POTTERMANIA®

Turbo ME series battery charger

Operation Manual

Model	# 12V Output Bank	Max. Output	Battery System (DC)		
			12V	24V	36V
Turbo M106E	1	6 Amps	✔		
Turbo M108E	1	8 Amps	✔		
Turbo M208E	2	8 Amps	✔	✔	
Turbo M212E	2	12 Amps	✔	✔	
Turbo M312E	3	12 Amps	✔	✔	✔

Important Notice

This manual contains important safety, operation, and installation instructions. Please read the entire instructions before using your Powermania Turbo ME onboard battery charger.

WARNING: CHECK BATTERY TYPE.

This charger should be used to charge only Lead Acid type of 12V DC batteries; Flooded Lead-Acid, AGM (Absorbent Glass Mat), and GEL (Gelled Electrolyte Lead-Acid). Use of this product to charge other types of batteries may cause batteries to burst and result in personal injuries. If you are unsure about the type of battery, please consult with battery manufacturers.

WARNING: RISK OF EXPLOSIVE GASES!

Working in the vicinity of lead acid batteries is dangerous. Batteries generate explosive gases during normal operation. For this reason it is extremely important to follow safety instructions each time before using this charger.

WARNING: DO NOT USE 2-PIN AC ADAPTER/EXTENSION CORD.

Do NOT use the charger with a 2-pin AC adapter or extension cord. Do NOT cut or make any modification to the factory equipped AC power cord. Doing so can result in serious personal injury.

CAUTION: CONNECT ONLY TO PROPERLY GROUNDED OUTLET.

The charger MUST ONLY be connected to a properly grounded AC outlet that is protected by Ground Fault Circuit Interrupter (GFCI) breaker.

DANGER: ALWAYS UNPLUG AC POWER CORD BEFORE MAKING ANY DC WIRING CONNECTION.

The AC power cord MUST be UNPLUGGED from the outlet BEFORE connecting any DC wire to batteries or making any DC wiring connection change. Fail to do so may cause electrical shock resulting in serious personal injury or death.

INTRODUCTION

Thank you and congratulations on your new purchase of the Powermania Turbo ME series onboard battery charger. This charger is waterproof, corrosion-resistant and shock-resistant—ideal for recharging and maintaining 12V DC batteries in marine applications and other harsh environments. Featuring Automatic 3-Stage Smart Charge and Battery Selector, this charger is designed to charge and maintain various types of 12V DC batteries using full automation. Our charging process has been proven to bring out the batteries' full potential charge after each charging session while also extending their lifespan at the same time.

The Turbo ME also comes equipped with extensive safety features and intuitive LED indicators to help protect your investment. Please visit our website www.powermaniausa.com for the latest product updates and information.

PERSONAL SAFETY PRECAUTIONS

1. Someone should be within the voice range or close enough to come to your aid when working near a Lead-acid battery. Work in a well ventilated area away from ignition sources.
2. Have plenty of water and soap nearby in case battery acid comes in contact with skin, clothes, or eyes.
3. Wear complete eye protection and clothing protection. Avoid touching eyes while working near batteries.
4. If battery acid contacts skin or clothing, wash them immediately with water and soap. If acid enters eyes, immediately flood the eyes with running cold water for at least 10 minutes and get medical attention. Follow battery manufacturer's recommendations if you come in contact with acid.
5. Never smoke or allow open flame near batteries.
6. Do not drop a metal tool onto a battery as that may spark or short-circuit a battery and it may cause an explosion or fire.
7. Remove all personal metal items such as rings, bracelets, necklaces, and watches when working near batteries. A battery can cause short circuit currents that are high enough to weld metals and cause serious burns.

PRECAUTIONS PRIOR TO CHARGE BATTERY

- Do not charge outside of battery manufacturer's recommended temperature conditions.
- Do not use this charger to charge dry cell batteries for home appliances.
- Do not operate the charger if any of the prewired cables or LED's is damaged.
- Make sure all onboard connected electronic devices are turned off.
- If a battery needs to be removed from the vehicle or boat to be charged, always remove the

grounded negative terminal from the battery first.

- Be sure to have enough open space around the battery for good ventilation during charge. Gas can be forcefully blown away using a piece of cardboard or other non-metallic material as a fan.
- Wear full eye protection when cleaning battery terminals in case corrosive materials get in contact with eyes.
- Add distilled water in each cell until battery acid reaches levels specified by battery manufacturer. Do not overfill. For batteries without cell caps, please follow the recharging instructions provided by battery manufacturers.
- If necessary, use only industrial grade, UL approved extension cord connecting to the charger. When using extension cord, connect the charger end first before you plug the extension cord to a power outlet. When unplugging, unplug the end connecting to power outlet first, and then unplug the end connects to the charger.
- Make sure the AC power outlet you are connecting the charger to is GFCI (Ground Fault Circuit Interrupt) protected.

BOX CONTENTS

- Turbo ME series charger prewired with one AC power cord and DC output cable(s)
- Operation manual / Registration card
- 4 x installation screws

SPECIFICATIONS

	M106E	M108E	M208E	M212E	M312E
Max. Input Current (@120V AC)	2 Amp	3 Amps	3 Amps	4 Amps	4 Amps
Maximum Output	6 Amps	8 Amps	8 Amps	12 Amps	12 Amps
# Output Bank (Prewired)	1	1	2	2	3
Output Voltage Configuration	12V DC	12V DC	12/24V DC	12/24V DC	12/24/36V DC
Weight	4.7 lb.	4.7 lb.	5.4 lb.	8.9 lb.	9.4 lb.
Dimension (Inch)	$6^{1}/_{2}$ x $4^{1}/_{2}$ x $2^{1}/_{2}$	$6^{1}/_{2}$ x $4^{1}/_{2}$ x $2^{1}/_{2}$	$6^{1}/_{2}$ x $4^{1}/_{2}$ x $2^{1}/_{2}$	$8^{1}/_{4}$ x $5^{3}/_{4}$ x $2^{3}/_{4}$	$8^{1}/_{4}$ x $5^{3}/_{4}$ x $2^{3}/_{4}$
Recom. Max. Battery Capacity*	72 Ah	96 Ah	96 Ah	144 Ah	144 Ah

* All connected batteries combined

SPECIFICATIONS (All models)

Nominal input voltage:	100V~120V AC
Nominal input frequency:	50~60Hz
Nominal output voltage/bank:	12V DC
Battery type setting:	1. Flooded (Lead-Acid) / AGM
	2. GEL
	3. AGM+
Max. Absorption time:	4 hours
Operational temperature:	-4°F ~ 122°F
Storage temperature:	-40°F ~185°F
Output cable length:	5 feet / 152 cm
Power cord length:	5 feet / 152 cm
LED indicators:	1. Power
	2. Charge status
	3. Over-voltage Indicator
	4. Overheat Indicator
	5. AGM+ Charge Mode
	6. GEL (Gel Cell) Charge Mode
	7. Flooded (Lead-Acid)/AGM Charge Mode
Special features:	Adaptive Loading
	3-Stage Smart Charge
	Battery Type Selector
Safety features:	Ignition Protection
	Overheat Protection
	Over-Current Protection
	Over-Voltage Protection
	Reverse Polarity Protection
	Short Circuit Protection
Compliances:	FCC Part 15 Class A
	IP65 (Splash-proof)
	Constructed in accordance to Marine UL 1236

SPECIAL FEATURE: Adaptive Loading (not applicable to M106E/M108E)

USER BENEFIT:	**Fully charges all connected batteries in the shortest time.**

The Adaptive Loading feature dynamically adjusts the charger's output level on each output bank. More charging power is allocated to battery that is low in charge, and less charging power to battery that is closer to being fully charged.

In Scenario 1 (left chart), the two batteries have similar charge levels. The Adaptive Loading feature allocates approximately the same output current to both batteries. In Scenario 2 (right chart), the first battery's is close to be fully charged while the second battery is discharged. The Adaptive Loading feature allocates only 10% of its charging current to the first battery and the other 90% to the discharged one.

Note that in both scenarios the charger utilizes its full 100% output capacity. In contrast to the other chargers with fixed output-per-bank constraints, the Turbo ME charges all connected batteries to their fullest charge in the shortest time.

SPECIAL FEATURE: 3-Stage Smart Charge

USER BENEFIT:	**Maximizes battery potential and prolongs battery life.**

Turbo ME charges battery in three sequential stages: Bulk, Absorption, and Float. This mechanism is proven to bring battery to its fullest charge, and also to maintain battery's full charge from self

discharge.

At the first stage (Bulk), the charger provides its maximum constant current to fast charge the battery. The battery's voltage rises as it absorbs the charge. When the battery voltage reaches 14.6V (Flooded mode*), it is about 80% recharged. The charger then moves to the second stage.

At the second stage (Absorption), the charger continues to charge the battery at 14.6V (Flooded mode). The charging current slowly decreases as the battery charges up to 100%. When the battery is fully charged, the charger then moves to the third stage.

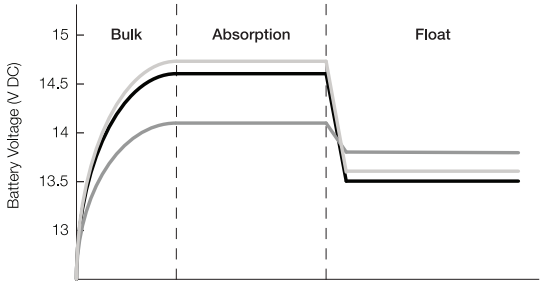
At the third stage (Float), the charging voltage is reduced to 13.5V (Flooded mode). The charger can be left connected to the battery indefinitely to maintain the battery's full charge. If the battery loses a significant amount of charge from usage, the charger will start a new recharge cycle.

* Please refer to page 17 for voltage settings on each charge mode.

** Full charge is signified by two conditions:

1. The charger's output current drops to a minimal level.
2. The 4-hour Absorption period expires.

If either one of these conditions are met, the charger will then move into the third stage (Float).



Line	Charge Mode
	Flooded. Lead-Acid / AGM Mode
	GEL Mode
	AGM+ Mode

SPECIAL FEATURE: Battery Type Selector

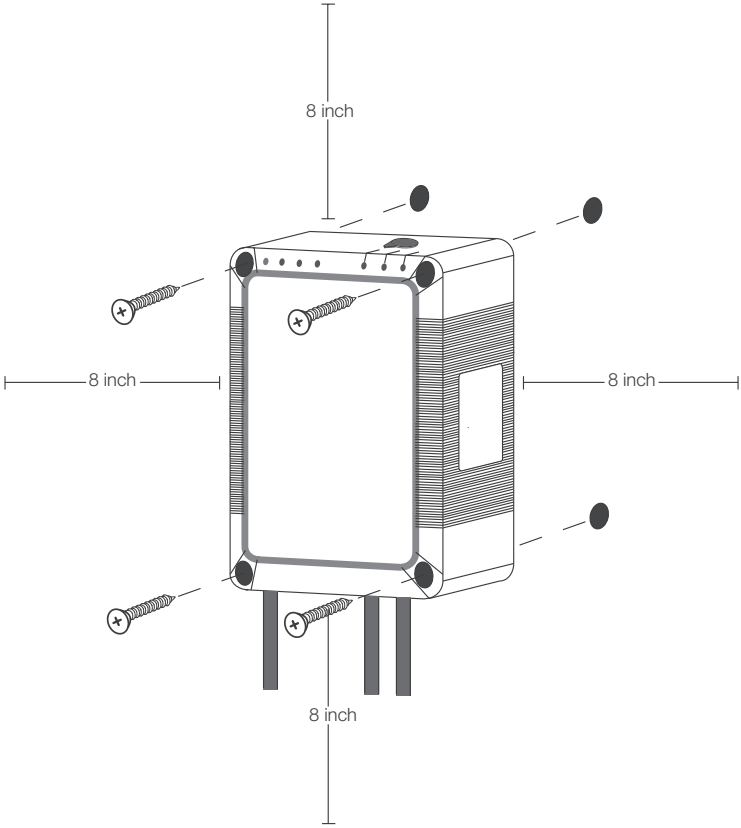
USER BENEFIT:	Compatible with various types of 12V batteries (Flooded Lead-Acid, AGM, High Power AGM, and GEL).

The Battery Selector feature allows users to select different types of 12V batteries to charge. The initial factory setting is at "Flooded Lead Acid/AGM" charge mode. The other two charging modes are "GEL" charge mode and "AGM+" charge mode. Select "AGM+" charge mode when charging high power AGM batteries. Please refer to Table 1 on page 17 for different charge voltage settings at each charge mode.

INSTALLING THE CHARGER

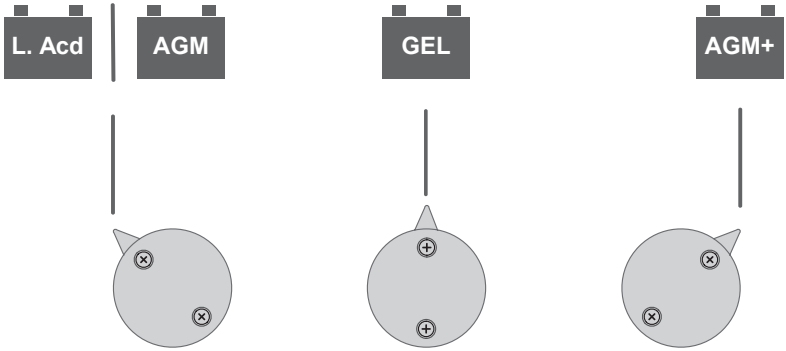
The Powermania Turbo ME series charger is designed to be mounted onboard. The chart below shows the proper orientation of the mounting position. The LED lights line up horizontally at the top and the output cables at the bottom. This orientation optimises air ventilation during operation.

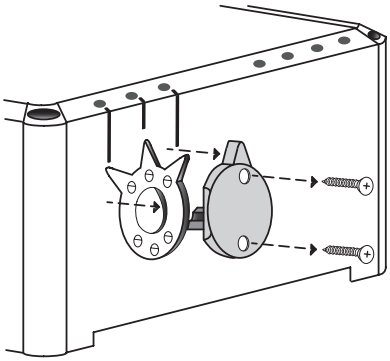
- Select a well ventilated area where there are at least 8 inches of clear air space around the charger.
- Make sure the charger's output cables can reach all batteries from the mounting position.
- Do not mount the charger on carpeted, upholstered, or varnished surfaces.
- Make sure the mounting surface can firmly hold the charger with the provided screws.
- Place charger on the tentative mounting area. Use a pencil to mark position of each mounting hole.
- Use 1/8" drill bit to drill on the marked position.
- Align the charger to the drilled holes, and then secure the charger with provided screws.



SELECT BATTERY TYPE

The Battery Selector's tip point can be switched among three positions as follows. From left to right, the first position (factory default) is for charging Flooded Lead-Acid type and AGM type battery. The middle position is for charging GEL (Gel Cell) type battery, and the right position is for charging High Power AGM type battery. Please refer to Table 1 on page 17 for voltage settings in each charge mode.





To switch to a different charge mode, please follow these steps:

1. Make sure the charger's power cord is unplugged from the power outlet.
2. Loosen the screws from the battery selector.
3. Pull the battery selector straight out from the charger.
4. Place the battery selector back to the charger with the desired position.
5. Secure the screws back to the battery selector.

CAUTION: RISK OF PERSONAL INJURY

The screws used to secure the battery selector must be 10mm or shorter. If the screws are longer than 10mm, the charger could be damaged and could result in serious personal injury.

CONNECT EVERY DC OUTPUT CABLE TO BATTERY TERMINAL FOR SAFETY REASONS.

MAKING DC CONNECTION

The following pages (p.12 - p.16) demonstrate proper DC wiring configurations for Powermania Turbo ME series chargers. When making DC connections, make sure each set of output cables (one positive and one negative) is connected to the same battery set of terminals. The red wires are positive (shown as grey color on the charts) and the black ones are negative. Never connect a black wire (negative) to a terminal that is connected with a red wire (positive).

Always connect ALL of the charger's output cables to battery terminal(s). **NEVER LEAVE ANY SET OF OUTPUT CABLES UNCONNECTED.**

For multi-output models, it is recommend to **CONNECT THE CHARGER'S FIRST OUTPUT SET (OUTPUT 1) TO MAIN HOUSE BATTERY.** The first output set is located next to the AC cord.

Please refer to the following legend reference used on the connection charts:

Fuse holder

Positive output (Red wire)

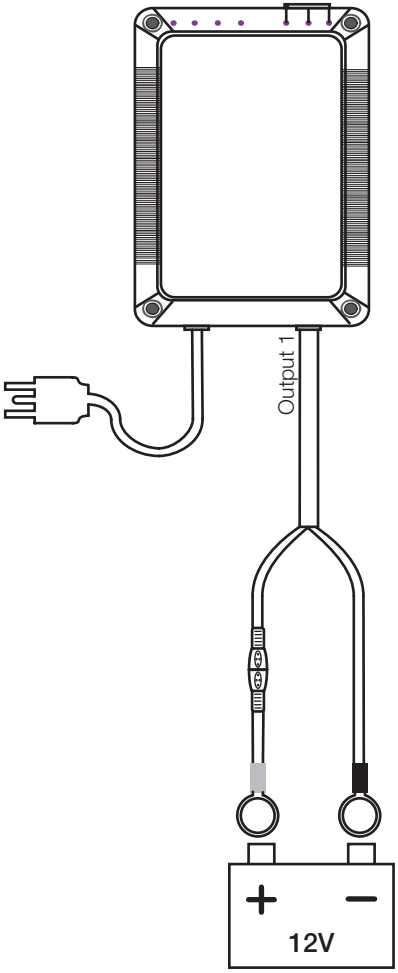
Negative output (Black wire)

Jumper cable (not included)

AC input power cord

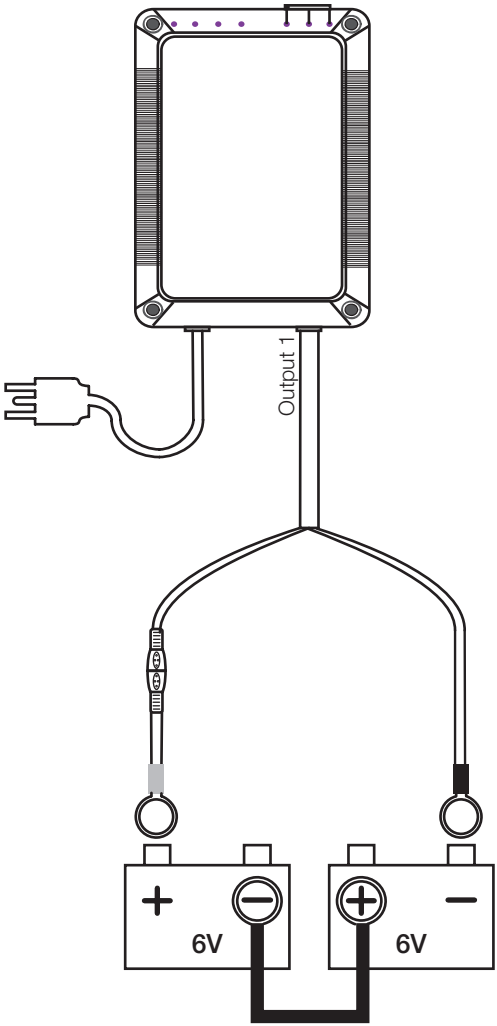
CONNECT EVERY DC OUTPUT CABLE TO BATTERY TERMINAL FOR SAFETY REASONS.

Connection 1A: Connecting 1-bank charger (M106E/M108E) to one independent 12V battery.



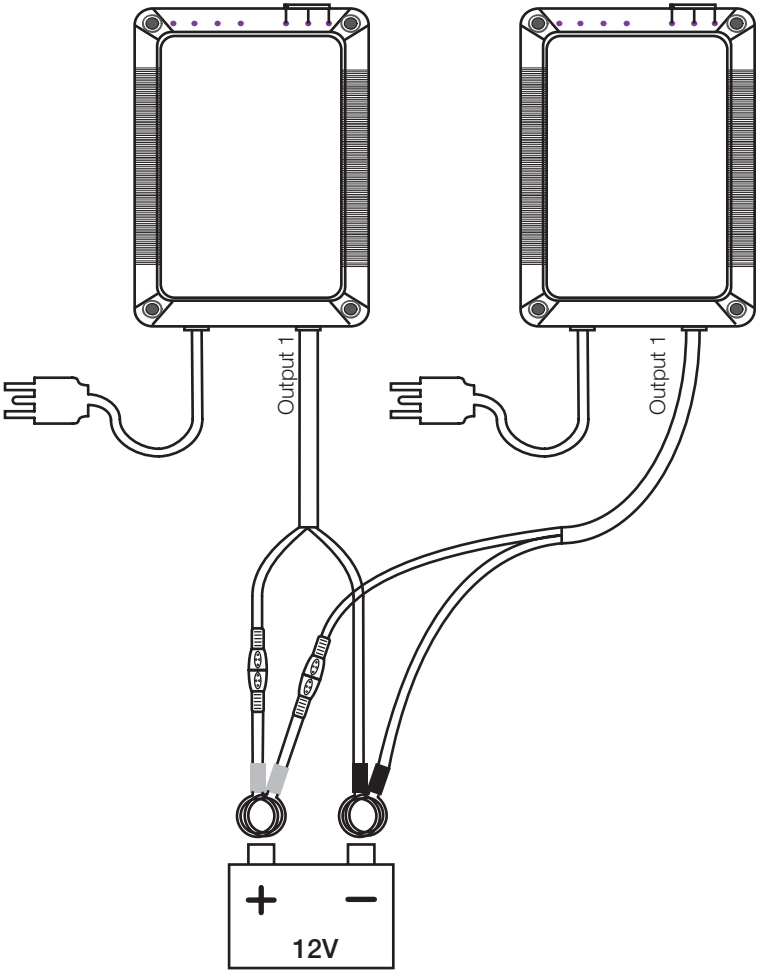
CONNECT EVERY DC OUTPUT CABLE TO BATTERY TERMINAL FOR SAFETY REASONS.

Connection 1B: Connecting 1-bank charger (M106E/M108E) to two serial-connected 6V batteries.



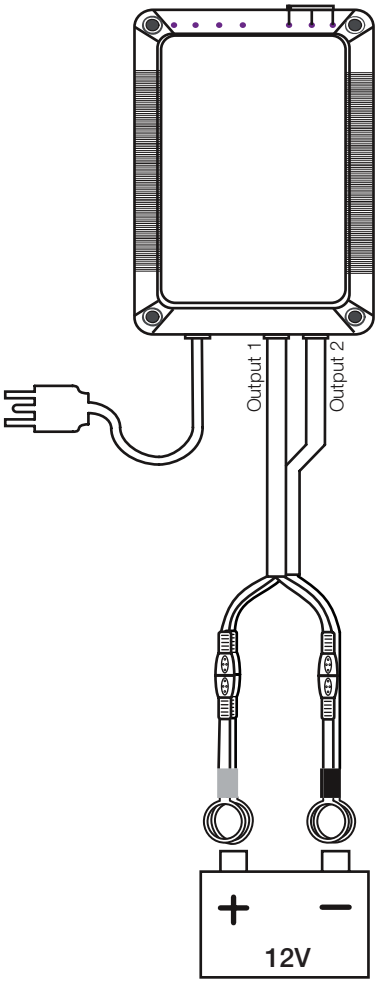
CONNECT EVERY DC OUTPUT CABLE TO BATTERY TERMINAL FOR SAFETY REASONS.

Connection 1C: Connecting two 1-bank chargers (M106E/M108E) to one independent 12V battery (Parallel charging - to increase charging power).



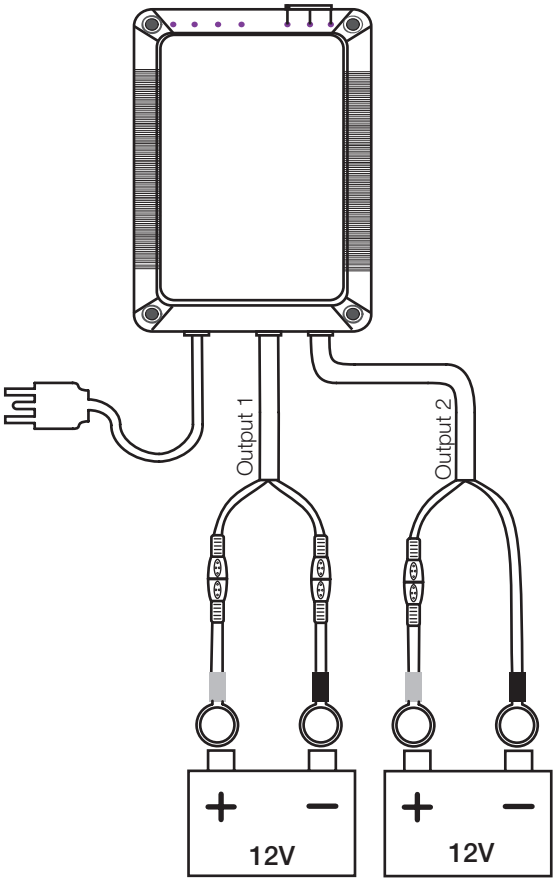
CONNECT EVERY DC OUTPUT CABLE TO BATTERY TERMINAL FOR SAFETY REASONS.

Connection 2A: **Connecting 2-bank charger (M208E/M212E) to one independent 12V battery.**



CONNECT EVERY DC OUTPUT CABLE TO BATTERY TERMINAL FOR SAFETY REASONS.

Connection 2B: Connecting 2-bank charger (M208E/M212E) to two 12V batteries.

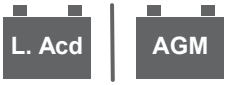


Note that each output bank is designed to be connected to one 12V battery directly. The batteries can be connected in series (24/36V), or parallel (to increase Ah capacity).

OPERATING THE CHARGER

1. Install the charger and make appropriate DC wiring connections.
2. Choose appropriate setting on the Battery Selector.
3. Plug in AC power cord to properly grounded outlet.
4. The Power indicator LED will display green, indicating the presence of AC power.
5. The charger will automatically start a new charge cycle.

Table 1. Battery Voltage Settings

	Charge Mode	Voltage (Absorption)	Voltage (Float)
	Flooded (Lead-Acid) / AGM	14.6V DC	13.5V DC
	GEL	14.1V DC	13.8V DC
	AGM+*	14.7V DC	13.6V DC

* AGM+ Mode is designed for charging High Power AGM batteries

LED INDICATOR DESCRIPTION

Icon	Indicator	Description
	**POWER**	**GREEN:** Power On
	**CHARGE STATUS:**	**RED:** Bulk / Absorption stage **GREEN:** Float stage

LED INDICATOR DESCRIPTION

Icon	Indicator	Description
	**OVER-VOLTAGE WARNING**	**ORANGE:** Voltage exceeds range
	**OVERHEAT WARNING**	**ORANGE:** Temperature exceeds range.
	**AGM+ CHARGE MODE**	**GREEN:** Charging in AGM+ mode
	**GEL CHARGE MODE**	**GREEN:** Charging in GEL mode
	**FLOODED(LEAD-ACID) / AGM CHARGE MODE**	**GREEN:** Charging in Flooded (Lead-Acid)/ AGM Mode

DANGER: ALWAYS DISCONNECT AC POWER CORD PRIOR TO MAKING ANY DC WIRING CONNECTION CHANGE OR CHECKING FUSE.

TROUBLESHOOTING

Problem	Possible Cause	Solution
Power indicator **GREEN** LED is not on.	No AC input.	Check AC input connection. Make sure AC power is present.
	Short circuit at DC output.	Check and correct battery wiring connection (Refer to wiring connection charts). Replace broken fuse if necessary.*
Overheat indicator LED displays **ORANGE**	Ambient temperature exceeds safe range.**	Remove any object obstructing airflow around the charger. If the charger was operated under direct sunlight, move it away from direct sunlight exposure. Wait for the charger to cool down. Charge will start when the ambient temperature drops to the safe range.
Over-Voltage indicator LED displays **ORANGE**	Battery voltage exceeds safe range.	Check and correct battery wiring connection. (Refer to wiring connection charts.) Make sure each output is connected to one 12V battery. Wait at least 30 seconds before plugging in AC power again. If Over-Voltage LED continues to display orange even with correct wiring connections, unplug the charger's AC power input and stop using the charger to avoid possible damage to the battery and/or connected devices.

* When replacing blown fuses, please replace with fuses of the same rating and size. Please contact Powermania for more information on the fuse ratings for each model.

** The operational ambient temperate range is -4°F~122°F (-20°C~50°C).

MAINTAINING THE CHARGER

The Powermania Turbo ME charger requires no specific maintenance. However, it is recommended to do the following to ensure reliable and optimal performance from your battery:

- Regularly clean battery terminals and charger's output ring terminals with baking soda and tighten all DC wiring connections.
- Regularly check and maintain proper battery electrolyte level following battery manufacturer's instructions.

It is recommended that you keep the charger's power on to maintain the connected batteries during long storage periods. This method has been proven to extend battery life.

WARRANTY AND SERVICE INFORMATION

Powermania, at its discretion, provides 2-year limited warranty on Turbo ME chargers against defects in material or workmanship under normal use. The warranty coverage period is calculated as follows:

- If customer provides a valid purchase receipt, the 2-year period is calculated from the date of purchase.
- If customer cannot provide a valid purchase receipt, the 2-year period is calculated from the manufacture date based on serial number.

The following conditions are NOT covered under warranty:

- Physical damage
- Normal wear and tear
- Damage caused by accidents, misuse, or alteration of the product including cutting or splicing AC/DC cables.

You may contact Powermania directly for service or warranty inquiry. Pllease note that Customer is responsible for paying the cost of shipping the defective product to Powermania.

CONTACT INFORMATION

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www.powermaniausa.com

POWERMANIA™ Product Registration Card

Register online at www.powermaniausa.com

Model number:

Serial number:

First & Last name:

Address:

City: State: Zip:

Email: Telephone:

Date of Purchase (mm/dd/yyyy):

Purchased from (Dealer):

Type of application:

Comments:

Place
Stamp
Here

Powermania, Inc.
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USA

POWERMANIA®

UNLEASH THE POWER

RWME1210 Rev A