Energy Storage Solution
Mitigation - Fire risk > System Protection

Fire system safety design

Cell, modules and rack have all passed the UL9540A test, and the test results show that thermal runaway is strictly controlled within the initiating cell, there is no flaming, flying debris or gas explosion. And adjacent cells and modules function well after test.

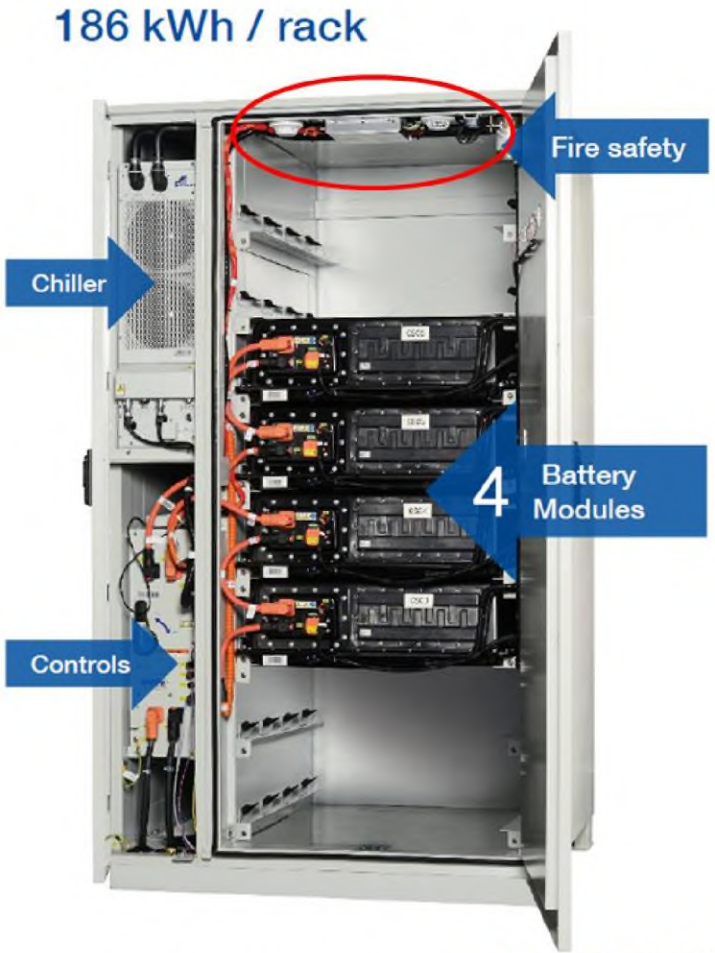
On this basis, CATL still designed the fire detection and suppression system.

Battery room of every cabinet is equipped with aerosol fire extinguishing system, composed of a smoke detector, a temperature detector and a aerosol fire extinguishing device.

When both detectors are triggered, the fire extinguishing agent will be released.

When only a detector is triggered, it's defined as first-level fire alarm. When both of the two detectors are triggered, it's defined as second-level fire alarm.

At the same time, the aerosol fire extinguishing system interacts with the battery management system (BMS). When the BMS detects a first-level fire alarm, the alarm cabinet quits the state of operating and send signl to the EMS. When the BMS detects a second-level fire alarm,the aerosol of the alarm cabinet is released, with all of the electrical cabinets in the system out of operation and signl reported to the EMS.

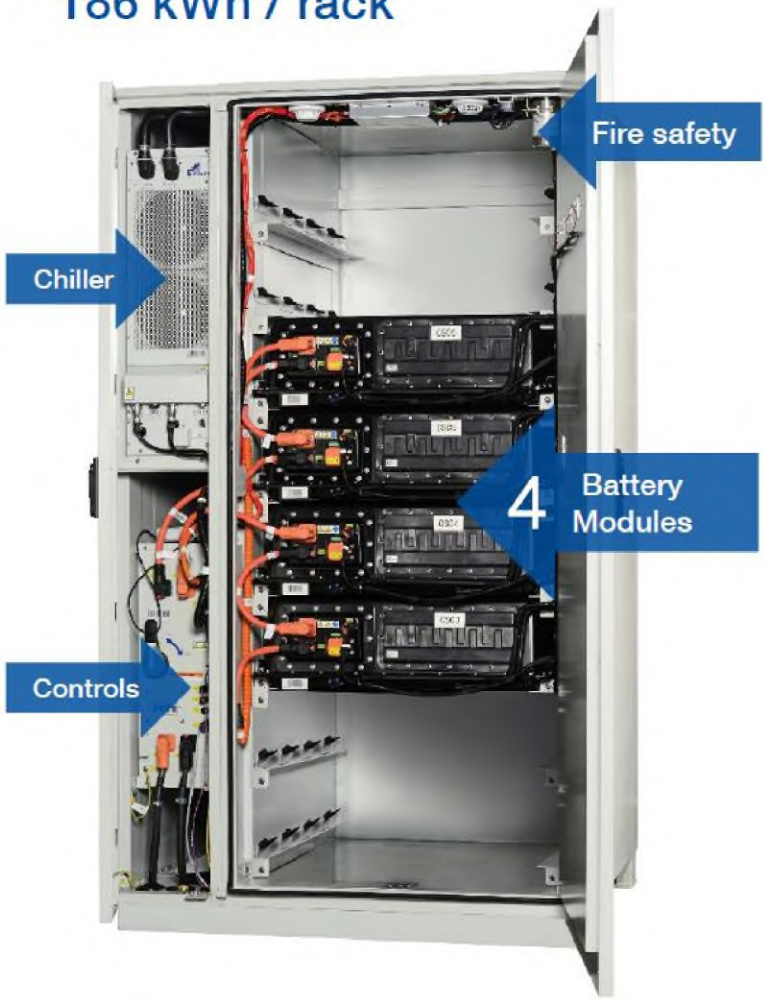


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SUNSYS B-Cab L

186 kWh / rack

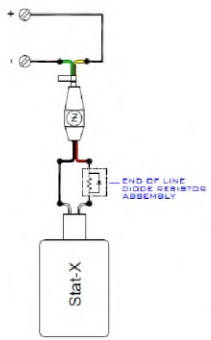


Detection :



Heat Detector	APOLLO FIRE DETECTORS LTD	55000-142	Supply voltage: 9-33 Vd.c., 0 °C to 60 °C, Detection of temperature: 76.7 °C	UL 521	UL S5053
Smoke Detector	APOLLO FIRE DETECTORS LTD	55000-326	Supply voltage: 9-33 Vd.c., 0 °C to 60 °C	UL 268	UL S5022

Extinction : Fire Suppression Systems – Stat-X from Fireaway



Compound: (particulate)	% Original Mass
Particulate captured within generator housing during discharge/cooling	30.00
K_2CO_3	22.08
$KHCO_3$	3.280
KNO_3	3.160
Other potassium compounds	2.200
NH_4HCO_3	9.280
Compound: (gas carrier)	
N_2	21.93
H_2O	6.550
CO_2	1.361
CO	0.097
NH_3	0.041
NO	0.001
NO_2	0.002
HCN	0.006
Other	Trace
Total	100.00

Model	30E	60E	60ME	100E	250E	500E	1000E	1500E	2500E
Aerosol Mass: grams	30	60	60	100	250	500	1000	1500	2500
Weight: kg (lbs)	.4 (.8)	.5 (1.1)	.5 (1.2)	.9 (2.0)	2.5 (5.6)	3.4 (7.6)	7.1 (15.7)	8.6 (19.0)	11.3 (24.9)
Length: mm (inches)	86 (3.7)	129 (5.0)	153 (6.0)	136 (5.3)	154 (6.1)	250 (8.1)	192 (7.5)	230 (9.0)	293 (11.5)
Diameter: mm (inches)	51 (2.0)	51 (2.0)	51 (2.0)	76 (3.0)	127 (5.0)	127 (5.0)	203 (8.0)	203 (8.0)	203 (8.0)
Discharge Time: (in sec)	7.0	10.0	10.0	12.0	12.0	23.0	16.0	23.0	36.0

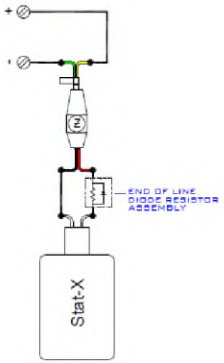
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Extinction : Fire Suppression Systems – Stat-X from Fireaway

The extinguishing agent released by aerosol fire extinguishing device is mainly composed of ultra-fine potassium salt particles and inert gas. Potassium salt is considered to be one of the most effective fire-extinguishing agents, and its fire-extinguishing mechanism is similar to Halong, which extinguish fires by impeding the complex chemical chain reaction of combustion or explosion. The combustion chain reaction requires the participation of OH, H and O radicals, and ultrafine potassium salt particles can quickly consume these free radicals and prevent the combustion chain reaction from proceeding. Total flood fire extinguishing method is adopted. A certain concentration of fire extinguishing agent is sprayed and fill the entire protection area, which can extinguish any open flame in the protection area. It's effective for electrical fires, electrolyte fires and other combustibles fires(A/B/C fires)





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Mitigation - Fire risk > Maintenance

Schedule	Requirement
Weekly	Check all Electrical Connections
	Visual inspection of Components
Semi-Annual	Inspect/Test all system components
	Test electrical continuity
	Inspect bracketing & position of generators
10 - Year	Remove from Service

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Emergency plan for major issues

Fire accident plan

Step 1: Evacuate people to safe area, delimit the safety isolation zone and call the police according to the situation.

Step 2: If possible, proceed as follows in the case of personal safety:

1）If the wiring harness between rack is smoking or on fire, use carbon dioxide or dry powder fire extinguisher to extinguish the fire.
2）If the batteries are on fire, choose to use water spray to extinguish the fire at a long distance.
3）If you accidentally inhale smoke, please transfer and seek medical attention as soon as possible.

Step 3: Notify the manufacturer to obtain further handling suggestions.