

## CONGRATULATIONS

to the purchase of your new professional switch mode battery charger. This charger is included in a series of professional chargers from CTEK SWEDEN AB and represents the latest technology in battery charging.

## SAFETY

- The charger is designed for charging only batteries according to the technical specification. Do not use the charger for any other purpose. Always follow battery manufacturers' user and safety recommendations.
- Never try to charge non-rechargeable batteries.
- Never place the charger on top of the battery or cover the charger when charging.
- Never charge a frozen or damaged battery.
- Never charge a Li-battery with temperature below 0°C (32°F) if not specified by the battery manufacturer.
- Never use a charger with damaged cables. Ensure that the cables have not been damaged by hot surfaces, sharp edges or in any other way.

- Never place a fan-cooled charger so that dust, dirt or similar can be sucked into the fan.
- A damaged cable must be replaced by a CTEK representative using an original part supplied by CTEK. A detachable cable can be replaced by the user using an original part supplied by CTEK.
- Connection to the mains supply must be in accordance with the national regulations for electrical installations.
- Chargers with grounded mains plug must only be connected to a grounded socket outlet.
- During charging, Lead-Acid batteries could emit explosive gases. Prevent sparks close to the battery. Provide for good ventilation.
- Chargers with IP-class lower than IPx4 are designed for indoor use. See technical specification. Do not expose to rain or snow.
- Connect the charger to the battery's positive pole and then to the negative pole. For batteries mounted inside a vehicle, connect the nega-

tive connection to the vehicle chassis remote from the fuel pipe. Then connect the charger to mains supply.

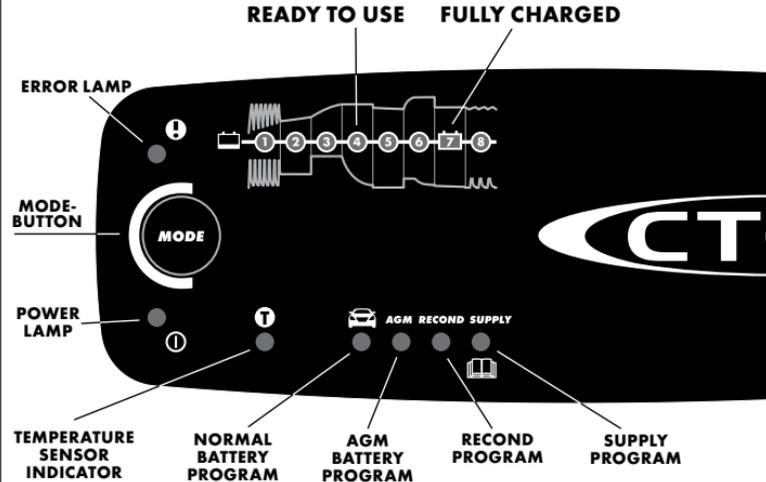
- Disconnect the charger from the mains supply. Next remove the negative connection (vehicle chassis) and then the positive connection.
- Don't leave any battery unattended for a longer period of time during charging. If any error occurs disconnect the charger manually.
- **(IEC 7.12 ed.5)** This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

**(EN 7.12)** This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge if they have been given supervi-

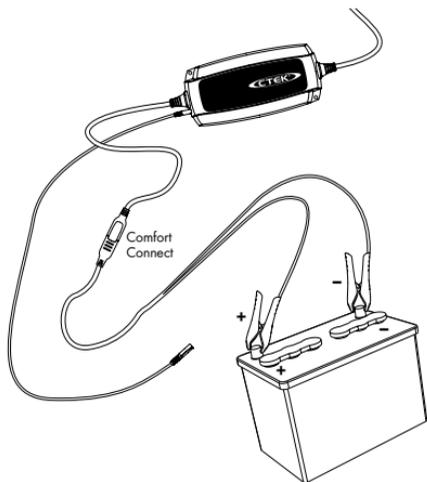
sion or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

## HOW TO CHARGE

1. Connect the charger to the battery.
2. Connect the charger to the wall socket. The power lamp will indicate that the mains cable is connected to the wall socket. The error lamp will indicate if the battery clamps are incorrectly connected. The reverse polarity protection will ensure that the battery or charger will not be damaged.
3. Press the MODE-button to select charging program.
4. Follow the 8-step display through the charging process. The battery is ready to start the engine when STEP 4 is lit. The battery is fully charged when STEP 7 is lit.
5. Stop charging at any time by disconnecting the mains cable from the wall socket.



## CONNECT THE CHARGER TO A BATTERY

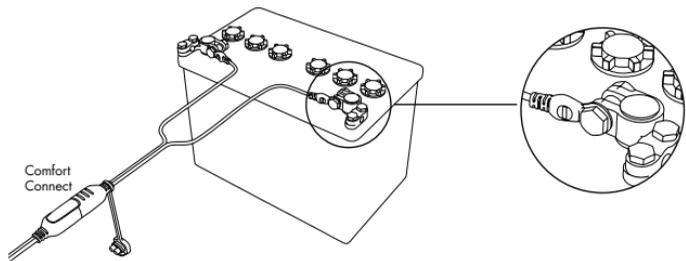


### INFO

If the battery clamps are incorrectly connected, the reverse polarity protection will ensure that the battery and charger are not damaged.

### For batteries mounted inside a vehicle

1. Connect the red clamp to the battery's positive pole.
2. Connect the black clamp to the vehicle chassis remote from the fuel pipe and the battery.
3. Connect the charger to the wall socket.
4. Disconnect the charger from the wall socket before disconnecting the battery.
5. Disconnect the black clamp before the red clamp.



## CHARGING PROGRAMS

Settings are made by pressing the MODE-button. After about two seconds the charger activates the selected program. The selected program will be restarted next time the charger is connected.

The table explains the different Charging Programs:

Program	Battery Size (Ah)	Explanation	Temp range
	20-300Ah	<b>Normal battery program</b> 14.4V/10A. Use for WET batteries, Ca/Ca, MF and for most GEL batteries	<b>-20°C--+50°C</b> (-4°F-122°F)
<b>AGM</b>	20-300Ah	<b>AGM battery program</b> 14.7V/10A Use for AGM batteries.	<b>-20°C--+50°C</b> (-4°F-122°F)
<b>RECOND</b>	20-300Ah	<b>Recond program</b> 15.8V/1.5A Use to return energy to the empty WET and Ca/Ca batteries. Recond your battery once per year and after deep discharge to maximise lifetime and capacity. The Recond program adds STEP 6 to the normal battery program.	<b>-20°C--+50°C</b> (-4°F-122°F)
<b>SUPPLY</b>	20-300Ah	<b>Supply program</b> 13.6V/10A Use as 12V power supply or use for float maintenance charging when 100% capacity of the battery is required. Supply program activates step 7 without time or voltage limitation.	<b>-20°C--+50°C</b> (-4°F-122°F)



### WARNING!

The spark protection on the battery charger is disabled during SUPPLY program.



## ERROR LAMP

If the error lamp is lit, check the following:



**1. Is the chargers positive lead connected to the battery's positive pole?**

**2. Is the charger connected to a 12V battery?**

**3. Has charging been interrupted in STEP 1, 2 or 5?**

Restart the charger by pressing the MODE-button. If charging is still being interrupted, the battery...

**STEP 1:** ...is seriously sulphated and may need to be replaced.

**STEP 2:** ...can not accept charge and may need to be replaced.

**STEP 5:** ...can not keep charge and may need to be replaced.

## POWER LAMP

If the power lamp is lit with a:



**1. STEADY LIGHT:**

The mains cable is connected to the wall socket.

**2. FLASHING LIGHT:**

The charger has entered the energy save mode. This happens if the charger isn't connected to the battery in 2 minutes.

## TEMPERATURE SENSOR



The charger is equipped with a temperature sensor. The temperature sensor will adjust the voltage to the ambient temperature. For MXS 10 EC - the temperature sensor is not detachable. Activated temperature sensor will be indicated by a lit temperature sensor indicator lamp.

## READY TO USE

The table shows the estimated time for empty battery to 80% charge

BATTERY SIZE (Ah)	TIME TO 80% CHARGED
20Ah	2h
50Ah	5h
100Ah	10h
200Ah	20h

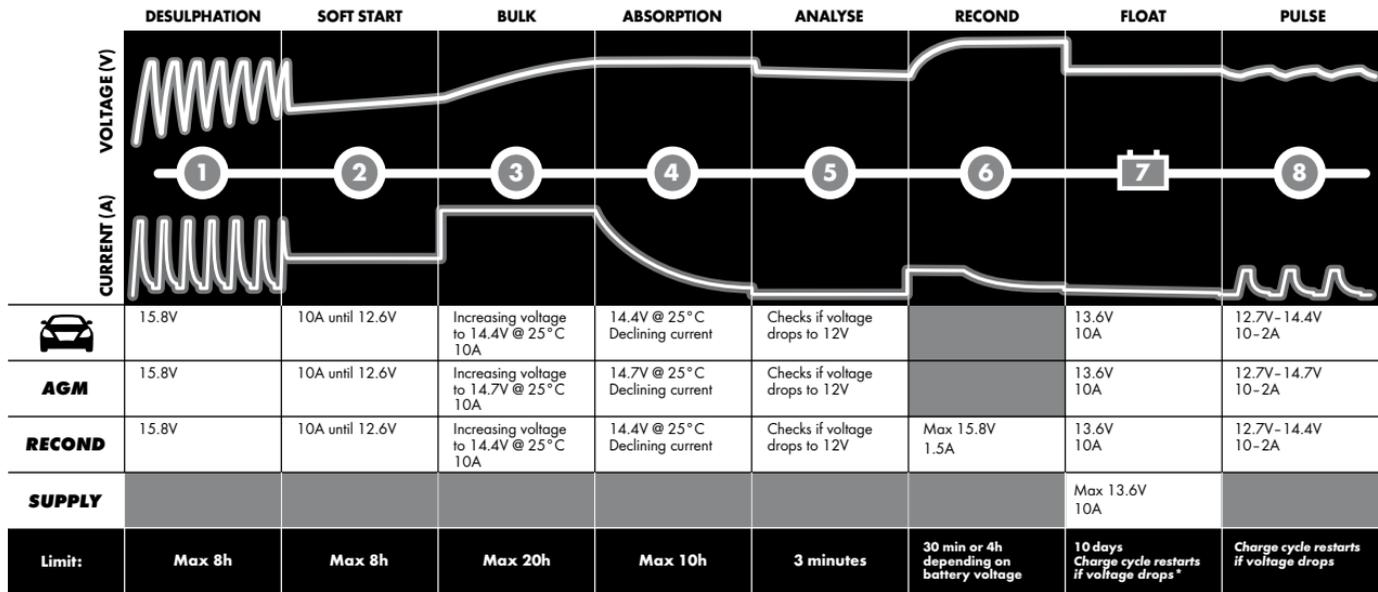
## TECHNICAL SPECIFICATIONS

Model number	1046
Rated Voltage AC	220-240VAC, 50-60Hz
Charging voltage	 14.4V, <b>AGM</b> 14.7V, <b>RECOND</b> 15.8V, <b>SUPPLY</b> 13.6V
Start voltage	2.0V
Charging current	10A max
Current, mains	1.4A <sub>rms</sub> (at full charging current)
Back current drain*	Less than 1Ah/month
Ripple**	Less than 4%
Ambient temperature	-20°C to +50°C, output power is reduced automatically at high temperatures
Charger type	8-step, fully automatic charging cycle
Battery types	All types of 12V lead-acid batteries (WET, MF, Ca/Ca, AGM and GEL)
Battery capacity	20-300Ah
Insulation class	IP65

\*) Back current drain is the current that drains the battery if the charger is not connected to the mains. CTEK chargers has a very low back current.

\*\*) The quality of the charging voltage and charging current is very important. A high current ripple heats up the battery which has an aging effect on the positive electrode. High voltage ripple could harm other equipment that is connected to the battery. CTEK battery chargers produce very clean voltage and current with low ripple.

## CHARGING PROGRAM



\*Supply program is not time or voltage limited.

### STEP 1 DESULPHATION

Detects sulphated batteries. Pulsing current and voltage, removes sulphate from the lead plates of the battery restoring the battery capacity.

### STEP 2 SOFT START

Tests if the battery can accept charge. This step prevents that charging proceeds with a defect battery.

### STEP 3 BULK

Charging with maximum current until approximately 80% battery capacity.

### STEP 4 ABSORPTION

Charging with declining current to maximize up to 100% battery capacity.

### STEP 5 ANALYSE

Tests if the battery can hold charge. Batteries that can not hold charge may need to be replaced.

### STEP 6 RECOND

Choose the Recond program to add the Recond step to the charging process. During the Recond step voltage increases to create controlled gassing in the battery. Gassing mixes the battery acid and gives back energy to the battery.

### STEP 7 FLOAT

Maintaining the battery voltage at maximum level by providing a constant voltage charge.

### STEP 8 PULSE

Maintaining the battery at 95-100% capacity. The charger monitors the battery voltage and gives a pulse when necessary to keep the battery fully charged.

## LIMITED WARRANTY

CTEK SWEDEN AB, issues this limited warranty to the original purchaser of this product. This limited warranty is not transferable. The warranty applies to manufacturing faults and material defects for 2 years from the date of purchase. The customer must return the product together with the receipt of purchase to the point of purchase. This warranty is void if the battery charger has been opened, handled carelessly or repaired by anyone other than CTEK SWEDEN AB or its authorised representatives. One of the screw holes in the bottom of the charger is sealed. Removing or damaging the seal will void the warranty. CTEK SWEDEN AB makes no warranty other than this limited warranty and is not liable for any other costs other than those mentioned above, i.e. no consequential damages. Moreover, CTEK SWEDEN AB is not obligated to any other warranty other than this warranty.

## SUPPORT

For support and more information about CTEK products: [www.ctek.com](http://www.ctek.com), [info@ctek.com](mailto:info@ctek.com), [info@ctek.se](mailto:info@ctek.se), +46(0) 225 351 80. For latest revised manual see [www.ctek.com](http://www.ctek.com).

