



Battery Charger

MXT 14000 AE

For lead-acid batteries



*User Manual and Guide to professional
charging of starter and deep cycle batteries.*

Model 1015



INTRODUCTION

Congratulations on purchasing your new CTEK professional switch mode battery charger. This charger is part of a range of professional battery chargers from CTEK SWEDEN AB. It represents the latest technology in battery charging with charging and analysis in seven steps with temperature compensation. **Read this User Manual and follow the instructions carefully before using your new charger.**

SAFETY

- The charger is designed for lead-acid batteries. 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 corrosive. Rinse immediately with water if acid comes into contact with skin or eyes. Seek medical advice.
- Make sure that the cable is not 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 charger cabling 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.
- When using outdoors the charger has to be positioned horizontally with the long side or topside turned up.
- When using the 19mm cig plug connector the mating part must be approved for 14A or more.

CHARGING

Connecting the charger to a battery fitted in a vehicle

1. The power cord should be disconnected when connecting or disconnecting the battery leads.
2. Identify the battery terminal that is grounded (connected to the chassis). The negative terminal is normally the grounded post.
3. Charging a negatively grounded battery. Connect the red cable to the positive terminal on the battery and the black cable to good metal engine ground away from the battery. Ensure you do not connect the black cable to fuel lines or sheet-metal body parts.
4. Charging a positively grounded battery. Connect the black cable to the negative terminal on the battery and the red cable to good metal engine ground away from the battery. Ensure you do not connect the red cable to fuel lines or sheet-metal body parts.

Connecting the charger to an out of vehicle battery:

1. The power cord should be disconnected when connecting or disconnecting the battery leads.
2. Connect the red cable to the positive terminal on the battery and the black cable to the negative terminal.
3. If the battery leads have been connected incorrectly, the reverse polarity protection system will ensure that neither the charger nor the battery are damaged.

Start charging

1. Connect the chargers AC cord to an AC Power Supply. The charger will indicate POWER, yellow indication lamp (B).
2. The lamp for completely discharged battery (1) will illuminate if the battery's voltage is less than 24V.

3. Normal charging will be indicated by the following lights: start (1), bulk charging (2), absorption charging (3) or maintenance charging (4). When the maintenance charging lamp illuminates the battery is fully charged. Charging will start if the voltage drops. The charger can normally be connected for months. Reconditioning is indicated by the lamp (5) illuminating.
4. If the battery leads have been connected incorrectly, the reverse polarity protection system will ensure that neither the charger nor the battery is damaged and is indicated by lamp (0).
5. If nothing happens. If the lamp indicating the setting and the power lamp remain lit but no other lamp illuminates, the connection to the battery or chassis may be poor or the battery may be faulty. Another cause may be a lack of voltage in the AC Power Supply. Begin by improving the connection between the battery and charger.
6. Charging can be stopped at any time by disconnecting the charger's AC cord. Always disconnect the AC cord before disconnecting the battery leads. When you stop charging a battery installed in a vehicle you should always disconnect the battery lead from the chassis before disconnecting the other battery lead.

IMPORTANT INFORMATION

Please note that the battery pack in the 24V system in most cases consists of more than one battery. They are linked up to the 24V system, but the individual batteries generally have a lower voltage. Therefore it is important for the charger to be connected correctly.

BATTERY TYPES AND SETTINGS

The charger is programmed according to "PROGRAM DESCRIPTION" with fixed settings and can easily be set for different types of batteries or conditions. The following recommendations should, however, only be seen as guidelines. Please consult the battery manufacturer for further instructions.

Settings are made by pressing the "MODE-button " and stepping forward one press at a time until the required mode is reached, the button is then released. After about 2 seconds the charger activates the selected mode. The selected mode is saved in a memory in the charger and remains there even if the charger is disconnected from battery and mains.

NORMAL	NORMAL - Normal setting for wet batteries, maintenance free and for most Gel batteries. Some Gel batteries prefer a slightly lower charging voltage. Please consult the battery manufacturer when in doubt.
SUPPLY 	SUPPLY - The charger operates at a constant voltage. This is the maintenance mode for applications where maximum capacity from the battery is important, like floor sweepers and golf carts. Note that the Spark protection function is suppressed in this mode.
RECOND	RECOND - This mode is used to recover deep discharged flooded batteries where you could expect a stratified acid (high acid weight in the bottom, low on top). Check with battery manufacturer when in doubt. Use this mode with care, because the high voltage will cause some water loss. 32V is normally no problem for electronics in 24V system. Consult your supplier when in doubt. Life of light bulbs will be reduced at higher voltage. Try to disconnect light from the battery during this phase. <u>Maximum effect and minimum risk for electronics is achieved by charging a disconnected battery.</u>

CHARGING PHASES

MXT 14000 AE charges and analyses in eight fully automatic steps.

The battery charger has an 8-step fully automatic charging cycle:

Desulphation

Desulphation with pulses recovers sulphated batteries. Indicates with lamp 1.

Start (Lamp 1)

Start mode for the charging cycle. The start phase continues until the battery's terminal voltage has risen above the set limit, at which point the charger switches to bulk charging. If the terminal voltage has not passed the voltage limit within the time limit, the charger switches to fault mode (lamp 0) and discontinues the charging. If so, the battery is faulty or its capacity is too large.

Bulk (Lamp 2)

Main charge when 80% of charging takes place. The charger delivers maximum current until the terminal voltage has risen to the set level. Bulk has a maximum time, at which point the charger automatically switches to Absorption.

Absorption (Lamp 3)

Complete charge up to virtually 100%. The terminal voltage is maintained at the set level. During this phase the current tapers successively. Once the current has tapered to the set limit, this phase switches to being timed. If the total time for Absorption exceeds the time limit the charger automatically switches to maintenance.

Analysis (Lamp 3)

Testing self-discharge. If self-discharge is too high, charging is discontinued and fault mode is indicated.

Maintenance charging - Float (Lamp 4)

Charging at constant voltage.

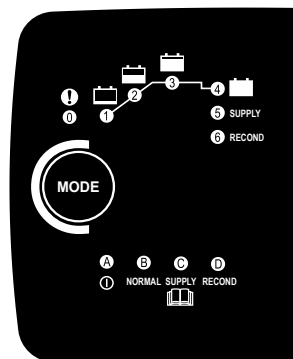
Maintenance charging - Pulse (Lamp 4)

State of charge varies between 95% and 100%. The battery receives a pulse when the voltage drops and keeps the battery in perfect condition when it is not in use. The charger can be connected for months at a time. The charger continuously measures the terminal voltage to determine whether a charging pulse should be initiated. If the battery is loaded and/or the battery's terminal voltage drops the charger starts a charging pulse until the terminal voltage reaches the set level. The charging pulse is then discontinued and the cycle is repeated infinitely. If the terminal voltage drops below a lower limit, the charger automatically goes back to the beginning of the charging curve.

Recond (Lamp 5)

This mode is used to recover deeply discharged flooded batteries. Recondition of deep discharged batteries. The voltage increases with reduced current for a limited time period. The higher voltage starts some gassing and mixing of the acid, which is beneficial for both battery capacity and expected life. Note that the battery could emit explosive gas during Recond. Recond is performed between Analysis and Maintenance.

INDICATORS



Lamp	Description
0	Fault mode, the charging is discontinued. For fault causes, see below.
1	Start mode
2	Bulk charging
3	Absorption charging
4	Maintenance charging
5	Supply
6	Recond reconditioning of completely discharged batteries.
A	Mains voltage connected
B	Normal
C	Supply
D	Recond

Fault mode

The charger goes to fault mode in the following situations:

- The battery is connected with poles reversed to the charger's terminals.

- The charger's analysis function has interrupted charging.
- The terminals on the charger are short-circuited after charging has started.
- The charger has been in start mode for more than 4 hours.

SPECIFICATION

Model	1015
Voltage AC	220–240VAC, 50–60Hz
Charging voltage	28.8V
Charging current	14A max
Current, mains	2.9A rms (at full charging current)
Back Current Drain*	<2Ah per month
Ripple**	<4%
Ambient temperature	-20°C to +50°C Output power is automatically reduced at higher temperatures
Cooling	Fan
Charger type	8-step, fully automatic
Battery types	All types of 24V lead-acid batteries (WET, MF, AGM and GEL)
Battery capacity	28–300Ah, up to 500Ah maintenance
Degree of protection	IP44 (Outdoor use)***
Weight	3.5 kg
Battery cable	6m with Anderson Powerpole connector
Extension cable	60cm with battery clips, 50cm with 12mm DC plug. (DIN EN ISO 4165), 50cm with 19mm cig plug connector****
Fuse	20A

*) Back current drain is the current that the charger drains from the battery if the AC cord is disconnected.

**) The quality of the charging voltage and charging current are very important. High current ripple heats the battery and ages the positive electrode. High voltage ripple can damage other equipment connected to batteries. The battery chargers from CTEK produce very high quality voltage and current with low ripple.

***) IP44 cannot be guaranteed if the charger is not positioned horizontally with the long side or topside turned up.

****) When using the 19mm cig plug connector the mating part must be approved for 14A or more.

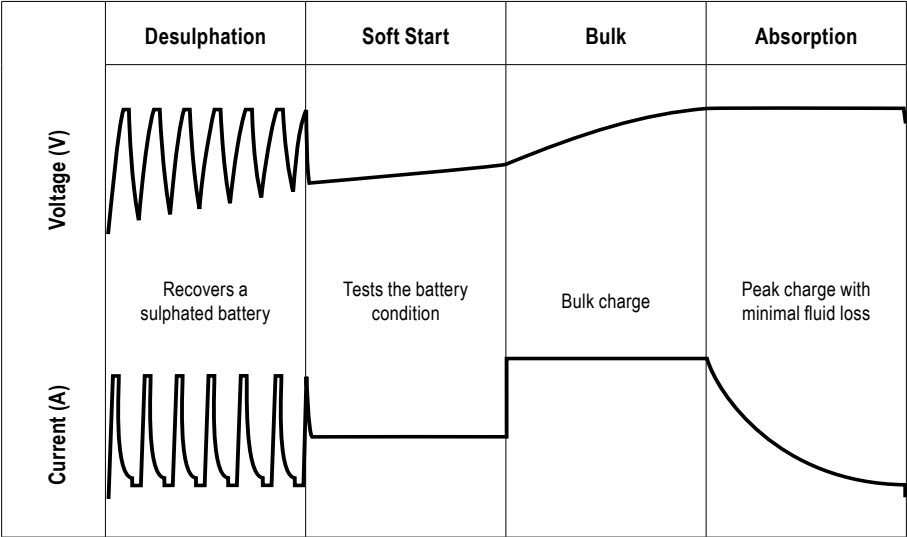
MAINTENANCE

The charger is maintenance-free. The charger must not be opened; doing so will invalidate the warranty. If the power cable is damaged it must be replaced by CTEK or its authorized representative. The charger casing can be cleaned using a damp cloth and mild cleaning agent. Remove the plug from the power socket before cleaning.

LIMITED WARRANTY

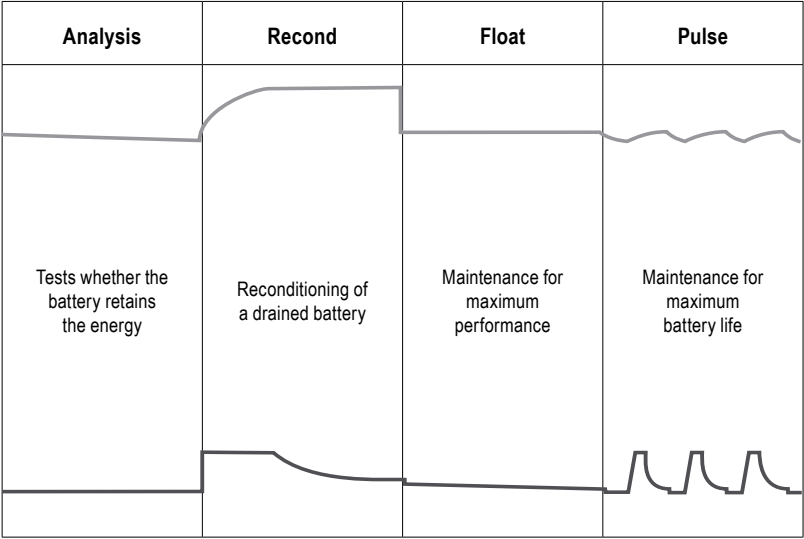
CTEK SWEDEN AB, Rostugnsvägen 3, SE-776 70 VIKMANSHYTTAN, SWEDEN issues this limited warranty to the original purchaser of this product. This limited warranty is not transferable. CTEK SWEDEN AB warrants this unit for 2 years from the date of purchase against defect workmanship or material. It is the obligation of the purchaser to forward the unit together with proof of purchase to the manufacturer or its representative with transportation cost prepaid. This warranty is void if the unit is abused, handled carelessly 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 this limited warranty.

PROGRAM DESCRIPTION



MXT 14000 AE PARAMETERS

Mode	Desulphation	Soft Start	Bulk	Absorption
PRESET	YES	Max 14A for 4h until the voltage reaches 25.2V.	14A for max 20h.	28.8V for 4h after the current dropped to 2.5A, max 12h.

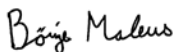


Analysis	Recond	Float	Pulse
Warning indication if voltage drops to 24.0V in 3 minutes.	Max 31.6V and 1.7A for 4h for deeply discharged batteries. Otherwise for 30 minutes (only in Recond mode).	27.2V with max 14A for max 10 days.	Pulse start at 25.8V, max voltage 28.8V.

DECLARATION OF CONFORMITY

CTEK SWEDEN AB, Rostugnsvägen 3, SE-776 70 VIKMANSHYTTAN, SWEDEN. Declares under sole responsibility that the battery charger XT 14000 EXTENDED-C, to which this declaration relates is in conformity with the following LVD standards: EN60335-1, EN60335-2-29 according to the terms of directive 2006/95/EG. 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 2004/108/EG.

VIKMANSHYTTAN, SWEDEN 2008-06-30



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