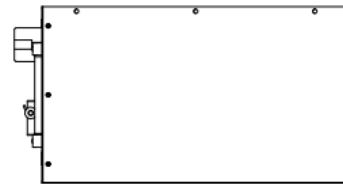
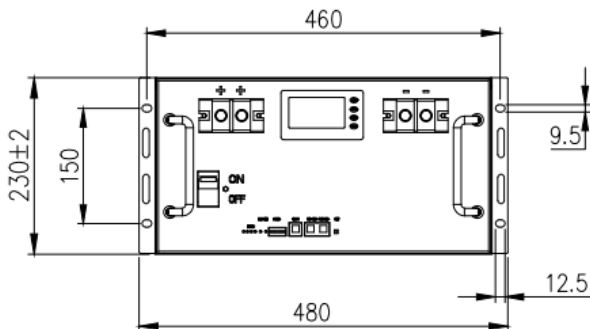
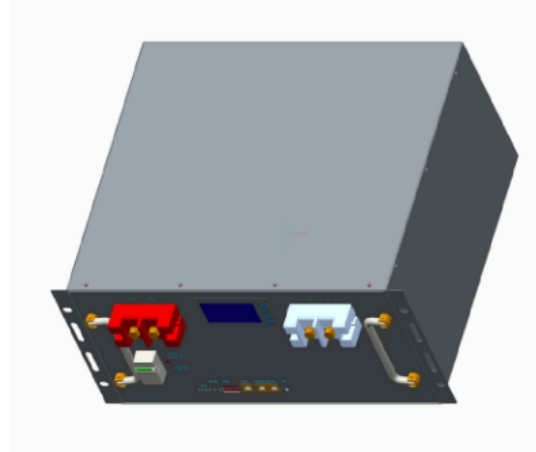
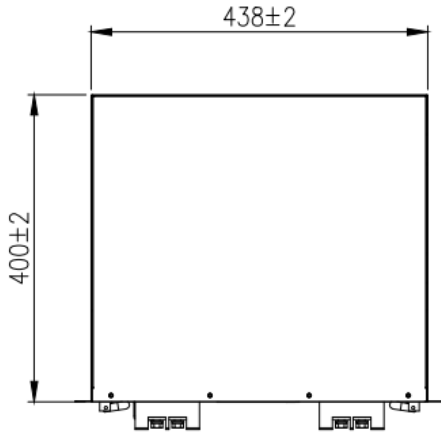


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1. 48V100E-1 Battery Dimensions in millimeters



If you need guidance, assistance, or have a question, you may call us at 803-380-6211. Emergency Support is available 24/7. Non-emergency support is available 8 am to 9 pm Eastern Time.

Press the On/Off/Reset button briefly to start the BMS and thus start the battery. This recessed button is labeled RST. Do not hold the button down over 14 seconds, unless directed to do so.

The battery ships with the battery off. Please use the White Plastic Reset Tool, attached to the left handle of the battery to start the battery. Press briefly, using the tool, on the recessed Reset (RST) switch. The circuit breaker has to be on to charge or discharge the battery.

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The recommended cable lug size is 5/16". If using a busbar, equal length pure copper 2/0 AWG battery cables with 5/16" lugs are recommended.

For higher power battery banks, with four or more batteries in parallel, the battery cables from the busbars to the interter(s) can be 4/0 AWG with 5/16" cable lugs. www.batterycablesusa.com offers high-quality battery cables custom built to your specifications.

The Battery and BMS start on Standby, not charging or discharging. When the BMS is in Standby, the Run LED flashes slowly, indicating the battery can be charged and discharged.

The Run LED flashes while discharging, and is on solid when charging.

Our 48V100E battery may be stacked two high. The steel case is strong enough to support the weight of one additional battery. Do not stack more than two high without a shelf or other support structure. Damage from over-stacking is not covered by our warranty.

The following protection features are included in the battery

2.2. Over-charge protection and recovery

2.3. Over-discharge protection and recovery

2.4. Charge over-voltage protection and recovery

2.5. Discharge over-current protection and recovery

2.6. Over-Temperature protection and recovery

2.7. High-temperature protection and recovery during charging and discharging

2.8. If the temperature approaches freezing, the charging current is diverted to the 100 Watt internal heaters. The heaters will raise the battery's internal temperature; charging resumes when the battery reaches a safe temperature.

2.9. Automatic Cell Balancing

The BMS precisely monitors each battery cell carefully. If out of balance, then automatic cell balancing is performed.

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2.10. Power On and Off

Item Number	Features	Definition
1	<p style="text-align: center;">Start / Power Up</p> <p style="text-align: center;">Using the “Reset” Switch</p>	<p>If the BMS is in the Off/Sleep/Hibernation State, Press the On/Off/Reset Button (labeled “Reset”).</p> <p>The Reset switch is recessed for safety. Use the white plastic reset tool to <u>press the button gently</u>, but do not use knives or other sharp objects. (The warranty does not cover physical damage to the recessed Reset Button.)</p> <p>When the Reset button is pressed briefly, the BMS starts, the LED’s light in sequence, and the BMS and battery are fully operational.</p> <p>If the battery is not being charged or discharged, then the battery is in Hibernation, ready to be charged or discharged.</p>
2	<p style="text-align: center;">Turn Off / Hibernate</p>	<p>When BMS is in Standby or is discharging, gently hold down the Reset button for 3 seconds.</p> <p>The BMS will enter a Hibernation state to save power. The LEDs will flash in sequence, then go off to indicate that the battery is dormant and not wasting battery power.</p> <p>The BMS consumes almost no power during Hibernation.</p>

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2.10. Short-circuit protection

The BMS detects and protects the battery from short circuits.

The Circuit Breaker also protects against short circuits.

Thus, there is double protection against excessive current draw.

2.11. LED Indicators

The battery has 6 LED indicators:

4 Green LED's, labeled SOC, for the battery state of charge,

1 Red LED, labeled ALM for "Alarm", indicates when a battery fault is detected, and the protection circuits are enabled,

1 Green LED, labeled Run, indicates the battery is in a normal operational condition, in Standby, Charging, or Discharging states.

2.12. Hibernation Function

The BMS features manual and automatic Hibernation. When 48 hours have occurred without charging or discharging, Hibernation Mode is activated. This mode helps preserve the battery's charge. Still, it is good practice to charge batteries every three months to a 50% state of charge.

When entering Hibernation Mode, or when the battery protection circuits are activated, the communication with the inverter(s) continues for 1 minute.

Hibernation Mode can be enabled by gently pressing and holding the Reset button for 6 seconds. When this mode is activated, the LEDs will flash in sequence, then turn off.

You may connect a computer to the battery. We call this computer the host computer. You may use the computer, with appropriate software, to enter Hibernation Mode.

2.13. On/Off/Reset Switch

The On/Off/Reset Switch is labeled "Reset".

When the Battery and BMS are being operated from the host computer, the On/Off/Reset

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switch on the battery is inoperative. The host computer has complete control.

Note that the host computer must select one battery out of multiple batteries connected in parallel, even if just one battery is connected.

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2.14. CAN Port and Two RS-485 Ports

The battery and BMS support communications with inverters and identical model batteries connected in parallel with appropriate cables.

The CAN port can communicate with inverters that use the CAN interface. Various protocols are supported. If an inverter supports CAN communications, typically, one of the following protocols is used.

Trophy Battery - Inverter Communications		
Inverter Brand	Protocol Name	Communication Method
Goodwe	V1.5	CAN
PYLONTECH	CAN-Bus-protocol PYLON-v1.3	CAN
Growatt	Growatt BMS CAN-Bus-Protocol low-voltage-V1.05 English version	CAN
	Growatt Protocol (RS-485)	RS-485
Victron/ Voltronic	Canbus BMS Protocol	CAN
	Voltronic Inverter and BMS RS-485 Communication Protocol	RS-485
LXP	Luxpowertek Battery CAN Protocol	RS-485
Sofar	CAN Rev 5	CAN
Deye/ Sol Ark	Use PYLONTECH Protocol	CAN
Others	Use PYLONTECH Protocol	CAN or RS-485
If you have other needs, please get in touch with us		

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When connecting to a host computer, one of the RS-485 ports is typically used.

When connecting multiple identical batteries in parallel, connect using RS-485 Ports.

The proper cable is a straight-through 8P8C network cable. This is a common CAT5e Ethernet cable.

The host computer, a PC, can monitor the battery, including the status of individual cells, operate the battery, and change the programmable BMS parameters.

For CAN Communications to certain Growatt Inverters, use a straight-through Ethernet cable, plugged in the CAN Port on the battery and the BMS Communications port on the inverter.

We have tested this with the Growatt SPF5000ES Inverter. Other Growatt inverters may have the same menu structure and the same underlying technology.

Set Menu Item 5 = Li

Set Menu Item 36 = 51

For Victron equipment, you may use the Cerbo GX communication port for communications. Other Victron "GX" equipment may not require the separate Cerbo GX communications hub.

CAN Communications is at 500,000 bps.

2.15. Battery Addressing

Each battery has an 8-Bit address switch. When batteries are connected in parallel, the address switched must be manually set on the front panel to an appropriate, sequential address.

This enables each battery and the host computer to communicate with individual batteries in parallel.

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Fifth Battery	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Sixth Battery	Up (On)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Seventh Battery	Down (Off)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Eighth Battery	Up (On)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Ninth Battery	Down (Off)	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)

Ten Batteries								
Master	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Up (On)
Second Battery	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Third Battery	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Fourth Battery	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Fifth Battery	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Sixth Battery	Up (On)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Seventh Battery	Down (Off)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Eighth Battery	Up (On)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Ninth Battery	Down (Off)	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Tenth Battery	Up (On)	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)

Eleven Batteries								
Master	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Up (On)	Down (Off)	Up (On)

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Second Battery	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Third Battery	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Fourth Battery	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Fifth Battery	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Sixth Battery	Up (On)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Seventh Battery	Down (Off)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Eighth Battery	Up (On)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Ninth Battery	Down (Off)	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Tenth Battery	Up (On)	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Eleventh Battery	Down (Off)	Up (On)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)

Twelve Batteries								
Master	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Up (On)	Up (On)	Down (Off)	Up (On)
Second Battery	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Third Battery	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Fourth Battery	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Fifth Battery	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Sixth Battery	Up (On)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Seventh Battery	Down (Off)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Eighth Battery	Up (On)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)

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Ninth Battery	Down (Off)	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Tenth Battery	Up (On)	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Eleventh Battery	Down (Off)	Up (On)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Twelfth Batteries	Up (On)	Up (On)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)

Thirteen Batteries								
Master	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Up (On)	Up (On)
Second Battery	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Third Battery	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Fourth Battery	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Fifth Battery	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Sixth Battery	Up (On)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Seventh Battery	Down (Off)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Eighth Battery	Up (On)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Ninth Battery	Down (Off)	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Tenth Battery	Up (On)	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Eleventh Battery	Down (Off)	Up (On)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Twelfth Battery	Up (On)	Up (On)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Thirteenth Battery	Down (Off)	Down (Off)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)

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Fourth Battery	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Fifth Battery	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Sixth Battery	Up (On)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Seventh Battery	Down (Off)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Eighth Battery	Up (On)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Ninth Battery	Down (Off)	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Tenth Battery	Up (On)	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Eleventh Battery	Down (Off)	Up (On)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Twelfth Battery	Up (On)	Up (On)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Thirteenth Battery	Down (Off)	Down (Off)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Fourteenth Battery	Up (On)	Down (Off)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Fifteenth Battery	Down (Off)	Up (On)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)

Sixteen Batteries								
Master	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Up (On)	Up (On)	Up (On)	Up (On)
Second Battery	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Third Battery	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Fourth Battery	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Fifth Battery	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Sixth Battery	Up (On)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)

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Seventh Battery	Down (Off)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Eighth Battery	Up (On)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Ninth Battery	Down (Off)	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Tenth Battery	Up (On)	Down (Off)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Eleventh Battery	Down (Off)	Up (On)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Twelfth Battery	Up (On)	Up (On)	Down (Off)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Thirteenth Battery	Down (Off)	Down (Off)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Fourteenth Battery	Up (On)	Down (Off)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Fifteenth Battery	Down (Off)	Up (On)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)
Sixteenth Battery	Up (On)	Up (On)	Up (On)	Up (On)	Down (Off)	Down (Off)	Down (Off)	Down (Off)

Front Panel Address Switch - Binary Address Scheme								
	Battery Address (0 to 15) Master or Only Battery = 0				Number of Additional Batteries (0 to 15)			
Binary Battery Address (0 to 15)	1	2	4	8				
Binary Number of Additional Batteries					1	2	4	8

2.16 Connecting Multiple Batteries in Parallel

Up to 16 identical models of Trophy Batteries may be connected to create a very powerful battery system.

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When connecting batteries in parallel, it is necessary to establish communications among the batteries. You also need to connect the battery outputs, which we cover in another section.

The first battery is considered the Master. It will communicate with the other batteries via RS-485 communications.

You need an 8P8C network cable which must be a straight-thru cable and not a network cable where the signals cross within the cable.

8P8C and RJ45 are typically interchangeable.

A straight-thru cable is such that the connections are to the same Pin at both ends of the cable. (Pin 1 to 1, Pin 2 to 2, etc.)

Here is an appropriate cable to use.

The following is a Monoprice cable, part number 5899. You may select 1 foot or longer cables. We recommend 3 foot long cables if you place multiple batteries side by side.

[Monoprice Cat6A Ethernet Patch Cable - Snagless RJ45, Stranded, 550MHz, STP, Pure Bare Copper Wire, 10G, 26AWG, 3ft, Blue - Monoprice.com](https://www.monoprice.com/products/product.asp?trq=cat6a&trq=ethernet&trq=patch&trq=cable&trq=snagless&trq=rj45&trq=stranded&trq=550mhz&trq=stp&trq=pure&trq=bare&trq=copper&trq>wire&trq=10g&trq=26awg&trq=3ft&trq=blue&trq=monoprice.com)

Each battery has two RS-485 Ports. You may plug the cable into either of the RS-485 ports. Do not use the CAN Port for connecting multiple batteries.

There are two RS-485 ports on each battery.

2.17 Communicating with Inverters.

Trophy Batteries can communicate with many types of inverters.

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The inverter may use RS-485 or CAN communications. Using the same type of cable listed above, but possibly in a longer length, connect the cable to the RS-485 or the CAN port, as appropriate, and plug the other end to the port on your inverter.

When ordering cables, be sure to obtain one for your inverter if it supports communications with your batteries.

2.18 Connecting Power Cables

It is essential to use appropriately sized battery cables to connect one battery to your inverter or multiple batteries to one or more inverters. The power cables must be an appropriate size to carry the current your inverters will draw.

We recommend using 2/0 cables with 5/16" UL Listed Copper Lugs for connecting the batteries to a busbar or distribution block, or if you have only one battery, to your inverter or Lithium Ferrous Phosphate battery charger.

If you expect to draw high current, over 150 Amps from a bank of batteries, use 4/0 AWG copper cables from your busbars to your inverter using 5/16" UL Listed Copper Lugs.

We currently recommend using www.batterycablesusa.com for custom length battery cables. They build quality cables to order using true copper cables.

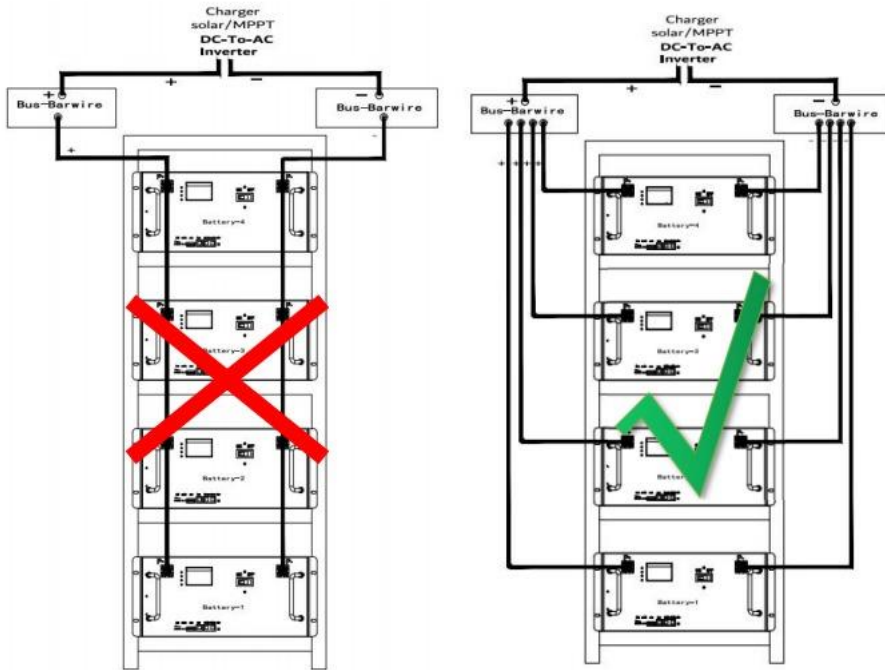
When using multiple batteries in parallel using busbars, use equal-length cables running to two busbars, or power distribution blocks, one for negative voltages and one for positive. Then connect your inverter(s) to the busbars. All negatives must be connected together; all positives must be connected together.

You may connect batteries in parallel without using busbars. Please call us at 803-380-6211 so we may advise you personally. Our advice will be custom tailored to your situation.

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Never put the batteries in series by connecting negative to positive.

Note: These drawings do not show equal length cables, but be certain to use only equal length cables.



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2.19 Soft Start - Pre-charge function

The Soft Start/Pre-charge function protects your inverter(s)'s capacitors.

Without this function, the high current capabilities of the battery could destroy capacitors or circuits in inverters. The inrush current could burn out the capacitors or the wires or circuit traces leading to the capacitors.

The Soft Start/Pre-charge function limits the amount of in-rush current to your inverter. This function is automatically enabled when the battery is first powered up (with the Circuit Breaker on).

Note that the battery must be in a full power off state for the pre-charge function to operate. The Run Light must not be flashing, or on solid, all LED's and the LCD display must be off.

To enable this function, first power off your battery, then turn off the circuit breakers on all other batteries, if you are running multiple batteries in parallel, then with your inverters powered off and disconnected from your electrical load (AC Output Circuit Breakers off), power on your battery using the Reset Button. If your inverter does not turn on automatically, then turn it on manually after 30 seconds.

Then, if you are running multiple batteries in parallel, turn on the other batteries and turn on the circuit breakers on the batteries.

When your inverters are powered, up, and all of your batteries are powered up, you may turn on the AC Circuit Breakers when it is safe to do so.

Soft-Start/Pre-charge sends limited power to the inverters for a few seconds to charge your capacitors slowly.

2.20. Charging Current Protections

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The charging flow limit is divided into two modes: Active Flow Restriction and Passive Flow Restriction. This is an automatic function that protects your battery from excessive current during charging.

1. **Passive Flow Limit:** This is the normal condition. When the battery is being charged, the BMS allows up to the maximum charging current to flow into the battery. If the maximum charging current value is exceeded, set at the factory to 100 Amps, then the charging current is limited to the Active Flow Limit, typically ten amps.
2. **Active Flow Limit:** When the battery is being charged, and the Active Flow Limit is enabled due to an excessive charging current, the BMS limits the charging current to 10 Amps to protect the battery. This occurs when the charging current exceeds the maximum current limit.

If the Active Flow Limit is enabled, then after 5 minutes, the current is again checked, and if it does not exceed the maximum charging current, then the Active Flow Limit is disabled, and regular charging resumes.

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3. LED Indicators

3.1. Six LED Indicators

The Green Run LED indicates that the battery is in the normal operational mode.

The Red ALM (Alarm) indicates that a fault has occurred.

The Four Green SOC (State of Charge) LED's indicate the current state of charge of the battery.



3.2. LED State of Charge Indicators

LED		Charging				Discharge			
State of Charge LED's		L4●	L3●	L2●	L1●	L4●	L3●	L2●	L1●
	0~25%	Off	Off	Off	Flashing	Off	Off	Off	On
	25~50%	Off	Off	Flashing	On	Off	Off	On	On
	50~75%	Off	Flashing	On	On	Off	On	On	On
	≥75%	Flashing	On	On	On	On	On	On	On
Run LED ●		On				Flashes			

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3.3. LED Flash Modes

Flash mode	LED On Time In Seconds	LED Off Time In Seconds
Flash 1	1/4	3 3/4
Flash 2	1/2	1/2
Flash 3	1/2	1 1/2

3.4. System Mode Indicators

System Status	Run Status	RUN	ALM	SOC				Description
		●	●	●	●	●	●	
Off	Power Save	Off	Off	Off	Off	Off	Off	Battery is in Hibernation Mode
Standby	Normal	Varies	Off	Off	Off	Off	Off	Standby Mode
Charging	Normal	On	Off	According to the current state of charge				Maximum LED Flash 2
	Over-Current	On	Flash 2	According to the current state of charge				Maximum LED Flash 2
	Over-voltage protection	Flash 1	Off	Off	Off	Off	Off	
	Over-Temperature protection	Flash 1	Off	Off	Off	Off	Off	
Discharging	Normal	Flash 3	Off	According to the current state of charge				Normal Discharge
	Over-Current Discharge	Flash 3	Flash 3					Excessive Current Draw
	Over-Temperature	Off	On	Off	Off	Off	Off	Battery Discharge Stops

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4. 48V100E-1 Battery System Parameters

48V100E-1 Battery			Battery Parameters
Single Battery Cell	1	Battery Cell Model	EVE Energy 105 AH Cells
	2	Battery Chemistry	Lithium Iron Phosphate + Graphite
	3	Rated Voltage (V)	3.2 Volts per Cell Nominal
	4	Rated Capacity (AH)	105 Amp-Hours, Initial Capacity 110 Amp-Hours
	5	Size (mm) per Battery Cell	36.7*130.3*200.5mm
	6	Weight (Kg) per Battery Cell	2.0 Kg
Battery System	1	Battery Model	48V100E-1
	2	Battery Applications	Numerous
	3	Battery System Capabilities	Up to 16 identical model batteries may be connected in parallel. Batteries must not be connected in series.
	4	Cooling Mode	Natural Cooling
	5	Rated Voltage (V)	51.2 Volts (Nominal)
	6	Rated Capacity (AH)	100 Amp-Hours
	7	Rated Energy (WH)	5,120 Watt-Hours
	8	Charge and Discharge Terminals	The same battery terminals are used for charging and discharging
	9	Communication Ports	Two RS-485 (19,200 bps) and One CAN (500,000 bps)
	10	Display	LCD Display with controls
	11	Maximum Batteries in Parallel	16 Batteries must not be connected in series.
	12	System Charging Voltage	56.0, 56.4, or 56.8 Volts
		Absorption Voltage	Same as Above
Float Voltage		54.0 Volts	
System Charging Termination		56.8 Volts	
13	Normal Full Charged Voltage	53.7 Volts	
13	System Discharge Termination	43.2 Volts	

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14	Single-Cell Charging Alarm Single-Cell Protection Voltage	3.500 Volts (Alarm) 3.650 Volts (Protection)
15	Single-Cell Discharge Alarm and Protection Voltage	2.900 Volts (Alarm) 2.700 Volts (Protection)
16	Cell Charging Operating Temperature Range	-0~45 °C
17	Discharge Operating Temperature Range	-10~50 °C
18	Continuous Charging Current (A)	100 Amps
20	Continuous Discharge Current (A)	100 Amps
21	Discharge Protection (Overcurrent)	110 Amps
22	Battery Cycle Life	<p>Cycle Life, under Torture Test conditions, is greater than 3500 Cycles with capacity retention greater or equal to 80%. Normal Operational Cycle Life is much higher.</p> <p>The Individual Cell Cycle Life Torture Test conditions exceed what can occur when using the battery. These Torture Tests are run without our BMS protecting the cells.</p> <p>Our Battery's BMS prevents these extreme conditions, protecting the battery cells and extending the life of the battery.</p> <p>The Cycle Life Torture Test procedure is: Cell charged at 105 amps to 100% State of Charge, then Cell is allowed to rest for 30 minutes, then discharged at 105 amps to 0% State of Charge (2.5V cell voltage). Then repeated until battery capacity is 80% of the rated capacity.</p> <p>In normal operation, our battery's BMS prevents charging to 100%, discharging to 0%, charging at 105 Amps and discharging at 105 Amps.</p>

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		<p>A far greater Cycle Life is achieved when limiting the depth of discharge on a routine basis, and not charging to 100%.</p> <p>Limiting the charge and discharge currents to 80 Amps or less also extends the life of the battery.</p> <p>When multiple batteries are used in parallel, much higher charge and discharge currents are allowed.</p> <p>Battery Cycle Life is greatly improved by charging and discharging at less than 80 amps, and routinely avoiding discharges to below 20% state-of-charge.</p> <p>Routinely limiting discharges to higher states of charge, such as to 50%, or higher, improves the cycle life of the battery.</p>
23	Battery Case Size (width x height x depth) (mm)	(480±2)×(400±2)×(230±2) mm
24	Battery Case Weight	45.5 Kg ± 2 Kg
Note	<p>Battery Heat Feature is included. If battery cell temperature approaches 0 °C, then charging current, if available, will be diverted to the 100 Watt battery heaters. When the temperature rises to a safe level, normal charging resumes automatically. The Battery Heat Feature is controlled automatically by the Battery Management System.</p>	

5. Storage and Transportation

5.1 During storage and transportation, the battery should meet the storage environmental conditions to preserve the battery full performance.

5.2 During battery storage and transportation, maintain 50% to 70% state of charge.

If in storage, the battery must be charged to 50% to 70% every three months.

5.3 Do not short circuit the battery.

5.4 Do not expose the battery to liquids, oils, grease, acidic or corrosive conditions

5.5 Do not drop or physically damage the battery.

5.6 Do not weld to the battery case.

5.7 Stacking this battery two high is allowed.

Stacking on multiple shelves or in strong industrial shelving is acceptable.

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5.8 Allow natural cooling airflow in summer. In winter, in excessively cold conditions insulating the battery is advisable

5.9 For storage, transportation, or idle conditions, ideal conditions are 10 to 35°C, in a dry, clean and well-ventilated area.

5.10 During the loading and unloading process, the battery should be carefully and gently handled. Do not roll the battery crate. Do not drop the battery or subject it to shocks. Do not stack the battery shipping crates over three high.

6. Battery Warnings and Precautions

Warnings!

- It is strictly prohibited to expose the battery to water.
- The battery should be stored in a cool and dry environment.
- It is strictly prohibited to reverse the positive and negative poles,
For charging, connect the positive voltage to the positive terminal
and the negative voltage to the negative terminal.
- Do not short-circuit the battery terminals.
- Do not transport or store batteries together with any metal that could come in contact with the battery terminals.
- Ensure that the battery and circuit breaker are off during transportation and installation.
- The battery must never be handled roughly. Do not roll the battery crate. Or roll the battery end to end or side to side.
- Do not physically damage the battery.
Do not weld to the battery.
Do not puncture the battery.
Do not drop tools on the battery.
Do not expose the battery to high heat or fire.
Do not store or install the battery outdoors, or expose it to sunlight.

Notes!

- Do not use or place the battery in high temperature conditions such as in hot sun or in a hot car, otherwise it may cause overheating, fire or functional failure, and reduced life; the recommended long-term storage temperature is 10-35°C. Do not store or use the battery

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outside, exposed to the elements.

- Do not expose the battery to fire or high heat from a heater to prevent dangerous conditions.
- Scrapped batteries shall be returned to a battery recovery point for disposal.
- Do not place or use batteries near strong static electricity sources, or strong magnetic fields, to prevent damage to the battery's safety protection devices.
- If the battery leaks, or out gasses due to extreme conditions, leave the area immediately. Do not get the electrolyte into one's eyes, do not rub. If exposed, wash the eyes with water immediately, and immediately go to the hospital for treatment.
- If the battery emits odors, emits higher heat than normal, shows discoloration, deformation, or any abnormality during use, storage, charging, the battery shall be immediately turned off by the circuit breaker, and disconnected from the system (the power load and charger).
- Never charge the battery with AC voltage, never connect the battery to AC.
- A proper lithium ferrous phosphate battery charger or inverter must be used for charging the battery. Do not use a vehicle alternator to charge the battery.
- The battery voltage and connections should be checked carefully during installation.
- Installation should be performed by a properly trained electrician.
- If the battery system is idle, or in storage, it must be monitored every three months, and charged to 50% to 70% state-of-charge every three months.
- If the terminals are dirty, apply a dry cloth before use, otherwise it may cause poor contact and functional failure.

7. Battery Specifications

The Trophy Battery LLC retains the rights to revise the battery specifications and improve battery models without incurring the obligation to retrofit other batteries

8. Warranty

The Trophy Battery Warranty is available on the www.trophybattery.com website.

9. Contacts, Support, and Emergency Support

You may reach Trophy Battery at 803-380-6211.

Routine support is available from 8 am to 9 pm Eastern Time.

If you have questions, please feel free to call us or email us at

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Emergency Support is available 24/7 at 803-380-6211.

10. Thank You

Trophy Battery thanks you for your interest in our batteries.

11. General Information and Legal Disclaimers

We plan to offer additional models of our batteries over time. We cannot guarantee that current models will be available in the future. Trophy Battery reserves the right to revise its product specifications without incurring the obligation to retrofit previous models. If you find errors in the specifications, please notify Trophy Battery. No Warranty of Merchantability and no Warranty of Fitness for a Particular Purpose” are supplied.

Trophy Battery believes these specifications are accurate but cannot be held liable for errors. It is the responsibility of the purchaser to ensure that the battery is suitable for its intended purposes.

The purchaser’s responsibility is have the battery installed by an electrician and use the battery properly, following all instructions, cautions, and warnings provided in this document and on the www.TrophyBattery.com website.

Trophy Battery will be happy to advise and consult with those interested in our batteries but offers no guarantees that our advice is accurate. We cannot be held liable for our good-faith communications.

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Recommended Voltages for most inverters:

Charging 56.0, 56.4 or 56.8 Volts

Float Charge 54.0 Volts

Discharge Cutoff Voltage 48.0 or 47.9 Volt.

The above is the recommend cutoff voltage. This will help ensure an extended life for your battery. You may set a lower cutoff voltage, as low as 44 volts, but this is harder on the battery.

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Recommended settings for MidNite Solar Charge Controller Model MNMPPT60DIY Inverter

Note, although this is a 48V Inverter, it uses setting that are 1/4th of the voltage value needed. For example, to set the Overvoltage Disconnect Voltage to 56.4, one must set 14.1 into the inverter.

Over Voltage Disconnect Voltage 14.1 (56.4)

Equalizing Voltage 14 (56)

Absorption Voltage 14 (56)

Floating Voltage 13.5 (54)

Low Voltage Disconnect Resorting Voltage 12.5 (50)

Under Voltage Alarming Voltage 12 (48)

Low Voltage Disconnect Voltage 11.5 (46)

Discharging Limit Voltage 11.4 (45.6)

Equalizing Duration Time 0 minutes

Equalizing Charging Interval 0 minutes

Absorption Duration Time 60 minutes

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