

Installation and Functions

FLEXmax Extreme

Included in Package

- FM Extreme-150VDC
- 2 x Mounting Bracket
- Silicone Grease Package
- 2 x Ferrite Clamp (install on HUB/DEVICE and RTS ports)

Provided by Customer

- PV Array
- Batteries
- MATE3
- Fan Kit
- Disconnect Devices
- Ground Fault Protection
- Wiring & Cabling

Dimensions

Height: 18.8" (47.1 cm); with fan 22.06" (56.0 cm)
 Width: 8.8" (22.4 cm)
 Depth to Wall: 6.0" (15.2 cm)

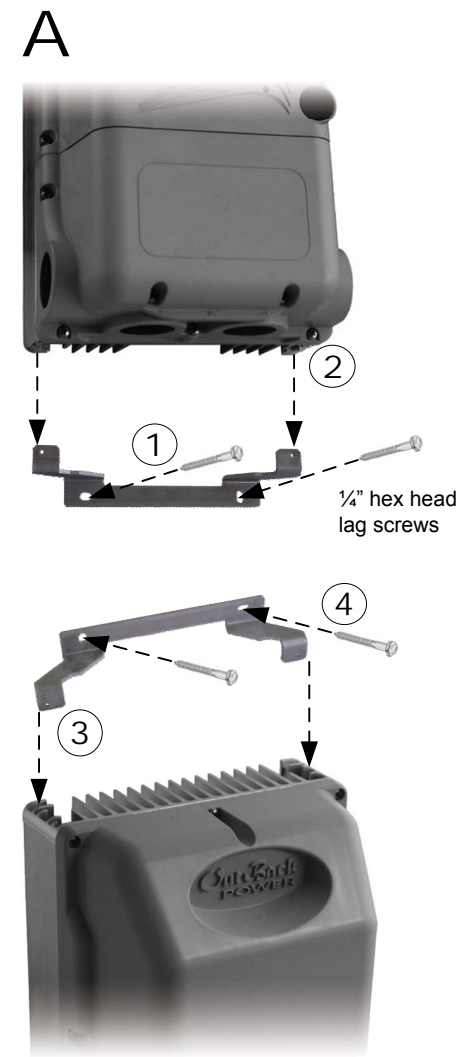
Mounting

The FLEXmax Extreme must be mounted upright at least 36" (91.4 cm) above the ground or floor. Installation in shade is recommended.

Conduit hubs must be connected to the conduit before connecting to the FLEXmax Extreme.

Clearance requirements are a minimum of 6" (15.2 cm) above and below the controller.

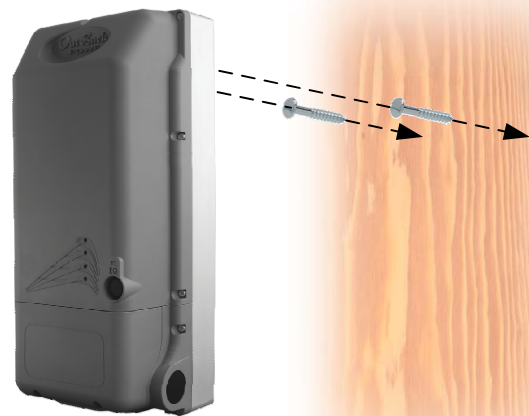
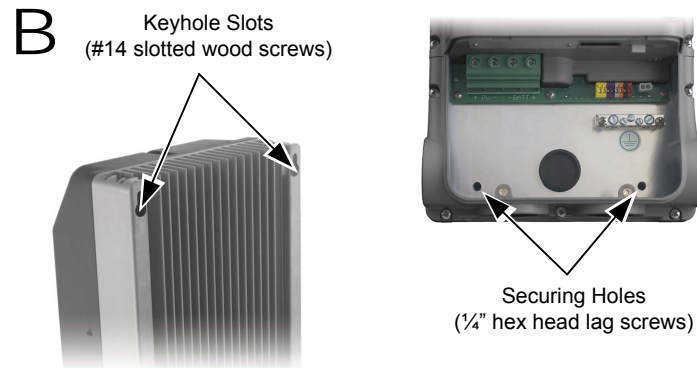
The unit can be mounted using either brackets (see A) or keyhole slots (see B) on a secure mounting surface.



Temperature

Range of ambient operating temperature: -20°C to 45°C (-4°F to 113°F)

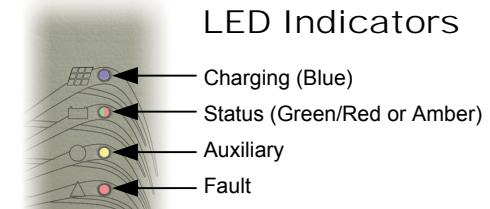
Unit output derated above 45°C (113°F)



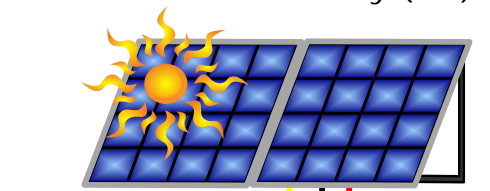
IMPORTANT: Example only. Actual wiring may vary. All configurations must comply with local and national electric codes. Consult your local electric authority to ensure compliance.

IMPORTANT: Wire sizes must comply with local and national codes. To comply with the NEC, input conductors and circuit breakers must be rated at 1.56 times the short-circuit current of the PV array.

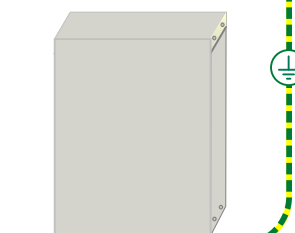
- Tighten all wire lugs and ground terminals to 4 Nm (35 in-lb) torque.
- Use copper wiring only (rated 90°C or higher).
- Refer to the NEC and other electrical codes for PV array cable sizing, length, and ampacity.
- Use #4 AWG (25 mm²) (minimum) for the controller output terminals to the batteries; output can accept up to #2 AWG (35 mm²).
- Negative-ground installation is depicted here; positive grounding is also permitted.



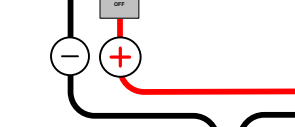
Photovoltaic Array (PV)



PV Combiner



PV Disconnect (external)

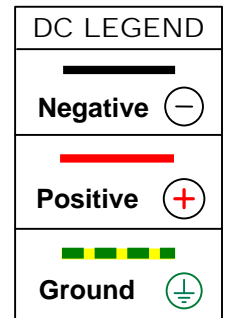


Charge Controller

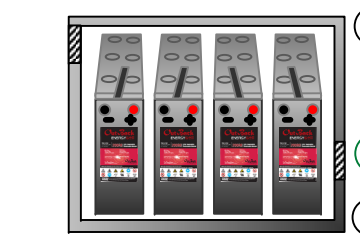


WARNING: Burn Hazard
 The heat sink can become hot when the charge controller is operating. Use caution when touching it during operation.

LED Indicators (see wiring section)								
Indicator		Controller State					Voltage	
Name	Color	Pattern	Bulk	Abs	Float	EQ		Other
Charge	Off	Off	N/A				< 10 W PV available	Battery rest
	Blue	Solid	X			X		
	Blue	Flash long		X				
Status	Blue	Flash short			X			Float
	Amber	Solid	X	X				≥ 1.91 Vpc
	Green	Solid			X			
	Red	Solid	X	X			Battery discharge	<1.91 Vpc
	Red	Flash	X	X			Critical batt discharge	<1.75 Vpc
	Amber/ Green	Flash				X		≤ EQ
AUX	Yellow	Solid	Any				AUX active	
Fault	Red	Solid	N/A				External Fault	

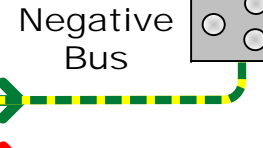


Battery Bank



Battery Nominal Voltages: 12-volt, 24-volt, 36-volt, 48-volt, 60-volt

Negative Bus



Ground Bus



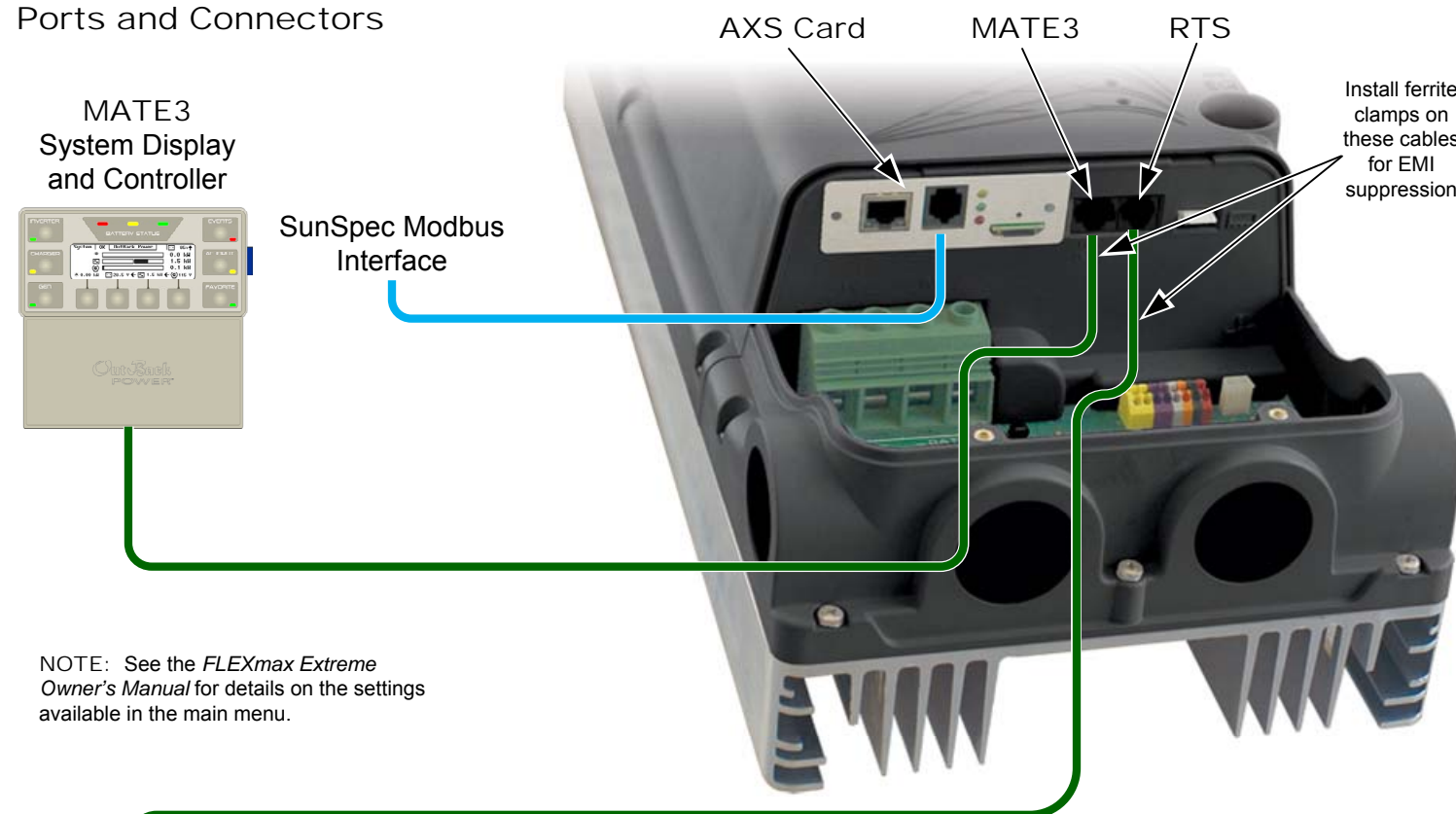
Battery Disconnect (external)



NOTE: Overcurrent protection for the battery circuit is to be provided by installer.

Ground Fault Protection (not provided, required by Article 690 of NEC)

Ports and Connectors



NOTE: See the *FLEXmax Extreme Owner's Manual* for details on the settings available in the main menu.

Remote Temperature Sensor (RTS)

Battery performance changes when the temperature varies above or below room temperature (77°F or 25°C). Temperature compensation is a process that adjusts charging to correct for these changes. If not compensated, a battery may remain undercharged in cold temperatures and may become overcharged when hot. Below room temperature, the charging set points are raised above their normal values. Above room temperature the set points are lowered.

The RTS is attached to a single battery near the center of the bank. When charging, the RTS will increase or decrease the charge voltage by a certain voltage per degree Celsius per battery cell.

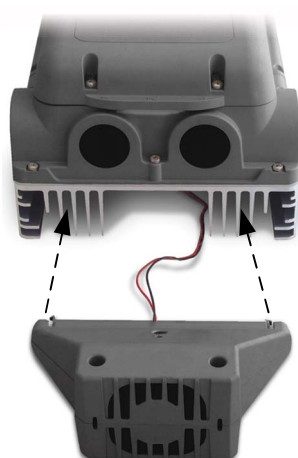
The compensation value (the "slope") is adjustable from 2 mV to 6 mV. Most batteries use a value of 5 mV.

This setting affects the **Absorbing** and **Float** set points. Equalization is not compensated in the FLEXmax Extreme.

Total compensation is determined by measuring the number of degrees C above or below 25. This number is multiplied by the number of 2-volt battery cells and the slope value.

Examples of Compensation					
Cells (Volts)	Slope Value	Temp	25°C ±	Calculation	Vdc Adjust
6 (12V)	5 mV	8°C	-17	$6 \times 0.005 \times 17$	+0.5 Vdc
12 (24V)	3 mV	36°C	+11	$12 \times 0.003 \times 11$	-0.4 Vdc
18 (36V)	5 mV	26°C	+1	$18 \times 0.005 \times 1$	-0.1 Vdc
24 (48V)	6 mV	0°C	-25	$24 \times 0.006 \times 25$	+3.6 Vdc
30 (60V)	2 mV	37°C	+12	$30 \times 0.002 \times 12$	-0.7 Vdc

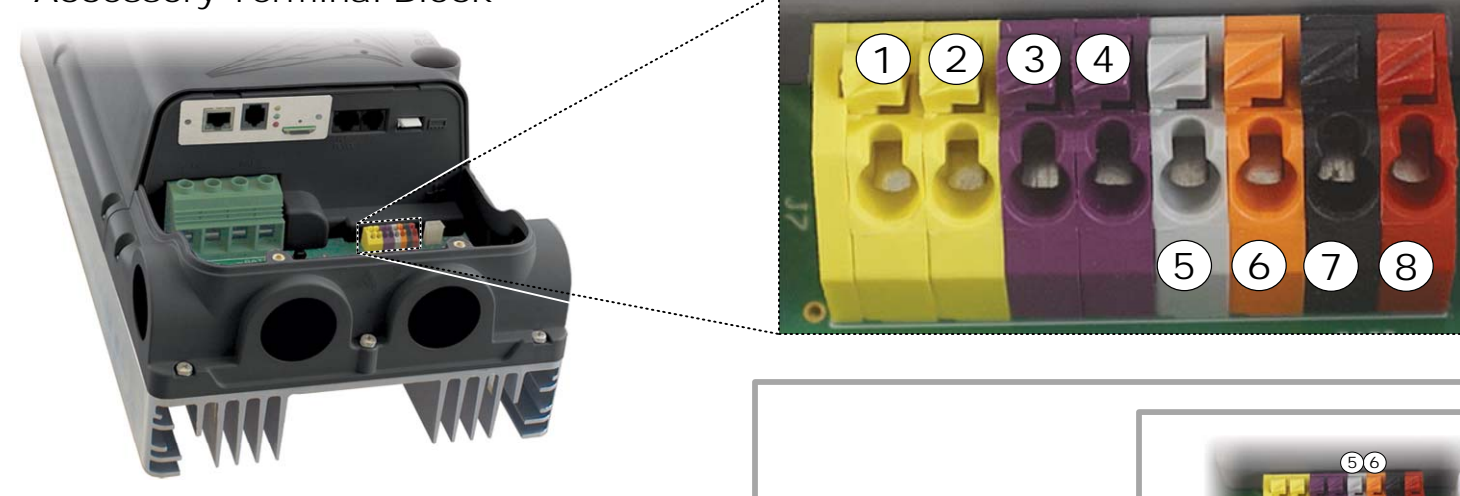
Fan Mounting



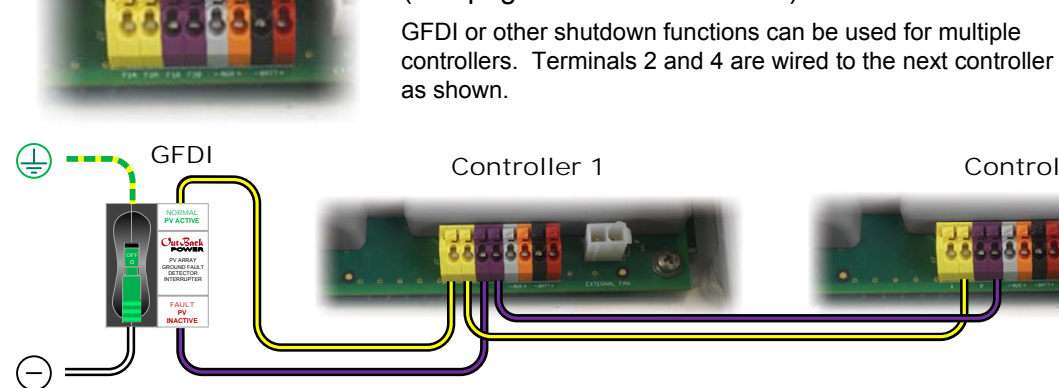
Fan Wiring



Accessory Terminal Block



External Fault Terminals (see page 1 for GFDI function)

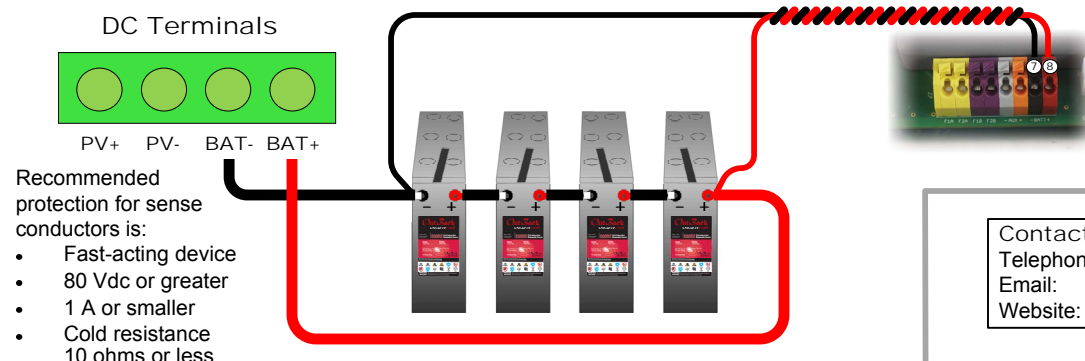


Auxiliary (AUX) Terminals

Used for diversion control and other functions

Battery Sense Terminals

These terminals monitor battery voltage more accurately than the main cable connections. A twisted-pair cable is recommended. The connections are made directly on the battery terminals. NOTE: Overcurrent protection devices are not shown.



IMPORTANT:
Not intended for use with life support equipment.

Contact Technical Support:
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