

KOP601 and KOP1001 Battery Charger Families

Microprocessor controlled, continuous duty,
fully programmable, multi-stage battery charger and battery monitor



Batteries have to be properly charged to achieve long term reliability. The KOP601 and KOP1001 charger families are fully programmable accordingly to the battery manufacturer charging specifications. The parameters may be set in the factory or in the field through a unique PC interface over the charger battery output leads. Through the same interface not only the charging parameters but also a lot of other information is accessible like: charged amp-hours for the last 32 chargings, charging times, error information, voltages at which charging has been started etc. Check the battery charger manual for a complete list of features.

MAIN PRODUCT FEATURES:

- **Fully automatic operation:** Charger may be left permanently attached to the batteries. It takes care about battery charging and also monitors the charging process.
- **Completely programmable:** Nickel-zinc or lead-acid (flooded, sealed and traction) batteries may be charged accordingly to battery manufacturer specifications. Up to **five charging phases** may be enabled to charge the battery with constant current, constant voltage or floating charge. For each of the charging phases a **lot of parameters** may be set as: max. current and voltage, max. charging time for that phase etc. (see example). Each charging phase (except the first one) may be conditionally executed after a defined number of Ah put into the battery or after a defined number of completed first charging phases. For example for the fully automatic **equalization** charging phase.

Pulse charging phase(s) may be used and the **pause** between consecutive phases also.

Programmable **automatic top-up cycle** prevents self discharge during non-operational periods - charger starts charging after a pre-defined number of days or when the battery voltage is lower than the parameter value.

The charger is **fully programmable without opening the box** or sending the charger back into the factory. The software for the PC and a K601-IF adapter is all what you need.

- **Simple to use and program:** No charger programming knowledge necessary – the parameter file has just to be transferred to the charger(s) – may be done in the factory (by us) also. We supply the charging parameter files for the common battery types and provide support for the others.
- **Battery monitor and Ah counter:**

This charger is also a battery monitor at no additional cost. It collects data about how the battery has been charged:

- total number of charging starts and total number of connections to the battery,
- at what battery voltage the charging has been started – frequent deep discharges can be monitored: 16 voltage windows between 18 and 24V (24V charger) or between 36 and 48 (48V charger),
- total Ah charged (has the battery pack been used a lot or not) - for each charging phase Ah counting may be separately enabled (for example: Ah are not measured for the floating charge)
- for each charging phase Ah counting may be separately enabled (for example: Ah are not measured for the floating charge phase),
- how many Ah have been put into the battery during the last 32 chargings (Ah counters tell you if the battery capacity degrades or if the battery has been properly charged and also how the vehicle has been used), measurement of the charging time for the last charging (each charging phase separately) and for all chargings together.

This data may be accessed through the same PC interface as for the charger parameters.

- **High precision:** Every charger is factory calibrated - no additional user calibration is necessary. No potentiometers or other movable parts inside, therefore no vibration problems for chargers built into the vehicles.
- **Programmable voltage drop compensation:** No problems with longer battery connections.

- **Temperature compensation:**

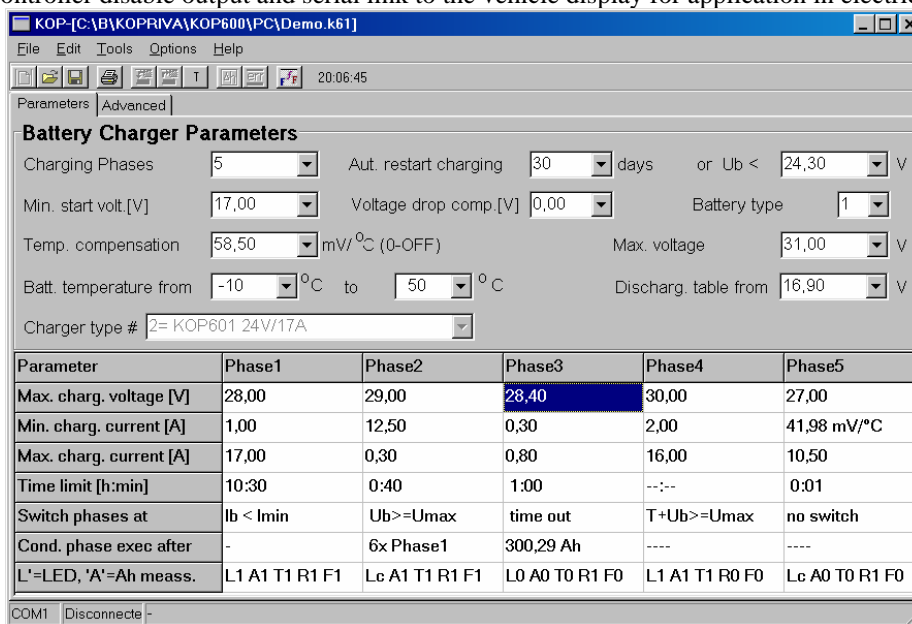
The charger adjusts the charging voltage to compensate for the battery temperature, providing an accurate charge in any climate. A low cost external battery temperature sensor may be used to monitor battery temperature. The battery temperature monitoring and voltage compensation can be enabled for each charging phase separately and set separately (two different values) for the main charging process and for the trickle charge

- **Low noise:** Fan speed adjusted accordingly to load and ambient temperature.
- **Battery status LED indicators:** Three LED's – one of them user programmable.
- **Compact size, low weight, ruggedized construction and maintenance free operation .**

TECHNICAL SPECIFICATION

Charger type	KOP601			KOP1001		
Nominal battery voltage	24V	36V	48V	24V	36V	48V
Programmable output voltage	20 – 33V	30 – 49,5V	40 – 66V	20 – 33V	30 – 49,5V	40 – 66V
Programmable output current	0,3 – 17A	0,2 – 12A	0,15 – 9A	0,60 – 34A	0,40 – 24A	0,30 – 18A
Input voltage	230V ±10% 50-60Hz			230V ±10% 50-60Hz		
Input power	600W			1200W		
Ambient temperature range	-25 to 35°C (gradual power reduction at higher ambient temperatures)					
Operating humidity	15 to 95% RH (non condensing)					
Weight (depends on cable length)	2,0 kg			3,6 kg		
Dimensions (l x w x h) in mm	240 x 108 x 82			240 x 215 x 82		
IP and approvals	IP21 / EN60 335-1 / EN60 335-2-29					

Options: drive controller disable output and serial link to the vehicle display for application in electrical vehicles.



Example of charger parameters (used only to present most of the options – not for a real battery)

Protection features:

- overload and short-circuit protection,
- reverse polarity protection,
- gradual power reduction at elevated ambient temperatures,
- non-sparking feature for safe battery connection,
- time-out programmable separately for each of the charging phases,
- battery temperature monitoring (optional temp. sensor) for battery protection and charging voltage compensation,
- AC fail recovery (charging resumes at the correct point after the AC power is restored),
- charger to battery mismatch protection,
- self test functions (at start and during operation).