

PHI 3.8™ BATTERY



CHEMISTRY	Lithium Ferro Phosphate (LFP) The safest Lithium Ion chemistry available No cobalt or risk of thermal runaway
OCPD	Built-in, accessible 80 Amp DC breaker on/off switch
BMS	Built-in Battery Management System
COMPATIBILITY	Compatible with all industry standard inverters and charge controllers Battery bank-to-inverter output sizing must adhere to a 2:1 ratio: $\text{battery quantity} = \frac{\text{inverter } kW_{AC} \text{ rating} \div \text{inverter efficiency}}{\text{battery MAX Continuous Discharge Rate (kW}_{DC})}$
MAINTENANCE	Maintenance-free No ventilation, cooling or thermal regulation required

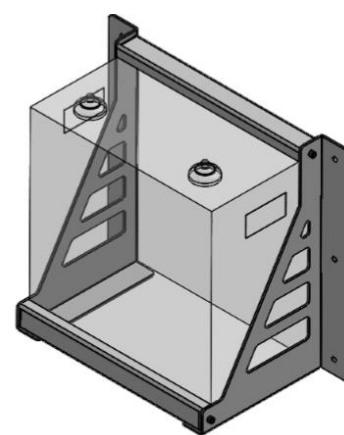
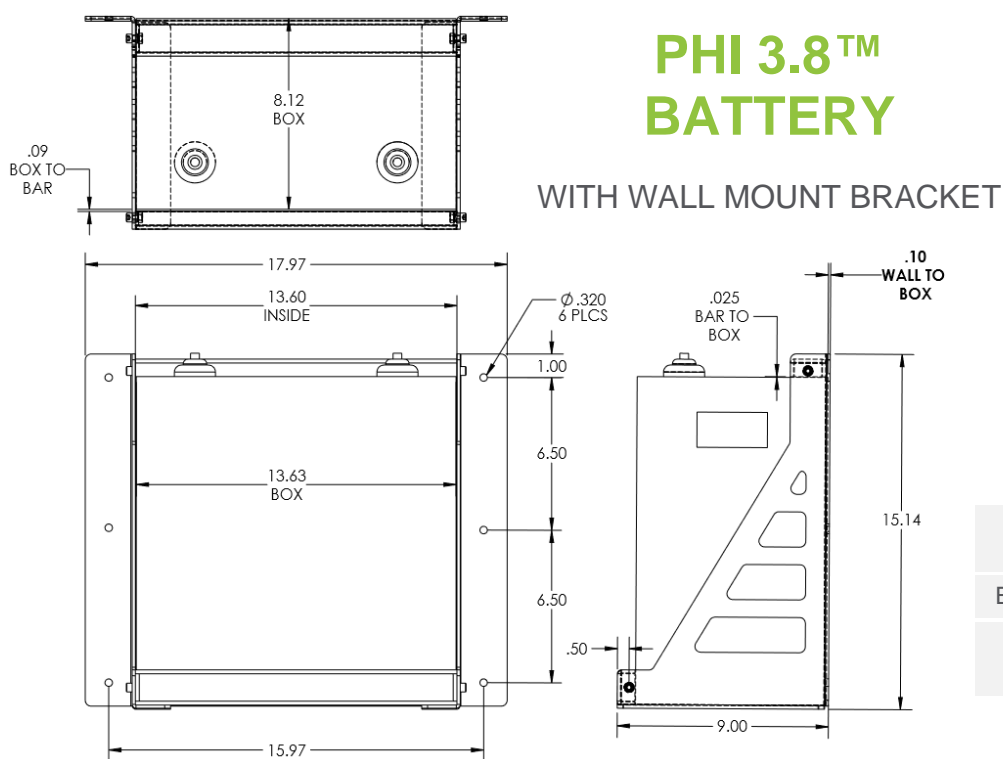
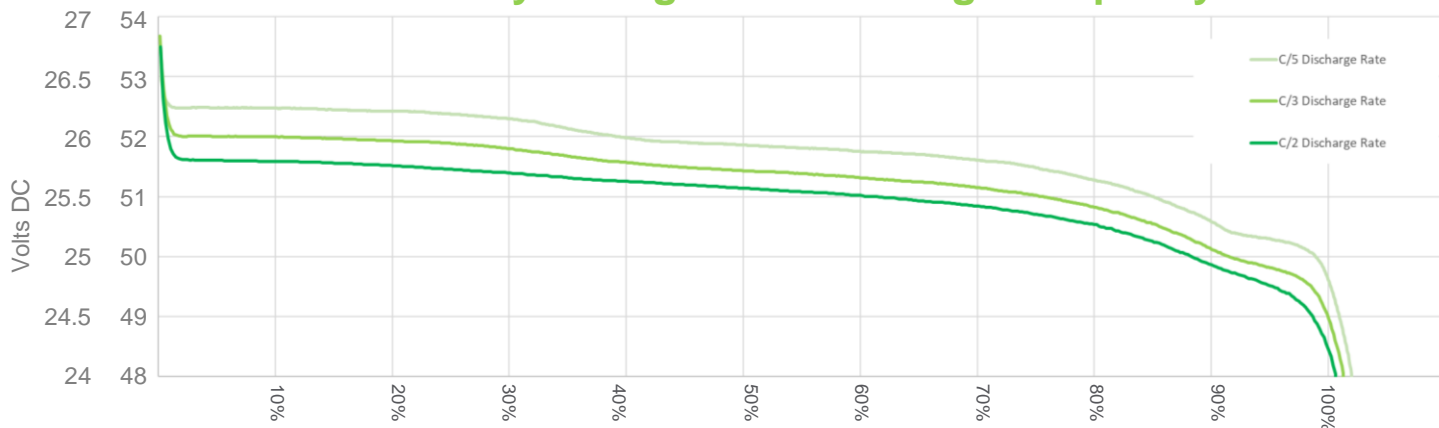
PHI 3.8 kWh Module	24V	48V
DC Voltages - Nominal	25.6 VDC	51.2 VDC
Amp-Hours	151 Ah	75 Ah
Rated kWh Capacity	3.8 kWh DC @ 100% DOD 3.04 kWh DC @ 80% DOD	3.8 kWh DC @ 100% DOD 3.04 kWh DC @ 80% DOD
MAX Discharge Rate (10 minutes)	60 Amps DC (1.53 kW DC)	60 Amps DC (3.07 kW DC)
MAX Continuous Discharge Rate	45 Amps DC (1.15 kW DC)	37.5 Amps DC (1.92 kW DC)
MAX Continuous Charge Rate	45 Amps DC (1.15 kW DC)	37.5 Amps DC (1.92 kW DC)
DC Voltage Range ¹	24 VDC to 28 VDC	48 VDC to 56 VDC
Depth of Discharge ¹	up to 100%	
Operating Efficiency	98%	
Charging Temperature ¹	32° to 120° F (0° to 49° C)	
Operating Temperature ¹	-4° to 140° F (-20° to 60° C)	
Storage Temperature	6 months: 14° to 77° F (-10° to 25° C) 3 months: -4° to 113° F (-20° to 45° C)	
Self-Discharge Rate	< 1% per month	
Cycle Life	10,000+ cycles (@ 80% DOD)	
Memory Effect	None	
Warranty	10 Years or 10,000 cycles (@ 80% DOD)	
Weight	78.24 lbs. (35.5 kg)	
Dimensions (W x H x D)	13.5 x 14 x 8 in. (15.5" H w/terminals) / 0.88 ft ³ (34.3 x 35.6 x 20.3 cm / 0.025 m ³)	

1. Max operating ranges. Refer to Warranty for recommended conditions.

- All specifications listed are typical/nominal and subject to change without notice.
- UN 3480, Lithium ion batteries, 9, II
- UL, CE, UN/DOT and RoHS compliant components - UL Compliant
- Designed and manufactured in California, USA

CERTIFIED
TO UL 1973

Battery Voltage VS. Discharged Capacity



Terminals	3/8 IN	10 MM
Battery Cables	6 AWG MINIMUM	
See Installation Manual for detailed wiring instructions.		

Short Circuit Current

Absolute discharge rate limits:

Based on	Amps DC
internal battery impedance	~2,000 A
battery management system	~200 A
built-in circuit breaker	80 A (continuous)
	200 A (1 second)
	400 A (100 microseconds)
	550 A (10 microseconds)

All PHI batteries monitor internal temperatures. Operating within the specified and warranted parameters ensures these temperatures are not exceeded and the battery is not adversely stressed. When critical temperatures are exceeded, the BMS will disconnect the battery from the DC Bus at indeterminate times and without notice/warning. Repeated exposure to these extremes adversely affects the health of the battery and voids the Warranty.

PHI 3.8™	24V	48V
Bulk & Absorb Charge	27.2 VDC	54.4 VDC
Absorb Time	1 HR	1 HR
Charge Controller Float Charge	27 VDC	54 VDC
Inverter Charging	2 STAGE NO FLOAT	
Equalization Charge	NONE	
Temperature Compensation	NONE	

Refer to the Integration Guide section of SimpliPhi's [Product Documentation](#) web page for inverter and/or charge controller specific settings. Must be followed to maintain PHI Warranty.

Sol-Ark-8K-48-ST Specifications

Solar

Max allowed PV Power	11000W
Max allowed PV Power per MPPT	6000W
Max DC voltage	500V
MPPT voltage range	150-425V
Starting voltage	175V
Number of MPPT	2
Solar Strings per MPPT	2
Max DC current per MPPT	18A (self limiting)
Max AC Coupled Input (Micro/String Inverters)	7,000W
Max Combined Solar Input (DC+AC)	13,000W

AC Output

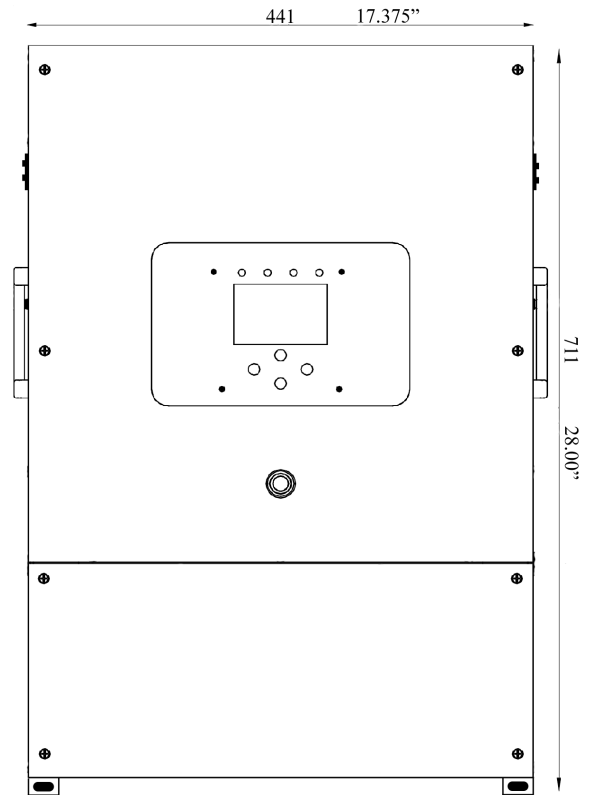
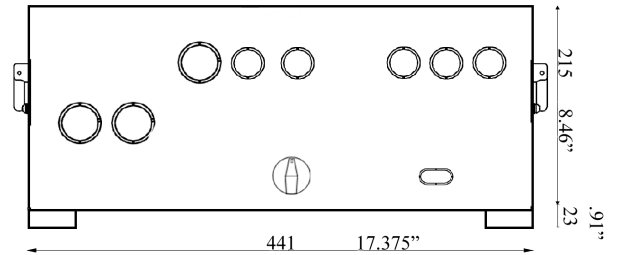
Connections	120/240V split phase
Continuous AC power on Solar or Battery	9000W 37.5A L-L (240V) 4800W 40A L-N (120V)
Surge AC power 5sec	20,000VA L-L (240V) 10,000VA L-N (120V)
Frequency	60/50Hz
Continuous AC power with Grid or Generator	12000W 50A L-L (240V) 6000W 50A L-N (120V)
CEC Efficiency	96.5% (Peak 97.5%)
Idle Consumption typical – no load	60W
Sell back power modes	Limited to Household or Full Grid-Tied
Design (DC to AC)	Transformerless DC
Response Time (Grid-Tied to Off-Grid)	4ms
Power Factor	+0.9 - 1.0

Battery (optional)

Type	Lead-Acid or Li-Ion
Nominal DC Input	48V
Capacity	90 – 2000Ah
Voltage Range	41.0 – 59.0V
Continuous Battery charging output	190A
Charging curve	3-stage w/ equalization
Grid to Battery Charging Efficiency	96.0%
External temperature sensor	included
Current shunt for accurate % SOC	integrated
External Generator Start based on voltage or % SOC	integrated
Communication to Lithium battery	CanBus & RS485

General

Dimensions (H x W x D)	28.0" x 17.375" x 9.37"
Weight	75 lbs
Enclosure	NEMA type 1 (Indoor Use)
Ambient Temperature (4 variable speed fans)	-25 to 55C, >45C derating
Display	Color touch screen
Wi-Fi Communication (monitoring or SW updates)	integrated
Snap on sensors for limited selling to Household	included
Standard Warranty	5 years
Optional Extended Warranty	10 years



Protection & Certifications

Electronics certified safety by SGS labs to NEC & UL specs – NEC 690.4B & NEC 705.4/6	Yes
Grid Sell Back – UL1741-2010/2018, IEEE1547a-2003/2014, FCC 15 class B, (April 2019: UL1741SA, CA Rule 21, HECO Rule 14H)	Yes
PV DC disconnect switch – NEC 240.15	integrated
Ground Fault Detection – NEC 690.5	integrated
PV rapid shutdown control – NEC 690.12	integrated
PV Arc Fault detection – NEC 690.11/ UL1699B	integrated
PV input lightning protection	integrated
AC input/output 50A breakers	integrated
Battery overcurrent fuse	integrated
User wiring enclosure w/ 3/4" & 1" knock-outs	integrated
Solar Flare/EMP Hardened to 2015 MIL-STD-461G (Independently tested June 2018)	optional