

# PAC 1600

## Installation and User's manual



## Advanced Battery Chargers

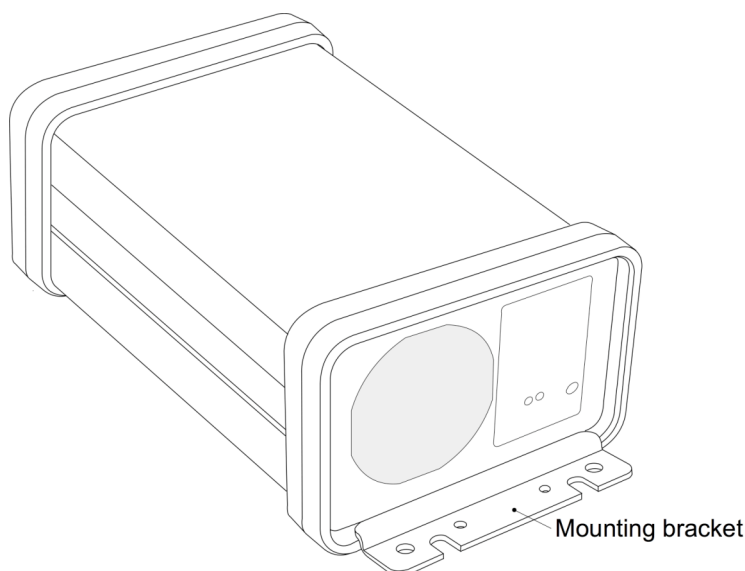


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Important	Read this manual before installing, or operating the battery charger.
PAC 1600	Powerfinn PAC 1600 battery chargers use modern switching technology. The intelligent micro controller extends the life of the battery by supervising the charging process. The charger is compact, lightweight and meets the EU safety and EMC requirements.
General	<p>PAC chargers are available for a variety of battery types. The charger type is indicated on the label attached to the side of the charger.</p> <p>Be sure to always use the correct type of charger. The charger type should correspond to the battery construction (sealed, vented, etc.) Attempting to charge a battery with the wrong type of charger may result in considerable damage.</p> <p>Check the battery to ascertain that the “five hour capacity” (in ampere-hours, Ah5) is between 5 and 14 times greater than the nominal current (in amperes) of the charger. E.g. a 10A charger is suitable for charging batteries with a 5 hours capacity of 50A-140A.</p>

## Installation

The following points must be respected when choosing a location for the charger.

1. The location must be dry, dust-free and indoor. The acceptable temperature range for operation is  $-20^{\circ}\text{C}^{\ast}$  to  $+40^{\circ}\text{C}$ . A higher ambient temperature will limit the current supply, see appendix A on page 6.  
*Caution: The charger is not waterproof. Keep the charger dry and away from areas with high humidity in order to avoid the risk for electrical shock and damage to the charger.*
2. The equipment may be installed horizontally or vertically. The horizontal position, however, is recommended with a height of 1 meter above floor level.
3. To ensure sufficient ventilation, leave a free space of at least 10 cm around all sides of the charger. Do not cover the unit.
4. The charging process generates explosive hydrogen gas. Keep the area well ventilated. Never use an open flame and avoid sparks close to the battery and charger.
5. In case the charger is mounted vertically with the cable plate downwards, the floor and material below the charger must be fire-resistant. Vertical positioning is prohibited if this condition cannot be met. Install the charger using the two mounting brackets, one at each side of the charger as shown in the figure. Fasten the brackets to the wall using the mounting holes in the brackets. Fix the sticker (see appendix C), if provided, to the top-side of the charger. Plug the main power cord into an earthed mains outlet.



Read these operating instructions before using the charger for the first time. *Read the safety instructions in the next paragraph thoroughly.*

To charge a battery with the PAC charger, follow these instructions:

1. Ensure that the charger is disconnected from the mains and that the work environment meets the conditions described in the previous paragraph.
2. Connect the charger cables to the battery terminals: the positive (+) cable to the positive (+) terminal and the negative (–) cable to the negative (–) terminal. The positive cable is red and has a yellow cable marker with a + symbol. The negative cable is black. The positive battery cable is commonly marked with red.

***Warning:*** *Because some sparks can occur when the cables are connected to the battery, the battery should be placed as far from the charger as possible and the charger's cables extended to reach the battery.*

3. Turn the power on by plugging the power cord in a mains outlet with protective earth. The fan will operate when the charger is turned on. The charger continuously monitors its own temperature level and reacts by controlling the charging current and fan speed. The charger will not overheat under normal conditions.
4. Go to step 7 in case the charger is programmed for constant voltage charging.
5. During the charging process the STATUS LED will continuously light orange. A constant red color indicates either a too low or too high voltage, or that the battery is not connected to the charger. Turn the power off by disconnecting the charger from the mains and make sure that the battery is suitable for the charger. The battery voltage should be 8-16V for a 12V charger and 16-32 V for a 24V charger. Check the cable connections and return to step 3.
6. The battery is fully charged, as soon the STATUS LED is green.
7. The charger will switch to maintenance charging about 16 hours after beginning to charge the battery. The process will terminate and the STATUS LED will flash intermittent red in case the battery is not fully charged after PAC switches to maintenance charging. This may occur if the battery is defect, or if the charger and the battery are incompatible (see page 2 'General').
8. Step 8 applies only to chargers programmed for constant voltage charging. During the charging process the STATUS LED lights continuously orange. The charger does not check the cable connections and starts charging immediately after the power is

switched on.

9. Always turn the supply power off before removing the charger cables by disconnecting the unit from the mains. This avoids heavy sparking.

**Car use:** Always refer to the user's manual of the car before connecting the charger to the car battery (see step 2) and removing it after finishing charging (see step 5). The battery terminal not connected to the car chassis has to be connected first. The other connection is to be made to the chassis far away from fuel lines and from the fuel induction i.e. carburetor. After finishing charging (step 5), unplug the charger from the mains before removing the charger cables.

## Safety Instructions

In addition to the safety measures mentioned under 'Installation' (page 3), the following personal precautions should be taken whenever charging batteries.

1. For emergency situations ensure in advance that help is available in time of need.
2. Batteries contain acid that is harmful to the eyes, skin and clothes. Always wear overalls and safety goggles. Never touch the eyes with unwashed hands after handling batteries.
3. Ensure that a working, fresh water tap is available. If acid gets into the eyes or on the skin, immediately flush the area with plenty of water for several minutes. If visible injury occurs, contact a physician immediately. In case of eye injuries, always contact a physician.
4. The charging process generates explosive hydrogen gas. Do not smoke or otherwise bring burning or sparking matter to the vicinity of the charger when it is in operation.
5. If a short circuit occurs, the battery may explode or the item causing the short may melt. Keep the work area clear from tools and debris. Remove jewelry, watches and etcetera before working with the battery.
6. The power cord should be unplugged and the battery must be disconnected from the charger in case the equipment is left unused for a longer period of time.
7. The charger must be situated away from heat sources like radiators and heat registers and in such a way that no objects can fall or liquid can be spilled into the cabinet openings.
8. Never attempt to recharge non-rechargeable batteries.

Trouble-shooting and repair

The most common faults are described under ‘Operations’ (page 4).

If the charger is not operating after the charger is connected to the mains, there may be a fault in the internal fuse, the power cord, or mains plug. Check that the charger is plugged in. Call an electrician or service repair technician if there seems to be a problem with the power cord or with the plug.

If the cause of malfunction cannot be found, contact your retailer or the manufacturer. Only authorized persons can repair the charger.

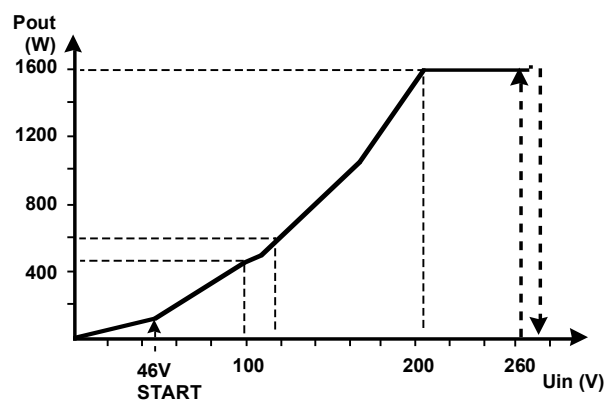
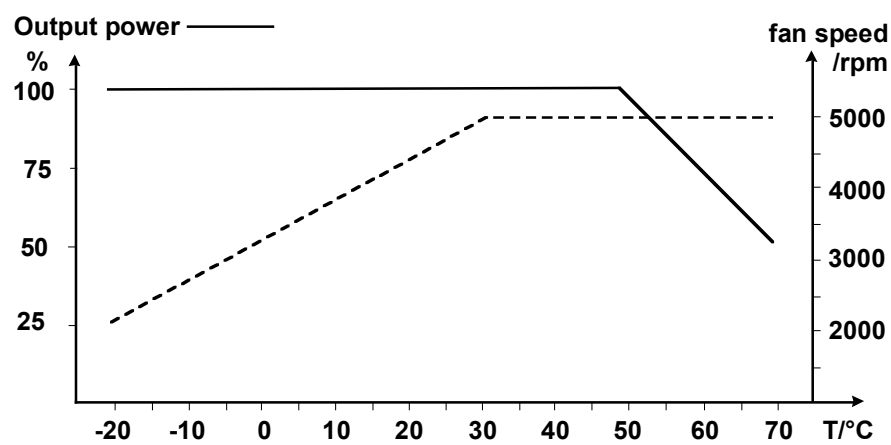
Guarantee

The charger has a guarantee of two year from the date of purchase. Guarantee covers manufacturing and component failures and is valid only if the equipment is installed and used according to the instructions in this manual.

Keep the receipt as evidence of the date of purchase.

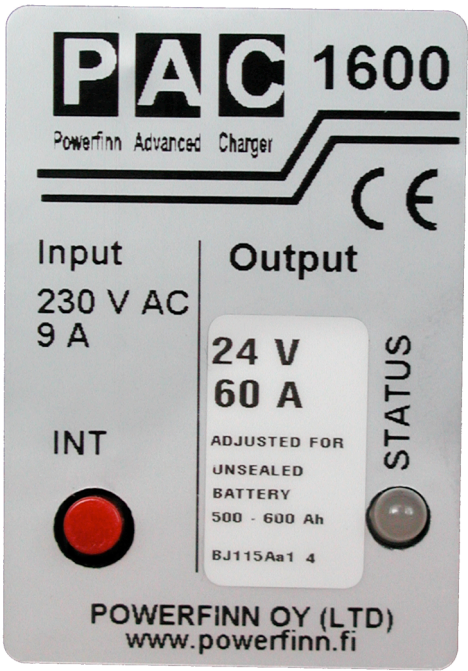
Appendix A

The following graphs show the effect of ambient temperature on output power and fan speed, as well as the effect of input voltage on output power.



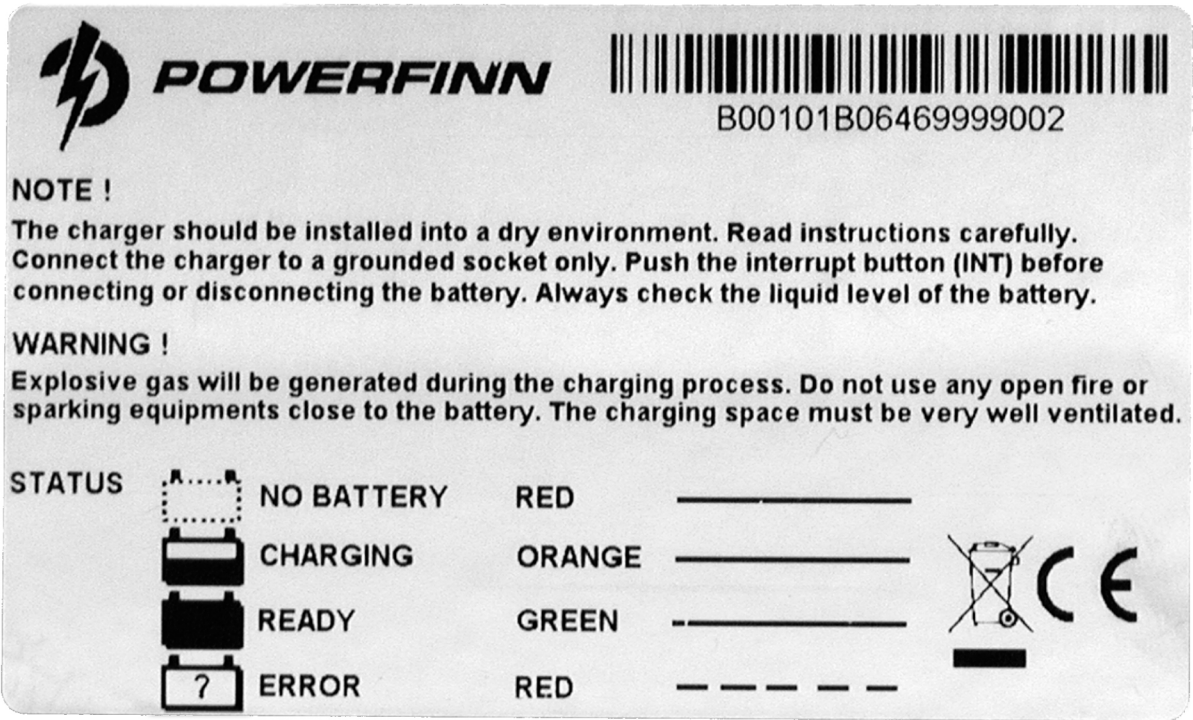
Appendix B

Example of the front panel label (varies per model).



Appendix C

Example of the top label (varies per model)



Note:  
Constant voltage chargers do not have DISCONNECTED and READY markings mentioned on the label



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