

## KOP21 Battery Charger

### User Guide



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## 1. Introduction

The KOP21 battery charger is a highly efficient, modern, fully automatic charger that is not only suitable for charging, but also maintenance and monitoring of the batteries. It can be used as a stationary device or also in a car due to its vibration resistant construction.

The charger has an output power of 20 kW with a very high efficiency of 96 %. The output current of 61 A guarantees fast charging and optimum service life of the battery. Up to 6 KOP21 chargers can be connected parallelly to achieve an output power of 120 kW.

The charger was professionally programmed or adjusted by your dealer for the delivered battery type. However, charging parameters (charging voltage, output current, charging time and other functions) can be adjusted if necessary. When setting the charging parameters, battery manufacturer's charging instructions as well as output currents and charging times have to be considered.

**Please read these instructions and safety information carefully  
before commissioning.**

## 2. Guidelines

- ◆ The charger can only be operated with the provided connection cable. The charging cable or connecting cables are not allowed to be changed, extended or interconnected in any way.
  - ◆ Always first remove the power plug and then the battery cable from the battery.
  - ◆ No non-rechargeable batteries shall be charged with this charger.
  - ◆ The charger shall not be installed in caravans.
  - ◆ Regularly check the device for damage on cables, connectors, housing etc. A faulty charger must not be operated.
  - ◆ Protect the device from direct sunlight, dust, moisture and rain.
  - ◆ The charger should be disconnected after charging is finished, but can remain connected if consumers are connected to the battery string. The charger can start the charging process independently if undervoltage is programmed.
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### 3. Mechanical Installation

The following points must be considered at installation:

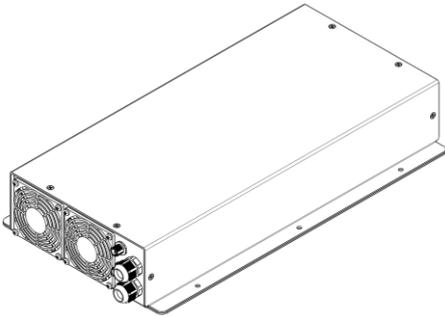
**a. Keep a distance to walls and other objects**

Keep enough distance (min. 10 cm) between cooling openings and other objects or walls so air can circulate effectively.

**b. Avoid heat accumulation**

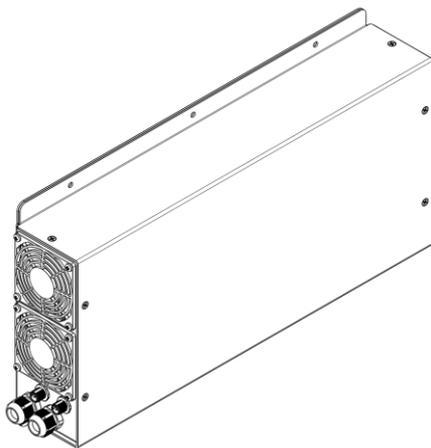
Relatively a lot of heat is generated due to high performance even though the efficiency is high. Therefore the charger must only be installed on places that ensure suitable air circulation. If this is not considered, air temperature rises in the surrounding area of the charger and the charging current decreases or the charger switches off completely.

**c. Horizontal mounting**



Always mount the device from above on a straight surface – like shown in the picture (never mount below a surface). A horizontal position enables the device to endure higher burdens caused by vibrations/impacts as a vertical or horizontal position under the surface.

**d. Vertical mounting**

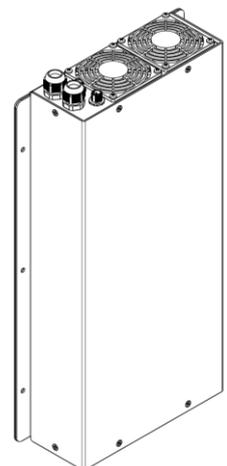


**Transverse mounting**

Cables and clamps must be positioned on the left side as shown in the picture.

**High mounting**

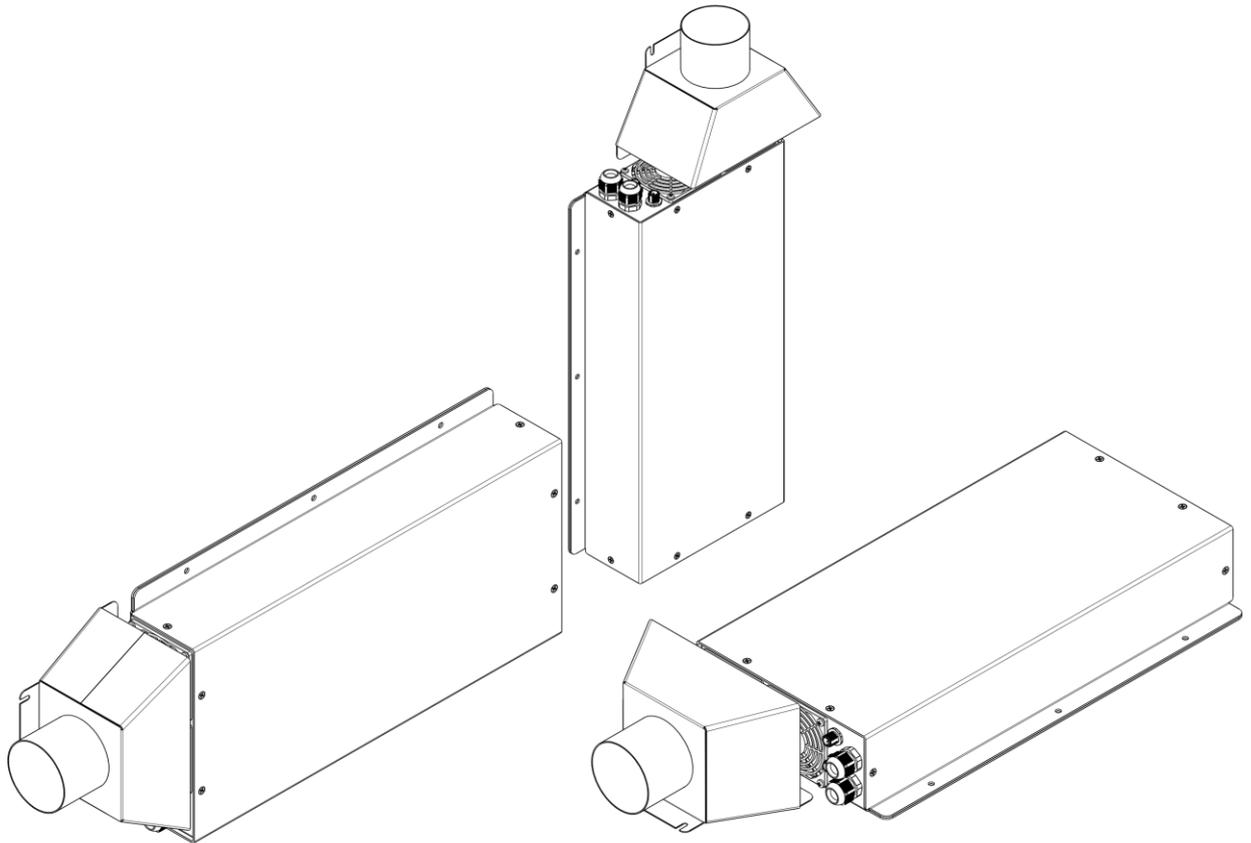
Cables and clamps must be on the upper side, so the fan can transport the hot air upwards – as shown in the picture.



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### e. Suction hood

The suction hood is an attachable accessory part that can transport hot air to the outside through a suction hose with an inner diameter of 80 mm.



- The charger must be mounted safely on a straight surface.
- It is recommended to position the charger vertically for stationary use and horizontally for mobile use.
- The charger should preferably be mounted in a dry environment far away from the battery.
- The room must be well aired and ventilated.
- **Do not drill any holes in the housing, components can get damaged!**

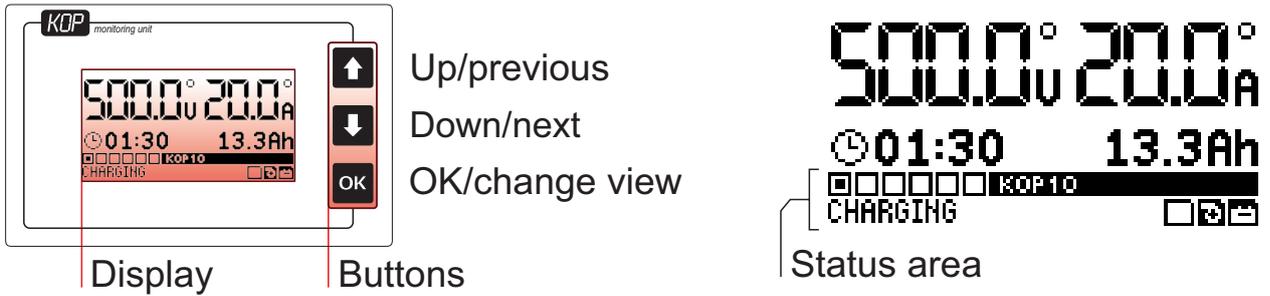
### 4. Protection Functions

- Mains fuse in both lines (can not be changed by the user)
  - Output fuse (can not be changed by the user)
  - Overload and short circuit protection
  - Overtemperature protection with power reduction
  - Overvoltage power-off
  - Undervoltage power-off
  - Charging time limit
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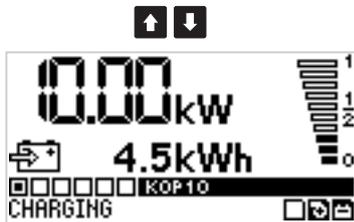


## 6. Display

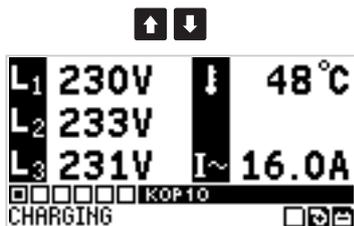
The KOP21 control unit with display is a device with graphical user interface for control and monitoring of the charger. It enables fast and precise monitoring of the charging process and shows various values on three screens. Buttons on the display enable changing among different screens. The data is presented in a graphical summary or in a detailed tabular view. The [OK] button enables switching between both views.



Battery voltage (V)  
Output current (A)  
Charging time  
Charged Ah

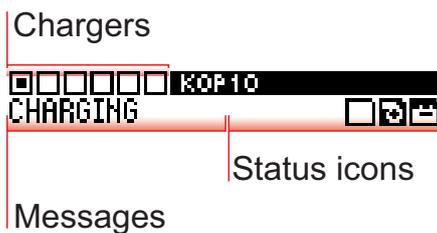


Charging capacity (kW)  
Charging energy (kWh)  
Bar display for Ah

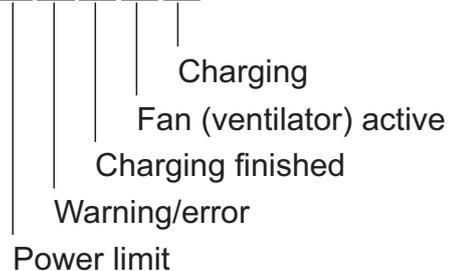


Input voltage (V)  
Input current (A)  
Charger temperature

### Status area



### Status icons



## 7. Technical Data

### a) KOP20/KOP21 control unit

Input voltage	230 V AC $\pm 15\%$ 45–65 Hz
Dimensions (L x W x H)	255 x 160 x 95 mm
Weight	1.5 kg
IP rating	IP65

### b) KOP20 power module

Input voltage	3 x 400 V AC $\pm 15\%$ 45–65 Hz
Peak input current	Max. 32 A (limited)
Power factor	> 0,99 at 50 % load or more
Min. output voltage	200 V
Max. output voltage	750 V
Nominal charging current	61 A
Efficiency	Up to 96 %
Output power	Max. 20000 W
Dimensions (L x W x H)	600 x 270 x 90 mm
Weight	14.3 kg
IP rating	IP21

## 8. Notifications

Notification	Description
INITIALISING	Initialising
ACTIVATION	Activation routine and self-check
READY	Charger ready for charging
CHARGING	Charging
END	Charging finished
END (TIME LIMIT)	Charging finished due to time limit
VOLTAGE TOO LOW	Battery voltage lower than minimum value
NO CHARGERS	No chargers connected
FALSE CHARGER TYPE	False charger type connected

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## 9. Warnings

<b>COOLING</b>	Do not cover the housing and protect the charger from heat or direct sunlight. Charging current is reduced at higher temperatures and charging time gets proportionately longer. The built-in fan must be able to cool the electronics well. The rotation speed of the fan depends on the temperature and output current.
<b>CONNECTION</b>	High currents flow at the output. Choose an output line with the right conductor cross section, use ferrules, keep contact areas clean and connect the output terminals correctly.
<b>FUSES</b>	The fuse in the charger is no sufficient protection for the battery line leading to the charger. A suitable fuse must be placed in close proximity to the battery clamp.
<b>NETWORK CONNECTION</b>	The mains current is electronically limited. Please check if the socket and network fuse are made for such current.
<b>BATTERY TYPE AND SIZE</b>	Please use this charger only for the predefined battery type. If the battery is of a wrong type, it can not be charged completely. Battery life can also get significantly shorter if the battery is charged the wrong way.
<b>LITHIUM BATTERIES</b>	Lithium batteries are very sensitive to overcharging and overtemperature. The charger can only regulate total voltage and is not able to recognise states of single cells. Therefore, the charger can only be used together with the battery management system.
<b>DETONATING GAS IN LEAD ACCUMULATORS</b>	Highly explosive, flammable detonating gas can be generated while charging a lead accumulator. The room in which lead accumulators are located during charging have to be well aerated and ventilated. Naked flames or glowing cigarettes are forbidden near batteries!
<b>ACID IN LEAD ACCUMULATORS</b>	The acid in lead batteries is corrosive and harmful. If the acid spills, clean the affected areas with plenty of water. If it comes into contact with the eyes, flush them with water immediately and contact a doctor fast.
<b>POISONOUS SUBSTANCES</b>	Lead and some battery admixtures are poisonous. Wash your hands thoroughly after work. The batteries must be disposed of in accordance with legal regulations.

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