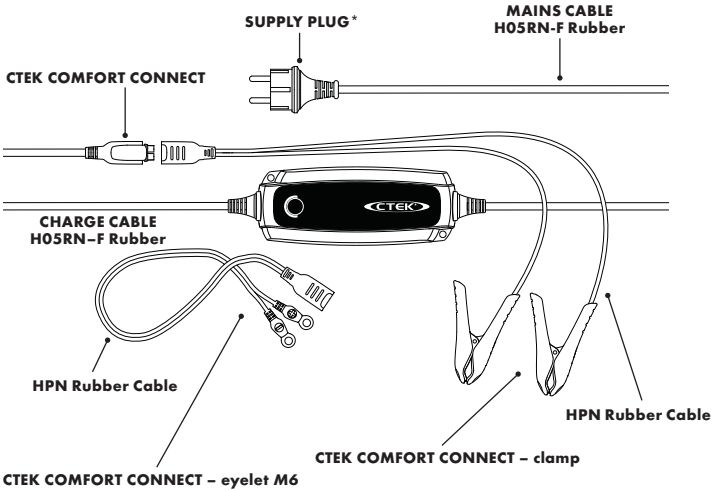
MANUAL

CONGRATULATIONS

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



* **Supply plugs may differ to suit your wall socket.**

HOW TO CHARGE

1. Connect the charger to the battery. Lamp 4, 5 and 6 now start flickering indicating VOLTAGE TEST PROGRAM. Ignore this and continue with the next step.
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 (3) to select charging program.

SMALL BATTERY PROGRAM **NORMAL BATTERY PROGRAM**

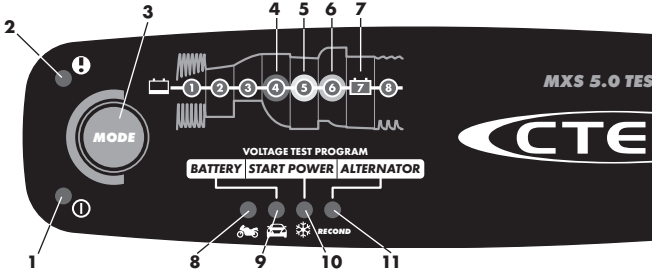
Continue to press the MODE-button to combine charging program with charging options.

COLD WEATHER OPTION **RECOND RECOND OPTION**

Press the MODE-button several times until the desired combination of charging program and options are lit.

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.

Note: *If the charger indicates START POWER lamp (10) and BAD lamp (4) press MODE-button for 2 sec to exit VOLTAGE TEST PROGRAM.*



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HOW TO TEST

TESTING PROGRAMS AVAILABLE

- ***BATTERY*** – Reveals a battery's current charge level.
- ***START POWER*** – Monitors a battery's output during the strain of engine cranking, to evaluate overall condition.
- ***ALTERNATOR*** – Establishes whether a vehicle's charging system is correctly charging the battery or not.

BEFORE TESTING

1. Read the SAFETY section in the manual to make sure you connect/disconnect the unit to the battery/safely.
2. Before doing the ***START POWER*** or ***ALTERNATOR*** tests, make sure the battery is fully charged. If it isn't, false results may occur. Before doing a ***BATTERY*** test, ensure ambient temperature is at least 5°C and that the battery has not been charged – by a mains charger or the vehicle – for at least an hour before testing.
3. Lamp 4, 5, and 6, show the results. 4 (red) indicates **BAD**, 5 (orange) **FAIR**, 6 (green) **OK**.

TESTING

(MAINS POWER NOT REQUIRED)

1. Connect the charger to the battery. Lamp 4, 5, and 6 illuminate in sequence to show the charger is in Testing Mode and ready.
2. Press the MODE-button (3) to move between the test programs: ***BATTERY*** (9), ***START POWER*** (10), ***ALTERNATOR*** (11).

BATTERY

1. Select ***BATTERY*** (9) using MODE-button (3).
2. After a few seconds the unit will show the results.
   BAD (4) recharge the battery as soon as possible.
   FAIR (5) charging is recommended for maximum battery life.
   OK (6) the battery is at a high state of charge.

START POWER

1. Select ***START POWER*** (10) using MODE-button (3).
2. Crank the engine over as soon as possible. Continue cranking for a few seconds, or until the engine starts.
   BAD (4) recharge the battery as soon as possible.
   FAIR (5) charging is recommended for maximum battery life.
   OK (6) the battery is at a high state of charge.

ALTERNATOR

1. Select ***ALTERNATOR*** (11) using MODE-button (3)
2. Start the engine, hold it at 2000 RPM, and monitor the results.
   BAD (4) Charging System fault.
   FAIR (5) Charging system fault.
   OK (6) Vehicle Charging system working OK.

TIPS

1. If the error lamp (2) immediately illuminates, the battery is incorrectly connected. Unplug the charger, correct the connections to the battery, and return to step 1.
2. If the lamp don't illuminate, this may be because the battery is so discharged it cannot support the unit. If so, fully charge the battery.
3. If mains mains voltage is detected, the MXS 5.0 TEST&CHARGE automatically enters Charging Mode. Press the MODE-button (3) for two seconds to switch back to Testing Mode, as signified by an illumination sequence in lamp 4–6.
4. Start Power Test

   OK (6) will illuminate at the start of the test, but may drop down to **BAD** (4). Before discarding a battery, it's worth charging it using the charger's Recond Mode and trying the ***START POWER*** test again. Batteries failing this test in warm weather will almost certainly fail completely when temperatures drop.

CHECK THE RESULT LAMPS

If the result lamp is lit:	**BAD** (4)	**FAIR** (5)	**OK** (6)
BATTERY	BELOW 12.4V	12.4–12.6V	ABOVE 12.6V
START POWER	BELOW 9.6V	9.6–10.5V	ABOVE 10.5V
ALTERNATOR	BELOW 13.3V	13.3–14.0V	ABOVE 14.0V

CHARGING PROGRAMS AND OPTIONS

Press the MODE-button to select between the charging programs and to add charging options. The lamps will indicate which programs and options that are selected. The selected program will be memorised and restarted next time the charger is connected.

Charging Programs

Program	Battery Size (Ah)	Explanation	Temp range
	1.2–14Ah	**Small battery program, 0.8A** Use for smaller batteries.	**-20°C–+50°C** (-4°F–122°F)
	14–160Ah	**Normal battery program, 5A** Use for normal sized batteries.	**-20°C–+50°C** (-4°F–122°F)

Charging Options

Option	Battery Size (Ah)	Explanation	Temp range
	1.2–160Ah	**Cold weather option** Use for charging at low temperatures and for power AGM batteries like Optima® and Odyssey®. Cold weather option increases charging voltage	**-20°C–+5°C** (-4°F–41°F)
RECOND	1.2–160Ah	**Recond option** Use to return energy to empty batteries. Recond your battery once per year and after deep discharge to maximise lifetime and capacity. The Recond option adds STEP 6 to the selected charging program.	**-20°C–+50°C** (-4°F–122°F)

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: *...cannot accept charge and may need to be replaced.*
   STEP 5: *...cannot 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 a battery in 2 minutes.

READY TO USE

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

BATTERY SIZE (Ah)	TIME TO 80% CHARGED
2Ah	2h
8Ah	8h
20Ah	4h
60Ah	12h
110Ah	26h

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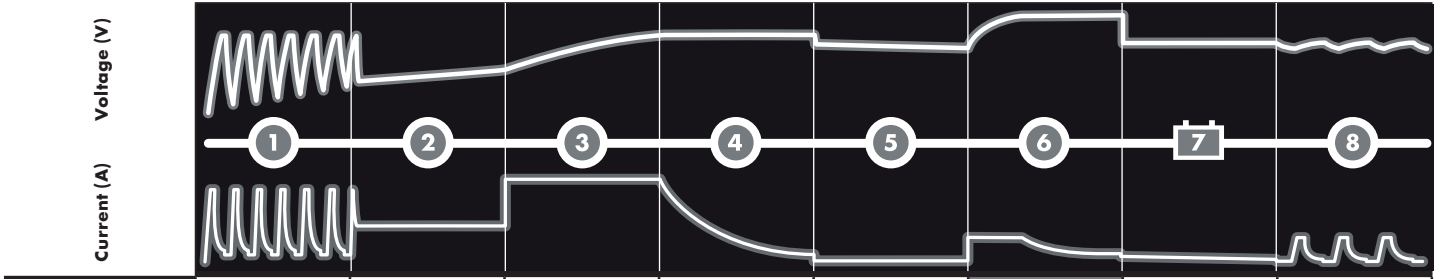
CHARGING PROGRAMS AND OPTIONS COMBINATIONS



	DESULPHATION	SOFT START	BULK	ABSORPTION	ANALYSE	RECOND	FLOAT	PULSE
	15.8V	0.8A until 12.6V	Increasing voltage to 14.4V. 0.8A	Declining current 14.4V	Checks if voltage drops to 12V		13.6V 0.8A	12.7V–14.4V 0.8–0.4A
	15.8V	0.8A until 12.6V	Increasing voltage to 14.7V. 0.8A	Declining current 14.7V	Checks if voltage drops to 12V		13.6V 0.8A	12.7V–14.7V 0.8–0.4A
RECOND	15.8V	0.8A until 12.6V	Increasing voltage to 14.4V. 0.8A	Declining current 14.4V	Checks if voltage drops to 12V	Max 15.8V 0.3A	13.6V 0.8A	12.7V–14.4V 0.8–0.4A
RECOND	15.8V	0.8A until 12.6V	Increasing voltage to 14.7V. 0.8A	Declining current 14.7V	Checks if voltage drops to 12V	Max 15.8V 0.3A	13.6V 0.8A	12.7V–14.7V 0.8–0.4A
	15.8V	5A until 12.6V	Increasing voltage to 14.4V. 5A	Declining current 14.4V	Checks if voltage drops to 12V		13.6V 5A	12.7V–14.4V 5–2A
	15.8V	5A until 12.6V	Increasing voltage to 14.7V. 5A	Declining current 14.7V	Checks if voltage drops to 12V		13.6V 5A	12.7V–14.7V 5–2A
RECOND	15.8V	5A until 12.6V	Increasing voltage to 14.4V. 5A	Declining current 14.4V	Checks if voltage drops to 12V	Max 15.8V 1.5A	13.6V 5A	12.7V–14.4V 5–2A
RECOND	15.8V	5A until 12.6V	Increasing voltage to 14.7V. 5A	Declining current 14.7V	Checks if voltage drops to 12V	Max 15.8V 1.5A	13.6V 5A	12.7V–14.7V 5–2A
Limit:	**Max 8h**		**Max 20h**	**Max 10h**	**3 minutes**	**30 min or 4h depending on battery voltage**	**10 days Charge cycle restarts if voltage drops**	**Charge cycle restarts if voltage drops**

CHARGING STEPS

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 charging of a defective battery.

STEP 3 BULK
Charging with maximum current until approximately 80% battery capacity is reached.

STEP 4 ABSORPTION
Charging with declining current to maximize up to 100% battery capacity.

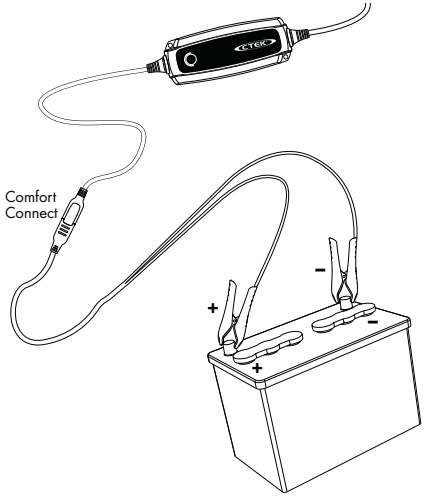
STEP 5 ANALYSE
Tests if the battery can hold charge. Batteries that cannot hold charge may need to be replaced.

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 returns 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.

CONNECT AND DISCONNECT THE CHARGER TO A BATTERY



INFO

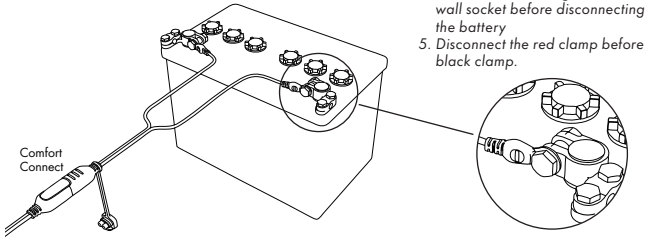
If the battery clamps are incorrectly connected, the reverse polarity protection will ensure that the battery and charger are not damaged.

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.*

Some vehicles may have positively earthed batteries.

1. *Connect the black clamp to the battery's negative pole.*
2. *Connect the red 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 red clamp before the black clamp.*



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TECHNICAL SPECIFICATIONS

Model number	1066
Rated Voltage AC	220–240VAC, 50–60Hz
Charging voltage	14.4V, ❄ 14.7V, **RECOND** 15.8V
Min battery voltage	2.0V
Charging current	5A max
Current, mains	0.6A rms (at full charging current)
Back current drain*	<1Ah/month in charge and test mode
Ripple**	<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	1.2–110Ah up to 160Ah for maintenance
Dimensions	168 x 65 x 38mm (L x W x H)
Insulation class	IP65
Weight	0.6kg

*) Back current drain is the current that drains the battery if the charger is not connected to the mains. CTEK chargers have 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.

SAFETY

- **The charger is** designed for charging only for batteries according to the technical specification. Do not use the charger for any other purpose. Always follow battery manufacturers recommendations.
- **Never try to charge** non rechargeable batteries.
- **Check the charger** cables prior to use. Ensure that no cracks have occurred in the cables or in the bend protection. A charger with damaged cord must be returned to the retailer. A damaged mains cable must be replaced by a CTEK representative.
- **Never charge** a damaged battery.
- **Never charge** a frozen battery.
- **Never place** the charger on top of the battery when charging.
- **Always provide** for proper ventilation during charging.
- **Avoid covering** the charger.
- **A battery being** charged could emit explosive gases. Prevent sparks close to the battery. When batteries are reaching the end of their lifecycle internal sparks may occur.
- **All batteries fail** sooner or later. A battery that fails during charging is normally taken care of by the chargers advanced control, but some rare errors in the battery could still exist. Don't leave any battery during charging unattended for a longer period of time.
- **Ensure that** the cabling does not jam or comes into contact with hot surfaces or sharp edges.
- **Battery acid is** corrosive. Rinse immediately with water if acid comes into contact with skin or eyes, seek immediate medical advice.
- **Always check** that the charger has switched to STEP 7 before leaving the charger unattended and connected for long periods. If the charger has not switched to STEP 7 within 50 hours, this is an indication of an error. Manually disconnect the charger.
- **Batteries consume** water during use and charging. For batteries where water can be added, the water level should be checked regularly. If the water level is low add distilled water.
- **This appliance is** not designed for use by young children or people who cannot read or understand the manual unless they are under the supervision of a responsible person to ensure that they can use the battery charger safely. Store and use the battery charger out of the reach of children, and ensure that children cannot play with the charger.
- **Connection to** the mains supply must be in accordance with the national regulations for electrical installations.

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 5 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

CTEK offers a professional custom support: **www.ctek.com**.
For latest revised user manual see www.ctek.com. By e-mail: **info@ctek.se**, by telephone: +46(0) 225 351 80, by fax +46(0) 225 351 95.

CTEK PRODUCTS ARE PROTECTED BY

2012-05-30

Patents	Designs	Trade marks
EP10156636.2 pending	RCD 509617	TMA 669987
US12/780968 pending	US D575225	CTM 844303
EP1618643	US D580853	CTM 372715
US7541778	US D581356	CTM 3151800
EP1744432	US D571179	TMA 823341
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SE526631	RCD 001119911-0002	V28573IP00
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