IMPORTANT FOR YOUR SAFETY!

Whenever you are handling or working with a lead-acid battery, consult your battery owners' manual for instructions and safety precautions.

COOLING FAN
Do not cover the cooling fan openings to ensure enough cooling flow. Otherwise the charging current will drop and the charging time will increase proportionally.
Use the charger for the defined battery type only, (according to the parameters). If the charging profile does not suit the battery type, the battery will not be charged properly and the life time of the battery may be shortened.

BATTERY TYPE
Use the charger for the define battery type only, (according to the parameters). If the charging profile does not suit the battery type, the battery will not be charged properly and the life time of the battery may be shortened.

GAS
Lead-acid batteries produce hydrogen-oxygen gases which can be explosive and sulfuric acid that can cause severe burns. Make sure working area is well-ventilated. Cigarettes or any open fires or sparks may cause an explosion. Keep all ignition sources away from the battery.

ACID
Battery acid can severely damage your eyes and skin. In event of accident, flush with water and seek medical help immediately. Use proper personal protective devices when handling a damaged or leaking battery. Treat material used to clean up a battery acid spill as hazardous waste.

TOXIC SUBSTANCES
Batteries contain hazardous materials. Among others lead and antimony are toxic substances. Waste lead-acid batteries are hazardous waste and must be treated according to the Battery Disposal Regulations.

OPERATING INSTRUCTIONS
BATTERY CHARGER EPS 600 AND EPS 1000

Battery chargers EPS 600 and EPS1000 are modem fully automatic devices suitable not only for charging but also for maintaining and monitoring the batteries. Charger stores data about charging times and Ah counting. This data may be accessed for further analysis.
The charger may be used as a stationary device or can be installed and operated in the vehicles. Charger should be mounted horizontally. Any drilled holes or any mechanical changes of the housing may damage the charger.

Your EPS battery charger was factory programmed for a specific battery type. Make sure the charging profile suits your battery type. To change the charging profile for a specific battery type, parameters may be programmed with a PC software package and a programming interface. The programming parameters allow the charger' s profile to suit the battery type. Up to five charging phases can be programmed. The charging voltages, currents, charging times, temperature compensation and other control functions can be programmed. Please contact your dealer for further information. By programming the charging profile always follow the battery producer instructions regarding voltages, currents and charging times.

Read the operating instructions carefully before using the EPS Battery charger.

Note: Please note, that new batteries reach the maximum capacity after multiple charging cycles have been completed successfully. Old batteries often don't reach the full capacity. This can cause the charging process not to end properly (example:
maximum charging time overflow).

TO START THE CHARGING PROCESS
Establish a safe connection between the battery and charger first. Then plug the mains connector. This sequence must always be followed in this order. When removing the connection, remove the mains plug from the mains first before disconnecting the battery circuit.
After connecting the battery, the red LED (error LED) flashes several times and then remains OFF. By starting the charging the yellow LED lights ON (also a click the inside relay can be heard and cooling fan starts to operate).

Indication LED pattern:

Yellow LED ON: Main charge phase with maximum charging current

Yellow LED flashes slowly (1 sec.): U-phase with constant voltage (appr. 80% charged)

Yellow LED flashes faster (0,3 sec.): Floating charge phase (30 mm. duration)

Green LED ON: Battery 100% charged

After this phase trickle charge follows.

The battery may be permanently connected to the charger. The Cooling fan is temperature controlled and operates at different speeds. The charging time depends on the battery capacity. If the battery has been partly discharged, the charging process will finish sooner.

IMPORTANT SAFETY INSTRUCTIONS

Read the manual thoroughly.

Charger must be used with the original cables only. Do not change, shorten, extend or short circuit the cables.

Remove the mains plug from the mains first before braking the battery circuit.

Only rechargeable batteries can be used. Do not connect any non-rechargeable batteries (like dry-cell batteries) to the charger.

Charger may be used for correct battery type only. Due to legal regulations, truck batteries may not be charged while built in the truck and connected to the electrical board supply system.

Do not use the charger inside motor-homes, campers or caravans.

Check the charger for cable, housing and connector damages before use. Do not operate the charger if any damages are present. . There are no user serviceable parts inside.

Do not expose the charger to rain, moisture, direct sunlight or dust..

Always disconnect mains after charging and generally when the device is not in use. During the trickle charge the charger remains attached to the mains.

Always disconnect the mains during a thunderstorm.

ERRORS	
No LED lights ON or flash after the charger has been connected to the mains.	1. Check if the battery is properly connected. 2. Check the Mains 3. Contact your after sales service
LED flashes periodically: n-times	Please see the error messages description of flash pattern below.

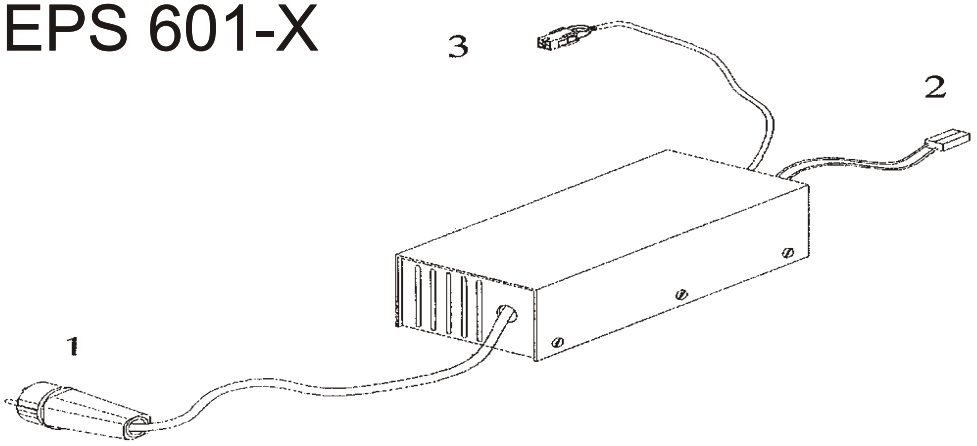
Error Messages

Number of LED flashes	Description
1	Charger temperature sensor failed
2	Charging time limit has been exceeded (faulty battery/battery aging)
3	Battery temperature sensor failed or not connected
4	Charger temperature during the charging process is to high
5	Battery voltage to high at start of the charging (improper battery)
6	Battery temperature too low
7	Battery temperature too high
8	Charger disconnected from the battery during charging
9	Bad parameter check sum
10	Problems with the current measurement offset
11	Bad parameter values
12	The current can not be measured/detected
13	Battery Charging current measurement is out of range
14	Battery charging current ca not be properly controlled.

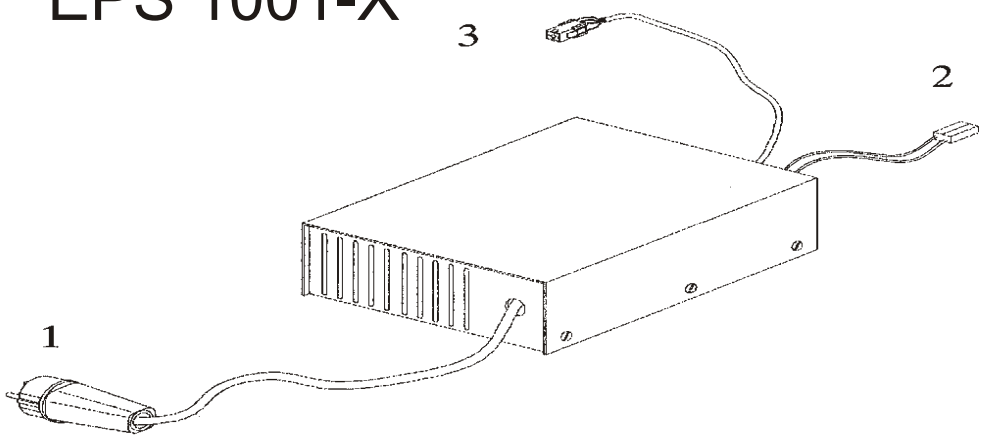
TECHNICAL SPECIFICATION

Charger type	EPS 600 24V	EPS600 36V	EPS1000 24V	EPS1000 36V	EPS1000 48V
Nominal battery voltage	24V	36V	24V	36V	48V
Nom. Output current	17A	12A	34A	24A	18A
Peak input power	600W / 5A		1200W / 10A		
Input voltage	230V - 50/60 HZ		230V - 50/60 HZ		
IP Protection Grade	IP 21		IP 21		
Weight	2.2 Kgs.		3.9 Kgs.		

EPS 601-X



EPS 1001-X



Description of the drawings:

1. 230V plug
2. Battery connector: red = Battery (+)
   black = Battery (-)
3. Temperature sensor (see the following table)

Single output EPS 600/1000 (Molex type connector)		Double output EPS 1000	
Pin	Function	Pin	Function
1, 2	Temperature sensor	1, 2	Temperature sensor for output 1
		3, 4	Temperature sensor for output 2

Any temperature sensors used are only active if the battery charger temperature compensation parameters have been set to values other than zero. We recommend to fix the temperature sensor to one of the battery terminals.

The charger EPS 1001 can be delivered with two separate outputs. The two outputs have no galvanic connection. In case of for example 24V charger with two outputs, they may serially be connected to a 48V string of batteries (each one to 24V string). With this option the batteries get better charge equalization. When viewing the charger from the rear, where the battery cables exit the housing, the output number one is in the middle and output number two at the top.

IMPORTANT:

The battery connectors carry large currents. The contacts and the whole connector gets very hot if the contacts/connector are not fitted properly. We strongly recommend the use of proper tools. The connection should be done by qualified personnel.
The charger has to be checked for mechanical damages on the housing or cables/connector before use. If any defects are found, then the charger can not be put into operation.