



Part Name: 13.8MW / 16.8MWhEnergy Storage System

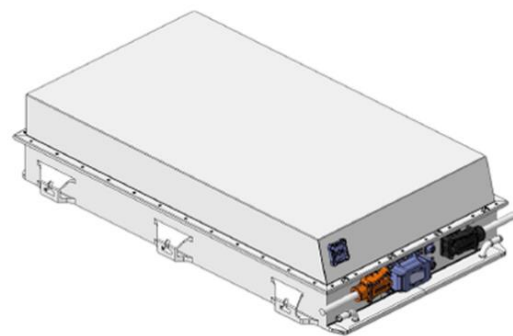
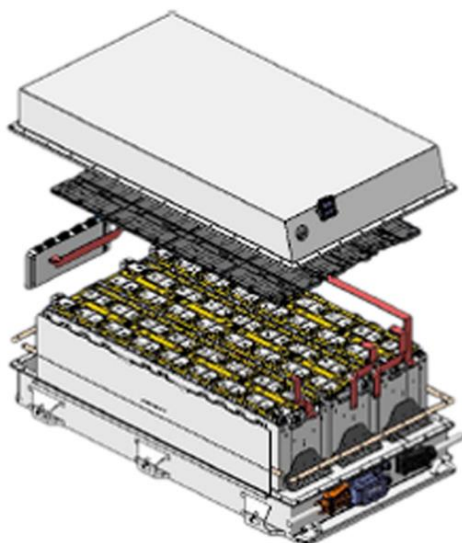
Model No.: ATE13.8MW16.8MWh-HC280

Revision	Description	Date(DD/MM/YYYY)	PM	Approved by
V0	Standard part	18/08/2022	Alex Yang	Alisa Chen



Cell Parameter

Battery Module		LFP71173207/280Ah
Material system		LFP
Capacity		280Ah
Nominal Voltage		3.2V
Charging Voltage		3.65V
Discharge Cut-off Voltage		2.5V
Charging Current	Standard charge	140A
	Max charge	280A
Maximum discharge current (duration) Max. Continuous Discharge Current (duration)		280A (Continuous)
Battery Weight		5430 ± 200g
Battery Internal Impedance		≤ 0.2 mΩ
temperature range ambient temperature	Charge	0~60℃
	Discharge	-30~60℃
	Storage	1 month -20℃~ 45℃
Cycle Life(0.5Ccharge-1Cdischarge 3.65V~2.5V) Ambient temperature : 25 °C ±2 °C		10000 cycles /70%



Battery Pack parameters

Configuration	1P30S
Voltage	75V~109.5V
Recommended discharge current	140A
Max discharge current	280A
Temp	-20°C~55°C
Designed life	> 10 years
Cycles	6000 Cycles (@25°C 0.5C)
Weight	195kg
Waterproof rating	IP67
Size(mm)	968*625*260
Cooling	Liquid cooling
Efficiency	94%



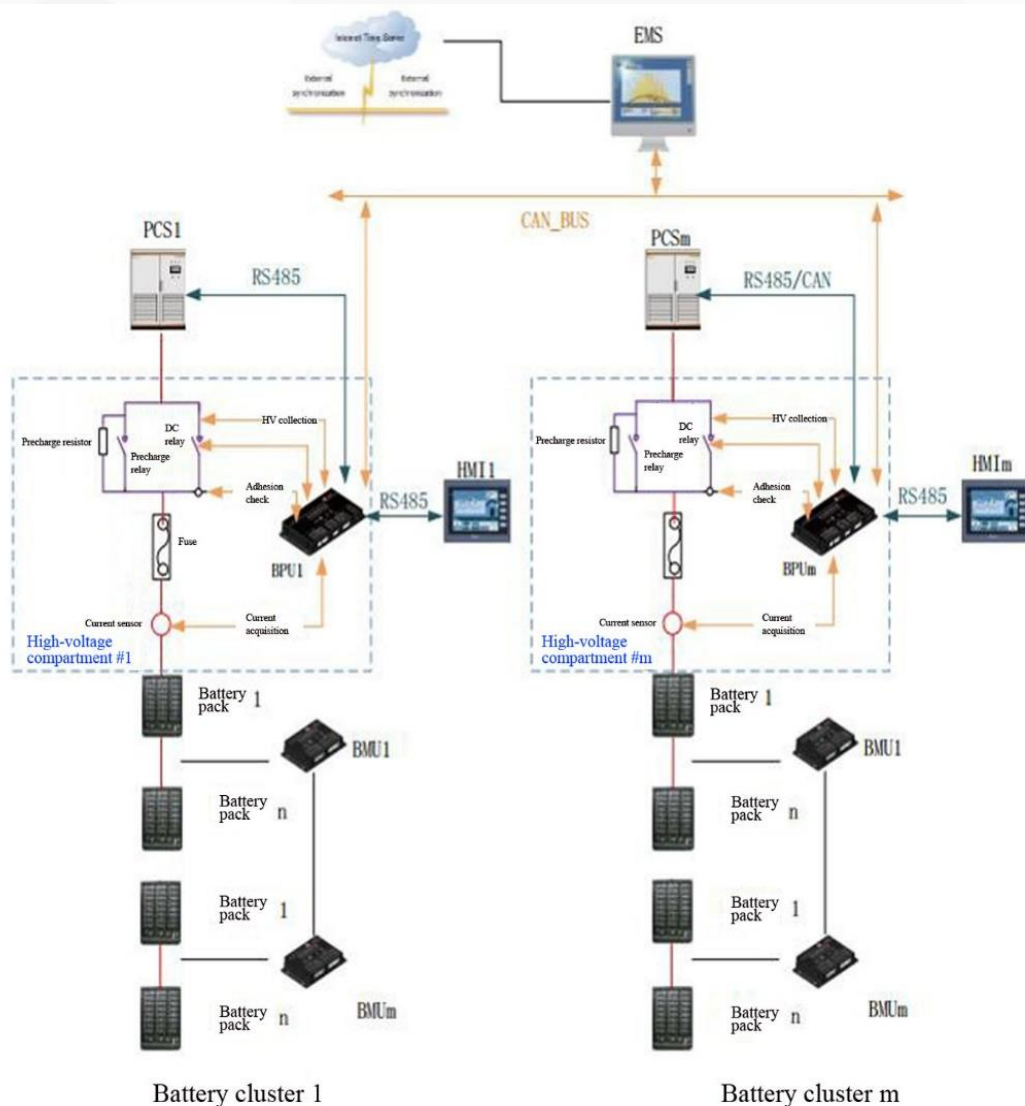
The battery cluster consists of 8ea 1P30S battery packs + 1 high voltage box

1248V/280Ah battery cluster parameters			
#	project	The main parameters	Remark
1	Cell model	LFP71173207/280Ah	
2	Batteries in series and parallel mode	1P30S	
3	Battery cluster rated voltage (V)	1248	390S
4	Battery cluster capacity (Ah)	280	System energy: 349.44KWh
5	Voltage Platform (V)	1014~1423.5V	2.6~3.65 unit
6	Continuous charge and discharge current (A)	Charging: 0.5C Discharge: 0.5C	25±2 °C
7	Battery cluster weight (kg)	about 2741	
8	Cooling method	liquid cooling	
9	Battery cluster size (mm)	718*947*2257	





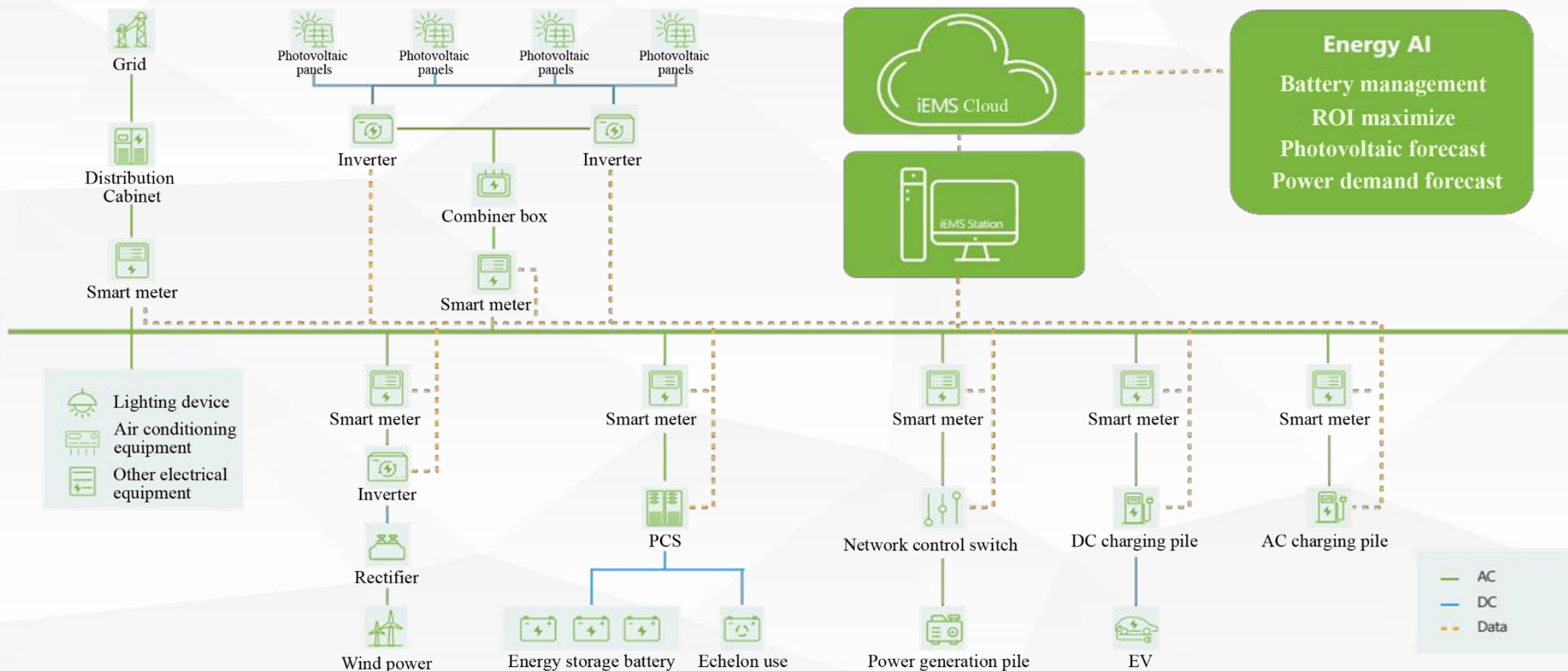
Power Management System / EMS



- ✓ Basic information: including SOC, SOH, total voltage, total current, chargeable capacity, rated capacity, remaining capacity, number of on-line batteries, number of on-line temperature sensors, average voltage, average temperature, etc.
 - ✓ Statistical information: including statistics of the highest battery cell voltage and location number, the lowest battery cell voltage and location number, the highest battery cell temperature and location number, the lowest battery cell temperature and location number, and the number of battery module charging and discharging times.
 - ✓ Status information: including leakage status, battery cell voltage status, charge and discharge current status, temperature status, communication status, SOC status, SD card status, etc.
 - ✓ Insulation detection: including the working status of the insulation module, positive insulation resistance, negative insulation resistance, insulation detection resistance, insulation module detection total voltage, etc.
 - ✓ Charger information: including charger type, charging status, charger connection status, charger output voltage, charger output current, charging time, remaining charge estimated time, and various abnormal alarm states, etc.
 - ✓ Relay information: including pre-charging relay, charging relay, discharging relay, cooling and heating relay, etc. on/off status display.
 - ✓ Device general information: including protocol version number, product UUID, hardware version, software version, product type, product name, SN code, etc.
 - ✓ Self-diagnosis information: charging relay self-diagnosis status, discharge relay self-diagnosis status, SOC full calibration diagnosis, SOC empty calibration diagnosis, national standard charger self-diagnosis status.
- ◆ High insulation withstand voltage level: the insulation withstand voltage level is up to the additional insulation specified in the international standard (see 6.2.3 in GB / T 18384.3), and the system's own insulation detection function can realize the real-time display of insulation status and effective protection of insulation faults, so as to ensure personal safety;
 - ◆ High resolution thermal management - the system has a variety of temperature control strategies such as temperature difference management, high and low temperature limit management, and dual management of cooling and heating to ensure that the system operates within a comfortable temperature range and prevent extreme events such as battery spontaneous combustion;
 - ◆ High flame retardant grade — all system keys reach UL - 94V0 flame retardant grade;
 - ◆ Decentralized two-level management — The system adopts a decentralized two-level management system, combining the principles of nearby management and centralized management, and reasonably divides the system function system, which greatly simplifies the interface and control complexity, and improves the system reliability.
 - ◆ Powerful balance management - power balance management of batteries can be carried out according to the smart balance strategy, effectively ensuring the consistency of batteries, and through thermal balance management, the battery pack can work in a uniform temperature range, effectively ensuring the battery temperature consistency;
 - ◆ Abundant epitaxial interfaces - external support for multiple active inputs, passive outputs and multiple isolated CAN bus outputs to meet diverse management needs and effectively achieve intelligent battery management;



Power Management System / EMS

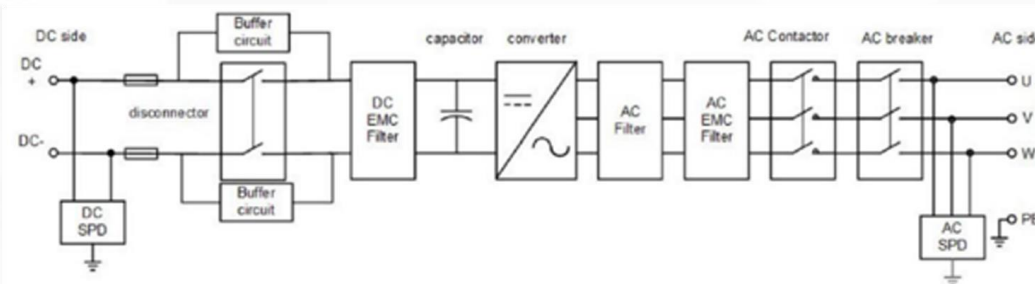




The system consists of 8 units of 17250 kW PCS composition

Parameter information (PCS-1725 kW outdoor type)

	Item	Performance/data
DC special effect	Maximum DC voltage	1500V
	DC operating voltage range	1000~1500V
	Maximum DC current	1936A
AC output characteristics	Rated AC output power	1725kW
	Maximum output power	1897kVA
	Rated voltage and frequency	50Hz/60Hz
	Rated grid-connected voltage	690V
	Allowable grid voltage range	-15%~10%
	Maximum output current	1588A
Off-grid output characteristics	Power factor	> 0.99/0.8 (lead) ~ 0.8 lag
	THDi	< 3% (rated output power)
	Rated output voltage	690V
	Output voltage accuracy	1%
	Maximum output current	1588A
	Voltage distortion (THDu)	< 1.2% (linear load)
Basic parameters	Rated voltage and frequency	50Hz/60Hz
	Overload capacity	110%
	Degree of protection	IP55
	Operating ambient temperature	-35 ~ 65 °C (> 45 °C derating)
	Relative humidity	0-100% (non-condensing)
	Cooling method	Forced air cooling
	Size	860*2270*1725mm
	Weight	1550kg
	Communication methods	RS485/CAN/Ethernet



Schematic of the PCS circuit



Heptafluoropropane (HFC-227ea) is colorless and odorless, and its ozone depletion potential (OPD) is zero, among the ISO -approved clean gas fire extinguishing agents, its cleanliness is good, and it has the characteristics of cleanliness, low toxicity, good electrical insulation performance, and high fire extinguishing efficiency . New materials are used for key parts, and the product performance is reliable. Its main indicators have reached the leading domestic level, with large insurance factor, reliable work , and convenient operation and maintenance. At the same time, it has various modes such as automatic, manual and mechanical emergency start, and the system is installed reliably .



Point type
photoelectric
smoke detector



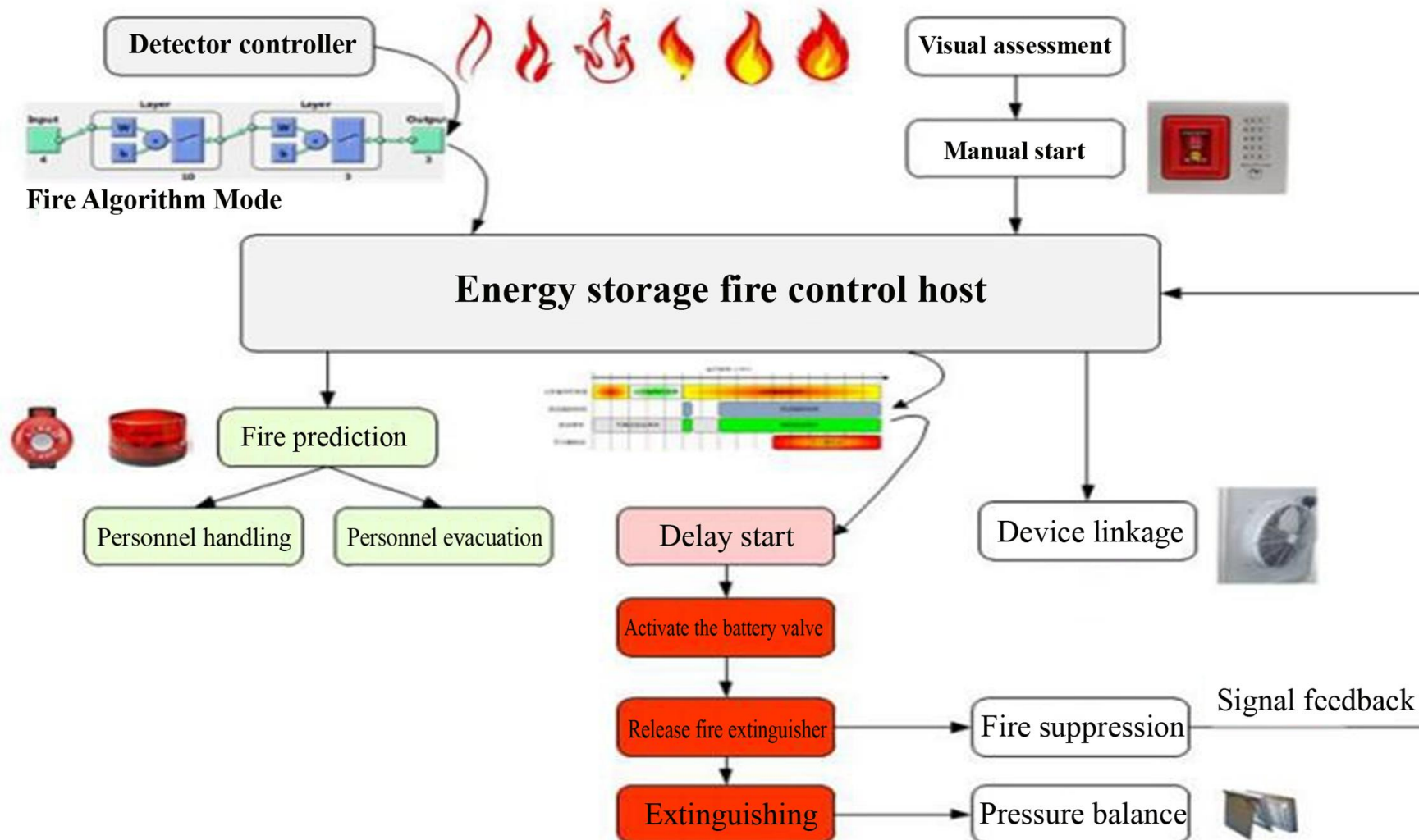
Fire sound
and light alarm



Manual fire
alarm button



Fire alarm
controller





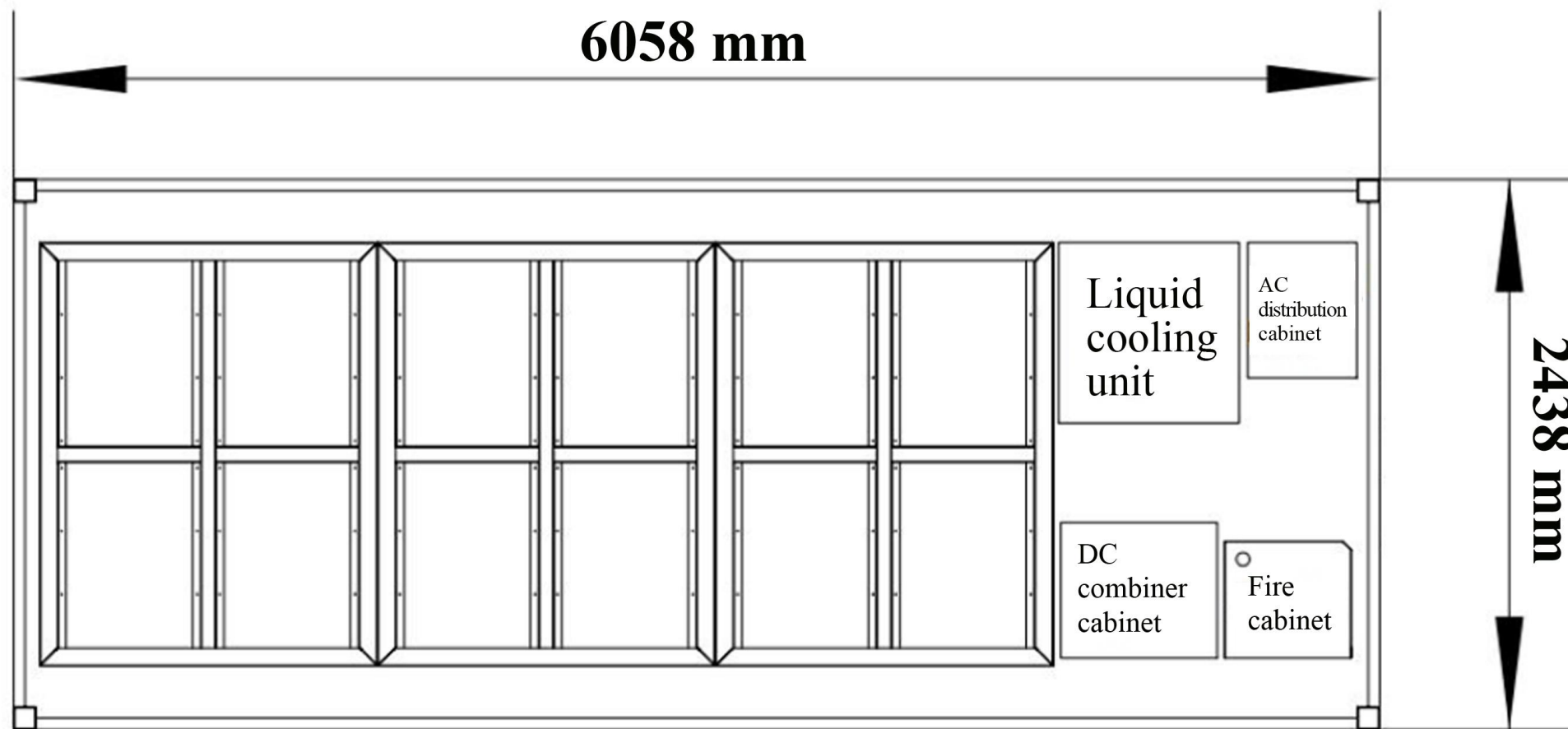
The battery system consists of 6 battery clusters in parallel

1248V/1680Ah Battery system parameters

No.	Item	Main parameters	Remarks	No.	Item	Main parameters	Remarks
1	Cell model	LF280	Lithium iron phosphate battery 280Ah	9	Container Spec	20 feet	6058*2438*2591
2	Match battery clusters	1P390S	1P30S*13	10	System voltage level	1500V	
3	Battery system rated voltage (V)	1248		11	Cooling method	Liquid cooling	
4	Battery system capacity (Ah)	1680	System energy: 2096.64kWh	12	EMS/PCS communication interface	Amphenol	
5	Voltage Platform (V)	1014~1423.5	2.6~3.65 unit	13	Cycle life (25-C 100% DOD 80% initial capacity)	0.25P/0.25P	6000
6	Adapt to the altitude	≤2000m		14		0.5P/0.5P	5000
						1P/1P	2500
7	Insulation resistance (Ω/V)	>1000 Ω/V		15	DC side output power	0.25P/0.25P	94%
8	Dielectric Withstand Voltage (V)	Insulation 1500V Withstand voltage 3820V		16		0.5P/0.5P	93%
						1P/1P	92%



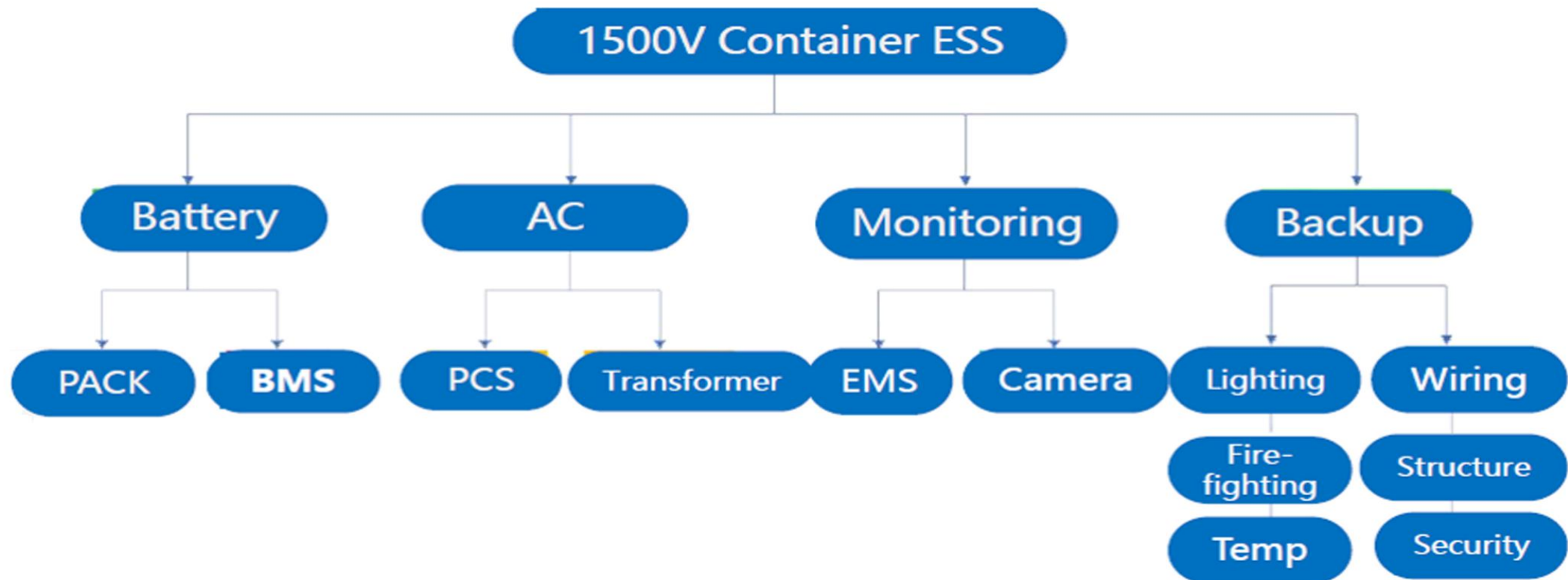
The 20 feet energy storage system consists of 6 battery clusters





Energy Storage System

13.8 kW/ 16.8 kWh energy storage system consists of
8ea 20 feet container systems + 8 PCS and other components :

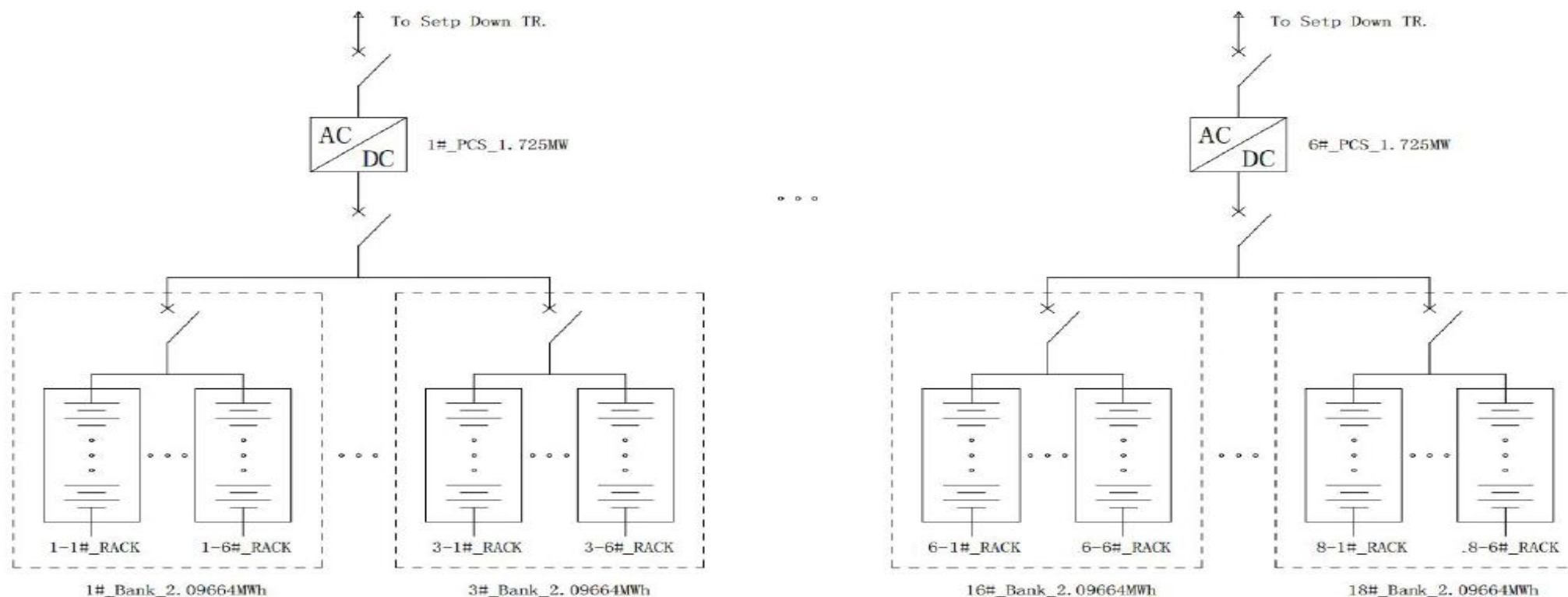




Energy Storage System

13.8 kW/ 16.8 kWh energy storage system consists of

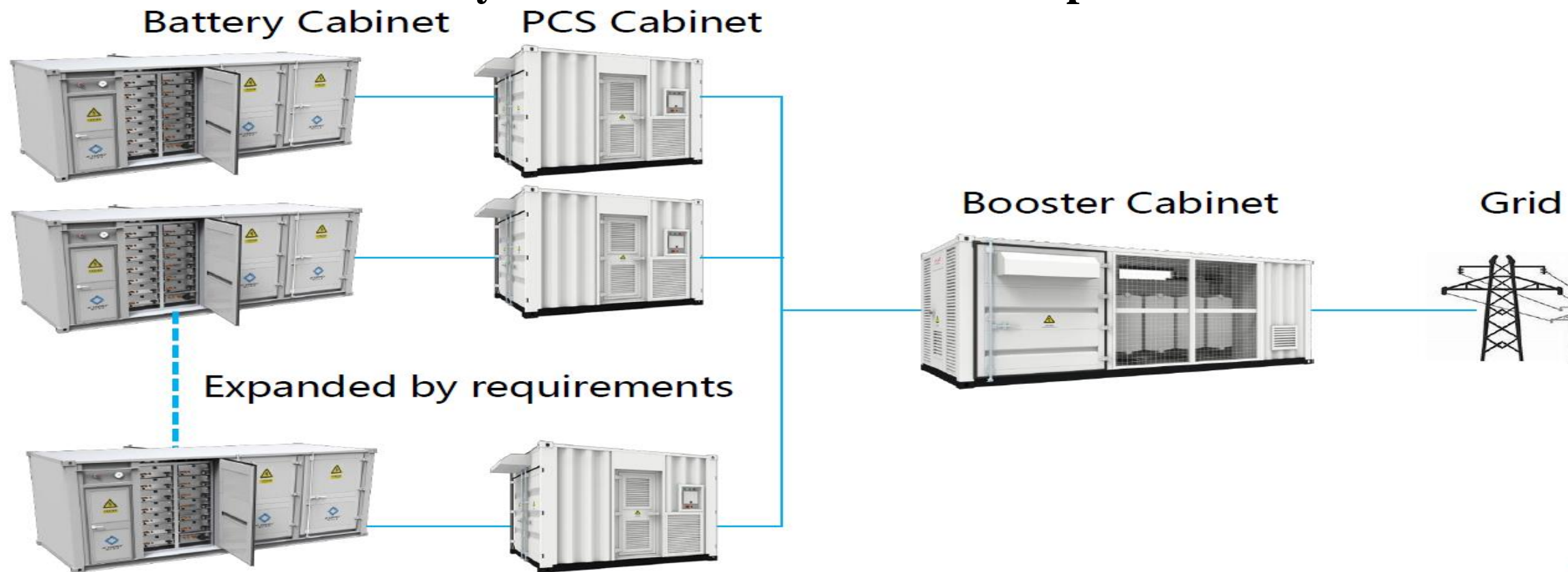
8ea 20 feet container systems + 8 PCS and other components :





Energy Storage System

**13.8 kW/ 16.8 kWh energy storage system consists of
8ea 20 feet container systems + 8 PCS and other components :**





Cloud Platform

- Intelligent operation strategy switching.
- Real-time push of station operation reports.
- It has two operation modes of local control and cloud monitoring, realizing unattended operation.
- 7*24 hours microgrid operation data display.
- Multi-dimensional statistical analysis of energy consumption and income data.
- Supports unified management of multiple sites in the cloud.





Bill of material (BOM List)

Name	Specifications	Unit	Quantity	Remark
Battery system	1248V280AH	Group	48	
Container	20 feet high box (6058*2438*2519mm)	indivual	8	
PCS	17250KW	indivual	8	
Temperature Control System	15KW	set	16	
Fire Fighting System	Heptafluoropropane	set	16	
DC combiner cabinet	Confluence	indivual	16	
AC power distribution cabinet	power distribution	indivual	8	
Auxiliary devices (including monitoring, lighting, cables)		indivual	1	
EMS	Customized Energy Management System	set	1	



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