

EN INSTALLATION GUIDE



Please read this document very carefully to avoid relay malfunction, equipment damage and/or fire hazards!

Introduction

The Battery Protect Relays TBP-40/60/100/200 (hereafter called TBP) are intelligent, watertight, solid state battery protection relays with a number of additional features. The battery input and load output connections are made using low loss solid bolts. Other connections, like the minus and the accessories, are provided by a 4-pole 6.3mm faston connector. A blue LED indicates the status (On/Off) and program position when operating in the programming mode. The user can choose between 10 different On/Off (Open/Close) voltage combinations, which can be programmed easily.

Installation

- 1) Please read all safety guidelines that are provided along with your battery.
- 2) Use main wires of sufficient diameter (TBP40 ≥ 10mm², TBP60 ≥ 16mm², TBP100 ≥ 25mm² and TBP200 ≥ 50mm²) and connectors of good quality. Make sure of proper fusing in the battery input line.
- 3) Warning! Live wires should never make contact with the case of the TBP or the vehicle.
- 4) Mount the TBP on a cooling (metal) surface, so it can dissipate the generated heat. Do not mount it near heat sensitive material or devices. Mount it as close as possible to the battery (less than 50cm) for optimal operation.
- 5) Use a 1.5mm² wire for the minus connection between the TBP and the battery. Fuse this wire with a 1A fuse. No other equipment should use this wire.
- 6) Make sure that the TBP is programmed first, before connecting the load.



Limitations of use: do not use in connection with life support systems or other medical equipment or devices. To be installed only by qualified technicians.

Programming

To start the programming mode a connection should be made between Input+ and the programming input. The LED will start flashing. The number of flashes represents the program-position (see table below) it is in. As soon as the desired program-position is reached, the connection between Input+ and the programming input should be removed immediately. To confirm the program-position, the LED will repeat the number of flashes. If this is not the desired position yet, the previous steps have to be repeated. A change in position 11 or 12 has to be programmed separately. The selected program-position will be remembered, even if the battery connection has been removed. After completing the programming, the equipment can be connected. ATTENTION! First remove the battery connection, connect the equipment to Output+ and then reconnect the battery. The Default program-position is position 1 + 11.

Remote On/Off and Alarm output

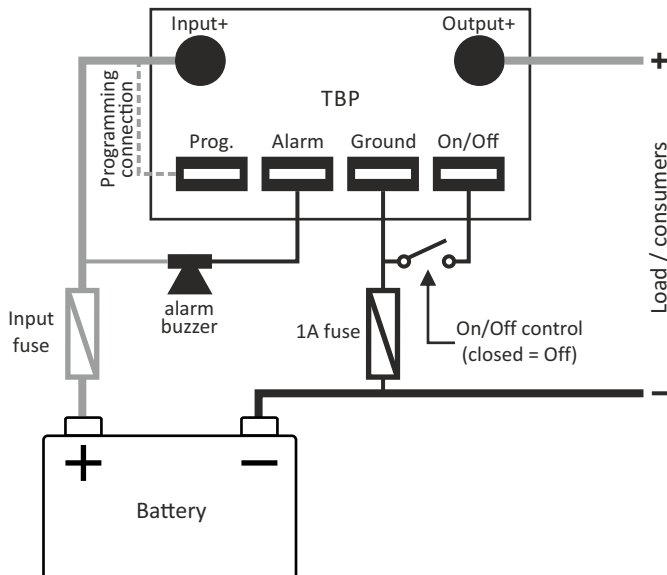
The TBP can be switched On and Off remotely by connecting a low current SPST switch to the On/Off input. When this input is switched to ground the relay will be opened, disconnecting the load from the battery. When this input is unconnected (floating), the relay closes again and operates as a battery protection device by monitoring the input battery voltage.

The alarm output can be used to connect to a buzzer, that will sound approx. 12 seconds after an under voltage level has been reached. Approx. 60 seconds later the TBP will be opened, disconnecting the load from the battery. The buzzer will also sound (this time pulsed) when an over voltage has been reached (16V/32V). In this case the TBP will be opened immediately to protect the connected load. Instead of using the alarm output to control a buzzer, you can also use it to for example control a charger or generator. For this, program-position 12 must be selected (default is position 11). In position 12 the alarm output is active low when an under voltage alarm is triggered and de-activates again when the upper voltage threshold has been

Specifications

Parameter	TBP-40	TBP-60	TBP-100	TBP-200
Main cable size	≥ 10mm ²	≥ 16mm ²	≥ 25mm ²	≥ 50mm ²
Auto voltage detect range	8 - 20V = 12V system / 20 - 25V = 24V system			
Undervoltage programs	10 combinations			
Over voltage disconnect	12V system → 16V / 24V system → 32V			
Shut down current	40 - 45A	60 - 65A	100 - 105A	200 - 210A
Shut down time	5 sec. @ overload (switch on after 1 minute)			
Surge current	120A		240A	480A
Voltage drop	0.1V @ 40A	0.15V @ 60A	0.13V @ 100A	0.13V @ 200A
Current consumption	Relay closed 4mA / Relay opened 2mA			
Voltage accuracy	2%			
Current accuracy	20%			
IP rating	IP 66			
Dimensions	82 x 41 x 65mm		61 x 112 x 120mm	
Weight	0.19kg		0.73kg	

Wiring diagram



Programming table

Program position	12V system		24V system	
	Voff	Von	Voff	Von
Position 1 (default)	10.50V	12.00V	21.00V	24.00V
Position 2	10.00V	11.50V	20.00V	23.00V
Position 3	9.50V	11.50V	19.00V	23.00V
Position 4	11.25V	13.25V	22.50V	26.50V
Position 5	11.50V	13.80V	23.00V	27.60V
Position 6	10.50V	12.80V	21.00V	25.60V
Position 7	11.50V	12.80V	23.50V	25.60V
Position 8	11.80V	12.80V	23.60V	25.60V
Position 9	12.00V	13.00V	24.00V	26.00V
Position 10	10.00V	13.20V	20.00V	26.40V
Position 11 (default)	Alarm output for indicator/buzzer control ¹⁾			
Position 12	Alarm output for external equipment control ²⁾			

¹⁾ Alarm output activates at under/over voltage and de-activates automatically

²⁾ Alarm output activates at under voltage (Voff) and de-activates when Von has been reached

Declaration of conformity

Manufacturer : TBS Electronics BV
Address : De Marowijne 3
1689AR, Zwaag
The Netherlands



declares that the following products:

Product type : Battery Protect Relay
Models : TBP-40, TBP-60, TBP-100 and TBP-200

conforms to the requirements of the following EU directives:
EMC directive 2014/30/EU
RoHS directive 2011/65/EU