



VMAXTANKS™

BC12M248

7 Stage

Automatic Smart Battery Charger, Desulfator & Maintainer

12V, 2/4/8A

FOR AGM, GEL AND WET BATTERIES



USER MANUAL

**THIS MANUAL CONTAINS IMPORTANT
SAFETY AND OPERATING INSTRUCTIONS**

IMPORTANT SAFETY INSTRUCTIONS

Please read this manual and follow the instructions carefully before using the charger.

WARNING:

- The **BC12M248** charger is designed to charge **12V** lead-acid batteries from 6Ah to 160Ah and maintain batteries up to 200Ah.
- The **BC2404** charger is designed to charge **24V** lead-acid batteries from 4Ah to 80Ah and maintain batteries up to 100Ah.
- The **BC3603** charger is designed to charge **36V** lead-acid batteries from 8Ah to 50Ah and maintain batteries up to 80Ah.
- The **BC4802** charger is designed to charge **48V** lead-acid batteries from 6Ah to 40Ah and maintain batteries up to 60Ah.
- Check battery manufacturer specifications before using this charger.
- Explosive gases may escape from the battery during charging. Provide ventilation to prevent flames and sparks.
- Do not expose charger to rain, snow or liquids.
- Battery acid is corrosive. Rinse immediately with water if acid comes into contact with skin or eyes.
- Do not charge a frozen or damaged battery.
- Do not charge non-rechargeable batteries.
- Do not place the charger on the battery while charging.
- 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.
- When working with a lead-acid battery, remove personal metal items such as rings, bracelets, necklaces, watch...
- Do not smoke or allow a spark or flame while charging.
- In order to reduce risk of electric shock, unplug charger from AC outlet before doing any maintenance or cleaning.
- Not for use by children or by anyone who is unable to follow instructions of this manual, unless they are supervised by an adult to ensure the proper use of charger.

MAIN FEATURES:

- High efficiency (>85%).
- Selectable charging rates to suit battery capacity.
- Selectable battery type.
- Temperature self-compensation: Charging voltage adapts to temperature to prevent over or under battery charging.
- Capable of recharging severely discharged or heavily sulfated battery.
- Reverse polarity protection, short circuit protection, sparks free contact.
- Ultra low input power consumption while in standby mode.
- Ease of use. Clear charging status display.
- Full microprocessor controlled.
- Does not over charge your battery even if it is kept connected in maintenance float mode.

◦ **Multi Charge Stages:**

- Battery desulphation charging
- Soft start charging
- Bulk charging
- Absorption charging
- Battery analysis
- Recondition charging
- Float & maintenance charging



Temperature sensor

Temperature & Safety Protection:

- **INTERNAL OVERHEAT PROTECTION:** The charger is equipped with built-in overheat and overload electronic circuit protection
- **TIMER PROTECTION:** Charger provides the maximum charging time for each charging stage. In the event it is wired to recharge a larger than recommended battery, charger will stop charging after maximum stage recommended time and the RED LED will be FLASH slowly. At this point, Battery must be disconnected.
- **REVERSE POLARITY:** Charger has reverse battery protection. (Red LED ON, while output leads are connected backwards), Disconnect and correct connection to battery.
- **SHORT CIRCUIT PROTECTION:** Charger will turn off upon detecting a short circuit (Red LED ON).

RECOMMENDED SETTINGS:

Charge Rate:

Charge Current	1A	2A	2.6A	4A	8A
Battery Capacity: Charging (AH)	4-20	6-40	8-50	10-80	40-160
Battery Capacity: Maintaining (AH)	4-30	6-60	8-80	10-100	40-200

Battery type:

Battery type (Voltage value at 25°C)		Absorption Voltage	Float Voltage	MAX
GEL	For Charging GEL batteries	14.1V	13.4V	14.4V
WET	For Charging FLOODED or WET Batteries	14.4V	13.5V	14.7V
AGM	For Charging AGM, Sealed, VRLA, Calcium batteries	14.7V	13.6V	15V

TECHNICAL SPECIFICATIONS:

Model	BC12M248	BC2404	BC3603A	BC4802
Type	Smart & Automatic	Smart & Automatic	Smart & Automatic	Smart & Automatic
Input (UL Version)	115Vac 50/60Hz	115Vac 50/60Hz	115Vac 50/60Hz	115Vac 50/60Hz
Input (CE Version)	220-- 240Vac	220-- 240Vac	220-- 240Vac	220-- 240Vac
Output Voltage	12V	24V	36V	48V
Output Current	2 / 4 / 8A	1 / 2 / 4A	2.6A	2A
Output Volt No Load	<0.5V	<0.8V	<1.0V	<1.5V
Minimum Start Volt	>2.0V	>4.0V	>6.0V	>8.0V
Input Power W / Load	34-126W	126W	126W	126W
Input Power No Load	0.3-0.8W	0.8W	0.8W	0.8W
Temperature Compensated	-30mV/ °C	-60mV/ °C	-90mV/ °C	-120mV/ °C
Size (L*W*H)	8*3.5*2 (in)	8*3.5*2 (in)	8*3.5*2 (in)	8*3.5*2 (in)
Net Weight	1.87LB	1.87LB	1.87LB	1.87LB
Approval	FCC & CE	FCC & CE	FCC & CE	FCC & CE

ELECTRICAL PARTS:

- AC power cord: 6 feet SPT-2 with UL plug
- Output lead: 6 feet SPT-2 2X18AWG with insulated battery clamps.

ENVIRONMENTAL CHARACTERISTICS:

- Operating temperature range: 32 to 104° F
- Storage temperature range: 10 to 170°F
- Operating humidity range: 90% RH Max

ECO MODE:

If AC power is connected, and the battery is not connected, the charger will automatically go into ECO mode. Input power draw in ECO mode is less than 1.5W (0.04kWh per day).

Power consumption in maintenance mode is 0.05kWh per day.

CHARGING INSTRUCTIONS:

STEP 1 - Pre Charge:

Battery & Electrolyte Level Check

- Check the battery electrolyte level (Only for Flooded or WET battery).
If necessary, remove the vent caps and add distilled water so the levels are halfway between the upper and lower fill lines.
- Check the battery label if it is 12V battery or 24V batteries etc.

STEP 2 - Connect Charger to Battery

- If the battery is **out of the vehicle**:
 - Connect the Red lead from the charger to the positive (+) battery terminal.
 - Connect the Black lead from the charger to the negative (-) battery terminal.
- If battery is still **in the vehicle**, determine if the vehicle is positively or negatively earthed.
 - If Negatively earthed (Most Common) – First connect the Red (+) battery charger lead to the Positive (+) battery post and then connect the Black (-) battery charger lead to the vehicle's chassis and away from the fuel line.
 - If Positively earthed – First connect the Black (-) battery charger lead to the Negative (-) battery post and then connect the Red (+) battery charger lead to the Vehicle's chassis and far away from the fuel line.

STEP 3 – Connect Charger to Power (115Vac / 230Vac)

- Connect the battery charger to AC mains powered socket.
- The Charger will automatically start when AC power is connected and switched on.

(Note: If the Fault Indicator LED illuminates Red, please check your connections as it's likely that the Positive and Negative leads are reversed. Refer to Trouble Shooting page for further information)

THE CHARGING PROCESS:

The charging stages and performance are as follows:

Battery initial condition check

After all connections are made, the charger will automatically diagnose battery condition.

If battery voltage is above 9V, charger will go into soft start stage.

Otherwise, charger will go into desulphation mode. If the battery voltage

does not exceed 9V after 6 hours of rejuvenation, you will need to disconnect the battery and check its condition, voltage rating or if it is connected to a load while charging.

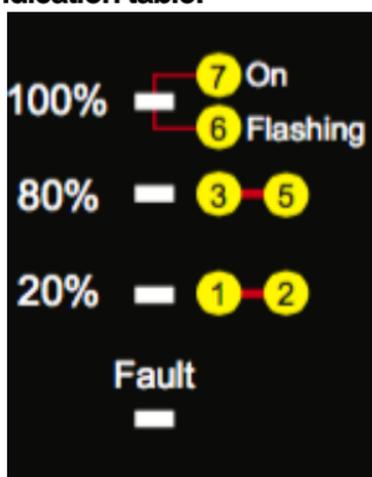
Smart Charging Stages

- **Desulfation:**
 - 20% charging LED: ON.
 - Engage high peak pulse for deep-discharge or sulphated battery
 - dissolve the lead sulphated crystal bring the electrolyte fluid to well-distributed state
 - The battery voltage will increase slowly.
- **Soft start:**
 - 20% charging LED: ON.
 - The battery voltage will increase slowly.
- **Bulk :**
 - 80% charging LED: ON.
 - The battery can be charged about 80%.
 - The charger delivers an almost constant current 2000mA until the battery voltage reaches the set value.
- **Absorption :**
 - 80% charging LED: ON.
 - The battery can charge up to almost 95%.
 - The charging current tapers and the charging voltage are kept constant at the set value.
- **Test Mode**
 - The charging is interrupted for a short period while battery voltage is measured.
 - If the battery voltage falls too quickly, the battery could be faulty.
 - FULL LED: Flashing.
- **Recondition charging**
 - Charger will go into this stage if battery fails Test Mode due to its condition, age or being under charged.
 - This stage can recover batteries from deeply discharged state increasing performance and battery life.
 - FULL LED: Flashing.
- **Float mode**
 - Full LED: ON.
 - The float mode allows the charger to effectively be left connected to your batteries; it works at a safe level and ready for use.
- **Maintenance mode**
 - Full LED: ON.
 - The program engages a special charging waveform and monitors the battery voltage variety, if the battery voltage sinks, the special pulses will keep the battery in optimal state, if the battery voltage drops even lower, the battery charger will switch into bulk charging . The maintenance mode allows the charger to be connected to the battery over the course of a season; If possible, check the electrolyte liquid level in the battery.

STEP 4 – Disconnect Charger from Battery

- If the battery is **out of the vehicle**:
 - Switch OFF and remove the AC power socket from the outlet.
 - Remove the black lead and then the red lead.
 - Check electrolyte levels if possible.
 (As they may need topping up with distilled water after charging)
- If the battery is **in the vehicle**:
 - Switch OFF and remove the AC power socket from the outlet.
 - Remove the lead from the vehicle chassis.
 - Remove the lead from the battery.
 - Check electrolyte levels if possible.
 (As they may need topping up with distilled water after charging)

LED status indication table:



LED	Status	Description
GEL	Green	GEL Battery Charging
WET	Green	Flooded, WET battery Charging
AGM	Green	Sealed, AGM, VRLA & Calcium Battery Charging.
20%	Green	20% capacity charging.
80%	Green	80% capacity charging.
100%	Flash	Test Mode or recondition charging.
100%	ON	Fully charged, maintaining the battery.
Fault	ON	Output short-circuit or reverse polarity.
Fault	Flash	Battery is Defective or capacity is too large
100%	ON	2 LEDs are lighting together. Battery is over voltage.
Fault	Flash	

TROUBLESHOOTING:

Problem	Error Code	Possible Causes	Suggested Solution
Charger Does Not Work?	No Indicator lights on	-No AC Power	- Check AC connections and make sure Power Point is switched ON
No DC Output?	Fault RED LED is ON.	-Output is short circuited -Reverse polarity connection to Battery	- Check DC connection between charger and battery and make sure they are not short circuiting. - Check that the crocodile clips / ring terminals are connected to the correct polarity.
No Charging Current?	Fault RED LED is flashing	-Battery is severely sulphated -Overheat protection mode	- Move battery & Charger to cooler environment
No Charging Current?	FULL & Fault RED LED are flashing	-Battery voltage is higher than charger rate voltage	- Check the battery condition. Battery may need replacement.
Long Charging Time, Full LED Does Not Turn On?	Fault RED LED is Flashing	-Battery capacity too large -Battery is defective	- Check the charger specification to match the battery capacity. - Battery cannot be charged and must be replaced.

MAINTENANCE:

The case should be cleaned occasionally. Disconnect from the power while cleaning.

If the power cord is damaged, or if there are any signs of physical damage, the charger must be serviced by a qualified technician.