

HIGH FREQUENCY ELECTRONIC BATTERY CHARGER

OPERATING MANUAL

Do not operate the battery charger unless you have read and understood the details of this operating manual.



IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS – This manual contains important safety and operating instructions for battery charger Model CBSW1-S 24/12.

Before using the battery charger, read all instructions and cautionary markings on the charger, battery pack, and product powered by the battery.

CAUTION – To reduce risk of injury, charge only the type of batteries indicated on the charger. Other types of batteries may burst causing personal injury and damage.

GENERAL INFORMATION

- This device is an electronic battery charger with microprocessor control.
- Charging process is fully automatic, protected against overload, short-circuit, reversed polarity and overtemperature.
- These charger are intended only for stand alone use, not onboard vehicles.

WARNINGS

- **This charger should not be used by persons with a lack of experience and knowledge on electrical systems and battery charging unless they have been trained by and/or supervised by a suitably knowledgeable and experienced person.**
- Before starting to charge, make sure the voltage of the charger matches the voltage of the battery, that the charging current suits the capacity of the battery and that the selected charging curve is correct for the type of battery to be charged.
- Make sure the rated input voltage of the charger suits the available supply voltage.
- **Danger:** Risk of electric shock.
- Make sure the AC supply is grounded.
- Make sure the AC supply cord is in good condition and that it is securely connected to the charger before use.
- Make sure the DC cables and DC connector are good condition before use.
- Do not use the battery charger if there are any signs of physical damage that may have affected the integrity of the case, exposing internal components.
- Never disconnect the battery while charging: this could cause sparks.

- Never use the equipment in the rain, in areas used for washing down equipment or in damp areas.
- Gases generated by some battery types during charging are explosive. Do not smoke in the vicinity of the batteries.
- Do not operate the charger in an explosive environment.
- Do not operate the charger near flammable liquid such as gasoline, oil or other volatile substances.
- Do not use on damaged battery packs.
- Never charge a frozen battery.
- Pay attention to any warnings provided by the battery manufacturer and equipment manufacturer.

HEALTH HAZARD

- Use protective glasses and gloves during battery maintenance. A damaged or leaking battery can cause chemical burns on contact.
- In case of contact with battery acid, wash the affected parts with fresh water and seek medical attention.

OPERATION

- **IMPORTANT:** Check that the battery type setting of the charger is suitable for the battery type
- Check the polarity of the battery pack, and connect to the battery charger to the batteries.
- Plug the charger into the AC supply.
- Turn on the charger via the ON/OFF switch.
- The charger will display the following during start-up:
 - “**bti**”
 - the firmware version number in 3 successive screens, example:
 - **010-**
 - **093-**
 - **004**
 - The nominal voltage setting, example: **24.0U**
 - The current setting, example: **12.0A**
 - The selection of charging curve memory location, example: **014c**
 - An indicator of the battery type setting, example: **AGM**
- The charger will then ready the battery pack voltage, example: **25.2U**
- If the battery pack voltage cannot be read, the error “**bat**” will be shown.
- If all is OK, a relay click will be heard, and the output begins with the bulk charging phase, with the **red** led ON.
- When the **red** led is ON and the **yellow** led is ON, the charger is in the second phase.
- When the **yellow** led is ON the charger is in the third phase
- When the **green** led is ON, the charger is in the final phase and it indicates the charge is complete.
- Before using the batteries, turn off the charger and disconnect the AC power to the charger, then disconnect the charger from the battery pack.
- If errors occur, the charging process will stop and an error code will be shown on the display. See the table of errors on the following pages.

CHARGING DATA

- During the charging process, and before turning off the charger, it is possible to see data relating to the charge cycle by sequentially pressing the “Press for Status” pad. This will show, in turn:
 - Current (A)
 - Charge voltage (V)
 - Charging time (Hours)
 - Amp hour capacity returned to the battery (Ah)
 - Power returned to the battery in kilowatt-hours (KWh)

CHARGER WILL NOT TURN ON OR START

- If the charger will not turn on or start, see troubleshooting below.

Issue	Check	Action Required
charger does not turn on	If the switch IS NOT lit when in the ON position	check that the charger is plugged in check AC power supply check the power cord and plug check the AC input fuse
charger does not start	If the switch IS lit when in the ON position	call dealer for service to check internal components and connections call dealer for service to check internal components and connections

ERROR CODES

- In the case of abnormal operation, an error code will be shown on the display.
- Use the tables below to determine the meaning and action required to overcome the error.

Operation Errors

Error Code	Meaning	Action Required
CF6	configuration error - incorrect dip switch setting	check dip switch settings
bat	charge reads zero or unacceptable voltage	check all battery connections check connection polarity check internal DC output fuse (if present) check battery voltage level - must be between 0.33 volts/cell and 2.4 volts/cell or the charger will not start
Srt	possible internal short circuit	call dealer for service

Phase Errors

Error Code	Meaning	Action Required
E01	maximum charging voltage exceeded - charge is interrupted	call dealer for service
E02	maximum charger temperature exceeded - charge is interrupted	call dealer for service
E031	phase 1 time limit exceeded	check battery condition for possible shorts check max current output of charger check that the charger is sized correctly for the battery capacity
E032	phase 2 time limit exceeded	check battery condition for excessive resistance check max current output of charger check that the charger is sized correctly for the battery capacity
Sct	global timer error	check battery condition check current output of charger check that the charger is sized correctly for the battery capacity

- Error code tables continued on next page

Battery Errors

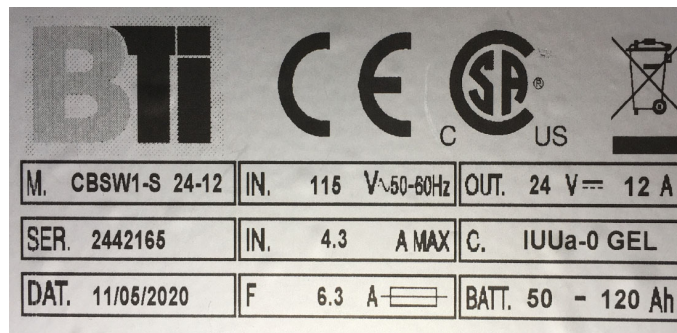
Error Code	Meaning	Action Required
E041	battery voltage is rising too slowly / battery is damaged or defective / charger has stopped for safety	call battery dealer for service
E042	current drop is too slow in second charging phase / battery has high internal resistance and may be overheating and/or gassing excessively / charger has stopped for safety	a new charge cycle may be attempted once the battery has cooled to ambient temperature call battery dealer for service
E043	current limit in final phase is exceeded / battery may be damaged or defective / charger has stopped for safety	call battery dealer for service

SERVICE

- Service should only be performed by qualified persons.
- Use only BTI replacement parts or identically rated components when performing repairs.

RATING LABEL

- The rating label shows the **Model** of charger (M.), **Input Voltage** (IN.), **DC Output** voltage and **Current** (OUT.)
- Note that the output current and/or voltage and battery type setting may have been adjusted on your unit. Refer to the **OPERATION** details above to confirm the settings.
- If the battery type setting is changed, it is recommended that this is noted on the front label.
- Before changing battery type setting, be sure to check the relevant BTI technical documents that match the serial number range of your charger.
- A sample product rating label is below.



TECHNICAL DATA

- AC Input voltage range: 115V AC +/- 10%, 50-60Hz
- AC current input: 4.3A max.
- AC fuse: 6.3A
- Efficiency: > 80%
- Output ripple at max load <150mV.
- Accuracy of power and voltage measurements 1%.
- Thermal protection against overheating.
- ISO isolation transformer, class H
- Operating temperature: -10°C to +45°C (14°F to 113°F)
- Storage temperature: -40°C to +45°C (-40°F to 113°F)
- Relative humidity range: 0 – 80%

REGULATORY AND COMPLIANCE

- The *Eyprit 24/12* chargers are CSA Listed:
CAN/CSA-C22.2 No 107.2 and UL 1236
- The *Eyprit 24/12* chargers are CE compliant.



The tests of electromagnetic compatibility (EMC) on these devices were carried out in compliance with the CEI EN55014-1+A2(04/98-06/99) and CEI EN 55014-2(10/98) STANDARD norms, with the test instructions and conditions as requested by the norms.

NORM	RESULT
EN 55014-1+A2	COMPLIANT
EN 55014-1	COMPLIANT
EN 61000- 3-2	COMPLIANT
EN 61000- 3-3	COMPLIANT
EN 61000- 4-2	COMPLIANT
EN 61000- 4-4	COMPLIANT
EN 61000- 4-5	COMPLIANT
EN 61000- 4-6	COMPLIANT
EN 61000- 4-11	COMPLIANT



Regarding immunity, these chargers are classified as Category II.

- The *Eyprit 24/12* chargers do not emit radio frequencies.