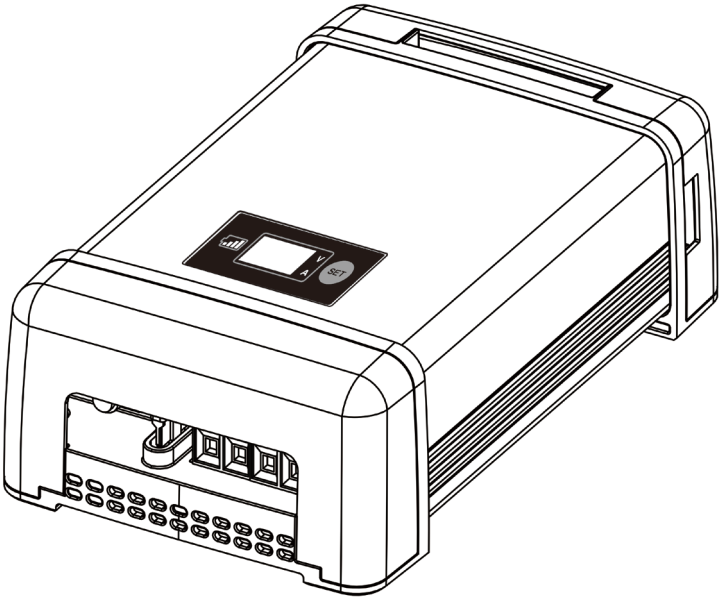
LBC-6140 / 6220
12V 40A / 24V 20A Pro. Lithium Charger

Operation 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 WARNING & PRECAUTIONS used in this manual.

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Quick user guide

1. *Check the rating label for correct AC voltage.*
2. *Connect to AC socket*
3. *3 digit LED.*
   After displaying the version, the voltage and current scroll display.
4. *Disconnect AC and connect output to battery then reconnect AC.*

USING THE SET BUTTON

Note: *3 digit LED Displays* LIt *means Lithium;* LFP *means LiFePO4*

The 3 Digits LED Display are defaulted to show the charging voltage and charging current separately change over in 3 seconds.
Short presses the SET button for charging voltage and charging current display selection.
Short presses the SET button twice can return the display back to scrolling.

Remark:

WiFi reset: (For WiFi & Bluetooth version only)
15 second long press on the SET button to *3 digit LED* will flash display “8.8.8” to reset the WiFi to factory default setting.

Warning / Cautions

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 **not** designed for any life saving application.*
- *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 and Lithium Fe PO4 (LFP).*
- *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 remove casing of the charger, there is no user -serviceable parts inside.*
- *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.*
- *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 all connections.*

Changes in the manual.
Manson Engineering Industrial Ltd. has the right to update and change the content of this manual without any prior notice and obligation.

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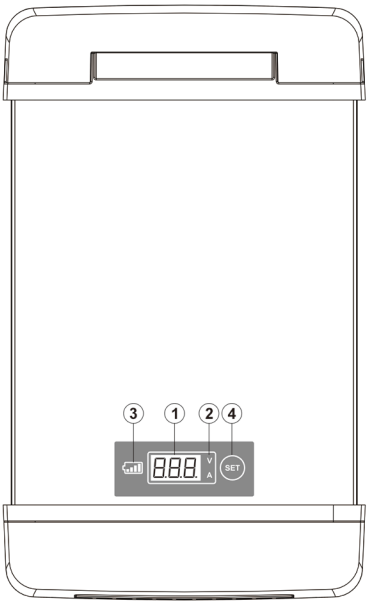
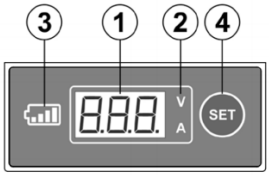
Introduction

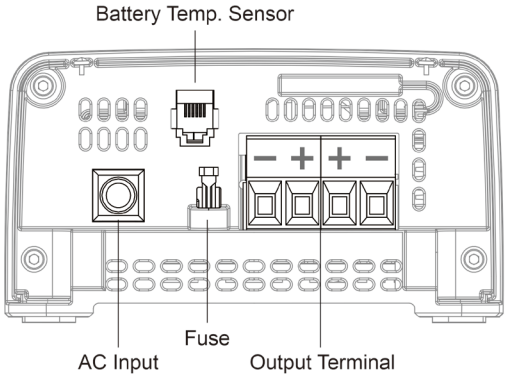
This pro charger is designed for applications that demand adaptive charging for Lithium (Lit) and LiFePO4 (LFP) batteries. Battery with or without load can be connected to the charger all the time and the charger will keep on monitoring the battery. It has Battery over temperature or low temperature protection function when connected the supplied battery temperature sensor.

Control & Indicators





1. 3 digit LED. Displays voltage, current, operation and fault code. No operation for 3 minutes, the LED turn off, press the button to restore the display.
2. LED indicates Voltage (V) and Current (A).
3. Battery Icon is on when Charger is set at the charger mode.
   a. Soft-start/ Bulk charging: Charger Icon indicator light flashing fast
   b. Absorption/EQ charging: Charger Icon indicator light flashes slowly
   c. Float charging: Charger Icon indicator light always on
   d. When in DC mode, the charge Icon indicator light remains off.
4. Set button



Using the charger

After checking for the correct ac voltage on the rating label and connection to AC supply, *3 digits LED scroll displaying the voltage and current after displaying the version*
The default battery type Lithium is on showing charger is in good working condition.

Press and hold the SET button until the 3 digits LED display flashing, the charger now goes into the setting MENU.
Remark: The charger will back to the normal operation automatically after 30 seconds in case no further action or selection. Any selection without confirmation will not save into the charger.

1. Battery Type and DC source Selection Procedure:
In the setting menu, the display shows "Lit" that means the battery types and DC source selection mode. Each short press will change the mode and battery type in cyclic order. Lit→LFP→DCS→Lit→….
Just stop at your desired battery type or DCS, press and hold the SET button for 3 seconds to next setting mode.

2.1 In case the battery type (Lit or LFP) is selected, you can set the Float charge ON/OFF
Press and hold the SET button until display "Lit" or "LFP" NOT flashing, the display will show "FLT". Short press the SET button will change the "ON" and "OFF" in cyclic order ON→OFF→ON→… Just stop at your desired selection, press and hold the SET button until the display not flashing and then goes to the next setting mode.

2.2 In case "dCS" is selected, you can set the output voltage
Press and hold the SET button until display "dCS" not flashing, the display will show the voltage value.

a. The first step is to set the unit digit of output voltage value. While unit digit flashes press SET button to change by 1V Steps: 12.8→13.8→14.8→12.8.
b. Press and hold the SET button to confirm the unit digit value and enter into decimal value setting of 0.1V steps.
c. Press SET button to change by 0.1V steps.
   13.0→13.1→13.2→13.3→13.4→13.5→13.6→13.7→13.8→13.9→13.0→…
   Press and hold the SET button to confirm and then goes to the next setting mode the charging current.

3. Charging current setting
The display will show the current setting. Short press the SET button can change the charging current value in cyclic order. 40→4→10→20→40→…
Just stop at your desired value, press and hold the SET button until the set value not flashing.
All settings completed and the charger will back to the normal operation automatically.

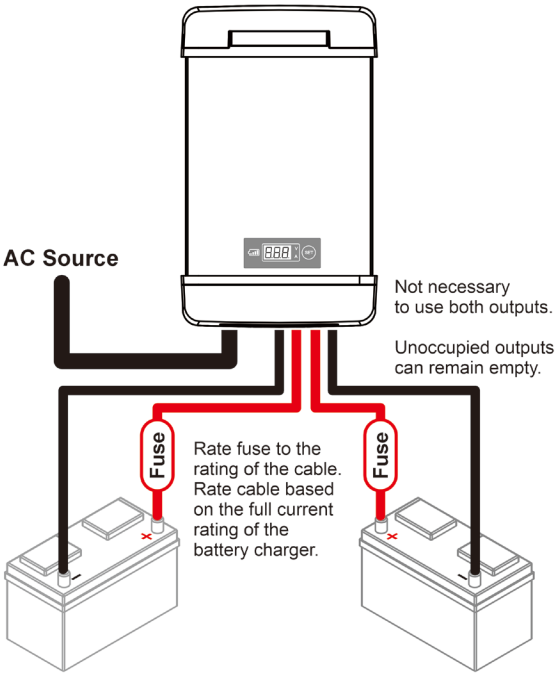
***WiFi setting* (WiFi/ Bluetooth version only)**
Bluetooth is available to be connect in factory default. Use Smartphone app from AppStore or Google play to connect charger using Bluetooth first. The charger Bluetooth name is start with "mbt". After connected with Bluetooth, it can configure WiFi connection within apps.

Battery Charger installation and Connection

Before connecting or disconnecting the charging cable, unplug AC cord from the mains.
First connect the Red cable to Positive + terminal of charger and the battery Positive + Pole.
Then connect the Black cable to the Negative – terminal and the Negative – Pole of the battery. Make sure all the connections are secured and well tighten up, double check on the correct polarity.
After AC is on, check for the correct battery type, if not you can always change to desire battery type by quick short presses without disconnection of the AC mains or battery.

Dual bank charging

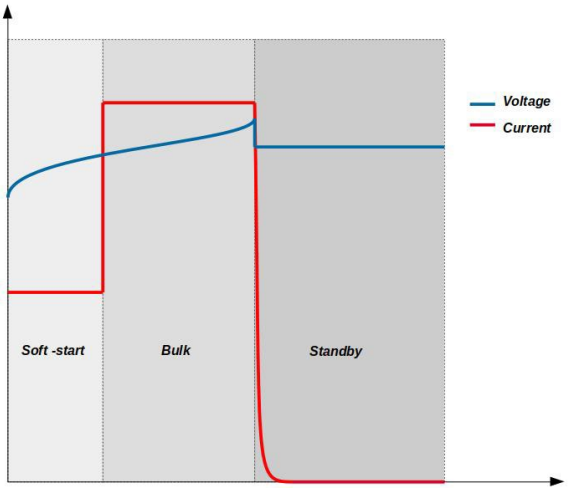
The two batteries must be of same chemical make up and type to avoid over and under charging because only one setting of charging profile for both.
Two batteries are charged simultaneously and the battery with the lowest level gets most share of the current in the Bulk charge stage until it is up to the sane voltage level of the second battery (battery with higher initial level).
Both batteries will go to the Absorption and the Float charge at the same time.



LiFePO4 (LFP) battery

Caution: Never charge LFP battery when its temperature is below 0°C.

There is a special charge algorithm and treatment for Lithium FePO4 (LFP) batteries to ensure safe and optimal charging adaptive to the special chemistry of the battery which is quite different to Lead Acid battery. There are only two active charging stages namely Bulk and inactive (no charging current) Standby Stage.



DC Source
Charger can be used as a constant 12.0-15.0V (LBC-9220: 24.0-30.0V) DC source with start upload limited to 2AMP and subsequent maximum continuous 28Amp (LBC-6220:14Amp) load without the battery.

Battery with load
A load can be connected to the battery during charging as long as the load is not larger than the rated output of the charger. The maximum continuous load should be less than 28Amp (LBC-6220:14Amp).

Supplied Accessories
Battery temperature sensor for battery low temperature protection and battery over temperature protection.

Cable size recommendation for 40A

AWG	Maximum Length (m)
10	2.5m
8	4m

Protection

Over Temperature Protection of battery
When this sensor detects the temperature of battery over 60ºC, the charger will decrease the charging current to 1Amp and LED display “F02”. When the battery temperature reduce back to 60 ºC.
Over Temperature Protection of charger:
At high operating temperature charger will gradually decreases the output power to protect the electronic components from further thermal stress and at the same time keeps a safe and continuous charging. The charger will decrease output current in 3 levels, while the charger temperature keeps on increasing, it will decrease output current to 30Amp first, then 20Amp and finally 1Amp. And LED display “F01”.
Short circuit protection by constant current method and auto reset when fault is clear.
Reversed polarity protection with 25Amp x2 (LBC-6140)/ 25Amp (LBC-6220) thermal fuse.

Specification

Model	**LBC-6140**		**LBC-6220**	
AC Input Voltage	190-264VAC 50Hz~			
AC Full Load	≤5A			
No Load Input Current (Standby)	≤120mA			
Output (Charge) Voltage Selection				
	Absorption	Float	Absorption	Float
Lithium	12.6V	12.2V	25.2V	24.4V
LiFePO4	14.6V	13.8V	29.2V	27.6V
DC Source Mode	12.0-15.0V		24.0-30.0V	
Minimum Battery Voltage	3V			
Efficiency	>90%			
Protections	Short Circuit protections (self recoverable) Over temperature protection (self recoverable) Battery over temperature protection, with battery remote sensor (self recoverable) Reverse Polarity (fused) (Replace by 25A x2 fuse for 6140, 25A fuse for 6220)			
Cooling	Thermostatically Controlled Variable Low speed FAN (0 – full speed)			
Operating Temperature	-10°C to +50°C (Maximum Output up at 40°C)			
Back Drain Current	Less than 1Ah/month			
Wireless Remote Control	WiFi models only (Smart phone APPS)			
Approvals	CE			
Dimension (LxWxH)	223x135x73mm		223x135x73mm	
Weight	1.8kg		1.8kg	
Recommended Battery Capacity Range	135Ah-400Ah (40A) 70Ah-200Ah (20A)		70Ah-200Ah (20A) 35Ah-100Ah (10A)	

Smartphone Apps

* This software is provided by 3rd party. It is no warranty from Manson on this software.
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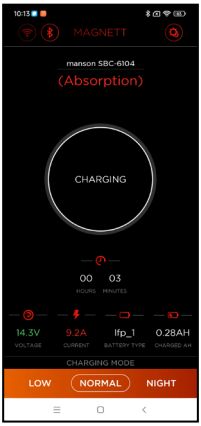

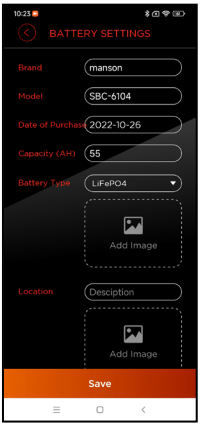

This apps support Manson LBC-6xxx series with WiFi version.

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Charger Monitor apps User manual

Mounting Hold Diagram