# POWERDRIVE_TYPE LEAD ACID BATTERY POWER-SUPPLY-CHARGER

*Photo for reference only*

## SPECIFICATIONS:

<table>
<thead>
<tr>
<th>Part Numbers:</th>
<th>XX-48015Eyy-Mxx</th>
<th>48V 15A Lead-Acid Charger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Type:</td>
<td>XX = 1R: 120Vac, 60Hz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>XX = 2R: 230Vac, 50Hz</td>
<td></td>
</tr>
<tr>
<td>Output Type:</td>
<td>yy Pre-2016, Requires a Number such as ‘20’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>yy Post-2016, Defaults to ‘00’</td>
<td></td>
</tr>
<tr>
<td>Suffix:</td>
<td>-Mxx Pre-2016 ‘M’ is not present</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post-2016 ‘M’ is present. Example: -M01</td>
<td></td>
</tr>
</tbody>
</table>

**IMPORTANT: READ AND SAVE THIS SAFETY INSTRUCTION MANUAL. KEEP IT WITH OR NEAR CHARGER AT ALL TIMES**
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Throughout the manual look for this symbol. It means BE ALERT – YOUR SAFETY IS INVOLVED. If you do not follow these safety instructions, personal injury and/or property damage, and/or death may occur.

1. **Features**
   - Many safety features include Reverse Battery Protection and automatic A.C. Disconnect when charge has completed.
   - 2016 Model release adds additional functionality including a Power-Good L.E.D. Indicator on the back side which illuminates Green when A.C. Power is good and Red if A.C. Power is not present or the protection Circuit Breaker opens.

2. **Introduction**
   The Diversified Power International, LLC (DPI) 48015 Power Supply Battery Charger is designed to replace the Original-Equipment-Manufacturer’s, (OEM) charger with an upgraded and improved charger design. It works in combination with the OEM’s on-board Charge Controller Module commonly known as the ‘PowerDrive Onboard Charger’.

   **CAUTION** – Since this product is intended to work with the OEM’S on-board Charge Control Module the internal A.C. relay, which connects/disconnects A.C. Power to the Power Devices inside the product is also controlled by the OEM’s on-board Charge Controller. A failed OEM On-Board Charge Controller may cause the collateral failure of or mis-operation of this product.
3. **NOTICE**

- DPI is not liable for errors, incidental or consequential damages resulting from the use of material contained in this manual.
- DPI’s Limited Warranty appears at the end of this manual and no other warranties, expressed or implied, are contained herein.
- This Instruction Manual contains proprietary information that is protected by copyright. All rights are reserved. No part of this manual may be photocopied, reproduced, or translated into another form, format or another language without the written consent of DPI.
- Information contained in this document is subject to change without notice and DPI reserves the right to change specifications and design at any time without notice and without obligation of making changes to previously sold product.
- PowerDrive and Club Car are register trademarks owned by Club Car


![WARNING:](image)

- **WARNING:** RISK OF EXPLOSIVE GASES. WORKING WITH LEAD-ACID BATTERY IS DANGEROUS. EXPLOSIVE GASES DEVELOP DURING NORMAL BATTERY OPERATION. READ THIS MANUAL EACH TIME AND MAKE CERTAIN YOU FULLY UNDERSTAND IT AND FOLLOW THE SAFETY AND OPERATING INSTRUCTIONS AT ALL TIMES.
- To reduce risk of battery explosion, follow all safety instructions below and those published by the battery manufacturer. Review cautionary markings on vehicle or equipment containing the battery.
- FOLLOW ALL SAFETY AND OPERATING INSTRUCTIONS PUBLISHED BY THE OEM MANUFACTURER OF THE ON-BOARD CHARGE CONTROLLER.
- Use of an attachment not recommended or sold by the battery charger manufacturer may result in a risk of fire, electric shock or injury to persons.
- Do not operate this charger if it has received a sharp blow, was dropped or otherwise damaged in any manner. Refer to a qualified service agent.
- Charger contains no serviceable parts. If it fails during its warranty period, contact your dealer for a warranty replacement.
- To reduce risk of electric shock, unplug charger from AC outlet before attempting any maintenance or cleaning.
- Never push objects of any kind into the charger through cabinet slots which may result in contact with dangerous voltages or may cause an electrical short circuit and property damage and/or personal injury or death.
- Do not use the charger if any of the following conditions are suspect to exist:
  - The charger plug and/or vehicle receptacle feel hot during charging
  - The plug’s pins or receptacle’s contacts are bent, damaged, worn or corroded
  - The plug, receptacle, or conductor cords are cut, worn, exposing wires or damaged in any other way.
  - The plug is loose or does not make a good electrical/physical connection
  - Loud or above normal buzzing is heard during charging
• When charging, the charger’s DC cord may be disconnected from the vehicle’s receptacle, SLOWLY. Avoid completely, jerking or pulling the DC cord out quickly as arcing/sparking/burning may result which could damage the plug and receptacle and could cause batteries to explode.

Using the charger with any of the above symptoms may result in a fire, property damage, personal injury, or death.

Personal Precautions While Working With Batteries

⚠️ DANGER:
ENSURE THAT THE CHARGING AREA IS VENTILATED. Hydrogen levels in the vicinity of chargers and batteries must never exceed 2%. The total volume of air in the charging must be exchanged four times per hour. Exhaust fans, if and when used inside a structure, should be located at the highest point of the roof - contact your local HVAC engineer.

• Do not charge vehicle batteries with the vehicle covered or enclosed because an accumulation of hydrogen gas may result which may then result in an explosion. Any enclosure or cover should be removed or unzipped and pulled back when batteries are being charged.
• Do not use in any indoor facility where air flow is limited
• Have someone within range of your voice to come to your aid when needed.
• Have plenty of fresh water and soap nearby in case battery acid contacts your skin, clothing or eyes. Wear eye and clothing protection and avoid touching eyes.
• If battery acid contacts skin or clothing, wash immediately with soap and water.
• If acid enters eye, immediately flush eye with running cold water for at least 10 minutes. Get medical attention immediately.
• NEVER smoke or allow a spark or flame in vicinity of battery.
• Be extra cautious not to drop a metal tool onto battery. It might spark or short circuit battery or other electrical part that may cause an explosion.
• Remove personal metal items such as rings, necklaces, watches, etc. Batteries can produce a short circuit current high enough to weld such items causing a severe burn.
• NEVER charge a frozen battery. Thaw it out for safer and more efficient charging.
5. Installation

The AC line, to which the charger is to be connected, must be capable of supplying 10 amperes to this charger. If the Charger part number begins with ‘1’ connect to a 120Vac-60Hz line; if part number begins with ‘2’ connect to a 230V-50Hz line.

⚠️ CAUTION: TO REDUCE THE RISK OF FIRE:
USE THIS CHARGER ONLY ON CIRCUITS PROVIDED WITH A MAXIMUM OF 20 AMPERE BRANCH CIRCUIT PROTECTION (CIRCUIT BREAKER OR FUSE), IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, ANSI/NFPA 70, AND ALL LOCAL CODES AND ORDINANCES.

The use of an extension cord with the charger should be avoided. The use of an improper extension cord could result in a risk of a fire or electric shock. If an extension cord must be used, it must be UL and/or CSA approved. Locate all cords so that they will not be stepped on, tripped over or otherwise subjected to damage or stress. Extension cord must be properly wired and in good electrical condition, and large enough for the AC rating of charger as specified in this TABLE:

<table>
<thead>
<tr>
<th>Length of cord (feet):</th>
<th>25</th>
<th>50</th>
<th>100</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWG size of cord:</td>
<td>12</td>
<td>12</td>
<td>10</td>
<td>8</td>
</tr>
</tbody>
</table>

Provide adequate ventilation for the batteries and charger. The convection-cooled design requires an unobstructed flow of cooling air for proper operation. Keep all charger ventilation openings at least two inches (2") (5cm) away from walls and other objects. Do not allow clothing, blankets, or other material to cover the charger.

⚠️ WARNING: CHARGERS CAN IGNITE FLAMMABLE MATERIALS AND VAPORS. DO NOT USE NEAR FUELS, GRAIN DUST, SOLVENTS, OR OTHER FLAMMABLES.

⚠️ WARNING: TO REDUCE THE RISK OF AN ELECTRIC SHOCK, KEEP THE CHARGER DRY. DO NOT EXPOSE IT TO RAIN. FOR STORAGE, KEEP THE CHARGER IN A BUILDING.
6. **Grounding Instructions**

This battery charger must be grounded to reduce the risk of electric shock. This charger is equipped with an AC cord set having an equipment-grounding conductor. This AC cord set must be connected to an appropriate receptacle that is properly installed and grounded in accordance with the National Electrical Code and all local codes and ordinances.

⚠️ **WARNING:** IMPROPER CONNECTION OF THE EQUIPMENT-GROUNDING CONDUCTOR CAN RESULT IN A RISK OF AN ELECTRIC SHOCK.

The conductor with insulation having an outer surface that is green, with or without yellow stripe(s), is the equipment-grounding conductor. If repair or replacement of the charger’s AC cord set is necessary, refer to a qualified service agent, and do not connect the equipment-grounding connector to a live terminal.

Each charger should have its own dedicated 15 ampere protective circuit breaker or line-fuse installed on a dedicated and separated single phase branch circuit, in accordance with all applicable electrical codes for the location in which product is used.

7. **Charge Instructions**

- **When starting to charge…**
  - The Charger operates under control from the OEM’s Onboard Charge Controller and as such, these instructions are not meant to replace the OEM’s Instruction Manual, but are presented here only as a reference:
  - When starting to charge, ensure that the Charger’s DC plug is initially disconnected from the vehicle charge receptacle.
  - Wait approximately 20 seconds and then re-establish charger to vehicle connection.
  - Insert the DC plug into the vehicle receptacle by aligning the plug’s raised insertion guide with the guide slot found on the receptacle. Slowly, push the plug straight in.
  - Now connect the Charger’s A.C. Cord to A.C. Power
  - The OEM Onboard Charge Controller will then activate the charger’s internal A.C. Relay and will produce a ‘Relay Click’ sound.
  - Under control of the Onboard Charge Controller, the charger will deliver power to the Onboard Charge Controller.
  - Monitor the charger’s ammeter for the charge rate. The ammeter may increase to some high value or may indicate a series of high/low startups as it continues to be controlled by the Onboard Charge Controller.
  - Once charging has been started, the amperage will gradually taper down to a lower value.

- **When terminating charge or charging has finished…**
  - First, disconnect the charger’s A.C. Cord from the wall receptacle
  - Then, to disconnect the plug from the vehicle, grasp the plug and not the cord, and slowly pull plug straight out - Do not rock or bend the plug. The battery charger DC plug must be pulled slowly from the receptacle to prevent arcing that could damage the plug and/or receptacle and could cause batteries to explode in the presence of hydrogen gas.
DANGER: RISK OF ELECTRIC SHOCK! DO NOT TOUCH ANY UNINSULATED PARTS OF THE CHARGER OUTPUT CONNECTOR, BATTERY CONNECTOR, OR BATTERY TERMINALS.

DANGER: VISUALLY AND MANUALLY INSPECT TO VERIFY THAT THE DC OUTPUT CORD SET, PLUG AND BATTERY CHARGING RECEPTACLE ARE IN GOOD WORKING CONDITION BEFORE EACH AND EVERY USE AND DO NOT USE THE CHARGER IF:

- The DC charging receptacle does not grip the DC cord set plug tightly, is loose or does not make a good electrical connection.
- The DC cord set plug or charging receptacle feel hotter than normal.
- The DC cord set plug blades or charging receptacle contacts are bent, corroded or are dark or bluish in appearance.
- The DC cord set plug, cords, receptacle or equipment charging wiring are cut, worn, broken or have any exposed conductors.
- The DC cord set plug, cords, charger or receptacles are damaged or distressed in any way.

Using the charger with any of the above symptoms could result in a fire, property damage or personal injury.

8. TROUBLESHOOTING GUIDE

To be able to troubleshoot safely and effectively, it is important to read this guide completely before beginning any tests.

WARNING: DO NOT DISASSEMBLE THE CHARGER. TAKE IT TO A QUALIFIED SERVICE AGENT WHEN SERVICE OR REPAIR IS REQUIRED. INCORRECT REASSEMBLY MAY RESULT IN A RISK OF ELECTRIC SHOCK OR FIRE. THE FOLLOWING PROCEDURES ARE INTENDED ONLY TO DETERMINE IF A MALFUNCTION MAY EXIST IN THE CHARGER.

DANGER: TO REDUCE THE RISK OF ELECTRIC SHOCK, ALWAYS DISCONNECT THE CHARGER’S AC CORD SET FROM AC POWER AND ITS DC CORD SET PLUG FROM BATTERIES BEFORE ATTEMPTING ANY MAINTENANCE OR CLEANING.

WARNING: DO NOT OPERATE THE CHARGER IF IT IS MALFUNCTIONING. PERSONAL INJURY OR PROPERTY DAMAGE COULD RESULT.
Symptom: Drive range is short. Battery undercharged or Battery does not seem to be fully charged
Possible Causes: Check Battery(s) in Battery Pack:

⚠️ **WARNING:** ENSURE THAT EACH INDIVIDUAL BATTERY, IN THE BATTERY PACK, IS AT THE SAME STATE OF CHARGE AS ALL OTHER INDIVIDUAL BATTERIES AND THAT ALL BATTERIES ARE:

- Equal condition, same age, same size, same type, same manufacturer and all have the same rating.
- TO REPEAT:
  - DO NOT MIX DIFFERING BATTERY SIZES OR TYPES or Battery Manufacturers, nor mix Old with New in the same pack!!
  - Doing so may cause the battery pack to become unbalanced and may cause permanent damage to the OEM Onboard Charge Controller, charger or cause excessive battery gassing (which liberates hydrogen gas) and may cause personal bodily or property damage.
  - Never use charger for any purpose contrary to its intended purpose of charging lead acid batteries in accordance with ALL instructions printed in this manual.
- Check for an unbalanced battery pack. During charging, use a voltmeter to check the voltage across each battery and confirm that no battery is higher or lower in voltage than other batteries by more than +/-0.2Vdc.
- Also while charging, check the temperature of each battery to determine if each battery is relatively at the same temperature – take note of any battery that is ‘colder’ that the rest and report it to a service technician as it may be an indication of a battery containing a shorted or partially shorted cell. There may be other batteries that are significantly hotter to the touch because they are over-charging to compensate for the colder battery is not really charging, due to a damaged cell
- Ensure that the battery pack is above minimum requirement – typically 42Vdc for a 48Vdc battery pack. If battery pack is lower than 42Vdc, the battery pack may have to be disassembled by a qualified service technician and each battery may be required to be individually charged and individually tested.

Symptom: Charger does not ‘hum’ or not working
Possible Causes: Charger Circuit Breaker open

- Locate the chargers protection circuit breaker on the rear of the charger. If the button appears to be pushed out, push it back in and restart charge
- On 2016 models fitted with a ‘Power-Good’ indicator and it is ‘Red’ it means that the protection circuit breaker has opened and the button has pushed out – push it in and restart charge. If the indicator is ‘Green’, have the charger serviced by a qualified service technician.
- Since the charger is under control by the OEM Onboard Charge Controller, the controller may be defective and may require inspection by a qualified service technician
Symptom: Charger does not ‘hum’ or not working
Possible Causes: OEM Onboard Charge Controller not functioning

• Since the charger is under control by the OEM Onboard Charge Controller, the controller may be defective and may not be activating the charger’s internal A.C. Relay via a 3rd pin in the chargers plug. Seek inspection by a qualified service technician.

Symptom: A.C. Line protection circuit breaker opens
Possible Causes: Component Failure in Charger

• This condition can be caused by a charger problem, a “weak” fuse or circuit breaker protecting the circuit or an overloaded circuit. If the building AC power fuse or circuit breaker blows, connect the charger to another outlet (on different circuits) in the building. If the charger operates properly on other circuits, have a qualified electrician inspect and test the original circuit. If the charger causes other fuses or circuit breakers (in the building) to open, the charger should be tested for a problem.
• Since the charger is under control by the OEM Onboard Charge Controller, the controller may be defective and may require inspection by a qualified service technician.

9. Schematic Drawing

Schematic is relevant for both pre-2015 and post-2016 designs.
10. **Kit Parts List**

If replacement items are needed, order by their corresponding Kit Number. Refer to Exploded Figure, on next page. For additional parts kits not listed, please call our factory.

<table>
<thead>
<tr>
<th>KIT No.</th>
<th>PARTS DESCRIPTION</th>
<th>Figure Item No</th>
</tr>
</thead>
<tbody>
<tr>
<td>KITS0002</td>
<td>Strain Relief Bushing For AC/DC Cords - Pre 2016</td>
<td>2</td>
</tr>
<tr>
<td>KITS0169</td>
<td>AC Relay Component - Pre 2016</td>
<td>8</td>
</tr>
<tr>
<td>KITS0175</td>
<td>AC Relay Module with Power-Good Ind. - Post 2016</td>
<td>8 (Not Shown)</td>
</tr>
<tr>
<td>KITS0119</td>
<td>AC Input Cord without IEC Connector - Pre 2016 North Am.</td>
<td>7, 6</td>
</tr>
<tr>
<td>IPCJ0038</td>
<td>AC Input Cord with IEC Connector - Post 2016 North Am.</td>
<td>7</td>
</tr>
<tr>
<td>IPCJ0039</td>
<td>AC Input Cord with IEC Connector - Schuko Plug</td>
<td>7</td>
</tr>
<tr>
<td>IPCJ0040</td>
<td>AC Input Cord with IEC Connector - UK Plug</td>
<td>7</td>
</tr>
<tr>
<td>IPCJ0041</td>
<td>AC Input Cord with IEC Connector - Australia Plug</td>
<td>7</td>
</tr>
<tr>
<td>IPCJ0042</td>
<td>AC Input Cord with IEC Connector - South Africa Plug</td>
<td>7</td>
</tr>
<tr>
<td>KITS0066</td>
<td>DC Output Cord, Club Car Round 3-pin - Pre 2016</td>
<td>1,2</td>
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<tr>
<td>OPCJ0068</td>
<td>DC Output Cord, Club Car Round 3-pin - Post 2016</td>
<td>1</td>
</tr>
<tr>
<td>KITS0120</td>
<td>Enclosure with Handle, Label, Hardware - Pre 2016</td>
<td>10</td>
</tr>
<tr>
<td>KITS0172</td>
<td>Enclosure with Handle, Label, Hardware - Post 2016</td>
<td>10</td>
</tr>
<tr>
<td>KITS0158</td>
<td>Diode Bridge Rectifier with Heatsink</td>
<td>9</td>
</tr>
<tr>
<td>KITS0113</td>
<td>Analog Front Panel Meter – 20A Scale</td>
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<tr>
<td>KITS0107</td>
<td>Bumper Feet, Set of 4 pieces</td>
<td>3</td>
</tr>
<tr>
<td>KITS0124</td>
<td>Transformer Kit, 120Vac 60Hz Input - Pre 2016</td>
<td>5</td>
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</tbody>
</table>

Additional Kits, Descriptions, Instruction Manuals and information, may be obtained by visiting our website:

[www.DPIpower.com](http://www.DPIpower.com)
Exploded View Drawing Referencing Kitted Parts
11. **LIMITED WARRANTY**

Diversified Power International LLC (DPI) warrants exclusively to the original purchaser that this product will be replaced or repaired, at DPI’s option, if it fails during the first 3 years after date of purchase due to a defect in material or workmanship.

In order for a claim to be processed the product must be returned to DPI (i) with all transportation charges prepaid, (ii) accompanied by a acceptable proof of purchase, and with a Return Material Authorization (RMA) number, previously obtained from DPI, **printed and clearly visible on the outside of the shipping container**.

This warranty does not apply if the product has been modified, abused, or damaged or improperly or negligently used, connected, maintained, or operated in any manner contrary to the instructions stated in this manual or affixed to the product’s enclosure. Repair or replacement as provided under this warranty is the exclusive remedy of the purchaser, and the purchaser shall have no claim against DPI except for the breach of an express warranty stated herein.

DPI shall not be liable for any incidental, consequential, or special damages for breach of any expressed or implied warranty. Except to the extent required by applicable law any implied warranty of merchantability or fitness for a particular purpose is limited in duration to the first three (3) years after the date of purchase (and lifetime Transformer warranty for original purchaser, only). Some states do not allow the exclusion or limitation of incidental or consequential damages or allow limitations on how long an implied warranty lasts, so the above limitations or exclusion may not apply to you. This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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Return information:

**DIVERSIFIED POWER INTERNATIONAL LLC**  
414 CENTURY COURT  
PINEY FLATS, TN 37686, U.S.A.  
423 538-9002  
RMA # ________________

For further information, product updates, technical information, or general inquiries, please visit our web site at:

[www.DPIpower.com](http://www.DPIpower.com)