

PRO Charging Systems

Safety, Installation and Operating Instructions *Instructions importantes concernant la sécurité*

Manual for the Following Battery Charger Models:

DP24/12, DP36/12



INSTRUCTIONS FOR THE FOLLOWING BATTERY CHARGER MODELS:

MODEL	AC SUPPLY	DC Output	Battery System	Battery Capacity
DP24/12	85 - 265 volts, 50 / 60 Hertz	Primary: 15 amps@24V Secondary: 10 amps @ 12 volts	Primary: 24V Secondary: 12V	75-250 ah(20hr rating)
DP36/12	85 - 265 volts, 50 / 60 Hertz	Primary: 15 amps@36V Secondary: 10 amps @ 12 volts	Primary: 36V Secondary: 12V	75-250 ah(20hr rating)

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IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS. This manual contains important safety and operating instructions for future reference.

Understand and relate the Hazard Levels and Signal Words utilized in this manual with the following definitions:



DANGER This symbol means: Immediate hazards, which will result in severe personal injury or death.



WARNING This symbol means: Hazards or unsafe practices, which could result in severe personal injury or death.



CAUTION This symbol means: Hazards or unsafe practices, which may result in minor personal injury, product or property damage.



This symbol means BE ALERT! Your safety, or the safety of others, is involved!

PERSONAL SAFETY PRECAUTIONS



Always read all instructions before using your charger!

1. **Wear complete eye protection and clothing protection.** Avoid touching eyes while working near battery. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, eyes, or other surfaces. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flood eye with running cold water for at least 10 minutes and seek medical attention promptly.

2. **Dress properly.** Wear protective, electrically nonconductive clothes and nonskid footwear. Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a lead-acid battery. A lead-acid battery can produce a short-circuit current high enough to weld a ring or the like to metal, causing a severe burn. Wear restrictive hair covering to contain long hair.

3. **Avoid working alone.** Be sure someone is within range of your voice or close enough to come to your aid when you work near a lead-acid battery.
4. **Stay alert.** Watch what you are doing, and use common sense. Do not operate any charger when you are tired.
5. **Keep children away.** Children must never be allowed in the work area. Do not let them handle machines, tools, battery chargers, or extension cords.
6. **Keep work area clean.** Cluttered areas invite injuries.
7. **Observe work area conditions.** NEVER smoke or allow a spark or flame in the vicinity of battery or engine. Don't expose to rain. Keep work area well lit.
8. **Do not overreach.** Keep proper footing and balance at all times. Do not reach over or across electrical cables or frames.
9. **Avoid electrical shock.** To reduce risk of electrical shock, unplug charger from outlet before attempting any maintenance or cleaning.
10. **Do not operate charger with damaged electrical cord or plug.** To reduce risk of damage to the electrical plug and cord, pull by plug rather than by the cord when disconnecting charger. If damaged, replace the electrical cord or plug immediately.
11. **Store idle equipment.** When not in use, store equipment in a dry location to inhibit rust. Always lock up tools and equipment and keep out of reach of children.
12. **Maintain charger with care.** Inspect periodically and, if it has received a sharp blow, been dropped, or otherwise damaged in any way, have it repaired by an authorized technician. Do not disassemble charger; contact PCS technical support when service. Incorrect reassembly may result in risk of electrical shock or fire.
13. **Check for damaged parts.** Before using any battery charger, carefully check any part that appears damaged to determine that it will operate properly and perform its intended function. Check for broken parts and any other condition that may affect proper operation. Any part that is damaged should be properly repaired or replaced by a qualified technician. Do not use the charger if any part does not operate properly.
14. **Replacement parts and accessories.** When maintaining, only use accessories intended for use with this charger.

SAVE THESE INSTRUCTIONS!

INSTALLATION AND PREPARATION



WARNING To reduce risk of battery explosion, follow these instructions, those published by the battery manufacturer, and by the manufacturer of any equipment that you intend to use in the vicinity of battery. Review all cautionary markings on these products and on the engine.

If it is necessary to relocate the battery for charging, first remove the grounded terminal from the battery. Then make sure all accessories are off, so as not to cause battery arcing.



WARNING RISK OF EXPLOSIVE GASES: WORKING IN THE VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. Batteries generate explosive gases during normal battery operation. For this reason, it

is of utmost importance that prior to each use of your charger, you read this manual and follow the instructions exactly.

Do not operate charger in a closed-in area or restrict ventilation in any way.

Clean battery terminals. Be careful to keep corrosion from coming into contact with eyes.

Add distilled water to each cell until battery acid reaches level specified by battery manufacturer. This helps purge excessive gas from cells. Do not overfill. For a battery without cell caps, carefully follow manufacturer's recharging instructions.

Study all battery manufacturers' specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.

When using an extension cord, make sure:

- that pins on plug of extension cord are the same number, size, and shape as those of the charger's plug;
- that extension cord meets UL (Underwriters Laboratories, Inc.) acceptance;
- that wire size is large enough for AC ampere rating of charger.



Always make your extension cord connection on the charger side before connecting to a nearby GFCI protected (Ground Fault Circuit Interrupt) outlet. Failure to use a GFCI outlet may result in electrical shock. Note: The DC connection should always be made before connecting or disconnecting the AC side.

Note: Extension cords should be industrial grade/heavy duty UL approved and grounded. Check extension cord before use for damage, bent prongs and cuts. Replace if damaged.

Connect the extension cord to the charger; then proceed to plug the extension cord to the GFCI protected (Ground Fault Circuit Interrupt) outlet.

Always remove the extension cord from the GFCI protected outlet first when charging is completed, followed by unplugging the charger.

GENERAL OPERATION



Use charger for charging a LEAD-ACID (lead acid, sealed lead acid, gel cell and AGM) or Lithium (LiFe) battery system only. It is not intended to supply power to a low voltage electrical system other than in a starter-motor application. Do not use battery charger for charging dry-cell batteries that are commonly used with home appliances. These batteries may burst, causing personal injury and damage to property.



DO NOT attempt to attach a charger to a battery pack if the output of the charger does not match the battery pack voltage. Example: Model i-3625 is a 36 volt output charger and is only usable on 36 volt battery systems. Charger and battery damage can occur.



Be extra cautious to reduce risk of dropping a metal tool onto battery. It might cause a spark or short-circuit a battery or other electrical part, possibly resulting in an explosion.



NEVER charge a frozen battery.

Assure that the area around your charger and batteries is properly ventilated. Connect your extension cord, with no AC Power present, to the battery charger and proceed to plug your extension cord into a 120VAC GFCI protected (Ground Fault Circuit Interrupt) outlet.



Risk of electrical shock! Do not touch uninsulated parts of the battery charger output connector, battery connector, or battery terminals.

Once you plug in your PCS battery charging system, the charge cycle will begin automatically. State of charge will be displayed by illumination of the Light Emitting Diodes (LEDS) on the battery status indicator located on the front of the unit.



DO NOT connect or disconnect the DC output electrical cord to or from the battery receptacle when the charger is on. Arcing and / or burning of the plug and receptacle could result and could cause the batteries to explode. If the charger must be stopped, first disconnect the AC power supply cord from its outlet, then disconnect the charger DC output plug from the battery receptacle.

We recommend that you leave your system plugged in. This will reduce sulfation on the lead plates of the batteries and allow your PCS charging system to keep your batteries fully maintained and ready to perform at their best.



To reduce the risk of fire, use only on circuits provided with 15Amperes Branch Circuit Protection in accordance with the National Electrical Code, ANSI/NFPA 70.



Study all battery manufacturers' specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.



Never place the charger directly above or below the battery being charged; gases or fluids from the battery will corrode and damage the charger. Locate the charger as far away from the battery as DC cables permit.



If it is necessary to remove battery from vehicle to charge it, always remove grounded terminal from battery first. Make sure all accesproes in the vehicle are off in order to prevent an arc.



Never smoke or allow an open spark or flame in the vicinity of the BATTERY the battery or engine.



Working in the vicinity of a lead-acid battery is dangerous. Batteries generate explosive gases during normal operation. For this reason it is of the utmost importance that prior to each use of your charger, you read and follow the instructions provided exactly.

CHARGING INDICATIONS

When your battery charging system is activated, the battery status indicators provides charging information utilizing five red LED indicators and one green LED indicator.

	<p>There are two sets of status LED's, one for each DC output.</p> <p>Your Dual Power Series charging system is factory set to the DeltaVolt selection, this allows both DC outputs to run flooded lead acid charging profiles.</p> <p>Additionally, each DC output may be configured, utilizing the DeltaView Link App (available free for Android and iOS), to run AGM or Lithium charging profiles.</p>
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Two amber LED indicators per battery system are provided in order to display what type of battery the charger has been programmed to charge. **NOTE:** For information on reconfiguring the battery type, please contact technical support (800.742.2740).

Battery System Percent Charged Indicators

Four LED indicators are provided in order to display the progress of the charge cycle in percentage of charge. Indications are as follows:

1 ST Amber LED	Illuminated configured for Flooded Lead Acid
2 ND Amber LED	Illuminated configured for either AGM or Lithium – see real time app display
1 ST RED blinking.	Charger plugged into A/C not connected to battery
1 ST RED LED	Charging - Initial Charging Up To 30%
2 ND & 3 RD RED LEDS	Charging - 60% Complete
1 ST , 2 ND & 3 RD RED LEDS.	Charging - 90% Complete
BLINKING GREEN LED	Finishing Stage (Note: Battery Type Indicator will also blink during this stage)
STEADY GREEN LED	Charge Complete –Float/Maintenance Mode-On for 5 minutes and off for 60 minutes

The green LED is illuminated whenever the charge cycle has terminated and the internal circuitry has determined the batteries to be fully charged. The green LED will blink during the finishing stage of the charge cycle. After the completion of the charge cycle, the green LED will remain on steady during the float-maintenance stage. **During this final stage current is only flowing to the battery system for 5 minutes and then current will stop completely for 60 minutes.**

Your system provides an equalization stage every 30 days while plugged in. If the charger is normally disconnected from A/C after completing charge, equalization can be accomplished by plugging back into A/C whenever this stage is desired. Battery manufacturers recommend that equalization is done once a month in order to further reduce sulfation on the lead plates of a battery, which helps promote longer battery life. Note: During this process the LEDs will go through their normal routine (Red LEDs counting up for % of charge along with the illuminated Red LED Battery Type) and then the Green LED and Red Battery Type LED will blink) until the unit returns to the maintenance mode and a steady Green LED and steady Red Battery Type LED. (Not applicable to Gel Profile)

TROUBLESHOOTING

PROBLEM: No LED indicators illuminated on battery status indicator.

Solution Sequence:

1. Confirm that AC Power is being delivered to the charger. Use a meter or test light to check the AC power supply from its source through all connecting points up to the charger.

PROBLEM: The charge status indicator changes rapidly back and forth from red to green or the green LED will not illuminate after excessive charging time (24 hours or more).

Solution Sequence:

1. Disconnect AC power from the charging system. This indication may signify a possible battery problem.
2. Call technical support for further assistance.

PROBLEM: A green LED was illuminated before disconnecting the power from the charger, but upon reconnection, red LEDs appear and remain on.

This is the normal operating procedure for the system. It indicates that a reanalysis of the battery status was initiated and after a series of steps the green LED will illuminate.

LIGHT EMITTING DIODES (LED) FAULT CODE INDICATIONS

The microprocessor is constantly monitoring the charger circuitry and will both detect and display blinking LED indications if a fault is detected. The battery type LED will be **OFF** during a fault code condition.

30% RED LED BLINKINGNO BATTERY DETECTED

This indication occurs whenever the charger circuitry cannot detect a battery. The charger circuitry will not allow charge current to flow under this condition. With the AC power supply cord unplugged, check the connection to the batteries for proper polarity (black wire to negative or -). Also check for corrosion free secure connections to the battery.

30 & 60% RED LEDS BLINKINGFORMING STAGE TIMEOUT SHUTDOWN

This indication occurs if the battery voltage has not risen above 1.75 volts per cell within the first 3 hours of charging. This indicates that a possible battery problem exists and that the charge cycle has been terminated at this point.

30, 60 & 90% RED LEDS BLINKING.....OVERALL TIMER SHUTDOWN

This indication occurs if the charger has not completed the charge cycle within the allowable factory set time period. This indicates that a possible battery problem exists and that the charge cycle has been terminated at this point.

30 & 90% RED LEDS BLINKINGINTERNAL OVERTEMP SHUTDOWN

This indication occurs if the charger circuitry has detected operating temperatures inside the charger enclosure that are above factory specified levels. This could indicate that a possible charger problem exists and that the charge cycle has been terminated.

30% RED & 100% GREEN LEDS BLINKING BULK STAGE SHUTDOWN

This indication occurs if the battery voltage does not rise properly during the Bulk Stage. This indicates that a possible battery problem exists and that the charge cycle has been terminated at this point. Please call technical support for further assistance (800.742.2740).

30% RED BLINKING NO BATTERY DETECTED

This will be the NORMAL indication when the charger is plugged into A/C but not connected to a battery pack, allowing the DeltaView signal to be retrieved with a DeltaView Reader. This can also be considered the NO BATTERY DETECTED fault code. Please call technical support for further assistance (800.742.2740).

Note: Disconnecting and reconnecting the AC power supply cord will reset the charger.