

# MANUAL

## CONGRATULATIONS

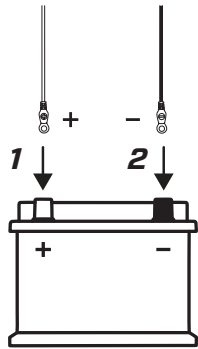
on the purchase of your new professional switch mode battery charger. This charger is included in a series of professional chargers from CTEK SWEDEN AB and represents the latest technology in battery charging.

## Read safety instruction



## HOW TO CHARGE

1. Connect the charger to the battery.

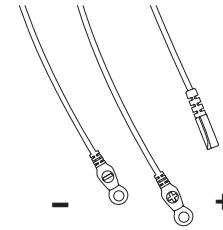


### For batteries mounted inside a vehicle

1. Connect the charger according to the vehicle manual.
2. Connect the charger to the wall socket.
3. Disconnect the charger from the wall socket before disconnecting the battery.

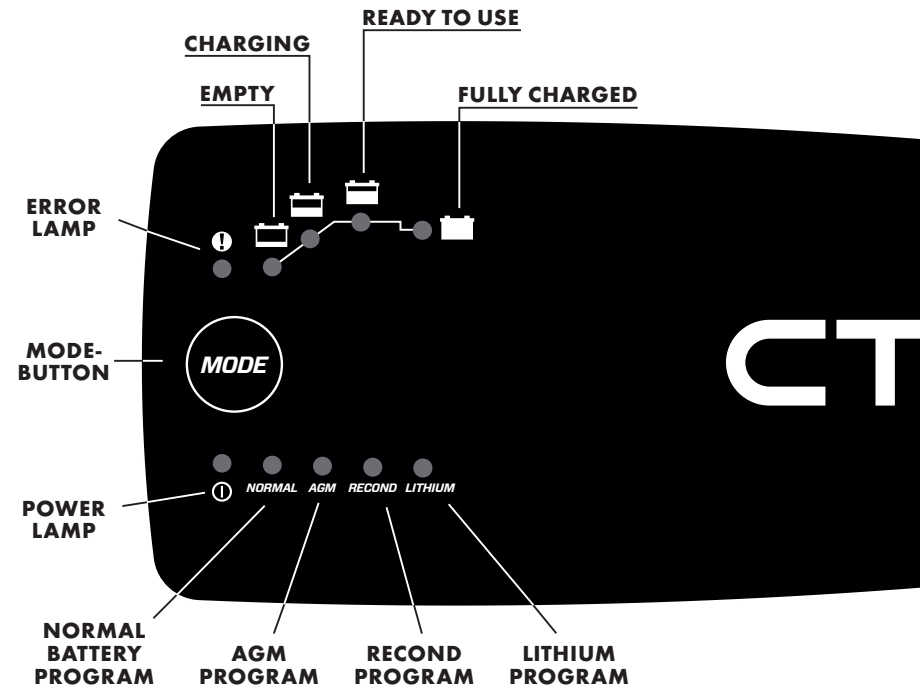


2. Connect the charger to the wall socket. The power lamp will indicate that the mains cable is connected to the wall socket. The error lamp will indicate if the ring terminals (M10) are incorrectly connected. The reverse polarity protection will ensure that the battery or charger will not be damaged.
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 as close to the battery as possible.



## LEAD-ACID

### 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
<b>NORMAL</b>	<b>Normal battery program</b> 14.4V, max 15A/max 25A. Only for lead-acid batteries.
<b>AGM</b>	Use to charge most AGM batteries including AGM START/STOP types. Some AGM should use lower voltage (NORMAL Mode), check battery manual if unsure.
<b>RECOND</b>	<b>Recond program</b> 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 discharge to maximise lifetime and capacity. The Recond program adds the Recond step to the normal battery program. Only for lead-acid batteries.

### READY TO USE

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

BATTERY SIZE M15/M25	TIME TO 80% CHARGED
30Ah/40Ah	2h/1.5h
100Ah/100Ah	6h/3h
200Ah/200Ah	11h/6h
300Ah/500Ah	16h/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 positive ring terminal connected to the battery's positive pole?


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


#### 3. Are the terminals 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 seriously 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
<b>NORMAL</b>	15.8V	Max 15A/25A until 12.6V	Increasing voltage to 14.4V, max 15A/25A	Declining current 14.4V	Checks if voltage drops to 12V		13.6V max 15A/25A	12.9V-14.4V 12-1.2A
<b>AGM</b>	15.8V	Max 15A/25A until 12.6V	Increasing voltage to 14.7V, max 15A/25A	Declining current 14.7V	Checks if voltage drops to 12V		13.6V max 15A/25A	12.9V-14.7V 12-1.2A
<b>RECOND</b>	15.8V	Max 15A/25A until 12.6V	Increasing voltage to 14.4V, max 15A/25A	Declining current 14.4V	Checks if voltage drops to 12V	Max 15.8V Max 1.5A	13.6V max 15A/25A	12.9V-14.4V 12-1.2A
Time limit:	8h		20h	16h	3 minutes	2h or 6h	10 days charge cycle restarts if voltage drops	Charge cycle restarts if voltage drops or 24h time passed

### 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 ANALYZE

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.

## LITHIUM

### 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
<b>LITHIUM</b>	<b>Lithium program</b> 13.8V, 15A/25A Use to charge Lithium batteries.	<b>0°C–+40°C (32°F–104°F)</b> Read the battery manual for charging outside this temperature range.

### 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.

### READY TO USE

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

BATTERY SIZE M15A/M25A	TIME TO 80% CHARGED
30Ah/40Ah	2h/1.5h
100Ah/100Ah	6h/3h
200Ah/200Ah	11h/6h
300Ah/500Ah	16h/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.

### ERROR LAMP

If the error lamp is lit, check the following:




#### 1. Is the positive ring terminal connected to the battery's positive pole?

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


#### 3. Are the terminals 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 parallel loads may be connected to the battery. Remove the parallel 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
<b>LITHIUM</b>	Max 14.4V 50mA auto, 5A manual	11V Max 15A/25A	11V Max 15A/25A	Max 15A/25A until 13.8V	13.8V Decreasing current and intelligent time control	Checks if voltage drops below 12V	14.4V Max 3A	13.3V, 15A/25A Cycle start at 12.9V	13.0V-13.8V 15A/25A 3.0A Cycle start at 12.9V
	Time limit:	5 x 30s 1m period	Max 10 minutes	Max 30h	Max 4h	3 minutes	If start charge volt- age less than 13.9V then max 2h	10days Charge cycle restarts if voltage drops	Max 1h pulse Auto pulse 10 days

## WAKE UP

Safely bypasses the discharge protection if active on the battery.

### 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 ANALYZE

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.

## TECHNICAL SPECIFICATIONS

<b>Model number</b>	1093
<b>INPUT</b>	220-240VAC, 50-60Hz, max 2.0A/15A, max 2.9A/25A
<b>OUTPUT</b>	15A/25A, 12V
<b>Start voltage</b>	2.0V Lead Acid batteries 8.0V Lithium batteries
<b>Back current drain*</b>	Less than 2.3Ah/month
<b>Ripple**</b>	Less than 4%
<b>Ambient temperature</b>	-20°C to +50°C (-4°F to +122°F)
<b>Battery types</b>	All types of 12V Lead Acid batteries (WET, EFB, Ca/Ca, AGM and GEL). 12V (4cells) Lithium batteries (Li-FePO <sub>4</sub> , Li-Fe, Li-iron, LFP)
<b>Battery capacity</b>	15A: 28-300Ah, Lead Acid battery types 20-280Ah, Lithium battery types 25A: 40-500Ah, Lead Acid battery types 30-450Ah, Lithium battery types
<b>Insulation class</b>	IP44
<b>Warranty</b>	5 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](http://www.ctek.com).

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