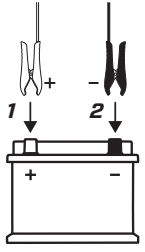
CONGRATULATIONS

on 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.

Read safety instruction

HOW TO CHARGE

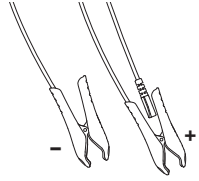
1. Connect the charger to the battery.



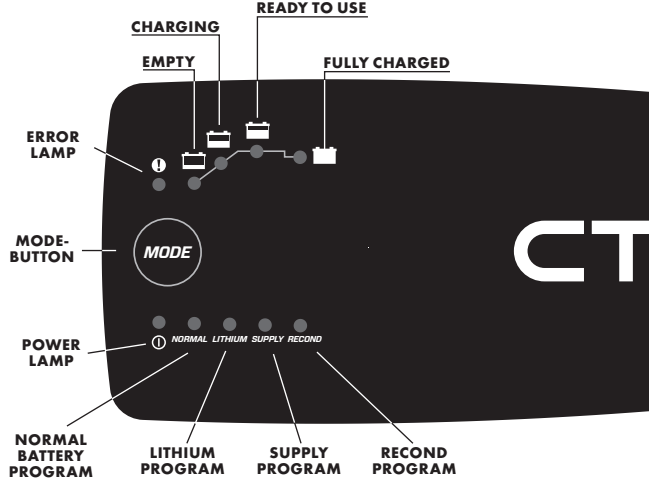
For batteries mounted inside a vehicle

1. Connect the charger according to the vehicles manual.
2. Connect the charger to the wall socket.
3. Disconnect the charger from the wall socket before disconnecting the battery.
4. Disconnect the black clamp before the red clamp.

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 indication lamps through the charging process.
   The battery is ready to start the engine when is lit.
   The battery is fully charged when is lit.
5. Stop charging at any time by disconnecting the mains cable from the wall socket.



Temperature sensor
The temperature sensor works automatically and will adjust the voltage to the ambient temperature. Place the temperature sensor in the positive clamp or as the close to the battery as possible.



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	Explanation
NORMAL	**Normal battery program** 14.4V/25A. Only for lead-acid batteries.
RECOND	**Recond program** 15.8V/1.5A Use Recond to return energy to empty WET and Ca/Ca batteries. Recond your battery once per year and after deep dischare to maximise lifetime and capacity. The Recond program adds the Recond step to the normal battery program. Only for lead-acid batteries.
SUPPLY	**Supply program** 13.6V/25A Use as a 12V power supply or use for float maintenance charging when 100% capacity of the battery is required. The Supply program activates the Float step without time or voltage limitation. ⚠ The spark protection on the battery charger is disabled during the SUPPLY program.

READY TO USE

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

BATTERY SIZE (Ah)	TIME TO 80% CHARGED
40Ah	1.5h
100Ah	3h
200Ah	6h
300Ah	16h

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 within 2 minutes or the battery voltage is below 2V.

ERROR LAMP

If the error lamp is lit, check the following:

1. Is the chargers red clamp connected to the battery's positive pole? Connect the charger according to the vehicles manual.

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

3. Are the clamps short circuited?

4. Has charging been interrupted in ▭ or ▬?
Restart the charger by pressing the MODE-button. If charging is still being interrupted, the battery...
▭ *...is seriosly sulphated and may need to be replaced.*
▭ *...can not accept charge and may need to be replaced.*
▬ *...can not keep charge and may need to be replaced.*

LEAD-ACID

								
	1	2	3	4	5	6	7	8
NORMAL	15.8V	Max 25A until 12.6V	Increasing voltage to 14.4V, max 25A	Declining current 14.4V	Checks if voltage drops to 12V		13.6V max 25A	12.9V–14.4V 20–1.2A
RECOND	15.8V	Max 25A until 12.6V	Increasing voltage to 14.4V, max 25A	Declining current 14.4V	Checks if voltage drops to 12V	Max 15.8V Max 1.5A	13.6V max 25A	12.9V–14.4V 20–1.2A
Time limit:	8h		20h	16h	3 minutes	2h or 6h	10days **charge** cycle restarts if voltage drops	**Charge** cycle restarts if voltage drops

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.

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	Explanation	Temp range
LITHIUM	**Lithium program** 13.8V/25A Only for Lithium batteries (Li-$FePO_4$, Li-Fe, Li-iron, LFP).	**0°C–+40°C** ***(32ºF–104ºF)*** Read the battery manual for charging outside this temperature range.
SUPPLY	**Supply program** 13.6V/25A Use as a 12V power supply or use for float maintenance charging when 100% capacity of the battery is required. The Supply program activates the Float step without time or voltage limitation. ⚠ The spark protection on the battery charger is disabled during the SUPPLY program.	

BATTERIES WITH "UNDER VOLTAGE PROTECTION"

Some Lithium batteries have an on-board UVP (under voltage protection) that disconnects the battery to avoid it becoming too deeply discharged. This prohibits the charger from detecting that there's a battery connected. To bypass this, the battery charger needs to open the UVP. There are two options available to "wake up" the battery - automatic and manual.

During the automatic "wake up" period the LED ▭ will flash until the charge program is started and LED ▭ is lit with a steady light. Automatic "wake up" will be active for maximum 5 minutes.

If the charger is in Standby mode after 10 minutes (⏻ power led is flashing) the automatic wake up did not succeed. Try the manual wake up.

To use the manual "wake up", press the Mode button for approximately 10 seconds to bypass the UVP. During the "wake up" period the LED ▭ will flash until the charge program is started and the LED ▭ is lit with a steady light. If the manual wake up is unsuccessful the power LED ⏻ will start to flash after latest 10 minutes. Disconnect any parallel loads from the battery and try again. If the charging does not start after that, the battery 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 within 2 minutes.

ERROR LAMP

If the error lamp is lit, check the following:

1. Is the chargers red clamp connected to the battery's positive pole? Connect the charger according to the vehicles manual.

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

3. Are the clamps short circuited?

4. Has charging been interrupted in ▭ or ▬?
Restart the charger by pressing the MODE-button. If charging is still being interrupted, the battery...
▭ *...can not accept charge or paralell loads may be connected to the battery. Remove the paralell loads and restart the charging by pressing the MODE-button.*
...restart the charger maximum 3 times. If the charger doesn´t continue to Bulk after that, the battery may need to be replaced.
▬ *...can not keep charge and may need to be replaced.*

LITHIUM

									
	Wake up	1	2	3	4	5	6	7	8
LITHIUM	13.0V	Max 25A	Max 25A until 13.8V	Declining current 13.8V	Checks if voltage drops to 12.0V	Max 3A	14.4V	13.3V Max 25A	13.0V–13.8V 25A–3.0A
Time limit:		Max 10 minutes	Max 30h	Max 4h	3 minutes	If start charge voltage less than 13.9V then max 2h		10days Charge cycle restarts if voltage drops	Max 1h pulse Auto pulse 10 days

STEP 1 ACCEPT
Tests if the battery can accept charge. This step prevents that charging proceeds with a defect battery.

STEP 2 BULK
Charging with maximum current until approximately 90% battery capacity.

STEP 3 ABSORPTION
Charging with declining current to maximize up to 95% battery capacity.

STEP 4 ANALYSE
Tests if the battery can hold charge. Batteries that can not hold charge may need to be replaced.

STEP 5 COMPLETION
Final charge with reduced current.

STEP 6 MAXIMIZATION
Final charge with maximum voltage up to 100% battery capacity.

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.

READY TO USE

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

BATTERY SIZE (Ah)	TIME TO 80% CHARGED
40Ah	1.5h
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TECHNICAL SPECIFICATIONS

Model number	1093
INPUT	220–240VAC, 50–60Hz, max 2.9A
OUTPUT	25A, 12V
Start voltage	2.0V Lead Acid batteries 8.0V Lithium batteries
Back current drain*	Less than 2.3Ah/month
Ripple**	Less than 4%
Ambient temperature	-20°C to +50°C (-4°F to +122°F)
Battery types	All types of 12V Lead Acid batteries (WET, EFB, Ca/Ca, AGM and GEL). 12V (4cells) Lithium batteries (Li-FePO$_4$, Li-Fe, Li-iron, LFP)
Battery capacity	40–500Ah, Lead Acid battery types 30–450Ah, Lithium battery types
Insulation class	IP44
Warranty	2 years

*) 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.

LIMITED WARRANTY

CTEK, 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. The customer must return the product together with the receipt of purchase to the point of purchase. This warranty is void if the product has been opened, handled carelessly or repaired by anyone other than CTEK or its authorised representatives. One of the screw holes in the bottom of the product may be sealed. Removing or damaging the seal will void the warranty. CTEK 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 is not obligated to any other warranty other than this warranty.

SUPPORT

For support, FAQ, latest revised manual and more information about CTEK products: www.ctek.com.

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