

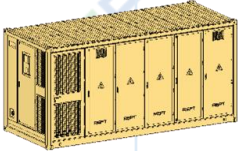
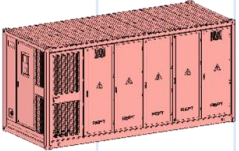
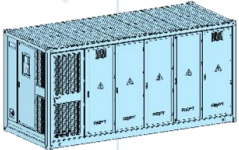
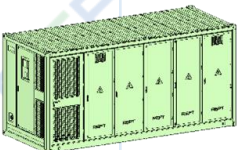
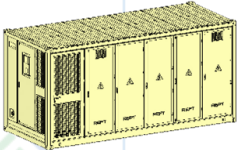
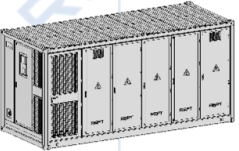
REPT 5.11 MWh DC Block

BESS Expert

REPT

DC Block Technology

DC Block Roadmap

	2023				2024				2025				2026				
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
2-hour System		 <ul style="list-style-type: none"> 1p52s module 3.7MWh 20ft HC Liquid cooled 				 <ul style="list-style-type: none"> 1p104s module 5.1MWh 20ft HC Liquid cooled 											
4-hour System						 <ul style="list-style-type: none"> 1P104s module 5.5MWh 20ft HC Liquid cooled 			 <ul style="list-style-type: none"> 1p104s module 500+ Ah cell 6 MWh 20ft HC Liquid cooled 				 <ul style="list-style-type: none"> All in one Liquid cooled 				
1-hour System							 <ul style="list-style-type: none"> 1p48s module 3.47MWh per 20ft HC (Available) 3.85MWh per 20ft HC (Rated) Liquid cooled 										

DC Block Technology

5.11MWh & 5.5 MWh Specifications

5.1MWh DC Block



5.5MWh DC Block

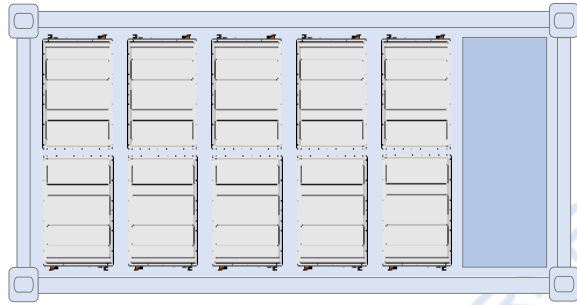


No.	Item	5.1MWh DC Block	5.5MWh DC Block
1	Cell type	320Ah Wending® Cell	345Ah Wending® Cell
2	Integration form	12 strings	12 strings
3	Rack integration form	1P416S	1P416S
4	Rated DC voltage	1,331.2V	1,331.2V
5	DC voltage range	1,040V~1,500V	1,040V~1,500V
6	Rated capacity	5.11MWh	5.51MWh
7	Dimension	6058L×2438W×2896H (20HQ ISO)	6058L×2438W×2896H (20HQ ISO)
8	Weight	44 t	45 t
9	Rated charge/discharge current	0.5p	0.25p
10	Cooling mode	Liquid cooling	Liquid cooling
11	Executive standard	UL 9540, UL1973, IEC 62619, IEC 63056, IEC 62477, UN 38.3, NFPA68, NFPA69, GB 36276	

DC Block Technology

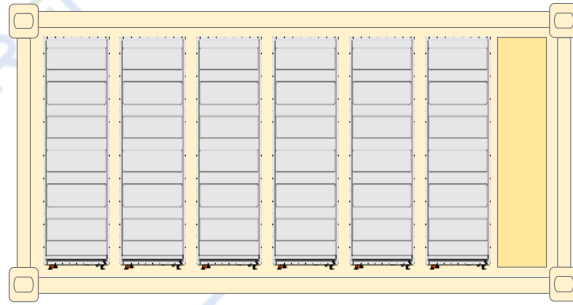
Design Upgrade- Higher Energy Density per Area

DC Block GEN.I (3.7 MWh)



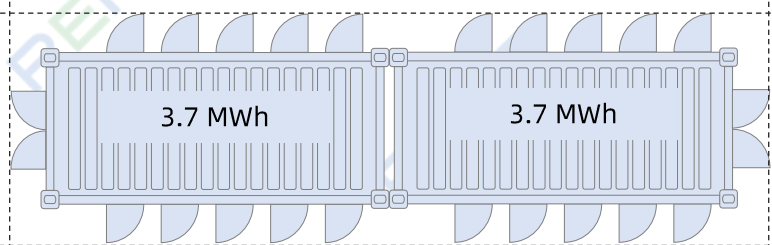
AED 252.3kWh/m²

DC Block GEN.I (5.1 MWh)



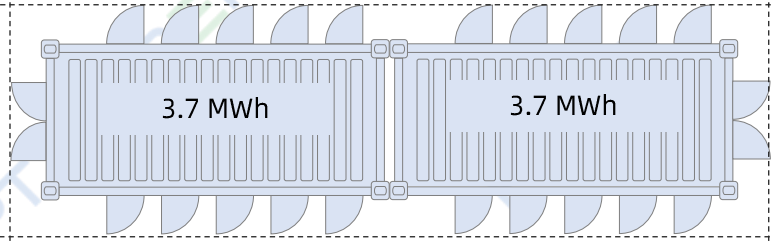
AED 346.1kWh/m²

VS



3.7 MWh

3.7 MWh

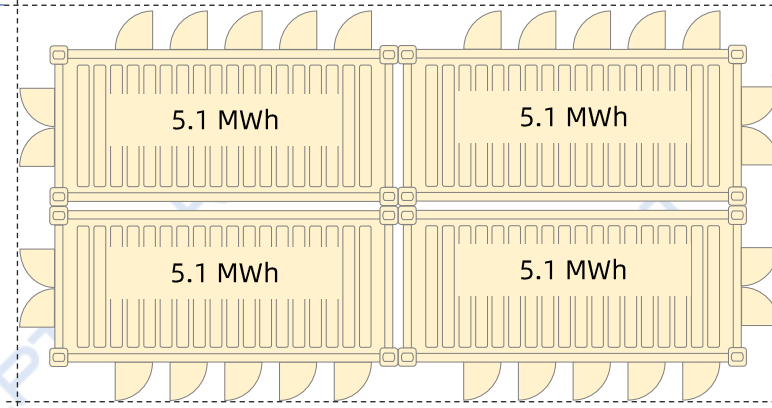


3.7 MWh

3.7 MWh

AED 119kWh/m²

27% Land Area Savings



5.1 MWh

5.1 MWh

5.1 MWh

5.1 MWh

AED 210.6kWh/m²

VS

Cell Capacity Upgrade

Internal Space Optimization

Single-Side Maintenance



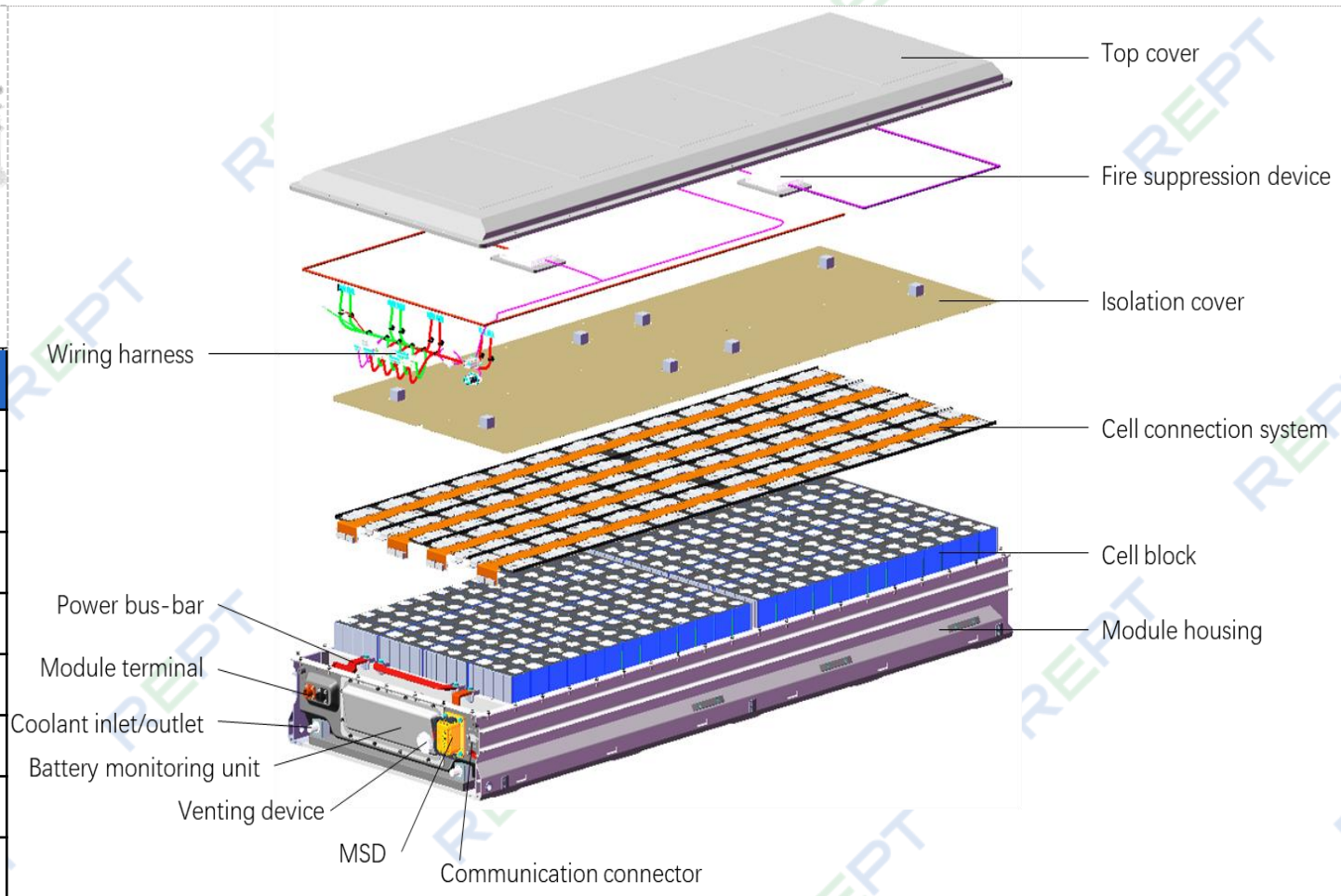
27% Land Saving

DC Block Technology

Y104 Module Specification



Item	Spec.
Configuration	1p104s
Nominal Energy (kWh)	106.5
Rated Voltage (V)	332.8
Dimension (mm)	780W×2150D×250H
Mass (kg)	690±5
Rated Power (kW)	53.25
IP level	IP67
Fire suppression	Internal to Module*

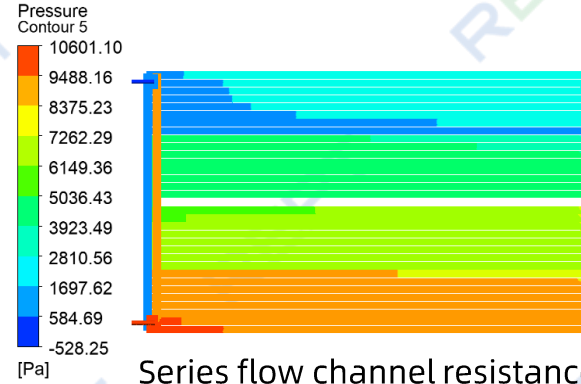
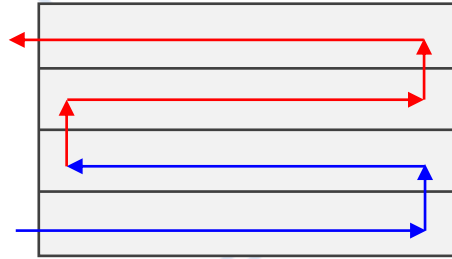


*first to offer Module level Fire suppression gas

DC Block Technology

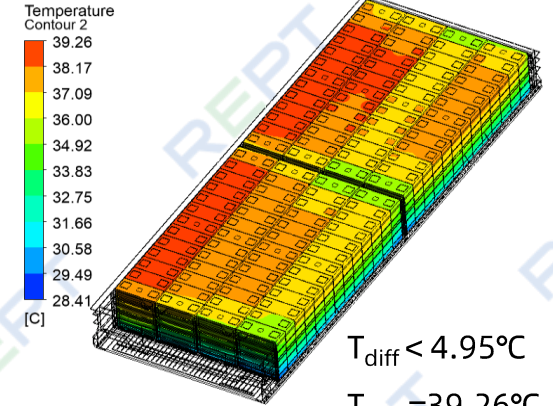
Liquid Cooling System Flow Pattern

Traditional Series Flow Channel



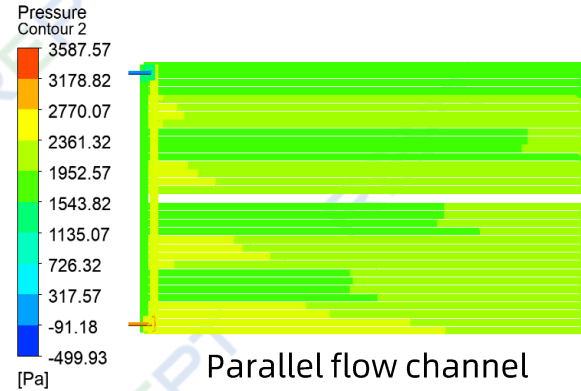
Series flow channel resistance

Cell Temp

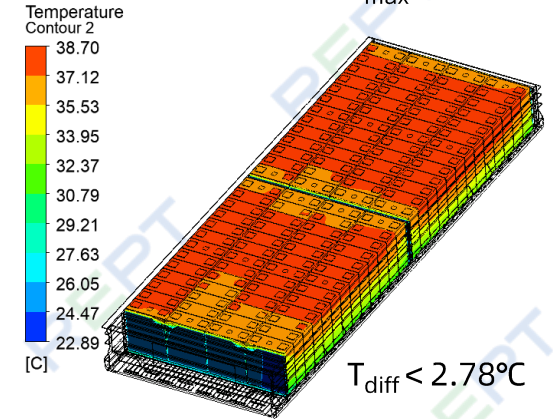


$T_{diff} < 4.95^{\circ}C$
 $T_{max} = 39.26^{\circ}C$

REPT Parallel Flow Channel



Parallel flow channel resistance



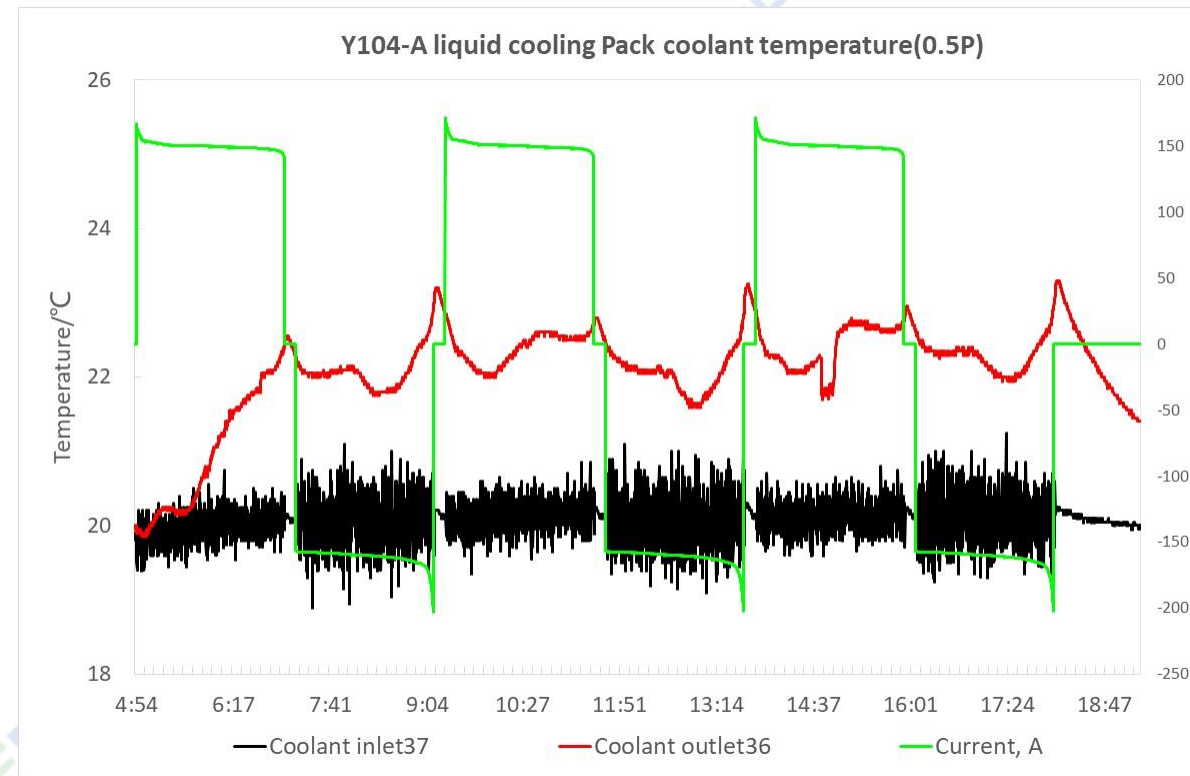
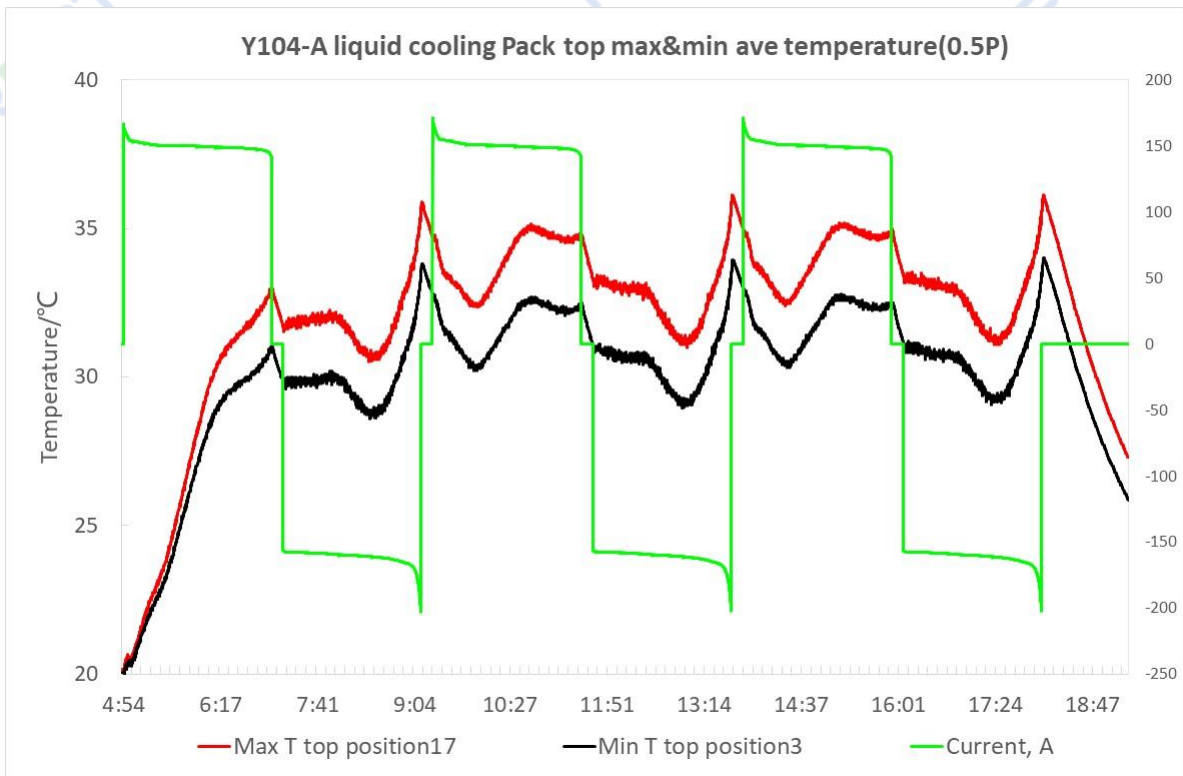
$T_{diff} < 2.78^{\circ}C$
 $T_{max} = 38.7^{\circ}C$

- At the same flow rate, flow resistance is reduced by **85%**, & module Temp difference is reduced by **2.17°C**.

- WHY? Even cooling Temp = more even distributed degradation over time, usable energy

DC Block Technology

Thermal Testing Results

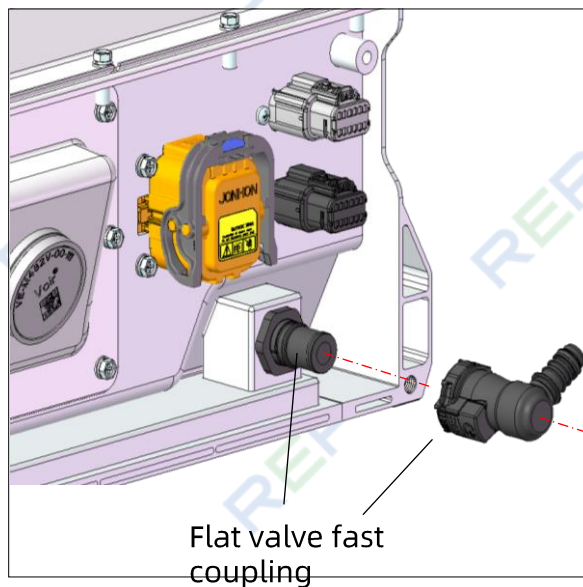
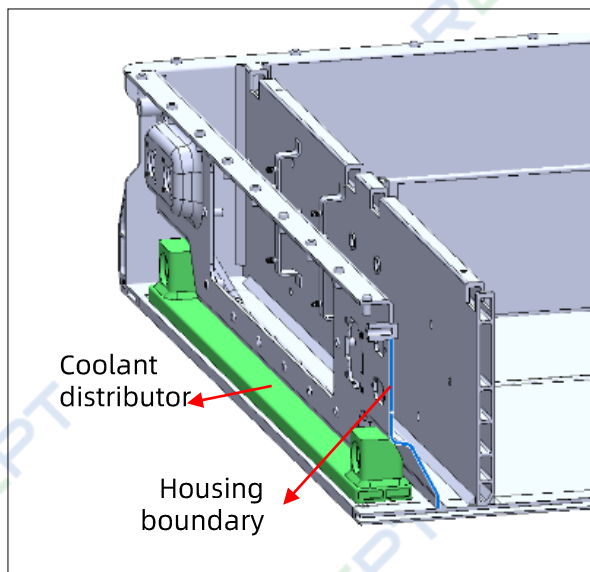


Maximum Temperature	36.2°C
Maximum Temperature Difference	2.8 °C

Average Temperature (Coolant at the Inlet)	20.1°C
Average Temperature (Coolant at the Outlet)	22.1°C

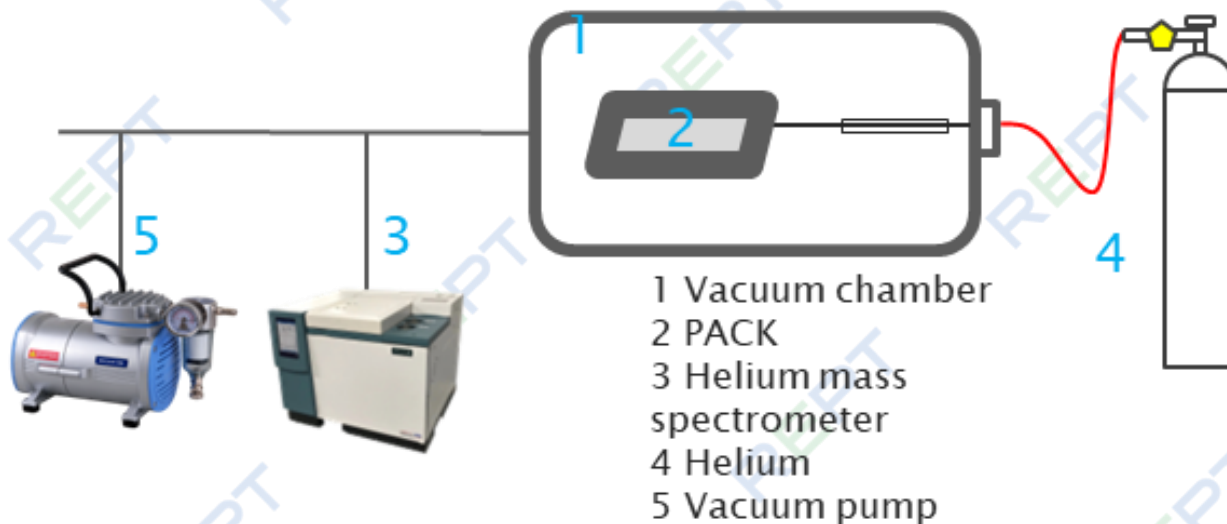
DC Block Technology

Leakage and Condensation Proof



Features

- External cooling plate integrated into housing
- Electrical and cooling systems separated
- Condensation prevention (module IP67 sealed)
- Self-sealing valve on Hoses- less fluid loss

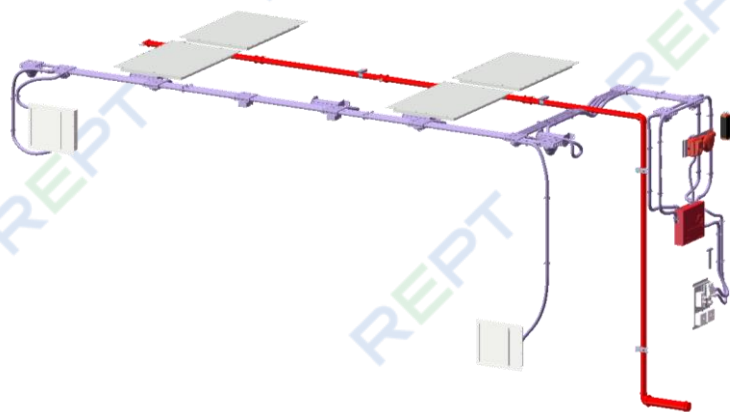


Factory Leak Test- Cooling Plate

- Helium leakage detection for each cooling plate in the manufacturing process.
- Helium leakage retest for module offline

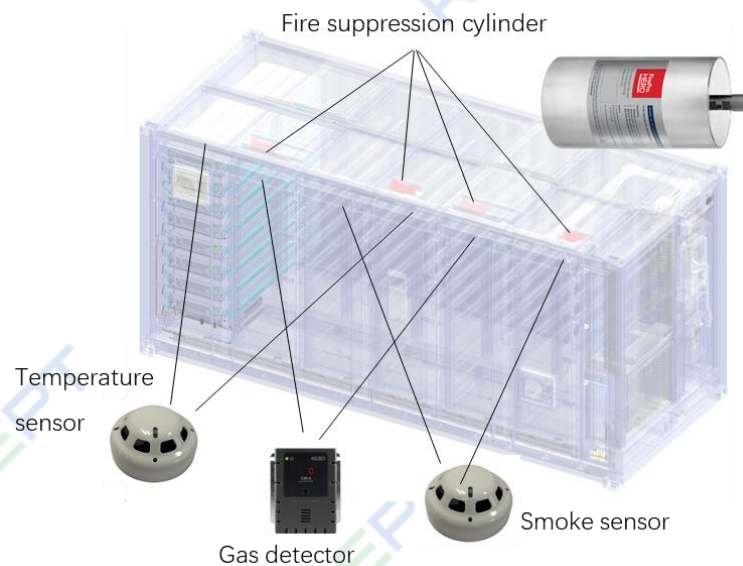
DC Block Technology

Fire Suppression Design

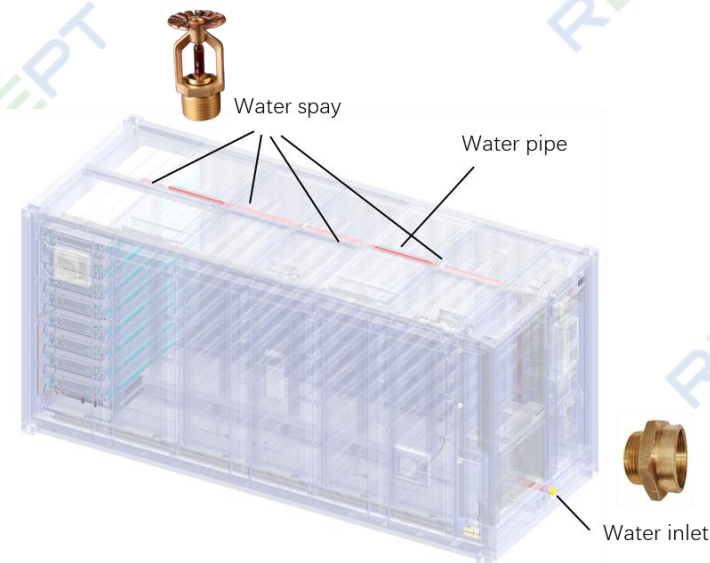


Fire Suppression System Configuration

- Explosion panels (top)
- Air vents (inlet right, outlet top)



Aerosol cylinder layout



Water pipe Layout

DC Block Technology

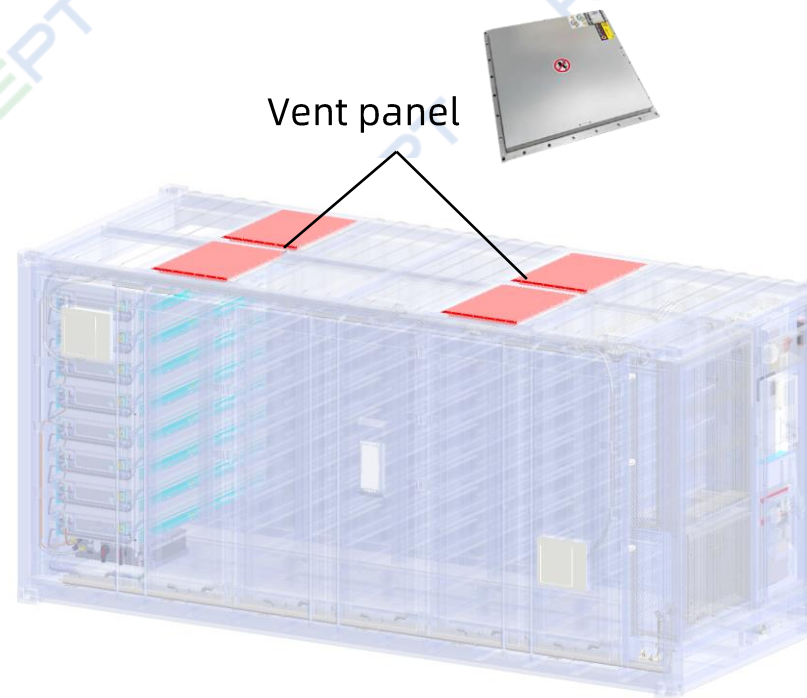
Fire Suppression NFPA 68&69 Compliance

Flammable
gas outlet



Ventilation (NFPA69)

Vent panel

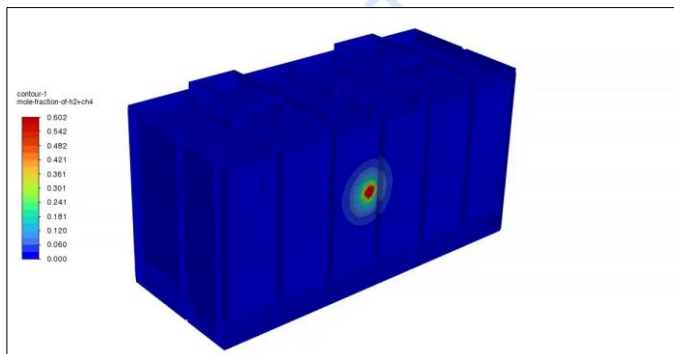


Explosion Prevention (NFPA68)

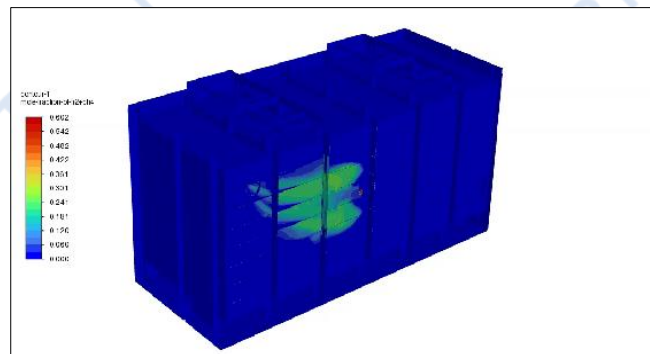
DC Block Technology

Fire Suppression NFPA 68&69 Compliance

Gas concentration (No Ventilation)

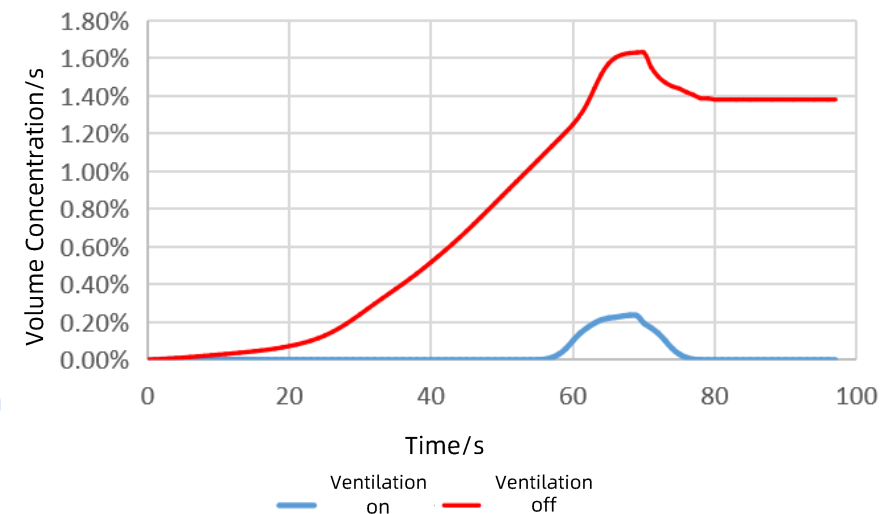


Gas concentration (With Ventilation)

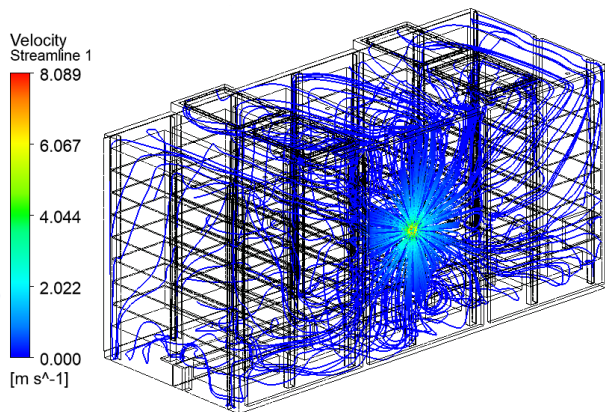


Simulation results: After starting the ventilation device, the concentration of combustible gas is controlled below 25% LFL, with no risk of explosion

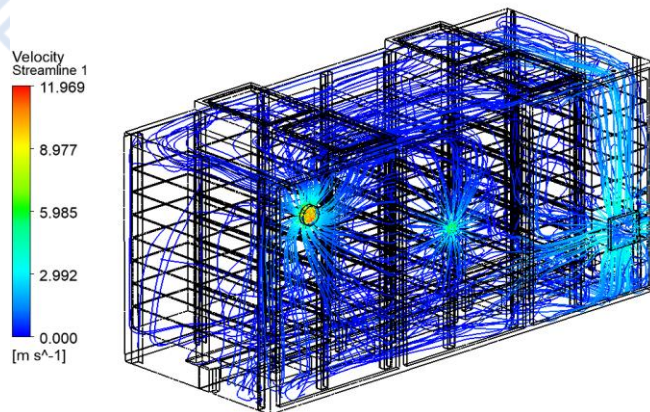
Volume Concentration of Combustible Gas



Gas flow field (No Ventilation)



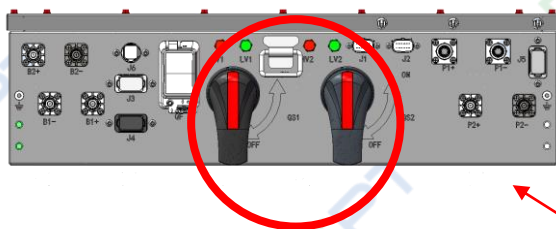
Gas flow field (With Ventilation)



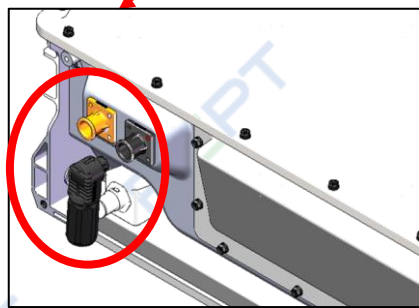
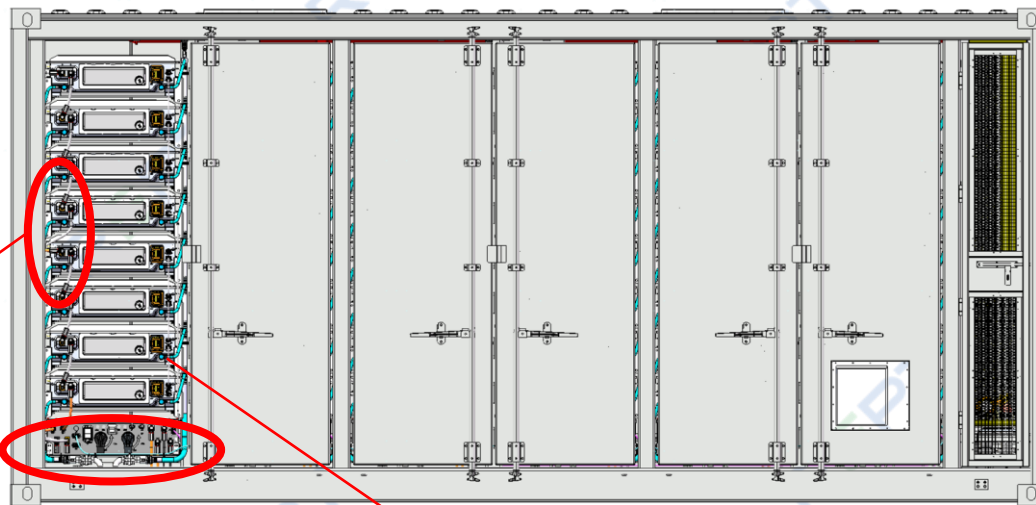
- ❑ Combustible gas volume concentration of 4% is the lower limit for gas combustion (i.e. 100% LFL), and the combustible gas volume concentration of 1% corresponds to 25% LFL.
- ❑ When the exhaust vent is closed, the relief valve of the single pack is opened, which can make the combustible gas volume concentration at the monitoring point on the top of the container exceed 1.6% (equivalent to 40% LFL);
- ❑ With exhaust opened, combustible gas volume is <math>< 0.3\%</math> (~7.5% LFL), with no risk of ignition and explosion.

DC Block Technology

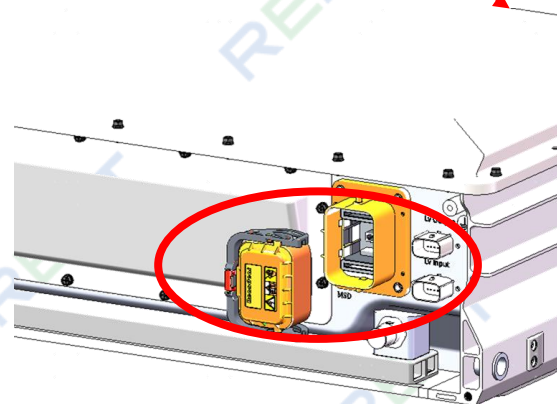
Electrical Design



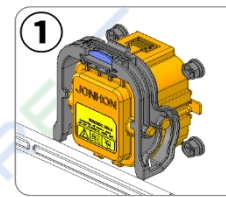
- Manual Disconnect switch for isolation



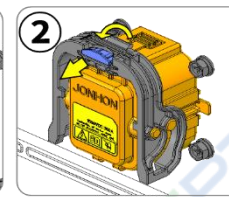
- Quick disconnects- no torque, less O&M labor
- Error proof with keys and colors.
- IPXXB & IP67 prevents level.



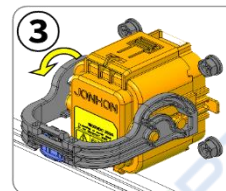
- MSD for every module
- Power off module when transport and operating



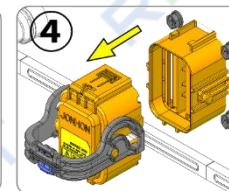
Locking status.



Pull the lock 1.



Lift lock 2 to release the handle. Turn the handle to a horizontal position.

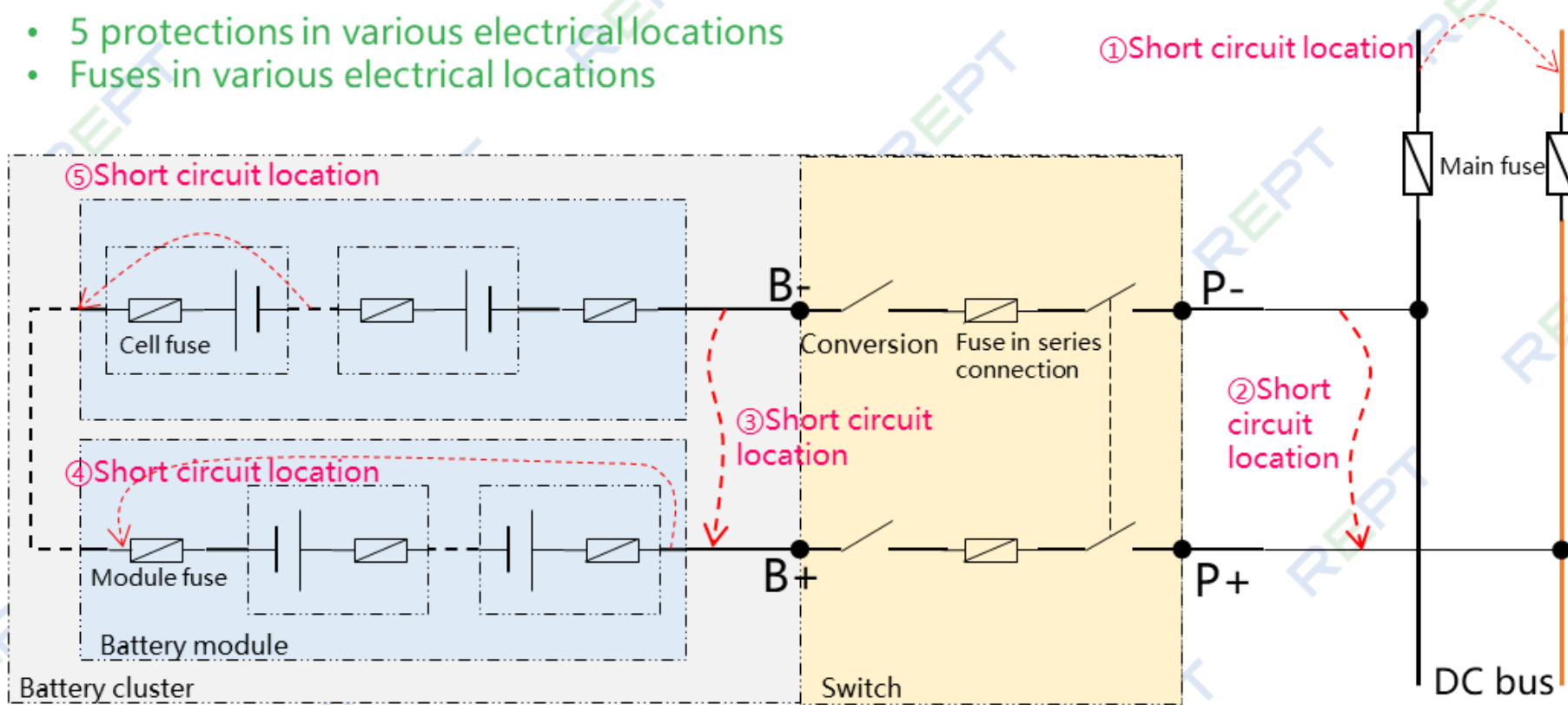


Push lock 3 to release the plug and pull it off.

DC Block Technology

Short-Circuit Protection

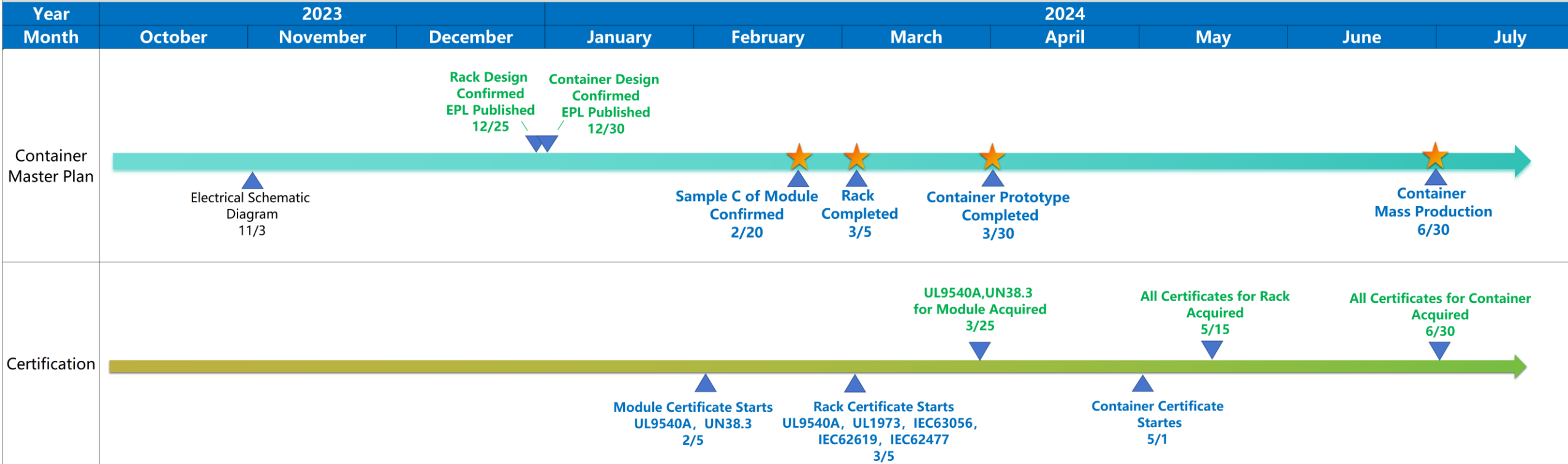
- 5 protections in various electrical locations
- Fuses in various electrical locations



Multi-level (4) short-circuit protection

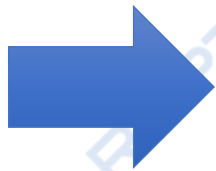
- Cell
- Module
- Switch
- DC Bus

Liquid Cooling 5.11 Mwh Container Development Plan



Summary Key Differentiators

- Internal Module level Fire Suppression
- Wending Cell capacity, & optimized layout
- Parallel Coolant flow design
- IP67 Rating
- Dual NFPA68/69 Rating
- 4 Stage Short circuit design



- Improved Safety Design
- Higher Energy Density
- Even temperature, less degradation
- Sealed battery module
- Improved Safety Design
- Improved Safety/ Fault current protection