XS 3600

Battery charger

For lead-acid batteries 14-120Ah

User's Manual and a guide to professional battery charging For Starter/Deep Cycle batteries

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INTRODUCTION

Congratulations on your purchase of your new professional XS 3600 Switch Mode Charger with Pulse Maintenance. XS 3600 is a member of a family of professional chargers from CTEK Sweden AB. It represents the state-of-the-art technology for battery charging. A XS 3600 will prolong the lifetime of your battery. Read this user manual and follow the instructions carefully before using the charger.

SAFETY

- The charger is designed for lead-acid batteries from 14-120Ah. Do not use the charger for any other purpose.
- Use safety glasses and turn your head away when connecting or disconnecting a battery.
- Battery acid is corosive. Rinse immediately with water if acid comes into contact with skin or eyes. Seek medical advice.
- Make sure that the cable is not being pinched or in contact with warm surfaces or sharp edges.
- While charging, a battery can emit explosive gases, so it is important to avoid sparks in the immediate area.
- Always provide for proper ventilation during charging.
- Avoid covering the charger.
- Make sure that the electrical cable does not come into contact with water.
- Never charge a frozen battery.
- Never charge a damaged battery.
- Do not place the charger on the battery while charging.
- The electrical connection must fulfil the national heavy current requirements.
- Check the cabling in the charger before use. Make sure there are no cracks in the cabling or in the protective covering. A charger with damaged cables may not be used.
- Always check that the charger has gone over to maintenance charging mode before leaving the charger unattended and connected for long periods. If the charger had not gone over to maintenance charging within 3 days, this is an indication of a problem. In this case the charger must be disconnected manually.
- All batteries fail sooner or later. A battery that fails during charging is normally taken care of by the chargers advanced control, but certain uncommon errors in the battery can still arise. Don't leave the battery charger unattended for a longer period of time.
- Only mount the charger on a flat surface.
- This equipment may not be used by children or by those who can not read and understand the manual if they are not supervised by a responsible person who can guarantee that the battery charger is being used in a safe manner. Store and use the battery charger out of the reach of children. Make sure that children do not play with the battery charger.

CHARGING

Charging batteries mounted in a vehicle:

1. The power cord should be disconnected before connecting or disconnecting the battery leads.
2. Identify the pole that is grounded (attached to the chassis). Ground is normally connected to the negative terminal.
3. Charging a negatively grounded battery. Connect the red wire to the positive pole of the battery and the black cable to the vehicle's chassis. Be careful not to connect the black cable in the vicinity of a fuel pipe or the battery.
4. Charging a positively grounded battery. Connect the black wire to the negative pole of the battery and the red cable to the vehicle's chassis. Be careful not to connect the red cable in the vicinity of a fuel pipe or the battery.

Charging of a battery not connected to a vehicle:

1. The power cord should be disconnected before connecting or disconnecting the battery leads.
2. Connect the red wire to the positive pole of the battery and the black cable to the negative pole.

Connecting the provided cables with eyelet terminals:

Make sure that the cable is not being pinched or in contact with warm surfaces or sharp edges. When the cable is mounted on the battery, it should not be connected to the charger. Connect the eyelet terminals to the battery's poles - the red cable to the positive pole and the black cable to the negative pole. After this, the quick contact can be connected.

Reverse Polarity Protection

If the battery cables are connected incorrectly, the reverse polarity protection will make sure that the charger and the battery are not damaged. In this case, the red warning lamp (0) will be lit.

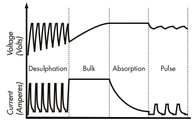
Start charging

1. Connect the power cord to the power outlet.
2. When you are sure the battery leads are correctly placed, connect the power cord to the power outlet to begin charging. If the battery leads are wrongly connected, the pole-changing switch will ensure the battery and charger are not damaged. The fault indicator ❶ will light. In which case start from the beginning again.
3. The charging lamp will now indicate charging or the maintenance lamp will indicate that the battery is fully charged. If the voltage drops the charger sends a pulse to the battery. The length of the pulse depends on how much the voltage has dropped. The charger can be connected for months.
4. If nothing happens: If the voltage indicator is lit but no other lamp is lit there could be a bad connection to the battery or chassis or the battery could be faulty. Check the wall power outlet. If you experience problems: start with the sensitive connection between the battery clamps and the charger.
5. Charging can be stopped at any time by disconnecting the supply cord. Always remove the power cord from the power outlet before disconnecting the battery leads from a battery in a vehicle. When you stop charging a battery in a vehicle, remove the cable from the chassis before removing the other cable.
6. If the charger lamp and the maintenance-charger lamp are flashing alternately, the reason for this is due to:

- An interruption during charging, due to a loose connection or because the battery has ceased to work.
- The battery has become sulphated. If the lamps flash for more than 30 minutes, this indicates that the battery is dead and needs to be replaced.
- If there is an interval of more than 10 seconds between the flashes, this indicates that the battery has a high self-discharge rate and may need to be replaced.

CHARGING PHASES

XS 3600 operates in a four step fully automatic cycle IU_pU_0. It begins charging with an almost constant current until maximum voltage is reached. The charger changes mode at this point. It locks the voltage at maximum level and allows the current to drop. The XS 3600 switches automatically to pulse maintenance charging when the current drops to 0.4A. The charging cycle restarts if the battery voltage drops to 12.9V.



Desulphation - Desulphation with pulsing for sulphated batteries.
Bulk - Charging where 80% of the energy is returned. The charger delivers an almost constant current until the battery voltage reaches maximum level.
Absorption - Charging up to almost 100%. The charge current falls and the voltage is kept constant at the maximum level.
Pulse - Maintenance phase, where the charger delivers a pulse if the battery voltage drops. Charging varies between 95% and 100%. The battery receives a pulse when the voltage reduces. Keep the battery in good condition when not in use. The charger can be connected for months.

TEMPERATURE PROTECTION

XS 3600 is protected from being overheated. The power will be reduced if the ambient temperature is raised.

MAINTENANCE

The charger is maintenance free. Note that disassembly of the charger is not permitted and will void the warranty. If the power cord is damaged, the charger must be left to the reseller for maintenance. The case can be cleaned with a soft damp cloth and mild cleanser. The charger should be disconnected from the power while cleaning.

EQUIPMENT

XS 3600 is delivered with a set of battery leads with battery pole clamps and a set of battery leads with eyelet terminals.

WARRANTY

CTEK SWEDEN AB, Rostugnsvägen 3, 776 70 VIKMANSHYTTAN, SWEDEN provides a limited warranty to the original purchaser of this product. This limited warranty is not transferable. The unit is warranted against defective workmanship or materials for two years from the date of purchase. The customer must return the product together with the original purchase receipt to the place of purchase. This warranty is void if the unit is handled carelessly, opened or repaired by anyone other than CTEK SWEDEN AB or its authorized representative. CTEK SWEDEN AB makes no warranty other than this limited warranty and expressly excludes any implied warranty including any warranty for consequential damages. This is the only expressed limited warranty and CTEK SWEDEN AB neither assumes nor authorizes anyone to assume or make any other obligation towards the product other than his limited warranty.

TECHNICAL SPECIFICATION

Model	XS 3600
Voltage AC	220-240VAC, 50-60Hz
Back current drain*	< 1mA/month
Voltage	Charging Voltage Nominal: 12V; 14.4V
Ripple**	Max 50mV rms, max 0.13A
Current	3,6A
Ambient Temperature	- 20°C to + 50°C, power is reduced automatically at increased ambient temperature.
Cooling	Natural convection.
Charging cycle	XS 3600 is a multistage fully automatic charger
Type of batteries	All types of 12V lead-acid batteries (Wet, MF, VRLA, AGM and GEL).
Battery Capacity	14 to 120Ah
Dimensions	165x61x38mm (L x W x H)
Insulation	IP 65***
Weight	0.5 kg

*) Back Current Drain is what the charger uses to drain the battery if the power cord is disconnected.
**) Quality of the current and voltage are very important. High current ripple heats up the battery and makes the positive electrode age prematurely. High voltage ripple could harm other equipment connected to the battery. XS 3600 produces a high quality current and voltage with very low ripplel.
***) If the power connected is the flat European contact type, the battery charger has insulation class IP63, except in Switzerland where IP65 is valid.

MANUFACTURER'S DECLARATION

CTEK SWEDEN AB, Rostugnsvägen 3, 776 70 VIKMANSHYTTAN, SWEDEN. Declares under sole responsibility that the battery charger XS 3600, to which this declaration relates is in conformity with the following LVD standards: EN60335-1, EN60335-2-29 according to the terms of directive 73/23/EEC with the addition of 93/68/EEC. This product also is in agreement with the following EMC standards: EN55011, EN 61000-3-3, EN 61000-3-2, EN55014-1 and EN55014-2 according to the terms of directive 89/336/EEC with the addition of 92/31/EEC and 93/68/EEC.

The charger comes in different models with different types of electrical plugs. The charger with the flat eurocontact is intended for Switzerland.

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BULK CHARGING TIME

The table shows the length of time for bulk charging.

Battery size (Ah)	Time (h)
14	3
20	5
60	15
100	25
120	27

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