



LIION ENERGY™

POWERSave™ LITHIUM ENERGY STORAGE SYSTEM

LARGE ENCLOSURE SERIES



ENERGY CONTROL & SAVINGS

ENERGY EMS SOFTWARE offering multiple system and electrical loads 24/7 control and monitoring built-in energy management system

- Auto Transition Off-Grid/On-Grid Back Up Power Support of critical loads during utility outages
- Time Of Use- Energy Shift
- Peak Shaving Modulation
- Frequency & Voltage Regulation
- DER & Utility Load Management Integration that includes IEE2030.5 Utility/DER Interface to meet specific requirements

- BMS & Safety Systems control and detection integration

INVERTER/POWER CONVERSION Cabinet

- Bi-directional charge/discharge 3 phase power control
- Grid following (on-grid) & grid forming(off-grid) phase match dynamic features offering high efficiency, collection, storage & energy distribution
- Offered in multiple power sizes and modules 215KW -1.72MW

SAFE & LONG-LIFE CYCLE BATTERIES

- LFP (Lithium Iron Phosphate) Batteries offering low thermal runaway, reduced degradation, high storage density and long shelf life is
- Built In Battery Module Point of Contact Liquid Thermal Cooling/Heating for safety and improved performance
- UL9540A certified

KEY FEATURES

APPLICATIONS include UTILITY, SUB- STATIONS. OFF-GRID, COMMERCIAL, INDUSTRIAL, MUNICIPALITY, UTILITIES, EV CHARGE STATIONS, CRITICAL INFRASTRUCTURE

SCALABLE- ALL IN ONE 20ft. Low profile main BESS design

PCS INVERTERS FOR GRID TIED AND UTILITY DER SYSTEMS

- PSC1250 (802KW @ 480VAC Grid and Loads) (1152KW @ 690VAC)
- PSC2500 (1603KW @ 480VAC Grid and Loads) (2304KW @ 690VAC)
- Bi-directional charge/discharge 3 phase power control

LFP BATTERY SYSTEMS TO MEET SHORT OR LONG TERM DURATION

- 344KWH Battery Racks up to 10 each per Large Enclosure
- Offers capacity ranges 344KWH up to 3.44MWH
- Built in Liquid Cooling Thermo System

FIRE & SAFETY: Built in Cross Zoned Smoke and Gas Detection. HVAC Thermal Management & Clean Agent 3M Novec Fire Suppression

COMPLIANCE: meets the requirements of UL9540, UL9540A, UL1741, & NPPA855

WARRANTY & SUPPORT includes 10-Years System & Controls PLUS 10-years or 6000 cycles on LFP Batteries system

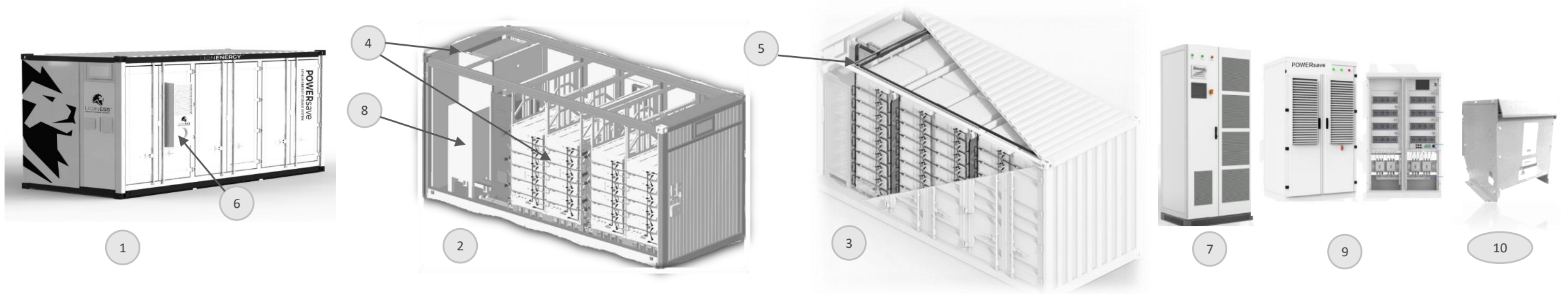
HYBRID DC to DC SOLAR COUPLING (optional equipment) ranging from 250KW-750KW built in MPPT controllers to use in place of AC solar coupled systems when applicable. Provides use of solar panel energy if off-grid where AC solar may not

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POWERsave™

LITHIUM ENERGY STORAGE SYSTEM



EQUIPMENT IDENTIFICATION

(Examples as reference)

1- PSE-20 Enclosure External View

2- Low to Medium Capacity Models

3- Large Capacity Models

4- LIQUID COOLING/HEATING SYSTEM

- Main Pump/Controller
- Liquid Lines and Connections to each Battery Module
- Note: Liquid cooling/heating plates built into battery modules
- Included on all models PSE-20, PSE-30, PSE-40

5- CLEAN AGENT PRESSURIZED FIRE SYSTEM/ SMOKE DETECTION/H2 DETECTION

- Suppression system pipe/nozzles/sensors
- Master controller & Fire Suppression Agent storage
- Included on all models PSE-20, PSE-30, PSE-40

6- HVAC- Main Enclosure

7- PCS/INVERTER

- Can be installed inside main enclosure PSE-20 model and NEMA54 Outdoor rated PSE-30 and PSE-40
- Power ranges 100KW to 1MW and up to 2 units per system

8- DC MASTER CONTROL CENTER

- DC BUS batteries/BMS Master

9- DC TO DC CONTROLLER

- Optional Equipment
- Inside main enclosure PSE-20 model
- Outside main enclosure PSE30 and PSE40 models

10- ISOLATION/STEP Voltage TRANSFORMER

- Outside main enclosure PSE20, PSE-30 and PSE40 models

11- Not shown, customized NEMA54 Outdoor Power Control Cabinet Enclosure when needed to house above equipment

GENERAL SPECIFICATIONS- MAIN BESS SYSTEM ENCLOSURE	
DIMENSIONS- MAIN BESS ENCLOSURE (only) does not include external PCS, DC to DC or other Cabinets that may be included with main enclosure	MODEL PSE20: 238.5" L x 96" W x 114" H (606 x 244x 289.50cm)
WEIGHT- MAIN BESS ENCLOSURE (reference subject to final system variables) does not include external PCS, DC to DC or other Cabinets that may be included with main enclosure	MODEL PSE20: 25,000-45,000 lbs. depending on battery capacity level (11340kg-20412kg)
ENCLOSURE RATING	IP54/NEMA3R Indoor/Outdoor
OPERATING TEMPERATURE	-20F to 122F (-20C to 50C)
MAX ELEVATION	3000m/10,000ft
COOLING/HVAC	Built in Forced Air Cooling (Power Electronics) for Battery System & Controls
COMPLIANCE (System)	UL9540, Meets Requirements NFPA855
INSTALLATION/MOUNTING	Above Ground Only, Concrete Pad Mount, Free Space, 3 ft. Wall Offset
PARALLEL AC Load Connectivity	Mutiple individual POWERSave Systems can be interconnected to AC loads as single parallel configuration system (Consult Manf. For info)
SAFETY	Built in Fire and Detection, BMS, Safety E-Stop, Visual Alarm Strobe, Built in Electrical Protection as listed each section
BATTERIES	
SPECIFICATIONS	TYPE: (LFP) Lithium Iron Phosphate
	CELL: 280Ah/3.2VDC (Nominal)Hard Aluminum Enclosure/Safety Venting
	MODULE PACK: 1P48S/153.6VDC/43KWh
	RACK: 1P8S/1228.8VDC/344KWh (1 to 10 racks depending on system)
	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 Thermal Runaway Testing, UL1973, UN38.3	
THERMAL MANAGEMENT/LIQUID COOLING SYSTEM	
LIQUID COOLING SYSTEM	AC POWER: 480VAC, 3 PHASE 50/60 HZ REFRIGERATION CAPACITY: 40KW/ HEATING CAPACITY: 16KW
SAFETY- FIRE SUPPRESSION & DETECTION/PRESSURE DEFLAGRATION (contact manf. for additional specs)	
FIRE SUPPRESSION	3M NOVEC 1230 Clean Agent pressurized built in overhead total flooded system, Fire Control Panel Interface
SMOKE DETECTION	Cross Zoned overhead mount
BATTERY GAS DETECTION (Early Warning Monitering & Alarm)	Cross Zoned H2/ H2s sensors
PRESSURE VENTING/DEFLAGRATION	Included(meets NFPA855 requirements)

POWERsave- Dynapower CPS1250 POWER CONTROL UNIT/INVERTER CABINETS	
KEY FEATURES	Dynamic Transfer (Millisecond Transition On Grid Following to Off-Grid Forming)
	Islanded Operation (UF Mode)
	Black Start (In-Rush Current Handling in UF Mode)
	Frequency Compensation Mode (F-Comp), VAR Compensation Mode (E-Comp), AC Current Limiting
	LVRT with Active Current Injection, Multiple Parallel Inverter Microgrid Mode
DIMENSIONS	49.0" L x 43.3" W x 79.72" H (1244.6 x 1099.8 x 2024.8mm)
WEIGHT	1980 LBS (898KG)
ENCLOSURE RATING	NEMA 3R/IP54 OUTDOOR
OPERATIONAL TEMP RANGE/HUMIDITY	(-30C to 60C and >45C derating) (-22F to 140F and >113F derating)
STORAGE TEMP RANGE	(-40C to 70C) (-40F to 158F)
COOLING	Forced Air. Controls are segregated within enclosure
ALTITUDE	1000 meters (3281 ft full power, 3000 meters (9842.5 ft (derated)
ELECTRICAL/INVERTER RATINGS (INPUT DC) from BESS Battery Source	
OPERATING VOLTAGE RANGE	VDC (697-1500) required for 802KW 480VAC system / VDC (998-1500) required for 1152KW 690VAC system
MINIMUM VOLTAGE FOR FULL ACTIVE POWER (V)	697VDC for 480VAC system / 998VDC for 690VAC system
DC POWER (KW)	813KW for 480VAC system / 1157KW for 690VAC system
MAX VOLTAGE (V)	1500VDC
CONTINUOUS CURRENT (A)	1165 Amps for 480VAC system / 1169 Amps for 690VAC system
OVERLOAD CONTINUOUS CURRENT (A)	1404 Amps
VOLTAGE RIPPLE (%)/CURRENT RIPPLE	1%/<5% for rated current 2% typical
PEAK EFFICIENCY	98.60 @1500VDC & 98.70 @1280VDC
ELECTRICAL/INVERTER RATINGS (OUTPUT AC) Supports both 480VAC 3P and 690VAC 3P output to transformer	
CONTINUOUS AC POWER (KW)	Line Voltage at (480VAC 3P)= 802KW Line Voltage at (690VAC 3P)=1152KW
LINE FREQUENCY (HZ)	60 HZ
CONTINUOUS AC CURRENT (A)	964 Amps
OVERLOAD AC CURRENT (A)	1157 Amps
POWER EFFICIENCY	Four Quadrant
HARDWARE PROTECTION	AC Breaker with Shunt Trip, AC Surge Protection, DC Input Fuses, DC Pre-Charge
SOFTWARE PROTECTION	Battery Voltage & Current Curtail Limits (Battery Protection), AC Current Limiting Pending, DC Over/Under Voltage, Over Current Faults, AC Over/Under Voltage, Over/Under Frequency, Over Current Faults, Anti Islanding Protection (Open Phase at Inverter Terminal), Temperature Monitoring & Protective Power Curtailment
CERTIFICATIONS & STANDARDS COMPLIANCE	UL1741SB, IEEE1547, CSA 22.2 #107.1, IEEE 519

POWERsave- Dynapower DPS500 DC to DC Solar Controller Cabinet	
KEY FEATURES	Use in Off Grid with BESS systems and ON-Grid BESS and AC coupled systems
	Reduce Installation Costs DC Coupled Architecture
	Clipping Recapture, Low Voltage Harvesting, Curtailment Recapture
	Energy Time Shifting, Ramp Rate Control
DIMENSIONS	33.5" L x 39.4" W x 80.5" H (850.9 x 1000.8 x 2044.7mm)
WEIGHT	1300 LBS (589.7KG)
ENCLOSURE RATING	NEMA 3R/IP54 OUTDOOR
OPERATIONAL TEMP RANGE	(-25C to 55C) (-13F to 131F)
COOLING	Forced Air. Controls are segregated within enclosure
ALTITUDE	1000 meters (3281 ft full power, 3000 meters (9842.5 ft (derated)
CABLE CONNECTIONS	SIDE OR BOTTOM ENTRY
ELECTRICAL RATINGS	
DC INPUT VOLTAGE RANGE (BATTERY PORT DC BUSS)	100-1500VDC
DC INPUT VOLTAGE RANGE (SOLAR PV PORT DC BUSS)	100-1500VDC
MAX POWER RATING	500KW @ 1000VDC 600KW@1200-1500VDC
MAX CURRENT RATING	(+/-)500A DC
MAXIMUM EFFICIENCY	99%
MAXIMUM EFFICIENCY	98%
AUX/CONTROLS POWER	CUSTOMER SUPPLIED 120VAC/60HZ 1KVA SERVICE
CERTIFICATIONS & STANDARDS COMPLIANCE	UL1741, CSA C22.2 #107.1, UL/IEC 62109-1, IEC/EN61000-6-4 and 6-2, CISPR 11/EN55011, IEEE Std C37.90.2, FCC Part 15- Class A
HARDWARE PROTECTIONS	DC Contactor & Precharge on Battery Port
SOFTWARE PROTECTIONS	DC Over Voltage & Under Voltage, DC Over Current, Over Temperature, Fuse Monitoring
USER INTERFACE	
REMOTE COMMUNICATIONS	Modbus TCP/IP
LOCAL INDICATORS	LAMPS ON FRONT PANEL indicating operating mode, alarm/fault status