CHARGE BOOSTER CLP 600

LEAB
mobile energy

Manufactured by
CLAYTON POWER

USER MANUAL
VERSION 8
30/03/2022

LEAB Automotive GmbH // Thorshammer 6 // 24866 Busdorf

www.leab.eu

Table of Contents

1 About the manual

This user manual is a supplement to the original operating manual from manufacturer Clayton Power. 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 property damage

The signal word *Notice* 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 medium level of risk which, if not avoided, can result in death or serious 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

Note

A note gives useful tips and information about the product.

2 General Safety

This manual aids safe handling of the device. Use the device solely in accordance with its intended use. Observe the safety instructions.

⚠ 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.

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 CLP 600 booster has been developed for permanent installation in vehicles for charging additional batteries (lead and lithium). The device may be used in both 24 V and 12 V vehicle power circuits and charges batteries with nominal voltages of 12 V and 24 V. The emergency start function allows the starter battery to be charged briefly (max. 5 min.) from the additional battery to enable the vehicle to start.

At the output, the unit supplies a DC voltage of 14.4 V or 28.8 V, depending on the charging characteristic, and thereby supplies consumers with power permanently or for a short time. The input voltage is 12 V or 24 V.

The device is designed for an operating temperature of -25°C ... +80°C.

2.2 Foreseeable misuse

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

3 About the product

Fig. 1: CLP 600

1	Data connection (M12)	2	Output (+)
3	Ground (GND)	4	Input (+)
5	Jump start button (emergency start)		

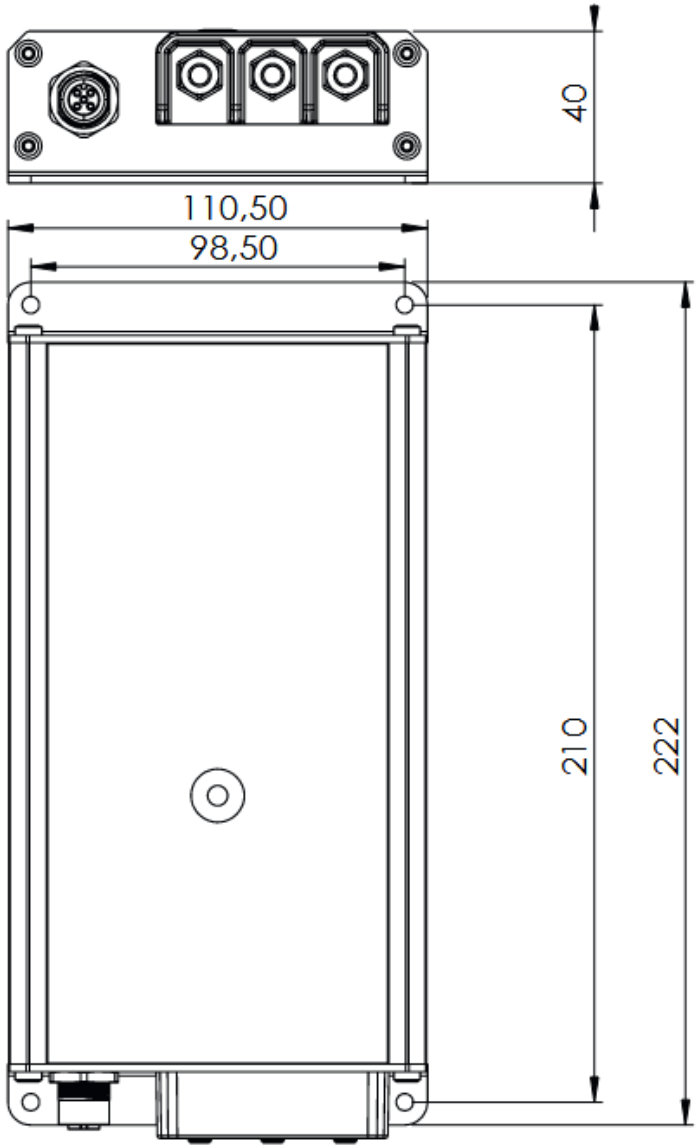
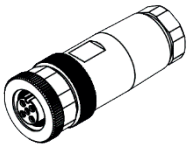
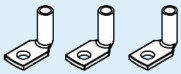


Fig. 2: CLP600 dimensional drawing in mm

4 Technical Specifications

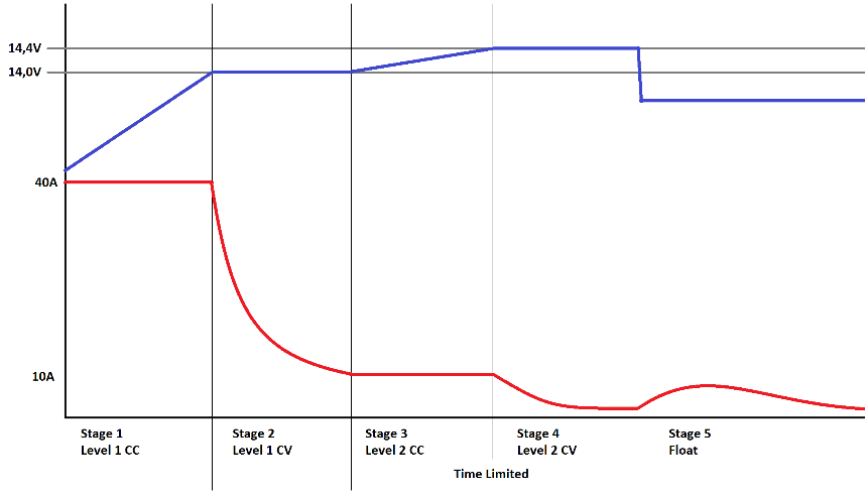
	Part no. 1041004001
Model	CLP 600
Input voltage	12 V / 24 V (11.5 V … 32 V)
Input current, max.	45 A
Output voltage	14.4 V / 28.8 V (with characteristic curve)
Output current, max.	40 A
Operating display	LED
Self consumption (standby)	< 1.6 W
Wakeup voltage (D+)	4 V … 36 V
Operating temperature	-25 °C … +80 °C
IP rating	IP21
Dimensions (L x W x H)	222 mm x 111 mm x 40 mm
Weight	830 g

5 Package Contents

	No.
CLP charging booster	1x
User manual	1x
Data adapter, M12 	1x
Nut, M6 	3x
Spring washer, M6 	3x
Cable lug, 16 mm^2 	3x
Screw, 16 mm 	3x

6 Charging Characteristic

The charging of lead-acid batteries is fully automatic with a five-stage charging characteristic for optimum battery charging.



Phase	Description	12 V	24 V
Stage 1	Constant current (Level 1)	40 A	20 A
Stage 2	Constant voltage (Level 1)	14.0 V	28.0 V
Stage 3	Constant current (Level 2)	10 A	10 A
Stage 4	Constant voltage (Level 2)	14.4 V	28.8 V
Stage 5	Charge retention	13.5 V	27.0 V

- Level 2 has a time limit of 8 h.
- The charging process restarts in phase 1 when the current in the charge retention exceeds 10 A.

7 Unpacking

TIP

To conserve resources during shipping, smaller unit components can be stowed in parts of the packaging of larger components.

1. When unpacking, check all shipping packages for the presence of smaller unit components.

To unpack the unit, proceed as follows:

1. Take all components out of their shipping packages.

⇨ The unit is unpacked.

After unpacking, check the *Package contents [▸ 8]*.

8 Assembly

To mount the device, perform the following steps:

TIP

Do not mount the device directly next to or above batteries.

Choose a cool, dry and well-ventilated mounting site.

1. Fasten the device to the 4 lateral holes (5 mm Ø).

⇨ The device is mounted.

9 Installation

Fitting the Data Adapter

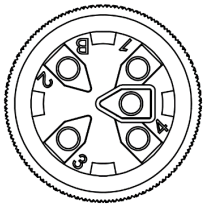


Fig. 3: Data adapter connectors

No.	Connection
1	Single Wire
2	Wake-up signal (D+ signal)
3	Ground
4	CAN High
5	CAN Low

Notice

It is not possible to operate the device without a wake-up signal.

As an alternative to signal D+, terminal 15 (ignition switch) can also be used. (**Notice!** This causes the auxiliary battery to be permanently charged by the starter battery via the charge booster even when the engine is switched off, without the starter battery being recharged).

A CAN connection must also be established in order to charge lithium batteries.

Connecting Batteries

Notice

Device defect due to excessive tightening torque

The connection bolts of the device can be damaged by an excessive tightening torque.

1. Apply between 5.5 Nm and 6 Nm tightening torque to each nut.
2. Do not overtighten the nuts.

To connect the batteries (starter battery and additional battery), perform the following steps:

1. Disconnect the batteries from the vehicle power circuit.

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

2. Secure the positive leads as close as possible to the batteries with suitable fuses (50 A).
3. Connect the outputs (2) and (4) of the device to the positive terminals of the batteries.
4. Connect the common ground (3) of the device to the negative terminals of the battery.
5. Connect the vehicle batteries to the vehicle power circuit.

⇨ The batteries are connected.

10 Normal Operation

10.1 Switching on the Device

Charging starts automatically when a wake-up signal (pin 2) is applied.

TIP

It is not possible to operate the device without a wake-up signal (signal D+).

As an alternative to signal D+, terminal 15 (ignition switch) can also be used. (**Notice!** This causes the auxiliary battery to be permanently charged by the starter battery via the charge booster even when the engine is switched off, without the starter battery being recharged).

10.2 Switching off the Device

The device switches off automatically if no wake-up signal (pin 2) is applied.

10.3 Operating Status

The LEDs indicate the operating status of the device.

LED	Status	Description
Power	Green, steady light	Device active, wake-up signal active
	Green, flashing, 1x	Device in standby mode, wake-up signal active
Charge OUT	Green, steady light	Charging process completed, additional battery fully charged
	Green, flashing (1 Hz)	Battery charging, charge status lead acid battery >80 %, lithium battery >95%
	Green, flashing (4 Hz)	Battery charging, charge status: lead acid battery <80 %, lithium battery <95%

LED	Status	Description
Charge	Red, flashing, 1x	Current too high / short circuit.
IN **and** OUT		Device requires restart.
	Red, flashing, 2x	Temperature too high. Device automatically restarts.
	Red flashing, 3x	Other errors
Jump start	Green, steady light	Emergency start completed.
(Emergency start function)	Green, flashing (4 Hz)	Emergency start active. Starter battery charging.
	Red, flashing	Error, emergency start not possible.
Data	Green, steady light	CAN connection active, device is controlled.
	Green, flashing (1Hz)	CAN connection active, device is not recognised.
IN/OUT 12 V	Green, steady light	12 V charging active
IN/OUT 24 V	Green, steady light	24 V charging active
IN/OUT 12 V **and** 24 V	Green, steady light	Automatic input voltage detection active
IN/OUT 12 V **or** 24 V	Red, flashing	Input voltage too low / too high

11 Emergency Start Function

To activate the emergency start function, perform the following step:

1. Press the jump start button for 3 seconds.

   ⇨ The starter battery is charged for a maximum of 5 minutes from the auxiliary battery. The jump start LED (emergency start) flashes green. Do not start the vehicle yet.

⇨ The jump start LED (emergency start) is lit green. The starter battery is charged, you can start the vehicle.

To end the emergency start function, perform the following step:

2. Press the jump start button.

⇨ The emergency start function ends, the charge booster returns to normal operation.

12 Disposal

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

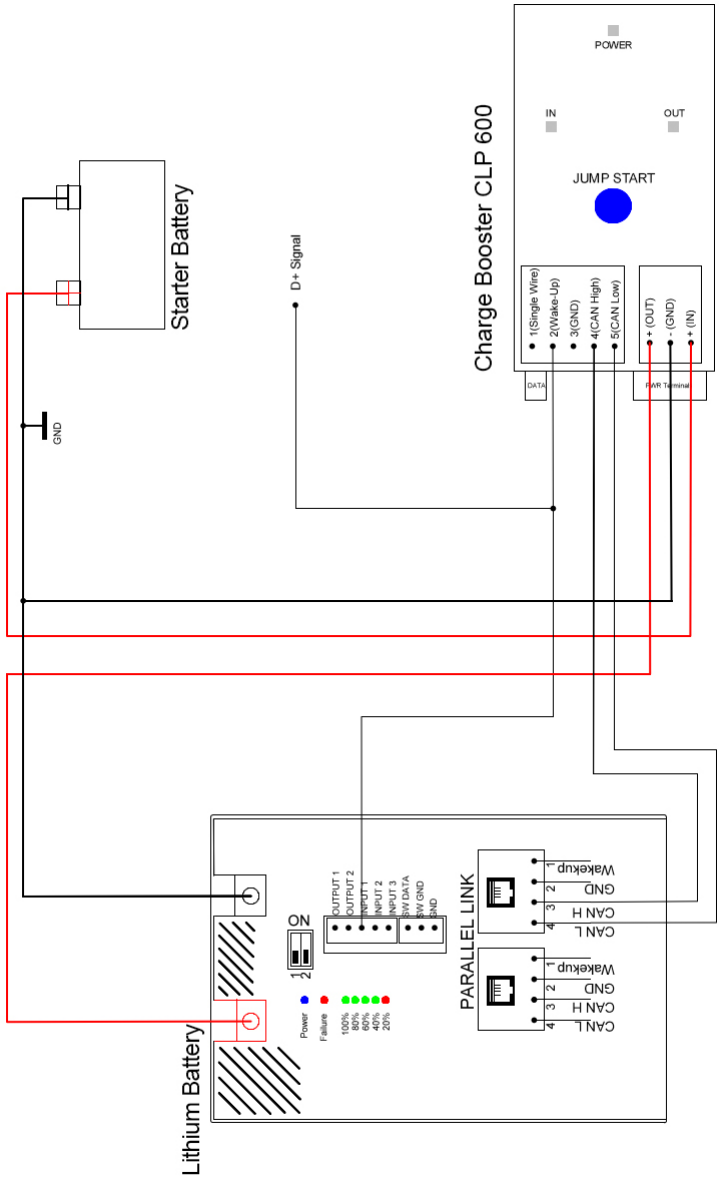
The system must not be disposed of with household waste. Take it to a recycling point or send it to your point of sale.

13 EU Declaration of Conformity

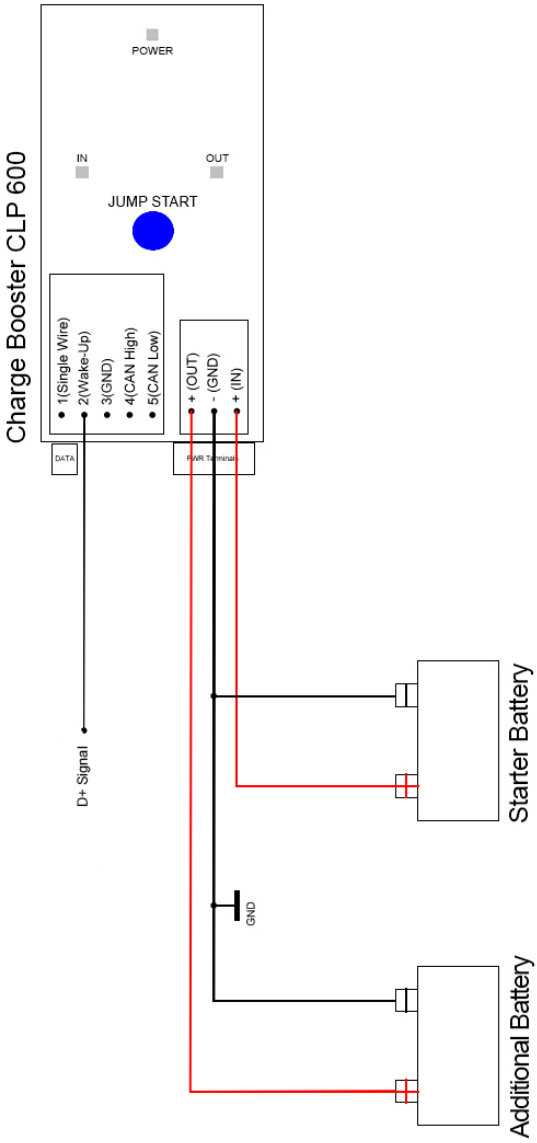
The The CLP 600 charge booster from Clayton Power complies with the requirements of the following directives:

- 2014/30/EU: EMC
- 2011/65/EU: RoHS

14 Connection diagram: Lithium battery from Clayton Power



15 Connection diagram: Lead-acid battery



We make energy mobile.

LEAB Automotive GmbH
Thorshammer 6
24866 Busdorf
Tel: +49(0) 4621 9 78 60-0
Fax: +49 (0) 4621 9 78 60-260
info@leab.eu