Containerized 40HQ ESS Concept with Prismatic Cells

Applications and Requirements:

- ESS in 2* 40 foot containers, all the containers need to equipped with smoke detection, fire suppression, HVAC, IP camera's, racking, cabling, grounding etc, according to EU technical requirment. PCS will be installed in one container.
- 2MW Power Conversion System
- 5,4MWh gross capacity, and 4MWh battery (net after 10 years)
- LFP Battery, 0,5C, 6000 cycles min

Performance Parameters of Energy Storage Module

◆ 1P14SModule：44.8V280Ah

Serial No.	Item	Parameter	Remarks
1	Rated voltage of module(V)	44.8	
2	Rated capacity(Ah)	280	1C rate discharge
3	Group mode	1P14S	Serial parallel scheme
4	Discharge energy/KWh	12.54	
5	Module weight(kg)	95±2	
6	Rated charge discharge rate	/	
7	Standard discharge current	140A	
8	Standard charging current	56A	
9	Maximum continuous discharge current (A)	280A	
10	Maximum continuous charging current (A)	140A	
11	working temperature	Charge：0~45℃	
12	working temperature	Discharge：-20~55℃	
13	Insulation requirements (MΩ)	≤20MΩ	
14	Module Dimensions	D656*W455*H220	
15	Cooling mode	Air Cooled	DC24V Fan
16	Executive Standards	GB/T 36276-2018Lithium ion battery for electric energy storage	

Module appearance

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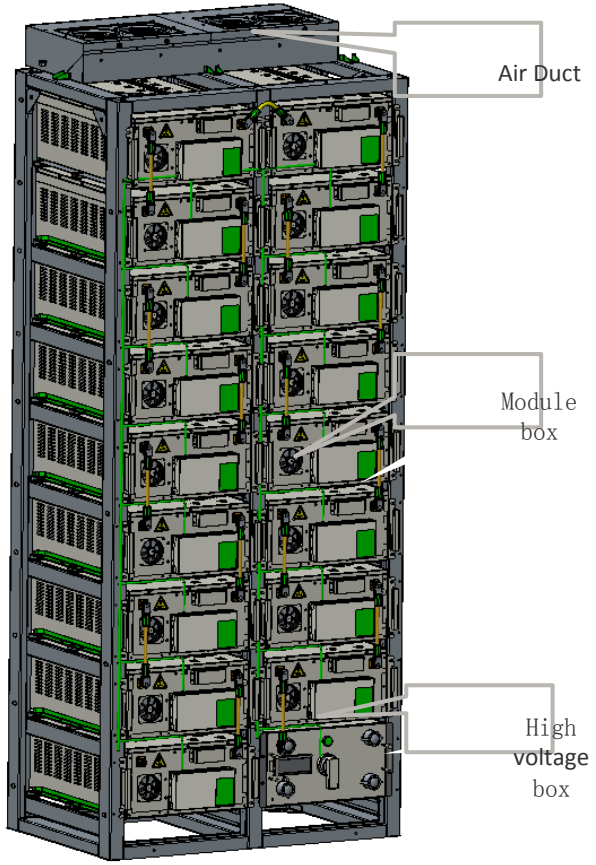
Battery Cluster Parameters

Serial No.	Item	Technical Parameter	Remarks
1	Rated voltage (50%SOC)	761.6V	238S, 17 Battery boxes
2	Rated Capacity	280Ah	
3	System grouping	238S1P	Serial parallel scheme
4	System discharge energy	213.25kWh	
6	Voltage range	618~868.7	Adjustable voltage range
7	Maximum pulse discharge current (10S)	400A	25℃, SOC50%
8	Maximum continuous discharge current	280A	
9	Maximum continuous charging current	140A	T >= 10℃
10	Maximum SOC running window	3%SOC~98%SOC	Available SOC range of battery
11	Insulation resistance value	Greater than 500m Ω	
12	Dimensions	W980*D667*H2300mm	
13	Weight	About 1800kg	
14	Heat dissipation mode	Air cooling and heat dissipation of plug box	
16	Executive Standards	GB/T 36276-2018Lithium ion battery for electric energy storage	

Schematic diagram of battery cluster



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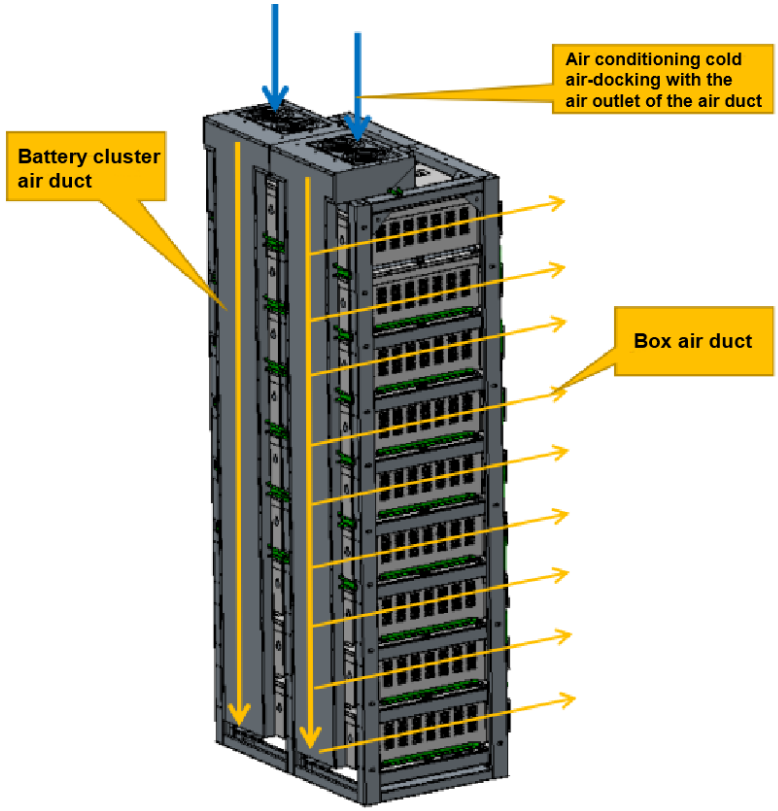
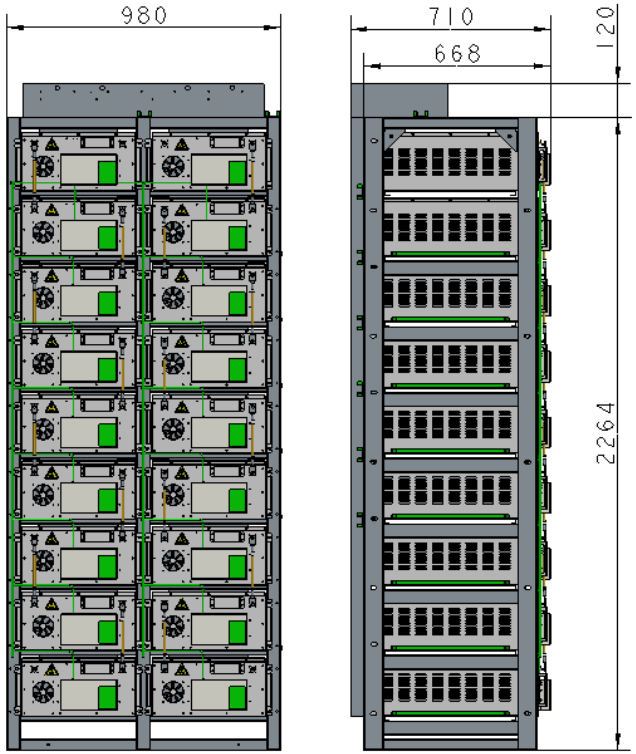
Appearance of battery cluster



Dimensional drawing of battery cluster (with air duct)



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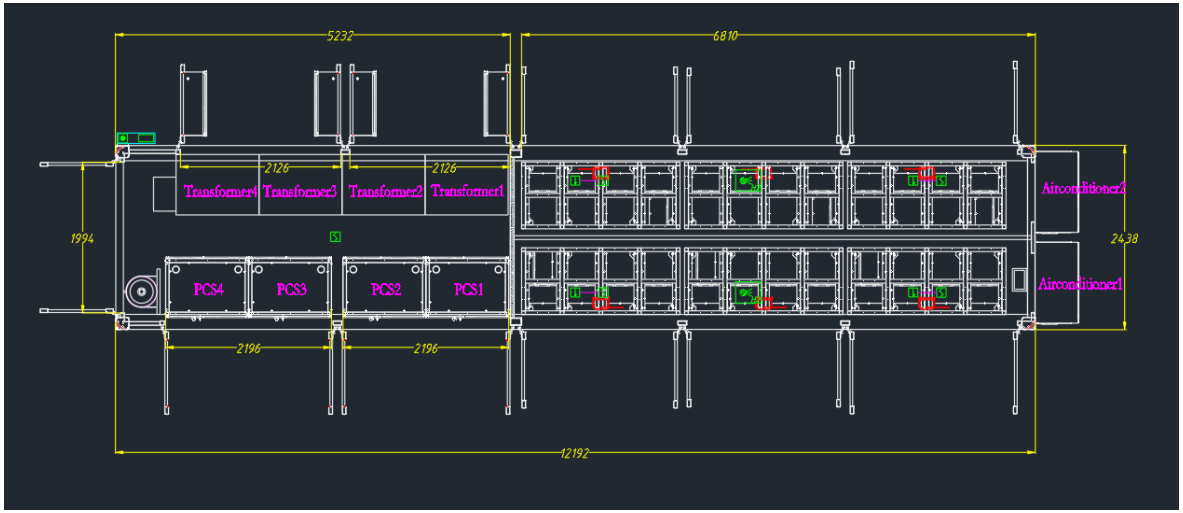
A: 40HQ Compact Containerised ESS with external AC, 2MW Power PCS+2.5MWh Battery



1、 The container is a 40HQ standard with length 12192mm container with built-in lithium iron phosphate battery, combiner cabinet, PCS, fire protection, etc;

2、 Max. 12 battery clusters(2.55MWh), which are accessible on both sides；

3、 2 sets of combiner cabinet；

4、 Four 500kW PCS are matched, and the corresponding voltage range of PCS is 600-900VDC；

5、 It is equipped with 2pecs external 5kW air conditioners；

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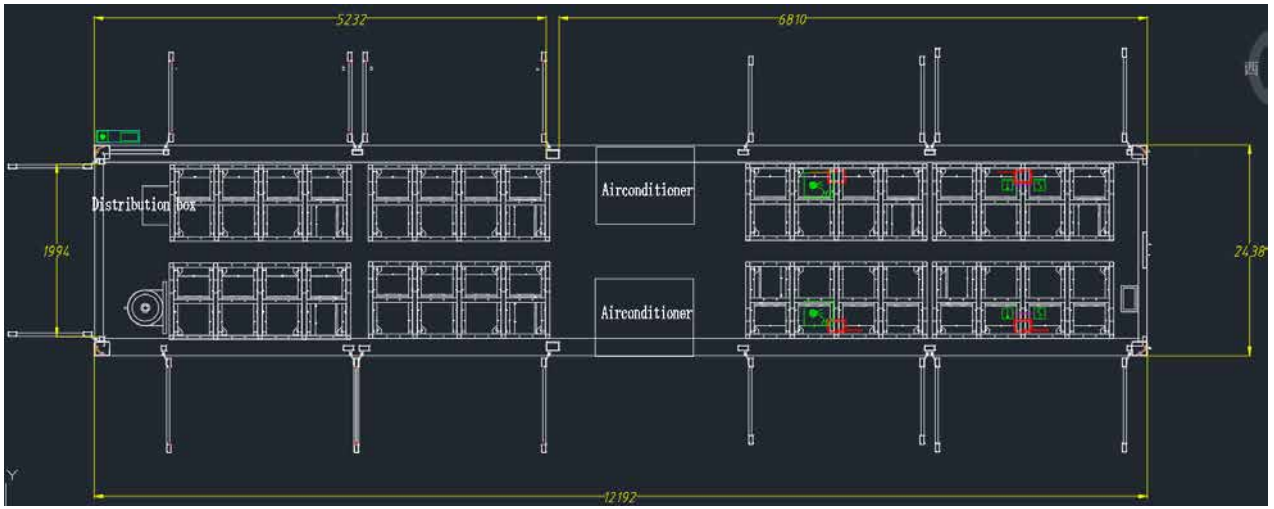
B: 40HQ Compact Containerised ESS with internal AC, 3,4MWh Battery



1、The container is a 40HQ standard with length 12192mm container with built-in lithium iron phosphate battery, combiner cabinet, fire protection, etc;

2、Max. 16 battery clusters (3,4MWh), which are accessible on both sides；

3、2 sets of combiner cabinet；

4、It is equipped with 2pecs internal 5kW air conditioners；

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General Technical Parameters of ESS (2*40foot)

Serial No.	Item	2000kW-5,9MWh Parameter introduction
1	System rated voltage(V)	761.6（238S）
2	System operating voltage range(V)	618~868.7（Cell 2.6V~3.65V）
3	System rated capacity(Ah)	Max 213.25k*(12+16)=5971k
4	Cell Type	Lithium iron phosphate prismatic cell
5	System weight(Kg)	Container A: 30T Container B: 34T
6	Continuous charging power（KW）	2000KW
7	Continuous discharge power（KW）	2000KW
8	SOC operating range（%）	Recommended Range 3%~98%SOC
9	System heating / cooling mode	Air conditioning
10	Number of battery system clusters	12+16 batch
11	Battery system dimensions	2* 40 HQ container

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General technical parameters of ESS (2*40HQ)

Serial No.	Item	2000kW-5,9MWh Parameter introduction
12	Wire Connection mode of battery system	Bottom (underground connection room is required at the bottom of box)
13	Battery type per cluster (rated)	761.1V280Ah, 213.25KWh
14	Plug in model	44.8V208Ah 14S1P
15	Cell model	HD-3.2V-280Ah
16	Air conditioning configuration	Two 5kW air/ conditioner
17	Combiner cabinet	Container A: 2sets Container B: 2sets
18	PCS	500kW built-in isolation transformer *4
19	Other	each container:1 set of Novec 1230 fire protection, 2 sets of water immersion sensors, 2 groups of lighting, temperature and humidity sensors
20	Electrical cabinet	Built in 5kvaups 4set / EMS cabinet(Ampowr Provides EMS)
21	Battery Design Lifespan	20 Years

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PCS

	PWS1-500KTL-EX	PWS1-500KTL-NA
Utility-interactive Mode		
Battery voltage range	600~900V	630~900V
DC max current	873A	
Quantity of battery strings	1/4/8	
AC voltage	380V	400V
AC current	760A	720A
Nominal power	500kVA	
AC frequency	50/60Hz(±2.5Hz)	60Hz(59.5~60.5Hz)
THDi	≤3%	
AC PF	Listed: 0.8~1 leading or lagging (Controllable) Actual: 0.1~1 leading or lagging (Controllable)	
Stand-alone Mode		
Battery voltage range	600~900V	630~900V
DC Max Current	873A	
Quantity of battery strings	1/4/8	
AC output voltage	380V(±10% configurable)	400V(±10% configurable)
AC output current	760A(short term overload 836A max)	720A(short term overload 792A max)
Nominal AC output power	500kVA	
AC max power	550kVA	

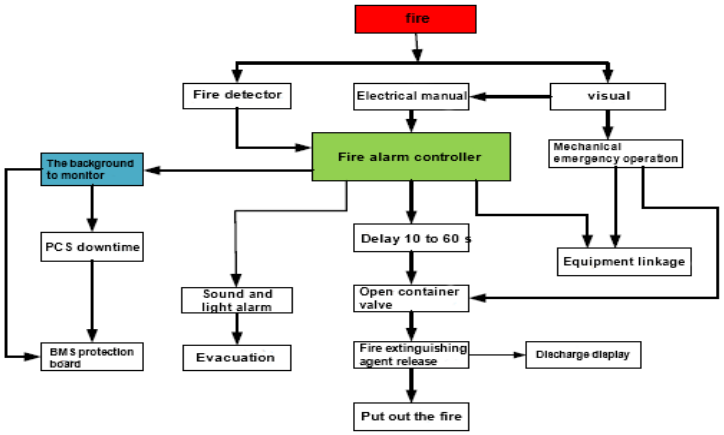
Output THDu	≤2%（Linear load）	
AC frequency	50/60Hz	60Hz
AC PF	Listed: 0.8~1 leading or lagging (Load-depend) Actual: 0.1~1 leading or lagging (Load-depend)	
Overload Capability	105%~115% 10min; 115%~125% 1min; 125%~150% 200ms	
Physical		
Cooling	Forced air cooling	
Noise	70dB	
Enclosure	IP20	NEMA1
Max elevation	3000m/10000feet (> 2000m/6500feet derating)	
Operating ambient temperature	-20°C to 50°C (De-rating over 45°C)	
Humidity	0~95% (No condensing)	
Size (W×H×D)	1100×2160×800mm	
Weight	600kg	
Installation	Floor standing	
Other		
Peak efficiency	98.20%	
CEC efficiency	-	97% w/o transformer
Protection	OTP, AC OVP/UVP, OFP/UFP, EPO, AC Phase Reverse, Fan/Relay Failure, OLP, GFDI, Anti-islanding	
Configurable protection limits	Upper/Lower AC Voltage/Frequency limit, Battery EOD voltage.	
AC connection	3-Phase 3-Wire	
Display	Touch Screen	
Communication	RS485,CAN,Ethernet	
Isolation	Non-isolation	
Certification	CE LVD IEC 62477, CE EMC IEC 61000, EN 50549-1:2019 G99, AS4777	ETL listed conforming to UL1741/UL 1741SA/UL 9540, CPUC RULE 21, ，CSA 22.2
Short circuit		
Fault current	2000A	
Fault duration	100ms	

Features

- Modular design and wide power range in single cabinet
- Bi-directional Power Conversion System
- Grid-support functions
- Multiple DC battery strings, different battery mixing application
- Flexible derating available

Fire Protection

Novec 1230 fluid is known as a fluorinated ketone and is manufactured by 3M. Novec 1230 fluid has a boiling point of 49 degrees C and therefore exists as a liquid at room temperature, it has been developed specifically to protect critical business assets, such as sensitive equipment. It rapidly extinguishes through a combination of heat absorption (its main action) and some chemical interference with the flame.Novec 1230 Fire Protection Systems is engineered to provide clean, fast, people-safe protection for applications requiring a “green” solution to fire suppression. The system includes detectors, a control unit, agent storage cylinders, piping and discharge nozzles.



Control Chart Of Fire Fighting System

Features:Safe for property, people, and to the environmentZero ozone depleting potentialNegligible global warming potentialAtmospheric lifetime of less than 5 daysSafe for use in occupied areasRequires minimal storage space

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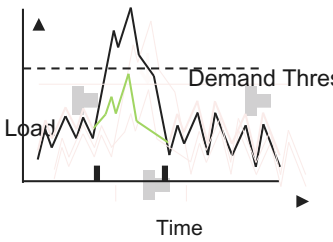
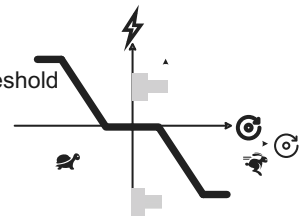
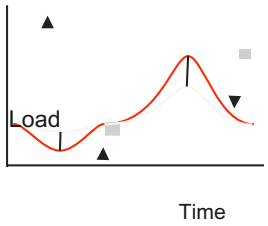
Applications



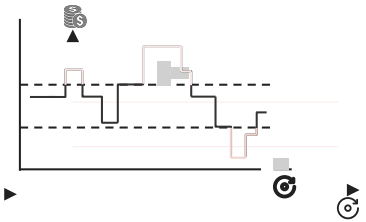
Demand Charge



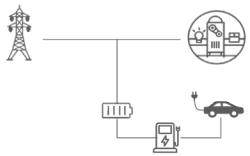
Frequency Regulation



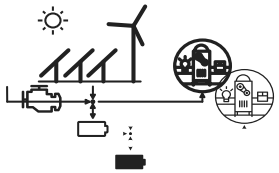
Peak Shaving



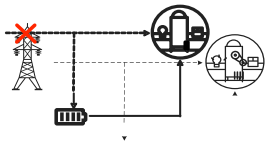
Spot Market



Energy buffer



Micro Grid



Backup power

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Shanghai, CN, 1MWh, LFP, PV Packing House

Inner Mongolia, CN, 30MWh, LFP, Wind&Solar Farm

CA, USA, 750kWh, LFP, Utility Grid+PV

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West Virginia, USA, 54MWh, LFP,Frequency Regulation

Taiwan, CN, 1MWh, LFP, Peak Shaving

NY, USA, 300kWh, LFP, Energy Buffer

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Southern California, USA，
80MWh, LFP, Grid Support

Henan, CN, 50MWh, LFP, Grid Support

Zimbabwa, 1.5MWh, LFP, Mircogrid

Thank you!

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