

Abbreviated installation instructions for PFC-20 charger.
Joe Smalley 14 February 2002, edited RJR 6-1-05

Installation

Install your AC plug on the wire coming out of the charger next to the circuit breaker. You need to select a plug that matches your outlet. If you are connecting to a 120 volt outlet, the white wire is neutral and the black wire is hot. If you are connecting to 208 or 220 or 240 volts, both the white and the black wires are hot. The green wire must be connected to a safety ground. If this is not done, a fault can expose users to lethal voltages.

Install the charger in a cool, clean and dry location. The powerstage needs cool air and doesn't like dirt or moisture.

If your battery pack does not have an Anderson connector installed, have a competent electrician do it for you. There can be lethal voltages on these wires and we don't want anyone hurt during installation. Disconnect the battery mid pack before installing connector. Reconnect the pack after installing the connector. Check the polarity of the connector before continuing. Do not connect the charger backwards.

Connect the Anderson connector to the battery pack connector.
PFC20s, and 30s have a Anderson style SB 50 Gray connector.
PFC50s have a Anderson Style SB 175 Blue connector.

Plug the AC plug into your outlet.
PFC20s have NON terminated ends. So you can install what you wish.
PFC30s have a 14-30 plug rated at 30 amps. Use the same or better ratings.
PFC50s have a 14-50 plug rated at 50 amps Use the same or better ratings.

Turn the charger AMPS knob full counterclockwise.(Zero amps)
Turn on the circuit breaker. The green LED should come on.

Calibration

You will need to adjust the voltage to match your battery pack acceptance voltage. If you do not know your acceptance voltage, consult your battery dealer or another battery expert. The charger is normally shipped set up for a 156 volt battery bank with a peak charged voltage of 190 volts

To adjust the voltage, turn the VOLTS trim pot with a small screwdriver until you find the threshold where the yellow LED changes state. If the yellow LED is off, turn the trim pot counterclockwise to get it to go on. If the yellow LED is on, turn the trimpot clockwise to get it to go off. When you find the threshold where the LED changes states, the cutoff voltage is set to the actual battery voltage and the charger will not charge the battery above this voltage. You will need to increase your set point to charge the battery.

Turn the AMPS knob clockwise to mid scale to get the charger to make some charge current. Adjust the VOLTS trim pot clockwise to get the battery voltage to rise. The voltage will rise about 20 volts per turn. As long as the yellow LED is on, the voltage will not rise from the set point on the trim pot. Keep turning the trim pot clockwise until the battery voltage is up to the acceptance voltage of your battery pack. If the yellow LED goes out before you reach your acceptance voltage, wait for the battery voltage to increase slightly. The delay can be reduced by increasing the AMPS knob setting. If your battery is deeply discharged, the wait might be several hours. This procedure is quicker if you start with a full battery. When you reach the acceptance voltage and the yellow LED is on, then this control is set properly.

The voltage trim adjustment is intended to be adjusted with the seasons and as the batteries age. You know that the control is set properly if the battery current drops to less than .5 amps after an overnight charge. If the current is higher than .5 amps, turn the voltage down to make it 0.5 amps. If it is less than .5 amps, tweak the voltage up to get .5 amps after an additional hour on charge.

Ending the charge

To end the charge, turn off the circuit breaker and disconnect the plug from the AC outlet. You do not need to disconnect the Anderson connector.

The pins of the AC connector may develop a capacitive potential after charging the battery. Do not touch the pins or you may feel a spark.

Recharging

Turn the AMPS knob to minimum (counterclockwise).

Plug the AC plug into the outlet.

Turn the circuit breaker on.

Turn the AMPS knob up to whatever the outlet will provide. Be advised that sharing an outlet with other devices will prevent you from pulling the breaker rated current. You need to share or the breaker will open and charging will stop.

Timing circuits

The charger has a timer built in that will turn off the charger after a fixed period of time. Depending on the position of the first dip switches, the time will be enabled 1) when the battery reaches acceptance voltage, 2) when power is applied or 3) when the Rudman regulators on a properly installed RegBuss interface come up to temperature. Turning the first three DIP switches off will disable the timer function.

The rotary switch sets the time out duration. A larger number is a longer period. 1 is 15 minutes, etc. Zero is the 3 O'clock position. Selecting It will result in 0 time. Use positions 1 through 15.

The Blue LED blinks when the timer is running. Faster blinks mean less time remaining.

When the timer runs out, the blue LED will stay on solid and the charger stops charging. To restart the timer, turn off the power and turn it back on.

Dip switch settings:

The dip switch is a 8 position switch bank on the upper right of the Charger's front blue pannel #1 is on the right is is so labeled.

- #1 Timer starts when voltage regulation point has been met.
- #2 Timer starts on Power on. For simple timed charges.
- #3 Timer starts on a Hot regulator sensed on the RegBuss port.
- #4 Timer stays unlatched if the Regbuss drops the hot signal. Leave this one ON.
- #5 On chargers so equipped, enables the LowBatt signal circuitry.
- #6 Sets all MK2 regulators to the high equalize setting. Kicks the regs up 1.5 volts, and lights the yellow LEDs on all connected MK2 Regs. Also used to test the Regbuss.
- #7 Sets instant time out at voltage regulation.
- #8 Charger timer reenable . Resets the timer, restarts charging if the voltage sags below a setpoint

Field Adjustable Set pots.

Set pots That are adjustable in the field. The voltage adjust pot is always available with the blue plate being drilled for your access. There are two other pots that can be used, But they need the Blue cover plate removed to access them.

The pot to the left of the voltage trim pot is the Analog Reg cutback set point. Adjust this only if you are using the analog features on the Regulator buss.

The Pot to the right of the RJ Regbuss connector is the auto restart timer re enable set point. This allows setting a voltage in percent of the main volts trim pot that the charger will restart at. Fully clockwise is at % 100 of volts trim(not recommended) fully counter clockwise is %0 also not recommended. Setting for %50 to %90 is. To enable this feature Dipsw #8 must be on. Pot is about %5 per full turn.(20 turn pot).

Indicators

Green LED (Power indicator)

OFF- Charger has no power or is turned off.

ON- Charger is plugged in and turned on.

Yellow LED (Cutback indicator)

OFF- The charger is current limited either by the control knob or the internal current limit (AKA bulk stage)

BLINKING- Charger is in thermal cutback. Cooler air will make more power.

ON solid- Charger is in voltage cutback (AKA acceptance stage)

Blue LED (timer function)

OFF- Timer is not running (timer criteria not met)

BLINKING- Timer is running (timer criteria met but not timed out)

ON solid- Timer has timed out and the charger is in stand by mode.

Red LED (fault condition)

OFF- Charger is operating properly.

BLINKING- Output fuse is blown or charger is disconnected from battery

ON- ambient temperature is over 170F

Primary WARNINGS!
***DISCONNECT ALL OTHER NON
ISOLATED CHARGERS. FROM PACK
AND FROM LINE CURRENT.***

***MAKE SURE THERE IS NO PATH
TO GND FROM BATT + , AND BATT-.***

***MAKE SURE THE POLARTIY IS
CORRECT BEFORE YOU HOOK THE
BATTERY PACK TO THE
CHARGER OUPUT CABLE.***

***Do Not Stand on your charger.
Deforming the case will result in shorting
the internal Circuit boards to the case.
DO NOT Operate this charger Unloaded.***

***FAILURE TO HEED THESE
WARNINGS WILL RESULT IN
DAMAGE TO YOUR CHARGER.
THESE ITEMS ARE NOT COVERED BY
Warrantee.***

Additional app. notes and Manuals are available for
down loading at :

Manzanitamicro.com

Please operate your EV and charger safely.