

CPC-9140 (OLED) / CPC-9120 (OLED)

Multi-Stage Battery Chargers

User Manual

Keep this manual in a safe place for quick reference at all times.

This manual contains important safety and operation instructions for correct use of the battery charger. Read through the manual and pay special attention to the markings and labels of the charger, battery and equipment connected to the battery system.

Pay special attention to these two types of notices used in this manual.

WARNING:

Failure to heed this warning may cause injury to persons and damage to Equipment.

CAUTION:

Failure to observe this warning may result in damage to equipment and improper functioning of the Charger.

WARNING:

- The charger is designed for in-door use. Protect the charger from ingress of water.
- This charger is made to charge only properly sized lead acid batteries.
- Don't recharging non-rechargeable batteries.
- Charging other types of battery or under-sized lead acid batteries may cause fire or explosion.
- Install the charger in accordance with all local codes
- Do not use the charger if it has been dropped or damaged.
- Do not charge the battery on boats. Remove the battery and charge on shore.
- Never attempt to charge a frozen battery
- Never attempt to charge a damaged battery.
- Wear protective goggles and turn your face away when connecting or disconnecting the battery.
- Never place the charger on top of a battery.
- Never smoke, use an open flame, or create sparks near battery or charger during normal charging operation as batteries may give out explosive gas.
- Do not charge batteries in an enclosure (box- in) due to possible explosion of entrapped explosive gas.
- Use of accessory not recommended may cause risk of fire, electric shock.
- Disconnect the mains supply before connecting or disconnecting the links to the battery.
- If the charger does not work properly or if it has been damaged unplug its AC and DC connection.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.
- Children shall not play with the appliance
- Cleaning and user maintenance shall not be made by children without supervision

CAUTIONS:

- Refer to battery manufacturer's specific recommended values for battery type settings and float voltage setting.
- Ensure all ventilation ports are not obstructed for efficient fan cooling, keep loose soft material or paper off at the bottom of the charger.
- During charging, the battery must be placed in a well ventilated area.
- If longer output charging cord is required, make sure the diameter is adequate for the current in given cable length.

Battery Type supported: WET, AGM, GEL, CALCIUM/CALCIUM, LiFePO4

INTRODUCTION

Congratulations on purchasing our new Digital Multi-Stage Switching Mode Battery Charger.

DESCRIPTION

The advanced full digital switch mode design and micro-processor result an adaptive charging control, fail-safe protections.

The informative Organic LED display shows:

Charging Current, Voltage, Total Ah (ampere hours), Real time charging profile, Misc. Settings and Fault Type.

There are settings for 6 battery types, 5 level of max. charging current, and power supply mode.

The Remote Voltage Sensing provides accurate voltage regulation at the battery terminal resulting a faster and safer battery charge even for longer lead from charger to battery.

Adaptive 5 stage charging (soft start bulk, bulk, absorption, float and standby) to ensure a complete, and safe charge of your battery according to the battery's discharged condition plus a manual 4 hour Recondition Charge for wet type battery.

The smart standby mode allows charger be connected to battery permanently with energy saving stand-by mode and periodic refreshing charge to keep the battery at optimal working condition.

There are extensive software and hardware protections for the charger and the battery banks.

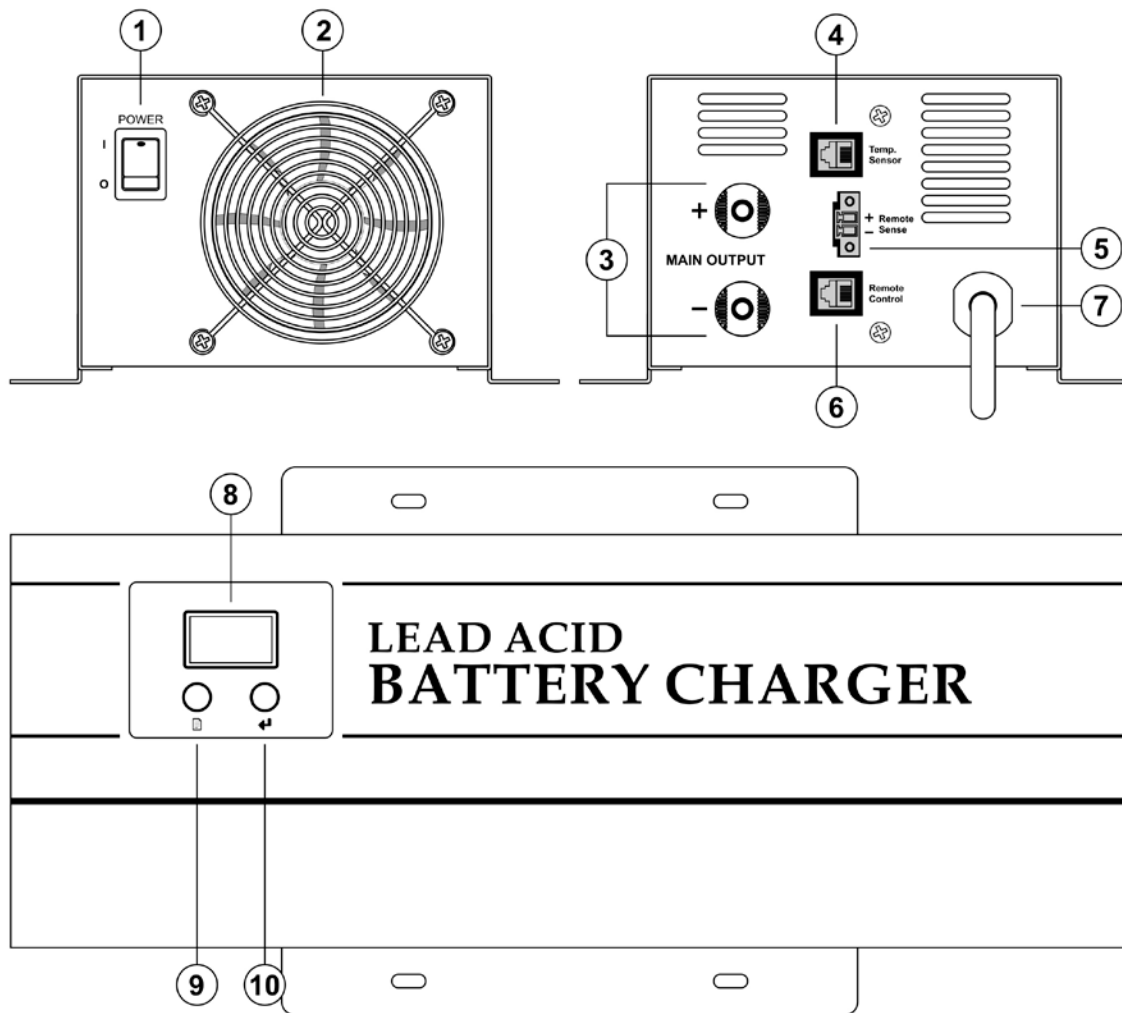
The AC over voltage and under voltage protection prevent damage to the charger in poor AC supply situation.

The charger will work in hot environment with reduced charging current until the final over temperature protection takes over.

INTENDED USE:

All Automotive, Mobile Home, Electric Scooters, Golf Carts, Deep Cycle, UPS Standby, Commercial Applications.

A. Control and Indicators







1. Power Switch
2. Thermo- control (zero to full speed) Fan
3. Main output terminals
4. Remote Temperature Sensor Socket
Connection to accessory temperature sensor
Sensor to increase/ decrease charging voltage at low/ high battery temperature
5. Remote Voltage Sensor Socket (40A model only)
Connect to positive and negative terminals of distant battery and increase charging voltage to make up for voltage drop along the connectors.
6. Remote Control Socket for remotely control of output on-off
7. AC input cord
8. OLED displays of Charger Mode
 - 8.1 Real time Charging Voltage, Current, total Ah to battery and Charging Profile.
 - 8.2 Set Battery type with Absorption & Float V, Set Max. Current
 - 8.3 Power Supply Mode with selected Voltage
 - 8.4 Fault diagnosis
9. Manual button
10. Enter button

B. Using the charger


1. Check the supplied accessories: remote temperature sensor for battery, terminal socket for remote voltage sensor.
2. Check the rating label's AC mains voltage matches your local mains.
3. Install properly sized fuses all connections to the battery and make sure all connections are secured.
4. Do all the necessary selections and settings before connecting to battery. .

C. Checking the factory settings of the battery charger



1. Power up the charger and displays of no battery is connected icon and 0.0V, 0.0A are shown.
2. Press  button to roll down the menu to "View settings"
3. Press  button to view the Batt. Type: Absorption, Float voltages
4. Press  button again to see the rest of the settings such as maxi. Current set.
5. To exit from the View Setting window, Press button  twice to exit.


In the Charger Mode, pressing any one of the two buttons , the OLED will alternatively display, battery voltage , charging current and charging profile , battery type and the total AH (ampere hour) into the battery.

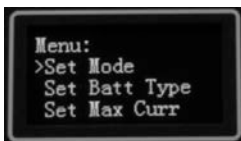





You can freeze and release the desired display by pressing 

D. Battery Type Selection

To prevent inadvertent setting of battery types, maximum output (charging) current, power supply mode, both the (Menu ) and the (Enter ) buttons must be pushed simultaneously in order to enter into the "Set Mode"

1. Power up the charger
2. Press and hold both buttons until it goes into setup menu as show in following screen
3. Press  button to roll down to "Set Batt Type" menu



4. Press  to go into Set Batt Type menu
5. Press  to scroll to your battery type then press  button to confirm selected battery type.




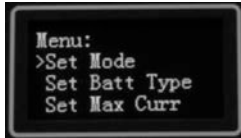
* If "Wet" battery type is selected, you have a choice to select "Recondition" or not.



* See Reconditioning Charge in the Appendix.

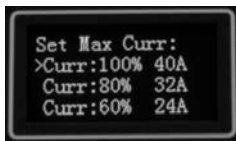
E. Maximum output Current


There are 5 max., charging current can be configured.

1. Power on charger
2. Press and hold both buttons until it goes into setup menu as show in following screen
3. Press  button to scroll down to “Set Max Curr” menu.



4. Press  to go into “Set Max Curr” as shown the following menu.
5. Press  button to scroll down 100%, 80%, 60%, 40% and 20% of Maximum current.

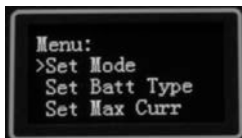




6. Press  button to confirm your selection.

See Appendix for optimal maximum output current for battery capacity AH.

F. Power Supply Mode

1. Power on charger
2. Press and hold both buttons until it goes into setup menu as show in following screen





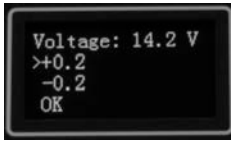
3. Press Enter  button at the “Set Mode “and the following menu window appears
4. Press Menu  button to point to Power Supply as show below




5. Use the  Press and the  buttons to select and set output Voltage between 12.4V to 14.2V



6. Press  button to switch arrow to +0.2 or -0.2 then press  to change the setting.



7. When output voltage is correct, move arrow to OK and press  to confirm.
8. Set the output to On or Off for the power supply mode to complete the setting as needed.
9. The voltage setting for power supply mode will be retained even after unit has been switched off.



G. Remote Temperature Sensor

Warning!

The temperature sensor must be installed at the Negative Terminal of the battery terminal, wrong connection to the Positive Terminal will damage the charger and the sensor.

The temperature sensor is used to optimal charging over wide ambient temperature range. Fix the temperature sensor in a position on the battery which is not affected by other cooling or heating source. Plug in the temperature sensor before switch on the charger to activate the temperature control function, never plug in the charger during charging.

Temperature compensation works at all charging stages; Bulk, Absorption & Float, Max. compensation voltage is 0.3V with reference at 25°C, 1°C for 0.02V.

When battery temperature exceeds 60°C, the charger output shuts down and auto recovers when temperature drops down below 50°C.

H. Remote Voltage Sensor Socket

Remote Voltage Sense

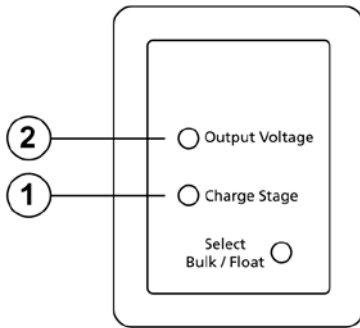
This feature makes up for the voltage loss due to long or under-sized charging cable.

The maximum compensation voltage is 0.3V.

Make sure the connect the sensing positive and negative wires (not supplied) are correctly to the supplied plug. Twisted wires thicker than #24 AWG are recommended.

It is recommended to unplug the Voltage Sense first before disconnecting the charger cable.

I. Remote Control Socket and Remote Control Indicator



This supplied accessory Remote Control Indicator with 2 meter cable is bundled with 40Amp model only. It is designed for caravan application or situation that remote monitoring of charging stage or voltage at the output (battery) terminal are useful. It can also alter the charging to bulk or float stage.

Output Voltage LED indicates battery voltage when no active load is connected to the battery terminal.

Charge Stage LED indicates 4 stage of charging and power supply mode as well.

The indications of both LEDs are show in Appendix 1.

The Select Button changes the charging stage from Bulk to Float, Absorption to Float, Float to Bulk depending at what stage the charger is in when the button is pressed.

This allow manual control of the charging stage when needed with load or no load condition in caravan application.

J. Specification

Model	CPC-9140	CPC-9120
AC input Voltage	200 – 240VAC, 50Hz	
AC input Current at Full Load	< 3.5A	< 2.5A
Output (Charge) Voltage Selections		
WET	Absorption 14.4V	Float 13.2V
AGM	Absorption 14.3V	Float 13.4V
Sealed 1	Absorption 14.4V	Float 13.5V
Sealed 2	Absorption 14.7V	Float 13.8V
Gel 1	Absorption 14.0V	Float 13.4V
Gel 2	Absorption 14.4V	Float 13.8V
CALCIUM / CALCIUM	Absorption 15.1V	Float 13.6V
LiFePO4	Absorption 14.4V	Float STOP Charging
Power Supply mode	12.4-14.2V	
Maximum Output Charging Current	40A	20A
Selectable Charging Current Level	20-100% (20% per step)	
Soft Start Bulk Charge		
Battery Voltage to Trigger (cut-in) Soft Start Bulk Charge Mode	< 12.3V Switches to Bulk Charge > 12.5V	
Soft Start Bulk Charge Current	50% of selected current level	
Protections	Output short circuit, output overload, charger over temperature, battery over temperature , output and input over voltage, input under voltage, Reverse Polarity ALL SELF RECOVERABLE	
Thermal output power de-rating	Yes 50 % THEN CUT OFF	
Fan Cooling	Yes ZERO TO FULL SPEED THERMO CONTROL	
Approvals	CE EN60335 EN55014 EN61000	
Remote Battery Temperature Sensor	Yes	
Dimension (L x H x D)	330 x 91 x 120mm (12.9 x 3.6 x 4.7inch)	
Weight	2kg (4.4lbs)	
Recommended Battery Capacity Range	30AH to 400AH (20% to 100% max. charge current)	80AH to 200AH

K. Appendix 1

FUNCTIONS	INDICATIONS OF LED1 & LED2	Remarks
LED1 Charger Status To indicate various Charging Stage or Power Supply Mode		
Soft Start Charging when battery voltage is low	Double flashes at short interval *-*-----*-*-----*-*	
Bulk Charging at full current	Flashing all the way *-*-*-*-*-*-*-*	
Absorption Charging at constant voltage	Single flashes at short interval *-----*-----*-----*-----	
Float Charging at reduced constant voltage	Single flashes at long interval *-----*-----*-----	
No Charging: either open circuit or connection to battery broken	LED1 and LED2 flashing alternatively *°_*°_*°_*°_*°_*°	check battery and connection to battery
Power Supply Mode	Solid ON	The select button of the remote LED display control has no function in power supply mode
LED2 Output (battery) Voltage Status To indicate charger output terminal voltage level. When no load connected to battery it indicates the battery voltage Charger Output Terminal Voltage = V_t		
V_t less than 11.0V	LED OFF	
V_t is between 11.3V and 12.0V	Flashing all the way *-*-*-*-*-*-*-*	
V_t is between 12.5V and 13.8V	Single flashes at short interval *-----*-----*-----*-----	
V_t is larger than 13.8V	Solid ON	
No Charging: either open circuit or connection to battery broken	LED1 and LED2 flashing alternatively *°_*°_*°_*°_*°_*°	check battery and connection to battery

L. Appendix 2

Reconditioning Charge is applicable only for wet type battery.

This slight over charging wet battery brings up the AH capacity of weaker cells so to make all six cells balanced. It also bubbles up the heavy part (sulphuric acid) of electrolyte to mix well with the water content. Periodic recondition charge will prolong the life of wet lead acid battery.

However, battery must be fully charged first before recondition charge is applied, and all loads should be disconnected due to higher charging voltage. The charger software is programmed to ensure proper conditions are met before recondition charge starts.

M. Charging Current and Battery Capacity

Most battery manufacturers recommend an optimal charging current at about 1/4 C or 25% of the battery capacity for stand alone battery, for example a 120 AH battery, the optimal maximum charging is $120 \times 25\% = 30\text{Amp}$.

Always check the label on the battery or consult manufacturer.