

7 STAGE Heavy Duty Fully Automatic Smart Charger User Manual



1. Summary

VMAXTANKS™ HD battery chargers utilize state of the art SMR technology and high-performance micro-processor control, resulting in a light weight, small volume, long operating time, cost effective charger with a wide scope of applicability. The utilization of high performance microprocessors gives HD chargers the intelligent control and full protection necessary while in use, including over current prevention, polarity short-circuit prevention, polarity transposition prevention, disoperation prevention, over voltage prevention, self lock prevention and fast charging. They further maintain unique functions of ultra-low composite pulse charging, temperature self-compensation and battery temperature reduction to efficiently protect and prolong the lifespan of the battery in use.

The charger could be utilized for electric forklifts, electric vehicles, electric pallet trucks, golf carts, solar, electric cleaning equipment, UPS and many other applications.

2. Features:

1. Ultra-low frequency composite pulse charging: Prevents new battery sulphation and removes it from old batteries.
2. Temperature self-compensation: Charging voltage adapts to temperature to prevent over or under battery charging.
3. Automatic Equalized Charging: Charging battery pack in automatic equalized charging as needed to maximize its overall lifespan.
4. Short-Circuit Prevention: Charger will turn off upon detecting a short circuit.
5. Overheat Protection: When the inner temperature of the charger is above 167 °F, charging current and fan speed are adjusted until temperature drops to an acceptable level.
6. Reverse Polarity Protection: Charger will disconnect upon detecting reverse polarity, preventing any damage to the charger or to battery.
7. Input low voltage & Overvoltage Protection: Charger will go into protection mode if the input AC voltage is below 90VAC or above 132VAC.
8. Test function: Charger displays charging voltage, current, charging time, and battery state of charge (25% 50% 75% 100% LEDs).

3. Charger Display



4. Charging Stages:

The VMAXTANKS™ HD chargers offer a fully automatic 7-Stage charging process-Desulphation, Soft Start, Bulk, Absorption, Battery Test, Recondition and Float- offering a very comprehensive and accurate charging process. This lengthens battery life and improves their performance.

VMAXTANKS™ HD chargers are suitable for most battery types designed to be charged with 2.45V/Cell including Calcium, Gel and AGM batteries. They may also help restore drained and sulphated batteries.

Desulphation

The Desulphation stage may break down sulphation that occurs in batteries that have been left flat for extended periods of time, bringing them back to full charge. Sulphation occurs when lead-sulphate hardens and clogs up the battery cells.

Soft Start

Soft Start is a preliminary charge process that gently introduces power to the battery. This protects the battery and increases battery life. This stage continues until the battery's terminal current has risen slowly above the set limit of soft start current, at which point the charger switches to bulk charging.

Bulk (Constant Current)

Bulk mode charges the battery at the maximum rate (constant current) putting a large amount of power into the battery in a short amount of time. This stage will charge the battery to approximately 80%, until the voltage reaches 14.5-14.7 volts for 12V charger or 29.0-29.4 volts for 24V charger.

Absorption (Constant Voltage)

The charge rate slows down so the battery can absorb more power and reach 100% charge. The voltage remains at a constant 14.7 volts for a 12V charger or 29.4 volts for a 24V charger while the current is gradually reduced until no more power can be added without over-charging the battery.

Battery Test

An automatic battery test is conducted immediately after the absorption stage. The test monitors the voltage for 90 seconds to determine if the charge was successful.

- ❖ 12V charger: If the voltage is below 13.2 volts (fail), the charger will initiate the Recondition stage.
- ❖ 12V charger: If the voltage is above 13.2 volts (pass), the charger will proceed to the final stage: Float
- ❖ 24V charger: If the voltage is below 26.4 volts (fail), the charger will initiate the Recondition stage.
- ❖ 24V charger: If the voltage is above 26.4 volts (pass), the charger will proceed to the final stage: Float.

Recondition

The battery recondition function is initiated automatically if the battery fails the battery test (stage 5). Failing the battery test indicates that

the absorption stage was unable to fully charge the battery. The recondition mode will then begin to introduce a low constant current for a period of 4 hours. The charger will then go into float charging mode.

This reconditioning stage can recover batteries from a deeply discharged state, increasing performance and battery life.

RECOND - This mode is used to recover deep discharged flooded batteries where you could expect a stratified acid (high acid weight in the bottom, low on top). Check with battery manufacturer when in doubt. Use this mode with care, because the high voltage will cause some water loss. 15.5V/31.0V is normally no problem for electronics in 12V/24V systems. Consult your supplier when in doubt. Life of the light bulbs will be reduced at higher voltage. Try to disconnect light from the battery during this phase. Maximum effect and minimum risk for electronics is achieved by charging a disconnected battery.

Float

After passing battery test, charger switches to float stage for a minimum of 1 hour insuring that the battery is at 100% state of charge. The charger will then go into standby mode. If charger stays connected to battery, it will keep monitoring its terminal voltage. If the terminal voltage drops below a lower limit, charger will automatically go back to the beginning of the charging curve.

5. Working conditions:

1. Charger should be placed in a well ventilated and dry area when in use. Avoid high temperature, dust and corrosive gases at all times.
2. Make sure the AC outlet matches that of the charger.
3. Free Charger vent from any blockages. Keep charger 2-3ft away from large objects. Clean filter as needed.
4. Altitude: below 10,000 feet.
5. Working temperature: -4 °F – +140°F.
6. Storage temperature: -49°F – +140°F.
7. Max humidity 90%, ambient temperature 77°F.

6. How to Use:

- 1- Connect positive charger clip (red) to the positive battery terminal, the negative charger clip (black) to the battery terminal.
- 2- Plug in AC power.
- 3- If Fault LED is ON, disconnect battery and check all connections.
- 4- Press the Power button to start charging. If Fault LED goes ON at this point, disconnect and check battery.
- 5- When all four LED's turn ON and Charging LED turns OFF, the battery is fully charged.
- 6- Press the Power button to turn off the AC power before disconnecting the battery.

7. Safety rules

- △ Use in a well ventilated environment.
- △ Avoid any flames, sparks and smoking when using charger.
- Read instructions carefully before use.
- Prohibit minors or unqualified users from operating charger.
- Do not operate while exposed to rain or snow.
- Turn off the AC power before connecting or disconnecting battery.
- Do not use with non chargeable batteries.
- Never attempt to short circuit the terminals.
- Make sure charging outputs of this charger match charging specifications of rechargeable batteries in use.
- Do not disassemble the charger; contact your supplier when service or repair is required. Incorrect reassembly may result in a risk of electrical shock or fire.

VMAXTANKS™ BC1225HD & BC2413HD

Model	BC1225HD	BC2413HD	
AC Input			
Power Supply	120VAC	120VAC	
AC input frequency	47Hz – 63Hz	47Hz – 63Hz	
Rated Power	470W	440W	
Output (at ambient temperature- 77°F)			
Max output voltage	15.5Vdc	31.0Vdc	
Bulk Charge Voltage	14.7V	29.4V	
Float Charge Voltage	13.5V	27.0V	
Max power	390W	390W	
Max Output current	25A	13.0A	
Max noise	60db	60db	
Voltage & Current Precision	±1%	±1%	
Max efficiency	≤97%	≤97%	
Temperature compensation	±3mV/ °F per CELL	±3mV/ °F per CELL	
Protection			
Input overvoltage protection	132Vac	132Vac	
Input low-voltage protection	90Vac	90Vac	
Output over voltage protection	15.6V	15.6V	
Abnormal Battery protection	When Battery Voltage is over 2.8V/Cell or below 1.65V/Cell.	When Battery Voltage is over 2.8V/Cell or below 1.65V/Cell.	
Output short-circuit protection	When detected, charger will shut down.	When detected, charger will shut down.	
Overheat protection	185°F±3 °F	185°F±3 °F	
Storage temperature			
Min	-49°F	-49°F	
Max	140°F	140°F	
Working conditions			
Min	-4°F	-4°F	
Max	140°F	140°F	
Appearance			
Size/Weight	Model	Length x Width x Height	Charger Weight
	BC1225HD	12.2 x 8.3 x 9.5 Inches	14 LB
	BC2413HD	12.2 x 8.3 x 9.5 Inches	14 LB

Dielectric strength: Input to output electric intensity≥2500V (10mA) /min

Dielectric resistance: ≥100MΩ / 500V

Waterproof level: IP46

Anti-seismic level: SAEJ1378