CHARGE BOOSTER BPC 12-12/40 & BPC 12-12/40 PRO

LEAB
mobile energy

USER MANUAL
VERSION 6
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1 About this Manual

Read this manual carefully and keep it in a safe place. This manual is aimed at Skilled workers in the field of automotive electrics .

Any modifications to the product or its components are prohibited and do not conform to its intended use. Only use original LEAB or LEAB-approved accessories.

Throughout the manual, you will be alerted to warnings and safety notices about potential hazards associated with handling the device. The colours and signal words indicate the severity of the hazard:

Notice

Possibility of material damage

The signal word *Attention* indicates that there is a possibility of material damage. To avoid material damage, follow the instruction.

⚠ CAUTION

Danger that can lead to minor injuries

A safety instruction with the signal word *CAUTION* denotes a hazard with a low degree of risk which, if not avoided, can result in minor or moderate injury. Read the safety information carefully and follow the instructions to avoid it.

⚠ WARNING

Hazards that can lead to severe injuries or death

A safety instruction with the signal word *WARNING* indicates a hazard with a high degree of risk which, if not avoided, will result in death or severe injury. Read the safety information carefully and follow the instructions to avoid it.

⚠ DANGER

Danger that will lead to severe injury or death

A safety instruction with the signal word *Danger* indicates a hazard with a high degree of risk which, if not avoided, will result in death or severe injury. Read the safety information carefully and follow the instructions to avoid it.

You will find notes at some points in the manual. These appear as follows:

TIP

A note provides useful tips and information about the product.

Read the note carefully and follow the instructions where applicable.

2 General Safety

This manual will help you to handle the device safely. Use the device solely in accordance with its intended use. Observe the safety instructions.

⚠ WARNING

Risk of burns from hot surfaces

During continuous operation, the surface of the device can reach temperatures of up to 80°C.

1. Avoid physical contact with the device during operation.

⚠ WARNING

Burns from escaping acid

Acid can leak out when handling batteries.

1. Wear acid-proof clothing when handling batteries.

⚠ WARNING

Risk of fire from overheated battery

Flammable gases can escape if the battery overheats.

1. Always charge batteries in well-ventilated rooms and away from ignition sources.

Notice

Device defects from incorrect installation

Incorrect installation can result in device defects.

1. Install the device in a dry and cool location.

2.1 Intended Use

The BPC charge booster is an active DC-DC converter which charges the additional battery from the on-board supply system. Using the voltage at the input, the modern voltage converter generates a regulated charging voltage for fast recharging of lead batteries (wet, gel and AGM batteries) or lithium batteries during travel.

At the output, the system supplies an adjustable DC voltage between 14.1 V and 15 V and thereby provides consumers with power permanently or for a short time. The input voltage is 12 V.

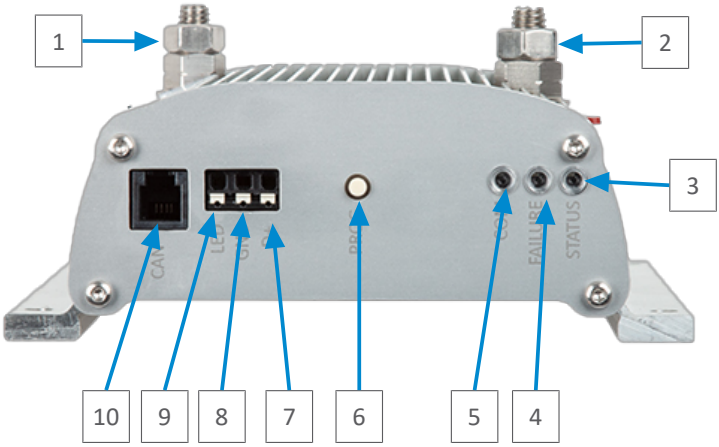
The device is designed for an operating temperature of -20 °C ... +50 °C.
A reduced output current is generated from surface temperatures of 70 °C.

2.2 Foreseeable Misuse

The device is designed for interior use only. Do not mount the device outside the vehicle.

3 About this Product

Fig. 1: BPC charge booster



1	DC output (Out)	2	DC input (In)
3	LED Status	4	LED Failure
5	LED Com	6	Program button
7	Port for D+ signal	8	Port for ground (GND)
9	Port for external LED	10	Connector for CAN communication (only with part no.: 1041003001)

4 Package Contents

	No.
BPC charge booster	1x
Insulating caps (red)	2x
User manual	1x

5 Technical Specifications

Model	Part no.:
BPC 12-12/40	1041003001
BPC 12-12/40 Pro *	1041003004

* Excluding port for CAN communication

	BPC charge booster
Input voltage	12 V (11.5 V … 15 V)
Output voltage	14.1 V/14.5 V/15 V (adjustable)
Output current, max.	40 A, reduced output current from 70 °C surface temperature
Input current, max.	55 A
Standby current, max.	< 10 mA
Degree of efficiency	> 95 %
Operating temperature	-20 °C … +50 °C
IP rating	IP21
DC connector	Bolt, M8 (max. 15 Nm)
Operating display	LED
Dimensions (L x W x H)	170 mm x 137 mm x 70 mm
Weight	900 g

6 Preparation

NOTE! Part no. 1041003001 only:**NOTE!** If you are using a Clayton Power lithium battery and CAN communication, there is no need to set the output voltage as it is detected automatically.

Before you install the BPC charge booster, the required output voltage must be set. To do this, proceed as follows:

Connect the 12 V battery (DC Input)

To connect the starter battery, proceed as follows:

1. Disconnect the starter battery from the on-board supply system.

⚠ **WARNING!** Disconnect the negative cable first.

2. Secure the positive cable as close as possible to the starter battery with a suitable fuse (60 A).
3. Connect the positive terminal of the starter battery to the DC input of the device with a cable (25 mm^2).

⚠ **CAUTION!** First connect the charge booster and then the starter battery.

NOTE! Loosen only the top nut.

4. Connect the negative terminal of the starter battery to the port for the ground (GND) of the device with a cable (2.5 mm^2).
   ⇨ The device is ready for operation (‘LED Status’ flashes green).
5. Connect the starter battery to the on-board supply system.

⇨ The BPC charge booster is connected to the starter battery.

Setting the Output Voltage

To set the output voltage, proceed as follows:

6. Press and hold the program button for at least 3 seconds until all LEDs light up.
7. To choose between the output voltages, press the program button.
   ⇨ The LED of the selected output voltage lights up green.

LED Com	LED Failure	LED Status	Meaning
●	●	●	**LED Com: 14.1 V for wet batteries**
●	●	●	**LED Failure: 14.5 V for gel and AGM batteries**
●	●	●	**LED Status: 15 V for lithium batteries**

Tab. 1: BPC charge booster output voltages

8. To store an output voltage, press the program button for 3 seconds until all LEDs go out.

⇨ The output voltage is set. To check the set output voltage, repeat step 1.

NOTE! After 10 seconds, the menu for setting the output voltage disappears again.

7 Assembly

Notice

Device defect due to the effects of dust and moisture

The effects of dust and moisture can cause device defects

1. Choose a cool, dry and well-ventilated assembly site.
2. Protect the device from the effects of dust and moisture.

To assemble the device, perform the following steps:

✓ Assemble the device on a flat and heat conductive surface.

1. Fasten the device with screws to the 4 lateral holes (Ø 4 mm).

⇨ The device is assembled.

8 Installation

To install the device, perform the following steps:

1. Disconnect the starter battery from the on-board supply system.

⚠ **WARNING!** Disconnect the negative cable first.

2. Secure the positive cable as close as possible to the starter battery with a suitable fuse (60 A).
3. Connect the positive terminal of the starter battery to the DC input of the device with a cable (25 mm^2).

⚠ **CAUTION!** First connect the charge booster and then the starter battery.

NOTE! Loosen only the top nut.

4. Connect the negative terminal of the starter battery to the ground port (GND) of the device with a cable (2.5 mm^2).

   ⇨ The device is ready for operation.

5. Connect the positive terminal of the additional battery to the DC output of the device with a cable (25 mm^2).

NOTE! Loosen only the top nut.

6. Connect the negative terminal of the additional battery to the shared ground with a cable (25 mm^2).
7. Connect the D+ signal of the vehicle (e.g. terminal 15 or terminal 51) with the port for the D+ signal of the device.

NOTE! When used with lithium batteries from Clayton Power, the vehicle's D + signal can also be transmitted via the device's CAN communication connection.

8. Connect the starter battery to the on-board supply system.

⇨ The device is installed.

8.1 Connecting an External LED

To connect an external LED, perform the following steps:

1. Connect the anode lead of the external LED to the DC input of the device.
2. Connect the cathode lead of the external LED to the of external LED port on the device.

⇨ The external LED is connected.

8.2 Establishing CAN Communication

NOTE! A connector for CAN communication can only be found on the BPC 12-12/40 charge booster (part no.: 1041003001).

The charge booster BPC 12-12/40 is used for easy charging of lithium batteries from Clayton Power. The BPC charge booster is switched on and off via CAN communication. In addition, the charge booster automatically detects the required output voltage.

To activate CAN communication, proceed as follows:

1. Connect one end of the CAN communication cable to a CAN bus connector on the Clayton Power lithium battery.
2. Connect the other end of the CAN communication cable to the CAN connector on the charge booster.

⇨ CAN communication is established automatically during operation.

9 Operation

9.1 Switching the Device On/Off

The BPC charge booster switches on automatically when the following conditions are fulfilled:

– signal D+ is present (connector for D+ or CAN communication).
– Charge booster is in standby mode.

The BPC charge booster switches off automatically when one of the conditions is not fulfilled.

NOTE! Connector for CAN communication (only with part no. 1041003001)

9.2 Operating Status

The BPC charge booster indicates the operating status via the LEDs on the charge booster. An external LED can also be connected.

LEDs on charge booster

LED	Status	Meaning
LED Status		Device inactive (no input voltage)
LED Status		Battery is charged
LED Status		Reduction in charging current, overheating protection (from +70°C surface temperature)
LED Status		Device is ready for operation
LED Status		Device in normal operation, charging current is limited
LED Com		CAN communication active
LED Com		CAN communication inactive
LED Failure		see **Error Codes** table in *Error Codes [13]*

With external LED (yellow)

LED	Status	Meaning
External LED		Battery is not charged
External LED		Error exists (see ‘LED Failure’ on device)
External LED		Battery is charged

10 Error Codes

Viewing the current error code

To view the error code, carry out the following step:

1. Press the program button briefly (less than 3 seconds).

⇨ The current error code is shown by the colour combination of the three LEDs (see table below).

NOTE! After 10 seconds, the menu for viewing the error codes disappears again.

LED Com	LED Failure	LED Status	Error Description
red	red	red	Input voltage is too high
green	red	red	Input voltage is too low
green	red	green	Output voltage is too high
red	red	green	Output voltage is too low
green	red	yellow	Output current is too high
yellow	red	green	Output current is too low
red	red	yellow	Temperature is too high
yellow	red	red	Temperature is too low
grey	red	grey	No error present

Tab. 2: Error Codes

11 Maintenance

Maintain the device at regular intervals:

– Ensure that the wiring between the batteries and the charge booster is secure.

– To remove dirt, clean the device from the outside with a dry cloth.

12 Disposal

Dispose of the device in accordance with the Waste Electrical and Electronic Equipment Regulations (WEEE).

The system must not be disposed of with household waste. Take it to a recycling point or return it to your point of sale.

13 EU Declaration of Conformity

The **BPC 12-12/40 and BPC 12-12/40 Pro charge boosters** comply with the requirements of the following guidelines:

– 2014/30/EU: EMV

– 2011/65/EU: RoHS

We make energy mobile.

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