



UC 800 Battery Charger

For lead-acid batteries 2-32Ah



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

Model 1019

US

INTRODUCTION

UC 800 is a switch mode charger with pulse maintenance and is a part of a series of professional battery chargers from CTEK Power Inc. These chargers represent the latest technology within battery charging. An UC 800 gives the battery maximum life. Read this User's Manual and follow the instructions carefully before you start to use the charger.

IMPORTANT SAFETY INSTRUCTIONS

California Proposition 65

WARNING: This product contains chemical known to the state of California to cause cancer or reproductive toxicity.

1. **SAVE THESE INSTRUCTIONS** – This manual contains important safety and operating instructions for battery charger models 1019.
2. When charging, batteries can emit explosive gases, therefore it is essential to prevent flames and sparks. The charger is designed for charging lead-acid batteries from 2 to 32Ah. Do not use for any other purpose. Do not expose to rain or snow.
3. Always provide good ventilation when charging.
4. Use of an attachment not recommended or sold by the battery charger manufacturer may result in a risk of fire, electric shock or injury to persons.
5. To reduce risk of damage to electric plug and cord, pull by the plug rather than cord when disconnecting charger.
6. An extension cord should not be used unless absolutely necessary. Use of improper extension cord could result in a risk of fire and electric shock. If an extension cord must be used, make sure that: a) Pins on plug of extension cord are the same number, size and shape as those of plug on charger; b) Extension cord is properly wired and in good electrical condition; and c) Wire size is large enough for ac ampere rating of charger as specified in "technical data".
7. Do not operate charger with damaged cord or plug – return the charger to the place where purchased.
8. Never operate the charger if it has received a sharp blow, been dropped or otherwise damaged in any way; take it to a qualified serviceman.
9. Do not disassemble charger; take it to a qualified serviceman when service or repair is required. Incorrect reassembly may result in a risk of electrical shock or fire.
10. To reduce risk of electric shock, unplug charger from AC outlet before attempting any maintenance or cleaning.

11. WARNING - RISK OF EXPLOSIVE GASES

- a) WORKING IN VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON, IT IS OF UTMOST IMPORTANCE THAT, YOU FOLLOW THE INSTRUCTIONS EACH TIME YOU USE THE CHARGER.
- b) To reduce risk of battery explosion, follow these instructions and those published by the battery manufacturer and the manufacturer of any equipment you intend to use in vicinity of battery. Review cautionary marking on these products and on engine.

12. PERSONAL PRECAUTIONS

- a) Consider have some one close enough by to come to your aid when you work near a lead-acid battery.
- b) Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing or eyes.
- c) Wear complete eye protection and clothing protection. Avoid touching eyes while working near battery.
- d) If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flood eye with running cold water for at least 10 minutes and get medical attention immediately.
- e) NEVER smoke or allow a spark or flame in vicinity of battery or engine.
- f) Be extra cautious to reduce risk of dropping a metal tool onto battery. It might spark or short-circuit battery or other electrical part that may cause explosion.
- g) Remove personal metal items such as rings, bracelets, necklaces, and watches when working with lead-acid battery. A lead-acid battery can produce a short-circuit current high enough to weld a ring or the like to metal, causing a severe burn.
- h) Use charger for charging a LEAD-ACID battery only. It is not intended to supply power to a low voltage electrical system other than in a starter-motor application. Do not use battery charger for charging dry-cell batteries that are commonly used with home appliances. These batteries may burst and cause injury to persons and damage to property.
- i) Never charge a frozen battery.

13. PREPARING TO CHARGE

- a) If necessary to remove battery from vehicle to charge, always remove grounded terminal from battery first. Make sure all accessories in the vehicle are off, so as not to cause an arc.
- b) Be sure area around battery is well ventilated while battery is being charged.
- c) Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes.
- d) Add distilled water in each cell until battery acid reaches level specified by battery manufacturer. Do not overfill. For a battery without removable cell caps, such as valve regulated lead acid batteries, carefully follow manufacturer's recharging instruction.
- e) Study all battery manufacturer's specific precautions while charging and recommended rates of charge.
- f) Determine voltage of battery by referring to car owner's manual and make sure that the output voltage selector switch is set at correct voltage. If charger has adjustable charge rate, charge battery initially at lowest rate.

14. CHARGER LOCATION

- a) Locate charger as far away from battery as DC cables permit.
- b) Never place charger directly above battery being charged; gases from battery will corrode and damage charger.
- c) Never allow battery acid to drip on charger when reading electrolyte specific gravity or filling battery.
- d) Do not operate charger in a closed-in area or restrict ventilation in any way.
- e) Do not set a battery on top of charger.

15. DC CONNECTION PRECAUTIONS

- a) Connect and disconnect dc output clips only after setting any charger switches to "off" position and removing ac cord from electric outlet. Never allow clips to touch each other.
- b) Attach clips to battery and chassis as indicated in 16(e), 16(f), 17(b) through 17(d).

16. FOLLOW THESE STEPS WHEN BATTERY IS INSTALLED IN VEHICLE. A SPARK NEAR BATTERY MAY CAUSE BATTERY EXPLOSION. TO REDUCE RISK OF A SPARK NEAR BATTERY:

- a) Position AC and DC cords to reduce risk of damage by hood, door or moving engine part.
- b) Stay clear of fan blades, belts, pulleys, and other parts that can cause injury to persons.
- c) Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has larger diameter than NEGATIVE (NEG, N, -) post.
- d) Determine which post of battery is grounded (connected) to the chassis. If negative post is grounded to the chassis (as in most vehicles) see (e). If positive post is grounded to the chassis, see (f).
- e) For Negative-grounded vehicle, connect POSITIVE (RED) clip from battery charger to POSITIVE (POS, P, +) ungrounded post of battery. Connect NEGATIVE (BLACK) clip to vehicle chassis or engine block away from battery. Do not connect clip to carburetor, fuel lines, or sheet-metal body parts. Connect to a heavy gage metal part of the frame or engine block.
Charger connection.
 1. Connect positive charger clip (red) to positive battery terminal.
 2. Connect negative charger clip (black) to a good metal engine ground away from the battery. Do not connect clip to fuel lines or sheet-metal body parts.
 3. Connect the AC cord to the socket. The red alarm indication light ⚠ will indicate a battery which is connected to reverse polarity.
- f) For Positive grounded vehicle, connect NEGATIVE (BLACK) clip from battery charger to NEGATIVE (NEG, N, -) ungrounded post of battery. Connect POSITIVE (RED) clip to vehicle chassis or engine block away from battery. Do not connect clip to carburetor, fuel lines, or sheet-metal body parts. Connect to a heavy gage metal part of the frame or engine block.
Charger connection.
 1. Connect negative charger clip (black) to negative battery terminal.
 2. Connect positive charger clip (red) to a good metal engine ground away from the battery. Do not connect clip to fuel lines or sheet-metal body parts.
 3. Connect the AC cord to the socket. The red alarm indication light ⚠ will indicate a battery which is connected to reverse polarity.
- g) When disconnecting charger, turn switches to off, disconnect AC cord, remove clip from vehicle chassis, and then remove clip from battery terminal.
- h) See operating instructions for length of charge information.

17. FOLLOW THESE STEPS WHEN BATTERY IS OUTSIDE VEHICLE. A SPARK NEAR BATTERY MAY CAUSE BATTERY EXPLOSION. TO REDUCE RISK OF A SPARK NEAR BATTERY:

- a) Check polarity of battery terminals. POSITIVE (POS, P, +) battery post usually has a larger diameter than NEGATIVE (NEG, N, -) post.
- b) Attach at least a 24-inch-long 6-gauge (AWG) insulated battery cable to NEGATIVE (NEG, N, -) battery post.
- c) Connect POSITIVE (RED) charger clip to POSITIVE (POS, P, +) battery of post.
- d) Position yourself and free end of cable as far away from battery as possible – then connect NEGATIVE (BLACK) charger clip to free end of cable.
- e) Do not face the battery when making the final connection.
- f) When disconnecting charger, always do so in reverse sequence of connecting procedure and break first connection while as far away from battery as practical.
- g) When disconnecting charger, disconnect in reverse sequence from connecting procedure. See operating instructions for charge information.
- h) A marine (boat) battery must be removed and charged on shore. To charge it on board requires equipment specially designed for marine use.

The battery charger must be connected to the battery according to the instructions above.

IMPORTANT SAFETY INFORMATION!

The UC 800 cannot be used to restore a fully worn out battery. If the UC 800 does not switch to maintenance charge after three days (green light illuminated), there is a fault. Possible causes:

- The battery is probably worn out and should be replaced.
- Some large antimony batteries may behave differently and can allow the UC 800 to charge the battery for too long, which can lead to overcharging. See caution!
- If power consumers like fitted alarms and navigation computers are connected to the battery, the charging process takes longer and this can also overcharge the battery.
- A sulphated battery will only accept current with difficulty, and consequently the charging process takes a particularly long time. A worn out battery cannot be fully charged. Therefore you should always check whether the charger has been switched to maintenance charge before you leave it turned on or unobserved for any length of time.

Caution: If the UC 800 does not switch to maintenance mode after three days, it has to be manually disconnected.

Note: A battery that hasn't changed to maintenance charge after three days is most likely worn out and needs to be replaced. All other batteries can be maintained for a very long time.

BATTERY TYPES






The following recommendations should only be considered as guidelines. In the event of uncertainty always refer to the battery manufacturer's recommendations.

UC 800 is suitable for charging all types of 6V lead-acid batteries: open batteries, MF, Wet, AGM and most GEL-batteries. Battery sizes from 2 to 32Ah. The charger can maintain batteries up to 100Ah.

CHARGING

The battery charger must be connected to the battery according to the instructions above.

Starting the charging process:

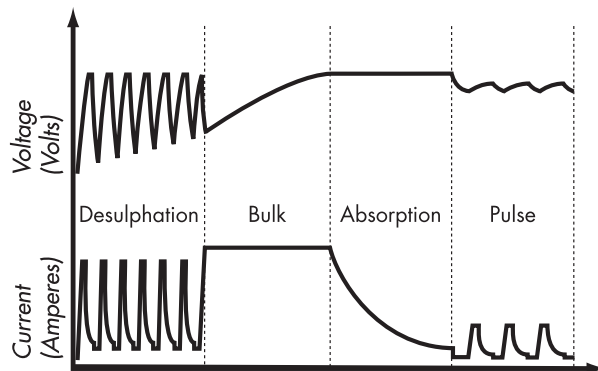
1. Once you have established that the battery cable has been correctly connected you can start the charging process. To do so, insert the charger plug into the AC socket.
2. Now either the charge indicator  or the maintenance charge indicator  lights up. When the maintenance charge indicator lights up, the battery is fully charged. If the battery voltage drops, the charger sends a pulse to the battery. The length of the pulse depends on how much charge the battery has lost. The UC 800 may be connected for months at a time. However it is recommended to monitor batteries on charge.
3. The red alarm indication light  will indicate a battery, which is connected to reverse polarity.
4. If nothing happens: If no indicator is illuminated, the connection to the battery or the chassis could be faulty, or the battery could be defective. If the charging process has not started, this could be due to the fact that the power socket is not supplying a current.
5. The charging process can be interrupted at any time. In addition pull the plug of the charger out of the power socket. Always remove the plug of the charger from the power socket before disconnecting the battery cable. If you interrupt the charging process of a battery fitted in a vehicle, the battery cable must always be first disconnected from the chassis and then from the other battery cable.
6. If the indicators for charge  and maintenance charge  are flashing alternately, this may have the following causes:
 - Interruption of the charging process because of a lost connection or because the battery is not conducting.

- The battery is sulphated. If the indicators flashes for more than 30 minutes the battery may be defective and should be replaced.
- If the flashing signal is flashing at intervals of more than 10 seconds, then there is a high self discharge of the battery, indicating a bad battery.

CHARGING CYCLE

UC 800 has a four step fully automatic charging cycle. At the start of charging the battery charger delivers maximum current to the battery and the battery voltage increases constantly to a set level of 7.2V. At this point the voltage will be regulated and kept constant while the charging current is successively lowered. Once the charging current has dropped below 0.4A the charger switches to maintenance charging.

If the battery is loaded and the battery's terminal voltage drops to 6.45V the charger automatically switches back to the beginning of the four step cycle. The charger requires a reverse voltage from the battery of at least 3V to start the charging cycle, this means that if the battery is so deeply discharged that the terminal voltage is lower than 3V the charger cannot charge the battery in question. A normal discharged battery has a terminal voltage of 5,25V.



Charging phases:

Desulphation - Desulphation with pulsing for sulphated batteries.

Bulk - Main charge when 80% of charging takes place. The charger delivers a constant current until the terminal voltage has risen to the set level.

Absorption - Complete charge up to virtually 100%. The terminal voltage is maintained at the set level. During this phase the current drops successively so the terminal voltage does not become too high. If the absorption phase has been in progress for more than 18 hours the charger switches to maintenance charging. This function prevents damage if the battery is faulty.

Pulse - Maintenance charging. Charging level varies between 95% and 100%. The battery receives a pulse when the voltage drops. Keeps the battery in perfect condition when it is not used. The charger can be connected for months at a time.

BULK CHARGING TIME

Battery capacity (Ah)	Time to ~80% charge (h)
2	1.5
8	6
20	20
32	36

SPECIFICATION

Model	1019
Voltage AC	100–120VAC, 50–60Hz. Output power is reduced at lower input voltage.
Current	0.2A rms (at full charging current)
Back current drain*	<1mA
Charging voltage	7.2V, Nominal: 6V
Ripple**	Max 50mV rms, max 0.05A rms.
Charging current	0.8A max.
Battery cable fuse	5A
Ambient temperature	-4°F to +122°F. Automatic reduction of power at increased ambient temperature.
Cooling	Natural convection. Do not cover the charger.
Charge cycle	UC 800 is a four-step fully automatic charger.
Type of batteries	All types of 6V lead-acid batteries (Wet, Maintenance Free, AGM and most GEL).
Battery capacity	2 to 32Ah, up to 100Ah for maintenance.
Dimensions	5½ x 2 x 1½ inches (L x W x H)
Weight	0.7 lbs

*) Back Current Drain is what the charger uses to drain the battery if the power cord is disconnected. The reverse current of the UC 800 is very low and corresponds to 1Ah per month.

**) The ripple wave describes how many disturbances are exhibited by current and voltage. A rippled voltage can cause damage to other equipment connected to the battery. The UC 800 supplies voltage and current with very low voltage rippling. This increases the life of the battery and ensures that equipment connected to it will not be damaged.

Recommended Minimum AWG Size for AC Extension cords

Length of cord feet (m)	AWG Size of cord
25 (7.6)	18
50 (15.2)	18
100 (30.5)	18
150 (45.6)	16

BATTERY CABLES

UC 800 is equipped with a set of battery cables with battery terminal clips and one set of battery cables with eyelet terminals. Do not shorten the battery cables.

Connecting the provided cables with eyelet terminals

Make sure that the cable is not pinched or in contact with warm surfaces or sharp edges. When the cable is mounted on the battery, it should not be connected to the charger. Connect the eyelet terminals to the battery's poles - the red cable to the positive pole and the black cable to the negative pole. After this, the quick connector can be connected.

OVERHEATING PROTECTION

The UC 800 is equipped with overheating protection. In high ambient temperatures the output power is reduced. Do not cover the charger.

MAINTENANCE

The UC 800 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 Power Inc, 2374 Edison Blvd, Twinsburg, OH 44087-2376, USA issues this limited warranty to the original purchaser of this product. This limited warranty is not transferable. CTEK Power Inc warrants this unit for 5 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 Power Inc or its authorized representative. CTEK Power Inc 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 Power Inc neither assumes nor authorizes anyone to assume or make any other obligation towards the product other than this limited warranty.

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