VMAXTANKS™

AUTOMATIC BATTERY CHARGER

MAINTAINER

6V&12V &14.4V 10AMP&9AMP

FOR LEAD ACID BATTERIES (STANDARD, GEL AND AGM)
&LIFEPO4 BATTERIES

With DC Adapter Mode& Battery Tester Mode

MODEL : BC61210ARC

USER MANUAL

THIS MANUAL CONTAINS IMPORTANT SAFETY AND OPERATING INSTRUCTIONS.

6V Lead Acid 12V Lead Acid LiFePO4 Battery Tester Adapter

WARNING

1. WARNING-RISK OF EXPLOSIVE GASES

a. Working in the vicinity of a lead-acid battery can be dangerous. Certain batteries may generate explosive gasses during normal battery operation.

b. Read Instructions carefully before use.

c. Not for use by children.

2. To reduce risk of a battery explosion, follow these instructions and those marked on the battery.
3. NEVER smoke or allow an open spark or flame in the vicinity of the battery or engine.
4. CAUTION - To reduce the risk of injury, use the charger for charging a rechargeable lead-acid or LiFePO4 battery only. It is not intended to supply power to a low-voltage electrical system.
5. Do not expose the charger to moisture, rain or snow. Use in well-ventilated and dry areas.
6. Use of an attachment not recommended or sold by the battery charger manufacturer may result in a risk of fire, electric shock, or injury to persons.
7. To reduce risk of damage to the charger's plug and cord, pull by plug rather than the cord when disconnecting the charger.
8. Make sure the cord is located so that it cannot be stepped on, tripped over, or otherwise subjected to damage or stress.
9. Read all the battery manufacturers' specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.
10. Do not use the battery charger unless the battery voltage matches the output voltage rating of the charger.
11. Do not operate the charger in a closed-in area or restrict ventilation in any way.
12. An extension cord should not be used unless absolutely necessary. Use of improper extension cord could result in a risk of fire and electric shock. If an extension cord must be used, make sure the extension cord is properly sized and is in good electrical condition.
13. Do not operate the charger with a damaged cord or plug. If the supply cord cannot be replaced and the cord is damaged, the appliance should be scrapped.
14. Do not operate the charger if it shows any signs of physical damage.
15. Do not disassemble the charger. Take it to a qualified repair station dealer when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.
16. To reduce the risk of electric shock, unplug the charger from an outlet before attempting any maintenance or cleaning
17. Do not attempt to charge a damaged or frozen battery.

› PREPARING TO CHARGE

a. If necessary to remove the battery from a vehicle for charging, always remove grounded terminals from the battery first. Make sure all accessories in the vehicle are off in order to prevent an arc.

b. Ensure the area around the battery is ventilated during charging.

c. Clean battery terminals. Be careful to keep corrosion from coming in contact with your eyes.

d. If battery is not sealed, add distilled water in each cell until the battery acid reaches the level specified by the battery manufacturer. This helps purge excessive gas from cells. Do not overfill. Fora sealed battery or a battery without cell caps, follow manufacturer's recharging instructions.

e. Refer to the battery manufacturer's charging specifications such as removal of cell caps during charging and recommended rates of charge.

f. Determine the voltage of the battery and make sure it matches the output rating of the battery charger.
g. Never place the charger directly above or below the battery being charged. Gasses or fluids from the battery will corrode and damage the charger.
h. Never allow battery acid to drip on the charger when reading gravity or filling the battery. Do not operate a charger in a closed-in area with poor ventilation e. Do not set a battery on top of the charger.

CONNECTING TO THE BATTERY

Do not connect the AC power plug until all other connections are made. Determine the correct polarity of the battery terminals on the battery. If the battery is in a vehicle, do not make any connections to the fuel lines, carburetor, or thin sheet metal parts. The below instructions are for a negative ground system (most common). If your vehicle is a positive ground system (very uncommon), follow the below instructions in reverse order:

1. Connect the positive (red) connector to the positive (+) battery terminal.
2. Connect the negative (black) connector to the negative (-) battery terminal.
3. Connect the battery charger into an electrical outlet. Do not face the battery when making this connection.
4. When disconnecting, disconnect in the reverse sequence, removing the negative first (or positive first for positive ground systems)

OPERATING INSTRUCTIONS:

AUTOMATIC MONITORING– Your new battery charger is completely automatic and can be left on whenever input power is made available to the charger. The charger output depends on the condition of the battery it is charging. When the battery is fully charged, the “Good” will indicate and the battery indicator will show “100%” , then the charger will switch itself to a storage charge mode and will automatically monitor and maintain the battery at full charge.

CABLE CONNECTIONS- Your new battery charger is equipped with two output leads, a red positive lead, and a black negative lead and a permanent mount eyelet lead with a 2-pin SAE connector. Always connect or disconnect the output leads before plugging into AC power. For all battery types: Connect the red positive (+) lead to the positive terminal of the battery. Connect the black negative (-) lead to the negative terminal of the battery.

NOTE: If the charger is left connected to a flooded lead acid battery for long periods of time, check water levels periodically as directed by the battery manufacturer to ensure the electrolyte is maintained at a proper level

ATTENTION: THE BATTERY CHARGER HAS A SPARK FREE AND REVERSE POLARITY PROTECTION.

AS A GOOD PRACTICE, NEVER ALLOW THE TWO CLIPS TO TOUCH EACH OTHER.

The battery charger will not produce voltage (turn on) until it recognizes at least two volts from the battery. The battery charger clips must be clipped to a battery in the correct polarity to initiate output voltage and begin charging when in Lead Acid (Pb) charge mode.

When in Lead Acid (Pb) charge mode if the charger is hooked up in reverse polarity, the red "Reverse Polarity" light will flash indicating that the connection has been made in reverse of the polarity of the battery and a charge has not been initiated. The clips must be re-connected in theproper polarity to start the charger, Red to positive (+ to +) and Black to Negative(- to -).

NOTE: DO NOT TURN YOUR BATTERY CHARGER ON AND OFF REPEATEDLY (Plug and Unplug) WITHIN A SHORT PERIOD. IF THIS HAPPENS, UNPLUG BATTERY CHARGER FROM AC POWER, WAIT FOR ONE MINUTE AND THEN CONNECT THE CHARGER AGAIN TO RESTART CHARGING CYCLE

ESTIMATED TIME TO CHARGE

(BATTERY CAPACITY) / (CHARGER CURRENT) = HOURS or

(AMP HOURS) / (AMPS) = EST. HOURS TO CHARGE

Suppose you have a 100AH (Amp-Hour) battery. Now Let's say you have a 10 Amp charger that will deliver 10 Amps for as long as it takes to get the battery voltage up to its recharged level. So how long will it take to actually charge the battery? You can make calculated guess by just dividing two numbers.

Example: (100AMP HOURS) DIVIDED BY (10AMPS)=10 HOURS: Some large capacity batteries may take up to 24 hours or even days to fully charge Note: it is recommended that only one battery be charged at a time.

FULLY DISCHARGED BATTERIES - LEAD ACID (Pb) CHARGING MODE: If your battery is totally discharged (below 2.0 volts) the BATTERY CHARGER circuitry will not start. The internal safety circuit of the battery charger must sense more than 2.0 volts in the battery before it will allow the charging circuit to turn on. Otherwise, the charger is inoperable. In this case, the bad battery indicator light will flash, which means charging has not been initiated. To initiate charge on a battery that is below 2.0 volts, you must fool the battery charger circuitry by momentarily jumping the discharged battery to a known charged battery (above 2.0 volts) This will trick the charger into initializing the charging sequence.

Note: Unless the battery was rapidly discharged (lights left on overnight) most 12 volt lead acid batteries that are at a state of charge that is less than 9 volts are likely to be worn out or defective

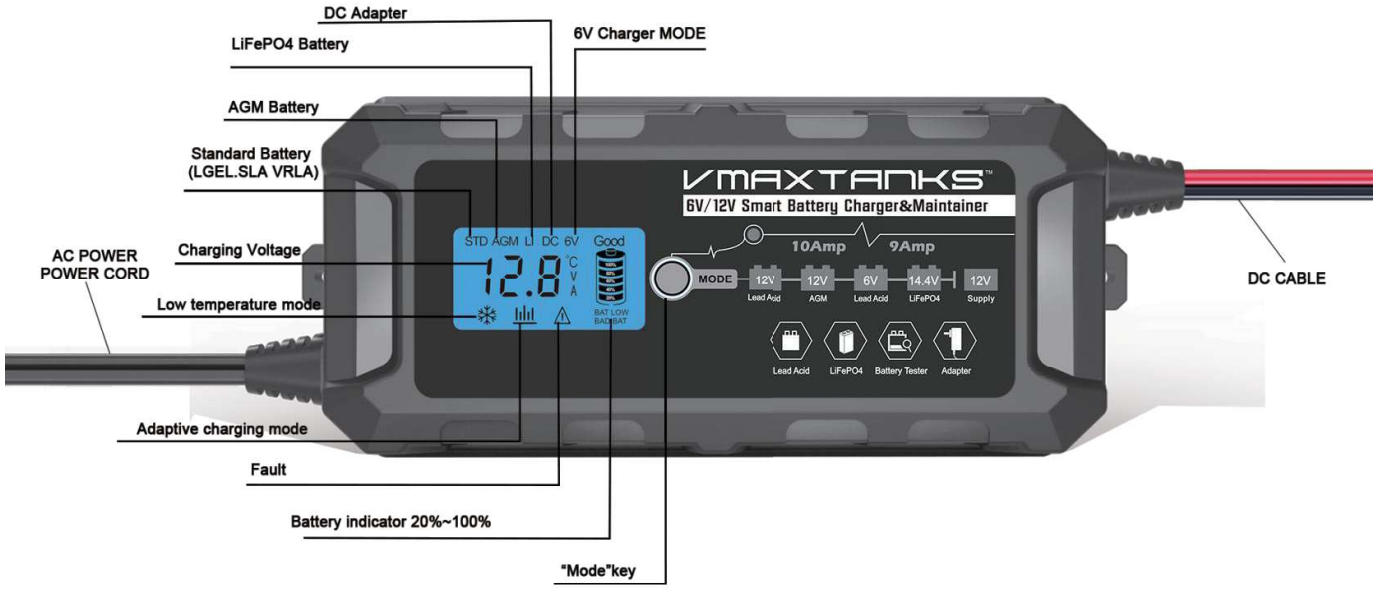
72 HOUR SAFETY FEATURE: A 72 hour Safety Timer will commence anytime the charger is on. This feature is designed to protect batteries from overcharging. If the battery voltage reaches the proper level within 72 hours, the charger will automatically switch to float mode. If your battery is defective, the Battery Charger will stop and the bad battery indicator will be indicated.

❯SELECTION FOR OPERATING MODE

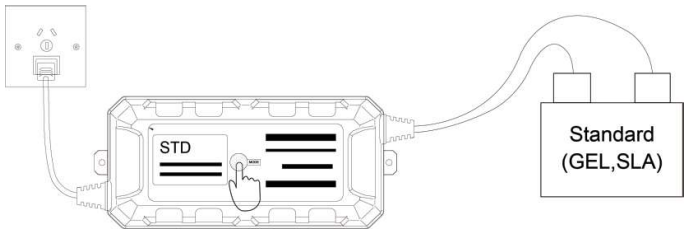
After AC power is connected with the wall socket properly, press the MODE button for battery charge mode selection before you connect the charger to the battery terminals.

LCD Signal	Operating Mode	Description
STD	Lead Acid charging	12V lead-acid battery charge mode（Standard，GEL，SLA，VRLA）
AGM	AGM Battery Charging	12V AGM battery charge mode
LI	LiFePO4 charging	14.4V LiFePO4 battery charge mode
DC	DC Adapter	12V DC Adapter
❄	Low temperature charging	Low temperature charging mode for 12V lead acid batteries(Standard&AGM)
6V	6V Lead Acid Battery Charging	6V lead-acid battery charge mode (Standard Flooded, AGM, GEL, VRLA, SLA)

LCD SIGNAL INSTRUCTION:

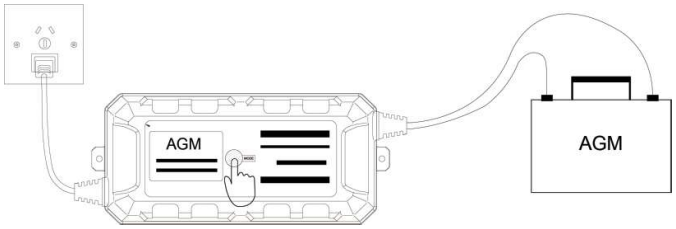


HOW TO USE:



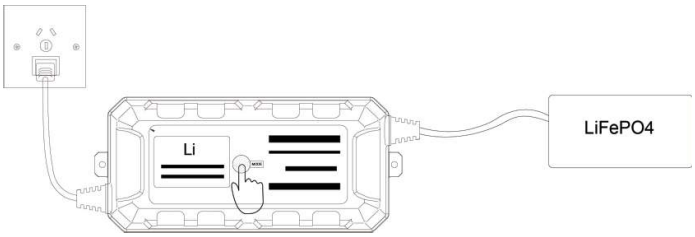
1.STANDARD MODE:

AC Power is connected with the wall socket properly,Press "MODE" key, The LCD signal will show "STD", the charger is switched to standard battery Mode (GEL,VRLA,SLA), correctly connect the charger output leads (Red"+",Black"-") to battery positive and negative terminals.



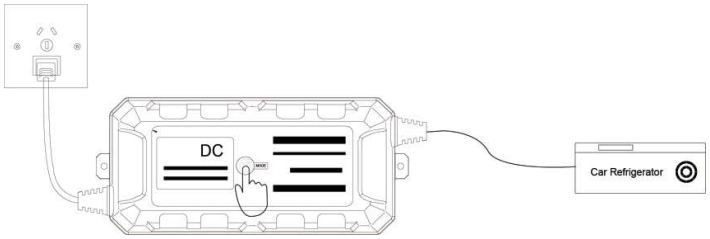
2.AGM MODE:

AC Power is connected with the wall socket properly, Press "MODE" key, The LCD signal will show "AGM", the charger is switched to AGM battery mode(AGM), correctly connect the charger output leads (Red"+",Black"-") to battery positive and negative terminals.



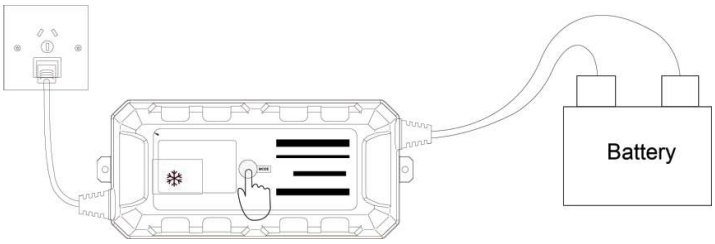
3.LI MODE：

AC Power is connected with the wall socket properly, Press "MODE" key, The LCD signal will show "LI", thecharger is switched to LiFePO4 battery mode(LiFePO4),correctly connect the charger output leads (Red"+",Black"-") to battery positive and negative terminals.



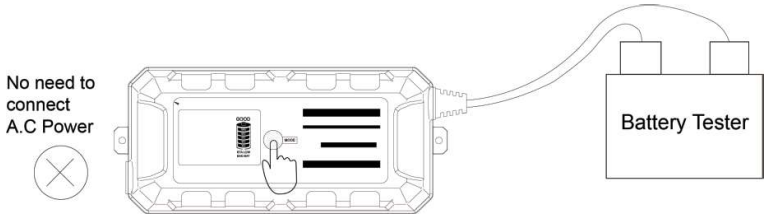
4.DC ADAPTER MODE:

AC Power is connected with the wall socket properly, Press "MODE" key and hold for 3-5seconds, The LCD signal will show "DC", the charger is switched to DC Adapter with 12V 10Amp (MAX output 120 Watt).



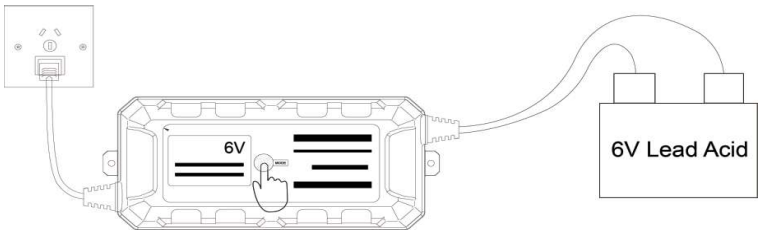
5.LOW TEMPERATURE CHARGINGMODE：

When the ambient temperature is below -10 degrees, Press “MODE”Key, The LCD signal will show“❄”this mode can be set for battery charging to facilitate the rapid recovery of the battery capacity. NOTED:ONLY FOR 12V LEAD ACID BATTERIS(Standard,AGM)



6.BATTERY TESTER MODE：

The charger can be used for testing your battery healthy.Correctly connect your battery positive and negative with the charger leads, no need to connect AC power.
The LCD display will indicate battery indicator 20-100%,“BAT LOW” will be indicated while the battery voltage is LOW.



7.6V MODE：

(6V Lead Acid Battery)
AC Power is connected with the wall socket properly, Press "MODE" key, The LCD signal will show "6V", the charger is switched to standard battery mode (GEL, VRLA, SLA), correctly connect the charger output leads (Red“+”, Black"-") to battery positive and negative terminals.

›LCD Signal INDICATION:

1)(Pb) lead acid battery charging mode：

LCD signal	Operating Mode	Indication
Power on	0 V	AC power is connected with the wall socket properly, Charger is standby,NO battery connected
STD Mode	12V lead acid battery charging mode	The charger is switched to 12V lead-acid (Pb) battery charging mode(standard,GEL,SLA,VRLA)
AGM Mode	12V AGM Battery charging mode	The charger is switched to 12V lead-acid (Pb) battery charging mode(AGM),Press"MODE"key to set
6V Mode	6V Lead Acid Battery Charging Mode	The charger is switched to 6V lead-acid (Pb) battery charging mode (Standard Flooded, AGM, GEL, VRLA, SLA)
	Low temperature charging Mode	Select this mode when ambient temperature is below 15°F Can be set for battery charging to facilitate the rapid recovery of the battery capacity. NOTED:ONLY FOR 12V LEAD ACID BATTERIES(Standard,AGM)
	20%-100% charge processes	Battery charge processes will commence,the whole processes include Qualification, Soft Start Phase, Bulk Phases,Adaptive charging Phase, Absorption Phase,Fully Charged Phase And Maintenance Phase
	Adaptive charging	The charger can make a calculated guess for the battery capacity.automatically adjust the charging current.to avoid overcharge battery while using this charger for a small capacity battery.
GOOD	Fully Charged Maintenance	The charging process is completed and the battery is in maintenance mode, it can be returned to service if necessary or left safely connected to the charger indefinitely
BAD BAT	Bad Battery	The battery is worn out or is possibly defective. Suggest replacing
BAT LOW	Battery voltage is low	The 12V battery voltage is under 9V; or the 6V battery voltage is under 4.5V
	Fault	Reverse Polarity or output short-circuit protection

2) Lithium Iron Phosphate (LiFePO4) Battery Charging Mode:

Note:
1) Please be sure not to touch clips together and make sure to connect the red positive (+) lead to the positive terminal of the battery and the black negative (-) lead to the negative terminal of the battery

LCD signal	Operating Mode	Indication
Power On	0 V	AC power is connected with the wall socket properly, Charger is standby,NO battery connected
LI	LiFePO4 battery charging Mode	The charger is switched to LiFePO4 battery charge mode
	20%-100% Charging processes	Battery charging processes will commence,the whole process include PCM Activation,Bulk Phases,Absorption Phase, Fully Charged
GOOD	Fully Charged	Charging is complete and battery can be put into service or left safely on the charger indefinitely
Bad Battery	Bad Battery	The battery is worn out or is possibly defective. Suggest replacing battery
BAT LOW	Battery voltage is low	The battery voltage is under 9V
	Fault	Reverse Polarity or output short-circuit protection

2) DC Adapter Mode

AC power is connected with the wall socket properly,Press “MODE” Key for 3-5 seconds,The device will enter DC adapter mode.The LCD signal will show “DC”,it can supply 120-Watt output (12V-DC & 10-Amp)

3) Battery tester Mode

The charger can be used for testing your battery healthy.Correctly connect your battery positive and negative with the charger leads, no need to connect AC power.

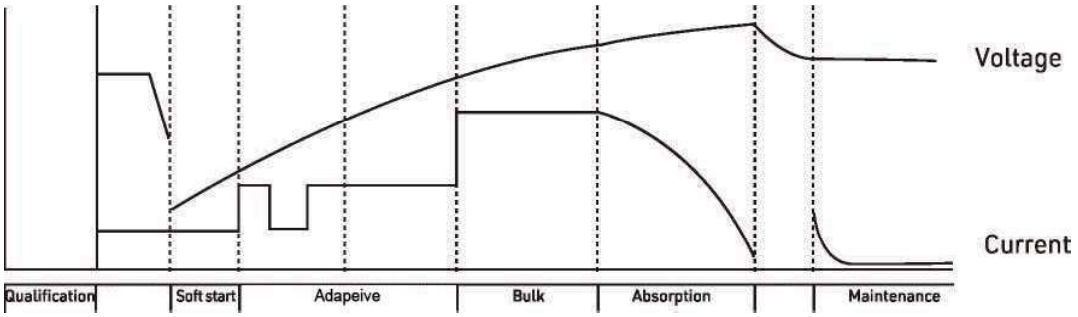
The LCD display will indicate battery indicator 20-100%,“BAT LOW” will be indicated while the battery voltage is LOW.

❯ TROUBLE MESSAGE LIGHTS CHECKLIST

NO LCD signal	A. Disconnect the charger from the AC outlet. Check connections to battery and ensure they are connected properly. B.Check to ensure that there is power at the AC outlet.
LCD Signal is ON,No charging current	A. Battery is not connected B. The battery may be damaged or below 2 volts, charge process will not begin. In this case the"Bad Battery" Light will be on
BAT LOW signal is ON	Battery voltage is under 9V
BAD BAT signal is ON	The battery is worn out or is possibly defectiveSuggest replacing battery with a battery.
The charger is charging but the 20-100% signal does not come on	A.The battery is worn out or is possibly defective. Suggest testing and/or replacing battery. B.The battery may have an excessive draw caused by a potential short circuit. Disconnect battery from charger. Suggest testing and/or replacing battery. C.The charged battery is larger than the marked capacity (shown in manual). Please recharge with a larger current charger.

› Pb Charging mode Lead-Acid Battery Charging Model

6 Stage Charge, Conditioning and Maintenance Process Map



1. Qualification Phase

Initially ensures the battery is in good condition prior to Launch of normal charge processes, as a safety measure charge processes will not begin if battery is below 2 volts.

2. Soft Start Phase

Soft Start is applied when the charger has detected a battery at a very low initial state of charge. Voltage and current are delivered at a specified rate to help the battery to recover prior to entering pulse charge mode.

3. Bulk Charge Phase

With the battery now having gone through Qualification and Recovery phases as needed the Bulk Charge phase gives the battery constant current, taking the battery up to 80% of its full capacity.

4. Adaptive Phase

The charger can make a calculated guess for the battery capacity. Automatically adjust the charging current.to avoid overcharge battery while using this charger for a small capacity battery.

5. Absorption Phase

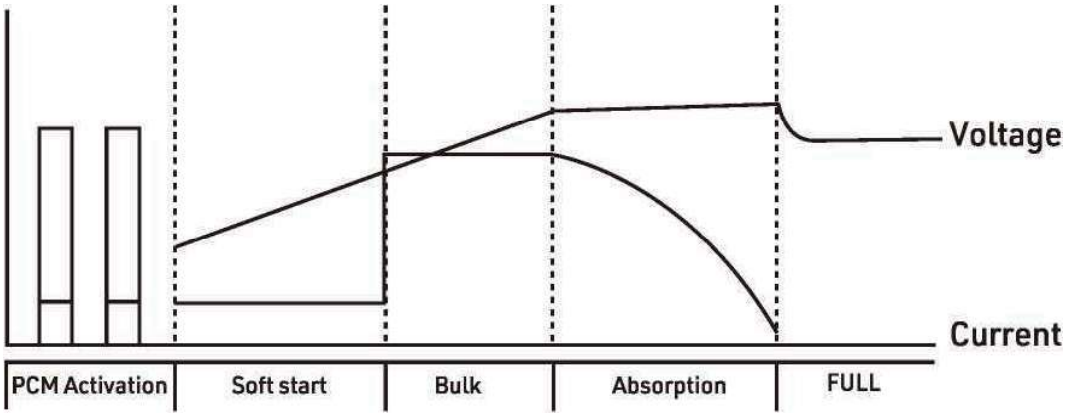
In the Absorption phase the battery is given constant voltage while current is reduced based on actions taken from ongoing battery monitoring until the battery is 100% charged.

6. Maintenance Phase

The battery can be left safely connected to the charger indefinitely. The charger will constantly monitor the battery and " turn-on" again as needed to maintain the battery at a full state of charge.

➢LiFePO4 Charging Mode(Lithium Battery Charge Mode)

4 Stage Charge, Conditioning Process Map



PCM Activation: Once the charger has been properly connected to the battery it will deliver a constant pulse frequency to activate the PCM before it enters into the charge program.

1. Soft Start Phase

Soft start is applied when the charger has detected a battery at a very Low Initial state of charge. Voltage and current are delivered at a specified rate to help the battery recover prior to bulk charge.

2. Bulk Charge Phase

With the battery now having been activated and gone through the Soft Start phase as needed the bulk charge phase gives the battery constant current, taking the battery up to 80% of its full capacity.

3. Absorption Phase

In the absorption phase the battery is given constant voltage while current is reduced based on actions taken from ongoing battery monitoring until the battery is 100% charged.

4. Full Charge

Charging is complete and the battery can be returned to service or left safely connected to the charger indefinitely.

Technical Specifications:

Model:	BC61210ARC
Input:	110Vac@60Hz
Input Cable:	14AWG U.S.SPT-2/ EU-H03W AUST/NZ-H03WV
Output:	6V 10A for Pb batteries 13.8V 10A for Pb batteries 14.4V 9A(max) for LiFePO4 batteries 14.9V 10A for AGM Battery 12V 10A for DC adapter
Max. Voltage:	14.5V Lead-Acid(Pb) Battery charging 14.9V AGM Battery charging 14.4V LiFePO4 Battery charging
Output Cable:	#14AWG insulated cable
Min.starting voltage:	2.0V(the charger can`t charge battery under 2.0V)
Overcharge Protection:	Yes
Reverse Polarity Protection:	Yes
Short Circuit Protection:	Yes
Spark Proof:	Yes
Cooling	Natural
Operating temperature	-10～50 degree
Waterproof	IP65
Battery Capacity:	Charging and maintenance all 30-150Ah Lead-Acid Batteries; Charging 9-108Ah LiFePO4 batteries

Charger selection and use

Charge and maintenance capacity ranges are suggested only as a guide for battery charger selection and application based on varied customer charging and maintenance requirements. Please be sure to follow safety and use information in the user guide for correct product application and use.

RoHS

Intertek
4009049