AUTOMATIC BATTERY CHARGER

MAINTAINER

12V 6A & 14.4V 4,5A

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

With DC Adapter Mode& Battery Tester Mode

MODEL : EPA1205L (LCD)

USER MANUAL

Ver2.0

THIS MANUAL CONTAINS IMPORTANT SAFETY AND OPERATING INSTRUCTIONS.
PLEASE SAVE THESE INSTRUCTIONS. KEEP WITH OR NEAR CHARGER AT ALL TIMES

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

WARINGS

1. WARNING-RISK OF EXPLOSIVE GASES

a.Working in the vicinity of a lead -acid battery can be dangerous. Batteries generate explosive gases during normal batter operation.

b.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.

c.The appliance is not intended for use by young children or infirm persons without supervision Young Children should be supervised to ensure that they do not play with the appliance.

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 us the charger for charging a rechargeable lead-acid battery only It is not intended to supply power to a low-voltage electrical system or to charge dry-cell batteries. May cause cause them to burst and cause injury to persons and damage to property.

5.Do not expose the charger to moisture,rain or snow.for indoor use only.

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 electric plug and cord, pull by plug rather than cord when disconnecting the charger.

8.Make sure cord is located so that it cannot be stepped on, tripped over, or otherwise subjected to damage or stress.

9.Study 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 extension cord must be used, make sure.

a.That pins on the plug of extension cord are the same number, size and shape as those of plug on charger;

b.That extension cord is properly wired and is in good electrical condition;

13.Do not operate the charger with 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 has received a sharp blow, been dropped, or otherwise damaged in any way Take it to a qualified repair station or EP dealer.

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 risk of electric shock, unplug the charger from an outlet before attempting any maintenance or cleaning.

› PERSONAL PRECAUTIONS

a. Someone should be within range of your voice or close enough to come to your aid when you work near lead-acid battery
b.Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes
c. Wear complete eye protection and clothing protection. Avoid touching eyes while working near battery
d. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters an eye, immediately flood eye with running cold water for 10+ minutes and get medical attention at once.
e. NEVER smoke or allow a spark or flame in vicinity of battery or engine
f. Do not drop metal tools on battery as it might cause a spark or short-circuit damage equipment or Lead to an explosion
h.Remove all metal items (jewelry) when working with a lead-acid battery, as they can produce a short-circuit current strong enough to weld metal, possibly causing a severe burn.
h. It is not intended to supply power to a Low-voltage electrical system or to charge dry-cell batteries. Charging dry-cell batteries may cause them to burst and cause injury to persons and/or damage to property
I. NEVER charge a frozen battery.

› PREPARING TO CHARGE

a. If necessary to remove battery from vehicle for charging, always remove grounded terminals from battery first. Make sure all accessories in the vehicle are off in order to prevent an arc.
b. Ensure area around battery is ventilated during charging. Explosive gas/micro particles can be blown away by using a piece of cardboard or non-metallic fans.
c. Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes
d. If battery is not sealed, add distilled water in each cell until battery acid reaches Level specified by battery manufacturer. This helps purge excessive gas from cells. Do not overfill. For a sealed battery or a battery without cell caps, carefully follow manufacturers recharging instructions
e. Study all battery manufacturers' specifications such as removal of cell caps during charging and recommended rates of charge
f. Determine voltage of battery by referring to vehicle owner's manual and make sure it matches output rating of the battery charger.

› LOCATE CHARGER

a. Place the charger as faraway from battery as the DC cables permit
b. Never place the charger directly above or below the battery being charged. Gases or fluids from the battery will corrode and damage the charger.
c. Never allow battery acid to drip on the charger when reading gravity or filling battery
d. Do not operate charger in a closed-in area with poor ventilation
e. Do not set a battery on top of charger

›CONNECTION PRECAUTIONS

Connect and disconnect DC output clips only after removing AC cord from the electric outlet. Never allow clips to touch each other.

1) Follow these steps when battery is installed in vehicle as a spark near battery may cause a battery explosion.

›a. Properly place AC and DC cords to reduce risk of damage by hood, door or any moving engine parts

›b. Stay clear of fan blades, belts, pulleys, and other parts that can cause injury to persons

›c. Check polarity of battery posts. A positive (+) battery post may have a larger diameter than a negative (-) post

›d. Determine which battery post is grounded to the chassis. If negative post is grounded to the chassis (as in most vehicles), see item (e) if positive post is grounded to the chassis, see item (f)

›e. Fora negative-grounded vehicle, connect the positive (red) clip from the battery charger to the positive (+) post of battery first. Connect the negative (black) clip from the battery charger to the vehicle chassis of the engine block remote from the battery and fuel line. Do not connect the clip to carburetor, fuel lines, or sheet-metal body, instead connect to a heavy gauge metal part of the frame or engine block;

›f. For a positive-grounded vehicle, connect the negative (black) clip from the battery charger to negative battery post first, then connect the positive (red) clip from the battery charger to the vehicle chassis or engine block remote from the battery and fuel line.

›g. If using permanently mounted eyelet Lead SAE connector, simply connect to charger output lead.

›h. Connect charger AC supply cord to an electric outlet

›i. When disconnecting the charger, disconnect AC cord, remove clip from vehicle chassis, and then remove clip from battery terminal

›j. See operating instructions for length of charge information

2) Follow these steps when battery is outside the vehicle. A spark near the battery may cause an explosion reduce risk of a spark near battery

›a.Check polarity of battery posts. A positive (+) battery post may have a larger diameter than *a* negative (-) post

›b. Attach at least a 1.8m Long 1.5mm' insulated battery out-put cable charger to the negative (-) battery post.

›c. Connect the positive (red) clip from the battery charger to the positive (+) battery post.

›d. Position yourself and the free end of cable as faraway from battery as possible, then connect negative (black) clip from the battery charger to free end of cable.

›e. Do not face battery when making final connection.

›f. Connect charger AC supply cord to an electric outlet.

3) When disconnecting the charger, always do so in reverse sequence of connecting procedure and break first connection while standing as far away from battery as practical.

› a. A marine (boat) battery must be removed and charged on shore, to charge it on the boat requires equipment specially designed for marine use.

› 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 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 clip 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 lead acid battery for long periods of time, check water levels periodically as directed by the battery manufacturer to ensure electrolyte is maintained at proper level

ATTENTION: THE BATTERY CHARGER HAS A SPARK FREE AND REVERSE POLARITY PROTECTION .
AS A GOOD PRACTICE, NEVER ALLOW THE TWO CLIPS 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 the proper 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

(BATTERYCAPACITY)+(CHARGER CURRENT)= HOURS or

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

Suppose you have a 60Amp-Hour Battery. Now Let's say you have a 6 Amps Charger

that will deliver 6 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 a calculated guess by just dividing two numbers.

Example: (60AMP HOURS) DIVIDED BY (6AMPS)=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 DISCHARGEDBATTERIES - LEAD ACID (Pb) CHARGING MODE: If your battery is totally discharged(below 2.0 volts) the BATTERY CHARGER circuitry will not start due to its internal safety circuit. 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

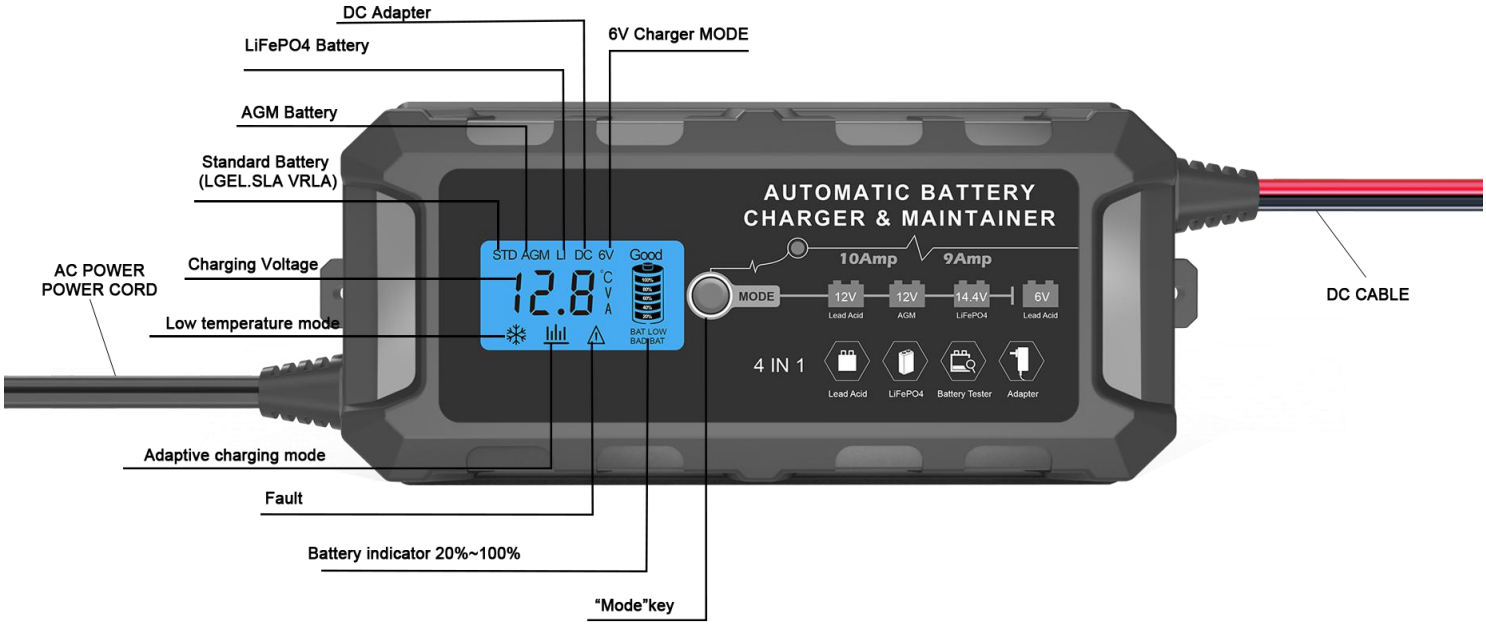
HOUR SAFETY FEATURE: A 72 hour Safety Timer will commence anytime the charger is on. This feature is designed to protect marginal batteries from over charging. If the battery voltage reaches the proper level within 72 hours, the charger will automatically switch to float mode. If your battery is marginal or defective, the Battery Charger will stop all the happens, the bad battery indicator will be indicated. If this is the case, please contact your local battery deal and have the battery tested

›SELECTION FOR OPERATING MODE

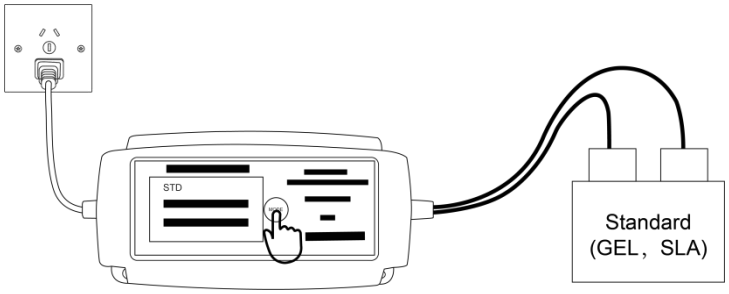
AC power is connected with the wall socket properly
Press MODE key for battery charge mode selection before you connect the charger to the battery terminals.

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)

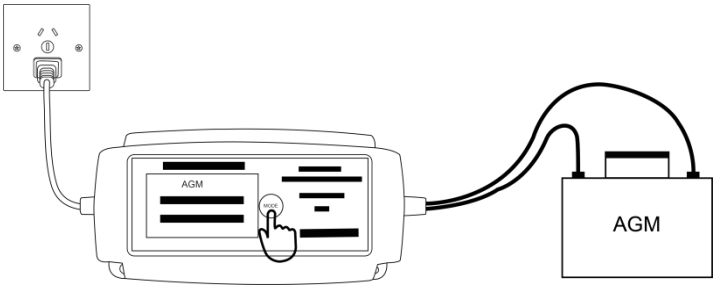
LCD SIGNAL INSTRUCTION:



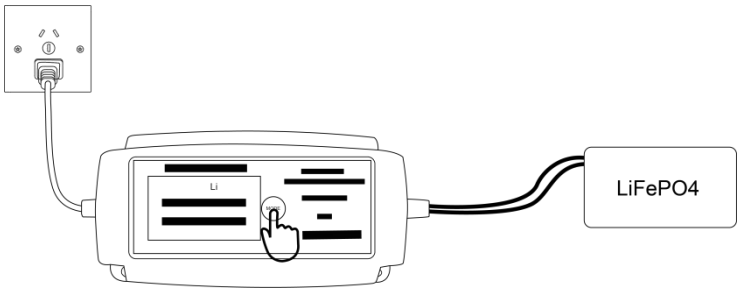
HOW TO USE:



1.STANDARD MODE:
A.C 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

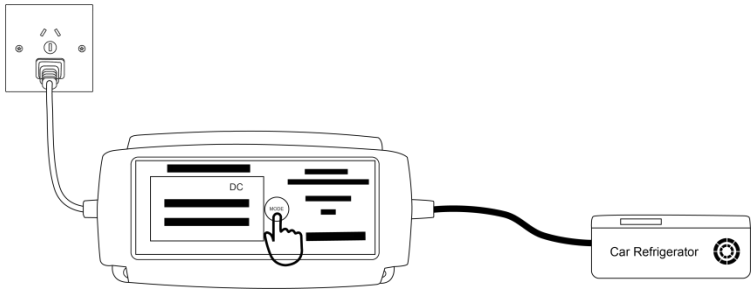


2.AGM MODE:
A.C Power is connected with the wall socket properly,Press "MODE"key,The LCD signal will show "AGM",the charger is switched to AGM battery mode(AGM),correctly connect the charger output leads (Red"+",Black"-")to battery positive and negative



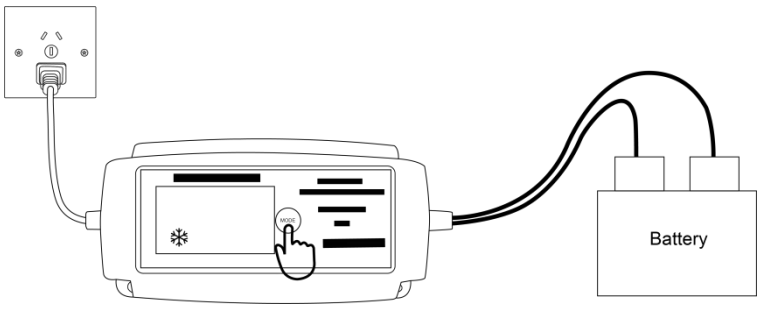
3.LI MODE：

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



4.DC ADAPTER MODE:

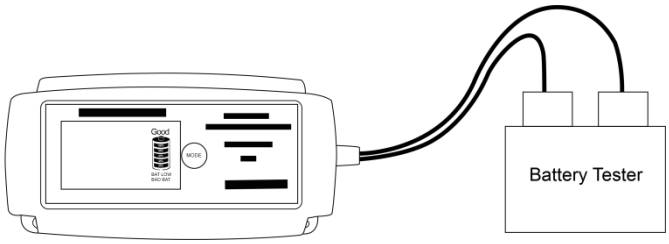
A.C Power is connected with the wall socket properly,Press "MODE"key and hold for 3-5 seconds ,The LCD signal will show "DC",the charger is switched to DC Adapter with 12V 6Amp (MAX output 72 Watt)



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)

No need to connect A.C Power



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,easily to know your battery status.

›LCD Signal INDICATION:

1)(Pd) lead acid battery charging mode：

LCD signal	Operating Mode	Indication
Power on	0 V	A. C. 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
	Low temperature charging Mode	When the ambient temperature is below -10 degrees, 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)
	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	A. C. 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

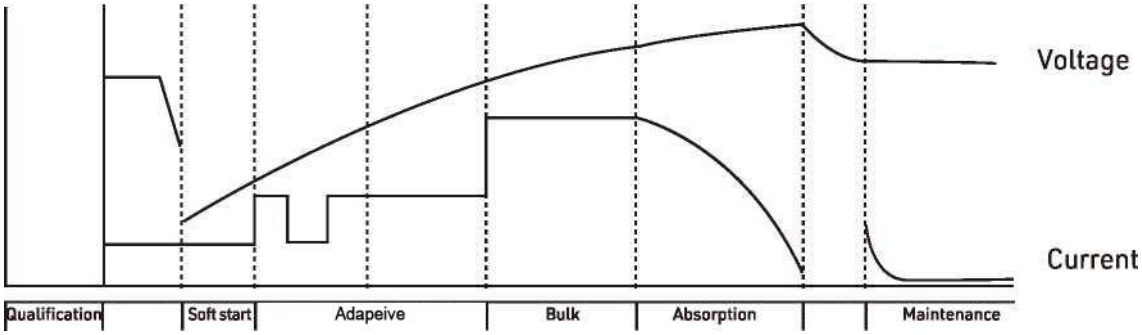
The charger can be used for testing your battery healthy.Correctly connect your battery positive and negative with the charger leads, no need to connect AC power.
The LCD display will indicate battery indicator 20-100%,”BAT LOW” will be indicated while the battery voltage is LOW,easily to know your battery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

›TROUBLE MESSAGE LIGHTS CHECKLIST

NO LCD signal	A.Disconnect the charger from the AC outlet Check connections to battery and ensure they are good B.Check to ensure that there is power at the AC outlet by plugging in a table lamp or power meter
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 defective Suggest 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 with battery B.The battery may have an excessive current 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 charger marked capacity (shown in manual) Please recharge with larger capacity 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

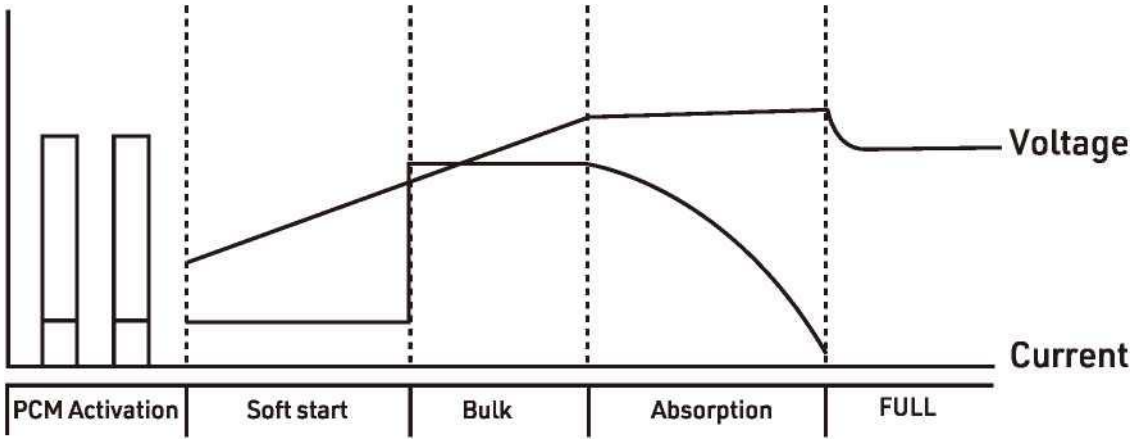
In the Absorption phase the battery is given constant voltage while current is reduced based on actions taken from ongoing battery monitoring until the battery is 100%o charged

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 readiness

➢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 to 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

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 on the charger indefinitely

Technical Specifications:

Model:	EPA1205L
Input:	100-240Vac@50Hz
Input Cable:	14AWG U.S.SPT-2/ EU-H03W AUST/NZ-H03WV
Output:	12.0V 6A for Pb batteries 14.4V 4,5A for LiFePO4 batteries 12V 6A for DC adapter 12V Battery Tester
Max. Voltage:	14. 5V Lead-Acid(Pb) Battery charging 14.9V AGM Battery charging 14.4V LiFePO4 Battery charging
Output Cable:	14#AWG(2.5mm) 1.8M
Min.starting voltage	2V(the charger can`t charge battery under 2V)
Overcharge Protection:	Yes
Reverse Polarity Protection:	Yes
Cooling	Natural
Operating temperature	-10～50 degree
Waterproof	IP65
Battery Capacity:	Charging and maintenance all 12-120Ah Lead-Acid Batteries; Charging 5-36Ah LiFePO4 batteries
Short Circuit Protection:	Yes
Spark Proof:	Yes

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 user guide for correct product application and use.