

e 360

EX-30ASC & EX-50ASC MPPT Solar Charge Controllers



USER MANUAL

MODEL EX-30ASC & EX-50ASC



Let's Get Started





Description

Your Expion360 Solar Charge Controller utilizes maximum power point tracking (MPPT) technology to optimize the energy captured from the sun. Solar charge controllers are essential to convert the energy from the solar panel(s) into energy that can be used to charge the batteries in your chosen energy storage solution. Our MPPT charge controller can increase solar charge utilization in excess of 30% more than pulse width modulation (PWM) charge controllers. This translates to faster charging times using the same solar panels and more energy to power your adventures!

This unit has many beneficial features to protect the charge controller and provide added utility for the users of our leading edge products. While our MPPT controllers are protected from damage due to excess internal temperature, we highly recommend installation in a well ventilated cabinet away from other devices that produce large amounts of heat. If the heatsink is unable to dissipate heat sufficiently, the charge controller will throttle the output current to your batteries. This is to protect the internal MPPT circuitry and prolong the lifespan of the unit.

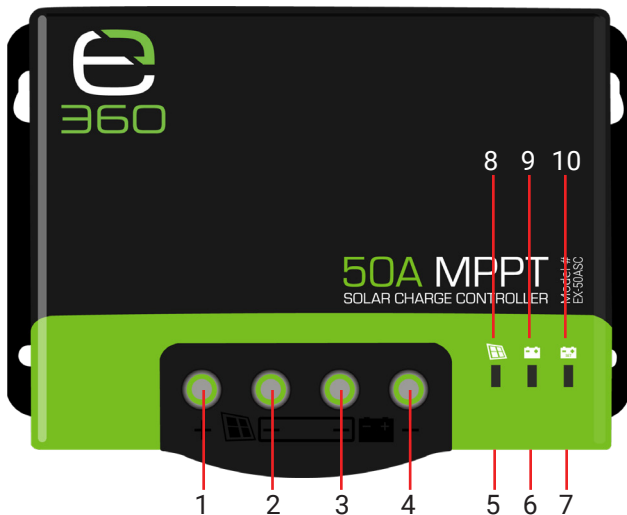
Use the Bluetooth app to connect your devices to the MPPT charge controller.

Thank you for choosing Expion360!

Safety Instructions

1. Please read the manual carefully before using the charge controller.
2. There are no parts inside the controller that can be maintained or repaired. The user will void the warranty if the controller is disassembled.
3. Install the controller indoors to prevent exposure of components and prevent water from entering the controller.
4. Please install the controller in a well ventilated area to prevent the heat sink from being overheated.
5. Protecting the charge controller with a fuse or circuit breaker is recommended.
6. Disconnect the PV input at the fuse or circuit breaker near the battery terminal prior to installation or adjusting any wiring at the controller.
7. To complete the installation process, confirm that all wiring connections are tight. Insufficient torque will lead to heat build-up at the terminal connection points and will damage the charge controller.

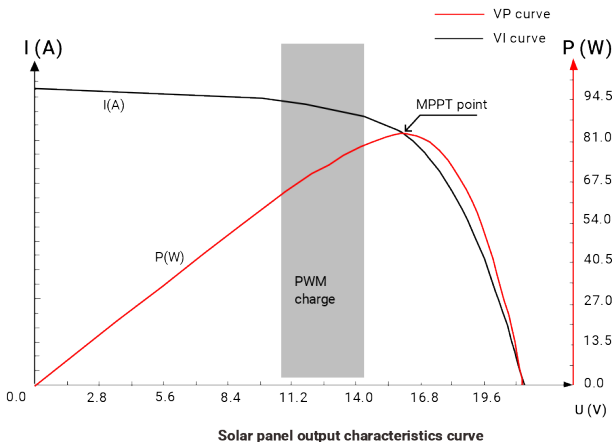
SOLAR CHARGE CONTROLLERS



1. Solar Panel (+)
2. Solar Panel (-)
3. Battery (-) Terminal
4. Battery (+) Terminal
5. External Temperature Sampling Port
6. Communications Port
7. Toggle Button
8. PV Input Indicator
9. Battery State
10. Battery Type

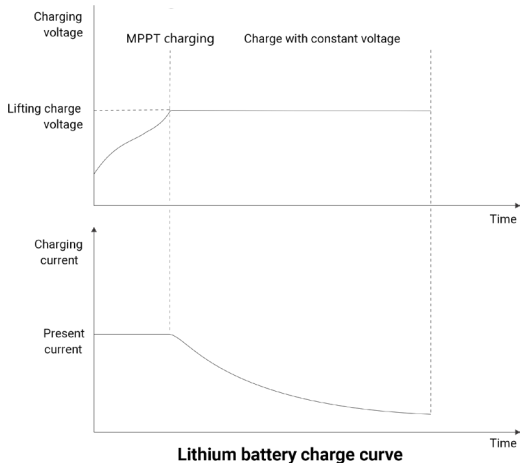
Product Features

- Maximum power point tracking (MPPT) technology with rapid response time, enabling higher efficiency up to 99.9%.
- Highly efficient internal conversion circuitry, offering up to 98% efficiency.
- Charging output has active voltage stabilization in the case of a sudden open circuit at the battery BMS controller.
- Thermal protection circuit will throttle performance when the ambient temperature surrounding the heat sink is high.
- Voltage compensation for charging line losses.
- Bluetooth connectivity for settings and live information.
- Parallel compatible with additional charge controllers, for added current handling.



Output Characteristics

The maximum power point for photovoltaics often change throughout the day due to fluctuating ambient temperature and light conditions. The MPPT controller can rapidly adjust controller parameters to keep the system at its maximum efficiency. This process is fully automatic and does not require any adjustments by users.



Lithium Charging Profile

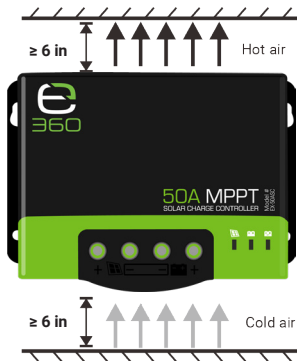
Charging your Expion360 lithium batteries with our MPPT solar charge controller is the optimal way to deliver energy. As the voltage of lithium batteries increases with additional charge from the charge controller, the MPPT technology is able to adjust the output current to maximize utilization of the solar power. Once the charge controller reaches the end of the constant current stage, the controller will automatically switch to constant voltage for the final stage of charging.

SOLAR CHARGE CONTROLLERS

WARNING: Danger, explosion hazard! Never install the controller and a vented battery in the same enclosed space! Also, do not install in an enclosed place where battery gas may collect.

WARNING: Danger, high voltage hazard! Photovoltaic arrays may generate very high, open-circuit voltages. Disconnect the circuit breaker or fuse before wiring and be very careful during wiring.

CAUTION: When installing the controller, ensure there is enough air to flow through the controller's heatsink, leaving at least 6 inches above and below the controller for natural convection. If installing the controller in a closed box, ensure reliable heat dissipation through the box.



Installation

Step 1: Choose an installation location

Avoid installing the controller in a location with direct sunlight, high temperature, and water, and ensure good ventilation around the controller.

Step 2: Mark the mounting position

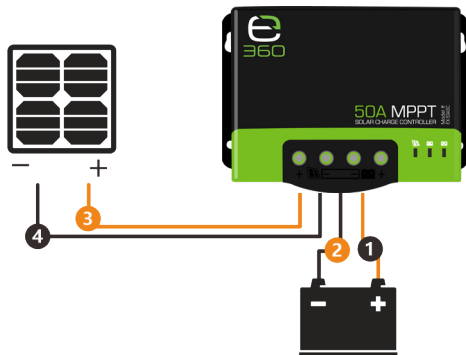
According to the mounting dimensions of the controller, drill 4 mounting holes of the appropriate size at the 4 marks. Fix screws into the upper two mounting holes.

Step 3: Fasten the controller

Hang the controller up, then fix the lower two screws.

Step 4: Wire for installation safety

We recommend the wiring sequence as illustrated below:



WARNING: Danger, electric shock hazard! We strongly recommend connecting a fuse or circuit breaker to the PV array and battery terminals to prevent electric shock hazards during wiring. Make sure the fuse or circuit breaker is disconnected before wiring.

SOLAR CHARGE CONTROLLERS

WARNING: Danger, high voltage hazard! Photovoltaic arrays may generate very high, open circuit voltages. Disconnect the circuit breaker or fuse before wiring and be very careful during wiring.

WARNING: Danger, explosion hazard! If the positive and negative terminals of the battery, and the wires connected to them, are short-circuited, it may cause a fire or explosion. Connect the battery first before connecting the solar panel. When wiring the controller, connect the (+) positive terminal first before connecting the (-) negative terminal. Please be very careful during installation.

LED Indicators



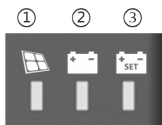
- ① PV Array Status
- ② Battery State
- ③ Battery Type

② Battery State Indicator	Charge State
Always on	MPPT charge
Slow flash	Absorption charge
Repeated flashing	Float charge
Quick flash	Equalization charge
Double quick flash	Current limiting charge
Off	No charge

② Battery State Color	Charge State
Green	Full battery voltage
Yellow	Normal battery voltage
Red, normal on	Battery voltage is below the undervoltage point
Red, slow flash	Over discharge
Red, quick flash	Battery overvoltage or over temperature

③ Battery Type	Charge State
Red	Flooded lead-acid
Yellow	Gel lead-acid
Green	Sealed lead-acid
Blue	12 V lithium
Purple	24 V lithium
White	User-defined custom

Led Indicators



① PV Array Status

② Battery State

③ Battery Type

Battery Type Selection

Press the button on the right side of the controller to toggle through the supported battery types. Press and hold the button for 8 seconds. The battery type indicator will start to flash and the controller will enter an idle state. Each button press advances the battery type to the next profile, and the LED color will update to indicate the current selection. After the preferred battery type is selected and ready to be saved, press and hold the button for 8 seconds, or do not press the button for 15 seconds. The controller will automatically save the current selection and will resume normal operating mode. To restore the factory default settings, press and hold the button for 20 seconds at any time.

Protection Features

Ingress protection

Rating: IP32

Input power limited protection

If the power of the solar panel is higher than the rated value, the controller will limit the power of solar panel to prevent over current damage. Controller enters current-limiting mode.

Battery reverse polarity protection

If the battery polarity is reversed, the system will not be operational.

PV input overvoltage protection

If the voltage at the PV array input is too high, the controller will automatically shut off the PV input.

PV input short circuit protection

If the voltage at the PV array input is short-circuited, the controller will turn off charging. Once the short circuit is removed, charging will automatically resume.

PV input reverse polarity protection

If the polarity of PV array is reversed, the controller will not be damaged. Normal operation will continue after wiring is corrected.

TVS lightning protection

If a lightning strike were to hit the PV array, the controller will protect the connected circuit from the high voltage spike.

Over-temperature protection

When the temperature of the controller becomes too warm, the controller will throttle the charging rate or stop charging.

System Maintenance

In order to maintain the best long-term performance of your charge controller, it is recommended to conduct the following inspections twice a year.

- Make sure the airflow around the controller is not obstructed. Remove any visible dust from the heat sink with a vacuum or compressed air.
- Verify that all exposed wires are undamaged due to friction with nearby objects, dry rot, destruction by insects or rodents, etc. These are common sources of unexpected damage to electrical devices. If any damaged wires are found, repair or replace the wires immediately.
- Check all wiring terminals for corrosion, insulation damage, signs of high temperature or burning/discoloration. Tighten terminal screws if there are signs of burning or discoloration after replacing the wire.

WARNING: Danger, electric shock hazard! Make sure that all power supplies to the controller have been disconnected before maintenance!

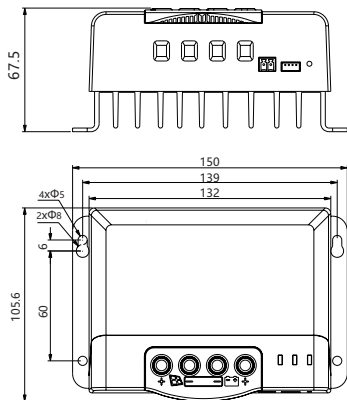
Notes



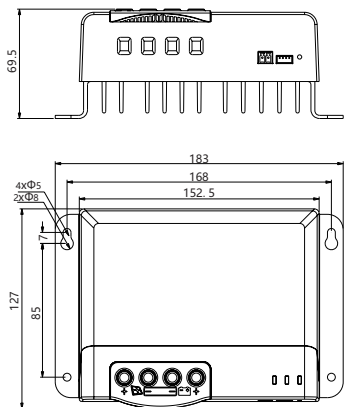
Technical Specifications

Model	MPPT 30 A	MPPT 50 A
System voltage	12 V / 24 V	12 V / 24 V
Zero load loss (parasitic draw)	< 10 mA	< 10 mA
Battery voltage	9 V - 32 V	9 V - 32 V
Max PV open-circuit voltage	92 V	92 V
Max PV input current	30 A	50 A
Rated charging current	30 A	50 A
Max output power	800 W (24 V)	1320 W (24 V)
Max power of PV input (12 V)	400 W	660 W
Max power of PV input (24 V)	800 W	1320 W
Charging conversion efficiency	≤ 98 %	≤ 98 %
MPPT tracking efficiency	> 99 %	> 99 %
Communications	TTL Modbus	TTL Modbus
Bluetooth	Wired Bluetooth remote	Wired Bluetooth remote
Internal temperature protection	Linear power reduction to protect controller	Linear power reduction to protect controller
Operating temperature range	-30 °F up to 150 °F (derate above 100 °F) -34 °C up to 65 °C (derate above 37 °C)	-30 °F up to 150 °F (derate above 100 °F) -34 °C up to 65 °C (derate above 37 °C)
Elevation	≤ 10000 ft (≤ 3,000 m)	≤ 10000 ft (≤ 3,000 m)
Protection grade	IP32	IP32
Weight	2.5 lb (1.1 kg)	3 lb (1.4 kg)
Max wire gauge at terminal connection block	8 AWG	6 AWG
Product dimensions	5.9 in x 4.2 in x 2.6 in (150 mm x 106 mm x 68 mm)	7.2 in x 5 in x 2.74 in (183 mm x 127 mm x 70 mm)

MPPT 30 A



MPPT 50 A





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