPEN THE DC BREAKER (CB2) BEFORE CONNECTING OR DISCONNECTING THE BATTERIES, SO THAT NO SPARK OR ARC WILL OCCUR AT THE BATTERY TERMINALS.*

2. APPLICATION

The Universal Maintenance Charger (UMC) is a standby constant voltage battery charger designed to provide:

1) temporary replacement for a battery charger that needs repair or refit
2) charging for a new installation of a battery bank waiting for charger installation, or batteries in storage
3) emergency replacement for a catastrophic failure of a dc bus

FEATURES

- Input voltage connections are available for 120/208/240/480Vac single phase 60Hz
  (input current control for temporary feeds that may lack charger's full current capability)
- The output voltage is designed to charge a battery bank of 24V, 48V or 130V depending on setting.
- The voltage output adjustment is broad enough to charge any cell combination from 20V to 145V
- Output voltage and current displayed through 1% digital meters (M1/M2)
- AC input circuit breaker (CB1)
- AC input ammeter (M3)
- DC output circuit breaker (CB2)
- Charger/battery voltage switch (SW2) to check dc voltage compatibility prior to connection
- No dc fuses to clear if battery connection is incorrect or setting is incorrect
- Front panel adjustable current limit to reduce input current and charge current
- Built-in mobile cart and lifting eyes for transportation
- Covered controls for maximum protection during transport or harsh environments

CONTROLS

- AC AMMETER (M3): 0-50Aac or 0-100Aac - 2% needle-indicating analog meter
- DC VOLTMETER (M2): 0-200Vdc 1% digital meter
- DC AMMETER (M1): 0-100Adc 1% digital meter
- DC OUTPUT VOLTAGE ADJUSTMENT (R5): 10-turn control for fine voltage adjustment
- DC OUTPUT CURRENT LIMIT CONTROL (R12): 1-turn current limit control
- DC VOLTAGE SELECTOR SWITCH (SW1): Coarse voltage selection for 24, 48 or 130V

APPLICATION CONSIDERATIONS

Although the battery charger is designed to operate with a battery, it can be connected to loads such as dc-to-dc power supplies or inverters. Ripple content is designed to be below 200 mVac rms, without the battery connected, on resistive load. The battery charger is designed to connect to a high capacitive load like a battery. It is wise to consider the effect when large inductive loads are attached, like a dc motor without the battery. The response to these loads is a reduction of output voltage with a recovery time in seconds. Once the load is stabilized the battery charger will support most loads with little problem. Conversely when loads are shed, there may be a voltage rise in the output due to the large filter stage. Care needs to be taken when the loads attached are sensitive to voltages 5% above the charger's set voltage level.

This charger can be used on any number of lead-acid, nickel-cadmium, or nickel-iron cells, as long as the desired voltages are within the UMC range. Batteries are not alike so check with the battery manufacture's charging procedures and practices. Pay attention to what the batteries are doing during the charging process. Some battery types may produce more gas (hydrogen and oxygen) and need to be monitored for loss of water. Never leave the charger unattended for long periods of time.

The battery charger can be installed in an environment more severe then specifications allow. Reduce the output current to 60% of the charger's rated output for 50 ºC ambient or 3,300 ft (1,000m) above sea level.

3. INSTALLATION

a. **Location:** Select a clean, dry location for the battery charger. It may be located in the battery room, but not over the battery, and must be upright. The openings for ventilation in the top, bottom and sides of the cabinet should not be obstructed, as they provide cooling and ventilation. Ambient temperatures between 32 °F and 122 °F, and elevations up to 3,300 feet above sea level, will not affect the performance of the charger. Operation at higher temperatures, or at higher elevations, is possible if the output current limit is reduced.

b. **Input Wire Sizes (recommended):** Size the ac input wiring to the UMC per the National Electric Code (NEC) and local (site) codes, for the trip rating of the UMC ac input circuit breaker (CB1). The UMC is capable of connections of 120V, 208V, 240V or 480V (60 Hz) ac single phase. Consult the I/O panel jumpers and connection input for each power source required. An I/O panel jumper diagram is located on the inside front panel of the UMC. See also the electrical schematic (**JE5039-##**) and connection diagram (**JE5040-##**) supplied with this operating manual.

130V-25A SINGLE PHASE		
AC INPUT VOLTAGE	**WIRE SIZE**	**FULL LOAD INPUT CURRENT**
120 **	8 **	32A **** (reduced output only)
208/240	8	34A/30A
480	14	16A

130V-50A SINGLE PHASE		
AC INPUT VOLTAGE	**WIRE SIZE**	**FULL LOAD INPUT CURRENT**
120 **	6 **	65A ** (reduced output only)
208/240	6	61A/54A
480	10	30A

** 120Vac input requires the output current reduced to 50% so not to exceed input breaker rating

c. **Output Wire Sizes:**
10-25 Ampere unit: use #8 AWG wire
10-50 Ampere unit: use #6 AWG wire

Connect the dc cables, making sure positive (+) and negative (-) polarity is maintained.

4. POWERING UP

a. With the ac and dc breakers (CB1/CB2) OFF, select desired voltage required for bus or battery (24V, 48V or 130V).
b. Reduce the OUTPUT CURRENT LIMIT ADJUST control (R12) to desired level. This adjustment will limit output current. This is helpful for two reasons. Temporary dc lines are often used to connect to the dc bus, and large wire may not be available for quick installation in an emergency. Also, the input feed may need to be connected to a source with limited current capability. Reducing the output current will also limit input current.
c. Set VOLTAGE CHECK switch (SW2) to "CHARGER VOLTAGE". This will allow the user to see and adjust the battery charger's output voltage prior to being connected to the batteries.
d. The charger can now be energized, by first closing the ac breaker (CB1). The "AC ON" lamp (DS01) will light. The front panel meter indicates the charger voltage. With the dc breaker (CB2) off, there will be no current flowing.
e. Adjust the OUTPUT VOLTAGE control (R5) to desired charging voltage. This control allows for adjustment for a wide variety of battery banks.
f. Switch the VOLTAGE CHECK switch (SW2) to "BATTERY VOLTAGE". The dc voltmeter (M2) will now indicate the battery voltage and the user can compare the battery voltage and the charger voltage before turning on the dc breaker (CB2). The meter will also display a "-" if the battery is connected in reverse polarity. Verify that the battery polarity is correct before proceeding.
g. Turn on the dc breaker (CB2). If the charger's voltage is higher then the battery voltage, current will flow. You may need to rotate the OUTPUT CURRENT LIMIT ADJUST control (R12) to allow current to flow.
h. Increase the OUTPUT CURRENT LIMIT ADJUST control (R12) to desired current level. The battery charger will be in current limit until the battery's voltage reaches the same level as the battery charger. Current limit adjustment needs to be set with current flowing into the batteries. Do not set the current limit higher than 110% of current rating of the charger.

7. MAINTENANCE

This charger requires a minimum of maintenance. There are no rotating parts and most components have an indefinite life with no expected aging effect. Large electrolytic capacitors (C1, C2) have a 20-year expected service life. They should be replaced when the output ripple voltage exceeds 500 mVrms, measured with a resistive load. If necessary, dry air may be used to blow dust out of the interior. In the event of any irregular operation, examine, and tighten if necessary, all internal and external connections. The unit is designed to be mobile. However, do not drop or slam the equipment down. If the charger is dropped, inspect interior for damage or loose components. ***NOTICE*** The warranty does not cover damage due to dropping.

8. INTERNAL PROTECTION

When operating normally, the OUTPUT CURRENT LIMIT ADJUST control (R12) will limit the maximum output current to approximately 110 percent of the rated charge current. In case of a high dc current demand, the current limit control will keep the charger output within safe values without tripping the dc circuit breaker (CB2) or the ac breaker (CB1). The connection of the 120V input needs to have the current limit control reduced to 50%. The input circuit breaker (CB1) is designed to protect the equipment at the 208/240 Vac connection. The input current for 120Vac is two (2) times the rating of the ac input circuit breaker (CB1). In the 480 Vac input connection, the UMC is protected by ac fuses (F3/F4) in addition to the ac circuit breaker (CB1). The dc circuit breaker (CB2) will trip if over current occurs or battery is connected in reverse polarity. Metal-Oxide Varistors (SS1/SS2) are used on the ac input and dc output for surge protection.

9. DESCRIPTIONS OF COMPONENT OPERATION

The Universal Maintenance Charger (UMC) uses an SCR phase-controlled ac-to-dc isolated power circuit. The following is a basic description of the main components, from input to output.

1. AC Input Power Section: This section includes the input terminals, CB1, F3 and F4, SS2 and T1. Its purpose is to supply an ac voltage of the proper magnitude and capacity to the rectifier section. It also supplies various other voltages used by the control unit and meters. It is connected to an ac source by means of a circuit breaker for most inputs and fuses and breaker in the 480 Vac input connection. The power transformer (T1) is an isolation type to prevent any currents from flowing into the dc bus from the ac line.

2. Rectifier Section: The Silicon-Controlled Rectifier (SCR) bridge accepts the ac voltage from the power transformer (T1), rectifies this voltage to dc, and controls the voltage's magnitude so that the charger's output voltage remains constant. The firing angle of the SCRs (Q1/Q2) is controlled by the action of the control module pc board (A1). The SCRs are protected from ac and dc voltage surges by means of Metal-Oxide Varistor (MOV) surge suppressors (SS1, SS2).

3. The Control Module: This printed circuit board (A1) generates a signal which phase-fires the gates of the SCRs (Q1/Q2). The output voltage of the charger is monitored by the voltage feedback circuit and advances or retards the phase angle of the trigger pulses so that the output voltage is maintained essentially constant.

4. The Filter Section: The eliminator-filter assembly (L2/C1/C2/CR1) minimizes the ac ripple voltage at the battery terminals. To accomplish this, the charger includes a low pass filter consisting of inductors (L1, L2) and capacitors (C1, C2). The filter section also includes a diode (CR1) placed across the output to prevent a reverse polarity battery connection from damaging the capacitors (C1, C2).

5. Meters: The dc ammeter (M1) uses a shunt (R13) to measure output current. The ac ammeter (M3) uses a current transformer (CT1) to measure ac input. The dc voltmeter (M2) and dc ammeter (M1) operate from a 10 Vdc supply powered by the transformer (T1) and a small rectifier circuit pc board (A2).

6. DC Output: The dc output circuit breaker (CB2) allows the user to disconnect the dc bus or battery from the charging circuit. The voltmeter can be switched from the dc bus to the battery charger's internal voltage using the selector switch (SW2). This allows the user to inspect setup prior to final connection.

7. Controls: The output adjustment knobs on the front panel control the output voltage (R5) and the output current (R12). These controls allow the user to adjust the charger for many charging applications. The voltage adjustment will be overridden by the current limit adjustment. The voltage adjustment is the fine adjustment of the output voltage. The current limit adjustment controls the maximum current allowed to be transferred to the load or battery.

UNIVERSAL MAINTENANCE CHARGER (UMC)
TROUBLESHOOTING AND REPAIR

⚠ CAUTION Before troubleshooting, always isolate and deenergize the charger by opening the ac circuit breaker (CB1) and the dc circuit breaker (CB2). This avoids the possibility of personnel injury or equipment damage from high short circuit currents. ***NOTICE*** Circuit breaker terminals and terminal boards have dangerous voltages across them even when breakers are open. After isolating the charger, check to ensure the voltage across filter capacitors is zero, for once charged they take several minutes to discharge if bleeder resistor (R1) is open. The dc circuit breaker (CB2) is provided to isolate the charger from the battery. Battery bus voltage will still be present on the input terminals and one side of the dc breaker (CB2). The meter select switch (SW2) will also hold the battery voltage. It is best to remove the battery connection at the battery for safety reasons.

AFTER LOCATING THE CHARGER PROBLEM, ALWAYS DE-ENERGIZE ALL AC AND DC CHARGER INPUTS AT THE POWER SOURCE BEFORE SERVICING

NOTICE Most repairs are performed with standard hand tools. Refer to the connection diagram (**JE5040-##**) and wire markers during replacement of any components.

1. QUICK FIRST CHECKS

- Check voltage of the ac supply to ensure that it is within 10% of the value of the specified input voltage.
- Inspect the I/O connections for proper jumper configuration.
- Turn the current limit control clockwise.
- Examine charger for any evident loose or improper connections, particularly at the control unit, transformer T1, input and output terminals.
- Check continuity of battery circuit by comparing voltage at charger terminals with total of cell voltages.
- Check the battery: if a cell is open or a connection is loose current may not flow into the battery bank.

2. TROUBLE-SHOOTING PROCEDURE

a. When a charger is not operating properly, the cause must be determined by checking various components until the fault is located.

b. A charger may experience more than one problem, each with its own symptoms. In many cases, failure of one component may cause another component to fail. Therefore, the following paragraphs treat major components, functional circuits and parts individually (or by symptom). Together with serviceability measurements and tests, the faulty part or component should be located.

c. Most of the following checks can be performed with a digital voltmeter or digital multimeter (DVM). An oscilloscope may also be helpful with more extensive troubleshooting.

3. TESTING OF COMPONENTS

a. Power Transformer (T1)

With the ac and dc circuit breakers open or OFF, open the cabinet and carefully check the line voltage across line terminals on TB1, terminals L1 to L2 (*do not confuse terminals L1 and L2 with the inductor components, also labeled L1 and L2)*. If ac voltage is indicated, turn on the ac circuit breaker (CB1) and check the voltage at terminals X1 and X5. The ac secondary voltage on the power transformer (T1) is approximately 180Vac. This can be measured at the bottom terminal of each SCR (Q1/Q2) with a DVM.

b. Polarity Protection Diode (CR1)

If the polarity protection diode (CR1) is shorted, the battery will discharge into it. This will trip the dc circuit breaker (CB2). With all power disconnected from the charger, disconnect the flying lead of CR1 and check across the diode with an ohmmeter (both polarities) for a shorted condition and replace if required. A normal diode should measure at least 10,000 Ohms in one polarity.

c. Rectifier Modules (Q1/Q2)

The SCRs (Q1/Q2) rarely fail while open. If a failure occurs in the SCRs, the breaker(s) will trip similarly to the polarity diode (CR1). To check the device(s), remove wires from the SCR modules (Q1/Q2) and inspect with an ohmmeter for shorted terminals. See the schematic symbol on the side of the device for terminal connections. SCR modules usually fail because of surge voltages. Therefore, the surge suppressors (SS1, SS2) should also be checked to determine if they are damaged or not connected.

d. Surge Suppressors (SS1, SS2)

The Metal-Oxide Varistor (MOV) type of surge suppressor is used on the input and output of the battery charger. If an MOV surge suppressor fails during a high-energy transient it may explode. This is an obvious failure and the part must be replaced. When the suppressor shows an infinite resistance in both directions measured with it disconnected from the charger and has a normal appearance it can be presumed to be in good operating condition. There is no way to test a good MOV.

e. Control Module PC Board Assembly (A1)

The voltage feedback and Current Limit circuit controls the battery charger output voltage. The feedback voltage from the wiper of the Voltage Adjustment potentiometer to output terminal (-) is 6-7Vdc when the charger is not in current limit. If the charger's output voltage is lower then expected, the resistors in the feedback loop should be checked or current limit control may not be fully ***clockwise*** (CW), or the charger may be in current limit.

f. DC Voltmeter (M2)

The dc voltmeter (M2) is connected across the charger's output or the charger's input before the dc breaker (CB2) depending on the position of the Voltage Check switch (SW2). The meter will only indicate if the charger's input power is applied, and ac breaker (CB1) is on. If there is no display, check for 9 Volts at pins 2 and 3 (around 9.5Vdc). The input signal is connected to pins 14 and 15 (output Volts/100). Calibrate the dc voltmeter (M2) by adjusting the potentiometer located on the meter itself. If the meter calibration is in doubt, check by using a precision digital multimeter.

g. DC Ammeter (M1)

The charger's dc ammeter (M1) measures a shunt (R13) connected in series between the charger's output and battery. The shunt is a 100A / 100mV shunt or 50A / 50mV shunt, depending on the model. But in either case the signal is 1mV for every Ampere out. Like the dc voltmeter (M2), it will only indicate if the charger's ac breaker (CB1) is on and input power is connected.

h. Filter Capacitors (C1, C2)

⚠ CAUTION When the dc circuit breaker (CB2) is turned ON, the filter capacitors (C1/C2) can be charged by the battery. Making the connection at the battery while the dc circuit breaker (CB2) is on may cause an arc at the battery terminal. Always turn off the dc circuit breaker (CB2) when connecting the battery. When the charger is turned OFF (ac and dc circuit breakers opened) the capacitor will take a minute to discharge into the bleeder resistor (R1). Filter capacitors (C1, C2) should always be checked for voltage before starting work inside the battery charger.

NOTICE Capacitors (C1, C2) may consist of one or more parallel-connected capacitors.

Before attempting to check the output ripple, it should be determined that in all other respects the charger is operating normally. Having determined this, the ripple may be checked by connecting a sensitive ac voltmeter (digital type preferred) to the battery terminals and measure the ac ripple voltage. If it measures more than 200 mV rms, do the following:

1. Check all filter capacitors (C1, C2) for any physical damage
2. Check wiring to capacitors for possible loose connections
3. Check to see if both the SCRs (Q1/Q2) are firing. (If only one of the SCRs is turning on, the charger will make a rumbling sound when current is flowing.)

UNIVERSAL MAINTENANCE CHARGER (UMC) REPLACEMENT COMPONENTS

To place an order for spare parts or replacement parts, please contact your sales representative and refer to the supplemental **PARTS DATA PACKAGE REPORT**, located at the end of this manual.

To help us ensure you receive the correct replacement parts, please provide the following information for each component:

- Model number and serial number of your battery charger
- Reference Designator from the schematic diagram (**JE5039-##**)
- Factory part number and description from supplied Parts Data Package Report
- Quantity required

Part numbers and descriptions may differ due to changes to design since manual printing.

UNIVERSAL MAINTENANCE CHARGER (UMC)
DOCUMENT CONTROL INFORMATION

DOCUMENT NUMBER

The text and graphics contained within this manual are controlled by the battery charger manufacturer's internal part number (**JA5017-00**). The revision level and dates of this manual's text and graphics are featured in the electronic filename listed below. These controls supercede all other available dates. The first and last pages of this manual are reserved for company-specific front and back cover artwork. Any revision levels, revision dates or document numbers featured on the first two and last two pages of this manual refer to the cover artwork only.

DOCUMENT INFORMATION

Document Number:	**JA5017-00**
Revision Level:	**6A**
Filename:	[JA5017-00.Rev6A.doc]
Last Date Saved:	[8/23/2021 1:35:00 PM]
Last Date Printed:	[8/23/2021 1:35:00 PM]

ON-LINE AVAILABILITY

Electronic versions of this manual and/or the standard drawings for the Universal Maintenance Charger (UMC) are available online. Saved in Adobe Acrobat Portable Document Format (PDF), they are readily available for downloading and printing. Please contact your sales representative for document availability or see the manufacturer's web site listed on the back cover of this manual.

PARTS DATA PACKAGE

A job-specific customized Parts Data Package report for the Universal Maintenance Charger (UMC) is supplied with all shipped units, and should be referenced in conjunction with this manual. This report lists customer, model number, serial number, factory configuration number, embedded subassemblies, and all included parts featuring a circuit symbol. Also listed with this parts list are manufacturer's part number, circuit symbol, item description, quantity used and identification of recommended spares (if applicable).

STANDARD DRAWINGS

Standard drawings are available for the Universal Maintenance Charger (UMC), which further detail the construction and operation of unit, and should be referenced in conjunction with this manual:

UMC (10-25 Adc) BB0443-00:

(http://www.atseries.net/PDFs/JH0003-UMC25.pdf)

JE5035-25 Universal Maintenance Charger (UMC) Series Drawing List / Data Nameplate Detail
JE5036-25 Universal Maintenance Charger (UMC) Series Outline NEMA-1 Style-5018 Wheeled Enclosure
JE5037-25 Universal Maintenance Charger (UMC) Series Internal Component Layout Style-5018 Enclosure
JE5038-25 Universal Maintenance Charger (UMC) Series Instrument Panel Detail
JE5039-25 Universal Maintenance Charger (UMC) Series Schematic: BB0443-00 (10-25 Adc)
JE5040-25 Universal Maintenance Charger (UMC) Series Connection Diagram: BB0443-00 (10-25 Adc)

UMC (10-50 Adc) BB0443-01:

(http://www.atseries.net/PDFs/JH0003-UMC50.pdf)

JE5035-50 Universal Maintenance Charger (UMC) Series Drawing List / Data Nameplate Detail
JE5036-50 Universal Maintenance Charger (UMC) Series Outline NEMA-1 Style-5018 Wheeled Enclosure
JE5037-50 Universal Maintenance Charger (UMC) Series Internal Component Layout Style-5018 Enclosure
JE5038-50 Universal Maintenance Charger (UMC) Series Instrument Panel Detail
JE5039-50 Universal Maintenance Charger (UMC) Series Schematic: BB0443-01 (10-50 Adc)
JE5040-50 Universal Maintenance Charger (UMC) Series Connection Diagram: BB0443-01 (10-50 Adc)

UMC SERIES

HINDLEPOWER INCORPORATED
formerly HITRAN Power Systems

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