

# ***POWERTECH***

## **Battery Isolators**

**MB-3680 (12V-100A) and MB-3682 (24V-100A)**

## **User Manual**

# 1. Introduction And Intended Applications

This innovative battery isolator is the only one in the market with separate settings for disconnect and reconnect voltages.

The independent settings of voltages cover a much wider and precise application requirement and types of batteries.

## **Intended Applications:**

*caravan, car with second battery, solar /wind charging multiple battery banks and battery over discharge or over charge.*

This unit when used between **two batteries**, it functions as an isolator as following:

- It isolates the main (starting) battery from the second battery in normal condition.
- It allows charging of the second battery only when the main battery is at the selected voltage level set in LVR (Connect).

This way , it also diverts excess power from the alternator to run equipment that feeds from the second battery.

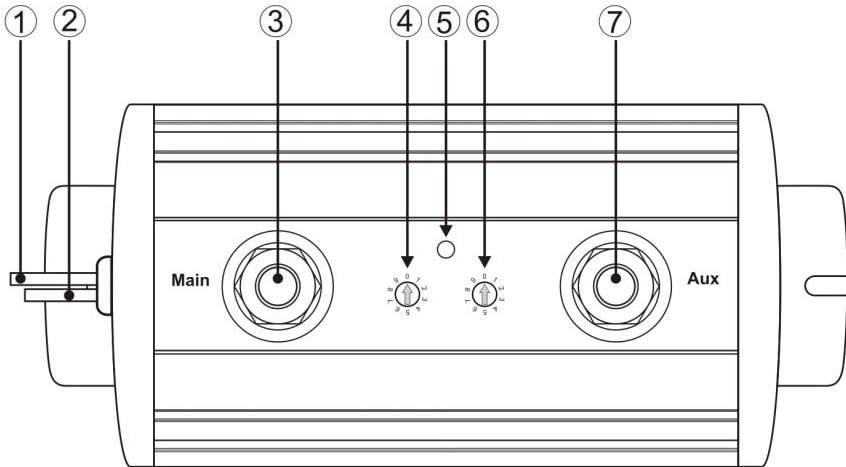
It does not allow the second battery to power the car electronics or feed into the starting of the car unless the manual Over-Ride Connection is activated .

It prevents excessively large charging current dumping into the depleted second battery from the main battery.

## **When used with one battery**

When it is used with one battery and a load , it acts as a low voltage cut off to keep the battery from over discharge according to the selected voltages settings.

## 2. Explanation of panel



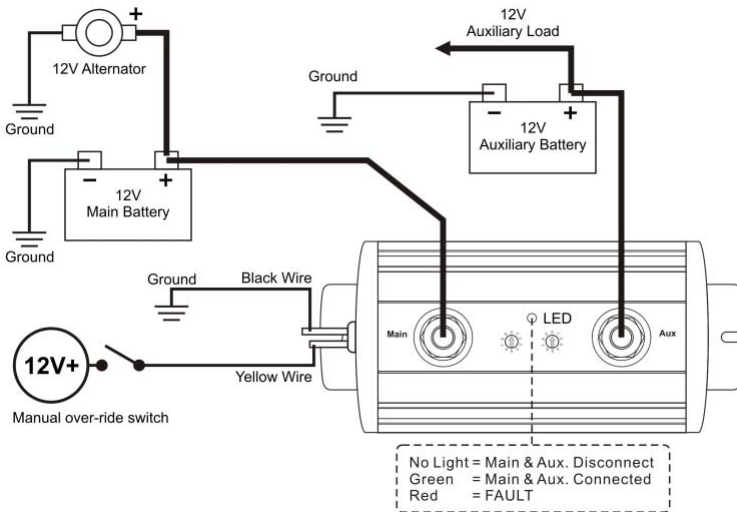
1. Black Wire for connection to Ground or Negative of battery
2. Yellow Wire when connected to a positive(+) battery terminal, it activate Connection of Main and Aux terminal. Isolate this wire when not in use.
3. Main Terminal for connection to the Positive battery terminal of main (starting) battery.
4. Disconnect Voltage Selector LVD
5. Dual colour LED Indicator:
  - A. No light = Disconnect; Green light = Connect
  - B. Red light solid = Over Voltage Protection for Main Terminal
  - Red light slow flash = Over Temperature Protection
  - Red light fast flash = Over Current Protection
6. Connect Voltage Selector LVR
7. Auxiliary Terminal for second battery or load



### 3. Installation notes:

1. Negative Ground convention is used , that is the chassis of vehicle is connected to the negative terminal of the starting battery.
2. Whenever possible, use the shortest connection to the unit and batteries.  
The voltage drop of large current will affect the accuracy of isolator if cable size and length are not correctly selected.  
Please refer to the following link...  
<http://www.zetataalk.com/energy/tengy10s.pdf>
3. Always double check the tightness of all connections by wiggling the connected terminals and etc. Connectors and fasteners are prone to vibration loosening in a moving vehicle.  
Loosen connections cause sparks .
4. Make sure the yellow wire (2) is isolated and insulated if not in use.  
Use a toggle switch to connect this yellow wire to the positive terminal of the battery for manual connection of the Main and Aux terminals.

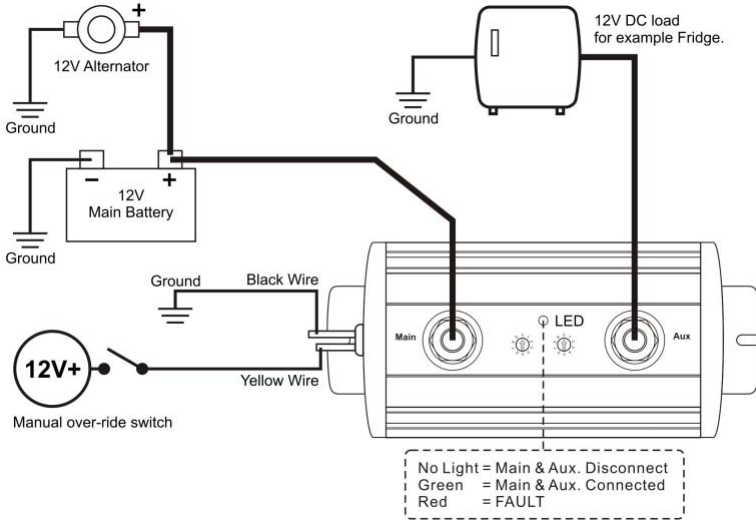
### 4. Installation for a Two Battery System



1. Select the suitable Disconnect (LVD) and Connect voltages (LVR) according to your requirement. For a normal 2 battery system the LVD is about 12.4V and LVR is about 13.3V. However the selections depend on the relative capacity difference of the 2 batteries and load at the auxiliary battery. It is advisable to make the difference between LVD and LVR wider if rapid on off actions occur frequently.
2. Please note that for the unit to function properly selections of LVR is always greater than LVD.
3. Switch off the car or DC charging source, connect the Main terminal first then the Aux. terminal. Switch on the car or the DC charging source, if the main battery is full and the auxiliary is low the green LED will be on.

- If the LED turns red at any time check on the specifications and make the necessary remedial action. There is no connection and operation when LED turns red. Once the fault has been cleared unit will return to normal operation.

## 5. Installation for a One Battery System



- The selected LVD is usually lower than the two battery system since the unit here is mainly used as a protection against over discharging the battery.
- However, the selection of LVD and LVR voltage are very much affected by the type of load and relative battery capacity. Select a higher LVD for relatively smaller load ; for high initial draw load such as Motor, choose a lower LVD.
- It is advisable to use a higher value of LVR to ensure a more completed charging operation .
- Check the battery's specifications for suitable LVR and LVD and in cycling or standby applications.
- If the LED turns red at any time check on the section of LED INDICATIONS of the specifications and make the necessary remedial action. There is no connection and operation when LED turns red. Once the fault has been cleared unit will return to normal operation.

## **6. Features**

1. 10 Selections of Disconnect Voltage
2. 10 Selections of Re-connect Voltage
3. MCU control with FET design resulting extremely low voltage drop & small standby current.
4. Wide Operating Temperature Range : - 40°C to + 60°C
5. Extruded Aluminum housing sealed with Polycarbonate end caps

## **7. Protections**

1. Instant disconnection when main terminal drops to 8.5V .
2. Over voltage protection at the main terminal.
3. Over temperature to the isolator >90°C case temperature
4. Over current to the unit .
5. Input reversed polarity protection to Main Terminal (self reset)

## 8. Specifications

Models	MB-3680		MB-3682	
Battery Voltage System	12VDC		24VDC	
Isolator Setting	Tolerance: $\pm 0.1$ Vdc for 12Vdc sys.		Tolerance: $\pm 0.2$ Vdc for 24Vdc sys.	
	LVD (Disconnect)	LVR (Connect)	LVD (Disconnect)	LVR(Connect)
	10.5V	12.9V	21.0V	25.8V
10 Disconnect Voltage Selections and 10 Connect Voltage Selections. LVD = Cut Out = Disconnect. LVR = Cut In = Connect	10.9V	13.0V	21.8V	26.0V
	11.2V	13.1V	22.4V	26.2V
	11.5V	13.2V	23.0V	26.4V
	11.9V	13.3V	23.8V	26.6V
	12.1V	13.4V	24.2V	26.8V
	12.4V	13.5V	24.8V	27.0V
	12.6V	13.6V	25.2V	27.2V
	12.8V	13.7V	25.6V	27.4V
	13.0V	13.8V	26.0V	27.6V
ON / OFF Delay Time For Isolator Mode	15 Seconds			
<b>Protection</b>				
Low Voltage Protection (No Delay)	8.5VDC $\pm 0.5$ VDC		17VDC $\pm 1.0$ VDC	
Over Voltage Protection	18.5VDC $\pm 0.5$ VDC		34.5VDC $\pm 1.0$ VDC	
Over Temperature Protection	Yes			
Protection Current (Start Point)	150A			
Continuous Output Current	100A			
Maximum Output Current (1 Minute)	110A			
Operation Current Consumption (LED ON)	9mA			
Standby Current Consumption (LED OFF)	6mA			
Voltage Drop With 100A (Main Batt. To Aux. Batt)	300mV (Max.)			
Operation Temperature Range	$-40^{\circ}\text{C}$ to $+60^{\circ}\text{C}$			
Manual Over-ride	Yellow cable (2) to Battery Positive triggers Main & Aux connection			
Indication By LED	LED GREEN = Connect		LED No Light = Disconnect	
	LED RED Protection:			
	1) Solid RED = Over Voltage (OVP).			
	2) Slow Flash RED = Over Temperature (OTP).			
3) Fast Flash RED = Over Current (OCP).				
Dimension (L x W x H)	162x75x50mm (6.3x3.0x2.0 inch)			
Weight	486g (17oz)			

## 9. Dimension Diagram

