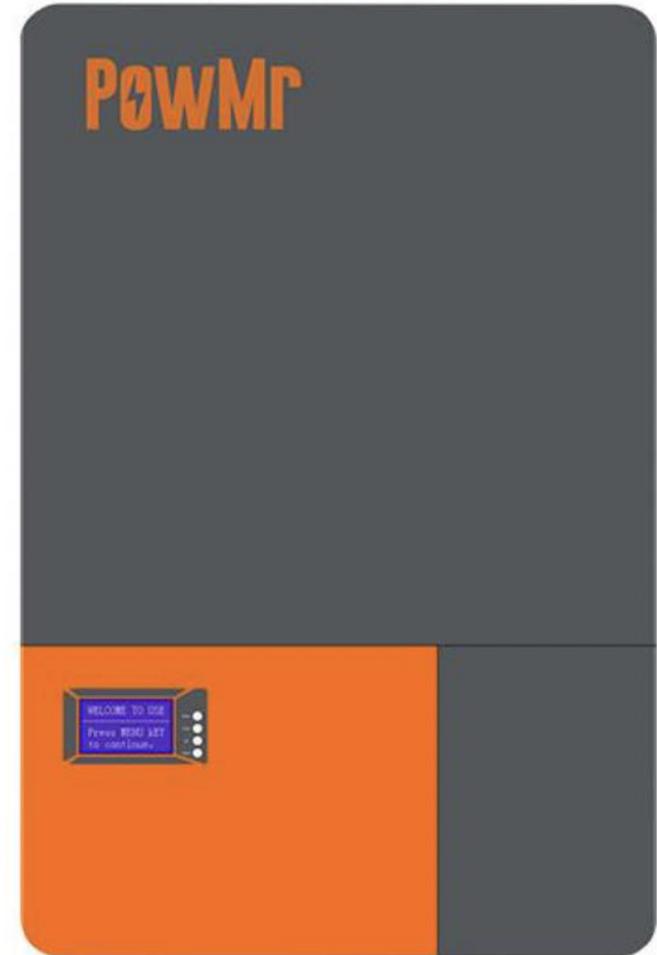


# PowMr Battery and Inverter

The PowMr Battery and Inverter System will provide up to 16 hours of near silent run time for the Mobile LED Trailer. Each battery on board provides 3-5 hours of power with expansion possibilities in both capacity and charging.

# POWMr



# PowMr Battery and Inverter

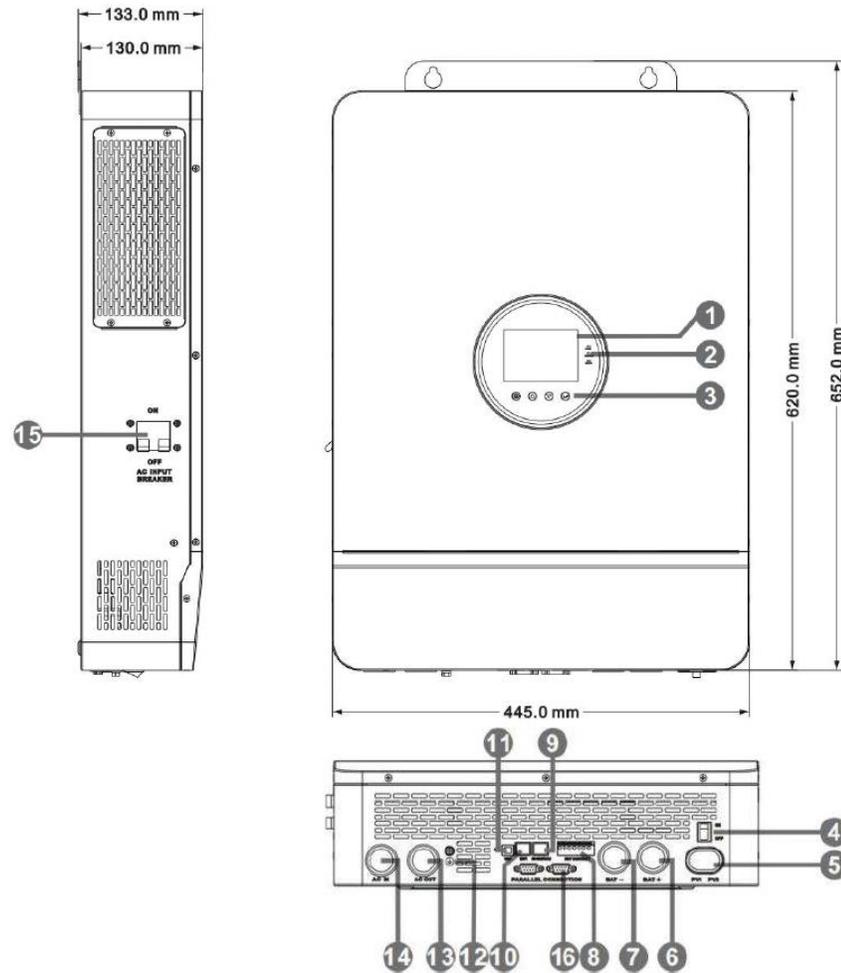
## Battery Specifications Page:

Battery Model	POW-LIO48100-16S	POW-LIO48200-16S
System Voltage	51.2V	
Capacity	100Ah	200Ah
Nominal Energy	5.12KWh	10.24KWh
Constant Voltage charging Voltage	58.4V	
Max. Discharge Cutoff Voltage	43.2V	
Recommended Discharge Cutoff Voltage	48V	
Max. Charging Current	100A	150A
Recommended Charging Current	40A	40A
Max. Discharge Current	100A	150A
Max. Parallel Connection of Batteries	16	
Communication Interface	RS232/RS485/CAN/Dry Contac	
Cycle Life	≥6000 Times @80%DOD, 25°C	
Operating Temp	Charging: 0~60°C; Discharging: -10°C~65°C	
Nominal Operation Altitude	< 2000m	
Nominal Operation Humidity	<90%RH	
IP Grade	IP21	
Recommended Operation Environment	Indoor	
Battery Dimensions (LxWxH)	550x470x202mm	700x630x170mm
Net Weight	44kg	87kg

# PowMr Battery and Inverter

## Inverter Key Components

Key functions, inputs and features of Inverter are displayed on this page:



1	LCD Screen	2	LED Indicators	3	Touchable key
4	ON/OFF Rocker Switch	5	PV INPUT (1/1)	6	BAT INPUT (+)
7	BAT INPUT (-)	8	Dry contact	9	CAN/RS485 port
10	WIFI Port	11	USB-B port	12	Grounding Screw
13	AC OUT (L1+L2+N)	14	AC IN (L1+L2+N)	15	AC INPUT breaker
16	Parallel Communication Port				

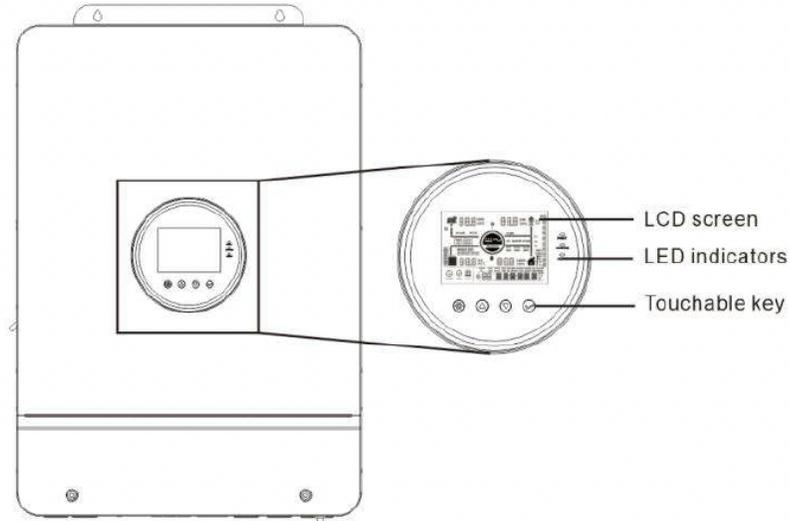
\*Note: Only the parallel model POW-SunSmart 8KP and POW-SunSmart 10KP have the parallel port.

# PowMr Battery and Inverter

## Inverter Menu Control

Key functions for user interfacing are shown on this page:

The operation and display panel below includes 1 LCD screen, 3 indicators, 4 touchable keys.



### ● Touchable Keys

Touchable Keys	Description
	Enter/exit the setting menu
	Go to the next selection
	Go to the previous selection
	Confirm/Enter the selection in setting menu

### ● LED Indicators

Indicators	Color	Description
<b>AC/INV</b>	Yellow	Steady on: utility grid bypass output
		Flash: inverter output
<b>CHARGE</b>	Green	Steady on: charging complete
		Flash: charging
<b>FAULT</b>	Red	Steady on: level-1 fault
		Flash: level-2 fault
		Off: level-3 fault or level-4 fault

# PowMr Battery and Inverter

## Box Location and Cooling System

The Cooling System on board allows for safe periods of operation at ambient temperatures up to 112 degrees F.



**Keep area clean and clear for unobstructed airflow critical to cooling the Inverter**

# PowMr Battery and Inverter

## Operation of Power System

Locate buttons on bottom of front panel and push ON for all batteries in system to send DC Voltage to Inverter.

Turn on **Inverter at Power Switch** located on the bottom right side of the front of the Inverter.



After battery and inverter start up, power may be released to components at the electrical panel in Power Box by turning on Breaker labelled "Inverter"

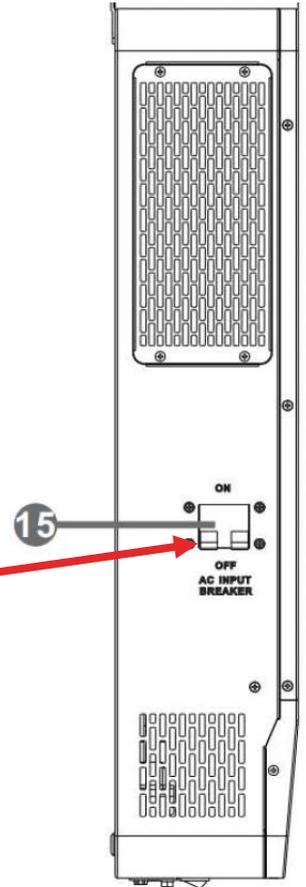
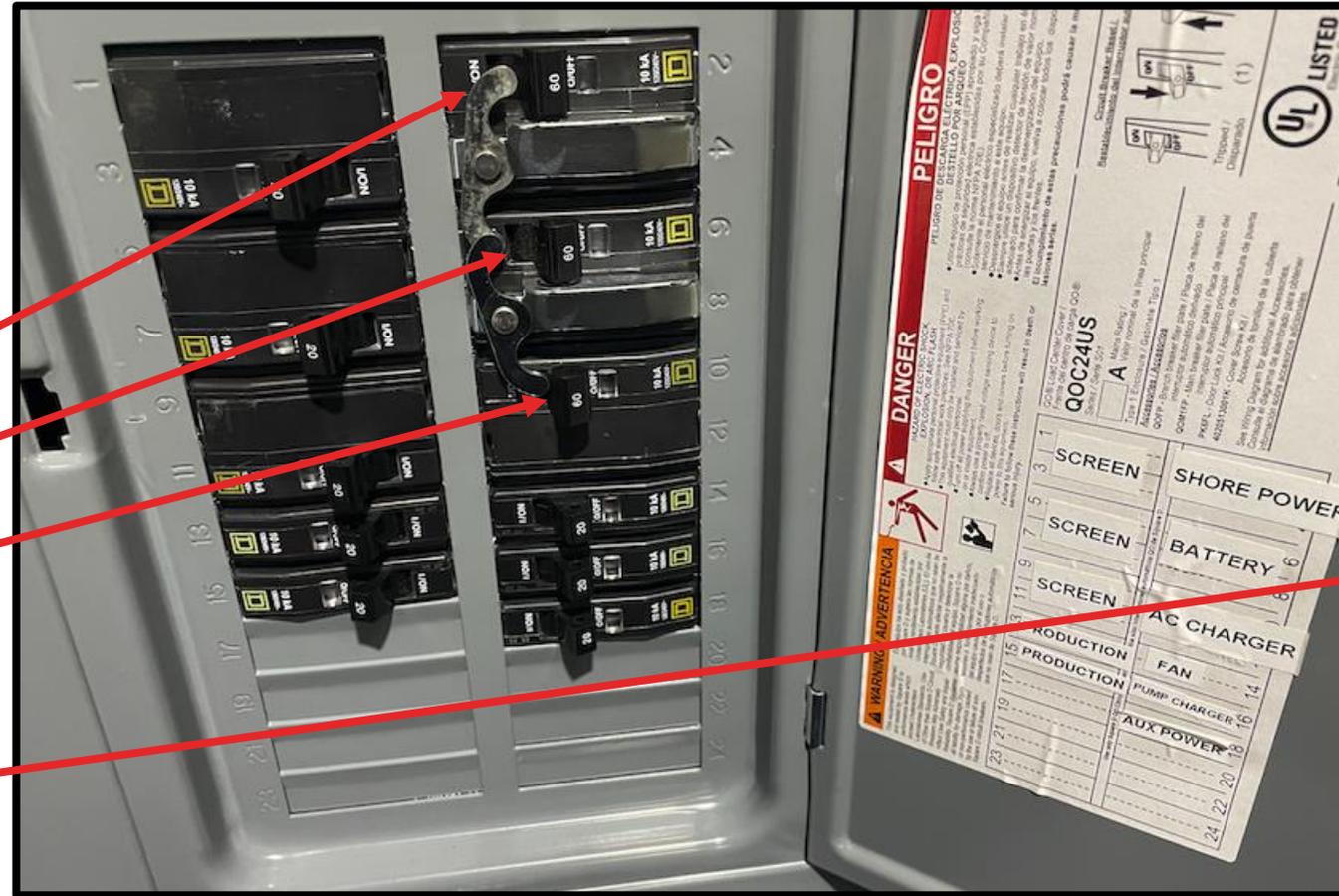


# PowMr Battery and Inverter

## Charging the Battery with Shore Power

If Shore Power is applied, charge the Battery system as follows:

- Shore Power Breaker set to ON
- Battery Breaker set to OFF
- AC Charger Breaker set to OFF
- Set Inverter Breaker



**The Breaker Interlocks will prevent Dual Voltage to the System to safely accomplish charging from Shore Power**

# PowMr Battery and Inverter

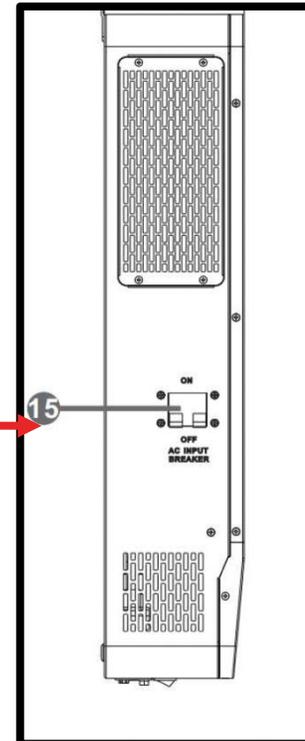
## Charging the Battery with 120v Charger:

Locate charger above the  
Battery near the Power

Run a 120v cord to the  
from a 15a circuit

Turn Inverter AC  
Breaker OFF

Charge recovery is at a 1:1 ratio – 1  
hour charging = 1 hour recovery

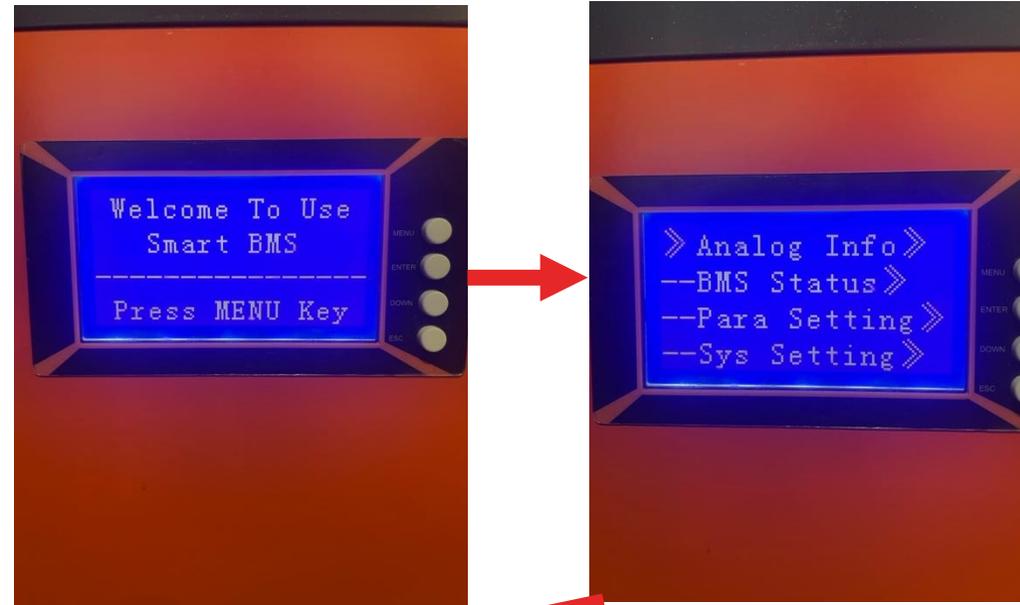


# PowMr Battery and Inverter

## Check State of Charge on Batteries

- On Battery Control Screen, press MENU
- Select ANALOG INFO by pressing ENTER
- Use DOWN button to scroll to next page
- Select CellCapacity with ENTER
- View "SOC" to determine charge

Note: Batteries are parallel, and SOC reflect total charge



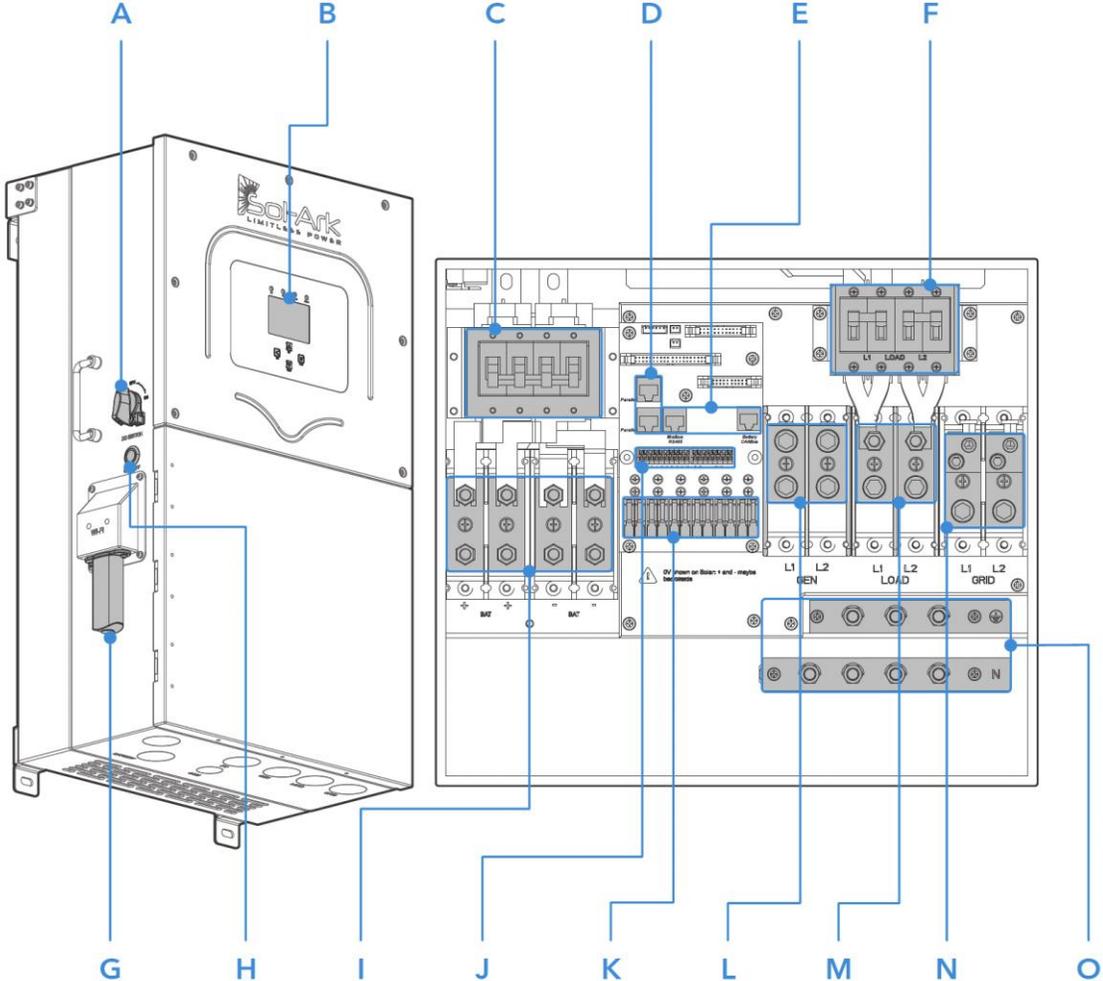
# Sol-Ark Inverter

The **Sol-Ark Inverter Package** is a power system which has adaptability to operate with several brands of Lithium-Ion batteries. The Inverter system provides up to 12 hours of near silent run time for the Mobile LED Trailer. This inverter system may be expanded with additional inverters and batteries for adaptable power needs.



# Sol-Ark Inverter

The **Inverter** front view layout and components are shown on this page:



Component	Name	Component	Name
A	PV DC disconnect	I	Battery terminals
B	LCD touch screen	J	Input pinouts for sensors and accessories
C	2x (200A) battery breakers	K	3x MPPT inputs
D	Parallel RJ45 ports	L	(90A) GEN terminal
E	BMS RJ45 ports (RS485 / CAN)	M	(200A) LOAD terminal
F	(200A) LOAD breaker	N	(200A) GRID terminal
G	Wi-Fi / Ethernet dongle	O	GROUND / NEUTRAL Busbars
H	ON / OFF Button		

# Sol-Ark Inverter

## Box Location and Cooling System

The Cooling System on board allows for safe periods of operation at ambient temperatures up to 112 degrees F.



**Keep area clean and clear for unobstructed airflow critical to cooling the Inverter**

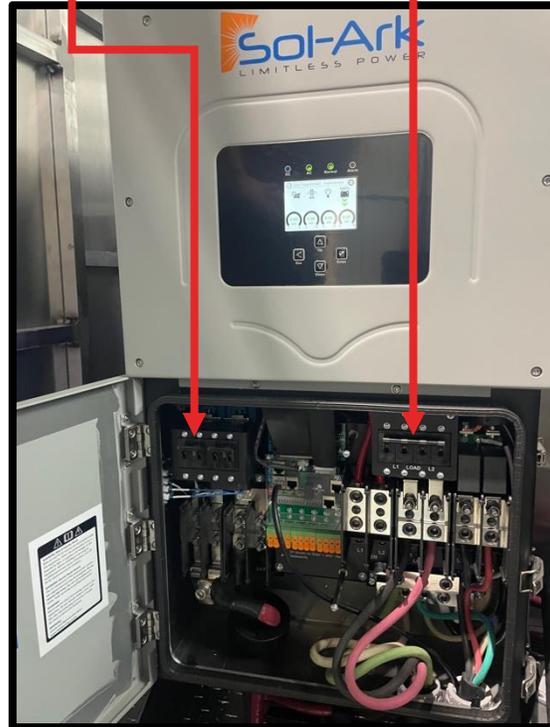
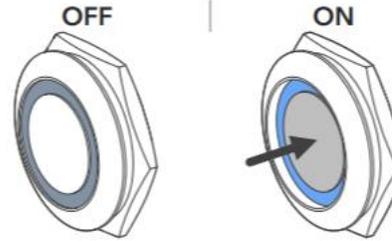
# Sol-Ark Inverter

To start up the Sol-Ark Inverter System, follow steps on this page:

Note: Ensure the Batteries which power the Inverter are powered on before attempting to start Inverter

## Power ON Sol-Ark 15K-2P-N

- Turn **ON** the battery breaker(s).
- PRESS** down the power button to the **ON** position. Wait for the **"Normal"** LED indicator to turn on. This may take a few minutes.
- Turn **ON** the PV DC disconnect switch. Wait for **"DC"** LED indicator to turn on.
- Turn **ON** the external "GRID" disconnect. Wait for **"AC"** LED indicator to turn on.
- Turn **ON** the internal "LOAD" and external "GEN" breakers.



# Sol-Ark Inverter

To shut down the **Sol-Ark Battery and Inverter System**, follow the steps on this page:

1. **TURN OFF** all AC breakers / disconnects ("GRID", "GEN" and "LOAD").
2. **TURN OFF** the built-in PV DC disconnect switch on the side of the inverter.
3. **PRESS** the power button, making sure it is in the **OFF** position. An "OFF" message will appear after the "Normal" LED turns off.
4. **TURN OFF** the battery breakers.
5. Wait a moment (~1 min) to ensure the inverter is completely de-energized.
6. Make sure that the Sol-Ark is properly connected to the batteries, solar panels, "GRID", "GEN", and "LOAD".



# Sol-Ark Inverter

During operation, take care to obey warning posted on this page. Common faults are also listed for quick troubleshooting of the power system.

## WARNINGS

-  Read this entire document before installing or using the Sol-Ark 15K-2P-N inverter. Failure to follow any of the instructions or warnings in this document can result in electrical shock, serious injury, or death. Damage to the 15K-2P-N inverter is also possible, potentially rendering it inoperable.
-  High Life Risk due to fire or electrocution - ONLY qualified persons should install the Sol-Ark inverter.
-  The system must have Ground connections and Neutral connections. Ground MUST be bonded to Neutral ONLY ONCE in the circuit.
-  Solar PV+/PV- are UNGROUNDED. Note, you may ground PV Racking/Mounts, but doing so directly to the Sol-Ark will likely result in damage in the case of a direct lightning strike to the PV array.
-  DO NOT connect the grid to the "LOAD" output terminal.
-  DO NOT reverse the polarity of batteries. Damage WILL occur.
-  DO NOT exceed 500V<sub>oc</sub> on any MPPT on the Sol-Ark.
-  DO NOT turn off the battery breaker if there is current flowing in or out of the battery in any amount.
-  DO NOT use impact drivers to tighten any fasteners on the Sol-Ark.
-  MUST use conduit (or double insulated wire) for AC wires entering/exiting Sol-Ark user area.
-  ALL terminals/breakers, including battery, MPPT, and AC Terminal Block inputs, should only have one conductor connected to them.

# Sol-Ark Inverter

During operation, take care to obey warning posted on this page. Common faults are also listed for quick troubleshooting of the power system.

## Battery cable sparks when connected

- If applicable, flip the built-in breakers of the battery bank before connecting or disconnecting batteries

## Battery symbol on the home screen is red

- The battery is below the empty voltage
- Battery is over-voltage

## Battery symbol on the home screen is yellow

- The battery is low, or the charge/discharge current is close to the programmed limit

## Grid symbol on the home screen is yellow

- Grid parameters are out of specified operating range
- There is a grid outage and there is no voltage on the "GRID" terminal
- System is Off-Grid

## System has restarted

- Occurs when the system has overloaded, battery voltage has surpassed 63V
- There was a Software update

## Batteries were connected backwards

- ⚠ System will be damaged, and warranty will be lost

## Why is the LCD screen still on when the power button is off?

- Occurs when the power button is in the "OFF" position
- Occurs when the system is not fully energized: PV or Grid only

## The Batt SOC% is not reaching 100%

- The Sol-Ark might be in the calibration phase and estimating the battery SOC. We suggest waiting three full days to let the unit go through the 4-stage charging curve to converge to an accurate %
- If the suggestion above does not work, you can re-adjust the battery capacity under "Battery Setup" → "Batt Capacity" to restart the calibration process

## Generator setup is reading 0Hz

- Generator is operating at a frequency outside the permissible range. Select "General Standard" grid mode. Widen the frequency range to 55Hz-65Hz as described in section 2.5 "Integrating a Generator"

## Color Touchscreen is Frozen

- Press and hold the escape button [⏪] for 7-10 seconds
- Perform a power cycle sequence in case the above suggestion does not work. See section 2.12 "Power Cycle Sequence"

## Grid Phase Wrong

- ⚠ If the Sol-Ark screen shows a "Grid Phase Wrong" message, it means there is a phasing issue in the wiring. If left unchecked it may cause overload faults and **DAMAGE**. See section 5.3 "Three-Phase Systems"

# Sol-Ark Inverter

During operation, take care to obey warning posted on this page. Common faults are also listed for quick troubleshooting of the power system.

## The "Alarm" LED indicator is on

- Check the system alarms menu to identify the alarm

## Grid HM value is negative when it should be positive (only applies in Limited to Home mode)

- Limiter Sensors are backwards, L1/L2 sensors are swapped, or incorrectly wired. Execute the "Auto Learn Home Limit Sensors" command described in section 2.9 "Limit Sensors, Automatic CT Limit Sensors Configuration"

## AC Overload Fault or Bus Unbalance Fault

- Check Transfer Switch/Subpanel wiring
- Check for large loads that consume more than the inverter rating

## The system connects to grid and quickly disconnects

- Verify Neutral wire connection (0Vac referenced to GND)
- Check the programmed frequency, and verify the Sol-Ark measures 120V between L and N
- If the system is overloading: verify that proper phase sequence between "GRID" and "LOAD" terminals

## DC Overload Fault

- Check PV voltage. Ensure no more than 500V
- Make sure you have not wired more than two (2) solar strings in parallel per MPPT

## System is beeping

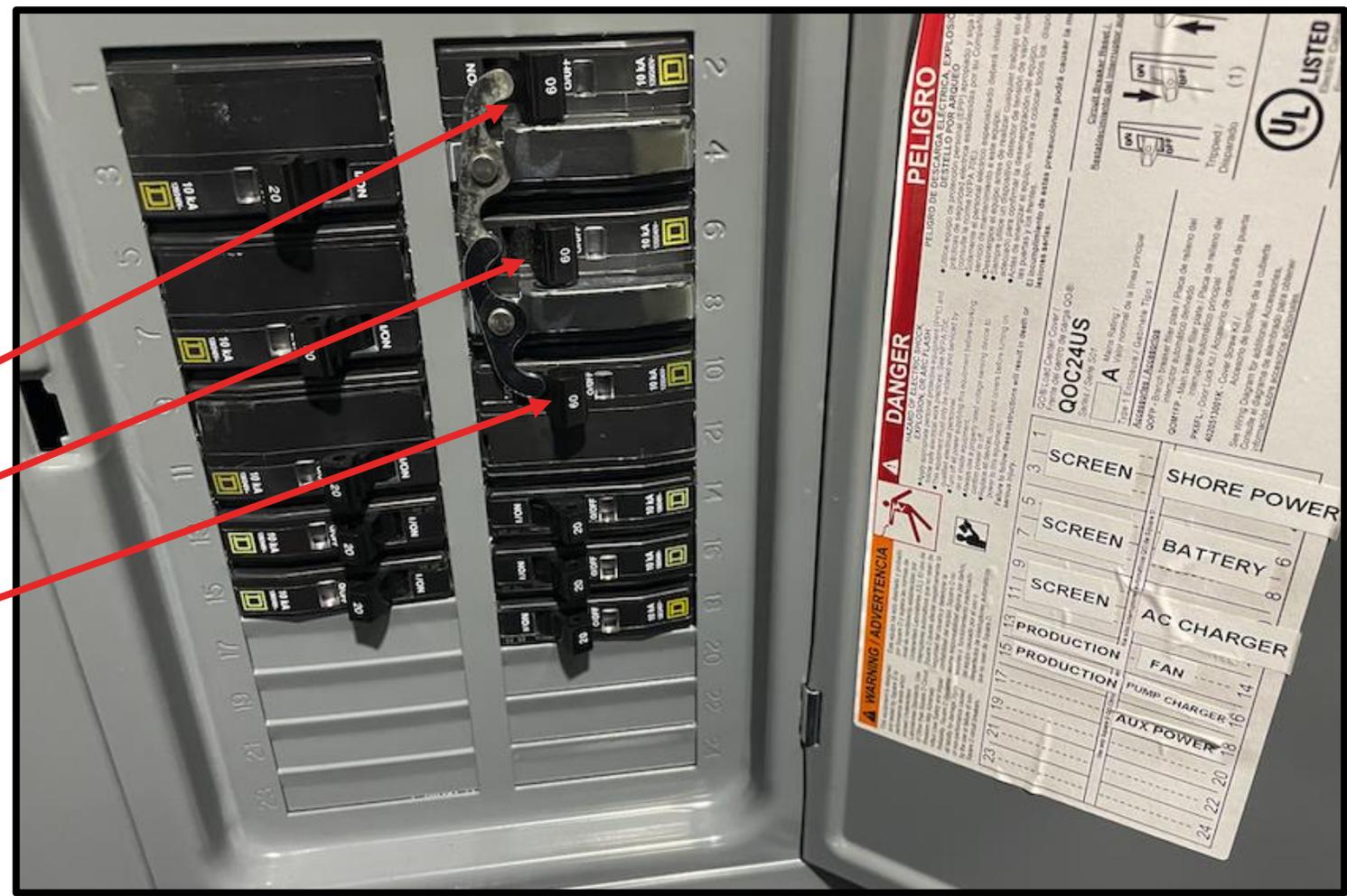
- Check the System Alarms menu to see which alarm has been triggered. Most alarms will self-reset
- Do a Power Cycle as described in section 2.12 "Power Cycle Sequence"

# Sol-Ark Inverter

## Charging the Battery with Inverter:

Charge the Battery system as follows:

- Ensure all batteries are OFF
- Shore Power Breaker set to ON
- Battery Breaker set to OFF
- AC Charger Breaker set to ON



The Breaker Interlocks will prevent Dual Voltage to the System to safely accomplish charging from Shore Power

# Sol-Ark Inverter

The Charge Controller integration will efficiently charge the batteries through the inverter in different stages depending on battery degradation, capacity and state of charge.

For more information, refer to the **Sol-Ark User Manual**

## 4-Stage Charging

The MPPT has a 4-stage battery charging algorithm for rapid, efficient, and safe battery charging. The next figure shows the stage sequence.

### Bulk Charge Stage

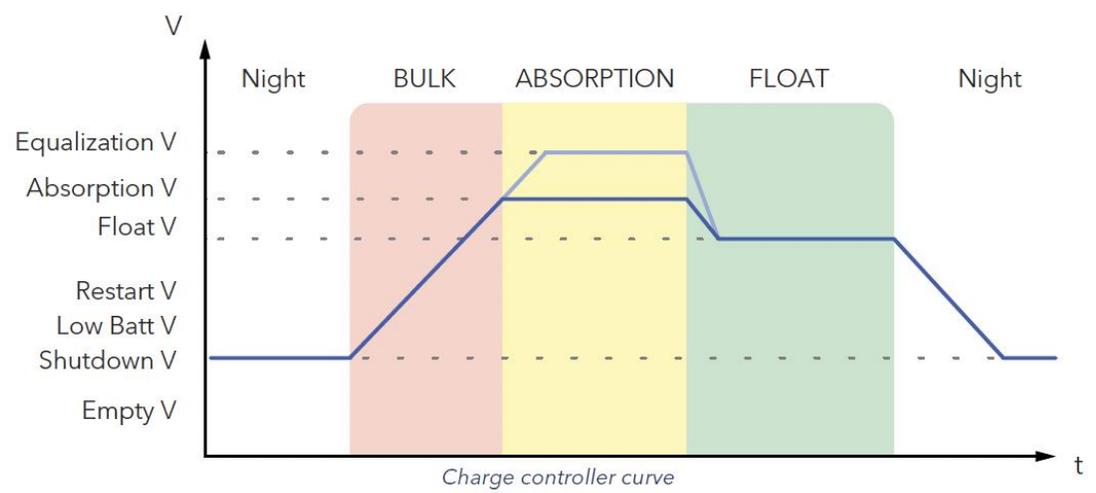
In the Bulk Charge stage, the battery is not at a 100% state of charge and has not yet reached the Absorption voltage setpoint. The controller will deliver 100% of available solar power to recharge the battery.

### Absorption Stage

When the battery has reached the absorption voltage setpoint, the Sol-Ark inverter uses constant-voltage regulation to maintain battery voltage at the absorption setpoint, preventing overheating and excessive battery gassing. The battery is allowed to come to a full state of charge at the absorption voltage setpoint. Absorption lasts until the battery charge amperage (A) rate reaches 2% of the programmed capacity (Ah).

### Float Stage

After the Absorption stage charges the battery fully, the MPPT reduces the battery voltage to the float voltage setpoint. If the batteries have 100% charge, there can be no more chemical reactions and all the charging current turns into heat and gassing. The Float stage provides a meager rate of maintenance charging while reducing the heating and gassing of a fully charged battery. The purpose of the Float stage is to protect the battery from long-term overcharge.

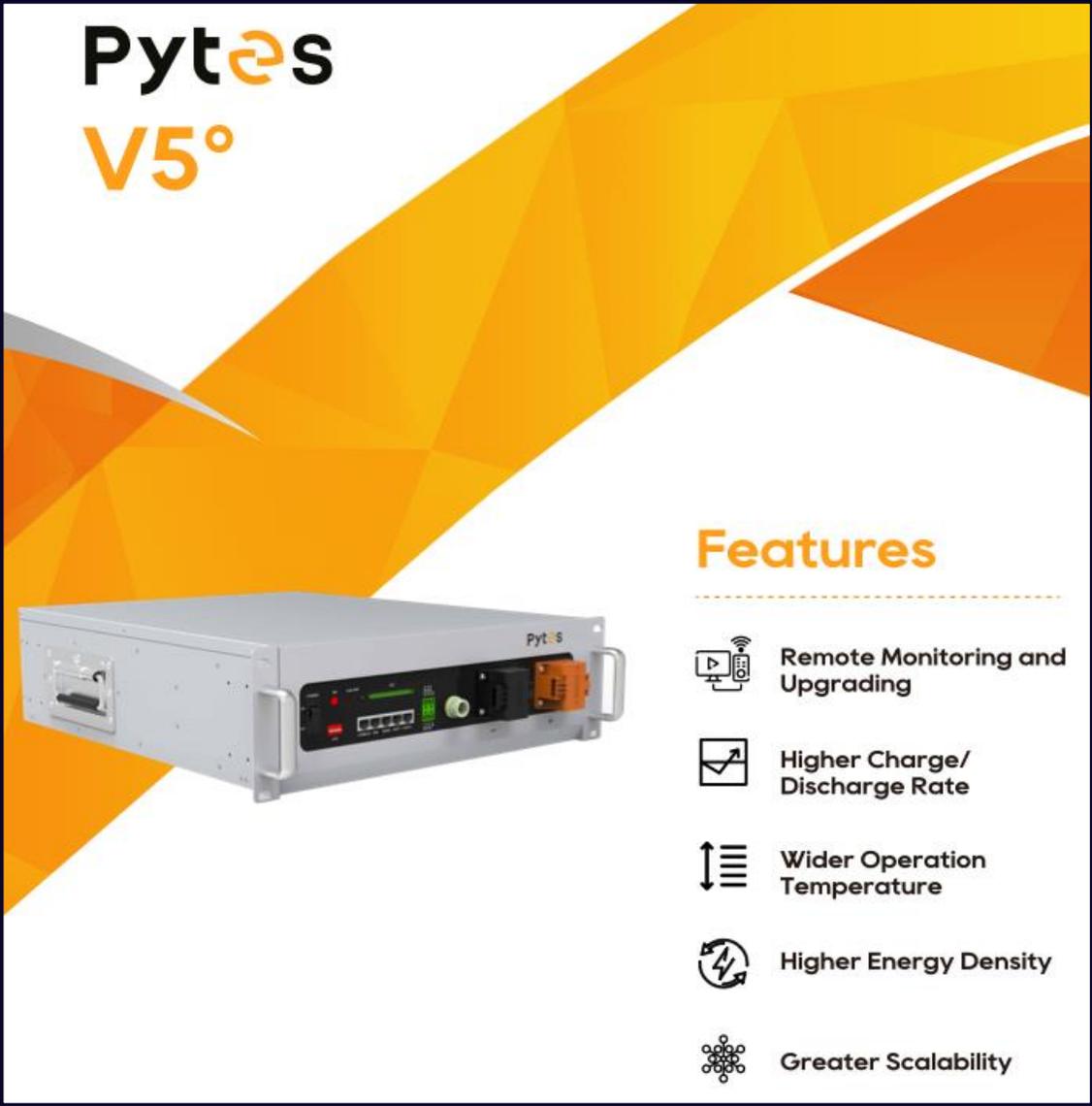


# Pytes Rack Battery System

The **Pytes Rack Battery** system provides expandable power options in a compact footprint to operate with any adaptable inverter.

Features included on the Image on this page, including charging capability from 32 degrees F to 113 Degrees F.

Pytes Rack Batteries are effective during operation from 14 degrees F to 122 degrees F.



**Pytes**  
**V5°**

**Features**

-  Remote Monitoring and Upgrading
-  Higher Charge/Discharge Rate
-  Wider Operation Temperature
-  Higher Energy Density
-  Greater Scalability

The image shows a white, rack-mountable Pytes V5° battery system. The front panel features a handle on the left, a control panel with a display and buttons, and a connector on the right. The background is a stylized orange and yellow geometric pattern.

# Pytes Rack Battery System

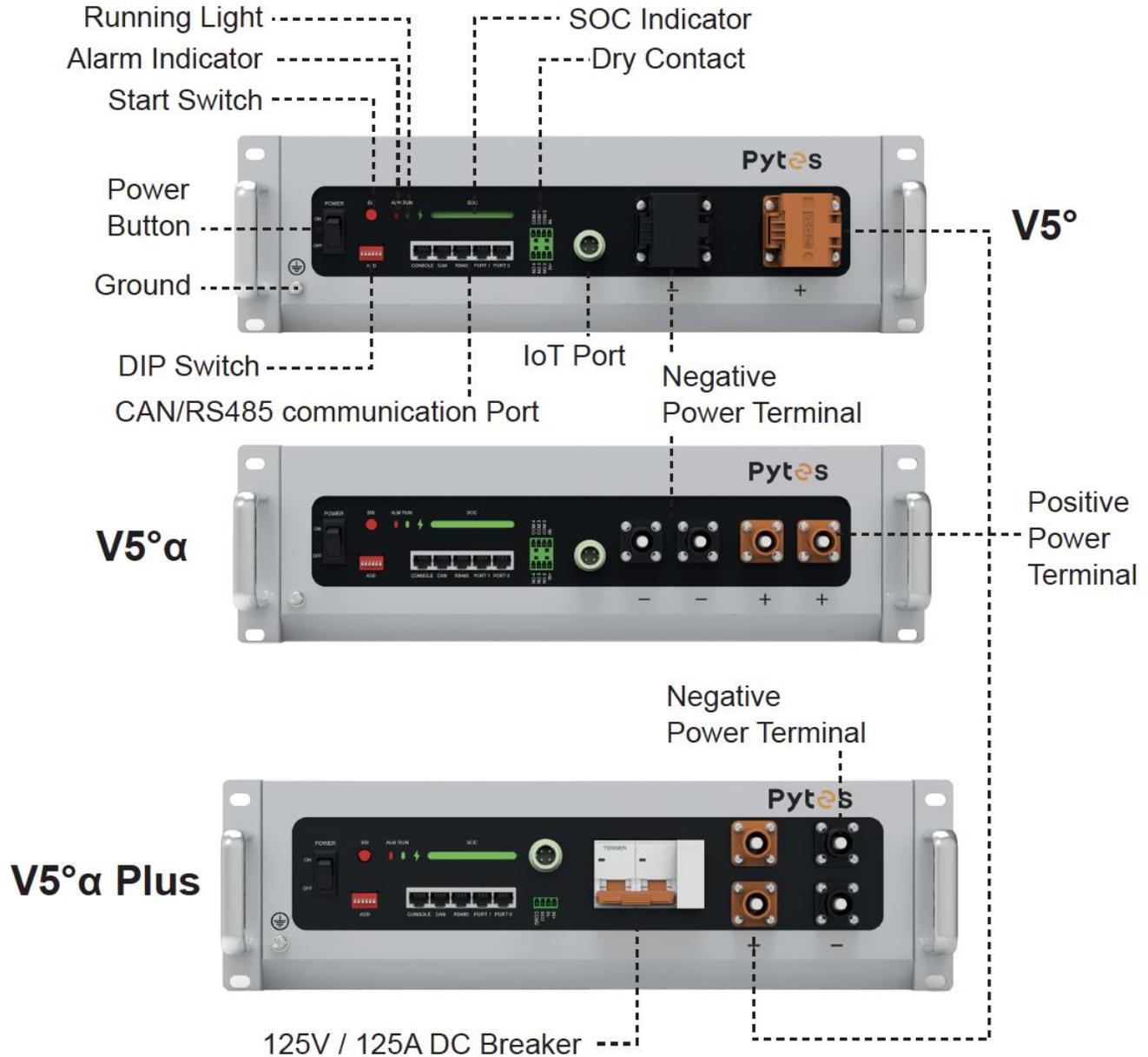
The Pytes Rack Battery specifications are shown on this page:

Battery Model	V5°	V5°α	V5°α Plus
Power Terminal	PHOENIX M6 Bolt	Amphenol SurLok Plus 8.0mm	
Chemistry	LFP		
Nominal Voltage	51.2V		
Voltage Range	47.5V~57.6V		
Nominal Capacity	100Ah		
Nominal Energy	5.12kWh		
Unit Dimension	L442mm*W530mm*H140mm(3.2U) L17.40in*W20.87in*H5.51in(3.2U)	L484*W578.2*H140mm(3.2U) L19.05*W22.76*H5.5in(3.2U)	
Unit Weight	44kg / 97lbs		45.34kg / 100lbs
Recommended Charge/ Discharge Current <sup>[1]</sup>	75A		
Max Charge/ Discharge Current <sup>[2]</sup>	100A		
Peak Charge/ Discharge Current	101A~120A (3min) 121A~180A (15sec)	101A~120A (3min) 121A~200A (15sec)	
Round-Trip Efficiency	≥95%		
External Communication	RS485, CAN, Dry Contact, WiFi (W/ Optional Device)		
Internal Communication	RS232		
IP rating of Enclosure	IP20		
DC Breaker	No		Dual Pole, 125Vdc, 125Adc, Icu 10kA
Cycle Life <sup>[3]</sup>	≥6000 Cycles		
Calendar Life	≥10 Years		
Operating Temperature	Charge: 0°C~45°C(32°F~113°F) Discharge: -10°C~50°C(14°F~122°F)		
Certificates	UN38.3, CE, UL1973, UL9540A, UL9540, IEC62619, CEC, SGIP		
Storage Temperature	Within 1month: -20°C~50°C(-4°F~122°F) 1-3months: -10°C~40°C(14°F~104°F) 3-12months: > 0°C~30°C(32°F~86°F)		
Heating System <sup>[4]</sup>	Temperature Rise 10°C(18°F)/Hour, Operation Temperature -18°C~15°C(-0.4°F~59°F)		

[1], [2]: The recommended and Max continuous charge and discharge current is for a battery cell temperature within 10°C~40°C(50°F~104°F)to consider. It will result in a derating on current if out of the temperature range.  
[3]: Test conditions 0.2C Charging/Discharging, @25°C(77°F), 90% DOD.  
[4]: Optional Device. Specified on Battery package whether integrated.  
Working with some inverters, heating system may consume energy from battery when there's voltage difference among system modules, between 0°C/32°F to 5°C/41°F. Follow 5.3.3 of this manual for multiple batteries power cable connection to minimize influence of the circular current, thus decrease battery energy loss.

# Pytes Rack Battery System

The Pytes Rack Battery front panel schematic is shown on this page:



# Pytes Rack Battery System

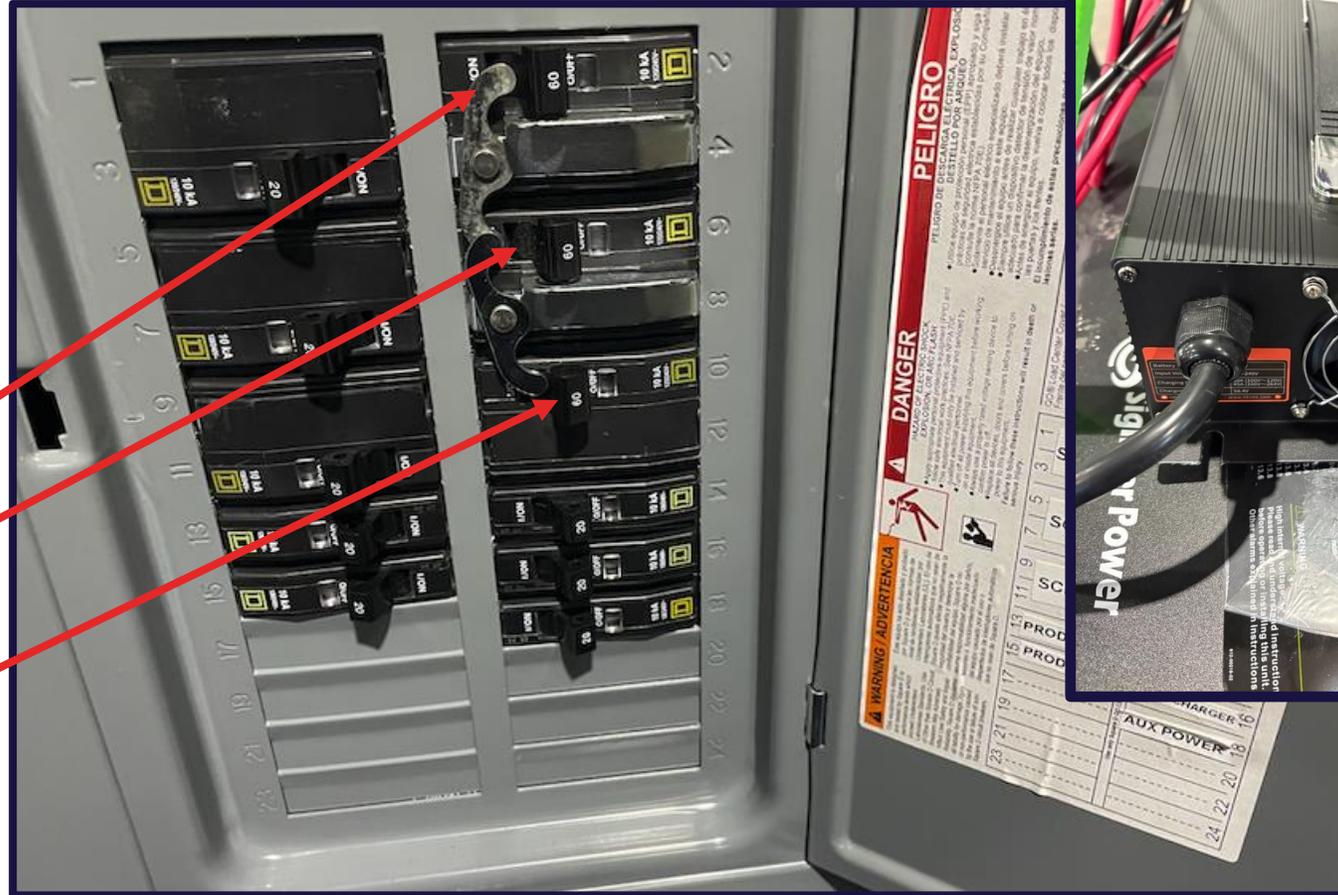
Charging the Battery with Trickle Charger:

Ensure all Batteries are OFF.

Charge the Battery system as follows:

- Shore Power Breaker set to OFF
- Battery Breaker set to OFF
- AC Charger Breaker set to OFF

Locate Battery Charger and Apply 120v to Outlet Plug



To completely recharge the battery system, allow for 6-10 hours to complete cycle.