



PRO Charging Systems

Safety, Installation and Operating Instructions

Instructions importantes concernant la sécurité

Manual for the Following Battery Charger Models:

TPS1212, TPS1220, TPS1225, TPS1230, TPS2412, TPS2420, TPS2425, TPS2430, TPS3612, TPS3620, TPS3625, TPS3630, TPS4813, TPS4818 and TPS4821 and any of these models with additional letters such as H, V, OB, RM, LIFT, etc.



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IMPORTANT NOTICE:

Please save and read these safety, operating and installation instructions before installing or applying AC power to your Pro Charging Systems (PCS) charger. Contact technical support at PCS with any product, installation, or service questions (800.742.2740).

Pro Charging Systems, LLC
LaVergne, TN 37086-3539

INSTRUCTIONS FOR THE FOLLOWING BATTERY CHARGER MODELS:

| MODEL | AC SUPPLY | DC Output | Battery System | Battery Capacity |
|---------|-------------------------------|--------------------|------------------|-------------------------|
| TPS1212 | 85 - 265 volts, 50 / 60 Hertz | 12 amps @ 12 volts | 12 volt, 6 cell | 75-250 ah(20hr rating) |
| TPS1220 | 85 - 265 volts, 50 / 60 Hertz | 20 amps @ 12 volts | 12 volt, 6 cell | 75-250 ah(20hr rating) |
| TPS1225 | 85 - 265 volts, 50 / 60 Hertz | 25 amps @ 12 volts | 12 volt, 6 cell | 150-395 ah(20hr rating) |
| TPS1230 | 85 - 265 volts, 50 / 60 Hertz | 30 amps @ 12 volts | 12 volt, 6 cell | 150-395 ah(20hr rating) |
| TPS2412 | 85 - 265 volts, 50 / 60 Hertz | 12 amps @ 12 volts | 24 volt, 12 cell | 75-250 ah(20hr rating) |
| TPS2420 | 85 - 265 volts, 50 / 60 Hertz | 20 amps @ 12 volts | 24 volt, 12 cell | 75-250 ah(20hr rating) |
| TPS2425 | 85 - 265 volts, 50 / 60 Hertz | 25 amps @ 12 volts | 24 volt, 12 cell | 150-395 ah(20hr rating) |
| TPS2430 | 85 - 265 volts, 50 / 60 Hertz | 30 amps @ 12 volts | 24 volt, 12 cell | 150-395 ah(20hr rating) |
| TPS3612 | 85 - 265 volts, 50 / 60 Hertz | 12 amps @ 12 volts | 36 volt, 18 cell | 75-250 ah(20hr rating) |
| TPS3620 | 85 - 265 volts, 50 / 60 Hertz | 20 amps @ 12 volts | 36 volt, 18 cell | 75-250 ah(20hr rating) |
| TPS3625 | 85 - 265 volts, 50 / 60 Hertz | 25 amps @ 12 volts | 36 volt, 18 cell | 150-395 ah(20hr rating) |
| TPS3630 | 85 - 265 volts, 50 / 60 Hertz | 30 amps @ 12 volts | 36 volt, 18 cell | 150-395 ah(20hr rating) |
| TPS4813 | 85 - 265 volts, 50 / 60 Hertz | 13 amps @ 48 volts | 48 volt, 24 cell | 75-250 ah(20hr rating) |
| TPS4818 | 85 - 265 volts, 50 / 60 Hertz | 18 amps @ 48 volts | 48 volt, 24 cell | 150-395 ah(20hr rating) |
| TPS4821 | 85 - 265 volts, 50 / 60 Hertz | 21 amps @ 48 volts | 48 volt, 24 cell | 150-395 ah(20hr rating) |

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IMPORTANT SAFETY INSTRUCTIONS

INSTRUCTIONS IMPORTANTES CONCERNANT LA SÉCURITÉ

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

CONSERVER CES INSTRUCTIONS. CE MANUEL CONTIENT DES INSTRUCTIONS IMPORTANTES CONCERNANT LA SÉCURITÉ ET LE FONCTIONNEMENT.

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



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



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



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 or repair is required (800.742.2740). 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. Approved accessories are available from Pro Charging Systems (800.742.2740).


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.

Pour réduire le risque d'explosion, lire ces instructions et celles qui figurent sur la batterie.

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.

Il est dangereux de travailler a proximité d'une batterie au plomb. Les batteries produisent des gaz explosifs en service normal. Il est aussi important de toujours relire les instructions avant d'utiliser le chargeur et de les suivre à la lettre.

Do not operate charger in a closed-in area or restrict ventilation in any way.
Ne pas faire fonctionner le chargeur dans un espace close et/ou ne pas gêner la ventilation.

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.


 **CAUTION** 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

 **WARNING** Use charger for charging a LEAD-ACID (lead acid, sealed lead acid, gel cell and AGM) battery 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.

Utiliser le chargeur pour charger une batterie au plomb uniquement. Ce chargeur n'est pas conçu pour alimenter un réseau électrique très basse tension ni pour charger des piles sèches. Le fait d'utiliser le chargeur des piles sèches pourrait entraîner l'éclatement des piles et causer des blessures ou des dommages.


 **WARNING** 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.

 **WARNING** 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. If damaged, contact PCS (800.742.2740).


 **CAUTION** NEVER charge a frozen battery.

Ne jamais charger une batterie gelée.

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.

 **DANGER** 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.


 **WARNING** 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.

 **CAUTION** 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.

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

Prendre connaissance des mesures de précaution spécifiés par le fabricant de la batterie, p. ex., vérifier s'il faut enlever les bouchons des cellules lors du chargement de la batterie, et les taux de chargement recommandés.

 **CAUTION** 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.


Ne jamais placer le chargeur directement sous la batterie à charger ou audessus de cette dernière. Les gaz ou les fluids qui s'échappent de la batterie peuvent entraîner la corrosion du chargeur ou l'endommager. Placer le chargeur aussi loin de la batterie que les cables c.c. le permettent.

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

S'il est nécessaire de retirer la batterie du véhicule pour la charger, toujours d'ébrancher la borne de mise à la masse en premier. S'assurer que le courant aux accessoires du véhicule est coupe afin d'éviter la formation d'un arc.

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

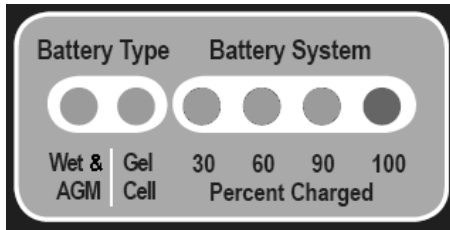
Ne jamais fumer près de la batterie ou du moteur et éviter toute étincelle ou flamme nue à proximité de ces dernie.

 **CAUTION** 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.

Il est dangereux de travailler a proximité d'une batterie au plomb. Les batteries produisent des gaz explosifs en service normal. Il est aussi important de toujours relire les instructions avant d'utiliser le chargeur et de les suivre à la lettre.

CHARGING INDICATIONS

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



Battery Type Indicators

Two amber LED indicators 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 Wet Cell and AGM* batteries |
| 2 ND Amber LED | Illuminated configured for Gel Cell batteries |
| 1 ST RED / 100% GREEN alternate. | Charger plugged into A/C not connected to battery and sending DeltaView signal |
| 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 |

***We normally recommend our STANDARD Delta Volt profile for AGM Batteries. There are some cases where particular AGM batteries are manufactured to different specifications and may need a special profile with a much lower finish voltage limitation. In these cases we will do our best to accommodate your unique need.**

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 current 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.
2. Check that the AC circuit breaker (on front of the unit) is depressed.
3. Call technical support for further assistance (800.742.2740).

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 (800.742.2740).

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 & 100% GREEN LEDS ALTERNATE BLINKING ON OFF.....DELTAVIEW SIGNAL OR 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.

LIMITED WARRANTY

Pro Charging Systems, LLC (PCS) makes this Limited Warranty only to the original retail purchaser.

PCS warrants this battery charger for two years (unless the charger is used in a Restricted Market) from the date of retail purchase against defective materials and/or workmanship. Restricted markets include markets outside of the USA, Rental applications and Heavy Industrial applications. Sometimes RM is designated in the PCS Part number when ordered, but is not part of the model number. Chargers used in Restricted Markets will have a warranty period of 18 months from the date of retail purchase against defective materials and/or workmanship. CR refers to "Certified Reconditioned" and designates a 1 year warranty.

If such defects should occur, this unit will either be repaired or replaced at the discretion of the manufacturer. It is the responsibility of the original purchaser to return the charger along with proof of purchase, transportation, and/or any mailing or handling charges prepaid to the manufacturer or its authorized representative. Chargers that are purchased more than two years beyond the date of production will automatically have a warranty start date that will be the two year anniversary of the production date.

This limited warranty is void if the product is misused, improperly maintained, handled carelessly or incorrectly operated. Additionally, this warranty is void if the charger is disassembled, the charger's charge cables are cut, the power cord is cut off, the charger is altered without authorization from PCS, the serial number is removed, or repair is attempted by anyone other than an authorized representative. PCS makes no other warranty other than this limited warranty and expressly excludes any implied warranty, including warranty for any incidental or consequential damages. This is the only expressed limited two year warranty authorized by PCS and does not authorize anyone to assume or make any other obligation towards the product other than this two year Limited Warranty. Some states do not allow limitation of incidental or consequential damages.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state. Please call Pro Charging Systems, LLC for full warranty information and/or service please call (800.742.2740).

Below are some of our other options in chargers and battery accessories. Call our technical support group for more detailed information or visit our web site www.pcsdv.com.

Products Overview

Pro Charging Systems builds high quality, leading-edge battery chargers designed to provide clients with value over the long-term. In short, our charging systems are designed and built to last. The company's advanced DeltaVolt® technology enables our products to substantially out perform the competition. Coupled with Pro Charging System's new DeltaView® technology, users can collect data and view it in ways never before possible relative to the performance of batteries and fleets of battery powered equipment.



While our charging systems are competitively priced, they provide significant additional value since our products charge batteries faster, maintain the charge for greater duration and make batteries last longer. That translates to greater productivity in industrial settings, happier boaters on the water, more time on the golf course and fewer batteries that have to be replaced overtime. The "value" multiplier for our product in most applications is significant.

Pro Charging Systems line of chargers including the Professional, Sportsman, Eagle, Patriot and Recreation Series provide impressive performance designed to keep your equipment running longer between charges while extending the service life of your batteries. That is why Pro Charging Systems is the charger of choice for industrial lift equipment companies, boat manufacturers, golf cart owners, floor scrubber companies and other industrial users. It is also why many battery manufacturers endorse Pro Charging System chargers since they extend both the performance and the life of batteries.

www.pcsdv.com