



GreensunSolar



**G500K-E1000**

**Power: 500kw**

**Energy: 964.608kwh**

**20FT Containerized Battery Energy Storage System LiFePO4 Battery Technology**

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20FT Containerized Battery Energy Storage System LiFePO4 Battery Technology



- **Maximum safety utilizing the safest type of lithium battery chemistry (LiFePO4) combined with an intelligent 2-level Battery Management System**
- **Outstanding performance and long lifespan with over 8000 cycles at 0.5C**
- **Optimized for both on-grid and off-grid applications**
- **20' containerized design complete with battery, Hybrid Inverter, HVAC, Fire Extinguishing System, Lighting.**
- **Designed for easy installation and maintenance**
- **Overall transportation**

## APPROVALS

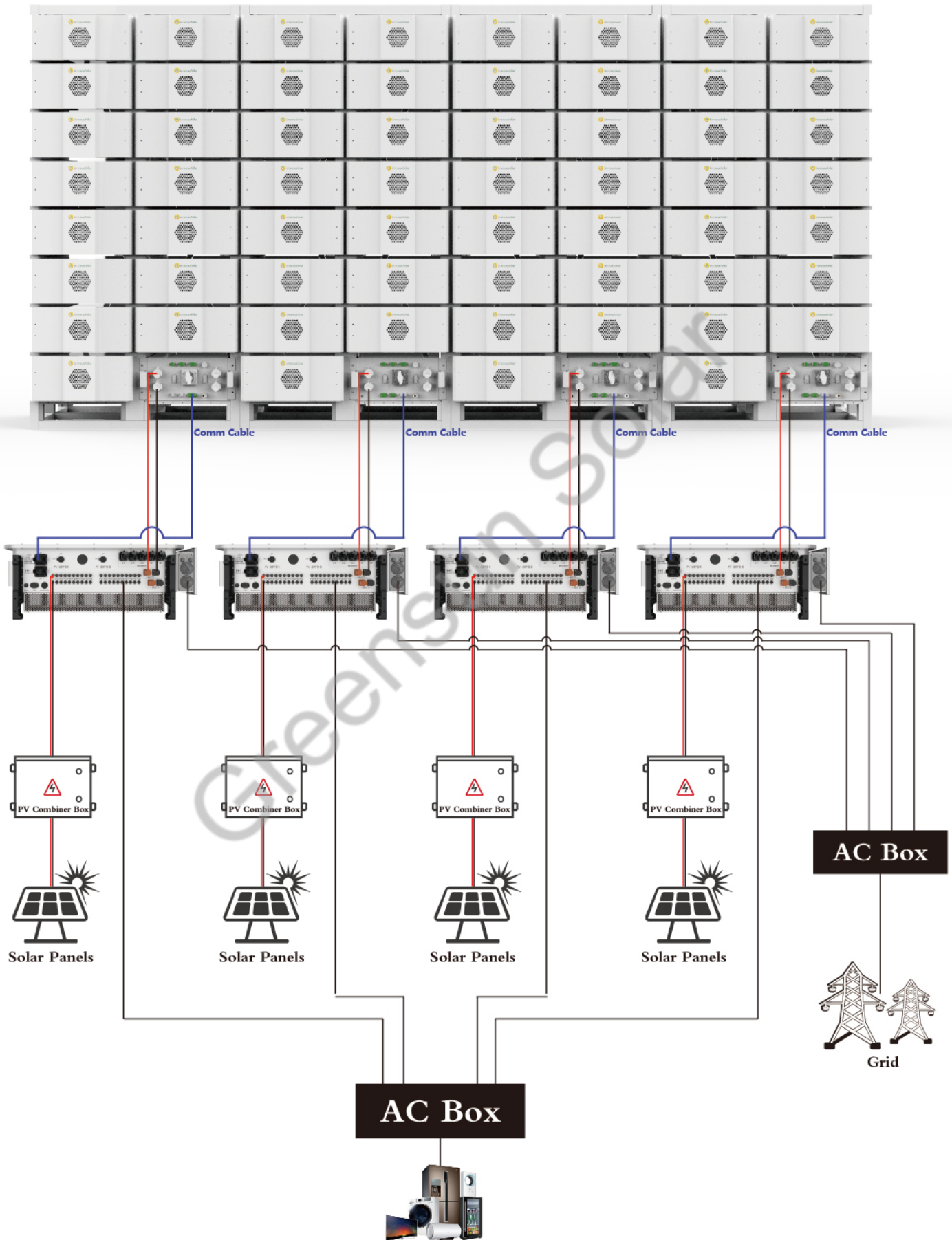
- Cells: UL 1642, Modules: CE
- UN 3536 MSDS certified



## SYSTEM INFORMATION

Model	G500K-E1000
<b>AC data</b>	
Rated power (kW)	500KW (4*125kw in parallel)
Rated voltage (Vac)	3/N/PE, 220 V / 380 V, 230 V / 400 V
Rated current (A)	721.6A (180.4 *4A)
Rated frequency(Hz)	45-55 / 55-65
THDi (on-grid)	<2%
THDu (off-grid)	≤ 1% linear; ≤ 5% non-linear
Power factor	> 0.99 (0.8 leading - 0.8 lagging)
On / off-grid switching	Support
<b>PV data</b>	
Max. PV input voltage (V)	1,000
Max. PV power (kW)	1000KW (250KW*4)
MPPT operating voltage range (V)	150-950
MPPT number / Max. input strings number	10 / 20* 4
<b>Battery data</b>	
Cell type	3.2V 314Ah/LiFePO4
Nominal voltage (V)	768/1P 240S
Nominal energy (kWh)	964.608
Working voltage range (V)	672~850
Max. charge and discharge rate	0.5C@25°C
Number of battery cycles	≥8,000
<b>System data</b>	
System specification	500kW/964.608kWh
Dimensions W *D *H (mm)	6,058×2,438×2,896
Net weight (kg)	16,000
Ingress protection	IP54
Max. operating altitude (m)	5,000(>3,000 derating)
Cooling	Intelligent air cooling
Fire extinguishing system	FM200
EMS communication	RS485, TCP/IP

### System group scheme



## 500KW POWER INVERTER SYSTEM

4UNITS SOLIS 125KW Hybrid Inverter in Parallel



- Solis 125kw hybrid inverters integrating PV controllers, energy storage converters
- Supports multi-unit parallel operation up to 1.25MW (Solis STS cabinet recommended for systems over 6 units)
- Delivers 160% overload for 200ms in off-grid mode, ensuring stable startup of heavy loads
- on/off-grid automatic switching units, greatly improving customer deployment efficiency and reducing installation costs.

AC(grid-connected)	
Rated power	125kw
Rated voltage	3Phase(3W+N+PE) 380/400V
Rated current	189.9 A / 180.4 A
Rated frequency	50/60Hz
THDI/ PF	<3%/ 0.8lagging-0.8leading
AC(off grid)	
Apparent power/Rated power	125kw
Rated voltage	3Phase(3W+N+PE) 380/400V
Rated current	189.9 A / 180.4 A
THDU	50/60Hz
Rated frequency/Range	<3%/ 0.8lagging-0.8leading
PV	
Max PV open-circuit voltage/Max PV power	1000V/250kw
PV mppt voltage range/Mppt number	150-950V
MPPT number / Max. input strings number	10 / 20
Max. input current (Max. short circuit current)	10 * 42 A (10 * 60 A)
Battery	
Battery voltage range	300-950V (Li-ion)
Max. charge / discharge current	200 A / 100 A + 100 A
Number of battery ports	2
Communication	CAN/ RS485

## LiFePO4 BATTERY PACK SYSTEM

### 768V 1256Ah(964.608kwh)

- ✦ Advanced Battery Management System
- ✦ Comprehensive monitoring of battery operating status, including voltage, current and temperature
- ✦ Passive cell balancing to maximize battery life
- ✦ Outstanding performance and long lifespan with over 8000 cycles at 0.5C
- ✦ Modular design with high scalability



Battery Pack specification		Battery module specification	
Normal voltage	768V	Normal Voltage	51.2V
Voltage Range	672-852V	Normal capacity	314Ah
Capacity	1256Ah(314Ah*4)	Normal energy	16.078KWH
Normal energy	964.608KWh	Voltage range	44.8-56.8V
Rack cluster quantity	4clusters	Cycles @ 25 °C	8000Cycle
Cluster capacity	768V 314Ah	BMU	Include
Connection method	One cluster connect with one inverter	Cell configuration	16S*1P
Max. Continuous Charge	628A	Cell Max. Continuous Charge	0.5C
Max. Continuous Discharge	628A	Cell Max. Continuous Discharge	0.5C
Communication	RS485/CAN	Communication	RS485/CAN
Air cooling	Yes	Air cooling	Yes
IP Level	IP 20	IP Level	IP 20
Cluster combination	15pcs battery module in series with one HV controller	Module Dimension	483*245*792mm
Cluster dimension	1070*800*2330mm	Module weight	125kg
Per Cluster weight	1980kg	Approvals	CE, MSDS, UN38.3

## BATTERY MANAGEMENT SYSTEM

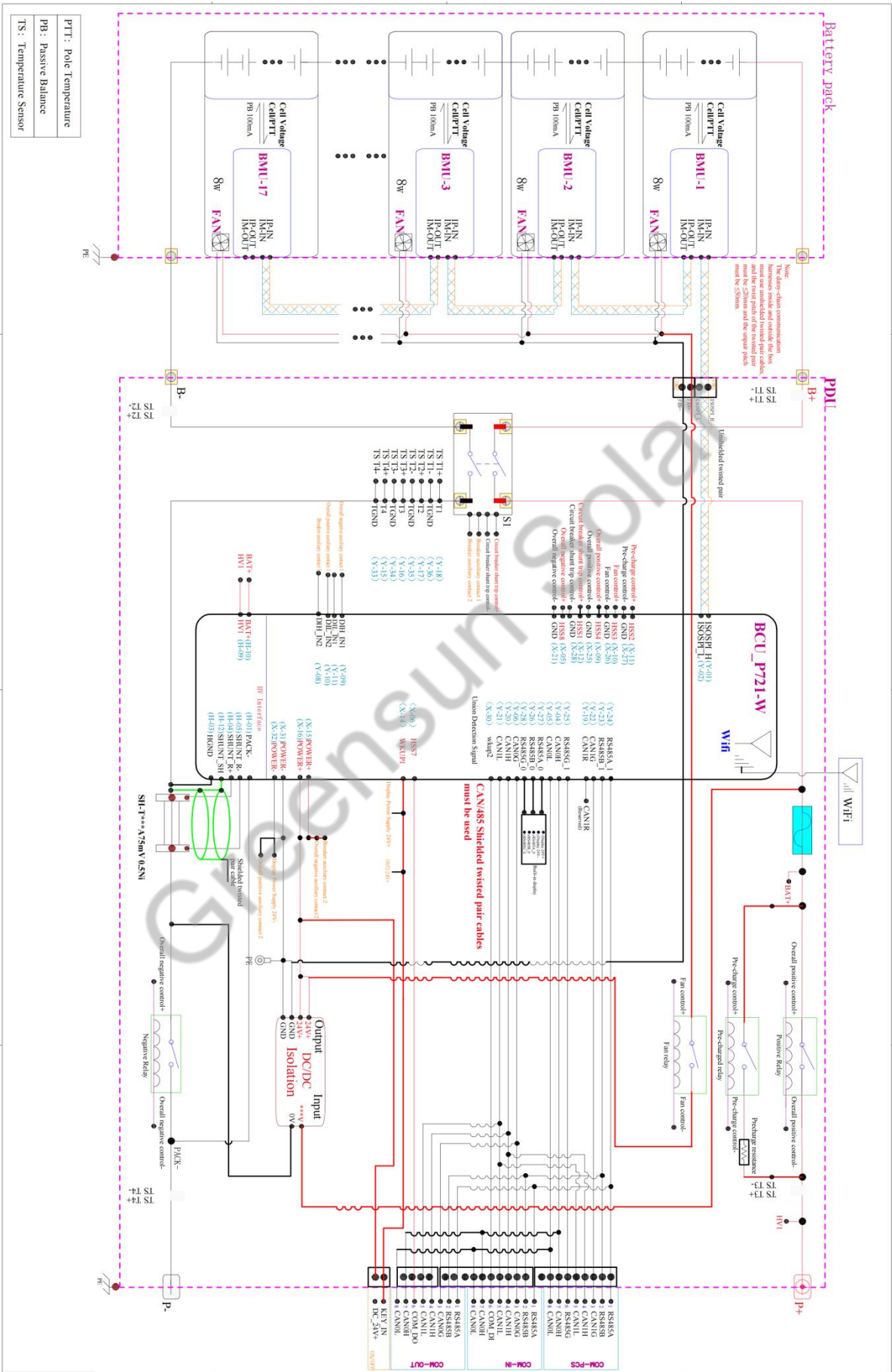
- Maximum safety utilizing the safest type of lithium battery chemistry (LiFePO<sub>4</sub>) combined with an intelligent 2-level Battery Management System which include **BMU, BCU**.
- The BMS provides all round, real- time monitoring and Protection of the lithium batteries within the ESS. It provides data on cell voltage, cell temperature, cable terminal temperature, battery string voltage, current, SOC and SOH.
- The BMS has been configured with a set value over limit logic, which is integrated with the main control terminal to deliver complete protection and maximum battery life.

BMU Parameter			
Item	Parameter	Item	Parameter
Operating temperature	-40℃~85℃	Enclosure temperature detection range	-40℃~125℃
Storage temperature	-40℃~105℃	Box temperature detection accuracy	±1℃
Operating humidity	5~95%	IsoSPI bus	Supported
Cell voltage detection range	0~5V	Balance control	Supported, maximum 100mA
Cell voltage detection accuracy	±5mV	/	/
BCU Parameter			
Item	Parameter		
Operating temperature	-40℃~85℃		
Storage temperature	-40℃~105℃		
Operating humidity	5%~95%		
High voltage detection accuracy	±0.5% or 0.5V		
Current detection accuracy	±0.5%FSR		
Insulation testing accuracy	±10% or 10KΩ		
SOC estimation accuracy	≤5%		
Charging port temperature detection accuracy	±1℃ (10K NTC)		
Supported protocols and standards	CCP、UDS、OBD-ii、GB/T 32960		
System power supply	Voltage range 6~36V (typical values 12V, 24V)		
Power consumption	Run	200mA@12V	
	Shutdown	100uA@12V	
Communication unit	CAN communication	2-channel, debugging CAN (non-isolated) and external CAN (isolated).	
	RS485 communication	2-channel, display screen 485 (non-isolated), external 485 (isolated)	
	IsoSPI communication	Supported	
	Wireless communication	Standard version, 4G, WiFi + Bluetooth combo	

Acquisition Unit	High Voltage Detection	P721	4-way, BAT+ / HV1 / HV3; PACK-
	Current Detection	Shunt, supports; Hall, supports single-range 5V Hall; preferred shunt;	
	Insulation Detection	Supports (battery packs B+/B-, range 0-6MΩ), measurement accuracy: ±10% or 10KΩ	
	Temperature Detection	5-channel (default temperature sensor model NTC103), measurement accuracy ±1℃	
	Low-Level Signal Detection	2-channel, connection to GND is valid.	
	High-Level Signal Detection	2-channel, active high (3.6~36VDC)	
	Wake-up Model Detection	4-channel, WKUP1/WKUP2/WKUP3/RTC	
Execution Unit	High-Side Switch	8-channel (total positive, pre-charge, total negative, heating, fan, indicator lights, etc.), 2A	
	Dry Contact Output	2-channel, isolated, 0.1A/route	
Data Storage	Onboard Storage	128MB SLC NAND FLASH	
RTC		Time synchronization function, accepts IRIG-B(DC) code time synchronization or network time synchronization.	

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### Electrical schematic diagram of high pressure box(sketch map)



## HVAC SYSTEM

The environmental control system inside the ESS adopts precision heating, ventilation and air conditioning designed to ensure ideal internal temperature whether discharging, charging or on standby.

The operation of the HVAC is fully automatic and responds to the internal temperature of the container. It is a highly reliable system and has a number of easy to use functions.



- **Cooling** - cooling starts when the containers internal temperature exceeds the cooling set point, and it stops when the temperature drops below the cooling set point.
- **Heating** - heating starts when the containers internal temperature is lower than the heating set point, and it stops when the temperature rises above the heating set point.
- **Dehumidification** - dehumidification starts when the containers internal humidity exceeds the dehumidification set point, and it stops when the humidity drops below the dehumidification set point.

HVAC SPECIFICATIONS		
PARAMETER	DEFAULT	SETTING RANGE
Cooling Set Point	29°C	16~38°C
Return Difference	6°C	1~10°C
High temperature alarm	45°C	30~60°C
Low temperature alarm	0°C	-45~10°C
Heating Point	5°C	5~26°C
Return Difference	10°C	1~10°C
Dehumidification Set Point	80%	50~90%
Return Difference	75%	45~95%

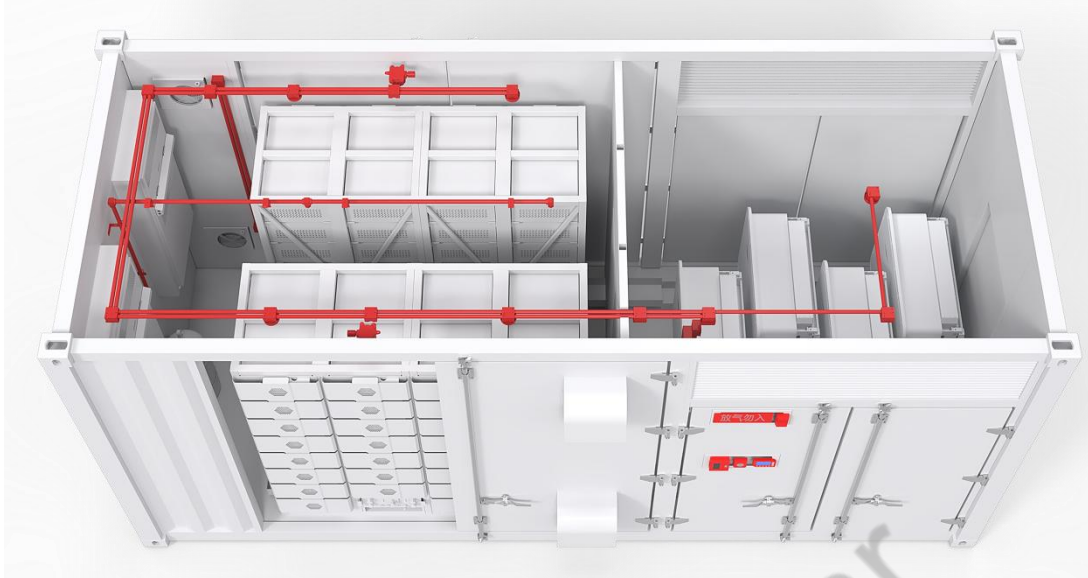
## Fire Extinguishing System

The fire suppression system is designed according to the container size, and the fire extinguishing gas is discharged from the extinguishing gas cylinders to the main pipeline and then to branch pipelines and sprayed from nozzles. The system includes fire detectors, audible and visual alarm, emergency start/stop button, gas release indicator, gas extinguishing controller, etc., and follows European standards. Main features include.

- Extinguishes electrical, liquid and solid substance fires
- Auto start, manual start and mechanical emergency start
- Effectively prevents accidental discharge caused by chronic leakage
- Configured to prevent accidental start
- Event logging function

Fire protection system technical information	
Item	Remark
Automatic fire alarm system	<ol style="list-style-type: none"> <li>1. Two smoke detectors and two temperature detectors are installed on top of the battery compartment, and one smoke detector is installed in the electrical compartment.</li> <li>2. Install an audible and visual alarm, a deflation indicator light, an emergency start/stop button/manual/automatic switch, and a manual fire alarm button outside the electrical compartment.</li> <li>3. Install an automatic fire alarm host inside the electrical compartment.</li> <li>4. The fire alarm control device for the energy storage power station can reserve one 485 external communication line and four passive normally open dry contact signals (fault, level 1 fire alarm, sprinkler feedback, and level 2 fire alarm). If fire station-level networking is required, each controller must be equipped with a CAN bus isolator and connected via CAN bus daisy-chaining, ultimately connecting to the station-level fire alarm host for communication.</li> </ol>
Gas fire extinguishing system	<ol style="list-style-type: none"> <li>1. A perfluorohexanone (PFH) fire extinguishing system with internal pressure bottles and piping is used, with a PFH fire extinguishing concentration of 7%.</li> <li>2. The battery compartment fire protection zone uses the battery compartment as the smallest unit for fire extinguishing. Compartment-level sprinklers are installed, and when a compartment-level fire extinguishing action is initiated, a single compartment-level spray is applied.</li> </ol>
Combustible gas system	<ol style="list-style-type: none"> <li>1. One CO combustible gas detector and one H2 combustible gas detector are installed on top of the battery compartment to monitor combustible gases within the compartment. Information is transmitted to the fire control room via the energy storage power station's fire alarm control device.</li> <li>2. A combustible gas concentration display (which also serves as a fan start/stop function) is installed outside the compartment to indicate the combustible gas status within the compartment.</li> </ol>
Emergency ventilation system	<ul style="list-style-type: none"> <li>• Inlet fan: Entire unit explosion-proof, explosion-proof marking Ex ec II C T4 Gc, protection level IP65, with motorized mechanism;</li> <li>• Exhaust fan: Entire unit explosion-proof, explosion-proof marking Ex ec II C T4 Gc, protection level IP65; 1382 m<sup>3</sup>/h.</li> </ul>

### Fire protection system layout



### Fire linkage logic diagram

