PB-MBW 40/60

Battery Guard MOSFET
40A / 60A

Owners Manual

Description

The Battery Guard MOSFET PB-MBW40/60 (hereafter referred to as the PB-MBW) is an intelligent, user-programmable, fully waterproof battery guard.

The PB-MBW has expansion options for an off switch and an alarm output to which a buzzer, LED strip or relay can be connected. To minimise **EN** losses, the PB-MBW is equipped with two bolt-on connections: input+ and output+. The remaining connections (neg, remote input, programmable input and alarm output) are connected via separate 6.3 mm faston connectors. The PB-MBW is equipped with a bright status LED which displays how it is functioning. The PB-MBW also features an "automatic board system detection", which enables it to automatically detect whether it is connected to a 12 V or a 24 V system.

Installation

Install the PB-MBW on a cooling metal surface to allow it to dissipate the heat it generates. Use a power supply cable of up to 50 cm for the PB-MBW. This is the only way to accurately monitor the battery voltage.

Please note!

- The product may only be installed by qualified electricians who are fully aware of the requirements for working with high battery voltages.
- The use of faulty connection material and/or excessively high gauge wiring may damage the PB-MBW.
- A short circuit between the battery's positive and negative terminals can cause serious damage to the system.
- Always use the correct fuses.
- Use a 1.5 mm2 cable directly from the battery to the PB-MBW for the negative (–) connection. Do not use this connection for anything else.

Wiring diagram
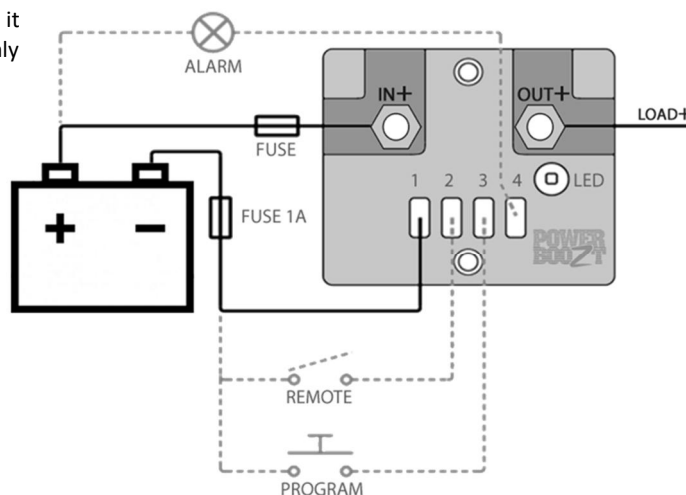
Operation

Input voltage protection

The input voltage protection values (undervoltage threshold, undervoltage reset, overvoltage threshold and overvoltage reset) can be set by the user. See "*Programming*" for an explanation of how to set these values.

Undervoltage

When the PB-MBW's input voltage drops below the undervoltage threshold for 15 seconds, the alarm output will turn on. The LED will also indicate undervoltage. The PB-MBW will shut down one minute later and the alarm output and LED will turn off.
When the PB-MBW's input voltage exceeds the reset threshold for 5 seconds, the PB-MBW will turn back on, and the LED will indicate that the PB-MBW is active again.

Overvoltage

The PB-MBW will shut down if the input voltage exceeds the overvoltage threshold for 0.5 seconds. The alarm output will indicate (at a frequency of 1 Hz) that overvoltage has been detected. The LED will also display this information.

Overcurrent protection

The current through the PB-MBW is measured constantly. If an excessive current flows through the PB-MBW for too long, the PB-MBW will shut down to prevent damage to both the PB-MBW and the connected equipment. The PB-MBW will turn on again after 1 minute.

Temperature protection

The PB-MBW will shut down immediately if its temperature exceeds 85 °C. The LED will indicate a fault. The PB-MBW will turn on again after 1 minute if the temperature has dropped below 75 °C.

Ground Loss protection

The PB-MBW will shut down if it detects that the negative (–) is disconnected on the power supply side. The LED will indicate a fault. The PB-MBW will turn on again after 1 minute.

Remote

A switch can be installed between the remote input and the negative (–) to manually disable the PB-MBW output. The PB-MBW will shut down immediately when the connection is made. The PB-MBW will turn on again when the connection is broken.

LED

The LED has two functions. The first is to indicate the PB-MBW's status. The different options are outlined below. The second is to programme the PB-MBW. This operation is described in the section "*Programming*".

LED CODE	FAULT DESCRIPTION
Two short blinks (± 0.15 sec.), then off for a long time (± 3.5 sec.).	PB-MBW is enabled.
One blink (± 0.5 sec.), then off (± 1.5 sec.).	PB-MBW is disabled because the remote has been activated.
One blink (± 1.0 sec.), then off (± 1.0 sec.).	Undervoltage or overvoltage detected.
Three short blinks (± 0.25 sec.), then off for a long time (± 2.5 sec.).	PB-MBW has been shut down for one minute due to one of the following causes: Ground loss, temperature protection, current protection, low output voltage.
LED is off.	PB-MBW has been shut down due to undervoltage.

Programming

To enter programming mode, a connection must be made between the programme input and the negative (–). The LED will blink once if the connection has been maintained for ± 2 seconds. Once this is done, the connection must be broken.

The same connection must be made briefly again to set the correct position number—the LED will light up as feedback.
At that point, programme position #1 is selected. The user can briefly make the connection again to select programme position #2, etc., etc..

If no connection is made for ± 4 seconds, the LED will display the set state again. (Example: programme position #4 is set by a user, the LED will blink 4 times)

Two types of settings are available. Positions 1 through 10 set the undervoltage threshold and reset values. Positions 11 and 12 set the overvoltage threshold and reset values. These settings must be selected individually.

The programmed positions are retained when the battery voltage is disconnected.

Programming table

	12V		24V	
	UNDERVOLTAGE (V)			
Position	Threshold	Reset	Threshold	Reset
1*	10.5	12	21	24
2	10	11.5	20	23
3	9.5	11.5	19	23
4	11.25	13.25	22.5	26.5
5	11.5	13.8	23	27.6
6	105	12.8	21	25.6
7	11.,5	12.8	23	25.6
8	11.8	12.8	23.6	25.6
9	12	13	24	26
10	10	13.2	20	26.4

	OVERVOLTAGE (V)			
	Threshold	Reset	Threshold	Reset
11*	16	15.8	32	31.6
12	15.4	15.2	30.8	31.4

* → Factory default.

Technical data

ELECTRICAL	PB-MBW40	PB-MBW60
Input voltage range	6…35V	
Maximum continuous output current (@25 °C)	40 A	60 A
Peak current (@25 °C)	300 A (± 0,7 sec)	
Voltage drop	40 mV @ 40 A	60 mV @ 60 A
Current consumption — Output active	3.2 mA	
Voltage accuracy	2%	
Current accuracy	10%	
Maximum alarm output load	100 mA	

INPUT & OUTPUT CONNECTOIN	PB-MBW40	PB-MBW60
Minimum conductor gauge	10 mm^2	15 mm^2
Bolt size	M6	
Cable lugs	Cable lugs must match the cable diameter used.	

FASTON CONNECTIONS	
Minimum conductor gauge	1,5 mm^2
Faston plug	6,3 mm

MECHANICAL	PB-MBW40/60
Mounting hole (Ø)	4.2 mm
Distance between mounting holes (centre to centre)	50.5 mm
Weight	155.4 g
Dimensions (H*L*W)	72.0*32.0*62.2 mm
IP Code	IP66
Housing material	PU552
Housing colour	Black
Cooling concept	Convection and conduction

GENERAL	
Operational ambient temperature	-10 °C ... +40 °C
Storage temperature	-25 °C ... +85 °C
Operational air humidity	Up to 95%, non-condensing.
Galvanic insulation	No
Remote contact switch-off	Yes

PROTECTION	
Overcurrent / Short circuit	Yes. (After 1 minute restart)
Overheating, shutdown	Above 85 °C. (After 1 minute restart)
Polarity protection	Yes, with fuse in the negative (-) line.