



Maximum Power Point Tracking (MPPT)
Solar Charge Controller

AP20MT

USER MANUAL



Please read this manual carefully before installation, and retain it for future reference.

V1.2

ABOUT US

ATEM POWER, born in June 2017, as a synonym for exciting outdoor experience, is an Australian company with dedication and passion for the R&D of high quality products in the field of renewable energy products, batteries and related accessories.

Since the company was founded, we have committed to innovation that aims to make your life infinitely more convenient. And the belief in our conviction for quality and commitment allows us to innovate in developing products that are optimally tailored to the needs of our amazing customers.

We engineer and supply solar products for homes, 4x4s, recreational vehicles and virtually any application you can think of. And we also develop reliable, high performing deep-cycled batteries and lithium batteries for standby or daily power needs. Accessories include battery chargers and inverters that are ideal for RV's, commercial vehicles, boats, yachts and many more applications!

At ATEM POWER, we stay true to our DNA by prioritizing technological innovation designed to improve our products and striving to provide excellent customer care. Because we are motivated to explore the limits of solar power!

WARNINGS & SAFETY INSTRUCTIONS

General Safety Precautions

- This product is not intended for use by persons with reduced physical, sensory or mental capabilities, or lack of experience or knowledge. Children should be supervised to ensure that they do not play with the product.
- NEVER operate the product in a wet environment, or at sites where gas or dust explosions could occur.
- NEVER touch uninsulated cable ends, and use ONLY insulated tools.
- The installer must provide a means for cable strain relief to prevent the transmission of stress to the connections.
- The MPPT controller is ONLY designed to regulate solar panels.
- NEVER connect more than 1 load to the controller.
- DO NOT reverse the polarity of the battery connection to the MPPT controller. It is highly likely that the controller will be burned if it is connected to the solar panel with reverse battery connection.
- Please set the correct battery type the first time you use.
- All lead-acid batteries produce harmful, explosive gases. The battery should be mounted in a well-ventilated area, as far as possible from any ignition sources. DO NOT smoke or have a naked flame in the vicinity of the battery under charge.
- Keep the battery away from any metal objects which may cause a short circuit of the battery terminals.
- Ventilation is highly recommended when mounting the controller in an enclosure. Never install the controller in a sealed enclosure with flooded batteries! Battery gasses from flooded batteries might cause corrosion and destroy the controller circuits.
- Loose power connections and corroded wires may result in high heat that can melt wire insulation, burn surrounding materials, or even cause fire. Ensure tight connections and use cable clamps to secure cables and prevent them from unnecessary movement.

Battery Safety

- Please note that this controller is ONLY compatible with lead-acid, AGM, GEL, calcium or LiFePO4 batteries.
- Be cautious when working with lead acid batteries. Immediately rinse the affected area with running water and seek medical assistance if lead acid comes into contact with your eyes or skin.
- DO NOT connect any inverters or battery charger into the load terminal of the controller.
- Connect battery terminals to the controller BEFORE connecting the solar panel to the controller. NEVER connect solar panels to the controller until the battery is connected.
- DO NOT use the controller to charge non-rechargeable batteries. Doing so may result in harm to the user and/or damage the solar panel, battery and controller.
- Refer to the specifications provided by the manufacturer of the battery to ensure that the battery is suitable for use with this product. The battery manufacturer's safety instructions should always be observed.
- The controller will achieve optimal performance when proper battery maintenance is regularly performed.

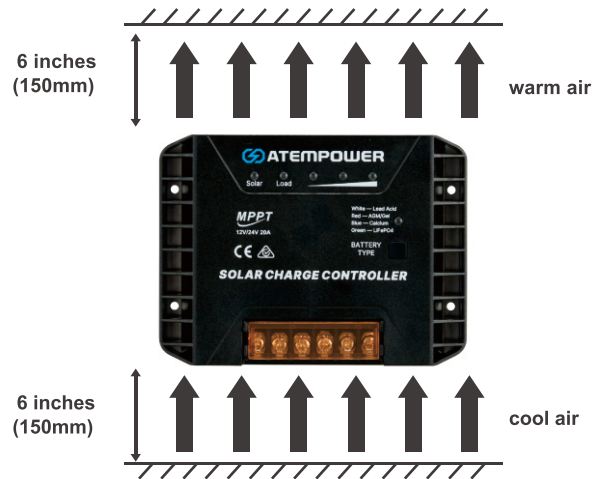
WHAT'S INCLUDED

- 1 PC(s) ATEM POWER 20A MPPT Controller
- 1 PC(s) User Manual

INSTALLATION INSTRUCTIONS

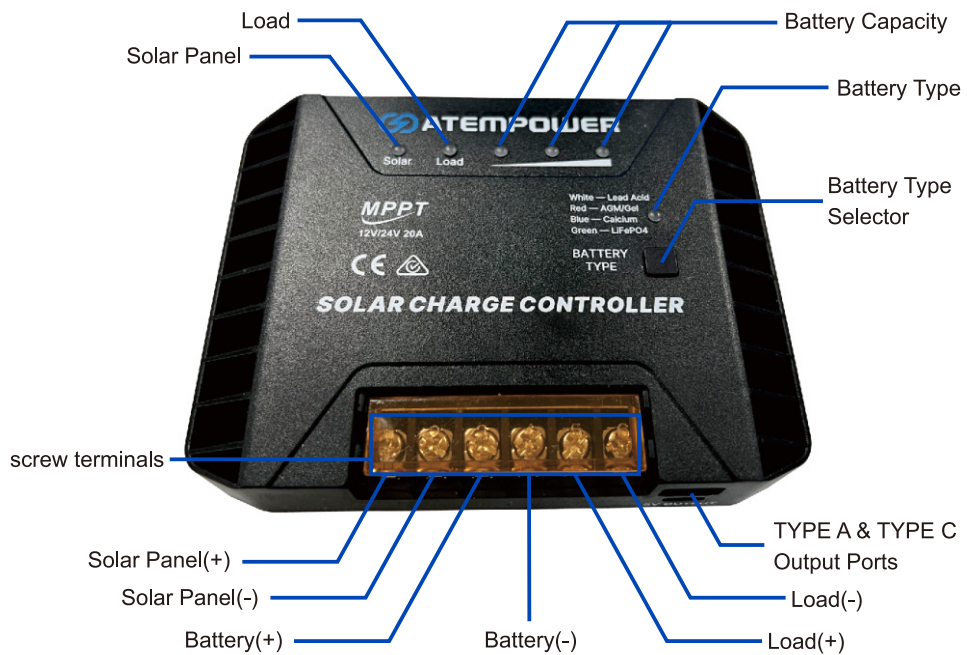
Mounting

1. Place the controller on a vertical surface protected from direct sunlight, high temperatures, and water and ensure there is good ventilation.
2. Ensure that there is sufficient room to run wires, as well as clearance above and below the controller for ventilation.
3. Mark Holes.
4. Drill Holes. Secure the controller.



OPERATION

Exterior Interface



Indication

Both the indicators of solar panel and load will illuminate Green when connected, and they will not illuminate when not connected correctly.

The three indicators of battery capacity will illuminate Red to indicate capacity.

The indicator of battery type will illuminate White for Lead Acid battery, Red for AGM/GEL battery, Blue for Calcium battery and Green for LiFePO4 battery.

Button Function

Press the button of battery type to select the battery accordingly.

Setup

1. Connect both positive and negative battery cables to their respective battery terminals on your controller.
2. Connect both positive and negative solar inputs to their respective battery terminals on your controller.
3. For load connection, connect both positive and negative cables to their respective battery terminals on your controller.

NOTE: It is recommended to have a fuse installed on battery positive wiring to prevent short circuits and potential damage to the controller or your vehicle.

Lithium Battery Activation

Lithium batteries typically require activation when their built-in battery protection has been breached due to overdischarging. The controller will constantly adjust its output voltage to initiate activation, after which it can resume normal charging. During activation, it's advisable to monitor the lithium battery's voltage using a multimeter.

Conditions for Lithium-ion battery activation:

If the battery voltage is not detected (<3V) when the user selects the 'LiFePO4' mode, the battery is considered to be in undervoltage protection mode and will be automatically activated. Note that during activation, the load connection to the battery must be disconnected and the battery polarity must be checked to ensure it is not reversed.

Steps:

1. Connect the lithium battery to the charge controller.
2. Connect the solar panel to the controller, and configure the battery type.
3. When in lithium battery mode, the charge controller automatically enables the activation function and supplies voltage to activate the battery.
4. If the voltage fails to increase, it may indicate that your battery is faulty. Please contact our customer service center for professional assistance.

Battery Voltage Parameters

Battery Type	Lead Acid	GEL/AGM	Calcium	LiFePO4
Maximum Voltage	14.4V	14.7V	15.4V	14.3V
Reconnect Charging Voltage	13.2V	13.2V	13.2V	13.2V
Under Voltage Warning Voltage	10.5V	10.7V	11.4V	10.4V
Under Voltage Reconnect Voltage	11.5V	11.7V	12.4V	11.4V
Over Voltage Protection	16.5V	16.7V	17.4V	16.4V

TECHNICAL SPECIFICATIONS

MODEL	AP20MT
Product Dimension	131*98*33mm
Battery Voltage Range	12V/24V
Max. PV Open Circuit Voltage	50V
Max. Solar Input Voltage	50V
Rated Charge Current	20A
Rated Discharge Current	20A
Max. PV Input Power	500W
Discharge Circuit Voltage Drop	≤0.3V
Self Consumption	≤8ma
No Load Current	< 10ma
Standby Curret Draw	≤4ma
Nominal Current Draw	≤10ma
USB Output	Type A+Type C; 5V/2.4A
Operation Temperature	-20°C~50°C
Storage Temperature	-30°C~70°C
Relative humidity	≤90%

MAINTENANCE AND CLEANING

To maintain the controllers performance it is recommended that the following maintenance be carried out.

- Ensure the controller is securely installed in a clean and dry ambient.
- Ensure there is no block on air-flow around the controller.
- Ensure the cooling fins are free of dirt, fragments, nesting insects or debris. If so, clear up in time.
- Ensure the controller is clean and periodically check the terminals to ensure they're clean before plugging in.
- Check for exposed wiring between solar panel and battery. Repair or replace some wires if necessary.
- Ensure all terminal screws are tight and that there is no corrosion on terminals and wiring.
- Confirm that all the system components are ground connected tightly and correctly.

FREQUENTLY ASKED QUESTIONS

Q: My controller is not operational.

A: For the controller to be operational it needs to be powered-up. The controller will power up if a battery and/or a solar supply is present. If the unit still does not power up please take the following steps.

- Visually check the solar chargers in case the solar charger has been damaged.
- Check for mechanical damage, burn marks or water damage.
- Inspect the battery terminals and the solar panel terminals for burn marks.
- Check if there is a burn smell (all very unlikely).

Q: My batteries are not charged.

A: Possible causes can be:

- Loose or missing battery cables.
- Loose cable connections, or badly crimped cable terminals.
- Missing or incorrectly wired battery cables.
- Incorrect settings.
- Incorrect polarities.
- The battery is full.

Q: My batteries are undercharged.

A: Possible causes can be:

- Too much DC load.
- Battery charge voltages are too low.
- The battery is almost full.
- Insufficient solar.

Q: My controller cannot reach its full rated output.

A: Possible causes can be:

- PV array too small.
- Temperature above 50°C.

Please be sure to let us know if you are still experiencing any issues on your side by contacting our customer center.



WARRANTY



ATEM POWER (“Manufacturer”) warrants, to the original purchaser, (“User”) that its MPPT solar charge controller, if purchased from Manufacturer or an authorized distributor or dealer, will be free of defects in material and/or workmanship under normal application, installation, use and service conditions from the date sold and for the duration (the “Warranty Period”) of 1 YEAR. Within the Warranty Period, subject to the exclusions listed below, the Manufacturer will replace or repair the MPPT solar charge controller, if the components in question are determined to be defective in material or workmanship. If the Manufacturer deems the MPPT solar charge controller to be not repairable, a new, similar controller will be offered, or a refund will be issued. This Limited Warranty is to the original purchaser of the MPPT solar charge controller and is not transferable to any other person or entity.

EXCLUSIONS:

This warranty does not cover defects that are caused by normal wear and tear, inadequate maintenance, transportation, storage or faulty repair, misuse, neglect, accident or failure to observe installation instructions or improper installation. It is recommended that the installation should be performed by suitably qualified technicians or the warranty will be voided. For further clarity, this warranty is also void if the MPPT solar charge controller:

- is used for applications other than which it was designed and intended for,
- is not properly installed in accordance with the user manual,
- is disassembled, altered, or repaired by someone other than an authorized Manufacturer's agent,
- has been subject to misuse, abuse or physical damage, or has been modified, altered,
- has been damaged by force majeure (e.g. overvoltage, storm, fire),
- selected by the user is not of the correct size and design for the intended application,

CLAIMS:

Request return authorization. No returns will be credited without an authorization. If an ATEM POWER product is suspected of being defective, you'll need to provide proof of purchase (e. g. a screenshot of the order) and a picture of the damaged goods in their entirety to service@atempower.com or the seller you purchased from for evaluation. In no event shall Manufacturer be liable for any loss or damages of any other kind, whether direct, incidental, consequential including lost profits, exemplary, special or otherwise, including any lost profits or removal, shipping, or installation expenses.

For more information, please visit: www.atempower.com