

BATTERY CHARGER CPC

LEAB
mobile energy



USER MANUAL
VERSION 1
16/09/2021

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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

Safety instructions with the signal word *CAUTION* indicate a hazard which, if not avoided, can result in minor or moderate injury. Read the safety instructions carefully and follow them to avoid the hazard.



WARNING

Hazards that can lead to severe injuries or death

Safety instructions with the signal word *WARNING* indicate a hazard which, if not avoided, can result in death or severe injury. Read the safety instructions carefully and follow them to avoid the hazard.

**⚠ DANGER****Danger that will lead to severe injury or death**

Safety instructions with the signal word *Danger* indicate a hazard which, if not avoided, will result in death or severe injury. Read the safety instructions carefully and follow them to avoid the hazard.

You will find useful tips and tricks in certain parts of the manual. These appear as follows:

**TIP****Tips provides additional, useful information.**

Read the tip carefully and follow the instructions where applicable.

2 Safety

This manual will help you to handle the unit safely. Use the unit solely in accordance with its intended use. Observe the safety instructions. Keep this user manual in an easily accessible place.

Any modifications to the unit or its components are prohibited and do not conform to its intended use.

2.1 Intended use

The charger has been developed for permanent installation in vehicles for charging Lead-acid batteries (wet, gel, AGM). The unit is designed for a temperature range of -30 °C ... 60 °C. Do not charge batteries with this charger outside the specified temperature range. At higher temperatures, the output power of the charger automatically decreases.



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.
-



WARNING

Burns from escaping acid

Acid can leak out when handling batteries.

1. Wear acid-proof clothing when handling batteries.
-



WARNING

Risk of injury from damaged, frozen or deformed batteries

Damaged, frozen or deformed batteries can cause injuries.

1. Before using the battery, make sure that the battery is undamaged and the electrolyte is not frozen.
-

2.2 Foreseeable misuse

The charger is designed solely for Interior use in vehicles and workshops. Never assemble the charger outside the vehicle. The charger is designed to charge all types of Lead-acid batteries (wet, gel, AGM) batteries. Charge only lead-acid battery batteries with the charger.

To avoid damage, never pinch the leads of the charger. In the event of damage, unplug the charger immediately and contact your dealer or LEAB.



Notice

Device defects from incorrect installation

Incorrect installation can result in device defects.

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

3 About this product

The CPC charger is a battery charger for permanent installation in vehicles as well as for workshop use. The robust and rubberised mounting rim allows for both secure, vibration-free and particularly easy attachment in the vehicle and - when used as a portable charger - laying down of the unit without the risk of damaging the sensitive vehicle surface. Installation is made much easier by a Neutrik connector and highly flexible Twinflex charging cables.

With 15 pre-programmed charging characteristics, the CPC can be set to charge wet, gel or AGM lead batteries and the appropriate battery capacity. For particularly gentle charging, a temperature sensor can be connected as an option.



Fig. 1: Front side of CPC charger

- | | |
|-----------------|----------------------|
| 1 Fan | 2 Reset button |
| 3 Potentiometer | 4 LED status display |

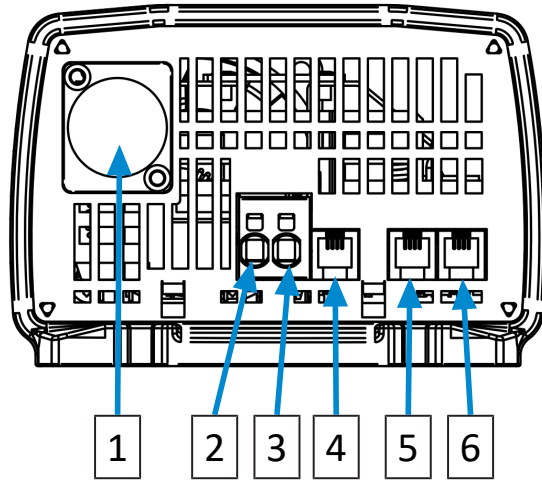


Fig. 2: CPC charger connection side

- | | |
|--|-----------------------------|
| 1 AC connection (Neutrik) | 2 Positive cable (DC) |
| 3 Negative cable (DC) | 4 CBL connection |
| 5 Sensor cable connection (CTS/
TS) | 6 Remote display connection |

4 Technical specifications

	Part no.: 0101036970	Part no.: 0101036971
Modell	CPC 1260	CPC 2440
Battery type	Lead acid (wet, gel/AGM)	Lead acid (wet, gel/AGM)
Battery capacity	150 Ah ... 600 Ah	120 Ah ... 400 Ah
Charging characteristics	15 optional characteristics (see characteristics sheet)	15 optional characteristics (see characteristics sheet)
AC cable	1.5 m, Neutrik	1.5 m, Neutrik
DC cable	1.5 m, open	1.5 m, open
Charging current	60 A	40 A
Ripple	< 3 %	< 3 %
Main charging	14.4 V/ 14.2 V/ 14.4 V	28.8 V/ 28.2 V/ 28.8 V
Trickle charging	13.5 V/ 13.6 V/ 13.8 V	27.0 V/ 27.2 V/ 27.6 V
Input voltage	230 V	230 V
Input frequency	50 Hz	50 Hz
Quiescent current (from the battery)	< 2 mA	< 2 mA
Switching frequency	100 kHz	100 kHz
Operating temperature	-30 °C ... +60 °C	-30 °C ... +60 °C
International Protection (IP class)	IP21	IP21
Protection class	I	I
Dimensions (L x W x H)	294 mm x 135 mm x 95 mm	294 mm x 135 mm x 95 mm
Weight	2.2 kg	2.2 kg

	Part no.: 0101036900	Part no.: 0101036901
Modell	CPC 1215	CPC 1220
Battery type	Lead acid (wet, gel/AGM)	Lead acid (wet, gel/AGM)
Battery capacity	50 Ah ... 150 Ah	60 Ah ... 200 Ah
Charging characteristics	15 optional characteristics (see characteristics sheet)	15 optional characteristics (see characteristics sheet)
AC cable	1.5 m, Neutrik	1.5 m, Neutrik
DC cable	1.5 m, Phoenix contact	1.5 m, Phoenix contact
Charging current	15 A	20 A
Ripple	< 3 %	< 3 %
Main charging	14.4 V/ 14.2 V/ 14.4 V	14.4 V/ 14.2 V/ 14.4 V
Trickle charging	13.5 V/ 13.6 V/ 13.8 V	13.5 V/ 13.6 V/ 13.8 V
Input voltage	230 V	230 V
Input frequency	50 Hz	50 Hz
Quiescent current (from the battery)	< 2 mA	< 2 mA
Switching frequency	100 kHz	100 kHz
Operating temperature	-30 °C ... +60 °C	-30 °C ... +60 °C
International Protection (IP class)	IP21	IP21
Protection class	I	I
Dimensions (L x W x H)	264 mm x 127 mm x 86 mm	264 mm x 127 mm x 86 mm
Weight	1.5 kg	1.5 kg

	Part no.: 0101036902	Part no.: 0101036903
Modell	CPC 2415	CPC 2420
Battery type	Lead acid (wet, gel/AGM)	Lead acid (wet, gel/AGM)
Battery capacity	50 Ah ... 150 Ah	60 Ah ... 200 Ah
Charging characteristics	15 optional characteristics (see characteristics sheet)	15 optional characteristics (see characteristics sheet)
AC cable	1.5 m, Neutrik	1.5 m, Neutrik
DC cable	1.5 m, Phoenix contact	1.5 m, Phoenix contact
Charging current	15 A	20 A
Ripple	< 3 %	< 3 %
Main charging	28.8 V/28.2 V/28.8 V	28.8 V/28.2 V/28.8 V
Trickle charging	27.0 V/ 27.2 V/ 27.6 V	27.0 V/ 27.2 V/ 27.6 V
Input voltage	230 V	230 V
Input frequency	50 Hz	50 Hz
Quiescent current (from the battery)	< 2 mA	< 2 mA
Switching frequency	100 kHz	100 kHz
Operating temperature	-30 °C ... +60 °C	-30 °C ... +60 °C
International Protection (IP class)	IP21	IP21
Protection class	I	I
Dimensions (L x W x H)	264 mm x 127 mm x 86 mm	264 mm x 127 mm x 86 mm
Weight	1.5 kg	1.5 kg

	Part no.: 0101036972	Part no.: 0101036973
Modell	CPC 2450	CPC 2460
Battery type	Lead acid (wet, gel/AGM)	Lead acid (wet, gel/AGM)
Battery capacity	140 Ah ... 500 Ah	150 Ah ... 600 Ah
Charging characteristics	15 optional characteristics (see characteristics sheet)	15 optional characteristics (see characteristics sheet)
AC cable	1.5 m, Neutrik	1.5 m, Neutrik
DC cable	1.5 m, open	1.5 m, open
Charging current	50 A	60 A
Ripple	< 3 %	< 3 %
Main charging	28.8 V/ 28.2 V/ 28.8 V	28.8 V/ 28.2 V/ 28.8 V
Trickle charging	27.0 V/ 27.2 V/ 27.6 V	27.0 V/ 27.2 V/ 27.6 V
Input voltage	230 V	230 V
Input frequency	50 Hz	50 Hz
Quiescent current (from the battery)	< 2 mA	< 2 mA
Switching frequency	100 kHz	100 kHz
Operating temperature	-30 °C ... +60 °C	-30 °C ... +60 °C
International Protection (IP class)	IP20	IP20
Protection class	I	I
Dimensions (L x W x H)	294 mm x 135 mm x 95 mm	294 mm x 135 mm x 95 mm
Weight	2.2 kg	2.2 kg

	Part no.: 0101036930	Part no.: 0101036931
Modell	CPC 1230	CPC 2430
Battery type	Lead acid (wet, gel/AGM)	Lead acid (wet, gel/AGM)
Battery capacity	90 Ah ... 300 Ah	90 Ah ... 300 Ah
Charging characteristics	15 optional characteristics (see characteristics sheet)	15 optional characteristics (see characteristics sheet)
AC cable	1.5 m, Neutrik	1.5 m, Neutrik
DC cable	1.5 m, Phoenix contact	1.5 m, Phoenix contact
Charging current	30 A	30 A
Ripple	< 3 %	< 3 %
Main charging	14.4 V/ 14.2 V/ 14.4 V	28.8 V/28.2 V/28.8 V
Trickle charging	13.5 V/ 13.6 V/ 13.8 V	27.0 V/ 27.2 V/ 27.6 V
Input voltage	230 V	230 V
Input frequency	50 Hz	50 Hz
Quiescent current (from the battery)	< 2 mA	< 2 mA
Switching frequency	100 kHz	100 kHz
Operating temperature	-30 °C ... +60 °C	-30 °C ... +60 °C
International Protection (IP class)	IP21	IP21
Protection class	I	I
Dimensions (L x W x H)	264 mm x 127 mm x 86 mm	264 mm x 127 mm x 86 mm
Weight	1.5 kg	1.5 kg

5 Charging characteristics

The CPC charger contains 15 different charging characteristics which you can select before connecting to the battery. Battery charging is fully automatic and micro-processor controlled with a 3-stage IU_1U_2 characteristic curve for gentle and optimum charging of the batteries.

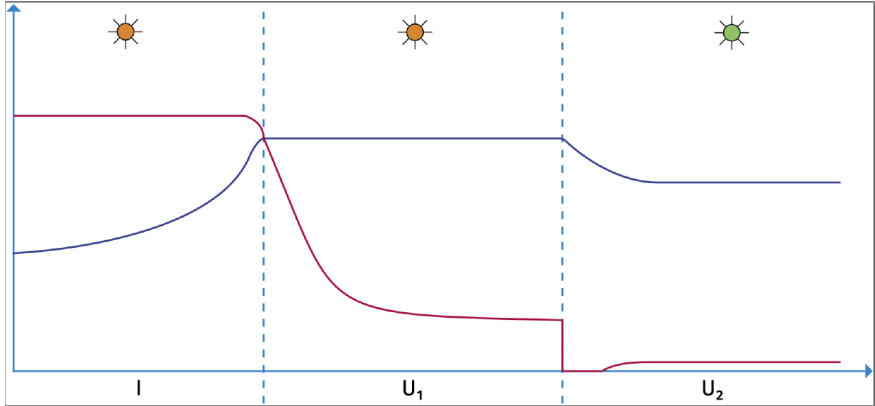


Fig. 3: Charging Characteristic

I phase: Charging with constant current

Depending on the battery charge state, the battery is charged with maximum charging current to store as much energy as possible in the battery. After reaching the set main charging voltage, the charger switches to the next charging phase (U_1). If the set main voltage is not reached within max. 10 hours, the unit enters the U_2 phase and reports an error.

NOTE! Deep discharged batteries with a voltage below 6 V or 12 V are not charged for safety reasons.

U₁ phase: Main charging with constant voltage

In the main charging phase, the voltage is kept at a constant value. As the battery increasingly charges, the current decreases continuously and approaches a lower limit.

Battery	Type	Main charge voltage
Gel battery	12 V	14.4 V
Wet cell battery	12 V	14.2 V
Gel battery	24 V	28.8 V
Wet cell battery	24 V	28.2 V

U₂ phase: Trickle charge with reduced voltage

In this phase, the charging voltage is reduced in order to maintain the battery charge for an unlimited period and counteract self-discharge. Additionally connected consumers are supplied via the charger in this phase without loading the battery.

Battery	Type	Main charge voltage
Gel battery	12 V	13.8 V
Wet cell battery	12 V	13.6V
Gel battery	24 V	27.6 V
Wet cell battery	24 V	27.2 V

6 Setting charging characteristics



Notice

Battery defect due to incorrect charging

To protect the battery from damage due to incorrect charging, set a suitable charging characteristic before installation. Follow the battery manufacturer's instructions.

To set a charging characteristic, perform the following steps:

1. Turn the potentiometer to the desired position (see characteristics sheet in Appendix).

NOTE! The arrow in the middle of the potentiometer indicates the selected characteristic.

2. To prevent accidental adjustment of the charging characteristic, stick the supplied sticker on the potentiometer. **NOTE!** Ensure that the notch in the sticker is above the LED.

⇒ The charging characteristic is set.

7 Assembly

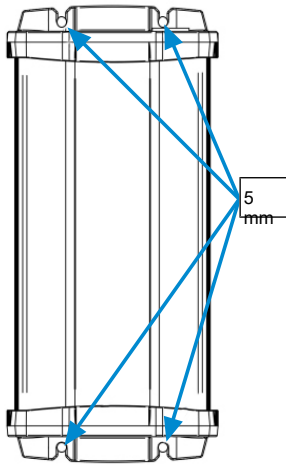


Fig. 4: CPC assembly

To assemble the unit, proceed as follows:



Notice

Device defects from incorrect installation

Incorrect installation can result in device defects.

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

- ✓ Choose a cool, dry and well-ventilated assembly site.
- ✓ Do not mount the unit directly next to or above batteries.

✓ Optimum cooling is achieved by mounting the unit vertically on a flat surface.

1. Fasten the unit with screws to the 4 lateral holes on the side (5 mm \varnothing).

⇒ The unit is assembled.

8 Installation

8.1 Connecting the battery

To connect the charger to the battery, proceed as follows:

1. Disconnect the battery from the vehicle power circuit.

⚠ WARNING! Disconnect the negative cable first.

2. Secure the positive cable of the device as close as possible to the vehicle battery with a suitable fuse.

3. Connect the positive cable of the unit to the positive terminal of the battery.

4. Connect the negative cable of the unit to the negative terminal of the battery.

5. Connect the vehicle battery to the vehicle power circuit again.

⇒ The battery is connected.

8.2 Connecting the unit to the 230 V mains

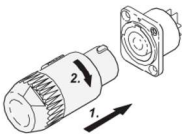


Fig. 5: Neutrik plug connection

To connect the unit to the 230 V mains, proceed as follows:

1. Fit the Neutrik plug in the AC connection.

2. Turn the Neutrik plug clockwise until it clicks into place.

NOTE! The two-pin earthed plug is only suitable for connection to fused, earthed 230 V mains supplies.

3. Plug the two-pin earthed plug into a 230-V mains supply.

⇒ The charger is connected to the 230 V mains supply.

8.3 Connecting the sensor cable

The unit is compatible with two different sensor cable. The TS sensor cable measures the battery temperature to optimally charge the battery. The CTS sensor cable measures the battery temperature and voltage to optimally charge the battery.

NOTE! When connecting, pay attention to the instructions and notes in the sensor cable installation instructions.

To connect the sensor cable, proceed as follows:

1. Insert the plug of the sensor cable into the connection for the temperature sensor on the back of the unit.

⇒ The sensor cable is connected.

8.4 Connecting the CBL control relay



A potential-free changeover contact is integrated in the CPC chargers, which switches during charging. This option can be used, for example, to implement an electrical start interlock with 230 V connection or charge monitoring.

Switching function of the changeover contact

- Pin 1 and pin 3 are connected when the charger is switched off.
- Pin 1 and pin 2 are connected when the charger is switched on.

Technical Data (insulation)	Capacity (max. values)
-----------------------------	------------------------

Output to housing	500 V 24 V (DC): 0.5 A
Output to ground	120 V 120 V (AC): 0.5 A

To connect the CBL control relay, proceed as follows:

1. Plug the RJ plug connector into the connector for the CBL relay.

⇒ The CBL control relay is connected.

8.5 Connecting the remote display

The remote display shows the charge status of the battery via an LED.

To connect the remote display, proceed as follows:

1. Plug the connecting cable for the remote display into the connector for the remote display of the charger.

⇒ The remote display is connected.

9 Operation

9.1 Switching on the unit

To switch on the unit, proceed as follows:

1. Connect the mains plug to a 230 V mains supply.

⇒ Charging starts automatically.

⇒ The unit is switched on.

9.2 Charging the battery

The charger begins to charge the battery as soon as it is switched on.

9.3 LED status display on the charger

Status	Description	Action
Steady light, orange	Battery is charging. The charger is in the main charging phase.	
Steady light, green	Battery is fully charged, charger is in trickle charge phase.	Charger can be switched off and the battery can be used.
Steady light, red	Error, overheating	<ul style="list-style-type: none"> – Check battery connection – Measure battery voltage – Disconnect the unit from the battery and allow it to cool down.
Flashing, red	Timeout in the main charge phase, charging interrupted.	<ul style="list-style-type: none"> – Check battery – Select larger charger – Consumer too large: Switch off consumer during charging.

9.4 Power supply unit function

CPC chargers with a charge program with a starting voltage of 0 V can also be used without a battery to supply DC consumers up to the maximum power of the charger. It should be noted here that the output voltage drops from the higher main charging voltage to the lower trickle charging voltage after a short time.

Vehicles can continue to be supplied with voltage when the battery is removed in order to avoid reprogramming the customer's own settings in the on-board computer and radio system.

9.5 Switching off the unit

To switch off the unit, proceed as follows:

1. Disconnect the mains plug from the 230 V mains.

⇒ The unit is switched off.

10 Maintenance

Check the charger as follows every time before you use it:

- Check the mains cable and mains plug for damage.
- Check charging cables and connections for damage.
- Check the charger for external damage.
- Check the tightness of the wiring between the charging cable and the charger.

NOTE! For battery maintenance, refer to the battery manufacturer's instructions.

11 Disposal



Dispose of the battery in accordance with national regulations. Bring the battery pack to a collection point or return it to your point of sale.

Dispose of all components 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.

12 EU Declaration of Conformity



The **CPC** chargers comply with the requirements of the following directives:

- 2014/30/EU: EMV
- 2014/35/EU: NRL
- 2011/65/EU: RoHS



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