
SMARTSUN™
ENERGY
BATTERY ENERGY
STORAGE SYSTEMS
SMARTSUN
ENERGY

SMARTSUN™ ENERGY

## **QUALITY & INNOVATION** AWARD


The SmartSun Energy brand was honored with the **Quality & Innovation award** during the gala of the 4th edition of Solar Energy Expo 2025 in Warsaw, **the largest renewable energy fair in Poland.**

solarenergy expo


# FLEXIBLE **ENERGY STORAGE** SYSTEMS

SMARTSUN™ ENERGY

**UTILITY** SCALE STORAGE SYSTEM

BESS **3420-20H** | BESS **5000-20H**

**ALL-IN-ONE** STORAGE SYSTEM

AIO **230-L** | AIO **261-L**

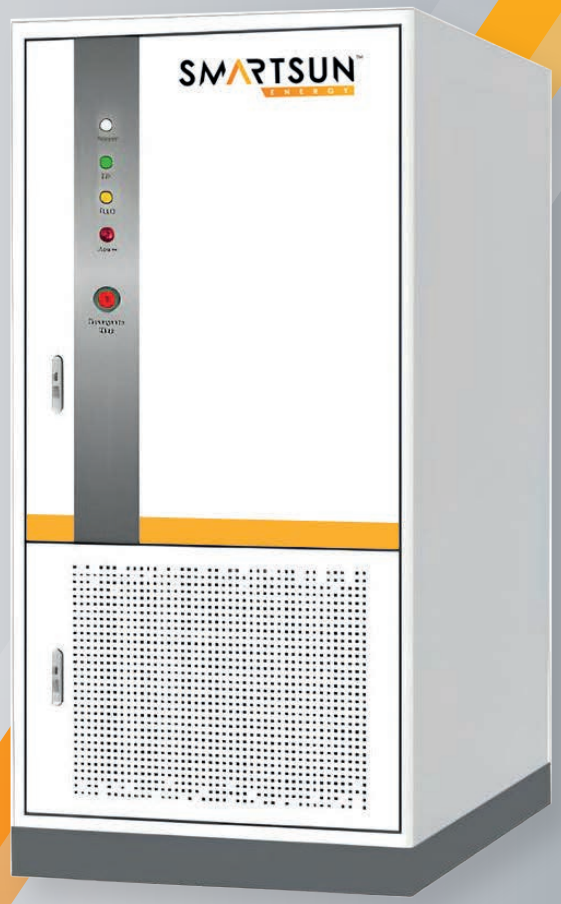

| | | | |
|---|---|---|---|
| An intelligent design integrating power distribution, air conditioning, lighting, and fire suppression systems. | Advanced battery life management system | Hierarchical BMS with multi-level control and protection | Customized modular design for flexibility and reliability |

SMARTSUN™
ENERGY

# ALL-IN-ONE STORAGE SYSTEM

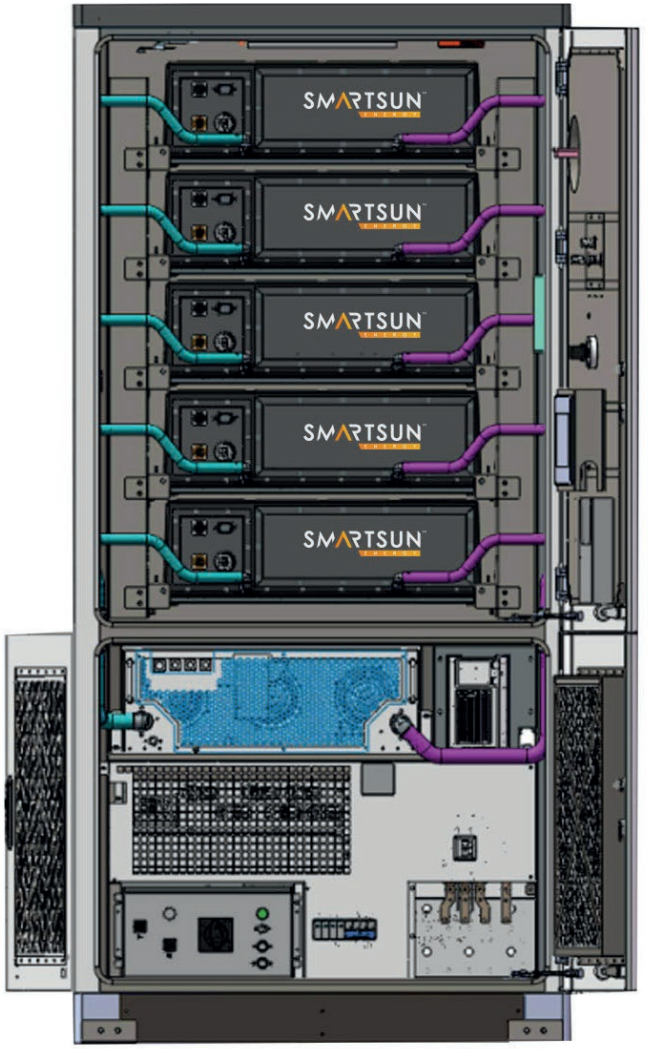
POWER CONVERSION SYSTEM (PCS)

BATTERY MODULE: 261 kWh (PACK)



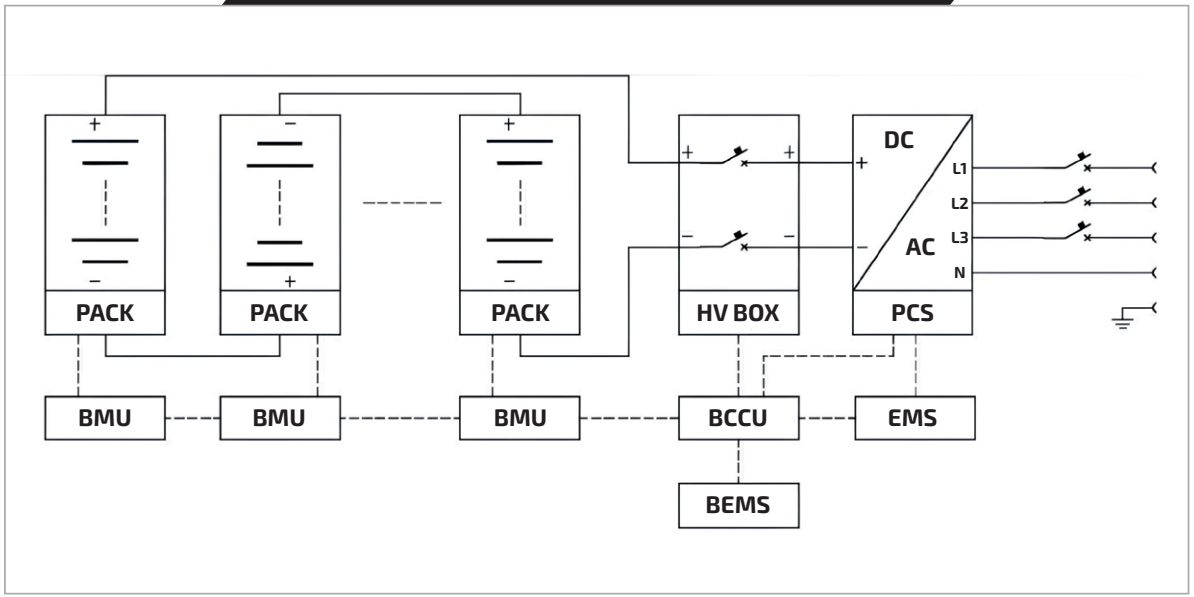
## ADVANTAGES

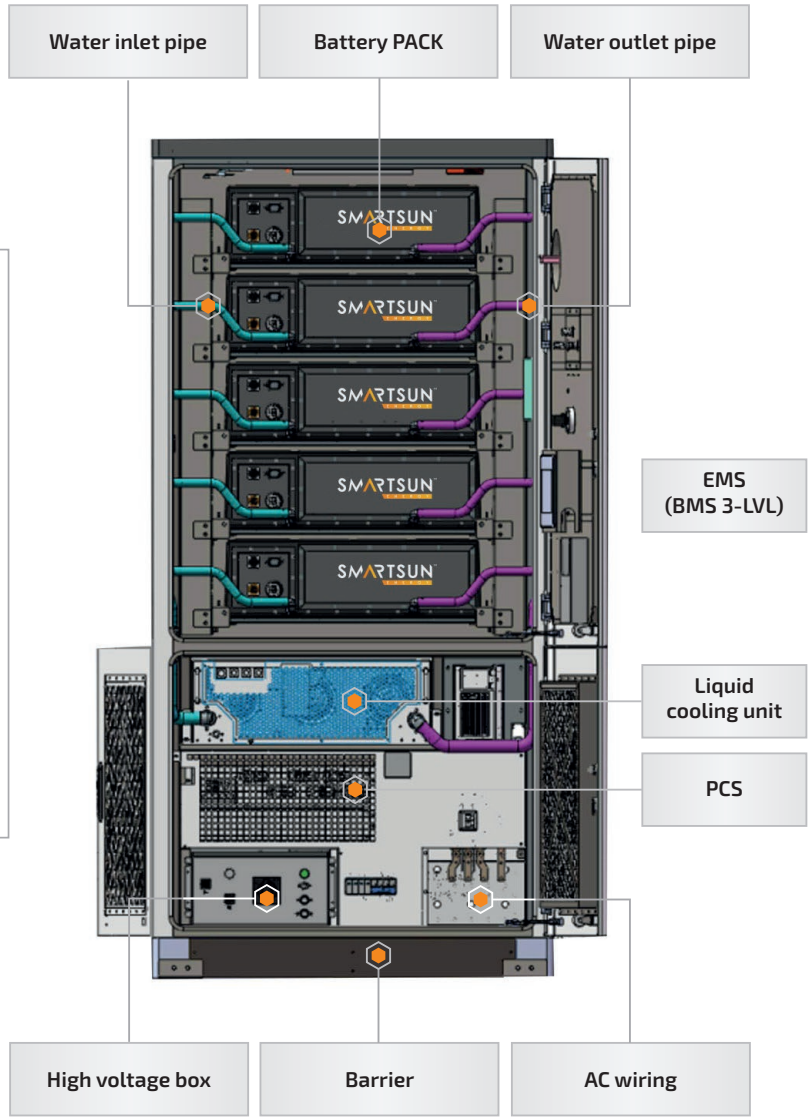
- **All-in-one design** integrating PCS minimizes transportation and installation costs; flexible multi-unit expansion.
- **Intelligent monitoring** and coordinated response ensure system security; **thermal/smoke** sensors enable rapid passive fire suppression of thermal runaway.
- **Non-uniform** flow channel design minimizes cell temperature differentials; multi-mode liquid cooling control optimizes system power consumption.
- Flexible multi-unit expansion allows connection of **up to 10 systems** in parallel (on-grid).
- Efficient air & liquid cooling with **automatic refill** ensures stable, trouble-free performance.
- Engineered with a **C4-rated design** for superior resistance to corrosion in demanding industrial conditions.



SMARTSUN ENERGY

## MAIN CIRCUIT TOPOLOGY



# **AIO** 261 kWh | TECHNICAL **DATA**

SMARTSUN™ ENERGY

| BATTERY INPUT | |
|---|---|
| Battery model | LFP 3.2 V / 314 Ah |
| Max. charge/discharge power | 0.5 C |
| Configuration of system | 1P260S |
| Number of packs | 5 |
| Nominal energy | 261 kWh |
| Rated voltage | 832 V |
| Nominal voltage range | 741 V - 923 V |
| Cooling method | Liquid cooling |
| Monthly self-discharge rate | ≤3% |

| AC OUTPUT | |
|---|---|
| Rated AC power | 125 kW |
| Rated voltage | 400 Vac |
| AC connection | 3W-N-PE |
| Rated frequency | 50 / 60 Hz±2.5% |
| THDi | (<) 3% |
| Cooling method | Air cooling |
| Overload capacity | 1.1 times (Long-term operation) ≤45°C |

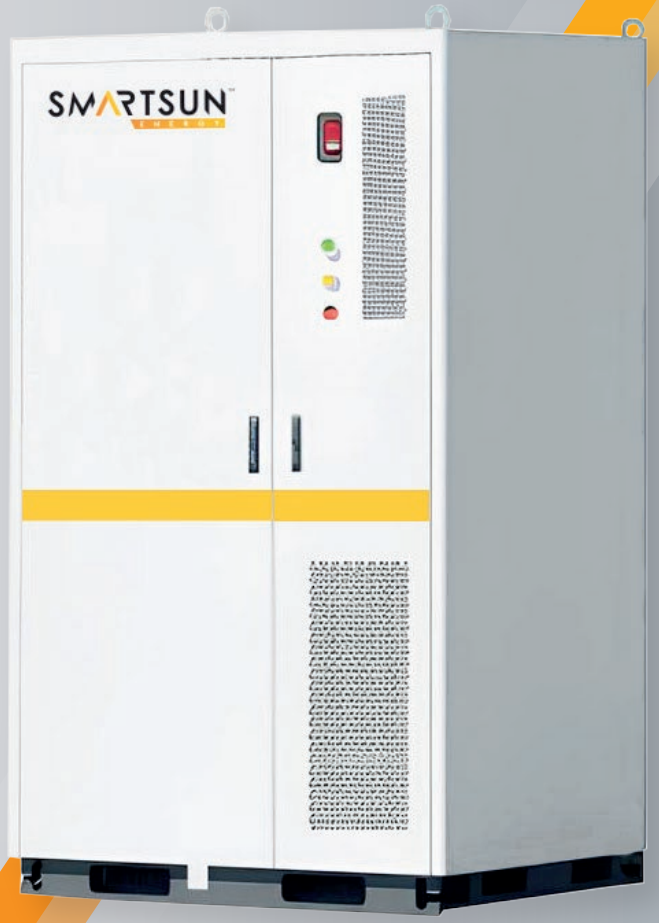
| GENERAL DATA | |
|---|---|
| Operating temperature-charging | Charging: 0°C~ 45°C / discharging: -20°C ~ 50°C |
| Storage temperature | -20°C ~ 50°C (short-term); 10°C ~ 30°C (long-term) |
| Environment humidity | 5% - 95% RH, without condensation |
| Operating altitude | ≤2000m |
| Degree of protection | Battery compartment IP65; Electrical compartment IP55 |
| Communication ports | EMS: RS485, Ethernet/BMS: RS485, CAN, Dry contact |
| Dimensions (W*D*H) | 1000*1350*2400 mm |
| Weight | ~2600 kg |
| Anticorrosion grade | C4 |
| Product certificates | CE, IEC62619:2022, CE-EMC, CE-LVD, MSDS, UN38.3 |
| Warranty | 5 years / ≥8000 cycles |

SMARTSUN™
ENERGY

# ALL-IN-ONE STORAGE SYSTEM

POWER CONVERSION SYSTEM (PCS)

BATTERY MODULE: 230 kWh (PACK)

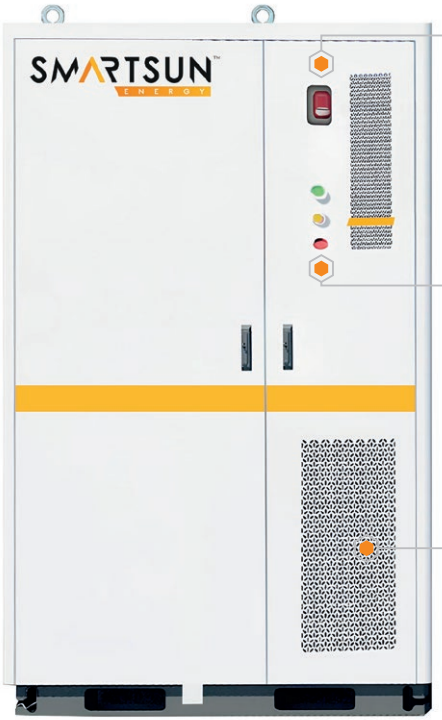


SMARTSUN™ ENERGY

## ADVANTAGES

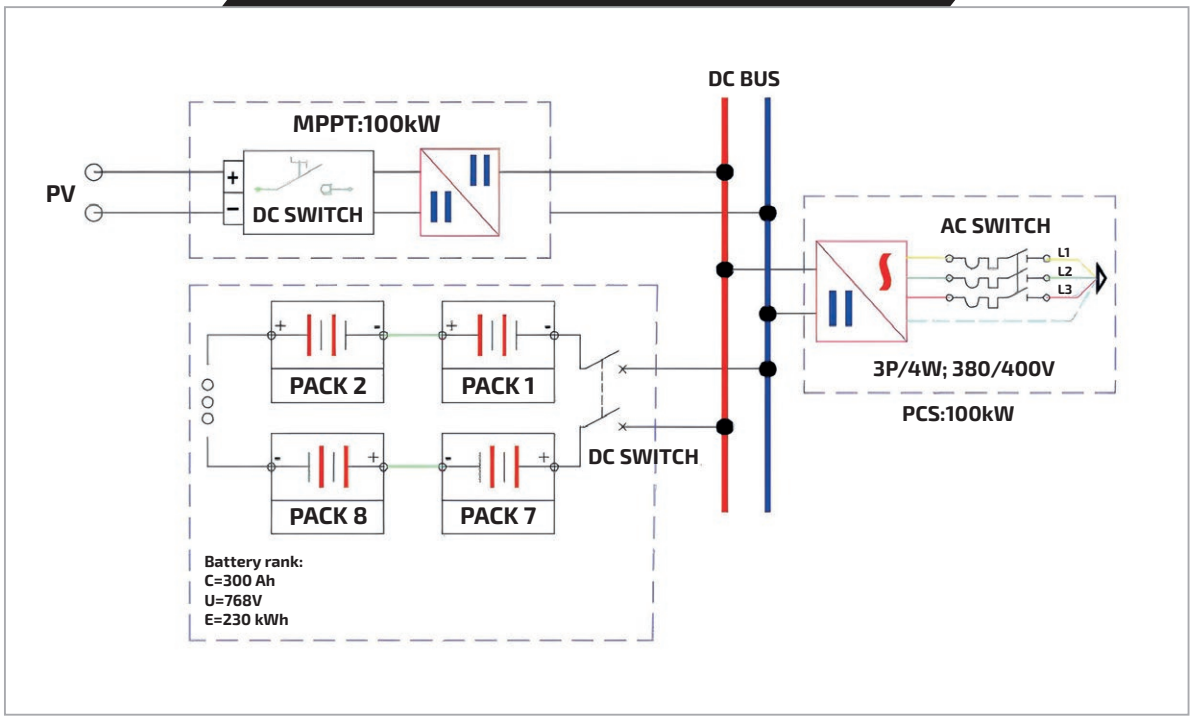
- **All-in-one design** integrating PCS minimizes transportation and installation costs; flexible multi-unit expansion.
- **Intelligent monitoring** and coordinated response ensure system security; **thermal/smoke** sensors enable rapid passive fire suppression of thermal runaway.
- **Non-uniform** flow channel design minimizes cell temperature differentials; multi-mode liquid cooling control optimizes system power consumption.

## ALL-IN-ONE CABINET

SMARTSUN™ ENERGY

## MAIN CIRCUIT TOPOLOGY




# **AIO** 230 kWh | TECHNICAL **DATA**

SMARTSUN™ ENERGY

| PV INTERFACE (OPTIONAL) | 230/PV-L |
|---|---|
| PV input voltage | 300 Vdc - 570 Vdc |
| Max. PV input power | 100 kW |
| Number of PV string | 1 |
| Max. PV input current | 200 A |
| Max. PV open circuit voltage | 600 V |

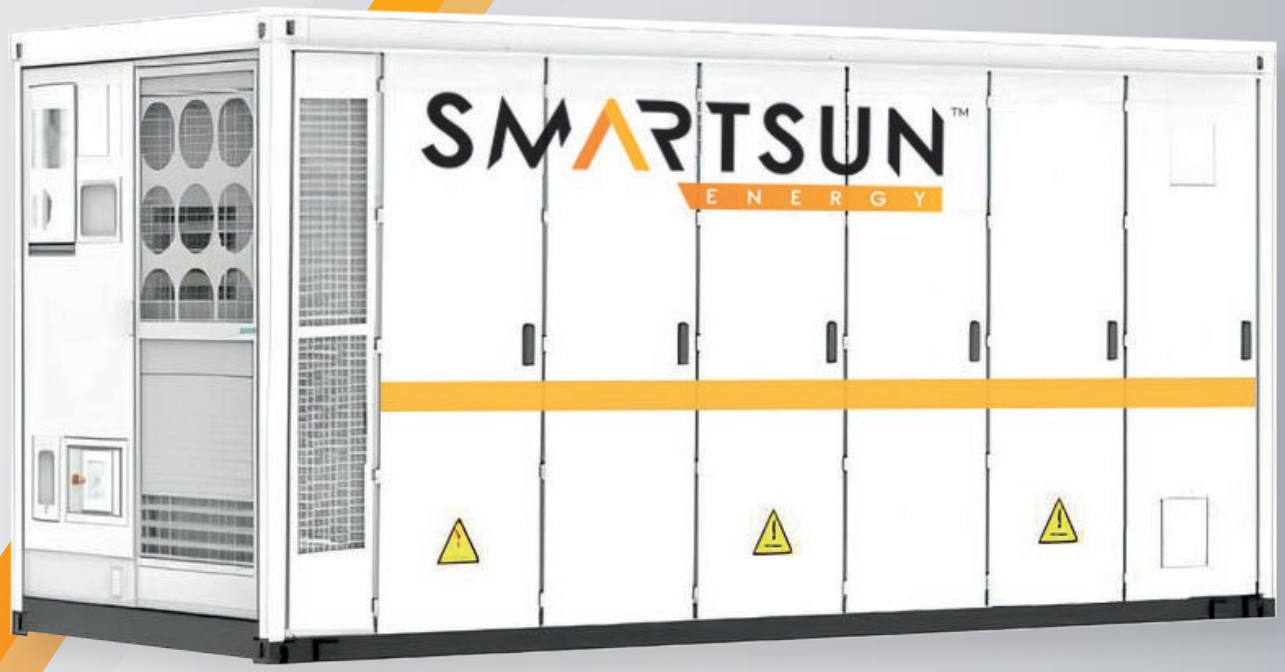
| BATTERY | 230-L & 230/PV-L |
|---|---|
| Cell type | $LiFePO_4$ |
| Cell specification | 3.2 V / 300 Ah |
| System configuration | 3P240S |
| Rated capacity | 230.4 kWh |
| Voltage range | 684 V - 852 V |

| AC OUTPUT (ON-GRID) | 230-L & 230/PV-L |
|---|---|
| Rated output power | 100 kW |
| Rated output current | 140 A |
| AC wiring | 3L/N/PE |
| Grid voltage range | 400 V (-20% ~ 15%) |
| Grid frequency range | 50 Hz / 60 Hz±2.5 Hz |

| AC OUTPUT (OFF-GRID) | 230-L & 230/PV-L |
|---|---|
| AC off-grid voltage | AC 400 V |
| AC voltage Range | AC 400 V±3% |
| AC off-grid frequency | 50 Hz / 60 Hz |
| Load unbalanced capability | 100% |

| GENERAL DATA | 230-L & 230/PV-L |
|---|---|
| Dimensions (W x D x H) | 1320*1280*2370mm |
| Net weight | 2460kg |
| Operating temperature range | -20°C~50°C |
| Working altitude | <2000m |
| Temperature control method | Battery: Liquid Cooling/Electrical Compartment: Air Cooling |
| Product certificates | CE, IEC62619:2022, CE-EMC, CE-LVD, MSDS, UN38.3 |
| Warranty | 5 years / ≥8000 cycles |

SMARTSUN™
ENERGY




# ENERGY STORAGE SYSTEM (ESS)

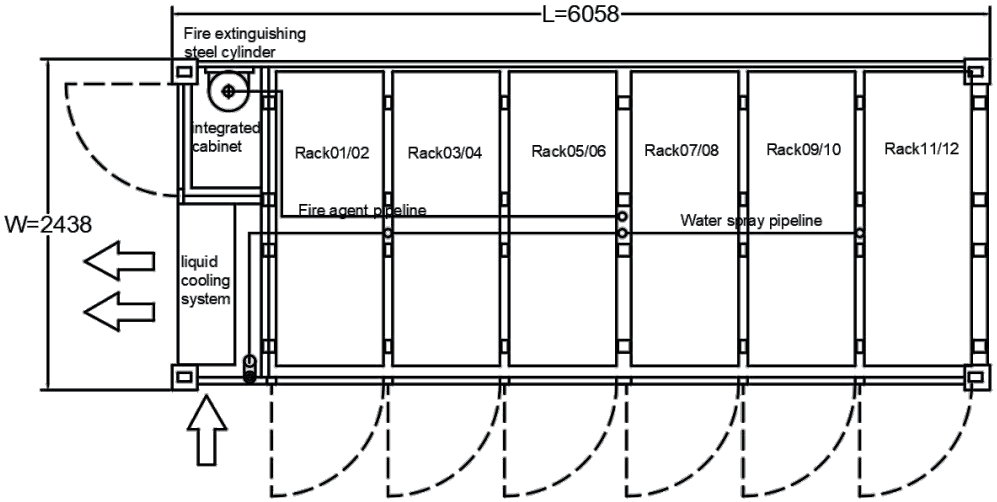
**BATTERY MODULE: 5015.96 kWh (PACK)**

**HVAC + EMS + BMS + FSS**

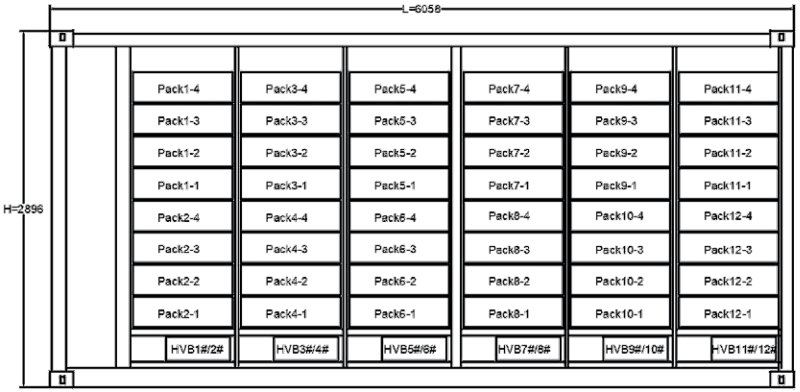
SMARTSUN™ ENERGY

## **5015 kWh** ENERGY SOLAR SYSTEM

## **VERTICAL** VIEW LAYOUT




## **FRONT** VIEW LAYOUT



# **ESS** 5015 kWh | SYSTEM **CONFIGURATION**

SMARTSUN™ ENERGY

| NAME | QUANTITY | SPECIFICATION |
|---|---|---|
| Battery container body | 1 | 20 feet high box; 6058x2438x2896 mm; non-walk-in design; protection level: IP55 |
| Battery system | 1 set | Using 314 Ah lithium iron phosphate battery; The battery container consists of 12 battery racks, each battery rack contains four 1P104S battery packs and one high-voltage box; battery management system included. |
| Temperature control system | 1 set | 60 kW (cooling capacity) liquid cooling unit, liquid cooling pipeline, coolant; 2.0kW (cooling capacity) ambient air conditioner, etc. |
| Fire fighting system | 1 set | PACK level immersion fire protection, gas fire protection, water fire protection, exhaust fan, 1 set of pressure relief device |
| Confluence cabinet | 1 set | DC 1500V; 12 inputs and 2 outputs (6 racks per stack) |

# **ESS** 5015 kWh | BATTERY PACK **PARAMETER**

SMARTSUN™ ENERGY

| NAME | PARAMETER | REMARKS |
|---|---|---|
| Cell capacity | 314 Ah | - |
| Configuration | 1P104S | - |
| Nominal energy | 104.4 kWh | 0.5P, 100% DOD, 25±2°C |
| Nominal voltage | 332.8V | 3.2 x 104 |
| Rated Capacity | 314 Ah | 0.5P, 100% DOD, 25±2°C |
| Voltage range | 291.2~374.4V | (2.8~3.6V) x 104 |
| Charge and discharge rate | ≤0.5C | - |
| Working temperature | 0~55°C (30~60°C) | Charging (discharge) temperature |
| Working humidity | 5% ~ 95% | - |
| Thermal management method | Liquid Refrigerating | - |
| Dimensions (WxDxH) | (785±1.5)x(2192±1.5)x(240±1.5) mm | - |
| Weight | 680±10kg | - |

# **ESS** 5015 kWh | BATTERY RACK **PARAMETER**

SMARTSUN™ ENERGY

| NAME | PARAMETER | REMARKS |
|---|---|---|
| Cell capacity | 314 Ah | - |
| Number of packs | 4 | - |
| Rack configuration | 1P416S | - |
| Nominal energy | 418 kWh | 0.5P, 100%DOD, 25±2°C |
| Nominal voltage | 1331.2V | 3.2 x 416 |
| Rated capacity | 314 Ah | 0.5P, 100% DOD, 25±2°C |
| Voltage range | 1164.8~ 1497.6V | (2.8~3.6V) x 416 |
| Charge and discharge rate | ≤0.5P | 100% DOD, 25°C |
| Working temperature | 0~55°C (-30~60°C) | Charging (discharge) temperature |
| Working environment humidity | 5%~95% | - |

# **ESS** 5015 kWh | SYSTEM **PARAMETER**

SMARTSUN™ ENERGY

| NAME | PARAMETER |
|---|---|
| Material type | $LiFePO_4$ |
| Auxiliary power | 400V AC, 50/60Hz |
| Cell model | 3.2V/314 Ah |
| Max. charge/discharge power | 0.5P |
| System configuration | 1P416S x 12 |
| Rated capacity | 5.01 MWh |
| Rated voltage | 1331.2V |
| Voltage range | 1164.8~1497.6V |
| Cooling method | Liquid refrigerating |
| BMU communication | CAN |
| Temperature | -30~50°C |
| Humidity | ≤95% RH, without condensation |

| NAME | PARAMETER |
|---|---|
| Altitude | <3000m, >2000m degrade |
| Noise | ≤80 dB(A) |
| Protection level | IP55 |
| Storage temp. | -20~45°C (1 month)<br>0~35°C (6 months) |
| FSS system | Temperature sensing, smoke sensing, combustible gas detector, ventilation, fire extinguishing agent, water sprinkler agent, reserved PACK-level firefighting |
| Anticorrosion grade | C3-M |
| Seismic grade | 7 level |
| Communication ports | Ethernet/CAN/RS485 |
| Dimension (L x W x H) | 6058 x 2438 x 2896 mm |
| Weight | ~44 T |
| Design life | 20 years |

SMARTSUN™
ENERGY


# ENERGY STORAGE SYSTEM (ESS)

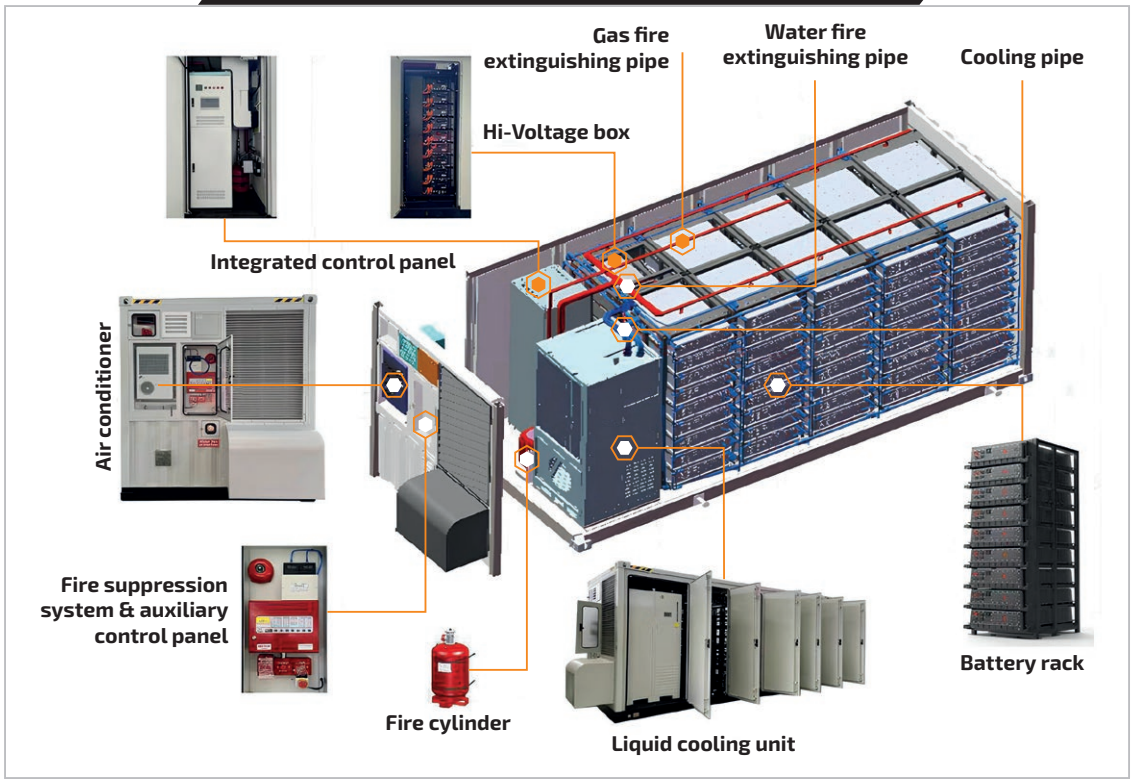
**BATTERY MODULE: 3421.44 kWh (PACK)**

**HVAC + EMS + BMS + FSS**

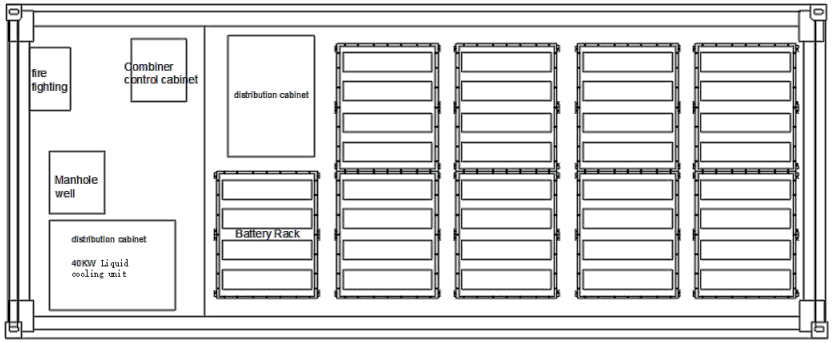
# **ESS** 3421 kWh | SYSTEM **COMPONENT**

SMARTSUN ENERGY

## **EXPLODED** VIEW




## **VERTICAL** VIEW LAYOUT



# **ESS** 3421 kWh | SYSTEM **CONFIGURATION**

SMARTSUN™ ENERGY

| NAME | QUANTITY | SPECIFICATION |
|---|---|---|
| Battery container body | 1 | 20 feet high box; 6058x2438x2896 mm; non-walk-in design; protection level: IP54 |
| Battery system | 1 set | Using 300 Ah lithium iron phosphate battery; The battery container consists of 9 battery racks, each battery rack contains four 1P396S battery packs and one high-voltage box; battery management system included. |
| Temperature control system | 1 set | 40 kW (cooling capacity) liquid cooling unit, liquid cooling pipeline, coolant; 1.5kW (cooling capacity) ambient air conditioner, etc. |
| Fire fighting system | 1 set | PACK level immersion fire protection, gas fire protection, water fire protection, exhaust fan, 1 set of pressure relief device |
| Confluence cabinet | 1 set | DC 1500V; 9 inputs and 1 outputs |

# **ESS** 3421 kWh | BATTERY PACK **PARAMETER**

SMARTSUN™ ENERGY

| NAME | PARAMETER | REMARKS |
|---|---|---|
| Cell capacity | 300 Ah | - |
| Configuration | 1P44S | - |
| Nominal energy | 42.24 kWh | 0.5P, 100% DOD, 25±2°C |
| Nominal voltage | 140.8V | 3.2 x 44 |
| Rated capacity | 300 Ah | 0.5P, 100% DOD, 25±2°C |
| Voltage range | 118.8~158.4V | (2.7~3.6V) x 44 |
| Charge and discharge rate | ≤0.5P | - |
| Working temperature | 15~45°C | - |
| Working humidity | 5% ~ 95% | - |
| Thermal management method | Liquid refrigerating | - |
| Dimensions (WxDxH) | 787x1088x235 mm | - |
| Weight | 313±5kg | - |

# **ESS** 3421 kWh | BATTERY RACK **PARAMETER**

SMARTSUN™ ENERGY

| NAME | PARAMETER | REMARKS |
|---|---|---|
| Cell capacity | 300 Ah | - |
| Number of packs | 9 | - |
| Rack configuration | 1P396S | - |
| Nominal energy | 380.16 kWh | 0.5P, 100% DOD, 25±2°C |
| Nominal voltage | 1267.2V | 3.2 x 416 |
| Voltage range | 1069.2~1425.6V | (2.7~3.6V) x 396 |
| Charge and discharge rate | ≤0.5C | 0.5P, 25±2°C |
| Working temperature | 15~45°C | - |
| Working environment humidity | 5%~95% | - |
| Dimensions (W x D x H) | 896 x 1065 x 2385 mm | ±4 mm |
| Weight (kg) | 3100 kg | ±80 kg |

# **ESS** 3421 kWh | SYSTEM **PARAMETER**

SMARTSUN™ ENERGY

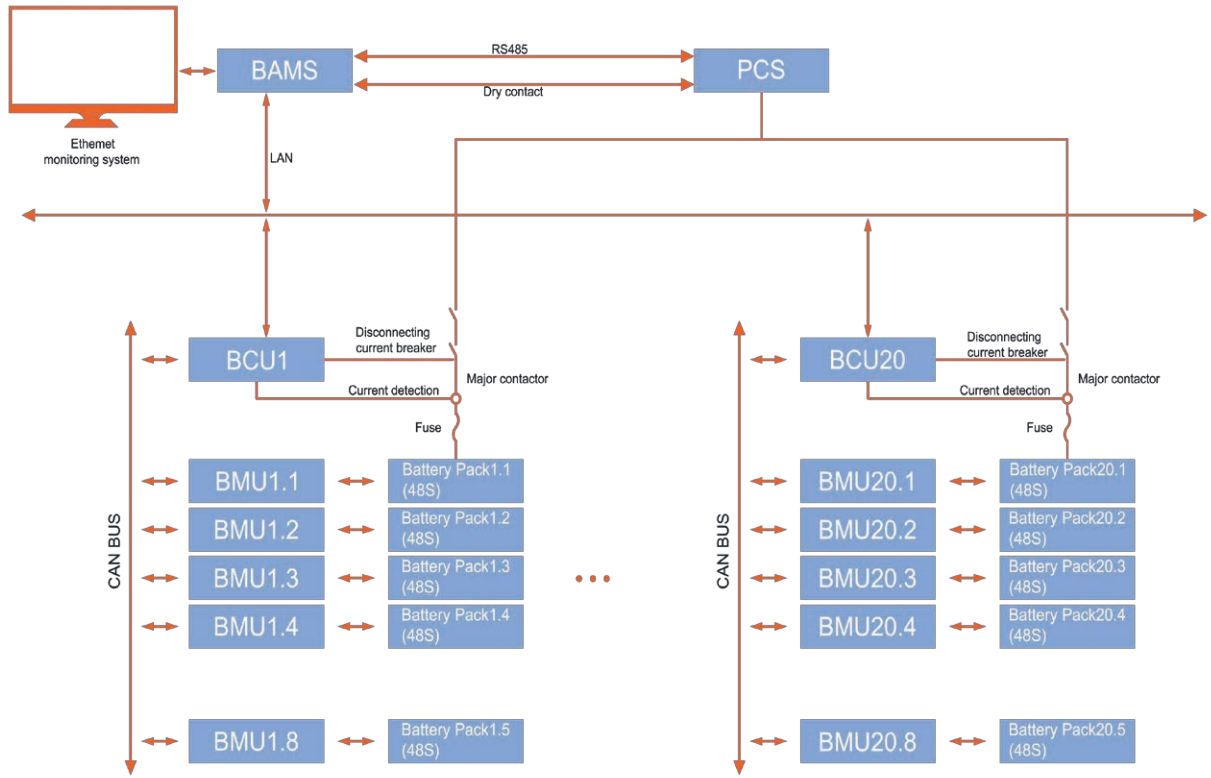
| NAME | PARAMETER | REMARKS |
|---|---|---|
| Number of racks | 9 | - |
| Dimension (W x D x H) | 6056 x 2438 x 2896 mm | ±10mm |
| Nominal capacity | 3421.44 kWh | 0.5P, 100% DOD, 25±2°C |
| Nominal voltage | 1267.2V | - |
| Voltage range | 1069.2V~1425.6V | - |
| Charge and discharge rate | 0.5C, 1710.72 kW | 0.5P, 25±2°C |
| Working temperature | 15°C~45°C | Charging power ≤0.5P |
| Working humidity | 5%~95% | - |
| IP class | IP54 | - |
| Cooling method | Liquid refrigerating | - |
| Fire suppression system | Perfluorohexanone fire extinguish system; sprinkler fire extinguishing system | - |
| Weight | 37 000 kg | Max. |
| Cycle life | 7000 cycles | 25±2°C, 0.5P/0.5P 93% DOD, 70% EOL |
| Calendar life | 15 years | 25±2°C, 50% SOC, 70% EOL |


SMARTSUN™
ENERGY
UTILITY STORAGE SYSTEM
AUXILIARY SYSTEM
BMS System
Liquid Cooling System
EMS System
Fire Protection System

SMARTSUN™ ENERGY

## ADVANTAGES

- **Standard three-tier architecture** design with clear logical hierarchy.
- **High voltage monitoring**, support 1500V total voltage acquisition, insulation detection.
- **Supports multiple protocols** and can be directly connected to the station EMS, cloud platform, and other systems.
- **Support PCS**, liquid cooler, fire, access control, video surveillance and other equipment access.



# **LIQUID COOLING** SYSTEM

SMARTSUN™ ENERGY

| ITEM | BESS 3420-20H | BESS 5015-20H |
|---|---|---|
| Input voltage | 3-Phase 4-Wire system; 400V+PE / 50Hz | |
| Max. power | 25.2 kW | 38 kW |
| Refrigerating capacity (t_water@20°C / t_environment@45°C) | 40 kW | 60 kW |
| Refrigerating power (L45°C / W20°C) | 21.4 kW | 31.7 kW |
| Heating capacity | 15 kW | 24 kW |
| Heating power | 22.2 kW | 28.2 kW |
| Dimension (W x D x H) | 1200 x 440 x 2400 mm | |
| Working environment | -30°C ~ 50°C | |
| Chiller adjustable temperature range | 15°C ~ 35°C (can be pre-set) | |
| Refrigerant | R410A | |
| Rated flow rate | 500 L/min | |
| Rated pressure difference | 130 kPa | |
| Medium | Ethylene glycol aqueous solution with a concentration of ≤60% | |

SMARTSUN™ ENERGY

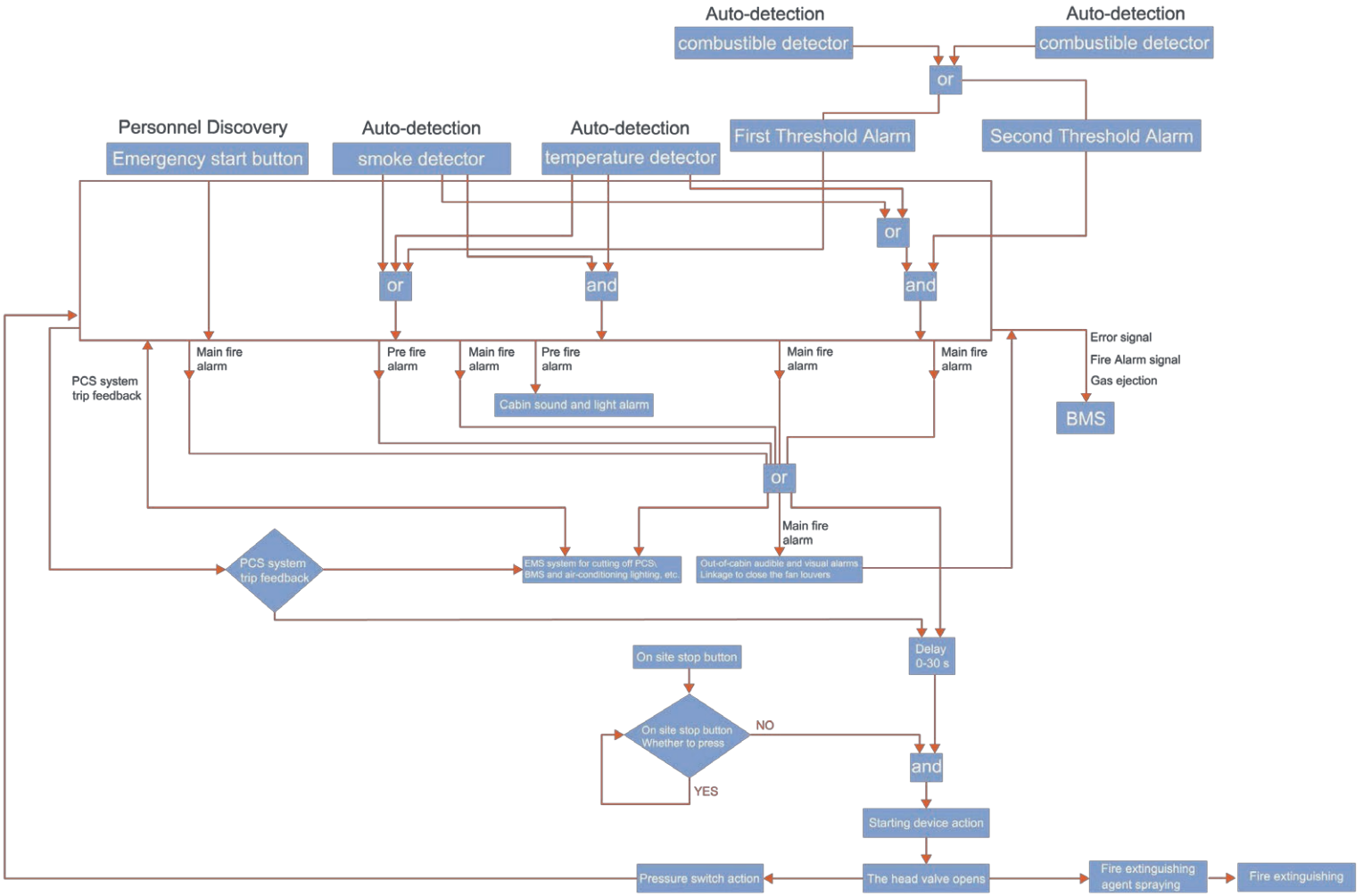
## GAS FIRE PROTECTION SYSTEMS CAN SIMULTANEOUSLY DETECT

Combine with temperature, smoke, carbon monoxide, hydrogen, combustible particles (TVOC) sensor.

## 2 LEVELS PREVENTION TO ENSURE SYSTEM STABILITY

- **First level prevention ( sound and light alarm)**
  Any of TVOC, CO, temperature, smoke sensor active.
- **Secondary level prevention (sound and light alarm and spray gas extinguishing)**
  Any two of VOC, CO, temperature, smoke active.
- **Additional prevention**
  A water-based fire-fighting pipe can be used in the event of gas fire-fighting system failure.

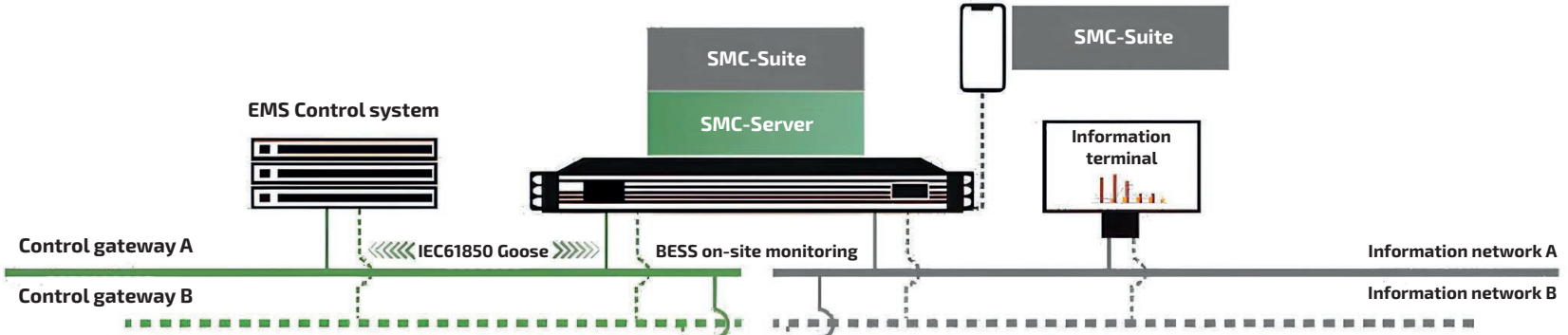
## SYSTEM DIAGRAM



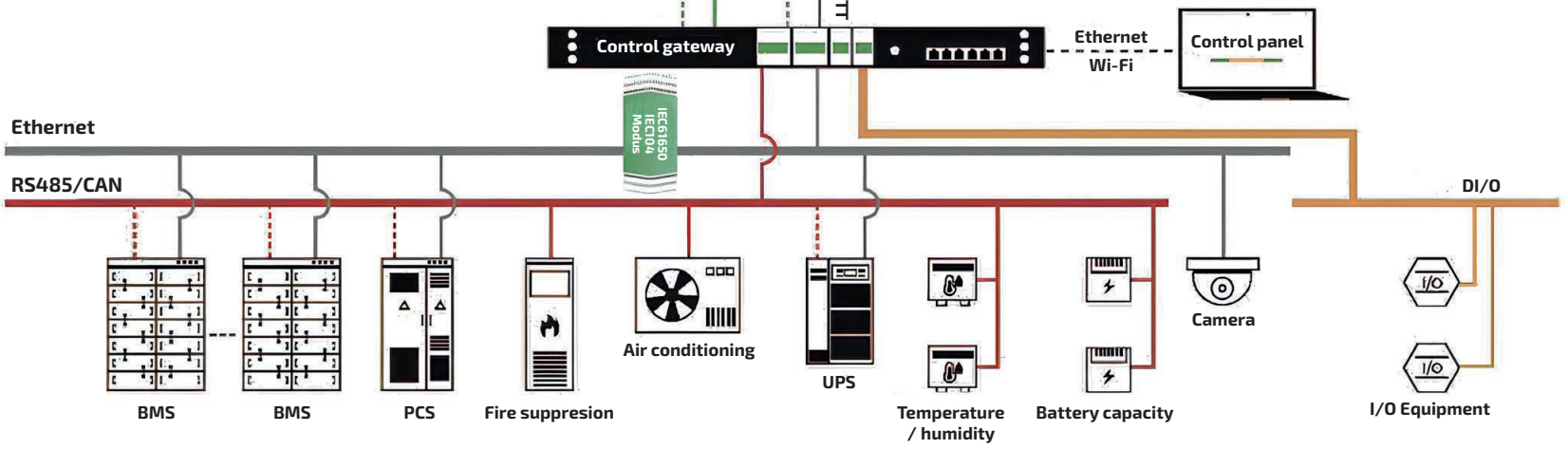
# EMS SYSTEM DIAGRAM

SMARTSUN ENERGY

## ON SITE MONITORING SYSTEM



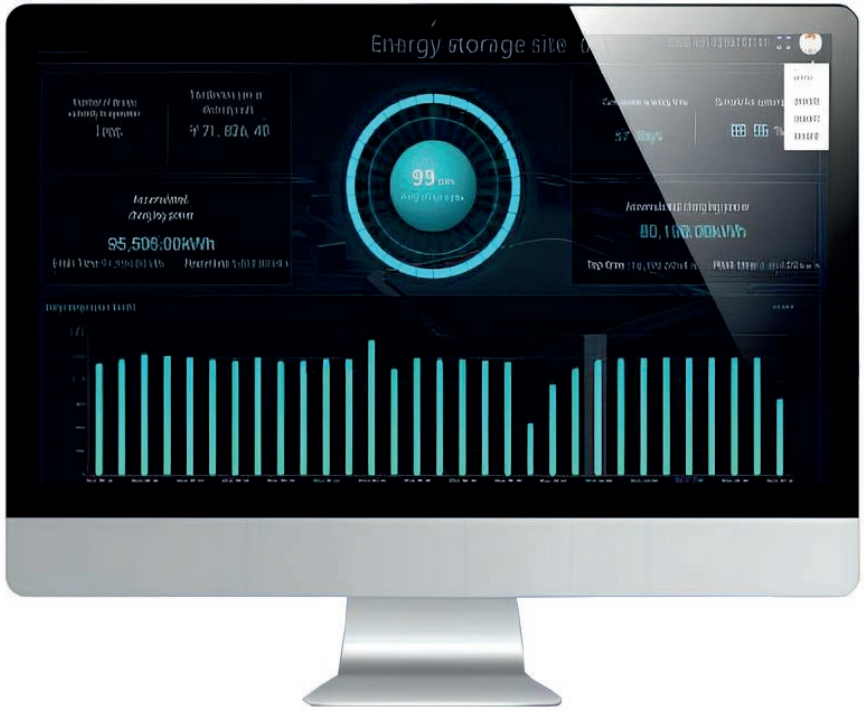

## EQUIPMENT BAY

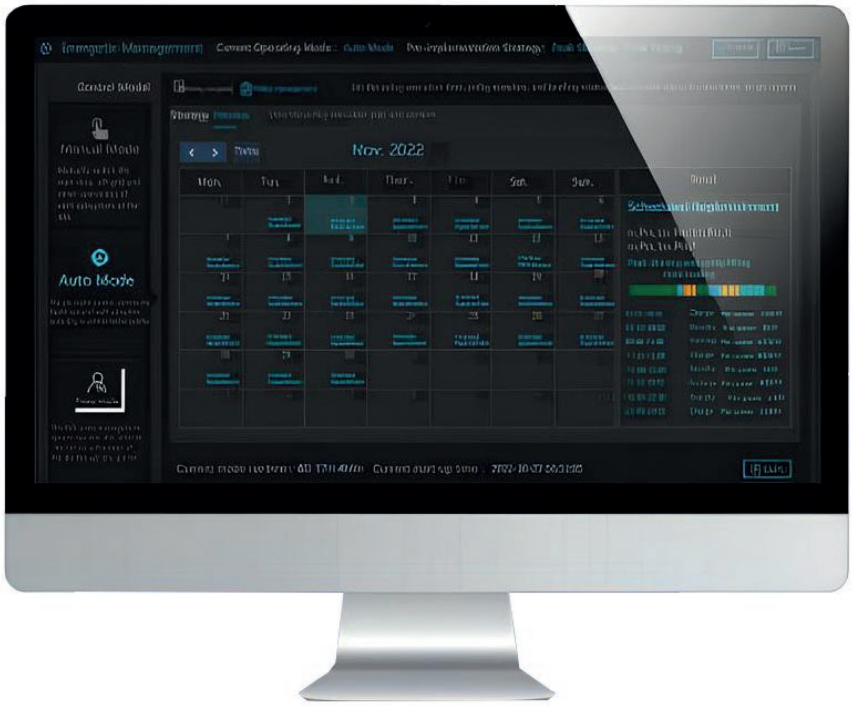


SMARTSUN™ ENERGY

## ADVANTAGES

- **Revenue statistics**
  Real-time calculation of energy storage system benefits.
- **Energy storage analysis**
  The utilization rate of the energy storage system.
- **Energy display**
  Cumulative charge statistics.
  Cumulative discharge statistics.
- **Running recording**
  Cumulative running time.
  Normal operation time.






## ADVANTAGES

- **Full-scenario policy adaptation**
  It supports multiple strategies such as peak shaving and valley filling, demand control, emergency control, and load tracking, and supports creating multiple policies and applying policies as needed.
- **On-demand control**
  Support manual, automatic, and superior system scheduling to meet all scheduling scenarios.
- **Flexible strategy timing**
  The policy application time is flexible, and the policy application can be applied in the smallest unit of days/weeks.

# EMS SYSTEM **FUNCTION**

SMARTSUN ENERGY


Data acquisition

Global monitoring

**FAULT RECORDING**

Real-time alerts

Data analysis

Record of operations

SMARTSUN ENERGY

# SMARTSUN ENERGY

WE MAKE IT GREEN

**POLAND**
SmartSun Energy
Sp. z o.o.

ul. Leszno 8/1
01-192 Warszawa

**SPAIN**
Smart Sun Pro Power S.R.L.

Carretera del Penoncillo 35
Lenox Costa, 29/70 Malaga

**HONG KONG**
SmartSun Energy
Co. Ltd

Unit 1411, 14/Floor
Cosco Tower
183 Queen's Road
Central, Hong Kong

**UK**
Smart Sunpro Power
Co., Limited

5th South Charlotte St.
Edinburgh FH2 4AN

**UAE**
SmartSun Energy
Renewable
Trading FZCO

Building A1
Dubai Digital Park
Dubai Silicon Oasis
999041 Dubai