

# POWERTECH

## DC-DC Isolated

### 4-stage Boost Charger

#### MB-3690

#### MB-3691

### INSTRUCTION MANUAL

Please read this instruction manual carefully before operating the device.

### Important Information!

Thank you for purchasing the DC-DC 4 stage boost charger.

Please read this instruction manual carefully before operating the device. Keep this manual in a safe place for future reference. This instruction manual is part of the product. It must be handed over along with the device if it is passed on to a third party.

  **WARNING!** Risk of Electric Shock!

**Do not open the device if it has been connected to the battery or DC power source.**

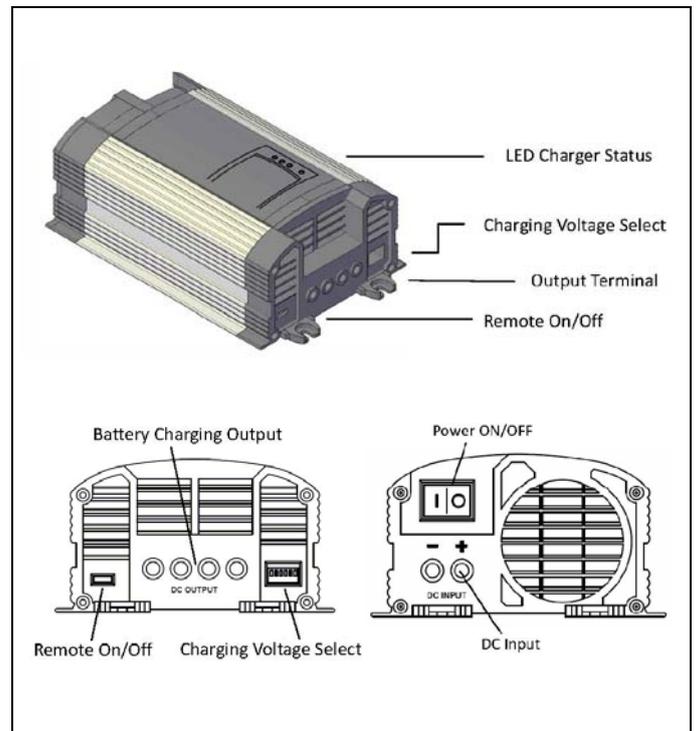
 **Warranty** only covers the cost of parts and labor for the repair service within the warranty period. Warranty will not apply where the device has been misused, altered, neglected, improperly installed, or physically damaged, either internally or externally or damaged from improper use or use in an unsuitable environment. We shall not be liable for damages, whether direct, incidental, special, or consequential, or economic loss even though caused by negligence, or other fault. If the device requires warranty service, please return it to the place of purchase along with a copy of the receipt with purchasing date.

### Specification

MODEL	MB-3690
<b>Input Voltage</b>	12VDC (8 ~ 16VDC operative)
Bulk / Absorption Charging	14.2V / 14.6V / 14.8V
Float Charging	13.2V / 13.5V / 13.8V
Power Supply	13.2V / 13.5V / 13.8V
Max. DC output current	<b>40A</b>
Efficiency up to	90%
Output short circuit	Yes
Battery reverse polarity	DC fuse
Input to output fully isolated.	Yes
Output terminal	2
Operation temperature	0°C to 40°C
Ventilation	Cooling Fan, thermal controlled
Weight (kg)	1.6
Dimensions (mm)	260 x 140 x 80

MODEL	MB-3691
<b>Input Voltage</b>	24VDC (20 ~ 30VDC operative)
Bulk / Absorption Charging	14.2V / 14.6V / 14.8V
Float Charging	13.2V / 13.5V / 13.8V
Power Supply	13.2V / 13.5V / 13.8V
Max. DC output current	<b>40A</b>
Efficiency up to	90%
Output short circuit	Yes
Battery reverse polarity	DC fuse
Input to output fully isolated.	Yes
Output terminal	2
Operation temperature	0°C to 40°C
Ventilation	Cooling Fan, thermal controlled
Weight (kg)	1.6
Dimensions (mm)	260 x 140 x 80

Specifications subject to change without notice.



This device has been CE tested and conforms to the applicable directives and standards.



### Disposal

When the device has become unusable, dispose of it in accordance with the applicable disposal regulations.

## Introduction

This compact DC - DC Isolated 4 stage Boost charger uses the latest switch-mode technology and is designed to meet all modern automobile applications, particularly dual battery systems. Galvanic isolated means you can connect to any load without worrying about interference from the input to the output.

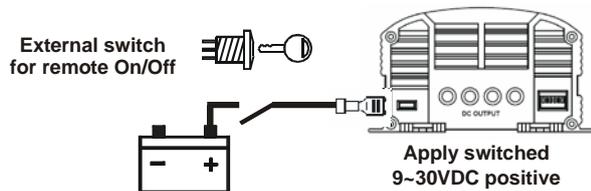
The 4 stage DC-DC Boost Charger is designed to charge Lead-acid batteries in dual battery systems to their best level, thanks to a smart 4-stage charging algorithm and voltage boosting to deliver a full charge without the issue of voltage drops. This improves the charge delivered to your battery, increasing battery life and saving on premature battery failure.

Since the DC supply from a vehicle's alternator is often unstable leading to a shortened lifespan of electronic device, this DC-DC isolated boost charger can be used as a constant power supply to run accessories that require a stable and clean DC voltage. For example: LCD TV, Digital Hi-Fi system, Wireless telephone systems, refrigeration systems, LED lighting, games, mobile computer and more....

The DC-DC boost charger is designed with overload and short circuit protection. It will automatically switch off the unit and re-start if the overload or short circuit problem is corrected. The cooling fan is thermal controlled. It will switch on and off automatically to control the internal temperature of the unit.

### Remote on/off controls

The male terminal (6.3mm) on the front panel is used for remotely switching on the DC-DC charger by applying 9-30VDC positive voltage (e.g. ignition from the vehicle engine or an external switch). Note: The working voltage is 32VDC maximum. The device power on/off switch must be switched off if you are using this feature.



### CAUTION!

Do not connect the male terminal to DC source over 32VDC or the device will be damaged. Keep the remote ON/OFF terminal insulated if it is not in use.

### Output Voltage Setting Table

SW No.	Battery Selector			Float Voltage			Power Supply		
1	ON	OFF	OFF						
2	*	ON	OFF						
3	*	*	ON						
4				ON	OFF	OFF	ON	OFF	OFF
5				OFF	ON	OFF	OFF	ON	OFF
6	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
12V Output	14.8	14.6	14.2	13.8	13.5	13.2	13.8	13.5	13.2

Note: Dip-SW No. 1, 2 and 3 are switched off automatically (regardless it is on/off), when Dip-SW No. 6 is switched on.

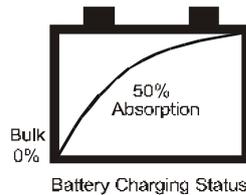
Battery Type	Dip Switch Setting	Float Volt	Bulk / Absorption Volt
SLA / GEL	SW 3 ON, SW 1,2,4,5,6 OFF	13.2V	14.2V
AGM	SW 2,5 ON, SW 1,3,4,6 OFF	13.5V	14.6V
FLOODED	SW 1,4 ON, SW 2,3,5,6 OFF	13.8V	14.8V

## Instruction and normal responses

### Operation as DC booster charger

Connect the input to the DC source, such as your vehicle alternator or cranking battery using suitable size cabling and fuse. Adjust the charge setting dip switch to get the optimum charge to suit your battery specification.

Connect the battery to the DC output. Turn ON the Power switch, the "POWER ON" LED lights up, this indicates the device is ready for charging. The smart DC-DC boost charger will perform the four stage charge automatically. The "BULK" LED lights up. This means the battery charger is beginning at the 1<sup>st</sup> stage of charging.



The 1<sup>st</sup> stage is to ensure battery is always charged at the maximum charging condition. This is to boost up the charging cycle and particularly wake up a weak battery to absorb energy.

After 10-20 mins, the charger will switch to 2<sup>nd</sup> stage, the "BULK" LED remains ON, the battery is charged at the maximum current to the battery.

At the 3<sup>rd</sup> stage, the charger will switch to "ABSORPTION" mode, the red LED goes out and the yellow LED lights up. The device is delivering constant voltage to the battery with reduced current. The charging voltage can be set by the switch No. 1,2 and 3.

At the 4<sup>th</sup> stage, the battery has been charged to about 90% of its rated capacity. The "ABSORPTION" LED goes out and the "FLOAT" green LED lights up. The charging current is decreased and the charging voltage is held at a constant level. Battery is now under "FLOAT" constant charging. The charging voltage can be set by the switch No.4 and 5.

### Operation as power supply

The device can be used as a Power Supply. Set the switch No. 6 to ON position. The device now operates as a power supply unit. The bulk and absorption LED goes out. Switch No. 1,2 and 3 are now disabled. The POWER ON and FLOAT LED light up. The power supply output voltage can be set by the switch No.4 and 5.

### CAUTION!

- Do not use the device near flammable materials or in any location that may accumulate flammable fumes or gasses.
- Hot surface when operating, especially at full load condition.
- Make sure the polarity is correct
- Do not locate the device on the top of the battery. Especially Flooded, Wet type battery. It may generate gas vapor while charging.
- Do not charge non-rechargeable batteries.
- Use the appliance only in the described manner.
- Do not expose the device to a heat source, such as direct sunlight or heating.
- Store the device in a dry and cool place

### Safety Operation!

- If cables have to be fed through walls with sharp edges, always use tubes or ducts to prevent damage.
- Do not pull on the cable, fasten the device and cable securely. Lay the cable so that it cannot be tripped over..
- Use the device only in the described manner.
- Children should be supervised to ensure that they do not play with the device.
- Do not allow water to drip or splash on the device.
- Make sure the air inlets and outlets of the device are not covered.
- Operate the device only if you are certain that the housing and the connection cables are undamaged.