



LIONENERGY™

POWERSave™
LITHIUM ENERGY STORAGE SYSTEM

**PS2 CABINET SERIES
PRODUCT DATA SHEET**

ENERGY CONTROL & SAVINGS

LIONESS™

ENERGY MANAGEMENT SYSTEM (EMS)

ENERGY SOFTWARE includes built in 24/7 cloud-based energy management monitoring & control

BACK UP POWER-RESILIENCY support for critical loads support in the event of short or long term power outages and costly downtimes

PEAK DEMAND- ENERGY MANAGEMENT

- Time of use energy shift arbitrage
- Peak Shaving Modulation



FEATURES

APPLICATIONS include indoor & outdoor COMMERCIAL, INDUSTRIAL, MUNICIPALITY, UTILITIES, CRITICAL INFRASTRUCTURE & EV CHARGE STATIONS

SCALABLE- ALL IN ONE DESIGN and Multiple Power and Capacity ranges available. Select from 30KW, 60KW & 90KW PCS Inverter Power and 101KWh to 187KWh Battery Capacity

HYBRID DC to DC SOLAR COUPLING with optional built in MPPT hybrid controllers to use in place of AC solar coupled system

SAFE & LONG-LIFE CYCLE BATTERIES

LFP (Lithium Iron Phosphate) Batteries offering low thermal runaway, high storage density and long shelf life

FIRE & SAFETY with Clean Agent Fire Suppression, Cross Zoned Smoke and Gas detection. HVAC Thermal Management Meets the requirements of UL9540 and NFPA855

COMPLIANCE: meets the requirements of UL9540, UL9541, UL1741, & NPPA855

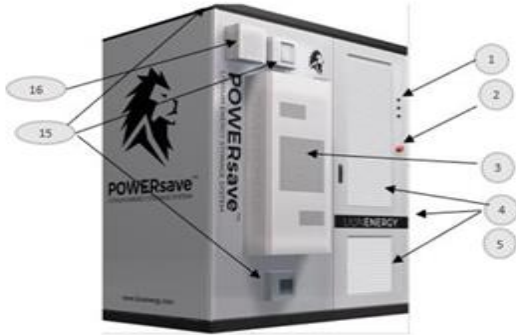
WARRANTY & SUPPORT includes 10-Years System & Controls & long cycle & low battery degradation 6000 cycles warranty

www.lionenergy.com | 385.375.8191

735 S. Auto Mall Drive, Suite 200 | American Fork, UT 84003

POWERsave™

LITHIUM ENERGY STORAGE SYSTEM



EQUIPMENT & OPTIONS

- 1- INDICATOR LIGHTS
- 2- EMERGENCY STOP
- 3- HVAC UNIT/THERMAL MANAGEMENT
- 4- AIR INLET
- 5- AIR OUTLET
- 6- 30KW PCS INVERTER(up to 3 as shown)
- 7- BATTERY MODULES/RACKS (up to 13 racks
190KWh capacity depending on sub model)
- 8- GATEWAY CONTROLLER
- 9- PDU/BATTERY HIGH VOLTAGE CONTROLLER

- 10- DC TO DC SOLAR CONTROLLER (45KW rating) up to 3 each per cabinet (optional equipment)
- 11- ATS (automatic transfer switch)(100KW rating) (optional equipment)
- 12a- Grid Side Circuit Breaker
- 12b- Load Side Circuit Breaker
- 12c- PCS side Circuit Breaker
- 13- Not shown Fire Suppression & Detection (optional equipment)
- 14- Not shown External Isolation/Step Transformer (optional equipment)
- 15- Pressure/Venting Deflagration (optional equipment)
- 16- Safety Alarm Signal

PS2 MODEL	POWER KW (1 INVERTER)	BATTERY CAPACITY (KWH)	# of BATTERY MODULES
003007	30KW	101KWh	7 (MINIMUM QTY)
003008	30KW	115KWh	8
003009	30KW	130KWh	9
003010	30KW	144KWh	10
003011	30KW	158KWh	11
003012	30KW	173KWh	12
003013	30KW	187KWh	13

PS2 MODEL	POWER KW (2 INVERTER)	BATTERY CAPACITY (KWH)	# of BATTERY MODULES
006007	60KW	101KWh	7 (MINIMUM QTY)
006008	60KW	115KWh	8
006009	60KW	130KWh	9
006010	60KW	144KWh	10
006011	60KW	158KWh	11
006012	60KW	173KWh	12
006013	60KW	187KWh	13

PS2 MODEL	POWER KW (3 INVERTER)	BATTERY CAPACITY (KWH)	# of BATTERY MODULES
009007	90KW	101KWh	7 (MINIMUM QTY)
009008	90KW	115KWh	8
009009	90KW	130KWh	9
009010	90KW	144KWh	10
009011	90KW	158KWh	11
009012	90KW	173KWh	12
009013	90KW	187KWh	13

OPTIONAL EQUIPMENT (add one or more suffixes listed to above main model)			
1 pc (45KW DC Solar Controller)	2 pc (45KW DC Solar Controller)	1 pc (SEL/PMU Grid Isolation Controller)	Built In Fire Suppression System
-1	-2	-3	-4
Example: 009007-2-3-4 (main system 90KW/100KWH with 2 each 45KW DC Solar Controllers & SEL/PMU Controller)			

GENERAL SPECIFICATIONS	
DIMENSIONS-ENCLOSURE BESS Cabinet	82.68" L x 51.20" W x 96.46" H (2100mm x 1300mm x 2450mm)
Approx Assembled Main Cabinet WEIGHT (Reference Only)	5188 lbs. (2353KG) Approximate 5882 lbs. (2668KG) actual may vary 6576 lbs. (2983KG) actual may vary
ENCLOSURE RATING	IP54/NEMA3R Indoor/Outdoor. C3 Corrosion Resistant with higher levels available
OPERATING TEMPERATURE	(-20F) to (122F) (-20C to 50C). Derated Performance at 60C
MAX ELEVATION	3000m/10,000ft
COOLING/HVAC	5KW built in Forced Air Cooling (Power Electronics) for Battery System & Controls
INSTALLATION/MOUNTING	Indoor/Outdoor rated. Above Ground Only, Concrete Pad Mount, Free Space minimum 3 ft. all sides and top. Reference manf. Installation manuals
PARALLEL AC & Solar DC Connectivity	Up to 2 POWERsave BESS Cabinets allowed interconnected or to separate load panels (preferred) (Consult Manf. For info)
SAFETY/PROTECTION SYSTEMS	
BATTERY MANAGEMENT SYSTEM (Included)	BMS (Battery Protection System)- Overcharge, Undercharge, Over Temp, Under Temp
OVER CURRENT PROTECTION (Included)	Main Breaker-AC Input (Rated Current 150A, Rated Voltage: 600Y/347V, Rated OCP 150A, Rated Instantaneous Short Circuit 1500A, Rated Uninterrupted Current:225A
SMOKE DETECTION (Included)	Built In cross zoned smoke & heat detection module & controls
BATTERY GAS DETECTION (Included)	Lion Tamer H2 gas detection system (Battery Compartment)
FIRE SUPPRESSION (Optional)	Optional 3M NOVEC 1230 Clean Agent pressurized built in total flooded cabinet suppression or water suppression sprinkler Contact Lion Energy for specifications and details
COMPLIANCE	
BATTERIES	UL9540A (LFP Batteries System Level)
MAIN BESS SYSTEM	UL9540 (System Level)
PCS INVERTERS	UL1741SB-CRD (PCS Inverters) California CEC, SUNSPEC IEEE2030.5 CSIP
GENERAL	Meets requirements of NFPA855 & NFPA2002 Battery Energy Storage Systems
BATTERIES	
TYPE	(LFP) Lithium Iron Phosphate
CELL	280Ah/3.2VDC (Nominal)Hard Aluminum Enclosure/Safety Venting
MODULE PACK	1P16S/51.2VDC/14.4KWh (Nominal)
RACK QTY (Total KWh Capacity)	Capacity depends on model size and option selected (Example: 100KWH, 145KWH, 190KWH)
CHARGE CURRENT/TEMP up to 90% DOD	CHARGE: Rated 0.5C, Max 1C Charge--- TEMP CHARGE: 32F-132F(0-50C)
DISCHARGE CURRENT/TEMP up to 90% DOD	DISCHARGE: Rated 0.5C, Max 1C Charge--- TEMP DISCHARGE: -4F-122F(-20-55C)
SAFETY/PROTECTION	BMS(Battery Protection System)- Overcharge/Undercharge, Over Temp/Under Temp
CYCLE LIFE rated up to 90% DOD	6000 R/T Cycles at 90% DOD at 70% retention (longer cycles depending on DOD and cycle rate)
CERTIFICATIONS/STANDARDS	Meets the requirements of UL9540A system level Thermal Runaway compliance
PDU Master Controller	Main Battery System DC Interface Controller

POWER CONTROL UNIT/INVERTER (Specification for each 30KW PCS Inverter)	
CAPABILITY/POWER	30KW each Inverter/PCS with up to max of 3 (90KW max)per Cabinet
GENERAL SPECIFICATIONS (each 30KW PCS Inverter)	*DIMENSIONS: 440 x 173 x 596mm WEIGHT: 33kg TEMP: -40C-60C *Forced Air Cooling/TEMP Range: -30C-60C/IP20 Rating/Non Isolation *CERTS: UL1741SB (CRD), IEE1547.1-2020
COMMUNICATION PORT	CAN/RS485/Ethernet/Wi-Fi, SUNSPEC IEE2030.5 (CSIP)
COMPLIANCE/LISTINGS/CERTIFICATION	UL9540,UL1741SB (CRD), CA Rule 21, IEE1547
BATTERY SIDE	*CHARGE-DISCHARGE VOLTAGE RANGE: 150V-750V(350V-750V @ full load) *RATED POWER:30KW/MAX POWER: 33KW * MAX CHARGE-DISCHARGE CURRENT: 90A *OVER VOLTAGE-OVER CURRENT PROTECTION: Software and DC Fuse
DC BUS SIDE	RATED POWER: 45kw, IN/OUT VOLTAGE RANGE: 700Vdc-830VDC, MAX INPUT CURRENT: 32.5A*2
AC GRID TIED OUTPUT	*RATED OUTPUT POWER:30KW-40A/MAX APPARENT POWER: 33KVA/MAX ACTIVE POWER:33KW-44A *RATED GRID VOLTAGE: 3/PE, 480VAC/POWER FACTOR: 0.8-1 (lead or lag) thdl (<3%)
AC OFF GRID OUTPUT	*RATED OUTPUT POWER:30KW-40A/MAX APPARENT POWER: 33KVA/MAX ACTIVE POWER:33KW-44A *RATED GRID VOLTAGE: 3-PE, 480VAC/POWER FACTOR: 0.8-1 (lead or lag) *OVERLOAD CAPACITY: 110-120%-10 min,120%-150% 200ms
PROTECTION (Other)	Overcurrent, Overload, Short Circuit, OTP, AC OVP/UVP, OFP/UFP,EPO, AC Phase Reverse, Fan/Relay Failure, OLP, DC GFDI, Anti Islanding
Main BESS Cabinet AC POWER (Electrical Requirements)	
AC INPUT Voltage	480V 3 Phase "WYE" (4 wire) 150A
AC OUTPUT Voltage at PCS Inverter	480V 3 Phase "WYE" (4 wire) 150A
ISOLATION & STEP UP/DOWN TRANSFORMER (External when required)	Connected externally between Battery Storage Unit (BESS) & AC Loads as required. Isolation Transformer must be rated for BESS PCS Inverter rated KVA, bi-directional type with primary voltage and secondary as specified
PEAK EFFICIENCY	97.3% (CEC)
SOLAR-DC -DC CONTROLLER (optional)	
TYPE	MPPT type-Bi-Directional Hybrid DC Converter- High Power Conversion- Rack Mount
POWER LEVEL	45KW (Nominal)
SOLAR PV Side & INPUT	*Max Input Voltage: 1100VDC (830VDC when working with 30KW PCS Inverter) *Rated Input Voltage: 600VDC, Start-Up Voltage 250VDC *MPPT Voltage Range: 250-960VDC (810VDC when working with 30KW PCS Inverter) *Number of MPPT per controller=3, Number of Strings per MPPT= 2 (Total 6 strings) *Max Input Current each MPPT= 32A per MPPT total controller 96A
DC BUS Side (Output)	*Max Output Voltage: 830VDC/ Working Voltage Range: 600V-830VDC/ Rated Voltage 700VDC * Max Working Current: 75A/Rated Current: 65A
PROTECTION	PV Reverse/Insulation Impedance/PV Slide Switch/Temperature/DC Arc/PID Repairment/PV SPD/BUS SPD
GENERAL SPECIFICATIONS	*COMMUNICATION: RS485/PV TERMINAL: MC4/DISPLAY: Led/NOISE: <65dB
THERMAL PROTECTION	
Cooling (Cabinet system)	5KW built in Forced Air Heating Cooling for Battery System & Controls (16-38C)
POWERsave SEL/PMU GRID ISOLATION CONTROLLER (External Mounted Enclosure)	
MAJOR COMPONENTS	SEL751 Relay, 3 phase NO Isolation Contactor, PMU/CT's (reference manf. Specifications)
ENCLOSURE (Indoor or Outdoor mounting)	NEMA3R 48" x 36" x 12" Steel Hinge Style Wall Mount .Reference manf. specifications and each BESS tied system for specific details or additional sizes
AC POWER RATING (3 Phase Isolation Contactor)	Available grid support contactor ratings 100A to 1500A (280Y, 480VAC, 240VAC)
EMS-OPERATING SYSTEMS	
LIONESS- ENERGY MANAGEMENT SYSTEM	Built In controller with cloud based programmable Energy Management System. Reference manf specifications
COMMUNICATION	Port: CAN/RS485/ETHERNET Protocol: Modbus TCP/RTU/IEC104 Requires customer at site Internet