OWNER'S MANUAL 193111-096

Issued August 27, 2026

IMPORTANT: Read these instructions before installing, operating, or servicing this system.

ECLIPSE II PLUS

Opportunity
Battery Charger

DO NOT DESTROY

AMETEK/PRESTOLITE POWER , TROY, OHIO 45373-1099, U.S.A.

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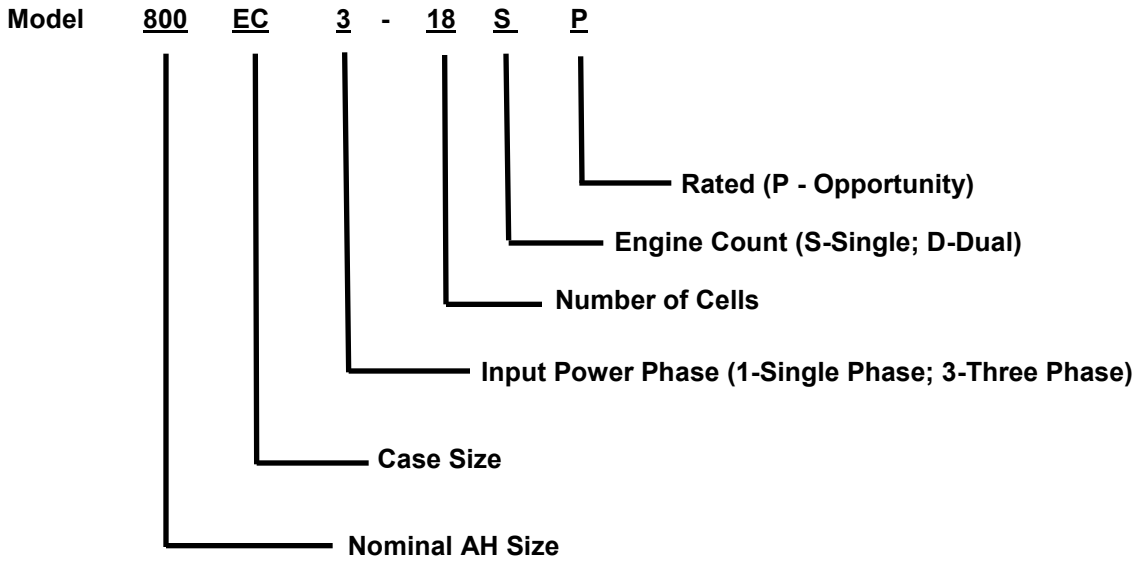
NOTE: Information regarding obtaining additional copies of this manual is located in the Introduction chapter of this manual.

A battery charger is identified by model number. Incorporated into the model number is the ampere-hour capacity, case size, input power phase, and number of cells in battery for which charger is intended. The following example explains the basic model numbering arrangement.



NOTE: This information is required for ordering certain replacement/service parts.

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INTRODUCTION **1**
How To Use This Manual 1-1
Equipment Identification 1-1
Receipt Of Equipment 1-1

SAFETY INSTRUCTIONS AND WARNINGS **2**

DESCRIPTION OF EQUIPMENT **3**
Operating Modes 3-1
Opportunity Charging 3-1
EC2000 Control 3-2

INSTALLATION **4**
Location 4-1
Environmental Characteristics 4-1
Grounding 4-1
Line Voltage Changeover Instructions 4-2
Line Connections to Battery Charger 4-2
Charging Cable Connectors 4-3
Pre-operation Checks 4-3
Pre-Operation Changes to the Factory Control Settings 4-3

MAINTENANCE **5**

OPERATION **6**
Preliminary 6-1
Normal Or Daily Charge 6-1
Equalize Or Weekend Charge 6-2
Manual Stop 6-2
AC Power Fail 6-2

EC2000 CONTROL FEATURES **7**
Main Features 7-1
Description of Features 7-2
EC2000 Charge Archive Function 7-5
EC2000 Charge Cycle Review Function 7-6

PROGRAMMING YOUR EC2000 CONTROL **8**
Using Extended AH for Opportunity/Fast Charging 8-6
Multi Amp Hour Programming 8-7
Timer Start Mode Programming 8-8

TROUBLESHOOTING **9**
Troubleshooting Table 9-1
Action 9-9

DIAGRAMS

WARRANTY

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INTRODUCTION

How To Use This Manual

IMPORTANT: It is especially important that all charger internal components be kept clean and dry, and all electrical connections tightened. Replace any precautionary or instruction label that cannot be easily read.

To ensure safe operation, read the entire manual, including the chapter on safety instructions and warnings.

Throughout this manual, the words **WARNING**, **CAUTION**, and **NOTE** may appear. Pay particular attention to the information provided under these headings. These special annotations are easily recognized as follows:

WARNING gives information regarding possible personal injury. Warnings will be enclosed in a box such as this.

CAUTION refers to possible equipment damage. Cautions will be shown in bold type.

NOTE offers helpful information concerning certain operating procedures. Notes will be shown in italics.

Equipment Identification

The unit's identification number (specification, model, serial number) appears on a nameplate attached to the front panel.

Receipt Of Equipment

When you receive the equipment, check it against the invoice to make sure it is complete and inspect the equipment for possible damage due to shipping. If there is any damage, notify the carrier immediately to file a claim. Furnish complete information concerning damage claims or shipping errors to the company shown on the cover of this manual. Include all equipment identification numbers and group part numbers (if any) as described above along with a full description of the parts in error.

Move the equipment to the site of installation before uncrating. Use care to avoid damaging the equipment when using bars, hammers, etc., to uncrate the unit.

Additional copies of this manual are available on the company website.

www.prestolitepower.com

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SAFETY INSTRUCTIONS AND WARNINGS

FOR OPERATION OF BATTERY CHARGING EQUIPMENT

IMPORTANT – READ AND UNDERSTAND THESE INSTRUCTIONS. DO NOT LOSE THEM. ALSO READ OPERATING/INSTRUCTION MANUAL BEFORE INSTALLING, OPERATING, OR SERVICING THIS EQUIPMENT.

A. General

Battery charging products can cause serious injury or death, or damage to other equipment or property, if the operator does not strictly observe all safety rules and take precautionary actions.

Safe practices have developed from past experience in the use of charging equipment. These practices must be learned through study and training before using this equipment. Anyone not having extensive training in battery charging practices should be taught by experienced operators.

Only qualified personnel should install, use, or service this equipment.

B. Shock Prevention

Bare conductors, or terminals in the output circuit, or ungrounded, electrically-live equipment can fatally shock a person. To protect against shock, have competent electrician verify that the equipment is adequately grounded and learn what terminals and parts are electrically HOT.

The body's electrical resistance is decreased when wet, permitting dangerous current to flow through the body. Do not work in damp area without being extremely careful. Stand on dry rubber mat or dry wood and use insulating gloves when dampness or sweat cannot be avoided. Keep clothing dry.

1. Installation and Grounding of Electrically Powered Equipment – Electrical equipment must be installed and maintained in accordance with the National Electrical Code, NFPA 70, and local codes. A power disconnect switch must be located at the equipment. Check nameplate for voltage and phase requirements. If only 3-phase power is available, connect *single-phase* equipment to only two wires of the 3-phase line. DO NOT CONNECT the equipment grounding conductor (lead) to the third live wire of the 3-phase line as this makes the equipment frame electrically HOT, which can cause a fatal shock.

   If a grounding lead (conductor) is part of the power supply cable, be sure to connect it to a properly grounded switch box or building ground. If not part of the supply cable, use a separate grounding lead (conductor). Do not remove a ground prong from any plug. Use correct mating receptacles. Check ground for electrical continuity before using equipment.

   The grounding conductor must be of a size equal to or larger than the size recommended by Code or in this manual.

2. Charging Leads – Inspect leads often for damage to the insulation. Replace or repair cracked or worn leads immediately. Use leads having sufficient capacity to carry the operating current without overheating.

3. Battery Terminals – Do not touch battery terminals while equipment is operating.

4. Service and Maintenance – Shut OFF all power at the disconnect switch or line breaker *before* inspecting, adjusting, or servicing the equipment. Lock switch OPEN (or remove line fuses) so that the power cannot be turned ON accidentally. Disconnect power to equipment if it is to be left unattended or out of service.

   Disconnect battery from charger.

   Keep inside parts clean and dry. Dirt and/or moisture can cause insulation failure. This failure can result in high voltage at the charger output.

C. Burn and Bodily Injury Prevention

The battery produces very high currents when short circuited, and will burn the skin severely if in contact with any metal conductor that is carrying this current. Do not permit rings on fingers to come in contact with battery terminals or the cell connectors on top of the battery.

Battery acid is very corrosive. Always wear correct eye and body protection when near batteries.

D. Fire and Explosion Prevention

Batteries give off explosive flammable gases which easily ignite when coming in contact with an open flame or spark. Do not smoke, cause sparking, or use open flame near batteries. Charge batteries only in locations which are clean, dry, and well ventilated. Do not lay tools or anything that is metallic on top of any battery. All repairs to a battery must be made only by experienced and qualified personnel.

E. Arcing and Burning of Connector

To prevent arcing and burning of the connector contacts, be sure the charger is OFF before connecting or disconnecting the battery. (If the charger is equipped with an ammeter, the ammeter should not indicate current flow.) Always connect battery before turning charger ON.

F. Medical and First Aid Treatment

First aid facilities and a qualified first aid person should be available for each shift for immediate treatment of electrical shock victims.

EMERGENCY FIRST AID: Call physician and ambulance immediately. Use First Aid techniques recommended by the American Red Cross.

DANGER: ELECTRICAL SHOCK CAN BE FATAL. If person is unconscious and electric shock is suspected, do not touch person if he or she is in contact with charging leads, charging equipment, or other live electrical parts. Disconnect (open) power at wall switch and then use First Aid. Dry wood, wooden broom, and other insulating material can be used to move cables, if necessary, away from person. IF BREATHING IS DIFFICULT, give oxygen. IF NOT BREATHING, BEGIN ARTIFICIAL BREATHING, such as mouth-to-mouth. IF PULSE IS ABSENT, BEGIN ARTIFICIAL CIRCULATION, such as external heart massage.

IN CASE OF ACID IN THE EYES, flush very well with clean water and obtain professional medical attention immediately.

G. Equipment Warning Labels

Inspect all precautionary labels on the equipment. Order and replace all labels that cannot be easily read.

DESCRIPTION OF EQUIPMENT

The basic charging circuit is the mosfet inverter high frequency-type with isolating transformer (s). This design regulates charging current by allowing the battery to determine its own charge cycle rate in accordance with its state of discharge. It provides a constant current-constant voltage-constant current (IEI) charge that eliminates the possibility of over-charging, even with line voltage variations of ± 10% and allows the battery to finish at the proper current regardless of battery age or gravity type.

The Eclipse II Plus provides opportunity battery charging over a wide range of environmental conditions. The charger will precisely charge your battery based on battery temperature, type, and size; by automatically adjusting its own output charge characteristic within the power limits of the chargers power circuit.

When applied with the Prestolite Power optional Battery Identification Module (BID), the Eclipse II Plus identifies a battery selected for opportunity charging at the time of connection and adjusts its output for that specific battery. During the charge cycle, or duration of connection if used as an opportunity charger the Eclipse II Plus continuously monitors the battery's temperature via the BID and adjusts its output to match the battery temperature as it changes throughout the charge cycle.

Upon connection of the battery, the Eclipse II Plus reads the information programmed into the BID and identifies the battery's AH rating, cell size, type of construction, electrolyte temperature, and programmed method of charge and adjusts its output curve based on this information.

The Eclipse II Plus is internally protected against overload and short circuits by both input and output fusing, plus Prestolite's unique *curve monitoring circuit* periodically measures the output curve to ensure that the voltage and current are within the limits set at the factory.

Operating Modes

The Eclipse II Plus reads the information that was programmed into the BID Module during installation and charges the battery based on an opportunity charging profile or a profile designed to recharge a fully discharged battery in 8 hrs. Valve regulated batteries of several types can also be recharged at the 8 hour rates when equipped with a properly programmed BID Module.

The Eclipse II Plus always defaults to the BID mode when an installed BID Module is detected. The charger automatically adjusts its output to match the battery information programmed into the module.

The BID Module allows users with various cell size batteries to charge any battery on any charger without the fear of mismatching batteries and chargers.

Opportunity Charging

In applications utilizing opportunity charging, the high current output of the Eclipse II Plus returns significant capacity to the battery during short periods such as breaks, lunch and shift changes. In many applications battery changing can be eliminated completely.

EC2000 Control

The extreme flexibility of the Eclipse II Plus lies in the state of the art micro controller used in the EC2000 charger control.

The EC2000 is made up of two main components: the Control /Regulator Board, and the Keypad/ Display. The Control portion provides the basic operating features of the charger, such as auto start/stop, auto equalize, charge cycle review, real time clock, communications, etc. The Regulator portion actually controls the level of the chargers DC output.

The Keypad/Display provides the user interface with the charger. The durable membrane keypad is impervious to moisture and mechanical shock. The backlit 2 line 20 character LCD display constantly shows the charger's output volts, amps, and amp hours returned during the charge cycle. The display also provides the user with plain English messages concerning charge cycle status.

Four bright LEDs shine through the keypad to keep the user informed of charge status at a glance, even from long distances. LEDs notify you that a charge is in progress, that the battery is 80% charged, equalize cycle, charge complete, and fault indication.

WARNING: Do not connect a battery to this charger if any lamp is lit. Do not disconnect a battery from this charger while a charge is in progress. Otherwise, damage to charger, arcing and burning of connector parts or a battery explosion may result. Batteries produce explosive gases. Keep sparks, flame, and cigarettes away. Ventilate when charging in an enclosed area. Always shield eyes when working near batteries.

INSTALLATION

Location

For best operating characteristics and longest unit life, take care in selecting an installation site. Avoid locations exposed to high humidity, dust, high ambient temperature, or corrosive fumes. Moisture can condense on electrical components, causing corrosion or shorting of circuits (especially when dirt is also present).

Adequate air circulation is needed at all times in order to assure proper operation. Provide a minimum of 12 inches of free air space at both sides of the unit. Make sure that ventilation openings are not obstructed.

Always remove the charger shipping skid from the unit before installation. The charger must be installed over a noncombustible surface such as concrete or metal. Keep the charging area clear of all combustible material such as wood, paper, and cloth. When moving the charger after the packing skid and box have been removed, make sure that lifting forks do not damage the charger panels or cables.

WARNING: SPARKS OR MOLTEN METAL falling through open bottom can cause fire or explosion.

- **Install over noncombustible material such as concrete or metal.**
- **Keep charging area clear of combustible material.**

Environmental Characteristics

Operating Characteristics	0°C to 40°C (32°F to 104°F)
Operating Altitude	To 2000 Meters (6562 Feet)
Operating Humidity	80% up to 31°c, decreasing to 50% at 40°C, non-condensing 80% up to 88°F decreasing to 50% at 104°F, non-condensing

Grounding

The frame of the power source must be grounded for personnel safety. Where grounding is mandatory under state or local codes, it is the responsibility of the user to comply with all applicable rules and regulations. Where no state or local codes exist, it is recommended that the National Electrical Code be followed.

In addition to the usual function of protecting personnel against the hazard of electrical shock due to fault in the equipment, grounding serves to discharge the static electrical charges which tend to build up on the surfaces of equipment. These static charges can cause painful shock to personnel, and can lead to the erroneous conclusion that an electrical fault exists in the equipment.

If a charger is to be connected to the AC power supply with a flexible jacketed cable, one having a separate grounding conductor should be used. When included in cable assembly, grounding conductor will be green, green with a yellow stripe, or bare. When connecting input power to charger (as instructed in Line Connection to Battery Charger section of this manual), connect grounding conductor to equipment grounding terminal, taking care to make a good electrical connection. Connect other end of grounding conductor to the system ground.

If, for any reason, an input cable which does not include a grounding conductor is used, the equipment must be grounded with separate conductor. Minimum size and color coding requirements must be in accordance with any applicable state or local code, or the National Electrical Code.

If metallic armored cable or conduit is used, the metal sheathing or conduit must be effectively grounded as required by state or local code, or the National Electrical Code.

If a system ground is not available, the charger frame must be connected to a driven ground rod (at least 8 ft [2438 mm] long), or to a water pipe that enters the ground not more than 10 ft (3048 mm) from the charger. A grounding conductor must be connected to the rod or pipe in a manner that will assure a permanent and effective ground. The conductor must be sized in accordance with any applicable state or local code, or by the National Electrical Code. If in doubt, use the same size conductor as is used for the conductors supplying power to the charger.

WARNING: ELECTRIC SHOCK HAZARD – Under no circumstance should you use a grounding conductor with a current carrying capacity less than the ampere rating shown in Table 4-1.

LINE AMPS	DISCONNECT SWITCH *	BRANCH FUSE SIZE (AMPERES)	COPPER CABLE SIZE AWG * *	
			POWER	GROUND
0-2.5	30A	5	No. 14	No. 14
2.6-4.5	30A	7	No. 14	No. 14
4.6-7.5	30A	10	No. 14	No. 14
7.6-12	30A	15	No. 14	No. 14
12.1-16	30A	20	No. 12	No. 12
16.1-18	30A	25	No. 10	No. 10
18.1-22	30A	30	No. 10	No. 10
22.1-24.5	60A	35	No. 8	No. 10
24.6-32.5	60A	40	No. 8	No. 10
32.6-40	60A	50	No. 8	No. 10
40.1-45	60A	60	No. 6	No. 10
45.1-57.5	100A	80	No. 4	No. 8
57.6-78	100A	100	No. 2	No. 8
78.1-102.5	200A	125	No. 2	No. 6
102.6-135	200A	150	No. 1/0	No. 6

Table 4-1 Recommended AC Input and Branch Fusing

The above table (Table 4-1) is based on 75°C (167°F) rated conductors and 40°C (104°F) ambient temperatures. Refer to National Electrical Code (2008) Tables 310-16 corrected to 40°C (104°F).

* For 115, 208, and 230-volt lines, use 250-volt disconnect switch.
For 440-480, 575-volt lines, use 600-volt disconnect switch.

* * Two conductors and ground conductor required for single phase.
Three conductors and ground conductor required for three phase.

Recommended minimum size of grounding conductors (based on National Electrical Code 2008 – Table 250-95).

Line Connections to Battery Charger

Follow local code requirements if different than instructions in this manual.

1. Turn charger OFF.
2. Be sure charger is connected correctly for available line voltage as instructed above.
3. On charger nameplate, note the AC input amperes corresponding to the line voltage to which charger is to be connected. Use that ampere value to select the proper disconnect switch, fuse, and power cable sizes from Table 4-1.
4. Route AC power input cable in through knockout provided in side panel of charger cabinet. Securely fasten cable wires to a power input terminal inside charger. Refer to Grounding section of this manual for proper connection of grounding conductor. (The lower access panel will have to be removed to provide access to terminal block.)
5. With disconnect switch (on AC input power line) in "OPEN" or "OFF" position, connect power cable coming from charger, to the switch. Install fuses in switch.

WARNING
At all times, safety must be considered an important factor in the installation, servicing and operation of the product and skilled, qualified technical assistance should be utilized.

AC Supply Input Conditions:

Supply voltage should not exceed +/-10% of rated input voltage value. Consistent power should be provided with fluctuations not to exceed 1200VAC 850Vrms) for a duration longer than 25 microseconds.

Special Considerations—Generators and Backup Power Systems

AMETEK Prestolite Power engineering has evaluated many manufactures of AC power protection devices in an effort to recommend equipment. Our hope was to recommend equipment to run in combination with generators to provide a clean and stable power source for our chargers.

To date we have not been able to secure equipment that allows safe charging operations while being powered from a generator. In most cases the manufactures of the AC power protection devices will not accept the warranty risk of the products connected to their filtered output. The cost of this type of protection equipment well exceeds the cost of replacing chargers due to expected loss of AC power regulation from the generator.

AMETEK Prestolite Power cannot warranty chargers at facilities that are powered primarily by a generator. Backup power generators may cause significant damage and warranty coverage will be evaluated on a case-by-case basis.

Charging Cable Connectors

If connectors are already attached to charging cables, make sure that they are attached so that positive charger polarity will connect to positive battery terminal.

If connectors must be attached to charging cables, follow instructions supplied with connectors.

CAUTION: Make sure connectors are securely attached to cables (good solder joint or well tightened set screws, whichever is applicable). Be certain that positive charger cable will connect to positive battery terminal. If necessary, trace cables into charger to determine polarity. The use of a DC voltmeter may show polarity. Improper connections will "blow" output fuse and may cause other damage.

Pre-operation Checks

1. Inspect charger thoroughly for damage; loose screws, nuts, or electrical connections.

WARNING: ELECTRICAL SHOCK HAZARD – Before inspecting or cleaning inside cabinet, turn OFF and remove fuses of disconnect switch (supplying AC power to charger) and disconnect battery.

2. Remove all special tags that are tied to charger. Keep tags with this manual for future reference. Leave all precautionary and instruction labels in place on charger. Carefully read and follow instructions on all tags and labels. Make sure all labels remain visible to anyone operating charger.

3. Make sure all charger cabinet panels are fastened in place, to assure proper flow of ventilating air through cabinet.

Pre-Operation Changes To The Factory Control Settings

Typically few changes are required to be made if the amp hour rating is sized to the battery and the voltage rating is equal to or greater than the battery. However, in some applications, some changes to the programmable control settings may be desirable. The most common changes are listed below:

TIME
: Factory Setting for Time is Eastern Standard. (see Programming the EC2000).

NO GASSING HOURS
: Factory Setting is 0 (see Programming the EC2000).

MAX BATTERY TEMPERATURE
: Factory Setting is 150° F (see Pro gramming the EC2000).

NOTE: It is advisable to check the day of the week, date, month, and year for accuracy

AUTO EQUALIZE
: Factory setting is ON (see Program ming the EC2000).

AUTO EQUALIZE TYPE
: Factory setting is by Cycle (see Pro gramming the EC2000).

AUTO EQUALIZE COUNT
: Factory setting is 05 (see Program ming the EC2000).

Other functions are available for programming the EC2000 to meet your specific charging needs. Programming these functions is described in the Programming Your EC2000 chapter of this manual.

MAINTENANCE

WARNING: ELECTRICAL SHOCK HAZARD — Before inspecting or cleaning inside cabinet, turn OFF and remove fuses of disconnect switch (supplying AC power to charger) and disconnect battery.

Inspection And Cleaning

For uninterrupted, satisfactory service from this charger, it's necessary to keep unit clean, dry, and well ventilated. ***At least every three months, or more often as necessary, wipe and blow out all dirt from unit's interior components, with clean, dry air of not over 25 psi (172 kPa) pressure***. Use a hand bellowsif compressed air isn't available.

If the unit is equipped with a fan, be sure to check for proper unrestricted operation. The fan should operate anytime a discharged battery is connected.

Check and tighten all electrical connections as necessary to eliminate unnecessary losses and to avoid subsequent trouble from overheating or open circuits. Check for broken wiring or damaged Insulation on wiring.

WARNING: ELECTRICAL SHOCK HAZARD — Failure to keep internal parts clean and dry may allow transformer (s) to short out, causing secondary circuits to carry dangerously high voltage.

Be sure to replace all charger cabinet panels after any servicing, to assure proper flow of cooling air through unit and to protect internal components.

WARNING: ELECTRICAL SHOCK HAZARD — All cabinet panels must be replaced to protect personnel from contact with hazardous voltages.

Lubrication

None required.

Fuse Replacement

The output silicon diodes in this charger are protected by a “fast-clearing” type fuse.

CAUTION: The use of any other type fuse besides the “fast-clearing” type may cause damage to silicon diodes.

OPERATION

The operating procedure given here explains the operation of a Prestolite Eclipse II Plus equipped with the Prestolite EC2000 control.

NOTE: If this charger is equipped with certain optional features, the operating procedure may be modified.

Preliminary

1. Make sure that charger is installed and grounded as instructed in this manual.

2. Turn on main fused disconnect switch that supplies AC power to charger.

3. Maintain electrolyte level in batteries to be charged, as instructed by battery manufacturer. The volume of electrolyte will expand during the charge. Therefore, to avoid overfilling, do not add water until the battery has received at least an 80% charge. This will usually be reached at the time gassing starts.

Normal or Daily Charge

(For batteries with ampere-hour capacity within the range shown on charger nameplate)

1. Insure that battery size matches the charger and/or charger setting. (Number of cells is equal to or less than the charger nameplate rating and ampere-hour capacity is within charger nameplate rating.)

2. Securely engage the battery and charger connectors.

3. The charger will display READING BID and update the progress bar (2 to 7 seconds) as the data is read into the charger.

4. After a short delay, the charger will turn on and the "Charge in Progress" LED will light. The alphanumeric display will indicate the cell size and amp hour settings for the upcoming charge cycle. Then it will display current charging cycle information. "Verifying Battery" may appear for several minutes if the mult-cell mode is on.

5. The "80% Charged" LED will light when the battery has reached the gassing point.

6. When the charge termination point is reached, the charger will turn off and the "Charge Complete" LED will be lit. If an equalize charge has been selected, the "Equalize" LED will be lit.

NOTE: To disconnect battery from charger before charge is complete, press the "Stop" key on the charger control panel.

NOTE: While not normally required, the charging rate may be adjusted to compensate for unusual ambient temperature, age of battery, etc. Refer to items 33 through 42 in Programming Your EC2000 chapter of this manual.

WARNING: EXPLOSION HAZARD - Do not connect or disconnect a battery unless the "Charge in Progress" LED is off; otherwise, damage to charger, arcing and burning of connector parts or a battery explosion may result (batteries produce explosive gases). Keep sparks, flame, and cigarettes away. Ventilate when charging in an enclosed area. Always shield eyes when working near batteries. Disconnect battery if charger is to be turned off for prolonged periods of time.

Equalize or Weekend Charge

Batteries may need periodic equalizing to correct for inequalities between cells that result from daily or frequent cycling. An equalizing charge should be given if any of the following conditions exist:

1. The specific gravity of any cell at the end of charge is 20 points less than the average.
2. The on-charge voltage of any cell at the end of charge is 20 MV less than the average.
3. The battery has been stored for 30 days.
4. A large volume of water has been added.

When the equalize mode is desired, follow the operation outlined for a normal charge and press EC2000 “Equalize” key to set the charge control for an Additional 3 hours more than required for a normal charge. The charge is complete when charge control automatically lights the “Charge Complete” LED.

NOTE: The EC2000 is shipped from the factory set to the Auto Equalize by Cycle mode, and will automatically provide an equalize charge every 5 complete cycles.

Manual Stop

To stop any charge cycle before charge complete, press the “Stop” key.

WARNING: Do not connect a battery to this charger if any lamp is lit. Do not disconnect a battery from this charger while a charge is in progress. Otherwise, damage to charger, arcing and burning of connector parts or a battery explosion may result. Batteries produce explosive gases. Keep sparks, flame, and cigarettes away. Ventilate when charging in an enclosed area. Always shield eyes when working near batteries.

AC Power Fail

The EC2000 Control will resume the charge where it left off when the AC power failure occurred, virtually unaffecting charge time.

As power is returned, if a charge cycle was in progress, the display may show “ACFAIL RESTART”. The charger is staggering the restart based on cycle run times. This will prevent multiple chargers from restarting all at once, minimizing peak restart power.

NOTE: If a battery is disconnected from the charger during an AC power failure and discharged, reconnecting it or any other battery may result in an incomplete charge cycle.

WARNING: ELECTRICAL SHOCK HAZARD – Before checking electrical components, turn off and remove fuses of disconnect switch (supplying AC power to charger) and disconnect battery.

Abnormal Shutdowns

1. Manual Stop
   If the manual stop key is pressed during the charge cycle, the charger will shutdown. All 4 LEDS will be flashing and the display will read “Manual Stop Fault”.

2. Back-Up Timer Shutdown
   The standard EC2000 Control has two back-up timers. The charger will shutdown and “Backup timer” will be displayed if 9* hours has passed since the start of a charge cycle and the battery has not reached gassing voltage (80% charged), or if 4 hours has passed since the battery has reached gassing voltage and a DV/DT charge termination has not occurred.

   *5 hours when in opportunity charge mode.

3. Battery Disconnect Shutdown
   If a battery is disconnected from the charger during a charge cycle, the charger will be shut down. All LEDS will be off.

4. Low Current Shutdown
   If the charger output falls below a predetermined level, a low current shutdown will occur. All 4 LEDS will be flashing and the display will read “Low Current Fault”.

5. Curve Error Shutdown
   If the charger output becomes uncontrolled and falls above or below the proper level for predetermined period of time, the charger will shutdown. All 4 LEDS will be flashing and the display will read “Curve Error Fault”.

6. Overtemperature Shutdown
   If the charger internal temperature exceeds a predetermined limit, the charger will shut down. All 4 LEDS will be flashing and the display will read “Overtemperature”.

7. Didt Shutdown
   After the 80% charged point, if the output current begins to rise for more than a predetermined time period, the charger will be shutdown. All 4 LEDS will be flashing and the display will read “Didt Fault”.

8. Low Voltage Shutdown
   If a battery on charge does not reach a minimum on charge voltage in a predetermined period of time, the charger will be shutdown. All 4 LEDS will be flashing and the display will read “Low Voltage Fault”.

9. High Amp Hour Returned Shutdown
   If the cycle amp hours returned exceed the BID AH setting or charger maximum AH rating for a predetermined amount, the charger will shutdown. All 4 LEDS will be flashing and the display will read “High Amp Hour Fault”.

10. Phase Error Shutdown
    If the charger control detects a problem with the unit’s input power, the charger will shutdown. All 4 LEDS will be flashing and the display will read “Phase Error”.

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EC2000 CONTROL FEATURES

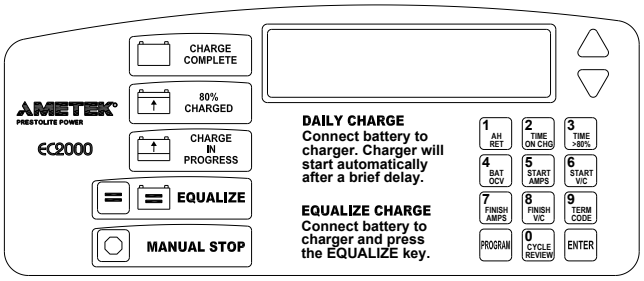

Figure 7-1

Main Features

1. 25 A/100AH high rate opportunity charging output.
2. Multi-Voltage Charging Capability
3. Multi-Ampere-Hour Charging Capability
4. Automatic or Manual Battery Temperature Compensation
5. 15 Minute Minimum DV/DT Charge Termination
6. 2x20 Character Alphanumeric Display
7. Four LEDs for Status Display
8. LED lamp test provided on start up
9. Manual Stop Capability
10. One touch Review of Charge Cycle

    Information during charge cycle or after charge complete
    - Amp hours returned during charge cycle
    - Total time on charge
    - 80% point to end of charge timer
    - Battery open circuit voltage
    - Start current
    - Start voltage (volts/cell)
    - Finish current
    - Finish voltage (volts/cell)
    - Charge termination code
11. Review of Charge Cycle Data and Programmed Features
12. Review of Archived Charge Cycle Data for the Last 512 Charge cycles.
    - Amp hours returned during charge cycle
    - Total time on charge
    - 80% point to end of charge timer
    - Battery open circuit voltage
    - Start current
    - Start voltage (volts/cell)
    - Finish current
    - Finish voltage (volts/cell)
    - Charge termination code
    - Equalize time
    - Start time
    - End time
    - Battery I.D.
    - Battery I.D. start temperature
    - Battery I.D. end temperature
    - Cycle ampere-hours
    - Cycle cell size
    - Battery Type
    - Month
    - Date
13. Automatic or Push-to-Start Operation
14. Manual or Automatic Equalize Operation
15. Fault Lock-out or No Fault Lock-out Operation
16. Back-up Timer Shutdowns
17. Failure Mode Diagnostics
    - High Battery Reject
    - Low Battery Reject
    - Battery Reject
    - Battery Over-temperature
    - Setup Error
    - Low Voltage S.D.
    - Charge Curve Error
    - Low Current S.D.
    - Backup Timer
    - Manual Stop
    - Fault Lockout
    - Over Maximum Amp Hour Returned S.D.
    - Charger Overtemperature S.D.
    - DIDT S.D.
    - Phase Error
18. One Part Number Control is User/Factory programmable for 6-9-12-18-24-36-40 Cells.
19. Adjustable 8-99 Hour Refresh Charge Delay
20. Voltage Time Feature (DV/DT Disable)
21. “Cell Forming” Feature (Programmable from

0-30 Cycles)

22. Programmed Features and Archive Data maintained for a minimum of 10 Years
23. Charge Cycle Data and Time-of-Day/Date maintained for a minimum of 10 Years
24. 6 Programmable Start Modes
    - Automatic Start (2 Second Delay)
    - Push-To-Start
    - Delayed Start
    - Time-of-Day Start
    - Time-of-Day Blockout
    - Timer Mode
25. Programmable Manual Override of Start Modes
26. User Programmable Password
27. Automatic Equalize By Number of Charger or BID Cycles, Day of Week
28. Programmable Cool Down Time
29. Staggered Start on ACFAIL Recovery

Description of Features

Multi-Voltage Charging — The Eclipse II Plus with EC2000 Control provides the capability to charge batteries of different cell sizes. With the Multi-Cell Mode ON, the charger automatically selects the proper output voltage. A 24 cell Eclipse II Plus will safely charge 24, 18, 12, 9, and 6 cell batteries. An 18 cell Eclipse II Plus will safely charge 18, 12, 9, and 6 cell batteries. A 12 cell Eclipse II Plus will safely charge 12, 9, and 6 cell batteries.

Fixed mode operation can be selected by programming Multi-Cell mode to OFF. In this mode the charger will charge only batteries of the cell size programmed into the Fixed-Cell size function.

If the battery is equipped with Prestolite BID Module, the Multi-Cell ON or OFF function will be overridden and the charger will charge the battery if it is within the charger output rating.

Multi-Ampere-Hour Charging — The Eclipse II Plus with EC2000 Control provides the capability of charging batteries of different cell sizes at the proper charge rates. Fixed Mode can be selected by programming an amp hour rating into the Fixed AH size function that is less than the charger ampere-hour nameplate rating. The output current will be adjusted to deliver current at the proper rate.

If the battery is equipped with a Prestolite BID Module, the Multi-Ampere-Hour function will be overridden and the charger will charge the battery at the rate programmed into the BID Module (BID Module programming is performed at the factory based on information provided by the customer) if it is within the charger output rating. If the BID and battery ampere-hour rating are greater than the charger rating, the charger will charge the battery at the nameplate amp hour rating.

Multi-AH Programming Feature – The Multi-AH Programming Feature allows the control to be programmed to charge different voltage batteries with the AH rates and curve types that have been programmed for that battery voltage. When a battery is connected, the control automatically senses the battery voltage and sets the charge curve and charging rates to the level that has been programmed.

If the battery is equipped with a Prestolite BID Module, the Multi-Ampere-Hour function and Multi-AH Programming will be overridden and the charger will charge the battery at the rate programmed into the BID Module (BID Module programming is performed at the factory based on information provided by the customer) if it is within the charger output rating. If the BID and battery ampere-hour rating are greater than the charger rating, the charger will charge the battery at the nameplate amp hour rating.

Temperature Compensation — The Eclipse II Plus with EC2000 Control is capable of modifying the output voltage to compensate for ranges of battery electrolyte temperatures from 32 to 132 degrees F. Because the 80% percent point is based on reaching a point on the charge curve rather than a single voltage, it is automatically adjusted with the output voltage.

CAUTION: Consult your batteries manufacturer for the recommended maximum battery temperature for your battery.

When the battery is equipped with a Prestolite BID module, the charger automatically reads the battery temperature throughout the charge cycle and adjusts the output voltage to match the battery temperature.

Manual adjustment of the charger output voltage to match the temperature of the battery is performed by programming the proper battery electrolyte temperature into the Fixed Battery Temperature function (BID readings automatically override the Fixed Battery Temperature setting).

Max Battery Temperature—The EC2000 monitors the battery temperature throughout the charge cycle. Programming the MAX BATT TEMP setting of the control to the desired maximum battery temperature will cause the charger to shut down if the battery on charge is equipped with a BID and

the temperature exceeds the set point. It will wait until the battery temperature has decreased to 5 degrees C below the set point before restarting the charge cycle.

Charge Termination — The EC2000 utilizes a patented proportional time DV/DT technique in order to determine the charge termination point. This technique returns approximately 107% of the amp hours removed from a battery (regardless of the state of discharge) and prevents variations in the incoming AC line voltage from affecting the amount of Energy returned to the battery. The minimum time required for a DV/DT charge termination on the EC2000 Control is fifteen minutes. The EC2000 Control can be programmed to utilize a voltage-time charge termination technique. If the DV/DT charge termination is disabled, the control will terminate the charge cycle four hours after the battery reaches the "80% Charged" point.

Alphanumeric Display — A backlit liquid crystal (LCD) 2x20 character display is standard on the EC2000 Control. The characters are .2 inches tall, making the information on the digital display legible at distances exceeding five feet. Plain English and easy to understand abbreviations are used to indicate charge status output current and voltage and other functions including; archive information, review information, programming information, fault information, and operating status. A blank display is utilized for AC power fail indication.

Status Display LEDs — The "Charge In Progress" LED (Amber) is illuminated whenever the charger is flowing current to the battery. There are four status LEDs provided to indicate the present operating status of the charger and battery (see Figure 7-1). A lamp test feature is provided. See Review of Charge Cycle feature.

Review of Charge Cycle — When the charge cycle is in progress or has been terminated, either by the EC2000 Control or the operator, the charge cycle history can be automatically read out by pressing the "Cycle Review" key. After displaying the information from memory, the unit will return to the normal (previous) display.

All status LEDs will be Illuminated during the review of function number one, thus providing a lamp test feature. Nine functions are displayed during a standard review. If the charger is idle, the information in all 58 review functions can be displayed. See the EC2000 Charge Cycle Review Feature section in this chapter. A single item can be selected by pressing the appropriate labeled key. This feature can greatly aid in the analysis of charge data and in situations where troubleshooting is required. See the Troubleshooting chapter in this manual.

Automatic or Push-to-Start Operation — In the automatic start mode, the charger will start 5-15 seconds after the battery is connected. The alphanumeric display will display "READING BID" and then display upcoming cycle information. In the push-to-start mode, the charger will not start the charge cycle until the "Enter" key is pressed. "Ent to Start Charge" will be displayed on battery connect when this feature has been selected.

Manual or Automatic Equalize — An equalize charge is a prolonged charge cycle (by 3 hours) used to correct any inequalities of voltage and specific gravity which may have developed between the cells during service. EC2000 Controls are shipped from the factory with the automatic equalize feature enabled. This mode of operation is indicated in the full Review "AUTO EQ. ON" function. There are three modes of automatic equalize. See the Automatic Equalize section in this chapter for further details. When the automatic equalize feature is active, the "Equalize" key on the front panel is disabled. When automatic equalize is disabled, an equalize charge is requested by pressing the "Equalize" key on the front panel of the EC2000 Control during countdown or after the charge cycle has started. If this key is pressed again during the charge cycle, the equalize request will be canceled if the equalize period has not begun.

Fault Lockout Operation — In the normal operating mode (No fault lock-out), if an abnormal shutdown occurs, disconnecting and reconnecting the battery will clear the fault and the EC2000 will restart the charge cycle as programmed. If an abnormal shutdown occurs with the fault lock-out feature enabled, disconnecting and reconnecting a battery will not clear the fault condition.
The alphanumeric display will display fault lockout, and the status LEDs will continue to flash even with no battery connected to the charger until the fault condition is cleared. The "Enter" key will clear the fault if it is pressed while a battery is not connected to the charger.

One Part Number Control — The standard EC2000 Control is user/factory programmable for 6, 9, 12, 18, 24, 36, and 40 cell Eclipse II Pluses with 100, 200, 400, and 600 amp shunts. Any combination of the above cell sizes and current shunt sizes can be selected by DIP switches on the P.C. board. This feature reduces the quantity of spare parts inventory. See Figure 8-1 for further information.

Refresh Charge Feature — A refresh charge of a storage battery is a charge given to charged, wet type batteries, which are in storage or inactive for long periods to replace losses due to limited action and to insure that every cell is brought periodically to a full state of charge. The EC2000 Control has an adjustable 8 to 99 hour refresh charge timer

(programmed through the “Refresh Delay” function) which starts with a normal charge complete, either DV/DT or voltage time. If a battery is left connected to the charger for the Programmed number of hours after a charge complete, the control will automatically begin a refresh charge cycle. The control will start automatically even if programmed for time-of-day start, delayed start or push-to-start operation. The EC2000 will not start the charge cycle during a time-of-day blockout period. It will automatically request an equalize cycle if it is programmed to equalize on that day. Charge cycle data (Functions #1-50) is not affected by a refresh charge. The charge termination technique for a refresh charge will be DV/DT regardless of how the control is user programmed, and the 0-80% back-up timer will be four hours and fifteen minutes during a refresh charge. This feature will insure that any battery left connected to the charger for extended periods of time will not be damaged due to self-discharge, and will be kept in a fully charged state.

Finish Cell Forming Feature — The EC2000 Control can be programmed to provide voltage-time charge termination and disable the low current shutdown feature for a limited number of charge cycles.

The number of cycles programmed into the Forming Cycles function will be forming cycles and that number will be decrement each time a charge complete condition is reached. The number of forming cycles selected can be from 0 to 30 charge cycles.

Input Kilowatt Hour Feature — The Control will calculate the *approximate* input kilowatt hour usage for each charge cycle. This feature may be helpful in determining the cost of charging given various charging scenarios with known electricity costs.

80% Charged Point — A standard EC2000 Control will light the “80% Charged” LED and enable the charge termination routine when the battery voltage reaches the gassing voltage and the charging has decreased below start current. The gassing voltage is nominally 2.40 volts/cell and is adjusted automatically when the charger output voltage is modified to charge batteries of different temperatures.

Data Retention — The EC2000 Control uses 2 types of electronic memory for data retention. Real time clock data is kept current by a non user replaceable lithium battery in the absence of AC power. All other program memory and charge cycle information is resident in non-volatile memory. The minimum data retention time should be at least 10 years.

Time-of-Day Start — The EC2000 Control can be programmed to delay the start of a charge cycle until a specific time of day. Any time of day, in one minute increments, can be used for the time-of-day start time.

When a EC2000 is programmed for time-of-day start, and a battery is connected to the charger, the programmed start time will be displayed. This feature can be used to save on energy costs, provide a battery cool down period, or to prevent opportunity charging.

WARNING: Enabling the Finish Cell Forming feature will cause the charger to continue to run for a period of time if the battery has been disconnected before Charge Complete or pressing the Manual Stop key. This condition will continue until the programmed number of cycles have been completed. The battery should never be disconnected while a charge is in progress.

Delayed Start — The EC2000 Control can be programmed to delay the start of a charge cycle for a specific period of time. Any time period from 1 minute to 23 hours and 59 minutes, in one minute increments, can be used for the delayed start period.

When a EC2000 is programmed for delayed start, and a battery is connected to the charger, the programmed delay time will be displayed.

The time displayed will be decremented once per minute so that the time displayed is always the amount of time remaining before the start of charge. This feature can be used to save on energy costs, provide a battery cool down period, or to prevent opportunity charging.

Time-of-Day Blockout — The EC2000 Control can be programmed to disable the charger during a specific time of day. The charger will turn off at the beginning of the block-out period, and resume the charge cycle at the end of the block-out period. Any period of time of day, in one minute increments, can be used for the time-of-day block-out period. When a EC2000 is programmed for time-of-day block-out, and a battery is being charged when the block-out period occurs, the programmed end of block-out time will be displayed. This feature can be used to save on energy costs, provide a battery cool down period, or to prevent opportunity charging.

Manual Override of Programmed Start Modes — A EC2000 Control, when programmed for time-of-day start, delayed start, or time-of-day block-out, can be manually overridden by pressing the “Enter” pushbutton while the start of the charge cycle is

being automatically delayed by the control. This manual override feature can be disabled through the “Start Override” programming function. The manual override feature allows the operator to start a charge cycle immediately if a battery is needed sooner than the programmed start time would allow.

Automatic Equalize — The EC2000 Control can be programmed for 3 different types of automatic equalize. EC2000 Controls are shipped from the factory programmed to automatically provide an equalize charge to every fifth complete charge cycle. The number of cycles between equalize requests can be varied from 0 to 30. If the EC2000 is programmed to automatically provide an equalize cycle every zero cycles, then an equalize charge cannot be requested manually and will never be provided automatically. The second type of automatic equalize mode is when an equalize charge is desired on a particular day of the week. When programmed for automatic equalize by day of week, the EC2000 will provide an equalize charge to any battery which is connected to the charger on the programmed equalize day. Additionally, any battery which is connected to the charger, previous to the day of week equalize day, will be given an equalize charge provided that it is at a charge complete status when the EC2000’s clock calendar switches to the equalize day. The automatic equalize features allow for the consistent application of equalize charges without constant attention by the operators. The third type of equalize is by BID count. When programmed for this mode, the current complete cycle count is read from the BID at connect and compared to that of the equalize cycle counter. An equalize will be requested when the BID count equals the equalize cycle count programmed into function 22.

For further information on programming and reviewing the EC2000 features, refer to the Programming Your EC2000 chapter and the Reviewing EC2000 Charge Data section of this chapter.

Programmable Cool Down Time — A programmable cool down feature allows the battery to cool down for 0 to 8 hours before the charger signals charge complete. During the cool down period the alphanumeric display reads “Cool Down”. This feature allows the battery to cool down before being returned to use and can be used to minimize the battery maximum temperature during operation.

Start Gassing – A programmable time that effects how long from the start of a charge cycle before the gassing portion can begin. If the battery on charge reaches the finish portion of the curve and the gassing time has not elapsed, the charger will shutoff and display “No Gassing”. This minimizes any battery gassing that may occur during an opportunity charge cycle. Once the start gassing time is past, the charger will restart at the standard finish current and complete the charge cycle. This feature only works when the charger is in Opportunity Charging mode.

Maximum Battery Temperature — The EC2000 Control can be programmed to interrupt the charge cycle if the battery temperature exceeds the limit programmed into function. The temperature may be programmed from 80°F to 150°F. Once the battery cools down past the trip temperature the charge cycle will be resumed. The display will show “Battery Cooling” if the charge has been interrupted and the cooling period is taking place. A BID must be in use to utilize this function.

User Programmable Password — You may enter a custom 4 number password for use in keeping programming functions protected. When the feature is enabled (function 55), you will be prompted to enter the password. After that, anytime the user tries to access the programming menu, they will be prompted for this password.

Programmable Start Rate Charging (Extended AH) - Batteries of any AH rating less than the charger nameplate AH rating can be configured for fast charging at start rates up to 50 amps/100AH. This mode enables fast/opportunity charging for a wide range of battery ratings. To operate in this charging mode, program the “BID battery type” (menu item 54) to curve 8, and the “BID Start Amps” (menu item 58) to the desired charger start rate in amps/100AH. For example, to charge an 800AH battery at 320 amps, the “BID Start Amps” would be programmed to 40A/100AH. Please note that if the programmed rate exceeds the maximum rated charger amps, the charger output will be limited to the maximum current rating. This may also be accomplished without using a BID by programming the control battery type to curve 8 (Function 38), and then programming the fixed start amps (Function 65) to the desired start rate.

EC2000 Charge Archive Function

The archive function allows up to 20 items of charge cycle information to be retrieved and displayed. The last 512 charge cycles are stored, with the most recent cycle labeled #1 and earlier cycles labeled in ascending order.

The most recent charger cycle data is moved to the #1 archive location when the next battery to be charged is connected to the charger. At this time the all previous archive cycle data is shifted to the next highest archive location (1 to 2, 2 to 3, etc.).

The following key sequence is used to access charge cycle archive data:

Keys	Display
PROGRAM	Enter 1-REV 2-PROG Function 3-MAH 4-ARCH
4 for Archive	Enter Arch Func # 001 001-512/00 to Download

Key in the charge cycle number and press enter.

The charge cycle data will automatically scroll through the display along with the charge cycle number. The 20 archive data items are described in detail below (see Figure 7-2).

AMP HOURS RET
The total ampere-hours returned during the charge cycle. This number includes ampere-hours delivered to the battery during the Verify, 0-80%, 80% to End, and Equalize portions of the charge cycle.

CHARGE TIME
The total charging time of the charge cycle. This number includes the time of the Verify, 0-80% 80% to End, and Equalize portions of the charge cycle.

80% TO END
The time the battery was charged from the 80% charged point until DV/DT or VT (depending on the control setting) charge termination. This time does not include any equalize charging time that may have been automatically or manually selected.

BATTERY OCV
The open circuit voltage of the battery immediately before the beginning of the charge cycle.

START AMPS
The value of the current delivered to the battery at the start of the charge cycle.

START VOLTS
The value of the battery voltage (in volts/cell) of the battery at the start of the charge cycle.

FINISH AMPS
The value of the charge current delivered to the battery at the end of the charge cycle.

FINISH VOLTS
The value of the battery voltage at the end of the charge cycle.

TERM
The reason for charge cycle termination. All possible codes are listed below:

1-Charge Comp	Normal Charge Complete
2-Low Current	Low Current Error shutdown
3-Manual Stop	Manual stop
4-Battery Dis	Battery disconnected while charging
5-<80 Backup	0-80% Back-up Timer Error Shutdown.
9-Curve Error	Charger Output Curve Error Shutdown
10-Overtemperature	Excessive Charge Component Heating
11-Phase Error	Unbalanced Input Line Error Shutdown
12-Didt	Rising Current/Falling Voltage Error shutdown
13-Lvsd	Low Charging Voltage Error Shutdown
14-Ahsd	Excessive AH Returned Error Shutdown
16-Arcless	The Arcless circuit is open

EQUALIZE TIME
The time of the equalize portion of the charge cycle.

START TIME
The time at the start of the charge cycle (military format).

END TIME
The time at the end of the charge cycle. Includes the equalize time if it was automatically or manually selected (military format).

BATTERY I.D.
The Battery I.D. number of the battery that was charged in the charge cycle. Requires Prestolite Battery Identification Module (BID).

BID START TEMP
The temperature of the battery sensed by the Prestolite Battery Identification Module at the start of the charge cycle.

BID END TEMP
The temperature of the battery sensed by the Prestolite Battery Identification Module at the end of the charge cycle.

CYC. AMP HOURS
The Ampere-hour setting of the charger during the charge cycle. This value cannot exceed the maximum charger output rating.

CYCLE CELLS
The Cell Size setting of the charger during the charge cycle. This value cannot exceed the maximum charger output rating.

BATTERY TYPE
The Battery Type setting of the charger during the charge cycle. This value cannot exceed the maximum charger output rating.

PRESENT MONTH
The month that the charge cycle occurred.

PRESENT DATE
The day of the month that the charge cycle occurred.

EC2000 Charge Cycle Review Function

The review function allows up to 66 items of charge cycle information to be retrieved and displayed. Only the last charge cycle is stored, with the data being moved into archive cycle #1 location when the next battery is connected to the charger. The review data functions described in detail below in ascending order.

A single review item can be accessed by entering its item number at the "Enter Rev Func # " prompt.

The following key sequence is used to access charge cycle review data functions.

Keys	Display
Program	Enter 1-REV 2-PROG Function 3-MAH 4-ARCH
1	Enter Rev Func # 01

Key in function number and press enter or scroll using arrow keys to review entire charge cycle (see Fig. 7-2). You may re-enter a new function number at any time to jump through the menu quickly.

01. AMP HOURS RET
The total ampere-hours returned during the charge cycle. This number includes ampere-hours delivered to the battery during the Verify, 0-80%, 80% to End, and Equalize portions of the charge cycle.

02. CHARGE TIME
The total charging time of the charge cycle. This number includes the time of the Verify, 0-80%, 80% to End, and Equalize portions of the charge cycle.

03. 80% TO END
The time the battery was charged from the 80% charged point until DV/DT or VT (depending on the control setting) charge termination. This time does not include any Equalize charging time.

04. BATTERY OCV
The open circuit voltage of the battery immediately before the beginning of the charge cycle.

05. START AMPS
The value of the current delivered to the battery at the start of the charge cycle.

06. START VOLTS
The value of the battery voltage (in volts/cell) of the battery at the start of the charge cycle.

07. FINISH AMPS
The value of the charge current delivered to the battery at the end of the charge cycle.

08. FINISH VOLTS
The value of the battery voltage at the end of the charge cycle.

09. TERM
The reason for charge cycle termination. All possible codes are listed below:

1-Charge Comp	Normal Charge Complete
2-Low Current	Low Current Error shutdown
3-Manual Stop	Manual stop
4-Battery Dis	Battery disconnected while charging
5-<80 Backup	0-80% Back-up Timer Error Shutdown.
9-Curve Error	Charger Output Curve Error Shutdown
10-Overtemperature	Excessive Charge Component Heating
11-Phase Error	Unbalanced Input Line Error Shutdown
12-Didt	Rising Current/Falling Voltage Error shutdown
13-Lvsd	Low Charging Voltage Error Shutdown
14-Ahsd	Excessive AH Returned Error Shutdown
16-Arcless	The Arcless circuit is open

10. EQUALIZE TIME
The time of the equalize portion of the charge cycle.

11. START TIME
The time at the start of the charge cycle (military format).

12. END TIME
The time at the end of the charge cycle. Includes the equalize time if it was automatically or manually selected (Military format).

13. CHARGER HEAT SINK TEMPERATURE
The last recorded temperature of the charger power components heat sink while the charger was charging.

14. BATTERY I.D.
The Battery I.D. number of the battery that was charged in the charge cycle. Requires Prestolite Battery Identification Module (BID).

15. BATTERY VOLTS
The present voltage of the battery connected to the battery charger (volts DC).

16. CYCLE Kwh
The estimated Kilowatt Hour usage for the last charge cycle.

17. BID START TEMP
The temperature of the battery sensed by the Prestolite Battery Identification Module at the start of the charge cycle (degrees F).

18. BID END TEMP.
The temperature of the battery sensed by the Prestolite Battery Identification Module at the end of the charge cycle (degrees F).

19. PRESENT TIME
The present time (military format).

20. WEEK DAY
The present day of week (SUN through SAT).

21. EQUALIZE TYPE
The type of auto equalize selected. The types that can be selected are listed below:

CYC. = By cycle count (see AUTO EQ. COUNT).

D.O.W. = By the day of week (see Auto EQ. Day).

BID = By BID count

22. EQUALIZE CYCLES
The number of charge cycles between equalize charges when the auto equalize function is programmed “ON” and the auto equalize type is set to “COUNT”.

23. EQ. DAY
The day of the week that an equalize charge cycle is performed when the auto equalize function is “ON” and the auto equalize type is set to “DAY”.

24. AUTO EQUALIZE
Shows the auto equalize function on or off.

Auto equalize “OFF”
Auto equalize “ON”

25. T.O.D. START
Time of day start time. (military format). See START MODE.

26. DELAYED START
Delayed start time interval. (00H 00M to 23H 59M). See START MODE.

27. BLOCK START
The beginning time of the time of day blockout function (AM/PM). See START MODE

28. BLOCK END
The ending time of the time of day blockout function. (AM/PM). See START MODE.

29. START OVERIDE
The start override function that allows the operator to override any of charger start modes (i.e. delayed start, time of day start, or time of day blockout) by pressing the ENTER key.

30. START MODE
Shows the selected start mode for the start of the charge cycle.

AUTO = Automatic mode

T.O.D.S. = Time of day start mode

DELAYED = Delay start mode

T.O.D.B. = Time of day blockout

TIMER = Timer Mode

31. FORMING CYCLES
The number of forming cycles for a new battery by disabling the low current shutdown, and setting VT Termination mode for the programmed number of cycles (00 to 30).

WARNING: Enabling the Finish Cell Forming feature will cause the charger to continue to run for a period of time if the battery has been disconnected before Charge Complete or pressing the Manual Stop key. This condition will continue until the programmed number of cycles have been completed. The battery should never be disconnected while a charge is in progress.

32. SPECIAL OPTION
Special option modes see below.

OFF

“P.T.S.“ = Push to start mode.

The charger will not start until the “ENTER” key is pressed.

F.L.O. = Fault lockout mode.

The charger will not restart until any faults are reset by pressing the “ENTER” key with no battery connected.

33. CYC. AMP HOURS
The ampere-hour setting of the charger during the charge cycle. This value cannot exceed the maximum charger output rating.

34. CYCLE CELLS
The cell size setting of the charger during the charge cycle. This value cannot exceed the maximum charger output rating.

35. FIXED CELL SIZE
The cell size the charger will operate at if the "multi-cell mode" is not selected and the charger does not detect a Prestolite BID module. See "MULTI-CELL MODE".

36. FIXED AMP HRS
The ampere-hour size the charger will operate at if the charger does not detect a Prestolite BID module.

37. FIX.BAT.TEMP.
The battery temperature used for charger output voltage compensation, if the charger does not detect a Prestolite BID Module (032 to 132°F).

CAUTION: Do Not Exceed the Battery Manufacturer's Maximum allowed Battery temperature.

38. BATTERY TYPE
The battery type the charger uses to select the proper output voltage and current characteristic, if the charger does not detect a Prestolite BID.

FLD = Standard flooded lead acid industrial type battery curve.

CTM. = Custom curve. Uses the voltage and current values programmed in the STRT A/100 A.H.,FIN. A/100A.H., GAS. V/C., and LID. V/C.

YGR
SLR
DSG
SLE
DAG
CDR
= Sealed lead acid battery curves

MAX = Opportunity Charge Curve

*MAH will be displayed if the Multi-Amp Hour Feature is turned on.

39. START AMPS/100
The selected output curve start current setting (10.0 to16.3 amps per 100 ampere-hours).

40. FINISH AMPS/100
The selected output curve finish current setting (0.0 to 7.9 amps per 100 ampere-hours).

41. GASSING V/C
The selected output curve gassing voltage level setting (2.00 to 2.99 volts/cell).

42. LID. V/C
The selected output curve lid voltage setting (2.00 to 2.99 volts/cell).

43. CHARGER I.D.
The battery charger identification number.

Factory setting = 0000

44. REFRESH DELAY
The number of hours before the charger automatically starts and refresh charges a battery that has not been disconnected (8 to 99 hours).

Factory Setting = 72 hours.

45. DVDT DISABLE
Disables the automatic DV/DT charge termination feature and enables Voltage Time charge termination.

OFF = (DV/DT Mode)

ON = (VT mode)

46. PRESENT MONTH
The current month (1 to 12)

47. PRESENT DATE
The current day of the month (1 to 31).

48. PRESENT YEAR
The current year (00 to 99).

49. MULTICELL MODE
Enables the automatic cell selection mode of operation for the charger. When turned off, the charger operates at the Fixed cell size (see FIX. CELL SIZE).

50. COOL DOWN HOURS
The number of hours cool down from the end of charge until charge complete is indicated by the charger (0 to 8).

51. BID CELLS
If a connected battery is equipped with a Battery I.D. module, the battery cells size (6,9,12,18,24,36) may be reprogrammed into the BID. The control must be in "Manual Stop" status.

52. BID NUMBER
If a connected battery is equipped with a Battery I.D. module, the I.D. number (001-999) may be re-programmed into the BID. The control must be in "Manual Stop" status.

53. BID AMP HOURS
If a connected battery is equipped with a Battery I.D. module, the battery amp-hour size (0000-9999) may be reprogrammed into the BID. The control must be in "Manual Stop" status.

54. BID BATTERY TYPE
If a connected battery is equipped with a Battery I.D. module, the battery type may be programmed into the BID. The control must be in "Manual Stop" status.

00	FLD	Flooded Lead Acid
01	CTM	Custom curve (programmable)
02	YGR	Sealed battery curve
03	SLR	Sealed battery curve
04	DSG	Sealed battery curve
05	SLE	Sealed battery curve
06	DAG	Sealed battery curve
07	CDR	Sealed battery curve
08	MAX	Opportunity Charge curve

55. PASSWORD
Optional password required to program if turned on.

56. NO GASSING HOURS
The number of Hours before the charger can begin the gassing portion of the charging cycle. (0 – 8 Hours)

57. MAX BATT TEMP
The maximum battery temperature for charging to start or continue. Once interrupted, the charge will restart after the temperature drops 5 degrees F. (For use with BID only)

58. BID START AMPS
Programs the charger start rate at the programmed BID AH rating to the selected amps/100AH. For example, to charge an 800AH battery at 320 amps, the "BID Start Amps" would be programmed to 40A/100AH. Please note that if the programmed rate exceeds the maximum rated charger amps, the charger output will be limited to the maximum current rating.

59. BATTERY CHARGE AMP HOURS
The accumulated amp hours charged into the battery. An Amp Hour Accumulator and BID module assembly must be installed on the battery to use this function. The Amp Hour Accumulator continually records this data while it is installed on the battery.

The data is automatically read from the bid when the control terminates each charge cycle, except for Manual Stop. The data is stamped with the date and BID number.

60. BATTERY DISCHARGE AMP HOURS
The accumulated amp hours discharged from the battery. An Amp Hour Accumulator and BID module assembly must be installed on the battery to use this function. The Amp Hour Accumulator / BID continually records this data while it is installed on the battery.

The data is automatically read from the bid when the control terminates each charge cycle, except for Manual Stop. The data is stamped with the date and BID number.

61. LONG TERM AVERAGE BATTERY TEMPERATURE
The average BID temperature of the battery. An Amp Hour Accumulator and BID module assembly must be installed on the battery to use this function. The BID continually updates the average while it is installed on the battery.

The data is automatically read from the bid when the control terminates each charge cycle, except for Manual Stop. The data is stamped with the date and BID number.

62. BATTERY CYCLES
The number of battery discharge cycles, based on the total discharge amp hours and 80% of the BID amp hour setting. An Amp Hour Accumulator and BID module assembly must be installed on the battery to use this function. The control continually updates this calculation using the total accumulated discharge amp hours read in from the BID.

63. CHARGE/DISCHARGE RATIO
The ratio of the total charge amp hours over the total discharge amp hours. An Amp Hour Accumulator and BID module assembly must be installed on the battery to use this function. The control continually updates this calculation using the total accumulated charge and discharge amp hours read in from the BID.

64. LCD DISPLAY CONTRAST ADJUST
Make this adjustment if the LCD display is difficult to read. Be sure the unit is in its permanent mounted position before making the adjustment.

65. FIXED START AMPS
(Opportunity/Fast charging without a BID)
Programs the charger start rate at the programmed charger AH setting to the selected amps/100AH. For example, to charge an 800AH battery at 320 amps, the “battery start amps” would be programmed to 40A/100AH. *Please note that if the programmed rate exceeds the maximum rated charger amps, the charger output will be limited to the maximum current rating.*

66. MAX CELL SIZE
Programs the Max Cell Size available on 40 cell Chargers in the multi-cell mode. The charger cannot automatically recognize the difference between 40 and 36 cell sizes and therefore, the Max Cell Size in that mode must be programmed to 36 or 40 cells. Regardless of this setting, 36 or 40 cell batteries with properly programmed Prestolite BID modules will correctly be charged.

36 = 36 Cells
40 = 40 Cells

67. NETWORK ID
The Network ID for the battery charger.

Default = 1234

68. EXTRA RUN TIME
The charge time can be extended past the normal charge termination point (pT/dV/dT or VT) from 0 to 59 minutes. If equalize has been selected, any extra run time programmed will not be added. This feature may be useful in some abnormal charging situations such as cold storage.

69. TMP COMP LEVEL
The VT Termination type selected for automatic temperature compensation level (when used with a Prestolite BID)

STD (1) - 4 hours VT
Def (0) - 6 hours VT

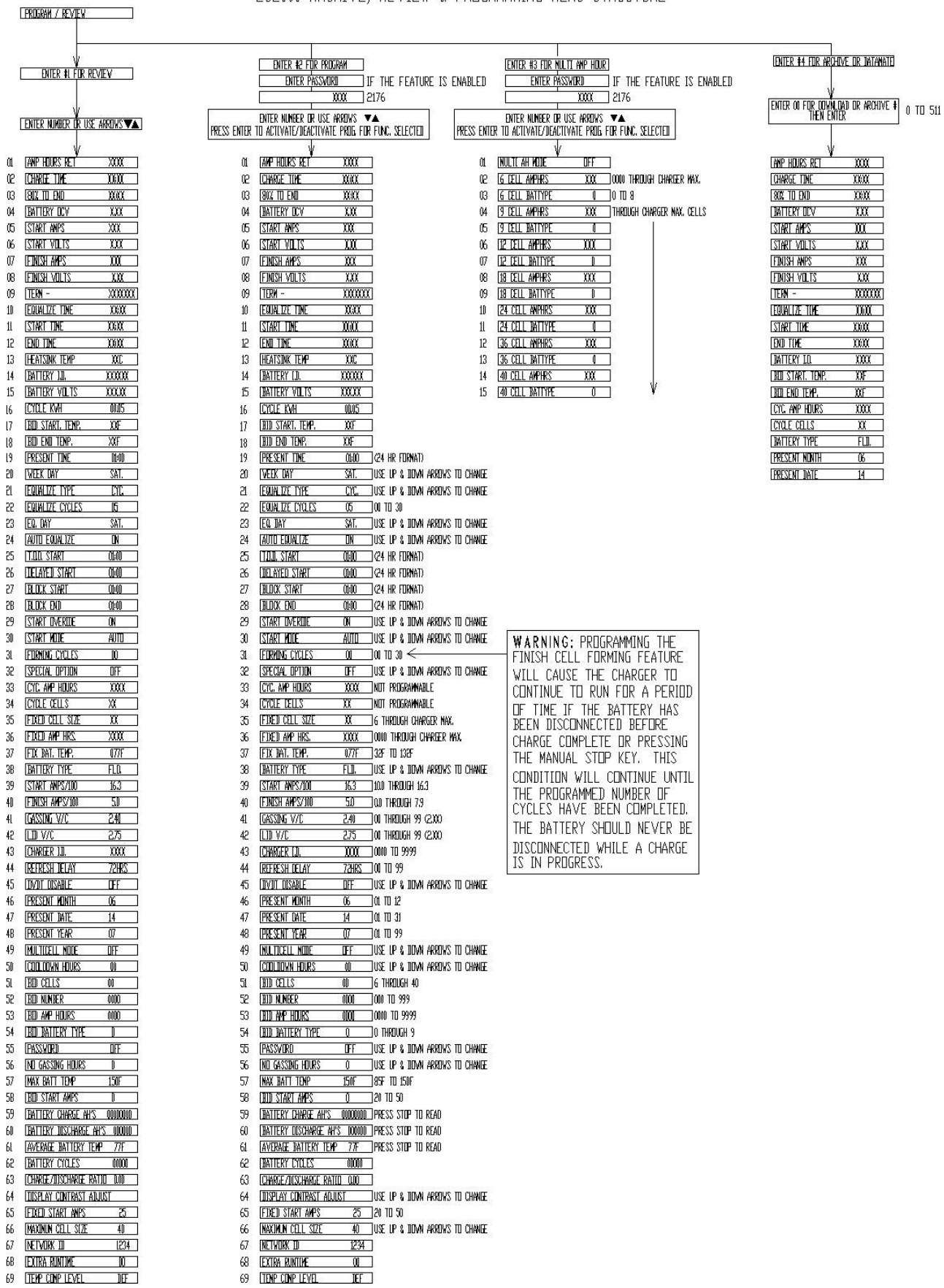
EC2000 ARCHIVE, REVIEW & PROGRAMMING MENU STRUCTURE
PROGRAM / REVIEW
ENTER #1 FOR REVIEW
ENTER NUMBER OR USE ARROWS ▼▲
ENTER #2 FOR PROGRAM
ENTER PASSWORD
XXXX 2176
IF THE FEATURE IS ENABLED
ENTER NUMBER OR USE ARROWS ▼▲
PRESS ENTER TO ACTIVATE/DEACTIVATE PROG FOR FUNC. SELECTED
ENTER #3 FOR MULTI AMP HOUR
ENTER PASSWORD
XXXX 2176
IF THE FEATURE IS ENABLED
ENTER NUMBER OR USE ARROWS ▼▲
PRESS ENTER TO ACTIVATE/DEACTIVATE PROG FOR FUNC. SELECTED
ENTER #4 FOR ARCHIVE OR DATAMATE
ENTER 00 FOR DOWNLOAD OR ARCHIVE # THEN ENTER
0 TO 511
01 AMP HOURS RET XXXX
02 CHARGE TIME XXXX
03 SOC TO END XXXX
04 BATTERY OCV XXX
05 START AMPS XXX
06 START VOLTS XXX
07 FINISH AMPS XXX
08 FINISH VOLTS XXX
09 TERM - XXXXXXX
10 EQUALIZE TIME XXXX
11 START TIME XXXX
12 END TIME XXXX
13 HEATSINK TEMP XXC
14 BATTERY I.D. XXXXXX
15 BATTERY VOLTS XXXXX
16 CYCLE KWH 0005
17 BID START. TEMP. XXF
18 BID END TEMP. XXF
19 PRESENT TIME 0000
20 WEEK DAY SAT.
21 EQUALIZE TYPE CYC.
22 EQUALIZE CYCLES 05
23 EQ. DAY SAT.
24 AUTO EQUALIZE ON
25 T.I.D. START 0000
26 DELAYED START 0000
27 BLOCK START 0000
28 BLOCK END 0000
29 START OVERRIDE ON
30 START MODE AUTO
31 FORMING CYCLES 00
32 SPECIAL OPTION OFF
33 CYC. AMP HOURS XXXX
34 CYCLE CELLS XX
35 FIXED CELL SIZE XX
36 FIXED AMP HRS. XXXX
37 FIX BAT. TEMP. 077F
38 BATTERY TYPE FLD.
39 START AMPS/100 16.3
40 FINISH AMPS/100 5.0
41 GASSING V/C 2.40
42 LID V/C 2.75
43 CHARGER I.D. XXXX
44 REFRESH DELAY 72HRS.
45 DVOT DISABLE OFF
46 PRESENT MONTH 06
47 PRESENT DATE 14
48 PRESENT YEAR 07
49 MULTICELL MODE OFF
50 COOLDOWN HOURS 00
51 BID CELLS 00
52 BID NUMBER 0000
53 BID AMP HOURS 0000
54 BID BATTERY TYPE 0
55 PASSWORD OFF
56 NO GASSING HOURS 0
57 MAX BATT TEMP 150F
58 BID START AMPS 0
59 BATTERY CHARGE AH'S 00000000
60 BATTERY DISCHARGE AH'S 000000
61 AVERAGE BATTERY TEMP 77F
62 BATTERY CYCLES 00000
63 CHARGE/DISCHARGE RATIO 0.00
64 DISPLAY CONTRAST ADJUST
65 FIXED START AMPS 25
66 MAXIMUM CELL SIZE 40
67 NETWORK ID 1234
68 EXTRA RUNTIME 00
69 TEMP COMP LEVEL 10F
01 AMP HOURS RET XXXX
02 CHARGE TIME XXXX
03 SOC TO END XXXX
04 BATTERY OCV XXX
05 START AMPS XXX
06 START VOLTS XXX
07 FINISH AMPS XXX
08 FINISH VOLTS XXX
09 TERM - XXXXXXX
10 EQUALIZE TIME XXXX
11 START TIME XXXX
12 END TIME XXXX
13 HEATSINK TEMP XXC
14 BATTERY I.D. XXXXXX
15 BATTERY VOLTS XXXXX
16 CYCLE KWH 0005
17 BID START. TEMP. XXF
18 BID END TEMP. XXF
19 PRESENT TIME 0000 (24 HR FORMAT)
20 WEEK DAY SAT. USE UP & DOWN ARROWS TO CHANGE
21 EQUALIZE TYPE CYC. USE UP & DOWN ARROWS TO CHANGE
22 EQUALIZE CYCLES 05 00 TO 30
23 EQ. DAY SAT. USE UP & DOWN ARROWS TO CHANGE
24 AUTO EQUALIZE ON USE UP & DOWN ARROWS TO CHANGE
25 T.I.D. START 0000 (24 HR FORMAT)
26 DELAYED START 0000 (24 HR FORMAT)
27 BLOCK START 0000 (24 HR FORMAT)
28 BLOCK END 0000 (24 HR FORMAT)
29 START OVERRIDE ON USE UP & DOWN ARROWS TO CHANGE
30 START MODE AUTO USE UP & DOWN ARROWS TO CHANGE
31 FORMING CYCLES 00 00 TO 30
32 SPECIAL OPTION OFF USE UP & DOWN ARROWS TO CHANGE
33 CYC. AMP HOURS XXXX NOT PROGRAMMABLE
34 CYCLE CELLS XX NOT PROGRAMMABLE
35 FIXED CELL SIZE XX 6 THROUGH CHARGER MAX.
36 FIXED AMP HRS. XXXX 0000 THROUGH CHARGER MAX.
37 FIX BAT. TEMP. 077F 32F TO 132F
38 BATTERY TYPE FLD. USE UP & DOWN ARROWS TO CHANGE
39 START AMPS/100 16.3 10.0 THROUGH 16.3
40 FINISH AMPS/100 5.0 0.0 THROUGH 7.9
41 GASSING V/C 2.40 00 THROUGH 99 (2.XX)
42 LID V/C 2.75 00 THROUGH 99 (2.XX)
43 CHARGER I.D. XXXX 0000 TO 9999
44 REFRESH DELAY 72HRS. 00 TO 99
45 DVOT DISABLE OFF USE UP & DOWN ARROWS TO CHANGE
46 PRESENT MONTH 06 01 TO 12
47 PRESENT DATE 14 01 TO 31
48 PRESENT YEAR 07 01 TO 99
49 MULTICELL MODE OFF USE UP & DOWN ARROWS TO CHANGE
50 COOLDOWN HOURS 00 USE UP & DOWN ARROWS TO CHANGE
51 BID CELLS 00 6 THROUGH 40
52 BID NUMBER 0000 000 TO 999
53 BID AMP HOURS 0000 0000 TO 9999
54 BID BATTERY TYPE 0 0 THROUGH 9
55 PASSWORD OFF USE UP & DOWN ARROWS TO CHANGE
56 NO GASSING HOURS 0 USE UP & DOWN ARROWS TO CHANGE
57 MAX BATT TEMP 150F 85F TO 150F
58 BID START AMPS 0 20 TO 50
59 BATTERY CHARGE AH'S 00000000 PRESS STOP TO READ
60 BATTERY DISCHARGE AH'S 000000 PRESS STOP TO READ
61 AVERAGE BATTERY TEMP 77F PRESS STOP TO READ
62 BATTERY CYCLES 00000
63 CHARGE/DISCHARGE RATIO 0.00
64 DISPLAY CONTRAST ADJUST USE UP & DOWN ARROWS TO CHANGE
65 FIXED START AMPS 25 20 TO 50
66 MAXIMUN CELL SIZE 40 USE UP & DOWN ARROWS TO CHANGE
67 NETWORK ID 1234
68 EXTRA RUNTIME 00
69 TEMP COMP LEVEL 10F
01 MULTI AH MODE OFF
02 6 CELL AMPHRS XXX 0000 THROUGH CHARGER MAX.
03 6 CELL BATTYPE 0 0 TO 9
04 9 CELL AMPHRS XXX THROUGH CHARGER MAX. CELLS
05 9 CELL BATTYPE 0
06 12 CELL AMPHRS XXX
07 12 CELL BATTYPE 0
08 18 CELL AMPHRS XXX
09 18 CELL BATTYPE 0
10 24 CELL AMPHRS XXX
11 24 CELL BATTYPE 0
12 36 CELL AMPHRS XXX
13 36 CELL BATTYPE 0
14 40 CELL AMPHRS XXX
15 40 CELL BATTYPE 0
WARNING: PROGRAMMING THE FINISH CELL FORMING FEATURE WILL CAUSE THE CHARGER TO CONTINUE TO RUN FOR A PERIOD OF TIME IF THE BATTERY HAS BEEN DISCONNECTED BEFORE CHARGE COMPLETE OR PRESSING THE MANUAL STOP KEY. THIS CONDITION WILL CONTINUE UNTIL THE PROGRAMMED NUMBER OF CYCLES HAVE BEEN COMPLETED. THE BATTERY SHOULD NEVER BE DISCONNECTED WHILE A CHARGE IS IN PROGRESS.
AMP HOURS RET XXXX
CHARGE TIME XXXX
SOC TO END XXXX
BATTERY OCV XXX
START AMPS XXX
START VOLTS XXX
FINISH AMPS XXX
FINISH VOLTS XXX
TERM - XXXXXXX
EQUALIZE TIME XXXX
START TIME XXXX
END TIME XXXX
BATTERY I.D. XXXX
BID START. TEMP. XXF
BID END TEMP. XXF
CYC. AMP HOURS XXXX
CYCLE CELLS XX
BATTERY TYPE FLD.
PRESENT MONTH 06
PRESENT DATE 14

Figure 7-2

Programming Your EC2000 Control

The programming function allows 42 functions to be programmed to customize your Prestolite Eclipse II Plus to your battery charging application. Programming is not available during an active charge cycle, and can only be accessed before battery connect or after charge termination.

All programmable functions are keyed with the sequence shown below. To prevent unauthorized access, use the optional password feature. Any single programming item can be accessed by entering its function number at the prompt or by using the arrow keys to scroll to the item. If the password feature is used and the improper number is entered, the control will reject access to programming and display “Password Failed”. The sequence may then be started over.

Keys	**Display** →
Program	Enter 1-REV 2-PROG Function 3-MAH 4-ARCH
2	Enter Prog Func #

Enter password if required. Key in function number or scroll using arrow keys to reach the desired programming function (see Figure 7-2).

Once the desired function is reached, press the “enter” key to enable programming. Functions 33/34 and 59-63 are not programmable. On functions with several numeric data fields, the display will show “Enter Numeric Value”. The flashing digit will change as the entries are keyed in. Press the “Enter” key again when programming of that function is complete. On functions with 1 or 2 data places, the display will show “ △ ▽ to Change Data”. Use the arrow keys to increment or decrement the data. Again press the “Enter” key when programming of that function is complete.

19. PRESENT TIME
The current time. Program in 24 hour military time format (0000 to 2359 military time).

20. WEEK DAY
The present day of week (SUN through SAT).

1 = Sunday

Use the up or down arrow to select the proper setting.

21. EQUALIZE TYPE
The type of auto equalize selected. The types that can be selected are listed below.

By cycle count (see AUTO EQ. COUNT). Factory setting.

By the day of week (see AUTO EQ. DAY).

By BID cycle count

Use the up or down arrow to select the proper setting.

22. EQUALIZE COUNT
The number of complete charge cycles between equalize charges when the auto equalize function is programmed “ON” and the auto equalize type is set to “COUNT” or “BID”.

05 = factory setting

Use the up or down arrow to select the proper setting.

23. EQ. DAY
The day of the week that an equalize charge cycle is performed when the auto equalize function is “ON” and the auto equalize type is set to “DAY”.

Saturday = factory setting

Use the up or down arrow to select the proper setting.

24. AUTO EQUALIZE
Sets the auto equalize function on or off.

Auto equalize “ON” = Factory Setting

Use the up or down arrow to select the proper setting.

25. T.O.D. START
Sets the time of day start time (0000 to 2359 military time). See START MODE.

Factory = 01:00

26. DELAYED START
Sets the delayed start time interval (00H 00M to 23H 59M)

Factory = 00H 00M. See START MODE

27. BLOCK START
Sets the beginning time of the time of day blockout function (0000 to 2359 military time). See START MODE.

Factory = 01:00

28. BLOCK END
Sets the ending time of the time of day blockout function (0000 to 2359 military time). See START MODE.

Factory = 01:00

29. START OVERIDE
Sets the start override function that allows the operator to override any of the charger start modes (i.e.; delayed start, time of day start, or time of day blockout).

On = Factory setting

Use the up or down arrow to select the proper setting.

30. START MODE
Selects the desired start mode for the start of the charge cycle.

Automatic mode	"AUTO" factory setting
Time of day start mode	"T.O.D.S."
Delay start mode	"DEL.S."
Time of day blockout	"T.O.D.B."
Timer	TIMER MODE

Use the up or down arrow to select the proper setting.

31. FORMING CYCLES
Sets the number of forming cycles for a new battery by disabling the low current shutdown and setting VT Termination mode for the programmed number of cycles (00 to 30).

00 = Factory Setting

Use the up or down arrow to select the proper setting.

WARNING: Enabling the Finish Cell Forming feature will cause the charger to continue to run for a period of time if the battery has been disconnected before Charge Complete or pressing the Manual Stop key. This condition will Continue until the programmed number of cycles have been completed. The battery should never be disconnected while a charge is in progress.

32. SPECIAL OPTION
Sets special option modes, see below:

OFF = factory setting
"P.T.S." Push to start mode

The charger will not start until the "ENTER" key is pressed.

"F.L.O." Fault lockout mode

The charger will not restart until any faults are reset by pressing the "ENTER" key and no battery is connected.

Use the up or down arrow to select the proper setting.

33. CYC. AMP HOURS
The ampere-hour setting of the charger during the last charge cycle. This value cannot exceed the maximum charger output rating. **Not programmable.**

34. CYCLE CELLS
The cell size setting of the charger during the last charge cycle. This value cannot exceed the maximum charger output rating. **Not programmable.**

35. FIXED CELL SIZE
The cell size the charger will operate at if the "multi-cell mode" is not selected and the charger does not detect a Prestolite BID module. See "MULTI-CELL MODE".

Factory setting = nameplate rating

06 = 6 cells
09 = 9 cells
12 = 12 cells
18 = 18 cells
24 = 24 cells
36 = 36 cells } only available on
40 = 40 cells } 36 & 40 cell units

NOTE: Maximum setting is the charger Nameplate rating.

36. FIXED AMP HRS.
The ampere-hour size the charger will operate at if The charger does not detect a Prestolite BID module (0001 to nameplate rating).

Factory Setting = nameplate rating

NOTE: Maximum setting is the charger Nameplate rating.

37. FIX. BAT. TEMP.
The battery temperature used for charger output voltage compensation, if the charger does not detect a Prestolite BID module (032 to 132°F).

77° = Factory Setting

CAUTION: Do Not Exceed the Battery Manufacturer's Maximum allowed Battery temperature.

38. BATTERY TYPE
The battery type the charger uses to select the proper output voltage and current characteristic, if the charger does not detect a Prestolite BID.

0 = FLD Standard flooded lead acid industrial type battery curve. Factory setting

1 = CTM. Custom Curve. Uses the voltage and current values programmed in the STRT. A/100A.H., FIN. A/100A.H., GAS. V/C, and LID. V/C.

2 = S.L.A. Sealed Lead Acid battery curve

3 = S.L.R. A charge curve that meets the requirements of some AGM (Absorbed Glass Mat) Type Lead Acid Batteries

4 = D.S.G. Sealed Lead Acid battery charge curve that meets requirements of the EPM "DEKA" Sealed Lead Acid battery.

5 = S.L.E. Sealed Lead Acid battery curve

6 = D.A.G. Sealed Lead Acid battery curve

7 = C.D.R. Sealed Lead Acid battery curve

8 = MAX Opportunity Charge curve

Use the up or down arrow to select the proper setting.

NOTE: Functions 39 through 42 apply only to the custom curve and cannot be changed unless the custom curve has been selected in Function 38.

39. START AMPS/100
The custom output curve start current setting (10.0 to 16.3 amps per 100 ampere-hours).

Factory setting = 16.3

40. FINISH AMPS/100
The custom output curve finish current setting (0.0 to 7.9 amps per 100 ampere-hours).

Factory Setting = 5.0

NOTE: For Functions 41 and 42, only information to the right of the decimal point can be entered.

41. GASSING V/C.
The custom output curve gassing voltage level setting (2.00 to 2.99 volts/cell).

Factory setting = 2.40

42. LID. V/C.
The custom output curve lid voltage setting (2.00 to 2.99 volts/cell).

Factory setting = 2.70

43. CHARGER I.D.
The battery charger identification number.

Factory setting = 0000

44. REFRESH DELAY
The number of hours before the charger automatically starts and refresh charges a battery that has not been disconnected (8 to 99 hours).

Factory setting = 72 hours.

45. DVDT DISABLE
Disables the automatic DV/DT charge termination feature and enables Voltage Time charge termination.

OFF (DV/DT mode) factory setting
ON (VT mode)

Use the up or down arrow to select the proper setting.

46. PRESENT MONTH
The current month (1 to 12).

47. PRESENT DATE
The current day of the month (1 to 31).

48. PRESENT YEAR
The current year (00 to 99).

49. MULTICELL MODE
Enables the automatic cell selection mode of operation for the charger. When turned off the charger operates at the Fixed Cell Size (see FIXED CELL SIZE).

OFF
ON Factory Setting

Use the up or down arrow to select the proper setting.

50. COOL DOWN HOURS
The number of hours cool down from the end of charge until charge complete is indicated by the charger (0 to 8).

0 = factory setting.

Use the up or down arrow to select the proper setting.

BID Programming

The following conditions must be met before a Prestolite BID can be programmed or reprogrammed with this charger.

a. A battery with the correct cell size BID must be connected to the charger.

b. The charger must be in the Manual Stop condition.

c. The control must be set to the programming menu and functions 51 thru 54 must be selected.

After the above conditions are met the BID can be properly programmed.

After a number entry is keyed in, the control will immediately attempt to program it in the BID while displaying “WRITING BID”. If the entered number is out of range or is not accepted by the BID, the control will return to the original prompt with all 0's displayed for the entered data. If the BID properly accepts the data, the programmed number will be returned to the display.

51. BID CELLS
Programs the Cell Size into the BID. Once programmed the charger will recognize the battery upon connection, bypass the battery cell size verify function, and charge to the programmed BID cell size.

06 = 6 Cells
09 = 9 Cells
12 = 12 Cells
18 = 18 Cells
24 = 24 Cells
36 = 36 Cells
40 = 40 Cells

52. BID NUMBER
Programs the battery identification number into the BID. (000 to 999)

53. BID AMP HOURS
Programs the battery ampere hour rating into the BID. Once programmed the charger will recognize the battery upon connection and charge the battery at the proper charge rates or the max charger output, whichever is greater. (0000 to 9999

54. BID BATTERY TYPE
Programs the battery type into the BID. Once programmed, the charger will recognize the battery type upon connection, and charge the battery with the proper curve.

0 = Flooded Curve
1 = Custom Curve
2 = Sealed Lead Acid Curve
3 = Sealed Lead Recombinant Curve Absorbed Glass Mat (AGM) Types
4 = Sealed Lead Acid Curve (“DEKA” and Other Gel Types)
5 = Sealed Lead Acid Curve
6 = Sealed Lead Acid Curve
7 = Sealed Lead Acid Curve
8 = Eclipse II Plus/Equinox Curve (Opportunity Charge curve)

55. PASSWORD

OFF = Factory Setting
On = Password Enabled

Use the up or down arrow to select the proper setting.

56. NO GASSING HOURS
The number of Hours before the charger can begin the gassing portion of the charging cycle. (0 – 8 hours)

Factory setting = 00 hours

Use the up or down arrow to select the proper setting.

57. MAX BATT TEMP
The maximum battery temperature for charging to proceed. (For use with BID only)
(080 to 150 degrees F)

Factory setting = 150

58. BID START AMPS
Programs the charger start rate at the programmed BID AH rating to the selected amps/100AH. For example, to charge an 800AH battery at 320 amps, the “BID Start Amps” would be programmed to 40A/100AH. *Please note that if the programmed rate exceeds the maximum rated charger amps, the charger output will be limited to the maximum current rating*

59. BATTERY CHARGE AMP HOURS
The accumulated amp hours charged into the battery. An Amp Hour Accumulator and BID module assembly must be installed on the battery to use this function. The Amp Hour Accumulator continually records this data while it is installed on the battery.

The data is automatically read from the bid when the control terminates each charge cycle, except for Manual Stop. The data is stamped with the date and BID number.

Read the data “on demand” by pressing the “Stop” key. *

Press and hold the “Equalize” button for 10 seconds to reset all data. *

60. BATTERY DISCHARGE AMP HOURS
The accumulated amp hours discharged from the battery. An Amp Hour Accumulator and BID module assembly must be installed on the battery to use this function. The Amp Hour Accumulator / BID continually records this data while it is installed on the battery.

The data is automatically read from the bid when the control terminates each charge cycle, except for Manual Stop. The data is stamped with the date and BID number.

Read the data “on demand” by pressing the “Stop” key. *

Press and hold the “Equalize” button for 10 seconds to reset all data. *

61. LONG TERM AVERAGE BATTERY TEMPERATURE
The average BID temperature of the battery. An Amp Hour Accumulator and BID module assembly must be installed on the battery to use this function. The BID continually updates the average while it is installed on the battery.

The data is automatically read from the bid when the Control terminates each charge cycle, except for Manual Stop. The data is stamped with the date and BID number.

Read the data "on demand" by pressing the "Stop" key. *

Press and hold the "Equalize" button for 10 seconds to reset all data. *

The control must be in Manual Stop mode. Note that all data is read in, Charge AH, discharge AH and average temperature when reading in the "on demand" mode.

62. BATTERY CYCLES
The number of battery discharge cycles, based on the total discharge amp hours and 80% of the BID amp hour setting. An Amp Hour Accumulator and BID module assembly must be installed on the battery to use this function. The Control continually updates this calculation using the total accumulated discharge amp hours read in from the BID. **NOT PROGRAMMABLE**

63. CHARGE/DISCHARGE RATIO
The ratio of the total charge amp hours over the total discharge amp hours. An Amp Hour Accumulator and BID module assembly must be installed on the battery to use this function. The control continually updates this calculation using the total accumulated charge and discharge amp hours read in from the BID. **NOT PROGRAMMABLE**

64. Display Contrast Adjust
When mounted in its permanent position the charger display should be clear and visible as possible. If it is not, try adjusting the display contrast with this function. Using the "Enter" key to get into programming mode, use the up and down arrows to make the contrast adjustment. Depending on conditions, it may take 20 or more presses of the either arrow key to make a visible change.

65. FIXED START AMPS (Opportunity/Fast charging without a BID)
Programs the charger start rate at the programmed charger AH setting to the selected amps/100AH. For example, to charge an 800AH battery at 320 amps, the "battery start amps" would be programmed to 40A/100AH. *Please note that if the programmed rate exceeds the maximum rated charger amps, the charger output will be limited to the maximum current rating.*

Factory Setting = 25

66. MAX CELL SIZE
Programs the Max Cell Size available on 40 cell chargers in the multi-cell mode. The charger cannot automatically recognize the difference between 40 and 36 cell sizes and therefore the Max Cell Size in that mode must be programmed to 36 or 40 cells. Regardless of this setting 36 or 40 cell batteries with properly programmed Prestolite BID modules will correctly be charged.

36 = 36 Cells
40 = 40 Cells

Use the up or down arrow to select the proper setting.

67. NETWORK ID
The Network ID for the battery charger.

Default = 1234

68. EXTRA RUN TIME
Used to program the amount of extra charge run time after normal charge complete. Factory set to 0.

0-59 minutes

69. TMP COMP LEVEL
The VT Termination type selected for automatic temperature compensation level (when used with a Prestolite BID)

STD (1) - 4 hours VT
Def (0) - 6 hours VT

Base line gassing voltage is
1. >90F is 2.35VPC
2. 65-90F is 2.37VPC
3. < 65F is2.40VPC

Base line LID voltage is
1. 77F DVDT begins at 2.65VPC
2. 100F DVDT begins at 2.58VPC
3. 60F DVDT begins at 2.70VPC

Using Extended AH for Opportunity/ Fast Charging on the ECLIPSE II PLUS

The Extended AH Feature of the Eclipse II Plus allows the user to Opportunity/Fast Charge batteries at charge rates from 20-50A/100AH, as long as the actual charge current is within the nameplate rating of the charger. Batteries that are rated below the maximum AH rating of the charger can be Opportunity/Fast charged at rates higher than the nominal 25A/100AH.

Using a BID

When a BID is installed on the battery, it must have the "Battery Start Amps" set to a value between 20 and 50. The charger will then supply a start current equal to the Battery Start Amps setting times the AH rating of the battery that is programmed in the BID divided by 100. See the example below:

Battery 24 cell, 600AH (24-100-13)
Charger 1050EC3-24DP

BID Settings:

BID Cells	24 (item 51)
BID AH	0600 (item 53)
BID Battery Type	08 (item 54)
BID Start Amps	40 (item 58)

Resulting Charge Rates:

Start Amps - 6 x 40 = 240 Amps
Finish Amps - 4.5 x 6 = 27A
Charger rated start amp = 261

Not using a BID

The example below describes how to accomplish Extended amp-hour charging without the use of BID Module on the battery.

Battery 24 cell, 600AH (24-100-13)
Charger 1050PACH3-24P

Charger settings:
Charger Fixed AH 0600 (Function 36)
Charger Curve Type 08 (Function 38)
Fixed Start Amps 40 (Function 65)

Resulting Charge Rate:

Start Amps — 6 x 40 = 240 Amps
Finish Amps — 4.5 x 6 = 27 Amps
Charger rated start amp = 261

Using "No Gassing" to prevent excess gassing in Opportunity and Fast Charge applications on the ECLIPSE II PLUS

The No Gassing Feature of the Eclipse II Plus allows the user to Opportunity/Fast Charge batteries until the battery reaches the gassing portion of the charge curve. At this point the charger stops delivering charge until the "No Gassing" interval has elapsed.

Using No Gassing

3 Shift Application

When Opportunity/Fast charging batteries in a 3 shift application and when it is desired to not charge the battery above 80% on the work days while finish and equalize charging on the weekends, the No Gassing interval should be set at or above the value of the longest break, meal or shift change period where the charger is connected to the battery. Typically a setting of 2 hrs would be adequate for this type of application.

2 Shift Application

When Opportunity/Fast charging batteries in a 2 shift application and when it is desired to not charge the battery above 80% on the work days while finish and equalize charging on the weekends, the No Gassing interval should be set at or above the value of the longest period where the charger is connected to the battery. Typically this is the length of the "off shift" and a setting of 6-8 hrs would be adequate for this type of application

1 to 1.5 Shift Application

When Opportunity/Fast charging batteries in a 1 to 1.5 shift application, time is available to charge the battery fully (100%) each day and maintain safe battery temperature levels. In this type of application the No Gassing interval should be set at or above the value of the longest break, meal or shift change period other than the "off shift" where the charger is connected to the battery. Typically a setting of 2 to 6 hrs could be adequate for this type of application.

Multi AmpHour Programming Your EC2000 Control

The Multi AH Feature of the EC2000 Control allows the user to customize his Eclipse II Plus to fit his multi–battery application. Using this feature, the flexibility of the Eclipse II Plus can be used to charge batteries of different Amp Hour capacities and types without using Battery Identification Modules (BIDs) or different chargers with different plug types.

The control can be programmed to charge different voltage batteries with the AH rates and curve types that have been programmed for that battery voltage. When a battery is connected, the control automatically senses the battery voltage and sets the charge curve and charging rates to the level that has been programmed.

The Multi AH functions are programmed through a separate menu item on the control. Complete steps for programming a typical application are listed to the right.

Application
6 cell, 450AH Gel Type Maintenance Free
12 cell, 680AH Flooded
18 cell, 744AH Flooded
800EC3-18SP Eclipse II Plus

With the control programmed as shown to the right, the control will charge any 6 cell battery that is connected to the charger at the proper 450AH rates for a *Deka Dominator* Sealed Gel Battery. Any 12 cell battery connected to the charger will be charged at the proper 680AH rates for a standard flooded battery. Finally, any 18 cell battery connected to the charger will be charged at the proper 744AH rates for a standard flooded battery.

By enabling the Multi AH function, any 6,9,12,18,24, and/or 36 cell battery that is equal to or less than the charger rated voltage can be charged at a unique AH rate and with a unique charge curve. For example, 900PACH3-24P can be programmed to charge 6, 9,12,18 and 24 cell batteries with different AH rates and/or different charge curves.

Key Entry	Display
	Eclipse II Plus
Program Review	**Menu Tree 1 – 4**
3	**Multi AH Mode OFF**
Enter	**Multi AH Mode OFF**
▲	**Multi AH Mode ON**
Enter	**Multi AH Mode ON**
▼	**6 Cell Amphrs 0750**
Enter	**6 Cell Amphrs 0750**
0450	**6 Cell Amphrs 0450**
Enter	**6 Cell Amphrs 0450**
▼	**6 Cell Battype► FLD**
Enter	**6 Cell Battype► FLD**
4	**6 Cell Battype► DSG**
Enter	**6 Cell Battype► DSG**
▼	9 **Cell Amphrs 0750**
▼	9 **Cell Battype► FLD**
▼	12 **Cell Amphrs 0750**
Enter	12 **Cell Amphrs 0750**
0680	12 **Cell Amphrs 0**680
Enter	12 **Cell Amphrs 0**680
▼	12 **Cell Battype► FLD**
▼	18 **Cell Amphrs 0750**
Enter	18 **Cell Amphrs 0750**
0744	18 **Cell Amphrs 0**744
Enter	18 **Cell Amphrs 0**744
▼	18 **Cell Battype► FLD**
Program Review	**Menu Tree 1 – 4**
Program Review	**Eclipse II Plus**

Timer Start Mode Programming Your EC2000 Control

The Timer Start Mode Feature of the EC2000 Control allows the user the override the automatic start/stop features of the control and manually select the desired charge time. This can be useful for charging batteries in a maintenance shop, or for extended equalize charging of batteries with severely mismatched cells.

The Timer Start Mode can be programmed in the Program Menu at Start Mode (function #30). With the Timer Start Mode selected the charger will display CHG CYCLE TIME when a battery is connected. Charge times from 0 hours, 1 minute, to 23 hours, 59 minutes can be entered. Pressing the Enter key will start the charge. The charger will then charge the connected battery based on the any parameters that have been programmed into the control. For example, ***constant current charging*** can be achieved utilizing the custom curve programming in conjunction with the Timer Start Mode. Listed to the right is an example of programming an Eclipse II Plus to constant current charge a battery for 20 hours at a 5 amp/100AH rate.

Application
24-Cell 935AH Battery
1050EC3-24DP Eclipse II Plus

When programmed and connected as shown to the right, the charger will charge the battery at 48 amps for 20 hours before automatically shutting off.

It should be noted that any programming that is done to set up a special charge (such as Timer Start Mode, Custom Curve, etc.) must be reset to allow resumption of normal charging.

Key Entry	Display
	Eclipse II Plus
Program Review	Menu Tree 1 – 4
2	Present Time 12:34
30	Start Mode Auto
Enter	Start Mode Auto
▲▲▲▲	Start Mode Timer
Enter	Start Mode Timer
36	Fixed Amp Hrs. 1050
Enter	Fixed Amp Hrs. 1050
0935	Fixed Amp Hrs. 0935
Enter	Fixed Amp Hrs. 0935
38	Battery Type FLD
Enter	Battery Type FLD
1	Battery Type CTM.
Enter	Battery Type CTM.
▼▼	Finish Amps/100 4.5
Enter	Finish Amps/100 4.5
50	Finish Amps/100 5.0
Enter	Finish Amps/100 5.0
▼	Gassing V/C 2.40
Enter	Gassing V/C 2.40
00	Gassing V/C 2.00
Enter	Gassing V/C 2.00
▼	Lid V/C 2.70
Enter	Lid V/C 2.70
99	Lid V/C 2.99
Enter	Lid V/C 2.99
Program Review	Menu Tree 1 – 4
Program Review	Eclipse II Plus

On battery connection, the control will ask for the cycle charging time to be entered. Key in 20 hours and press the “enter” key.

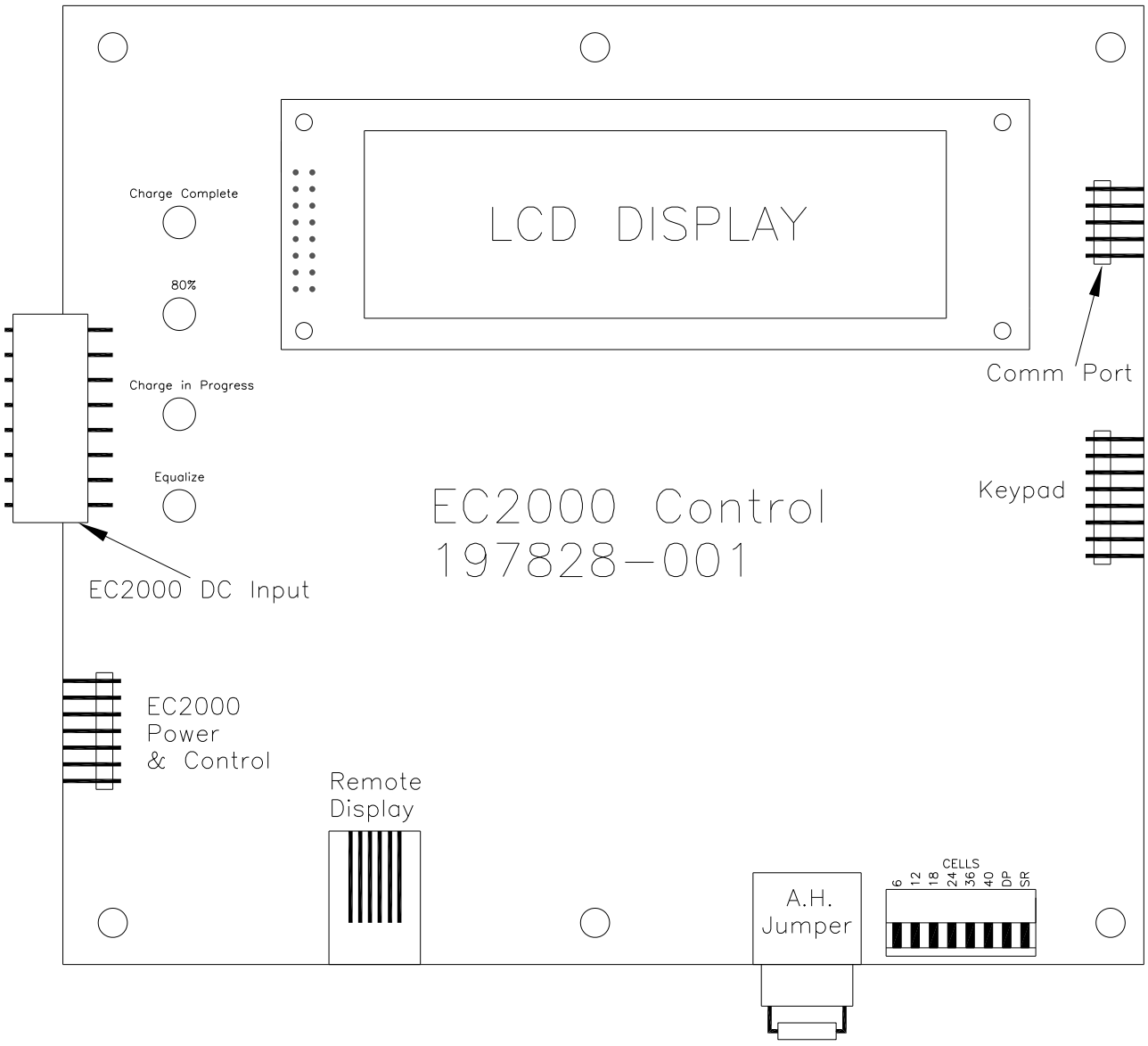
LCD DISPLAY
Charge Complete
80%
Charge in Progress
Equalize
Comm Port
Keypad
EC2000 Control
197828-001
EC2000 DC Input
EC2000
Power
& Control
Remote
Display
A.H.
Jumper
CELLS
6
12
18
24
36
40
DP
SR

Figure 8-1

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TROUBLESHOOTING

Troubleshooting Table

SYMPTOM	PROBABLE CAUSES	ACTION STEPS
No Display And No LED's	(1) No AC Voltage To Charger (2) Charger Input Fuses Are Blown (3) Bad Harness/Cable Connection (4) Bad Control Board (5) Bad Internal Charger Primary Board	1 2 3 4 5
No Keypad Response	(1) Keypad Not Connected (2) Keypad Connected Improperly (3) Bad Control Board (4) Bad Keypad	6 6 4 7
Bad LED Test	(1) Bad Control Board	4
Display Illegible/ Control Not Responding	(1) Electrically Noisy Environment (2) Low Input Voltage (3) Bad Control Board (4) Display Improperly Connected	8 9 4 10
Charger Doesn't Respond When A Battery Is Connected	(1) Output Fuse Is Bad (2) Bad Harness/Cable Connection (3) Bad Control Board (4) Output Cables Are Reversed (5) Bad Output Connector (6) Improper Battery Voltage Jumper Setting	11 3 4 12 13 14
Unit Smells Hot	(1) Inadequate Ventilation (2) Ambient Is Too Hot (3) Bad Harness/Cable Connection (4) Bad Control Board (5) Wrong Amp Hour Jumper (6) Charger Fans Not Operating (7) Bad Heat Sink Thermostat (8) Bad Internal Charger Power Board	15 16 3 4 17 18 19 5

SYMPTOM	PROBABLE CAUSES	ACTION STEPS
Battery Has Low S.G.s	(1) Reading Not Temperature Corrected	31
	(2) Bad Battery	32
	(3) Bad Equalize Schedule	33
	(4) Charge Curve Incorrect	25
	(5) Rates Set Incorrectly	26
	(6) Fixed Temperature Set Incorrectly	27
	(7) Too Cold	34
	(8) Bad BID	28
	(9) Not Enough Charging Time	30
Battery Doesn't Last Full Shift	(1) Faulty > Lift Interrupt	20
	(2) Manual Disconnect	21
	(3) A.H. Required > Battery Nameplate	22
	(4) Battery Not Providing Nameplate Rating	23
	(5) Equalize Schedule	24
	(6) Charge Curve Incorrect	25
	(7) Rates Set Incorrectly	26
	(8) Fixed Temperature Set Incorrectly	27
	(9) Bad BID	28
	(10) Charger Too Small For Battery	29
	(11) Not Enough Charging Time	30
Battery Water Usage Is Too High	(1) Rates Set Incorrectly	26
	(2) Fixed Temperature Set Incorrectly	27
	(3) Charge Curve Incorrect	25
	(4) Equalize Schedule	24
	(5) Control Set For Cell Forming	35
	(6) Control On Voltage/Time	36
	(7) Bad BID	28
Low Number Of A.H.s Returned To Battery	(1) Faulty Lift Interrupt	20
	(2) Battery Not Fully Discharged	38
	(3) Manual Disconnect	21
	(4) Rates Set Incorrectly	26
	(5) Fixed Temperature Set Incorrectly	27
	(6) Charge Curve Incorrect	25
	(7) Battery Not Providing Nameplate Rating	23
	(8) Bad Control Board	4
	(9) Bad BID	28
	(10) Charger Fans Not Operating	18

SYMPTOM	PROBABLE CAUSES	ACTION STEPS
Battery Temperature Too High	(1) Insufficient Cool Down Before And/Or After Charging	39
	(2) Battery Power Demand Too Great	40
	(3) Rates Set Incorrectly	26
	(4) Fixed Temperature Set Incorrectly	27
	(5) Charge Curve Incorrect	25
	(6) Equalize Schedule	24
	(7) Control Set For Voltage/Time	36
	(8) Control Set For Cell Forming	35
	(9) Bad BID	28
Incorrect Charge Rate	(1) Rates Set Incorrectly	26
	(2) Fixed Temperature Set Incorrectly	27
	(3) Charge Curve Incorrect	25
	(4) Battery A.H. Not Equal To Charger A.H.	26
	(5) Battery Has Incorrect Size BID	28
	(6) Bad Control Board	4
	(7) BID Not Programmed Properly	28
	(8) Inadequate Ventilation	15
	(9) Charger Fans Not Operating	18
Doesn't Shutdown When Battery Is Disconnected	(1) Control Set For Forming Cycles	35
	(2) Bad Control Board	4
	(3) Bad Internal Charger Primary Board	5
Erratic Operation	(1) Bad Control Board	4
	(2) Bad Harness/Connection - Loose or Incorrect	3
	(3) Bad Power Connection	41
	(4) Bad Output Cable Connector	13
	(5) Moisture Inside Cabinet	42
	(6) Lack of Maintenance	43
	(7) High Ambient Temperature	16
Meter Reading Wrong (V/C)	(1) Bad Output Connector	13
	(2) Bad Harness/Connection - Loose or Incorrect	3
	(3) Internal Power Connection	41
	(4) Bad Control Board	4

SYMPTOM	PROBABLE CAUSES	ACTION STEPS
Meter Reading Wrong (Amps)	(1) Bad Output Connector	13
	(2) Bad Harness/Connections – Loose Or Incorrect	3
	(3) Internal Power Connection	41
	(4) Bad Control Board	4
	(5) Shunt Calibration needed	44
High Input Current	(1) Bad Internal Charger Primary Board	5
	(2) AC Supply	1
	(3) Bad Control Board	4
	(4) Bad Harness/Connections – Loose Or Incorrect	3
Display reads - Curve Error Fault	(1) Bad Harness/Connections – Loose Or Incorrect	3
	(2) Bad Control Board	4
	(3) Bad Internal Charger Primary Board	5
	(4) Charge Curve	25
Display reads - Backup Timer Fault	(1) Fixed Temperature Set Incorrectly	27
	(2) BID A.H. > Charger A.H.	26
	(3) Bad Output Cable Connector	13
	(4) Incorrect Charge Curve Setting	25
	(5) Bad Battery	32
	(6) Bad BID	28
Display reads - Manual Stop Fault	(1) Someone Pressed Manual Stop Button	45
	(2) Bad Connection (Keypad-Control)	6
	(3) Bad Keypad	7
	(4) Bad Control Board	4
Display reads - Low Current Fault	(1) Fixed Temperature Set Incorrectly	27
	(2) Bad Harness/Connections – Loose Or Incorrect	3
	(3) Battery Not Fully Formed	46
	(4) Bad Battery	32
	(5) BID A.H. > Charger A.H.	26
	(6) Bad Internal Power Connection	41
	(7) AC Supply	1
	(8) Bad AC Fuse	2
	(9) Output Fuse Bad	11
	(10) Bad Control Board	4
	(11) Bad Internal Charger Primary Board	5
	(12) Bad Heat Sink Thermostat, if equipped	19

SYMPTOM	PROBABLE CAUSES	ACTION STEPS
Display Reads - Low Battery Fault	(1) Fixed Cell Setting Incorrect (2) Bad Harness/Connections – Loose Or Incorrect (3) Bad Battery (4) Bad Control Board (5) Bad Output Cables/Connector (6) BID Not Programmed Properly	47 3 32 4 13 28
Display Reads - High Battery Fault	(1) Fixed Cell Setting Incorrect (2) Bad Battery (3) Bad Control Board (4) BID Not Programmed Properly	47 32 4 28
Display Reads - Setup Error Fault	(1) Cell Size Setting Has Been Changed On Control Board (2) A.H. Resistor Has Been Changed On Control Board (3) Bad Keypad Connection (Keypad-Control) (4) Bad Keypad (5) Bad Control Board	48 49 6 7 4
Display Reads - Check AC Power	(1) Intermittent AC Fail (Supply) (2) Bad Harness/Connection – Loose Or Incorrect (3) Bad Control Board	1 3 4
Display Reads - Overtemperature Fault	(1) See “Unit smells hot” in this chapter	-
Display Reads - Phase Error Fault	(1) Bad Internal Charger Primary Board (2) AC Supply (3) Bad Control Board (4) Bad Harness/Connections – Loose Or Incorrect	5 1 4 3
Display Reads - DIDT Fault	(1) Bad Battery (2) Bad Control Board (3) Bad BID	32 4 28

SYMPTOM	PROBABLE CAUSES	ACTION STEPS
Display Reads - High Amp Hour Fault	(1) Bad Battery (2) Bad Control Board (3) Bad BID	32 4 28
Display Reads - Low Voltage Fault	(1) Bad Battery (2) Bad Control Board (3) Bad Internal Power Connection (4) Bad Harness/Connections - Loose or Incorrect	32 4 41 3
Unable to download Datalink records	(1) Bad Harness/Connections - Loose or Incorrect (2) Keypad connected improperly (3) Bad Keypad (4) PC Setup/Operating System	3 6 7 50

Action Steps

1. Reference the INSTALLATION chapter (pg. 4-1).

2. Disconnect AC power to the charger and replace the AC fuse. Reapply AC power to the charger. If the fuse (s) blows instantly, the primary PCB is probably bad. Contact the factory for replacement.

3. A bad wire harness connection can cause many different problems. Check the ribbon cable connections, make sure they are properly seated in their housings. Check the wire bundles and connectors, make sure they are connected well and crimped properly. Inspect all wiring crimp connected to the primary board. They should all be fully inserted and tight.

4. To check the board for proper operation, first check the S1 dip switch selections. They should match the charger maximum cell size, check the nameplate. Check DC voltages (+/- 5%) between J1-4 and the following: E34 = 4.85, E33 13.00, J1-1 = 5.00. If the charger still does not operate properly even though the above checks are correct, the control may need to be replaced.

5. The primary board is the large PCB that is on the lower left (both for dual engine units) side of the unit. It has several functions that include providing power to the control. Check that the 2 green LEDs are lit when AC power is applied. If they are not, remove power and check fuses FS1 and FS2. Contact the factory for any further details.

6. Open the charger door and check the keypad connection at J3 (right side of pcb). Make sure that the cable is not twisted and is fully engaged.

7. Once step 6 has been checked, with no battery connected to the charger, press any of the number keys. The display should display data represented by that key. If it does not, the keypad is bad.

8. Temporarily shut down any equipment on the same voltage supply line and see if the charger starts to respond normally. If the charger does, then check all grounds going to the equipment that is shut down. If the problems still exist, then return power to all the other equipment and call your local Ametek representative.

9. Measure the AC supply voltage coming into the charger to confirm that it matches the charger input voltage requirements. Also see Action #1.

10. On the left side of the display, a 16 pin header connector should be mated with a 16 position receptacle on the main control pcb. Check for full insertion and proper alignment.

11. Use an Ohmmeter and measure directly across the DC fuse. A good fuse will measure almost (0) Ohms and a bad one will measure a very high resistance, in the megohm range or greater. If for some reason a DC Fuse measures somewhere in between, replace the DC Fuse and send it in to your local Ametek representative.

12. Remove the charger side cover(s) to expose where the output cables connect to the charger. The black (Negative) output cable goes into the charger and connects to bus bar adjacent to the DC output fuse. The red (Positive) output cable goes into the charger and connects to the bus bar that is mounted to the top of the output transformer.

13. Make sure the output connector does not have any cracks on its casing that could result in a short. Make sure the output cable lugs are making a good connection with the battery connector. You will see traces of pitting on the lug surface from arcing if there isn't a good connection. This could be the result of a weak retainer clip in the connector or lugs that were soldered on incorrectly. If the lugs had too much heat applied to them when the cables were soldered on, the solder will wick up the cable and make it very stiff. When they are inserted into the connector, the stiff cable forces the retainer clip down and creates poor connection between the battery connector and the charger connector.

14. For 6 through 24 cell chargers, a jumper loop should be between pins 3 and 4 at the J8 connector on the left side of the control. For 36 and 40 cell units, the jumper should be from J8-2 to J8-4.

15. Refer to the INSTALLATION chapter and go to the paragraph labeled "LOCATION". This will define the guide lines. If a charger has inadequate ventilation, many different problems can occur. If a charger runs under extreme temperatures, any component inside the charger could fail prematurely.

16. An extremely high ambient temperature can cause many different problems. If a charger runs under extreme Temperatures, any component inside the charger could fail prematurely.

17. If the AH jumper is incorrect for the charger, it will cause the unit to charge at rates either higher or lower than Nameplate rating.

18. Visually inspect the fans located directly below the heat sink for damage or excessive debris buildup. Clean if required. Check the fan power wiring on the primary pcb. The connector is on the upper left side of the board and is labeled J4. The 2 fan wiring connections are labeled J4-1 and J4-2.

19. Remove power from the charger, and then open the charger door. Let the unit cool to room temperature. Find J5 connector on the center top side of the primary pcb. Using test probes, connect to positions 1 and 2. Using an ohmmeter, check the resistance across the terminals, it should be approximately 10,000 ohms @ 77ºF. Remove the test leads and repeat for positions 3 and 4.

20. A faulty lift interrupt on a lift truck can cause the battery to be or under charged. Check the interrupt voltage of the interrupt following the procedures found in your truck and/or lift interrupt operator's manual(s).

21. When it is necessary to stop the charge cycle before charge complete, always terminate the charge cycle by pressing the STOP key before disconnecting the battery from the charger.

22. If the application requires a larger AH battery than is presently in use, the only long term solution is to replace the battery with one of the proper AH rating.

23. Take Specific Gravity readings and measure Cell Voltages. If acid has been spilled or the battery has been extremely heated, it is possible that a battery's capacity could be greatly reduced, and the acid is not capable of increasing to the battery nameplate rating.

24. The proper equalize schedule is one that is tailored to the specific battery and charger operation. The EC2000 Auto Equalize feature can be used to automate the equalize schedule.

25. Using the Review feature of the control (See the Control Features chapter), check the charge curve setting of the charger. If it does not match the Battery Type (Standard, Sealed, Custom, Etc.), reprogram the control to the proper curve. (Refer to the Programming Your EC2000 Control chapter of this manual).

26. Using the Review feature of the control (See the Control Features chapter of this manual), check the Fixed AH setting of the charger. If it does not match the battery nameplate rating of the battery (it should be within 20% of the battery nameplate rating), reprogram the control to the proper Fixed AH rating (Refer to the Programming Your EC2000 Control chapter of this manual). If this is not possible due to the maximum rating of the charger, a larger charger should be used.

27. Refer to Program chapter. Go to function number 37 and confirm that the control is set for the correct Fixed Temperature Setting. If not, enter the correct setting.

28. The BID module communicates battery temperature, cell size, ampere hour, BID no., and type to the charger. A non-functioning or incorrectly programmed BID can cause charging and/or battery problems. Using the EC2000 Review Features (See the EC2000 Review Features in this manual), check the review items listed above. Replace a non-functioning or incorrectly programmed module with a new one.

29. Using the Review feature of the control (See the Control Features chapter of this manual), check the Fixed AH setting of the charger. If it does not match the battery nameplate rating of the battery (it should be within 20% of the battery nameplate rating), reprogram the control to the proper Fixed AH rating (Refer to the Programming Your EC2000 Control chapter of this manual). If this is not possible due to the maximum rating of the charger, a larger charger should be used.

30. Not enough charging time - In cases where opportunity charging is taking place, more time charging may be needed to keep the battery within its proper operating range. Be sure that the battery is charged per the users operations guide-lines. Those procedures may need to be adjusted to allow for more charging time or less battery load.

31. Specific Gravity readings vary with the temperature of the electrolyte. To temperature correct the Specific Gravity readings to match the nameplate ratings of the battery, use the following rule of thumb: +1 S.G. point per 3ºF that the electrolyte temperature exceeds 77ºF.

32. Take Specific Gravity readings and measure Cell Voltages. If acid has been spilled or the battery has been extremely heated, it is possible that a battery's capacity could be greatly reduced, and the acid is not capable of increasing to the battery nameplate rating.

33. The proper equalize schedule is one that is tailored to the specific battery and charger operation. The EC2000 Auto Equalize feature can be used to automate the equalize schedule. (See the EC2000 Features chapter of this manual.)

34. If battery electrolyte temperatures are well below 32ºF, the Eclipse will not be able to adequately charge the battery. Battery insulation or heaters would be required to keep the battery electrolyte temperatures close to 32ºF.

35. If the control is set to perform forming cycles, DV/DT termination is disabled, and the low current shutdown is disabled. To return to normal operation, program the control to “00” Forming Cycles (See the Programming section of your EC2000 Control chapter of this manual.

36. Program the control to DV/DT charge termination (See the Programming Your EC2000 Control chapter of this manual).

37. A faulty lift interrupt on a lift truck can cause the battery to be over or under charged. Check the interrupt voltage of the interrupt following the procedures found in your truck and/or lift interrupt operator’s manual (s).

38. If fully discharged batteries are desired for efficient operations, lift interrupts can be installed on the trucks to allow the operators to recognize a fully discharged battery.

39. In opportunity charging applications, higher than normal battery temperatures should be expected. In cases where the temperature is exceeding a reasonable value, utilize the battery cooling feature of the EC2000 Control or adjust the the battery use versus charging schedule to allow for lighter loads on the battery. In a standard charging mode, a cool down can be programmed into the EC2000 Control to add a specific cool down time between charge termination and the signaling of charge complete (See the Programming Your EC2000 Control chapter of this manual). A delayed start can be programmed into the EC2000 Control to add a specified delay time between battery connection and the start on the charge (See the Programming Your EC2000 Control chapter of this manual).

40. Battery is being discharged at too high (fast) of a rate. Consult the battery manufacturer or distributor for applications assistance.

41. Do a continuity or resistance test. Check for connection points that visually appear to have been exposed to extreme heat. Any connections that appear loose or overheated must be re-lugged and rechecked.

42. Disconnect the charger from the battery and the input AC. Blow out the charger with compressed air, and allow the unit to set unused for 1 to 2 weeks in a warm dry environment (as hot, up to 104ºF) and dry as possible.

43. Refer to the MAINTENANCE chapter in the manual. Electrical parts tend to attract dust and dirt after a long period of time, which can cause parts to fail prematurely.

44. Connect a 50% to 100% discharged battery to the charger. Within 3 minutes of when charging begins, press and hold the “program” key for 5 seconds, then release it. The lower line of the display should change to “shunt calibration”. Using the up and down arrow keys, adjust the charger output current shown on the EC2000 display to match a DC current clamp or calibrated test shunt. Press the “program” key again when the process is complete.

45. When it is necessary to stop the charge cycle before charge complete, always terminate the charge cycle by pressing STOP key before disconnecting the battery from the charger.

46. Program the forming cycles feature of the EC2000 Control to the number of cycles required to properly form the battery. (See the Programming Your EC2000 chapter of this manual).

47. Program the EC2000 Control to Multi-cell mode “ON” or program the Fixed Cell setting to the proper cell size for your battery. (See the Programming Your EC2000 chapter of this manual).

48. Set the Control PCB cell size dip switches to match the charger nameplate cell size and cycle AC power. Reset by pressing both arrow keys simultaneously until the display resets.

49. Replace the ampere hour jumper with one that matches the nameplate AH rating of the charger and cycle AC power. See the parts list included in this manual. Reset by pressing both arrow keys simultaneously until the display resets.

50. Contact Factory for assistance.

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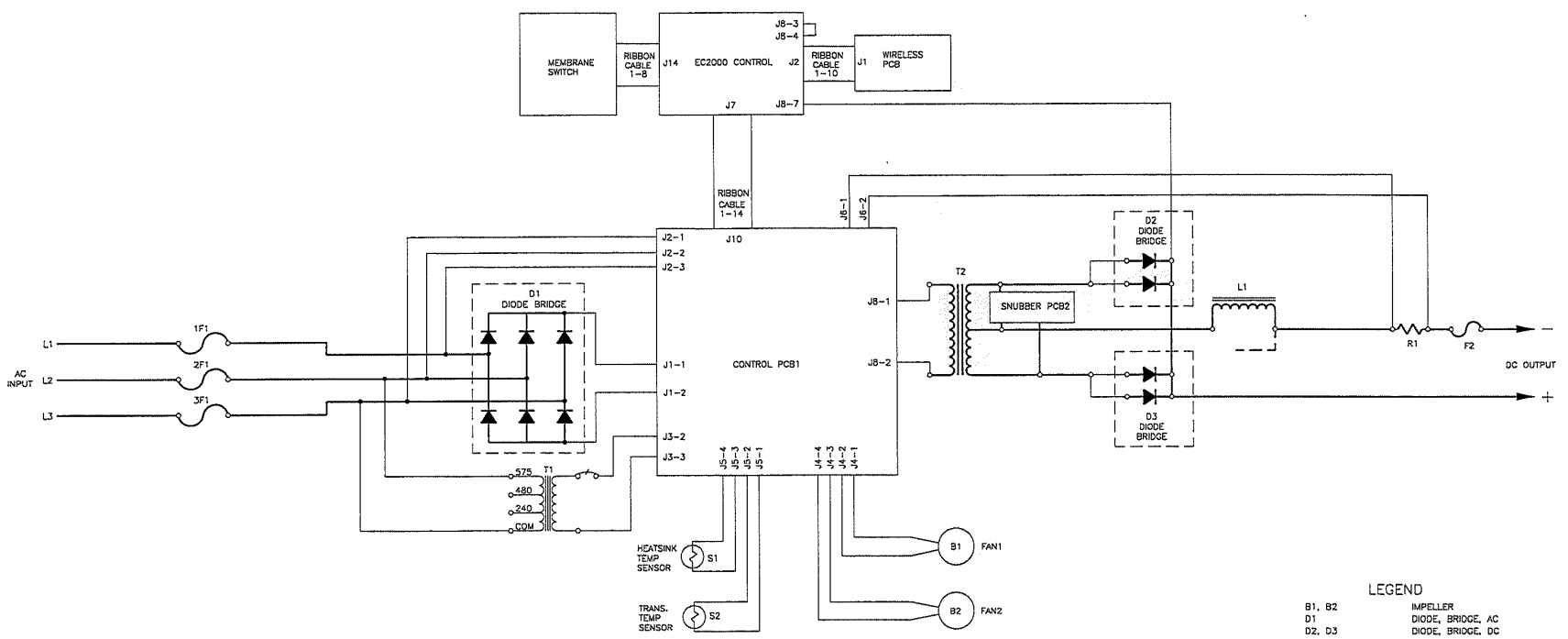
TYPE	DIAGRAM	OUTLINE
1 PAK	198533	198536
2 PAK	198554	
2 PAK W/DUAL CABLES	198555	
2 CIRCUIT	198504	



LEGEND

B1, B2	IMPELLER
D1	DIODE, BRIDGE, AC
D2, D3	DIODE, BRIDGE, DC
1F1, 2F1, 3F1	FUSE, INPUT AC
F2	FUSE, OUTPUT DC
J1, J2, J3, J4, J5 J6, J8, J10	CONNECTOR, ENGINE & CONTROL PC BOARDS
L1	INDUCTOR, OUTPUT
PCB1, PCB2	CONTROL AND SNUBBER PC BOARDS
R1	SHUNT, METER
R2	CONNECTOR, AMP HOUR
S1, S2	THERMOSTAT
T1	TRANSFORMER, CONTROL
T2	TRANSFORMER

CHANGE RECORD	
E.C. No.	DATE
A) NEW	10-5-11

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES [MILLIMETERS]
TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS.

PLOT DATE: 10-13-11
FILE NAME: 198533S1
ANGLES ± 3°
DECIMAL-INCH: .00 ± .03, .000 ± .010
METRIC: 0. ± 1.0mm, 0.0 ± 0.4mm, 0.00 ± 0.1mm
DO NOT SCALE DRAWING

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FINISH CODE PER 193814: NONE

ACTIVITY	REPLACES BY	REPLACES

TITLE: DIAGRAM, SCHEMATIC & CONNECTION
DESCRIPTIVE DATA: HIGH FREQUENCY CHARGER

DESIGNED	DRAWN	DATE	SCALE
MLB	BAM	10-4-11	NONE
CHECKED	APPROVED	RELEASED	SHEET
JMM		10-5-11	1 OF 2

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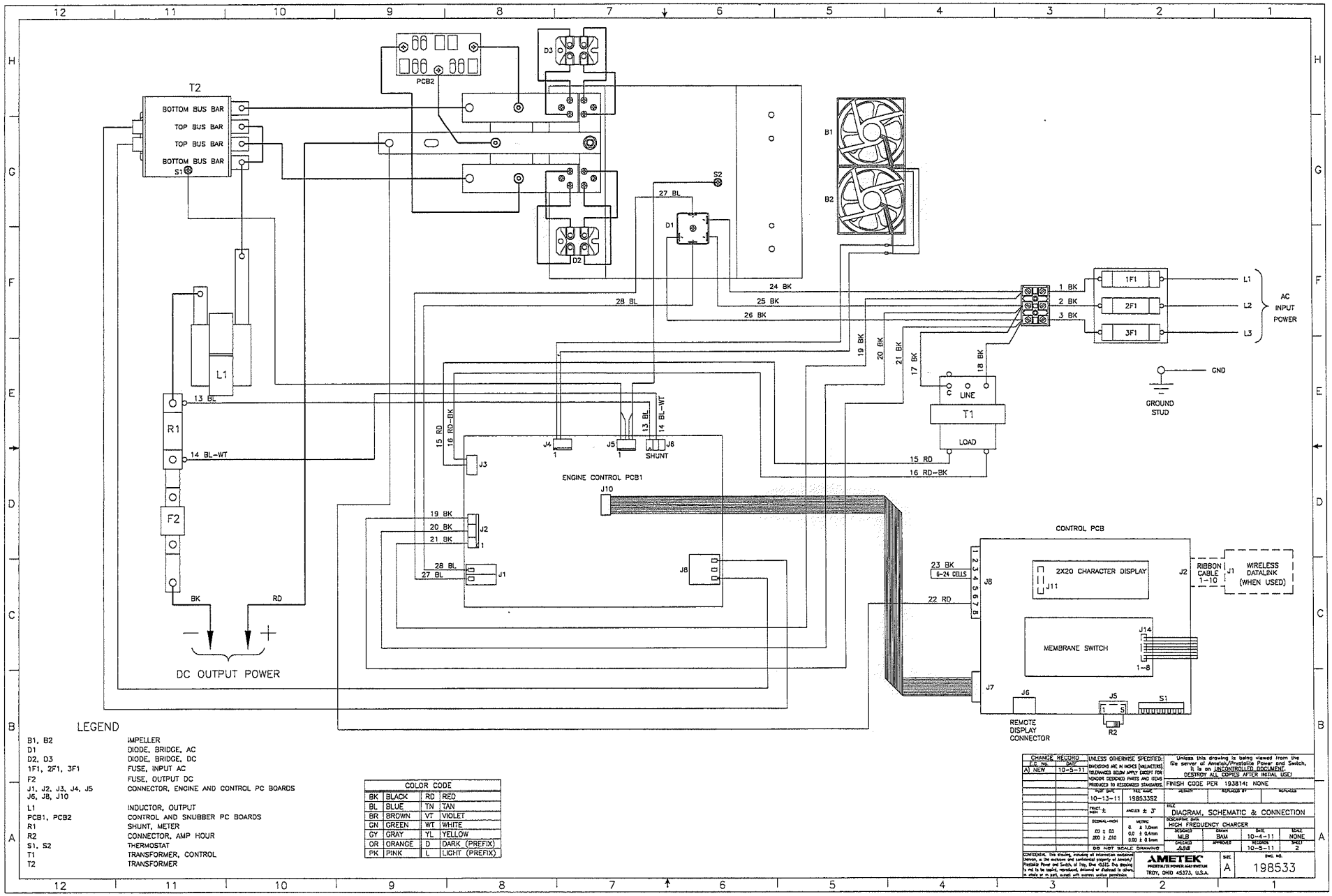
AMETEK PRESTOLITE POWER AND SWITCH
TROY, OHIO 45373, U.S.A.

SIZE: A
DWG NO.: 198533



LEGEND

B1, B2	IMPELLER
D1	DIODE, BRIDGE, AC
D2, D3	DIODE, BRIDGE, DC
1F1, 2F1, 3F1	FUSE, INPUT AC
F2	FUSE, OUTPUT DC
J1, J2, J3, J4, J5 J6, J8, J10	CONNECTOR, ENGINE AND CONTROL PC BOARDS
L1	INDUCTOR, OUTPUT
PCB1, PCB2	CONTROL AND SNUBBER PC BOARDS
R1	SHUNT, METER
R2	CONNECTOR, AMP HOUR
S1, S2	THERMOSTAT
T1	TRANSFORMER, CONTROL
T2	TRANSFORMER

COLOR CODE			
BK	BLACK	RD	RED
BL	BLUE	TN	TAN
BR	BROWN	VT	VIOLET
GN	GREEN	WT	WHITE
GY	GRAY	YL	YELLOW
OR	ORANGE	D	DARK (PREFIX)
PK	PINK	L	LIGHT (PREFIX)

CHANGE RECORD		
EC No.	DATE	
A) NEW	10-5-11	

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [MILLIMETERS]. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS.

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FINISH CODE PER 193814: NONE

DRAWN		REVISED BY	RELEASED
10-13-11	198533S2		

TITLE: DIAGRAM, SCHEMATIC & CONNECTION

DESCRIPTION: HIGH FREQUENCY CHARGER

DESIGNED	DRAWN	DATE	SCALE
MLB	BAM	10-4-11	NONE
CHECKED	APPROVED	RELEASED	SHEET
AJW		10-5-11	2

DO NOT SCALE DRAWING

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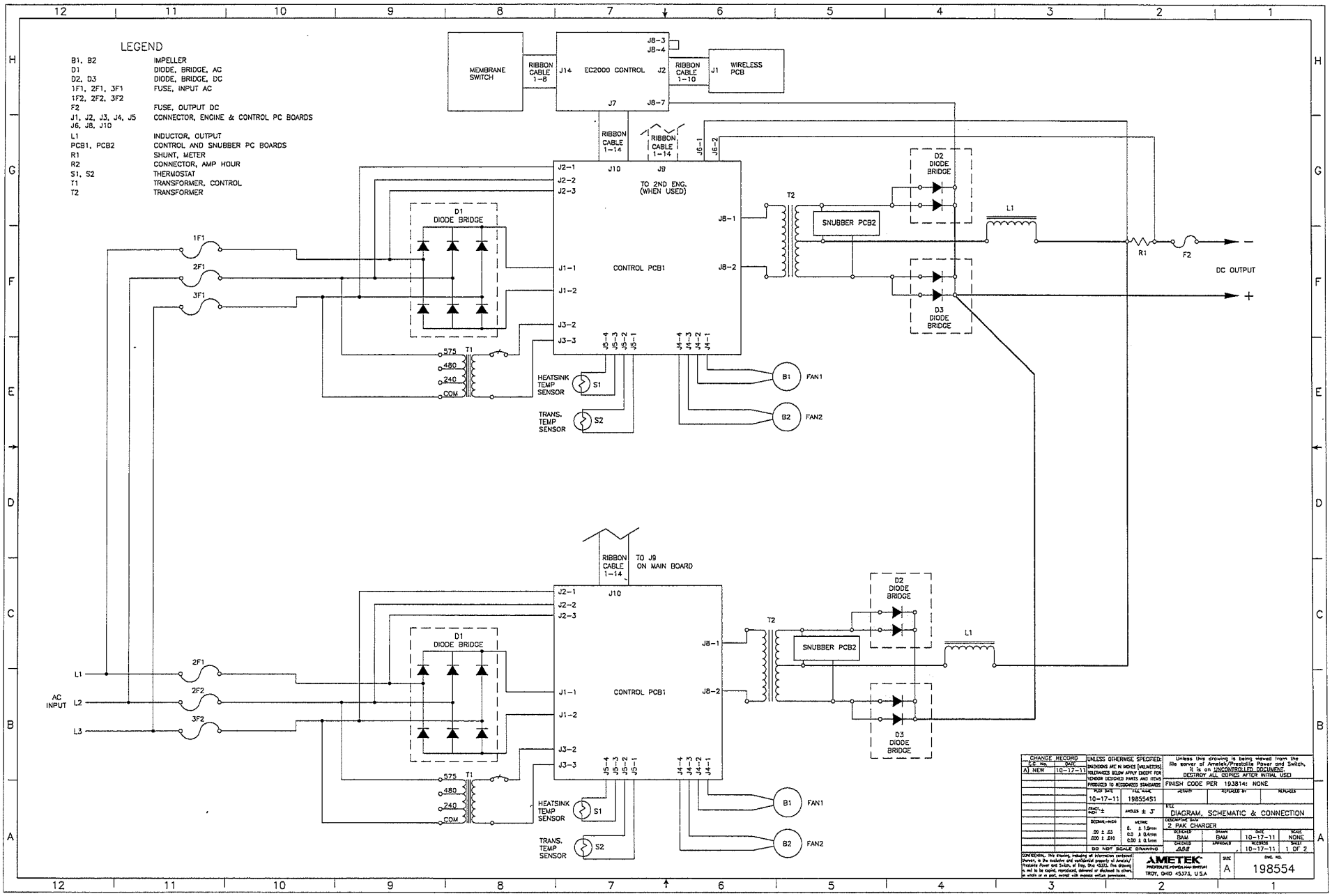
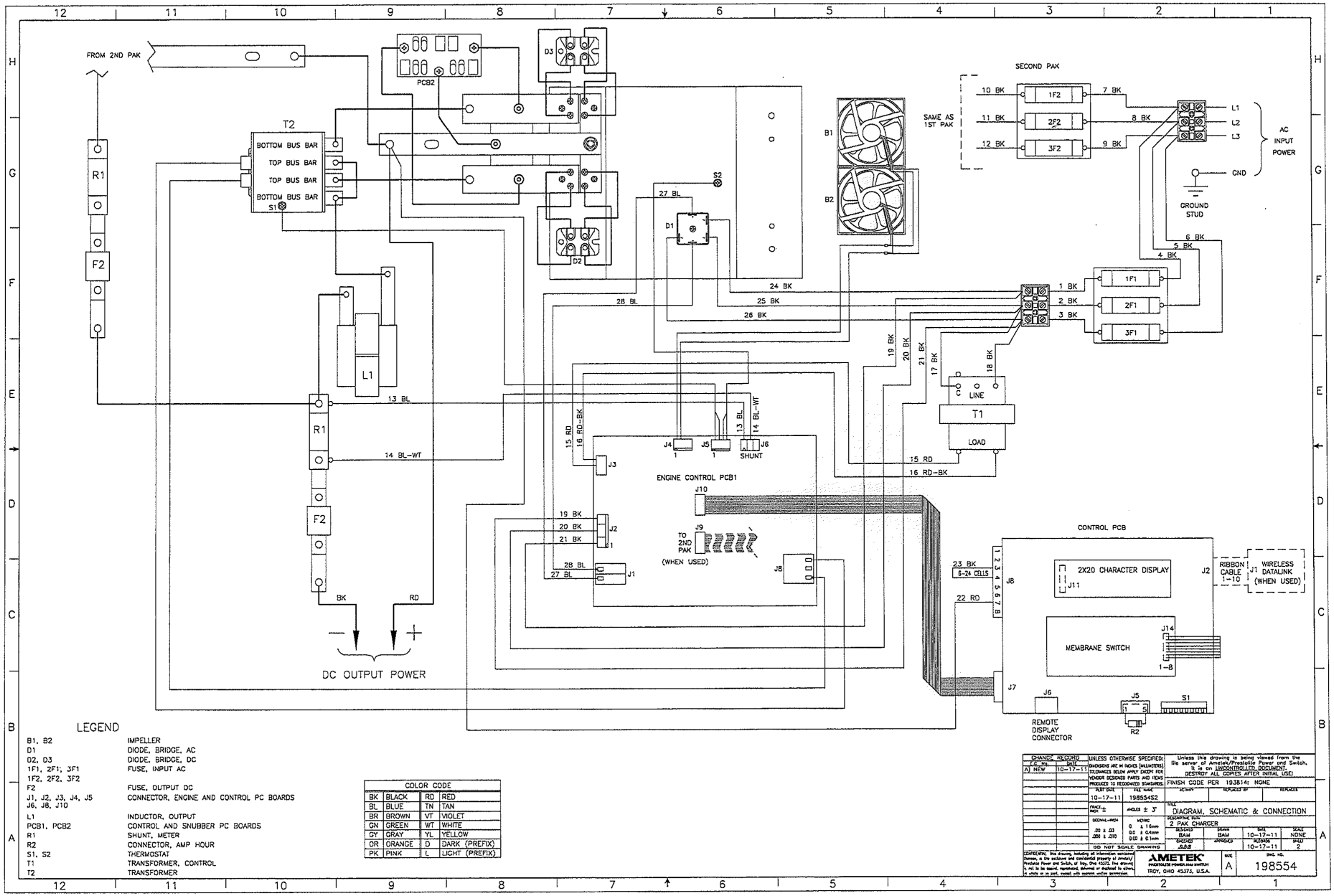
AMETEK
PRESTOLITE POWER AND SWITCH
TROY, OHIO 45373, U.S.A.

SIZE: A

DWG. NO. 198533


LEGEND
B1, B2 IMPELLER
D1 DIODE, BRIDGE, AC
D2, D3 DIODE, BRIDGE, DC
1F1, 2F1, 3F1 FUSE, INPUT AC
1F2, 2F2, 3F2
F2 FUSE, OUTPUT DC
J1, J2, J3, J4, J5 CONNECTOR, ENGINE & CONTROL PC BOARDS
J6, J8, J10
L1 INDUCTOR, OUTPUT
PCB1, PCB2 CONTROL AND SNUBBER PC BOARDS
R1 SHUNT, METER
R2 CONNECTOR, AMP HOUR
S1, S2 THERMOSTAT
T1 TRANSFORMER, CONTROL
T2 TRANSFORMER
MEMBRANE SWITCH
RIBBON CABLE 1-8
J14 EC2000 CONTROL
J2
RIBBON CABLE 1-10
J1 WIRELESS PCB
J8-3
J8-4
J7
J8-7
RIBBON CABLE 1-14
RIBBON CABLE 1-14
J6-1
J6-2
J10
J9
TO 2ND ENG. (WHEN USED)
J2-1
J2-2
J2-3
J8-1
J8-2
J1-1
J1-2
J3-2
J3-3
CONTROL PCB1
D1 DIODE BRIDGE
D2 DIODE BRIDGE
D3 DIODE BRIDGE
T2
SNUBBER PCB2
L1
R1
F2
DC OUTPUT
1F1
2F1
3F1
T1
575
480
240
COM
HEATSINK TEMP SENSOR
S1
TRANS. TEMP SENSOR
S2
J5-4
J5-3
J5-2
J5-1
J4-4
J4-3
J4-2
J4-1
B1
FAN1
B2
FAN2
RIBBON CABLE 1-14
TO J9 ON MAIN BOARD
AC INPUT
L1
L2
L3
2F1
2F2
3F2
2 PAK CHARGER
DIAGRAM, SCHEMATIC & CONNECTION
198554
A
1 OF 2
AMETEK
PRESTOLITE POWER AND SWITCH
TROY, OHIO 45373, U.S.A.



LEGEND

B1, B2	IMPELLER
D1	DIODE, BRIDGE, AC
D2, D3	DIODE, BRIDGE, DC
1F1, 2F1, 3F1	FUSE, INPUT AC
1F2, 2F2, 3F2	
F2	FUSE, OUTPUT DC
J1, J2, J3, J4, J5 J6, J8, J10	CONNECTOR, ENGINE AND CONTROL PC BOARDS
L1	INDUCTOR, OUTPUT
PCB1, PCB2	CONTROL AND SNUBBER PC BOARDS
R1	SHUNT, METER
R2	CONNECTOR, AMP HOUR
S1, S2	THERMOSTAT
T1	TRANSFORMER, CONTROL
T2	TRANSFORMER

COLOR CODE			
BK	BLACK	RD	RED
BL	BLUE	TN	TAN
BR	BROWN	VT	VIOLET
GN	GREEN	WT	WHITE
GY	GRAY	YL	YELLOW
OR	ORANGE	D	DARK (PREFIX)
PK	PINK	L	LIGHT (PREFIX)

CHANGE RECORD		UNLESS OTHERWISE SPECIFIED:	Unless this drawing is being viewed from the file server of Ametek/Prestolite Power and Switch, it is an UNCONTROLLED DOCUMENT. DESTROY ALL COPIES AFTER INITIAL USE.
F.C. NO.	DATE	DIMENSIONS ARE IN INCHES [MILLIMETERS]	
A) NEW	10-17-11	TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PURCHASED TO RECOGNIZED STANDARDS.	FINISH CODE PER 193814: NONE

PLOT DATE	FILE NAME	ACTIVITY	REPLACED BY	REPLACES
10-17-11	19853452			

FRACT. ± 1/64 | ANGLES ± 3°

DECIMAL-INCH: .00 ± .03; .000 ± .010

METRIC: 0 ± 1.0mm; 0.0 ± 0.4mm; 0.00 ± 0.1mm

DO NOT SCALE DRAWING

TITLE: DIAGRAM, SCHEMATIC & CONNECTION

DESCRIPTION: 2 PAK CHARGER

DESIGNED	DRAWN	DATE	SCALE
BAM	BAM	10-17-11	NONE
CHECKED	APPROVED	RELEASED	SHEET
JAB		10-17-11	2

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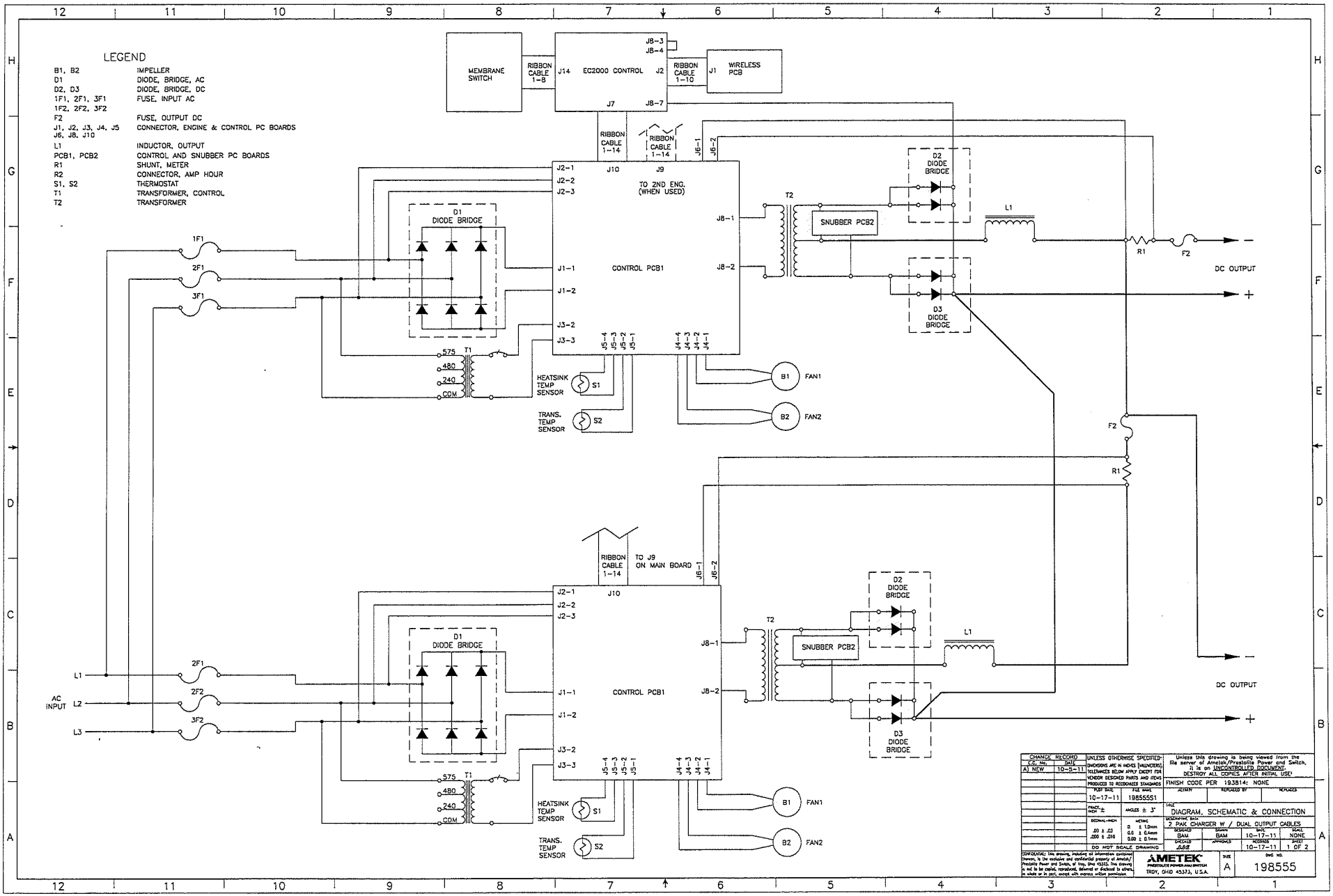
AMETEK PRESTOLITE POWER AND SWITCH
TROY, OHIO 45373, U.S.A.

SIZE: A | DWG. NO.: 198554


LEGEND
B1, B2 IMPELLER
D1 DIODE, BRIDGE, AC
D2, D3 DIODE, BRIDGE, DC
1F1, 2F1, 3F1 FUSE, INPUT AC
1F2, 2F2, 3F2
F2 FUSE, OUTPUT DC
J1, J2, J3, J4, J5 J6, J8, J10 CONNECTOR, ENGINE & CONTROL PC BOARDS
L1 INDUCTOR, OUTPUT
PCB1, PCB2 CONTROL AND SNUBBER PC BOARDS
R1 SHUNT, METER
R2 CONNECTOR, AMP HOUR
S1, S2 THERMOSTAT
T1 TRANSFORMER, CONTROL
T2 TRANSFORMER
MEMBRANE SWITCH
RIBBON CABLE 1-8
J14
EC2000 CONTROL
J2
RIBBON CABLE 1-10
J1
WIRELESS PCB
J8-3
J8-4
J8-7
J7
RIBBON CABLE 1-14
RIBBON CABLE 1-14
J6-1
J6-2
J10
J9
J2-1
J2-2
J2-3
TO 2ND ENG. (WHEN USED)
D1 DIODE BRIDGE
CONTROL PCB1
J1-1
J1-2
J3-2
J3-3
J8-1
J8-2
T2
SNUBBER PCB2
D2 DIODE BRIDGE
D3 DIODE BRIDGE
L1
R1
F2
DC OUTPUT
+
-
1F1
2F1
3F1
575
480
240
COM
T1
J5-4
J5-3
J5-2
J5-1
J4-4
J4-3
J4-2
J4-1
HEATSINK TEMP SENSOR
S1
TRANS. TEMP SENSOR
S2
B1
FAN1
B2
FAN2
AC INPUT
L1
L2
L3
2F1
2F2
3F2
RIBBON CABLE 1-14
TO J9 ON MAIN BOARD
J6-1
J6-2
J10
J2-1
J2-2
J2-3
D1 DIODE BRIDGE
CONTROL PCB1
J1-1
J1-2
J3-2
J3-3
J8-1
J8-2
T2
SNUBBER PCB2
D2 DIODE BRIDGE
D3 DIODE BRIDGE
L1
F2
R1
DC OUTPUT
+
-
575
480
240
COM
T1
J5-4
J5-3
J5-2
J5-1
J4-4
J4-3
J4-2
J4-1
HEATSINK TEMP SENSOR
S1
TRANS. TEMP SENSOR
S2
B1
FAN1
B2
FAN2
CHANGE RECORD
E.C. No. DATE
A) NEW 10-5-11
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES [MILLIMETERS]
TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS
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FINISH CODE PER 193814: NONE
PLOT DATE 10-17-11
FILE NAME 19855551
ADMIN
RELEASED BY
REPLACES
FRACT ± INCH
ANGLES ± 3°
TITLE DIAGRAM, SCHEMATIC & CONNECTION
DECIMAL-INCH .00 ± .03 .000 ± .010
METRIC 0. ± 1.0mm 0.0 ± 0.4mm 0.00 ± 0.1mm
DESCRIPTIVE TEXT 2 PAK CHARGER W / DUAL OUTPUT CABLES
DESIGNED BAM
DRAWN BAM
DATE 10-17-11
SCALE NONE
CHECKED AAS
APPROVED
RELEASED 10-17-11
SHEET 1 OF 2
DO NOT SCALE DRAWING
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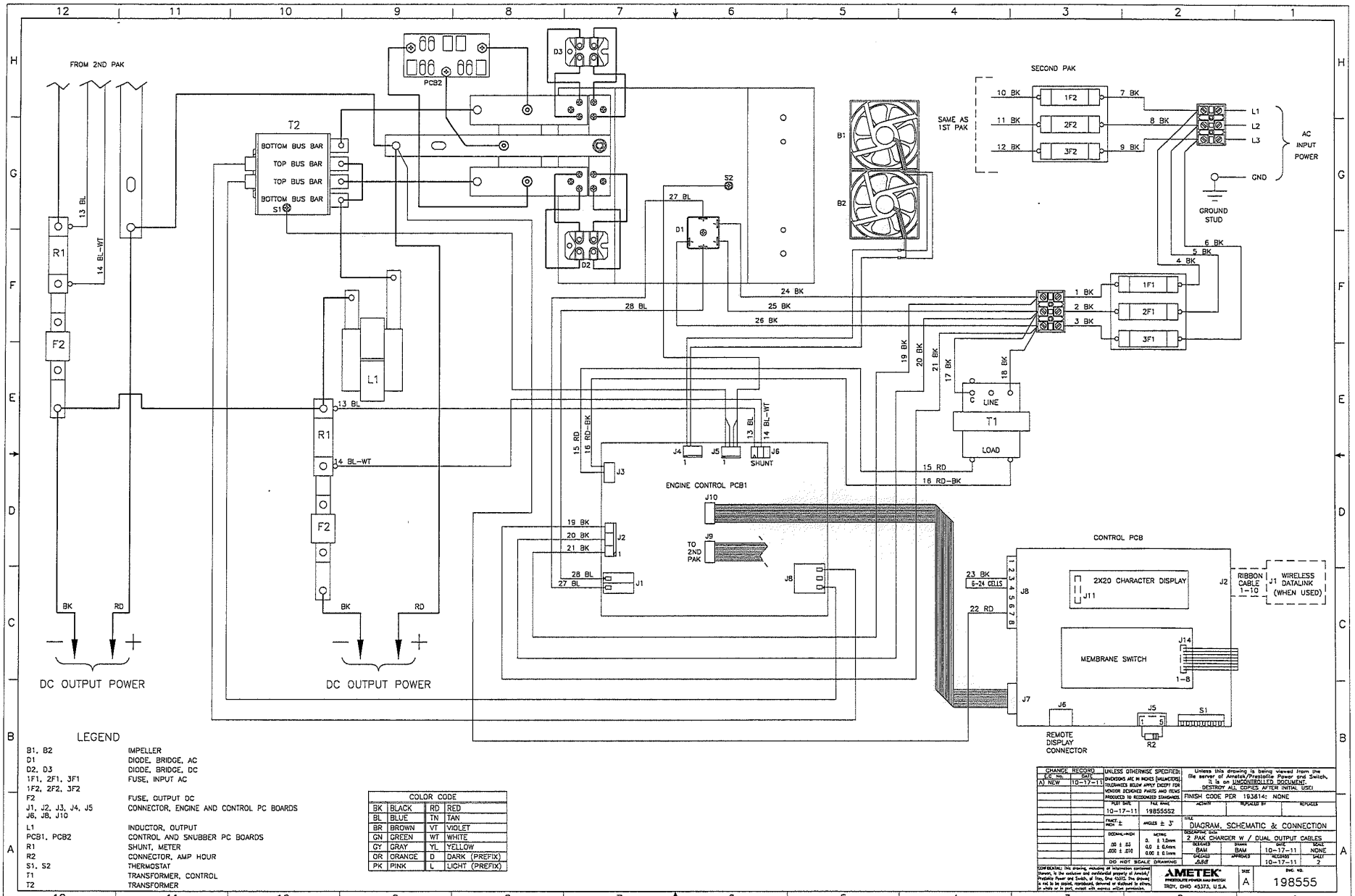
AMETEK PRESTOLITE POWER AND SWITCH TROY, OHIO 45373, U.S.A.
SIZE A
DWG NO. 198555



LEGEND

B1, B2	IMPELLER
D1	DIODE, BRIDGE, AC
D2, D3	DIODE, BRIDGE, DC
1F1, 2F1, 3F1	FUSE, INPUT AC
1F2, 2F2, 3F2	
F2	FUSE, OUTPUT DC
J1, J2, J3, J4, J5 J6, J8, J10	CONNECTOR, ENGINE AND CONTROL PC BOARDS
L1	INDUCTOR, OUTPUT
PCB1, PCB2	CONTROL AND SNUBBER PC BOARDS
R1	SHUNT, METER
R2	CONNECTOR, AMP HOUR
S1, S2	THERMOSTAT
T1	TRANSFORMER, CONTROL
T2	TRANSFORMER

COLOR CODE			
BK	BLACK	RD	RED
BL	BLUE	TN	TAN
BR	BROWN	VT	VIOLET
GN	GREEN	WT	WHITE
GY	GRAY	YL	YELLOW
OR	ORANGE	D	DARK (PREFIX)
PK	PINK	L	LIGHT (PREFIX)

CHANGE RECORD		
E.C. No.	DATE	
A) NEW	10-17-11	

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES [MILLIMETERS]
TOLERANCES BELOW APPLY EXCEPT FOR MINOR SCORED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS.

PLOT DATE	FILE NAME
10-17-11	19855552

FRACT ± 1/64 | ANGLES ± 3°

DECIMAL-INCH	METRIC
.05 ± .03	0. ± 1.0mm
.000 ± .010	0.0 ± 0.4mm
	0.00 ± 0.1mm

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FINISH CODE PER 193814: NONE

ACTIVITY	RELEASED BY	RELEASED

TITLE: DIAGRAM, SCHEMATIC & CONNECTION
DESCRIPTION: 2 PAK CHARGER W / DUAL OUTPUT CABLES

DESIGNED	DRAWN	DATE	SCALE
BAM	BAM	10-17-11	NONE
CHECKED	APPROVED	RELEASED	SHEET
JSB		10-17-11	2

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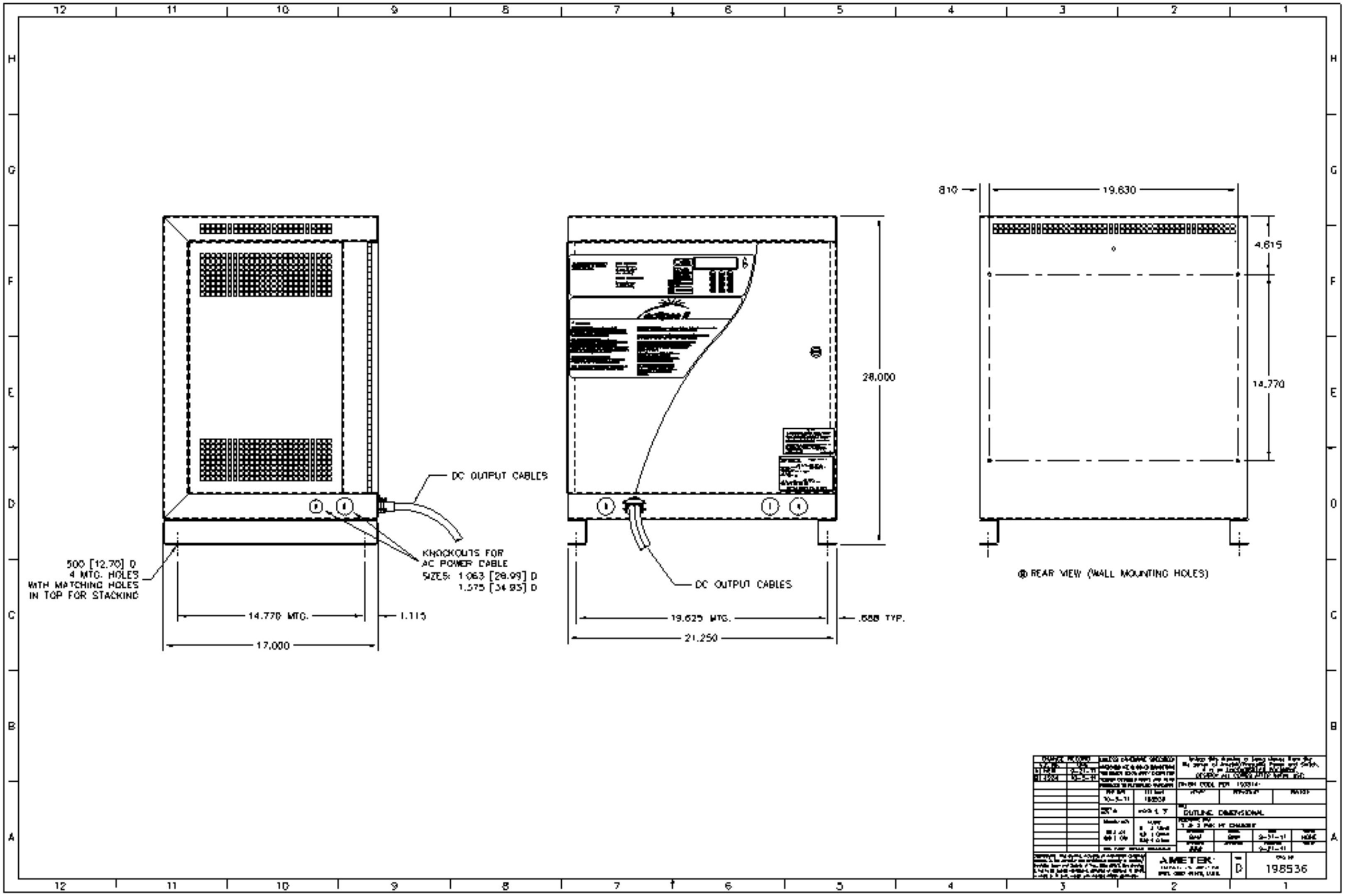
AMETEK
PRESTOLITE POWER AND SWITCH
TROY, OHIO 45373, U.S.A.

SIZE A

DWG. NO. 198555


DC OUTPUT CABLES
KNOCKOUTS FOR
AC POWER CABLE
SIZES: 1.063 [26.99] D
1.375 [34.93] D
.500 [12.70] D
4 MTG. HOLES
WITH MATCHING HOLES
IN TOP FOR STACKING
14.770 MTG.
1.115
17.000
28.000
DC OUTPUT CABLES
19.625 MTG.
.688 TYP.
21.250
.810
19.630
4.615
14.770
REAR VIEW (WALL MOUNTING HOLES)
OUTLINE, DIMENSIONAL
AMETEK
D
198536

AMETEK®
PRESTOLITE POWER

WARRANTY

AMETEK/PRESTOLITE POWER - INDUSTRIAL BATTERY CHARGERS
"ECLIPSE II", "ECLIPSE II PLUS", ECLIPSE II SLIMLINE,
ECLIPSE II-2 CIRCUIT, and All ECLIPSE II Series-HE (CEC) units
(Units sold 04/01/20 and after)

Ametek/Prestolite Power (hereinafter called "Prestolite") warrants that each new and unused Industrial Battery Charger manufactured and supplied by it is of good workmanship and is free from any inherent mechanical defects, provided that (1) the product is installed and operated in accordance with generally accepted industrial standards and in accordance with the printed instructions of Prestolite outlined in the product Owner's Manual, (2) the product is used under normal conditions for which designed, (3) the product is not subjected to misuse, negligence or accident, and (4) the product receives proper care, protection and maintenance under supervision of competent personnel. This warranty is subject to the following provisions:

AC SUPPLY INPUT CONDITIONS:

- Supply voltage should not exceed +/-10% of rated input voltage value.
- Consistent power should be provided with fluctuations not to exceed 1200VAC (850Vrms) for a duration longer than 25 microseconds.
- Primary Power provided by generator voids all warranty. Generator backup power, warranty coverage will be evaluated on a case-by-case basis.

1. **PRODUCT AND PARTS WARRANTED.** Subject to the exceptions listed below each Industrial Battery Charger is warranted for a specific period of time commencing from the date of its shipment by Prestolite, provided the charger is used in accordance with Prestolite's published performance rating for the unit involved. The exceptions to this warranty are as follows:

   a) Terms and conditions for warranty coverage:

FULL COVERAGE – LABOR & TRAVEL HOURS, MILEAGE & PART REPLACEMENT	5-years

   b) Prestolite reserves the right to review hours claimed for reasonableness. Travel time shall be based on the shortest distance either between the authorized dealer's servicing branch location or another service visit and the warranty service location, unless otherwise approved by Prestolite.
   c) Warranty Expense Limitation: The maximum warranty expense Prestolite will incur for any Battery Charger will be limited to the original purchase price of the Battery Charger.
   d) Primary switch contacts, fuses, bulbs and filters are not warranted unless found to be defective prior to use.
   e) Warranty claims are covered for the initial service visit. Additional on-site visits for the same unit within a rolling ninety (90) day period require prior authorization from Prestolite Technical Support. Prestolite reserves the right to deny or limit reimbursement associated with repeated visits where prior corrective actions were not implemented or where service efforts were duplicative.
   f) Multiple service calls for the same unit may indicate an underlying system or application issue. After two visits, Prestolite may require escalation to engineering or may direct alternative corrective actions.
   g) Warranty travel reimbursement may require submission of a completed service report including root cause classification.
   h) Prestolite reserves the right to direct service actions, require remote diagnostics, request component returns, or designate alternative service strategies prior to authorizing additional on-site visits.
   i) If repeated service is required for the same unit, Prestolite may, at its discretion, elect to replace the product or require factory return rather than continue field service.
2. **COMMENCEMENT OF WARRANTY TIME PERIODS.** The warranty periods indicated in the Warranty Schedule shall commence on the date of shipment by Prestolite.
3. **PERSONS COVERED BY WARRANTY.** Prestolite extends this warranty only to the purchaser of new equipment from Prestolite or one of its authorized distributors. The products purchased under this agreement shall be used exclusively by the buyer and its employees and by no other persons; and therefore, there shall be no third-party beneficiary to this warranty.
4. **LIMITATION OF REMEDY.** The existence of claimed defects in any product covered by this warranty is subject to Prestolite's factory inspection and judgement. Prestolite's liability is limited to repair of any defects found by Prestolite to exist or, at Prestolite's option, the replacement of the defective product F.O.B. factory after the defective product has been returned by the purchaser at its expense to Prestolite's shipping place. Replacement and exchange parts will be warranted for the remainder of the original Industrial Battery Charger Warranty or for a period of ninety (90) days, whichever is greater. Modifications or repairs performed by anyone other than Prestolite or an Authorized Service Provider will VOID all warranty.
5. **USE OF DEFECTIVE PRODUCT.** Continued use of an Industrial Battery Charger after discovery of a defect VOIDS ALL WARRANTIES.
6. **ALTERED EQUIPMENT.** Except as authorized in writing, the warranty specified does not cover any equipment that has been altered by any party other than Prestolite.

THIS WARRANTY IS GIVEN AND ACCEPTED IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABLILITY OR FITNESS FOR A PARTICULAR PURPOSE, OTHER THAN AS EXPRESSLY SET FORTH HEREIN. IN NO EVENT SHALL PRESTOLITE BE LIABLE FOR ANY ANTICIPATED OR LOST PROFITS, SPECIAL, DIRECT, INDIRECT OR INCIDENTAL DAMAGES, CONSEQUENTIAL DAMAGES, TIME CHARGES OR OTHER COMMERCIAL EXPENSES OR LOSSES, AND BUYER ASSUMES ALL RISK AND LIABILITY RESULTING FROM USE OF THE GOODS. PRESTOLITE DOES NOT AUTHORIZE ANY REPRESENTATIVE OR OTHER PERSON TO ASSUME ON BEHALF OF PRESTOLITE ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OR USE OF THE GOODS SOLD, AND THERE ARE NO ORAL AGREEMENTS OR WARRANTIES COLLATERAL TO OR AFFECTING THIS WRITTEN WARRANTY.

WARNING

At all times, safety must be considered an important factor in the installation, servicing and operation of the product and skilled, qualified technical assistance should be utilized.

AMETEK/PRESTOLITE POWER - TROY, OHIO USA

Data Sheet: 1158
Index: 070126
Replaces: 080524