

Regione Puglia

COMUNE DI SAN PANCRAZIO SALENTINO(BR) - SALICE SALENTINO(LE)
AVETRANA(TA) - ERCHIE(BR)

**PROGETTO PER LA REALIZZAZIONE DI IMPIANTO PER LA
PRODUZIONE DI ENERGIA ELETTRICA DA FONTI RINNOVABILI,
NONCHE' OPERE CONNESSE ED INFRASTRUTTURE, DI POTENZA
NOMINALE PARI A 36 MW ALIMENTATO DA FONTE EOLICA,
CON ANNESSO SISTEMA DI ACCUMULO INTEGRATO DI POTENZA
PARI A 24 MW, PER UNA POTENZA IN IMMISSIONE PARI A 60MW
DENOMINATO IMPIANTO "NEXT2"**

PROGETTO PARCO EOLICO "NEXT2"

Codice Regionale AU: CY53TR6

Tav.:	Titolo:
6_36	Impianto di accumulo Schede di progetto

Scala:	Formato Stampa:	Codice Identificatore Elaborato
n.d.	A4	CY53TR6_NPDI2_ERC_6_36_ElaboratoGrafico

Progettazione:	Committente:
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Indagini Specialistiche :	

Data Progetto	Motivo	Redatto:	Controllato:	Approvato:
15/09/2023	Prima versione	F.M.	S.M.	NPD Italia II srl



CATL

20-foot Container ---Liquid Cooling Battery System



C contents

- 1 Product Specification
- 2 System Overview
- 3 Installation

Note:
**Data updating is possible due to
continue improvement process**



Part

01

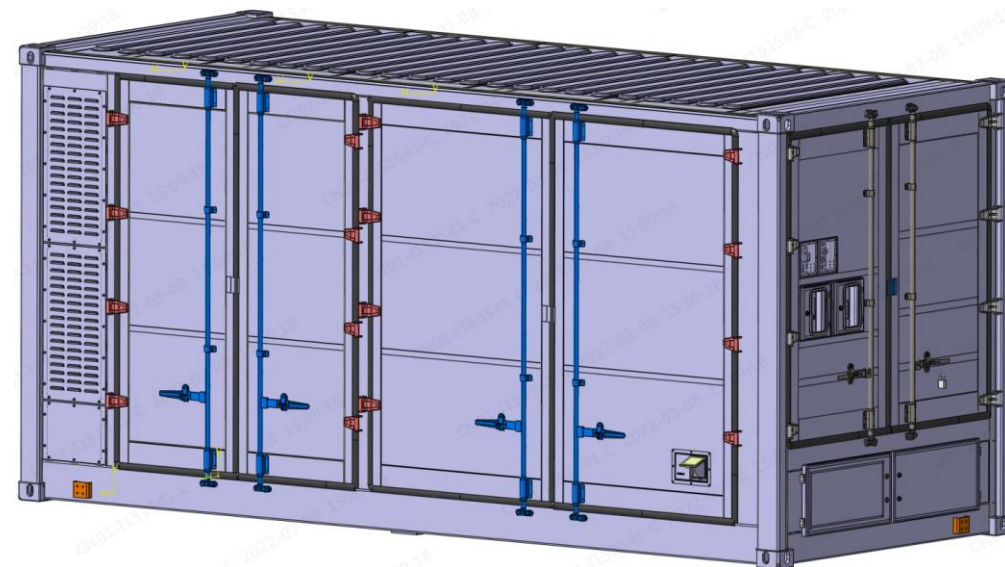
Product introduction
LFP 280Ah



Product introduction



NO.	Type	Description
1	Rated Energy	3.72MWh
2	Cell Cap(Ah)	LFP-280Ah
3	Rated Voltage	1331V/1500V
4	Container size	2462 (W)*6058(D)*2896(H)mm
5	Weight(T)	35T
6	Max Charging/Discharging Power	0.5P/0.5P
7	Cooling method	Liquid cooling
8	Color	RAL7035
9	IP	IP55



IEC 62619



UL 1973



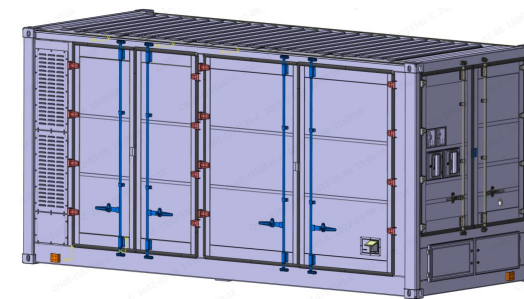
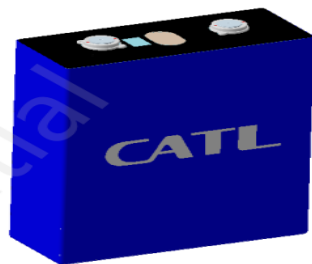
UL 9540A



IEC 62477-1



Specification:



Item	Cell-280Ah	Module	Container
Configuration	/	2P52S	10P416S
Dimension (W*D*H)(mm)	173.9*207.2*71.7	810*2060*240	2462 *6058*2896
Weight (kg)	5.36±0.30Kg	~660kg	~35000kg
Rated Voltage (V)	3.2	166.4	1331.2
Voltage Range(V)	2.5 ~ 3.65	145.6 ~ 187.2	1164.8 ~ 1497.2
Rated Energy(kWh)	0.896	93.18	3727



Specification:

Product Type		LFP battery bank	
NO.	Item	Specification	
1	Configuration	10P416S	
2	Rated Energy	3727kWh	
3	Rated Voltage	1331.2VDC	
4	Voltage Range	1164.8~1497.6VDC	
5	Charging Current (0.5P)	Rated	1400A
6	Charging Power (0.5P)	Rated	1863.68kW
7	Discharging Current (0.5P)	Rated	1400A
		Maximum	1600A
8	Discharging Power (0.5P)	Rated	1863.68kW



Specification:

Product Type		LFP battery bank	
NO.		Item	Specification
9	Operating Ambient Temperature	Charge	-25 °C...+55 °C
		Discharge	-25 °C...+55 °C
10	Auxiliary power supply	Voltage range	3AC 380...480V
11	Environment condition	Storage Temperature	-35 °C...+60 °C
		Application altitude	≤4000m (>2000m need be derated)
12	General Parameters	Communication protocol	CAN, RS485, TCP/IP
		Communication connection	Fast plug
		Power connection	Cable lug: 16 x M12
		Aux Power connection	Terminal
		Coolant	50% Ethylene glycol aqueous solution
13	Fulfill standard	cell	Cell: UN38.3, UL1973, IEC62619, UL9540A Container/rack: UL1973, UL9540A



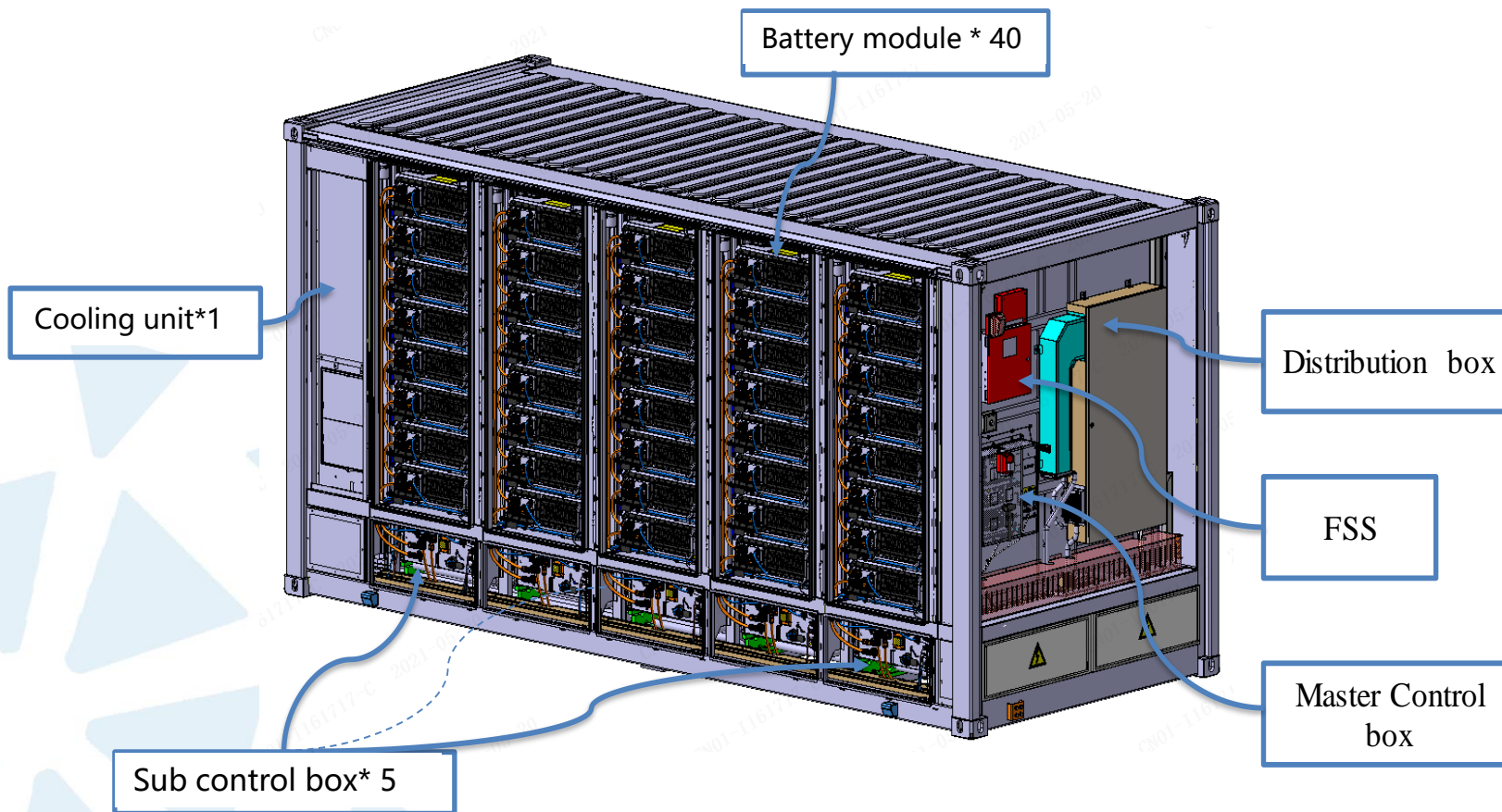
Part

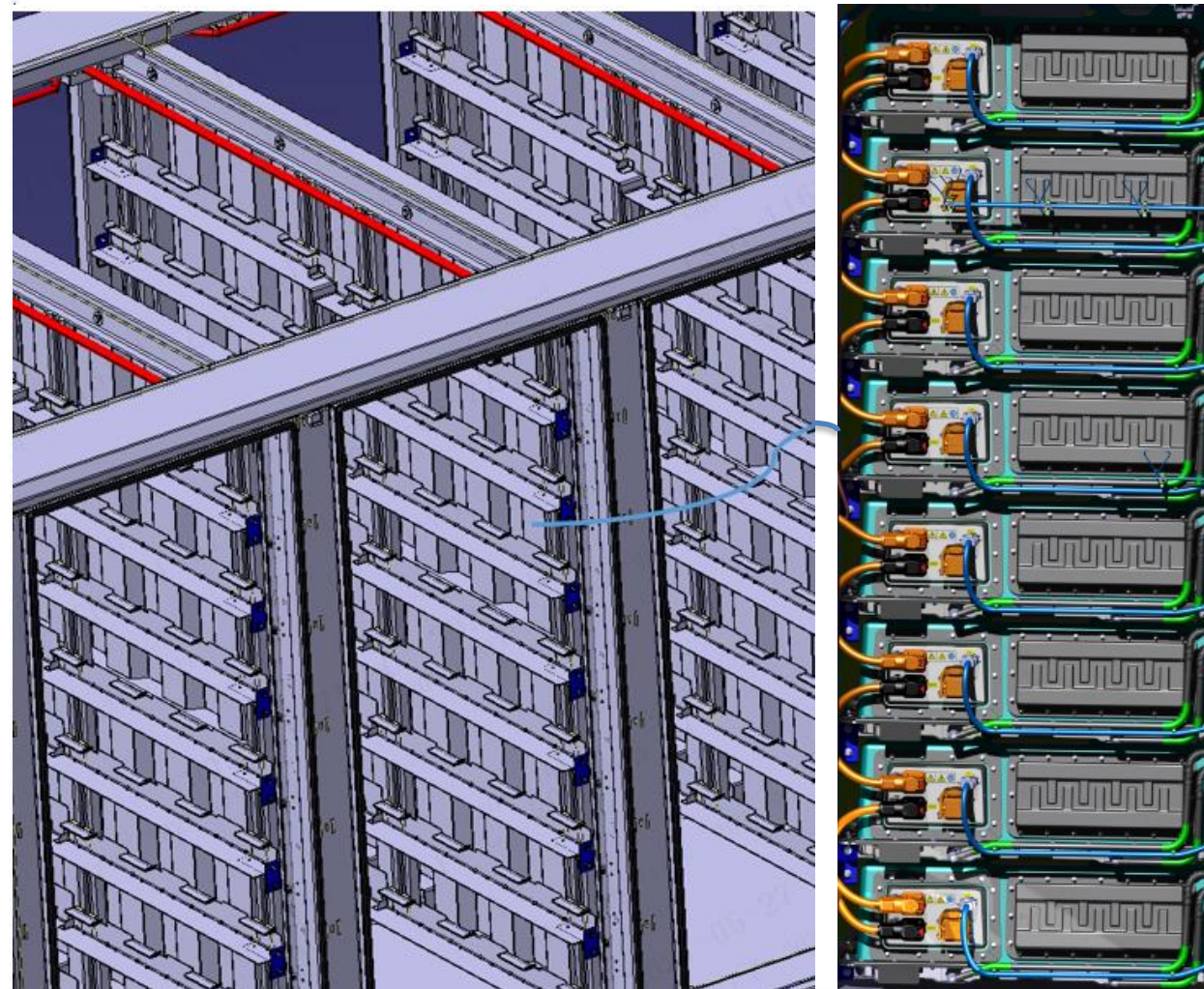
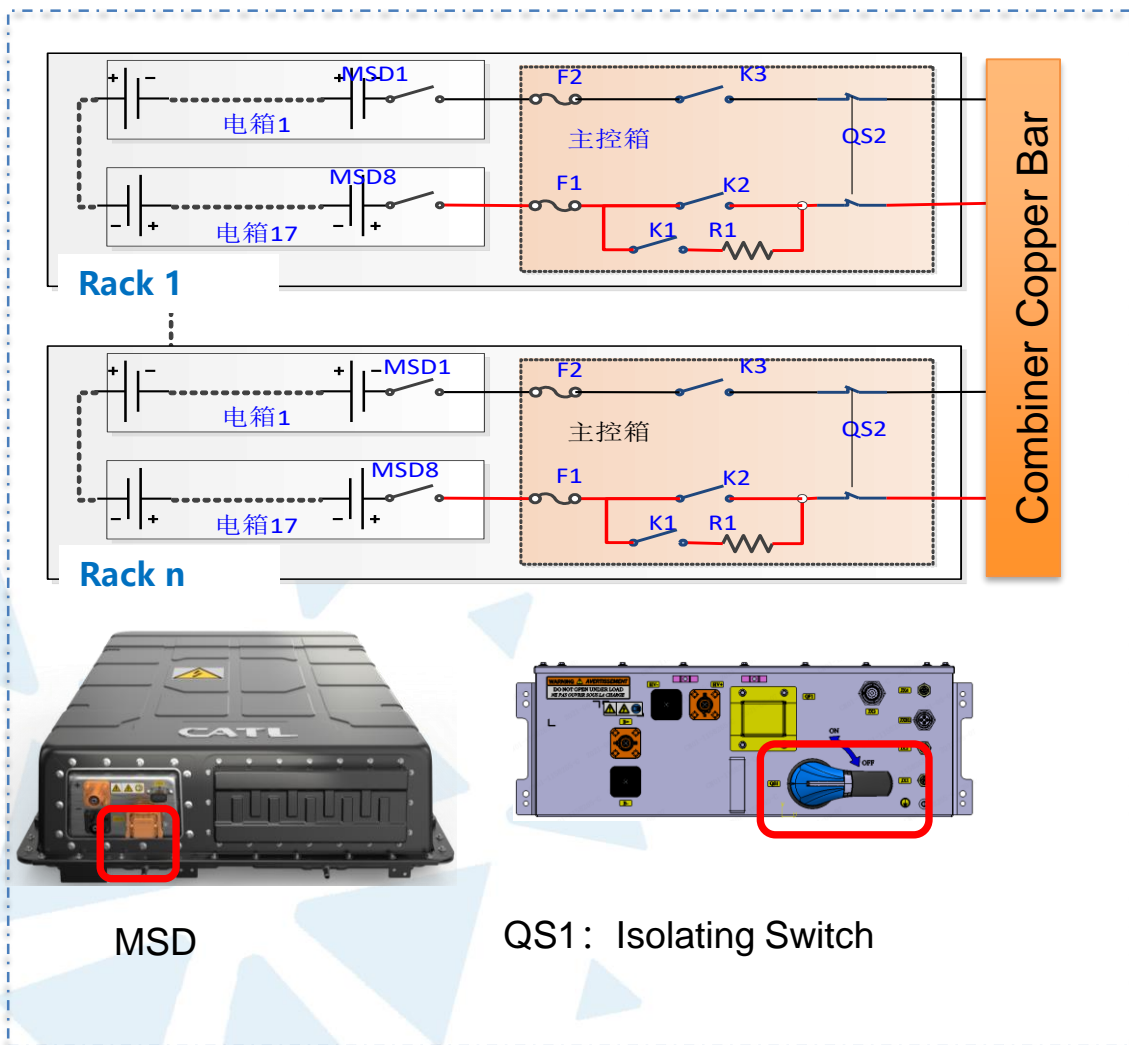
02

System Overview



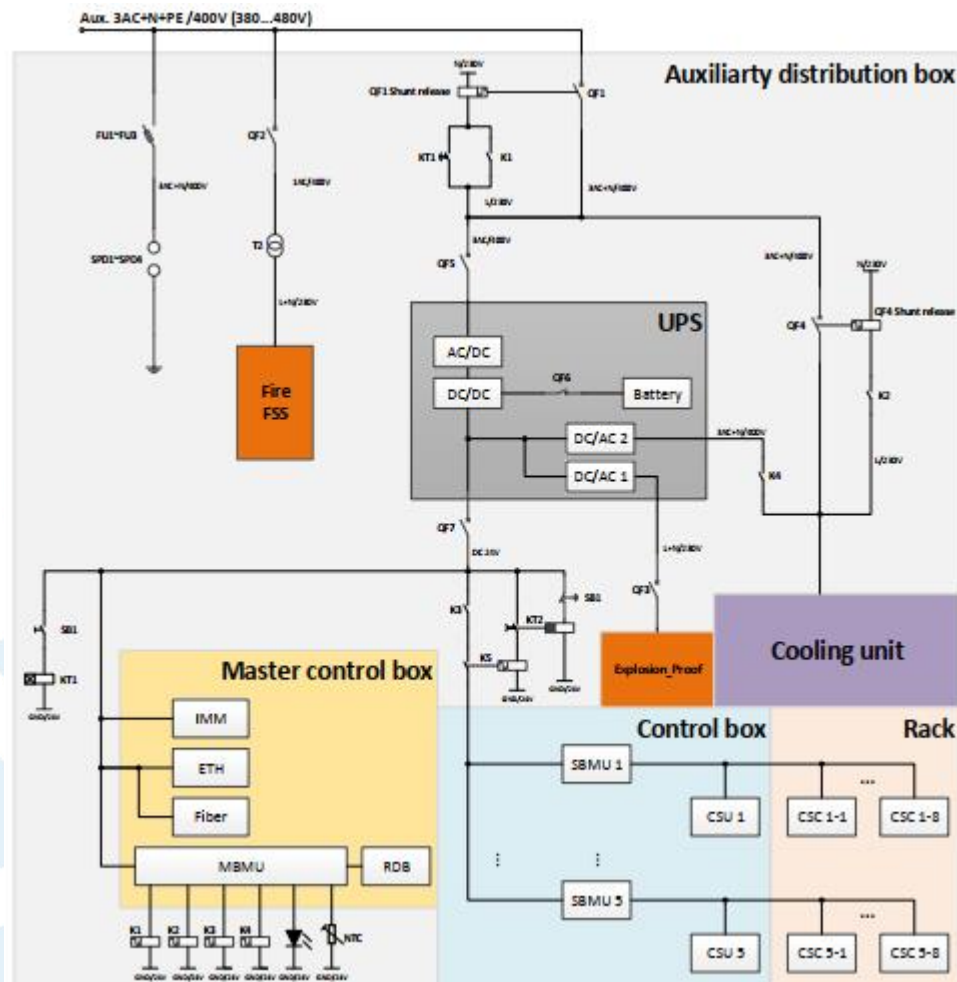
System Overview---Basic Configuration





✓ Module, Rack has disconnect device & Fuse to ensure safety

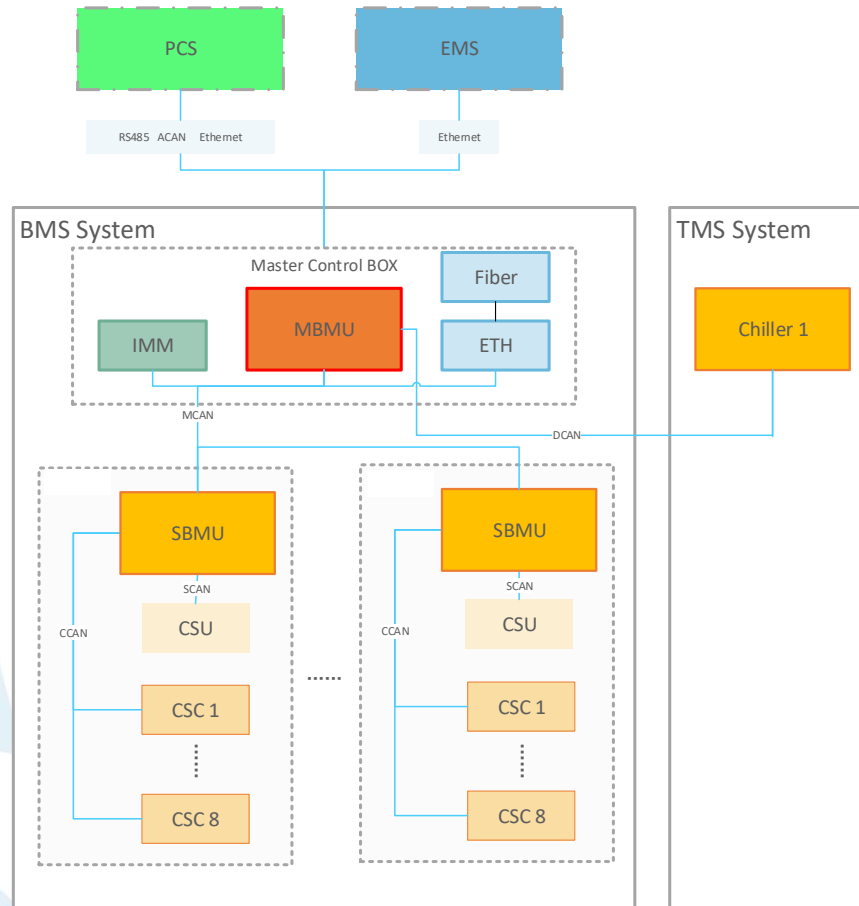
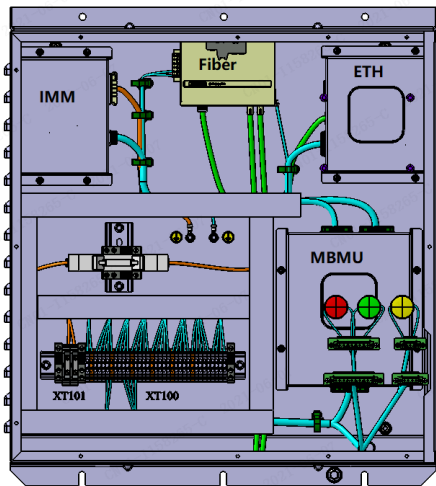
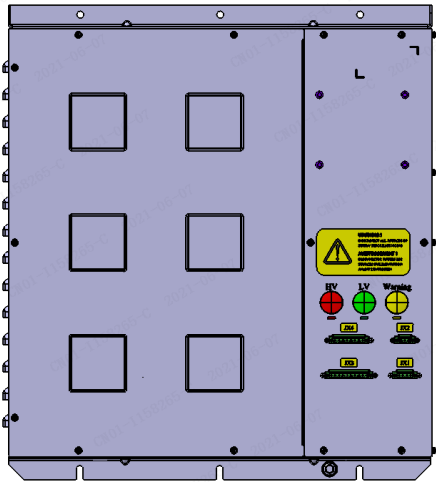
✓ Rack design / Fast Plug, efficient and safe



Feature:

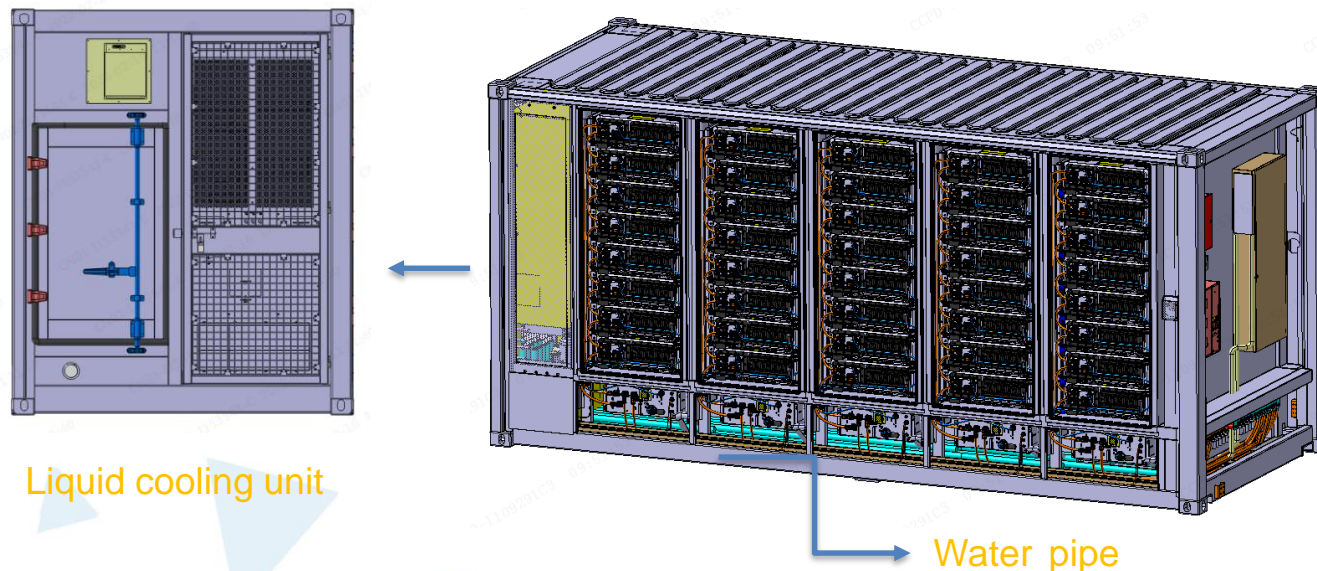
- ✓ Auxiliary power supply input : 380...480V 3AC, 50/60Hz
- ✓ Include DC24V power supply output & DC24V UPS for BMS system
- ✓ Include E-stop circuit
- ✓ Include circuit protection and power supply on-off control circuit
- ✓ Include Type II SPD for AC Power supply

Electrical Room/Master Control Box



Feature:

- ✓ Three level communication Architecture
- ✓ Integrated MBMU, IMM, ETH, Fiber Conversion Module in control box together.
- ✓ Support two container parallel connection
- ✓ Low power consumption of BMS system



Liquid cooling unit

Water pipe

Feature:

- ✓ Max. ambient temperature: 55 °C
- ✓ Power supply: 3AC 380~480V
- ✓ 15~40kW Cooling power for 0.5P System
- ✓ Cooling performance is auto-adjustable according to ambient temperature & precharge/charge status

Type	0.5 P System
Quantity of Chiller	1
Cooling Capacity	15~40kW

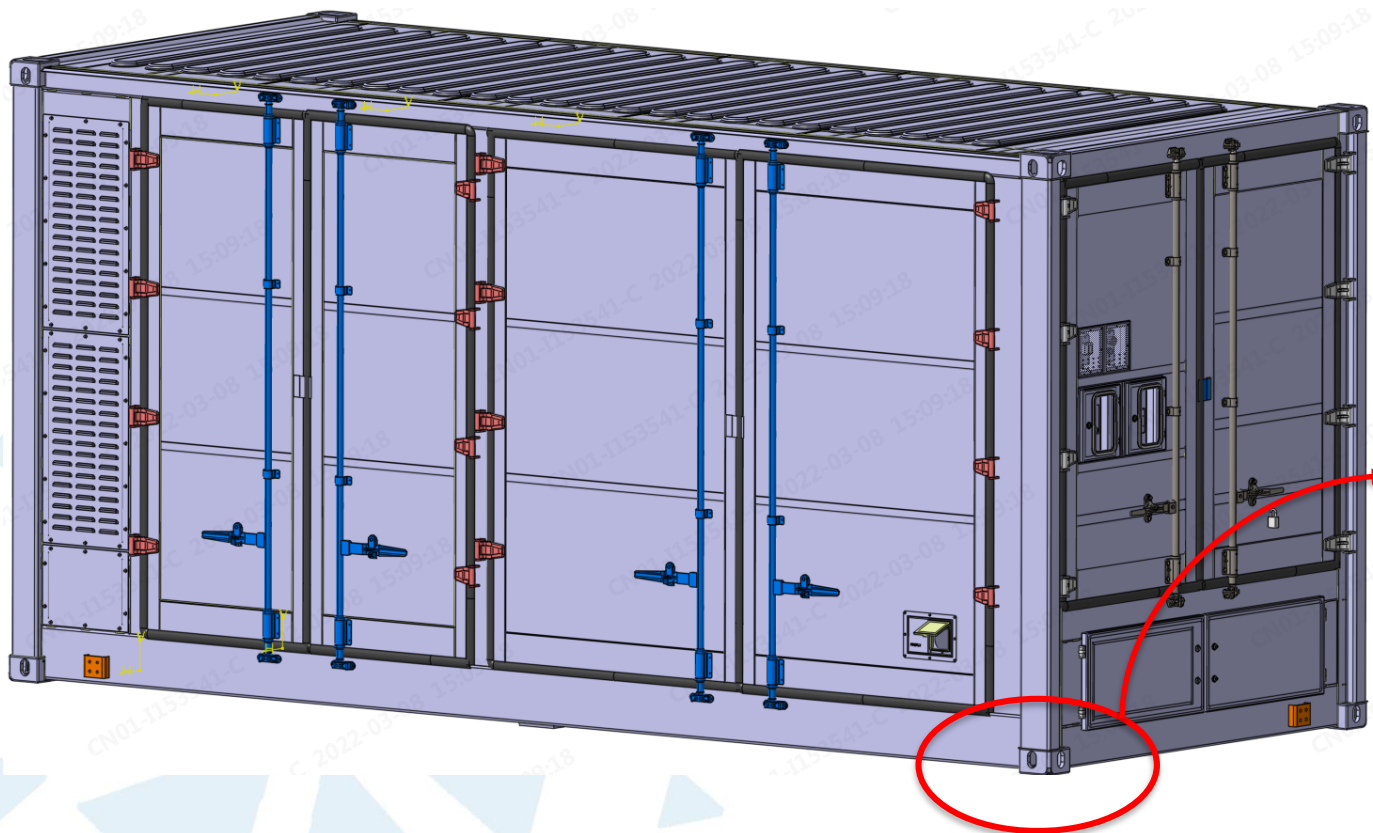


Part

03

Installation





Concrete Foundation:
Anchor **Bolt** Installation



Welding installation: The container bottom frame is **welded** to the embedded steel plate

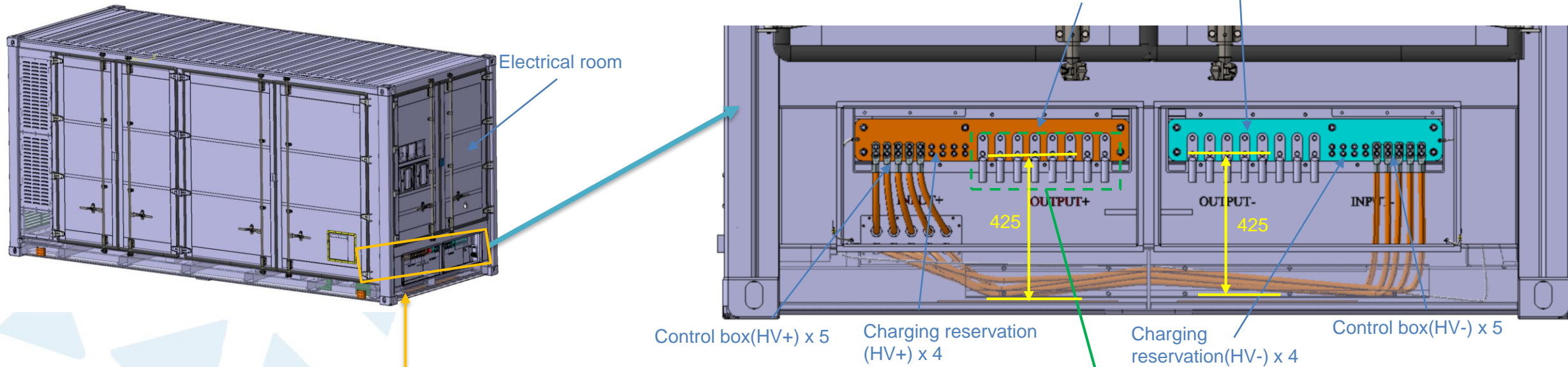


Twist lock installation:
The four bottom corners of the container can be fixed with the foundation through the container twist lock

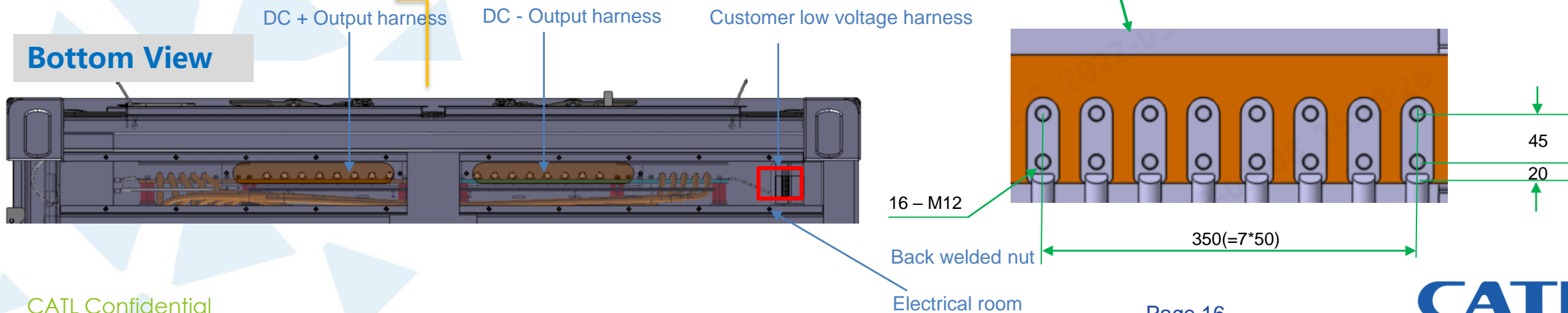
Installation: External power cable connection



Front View



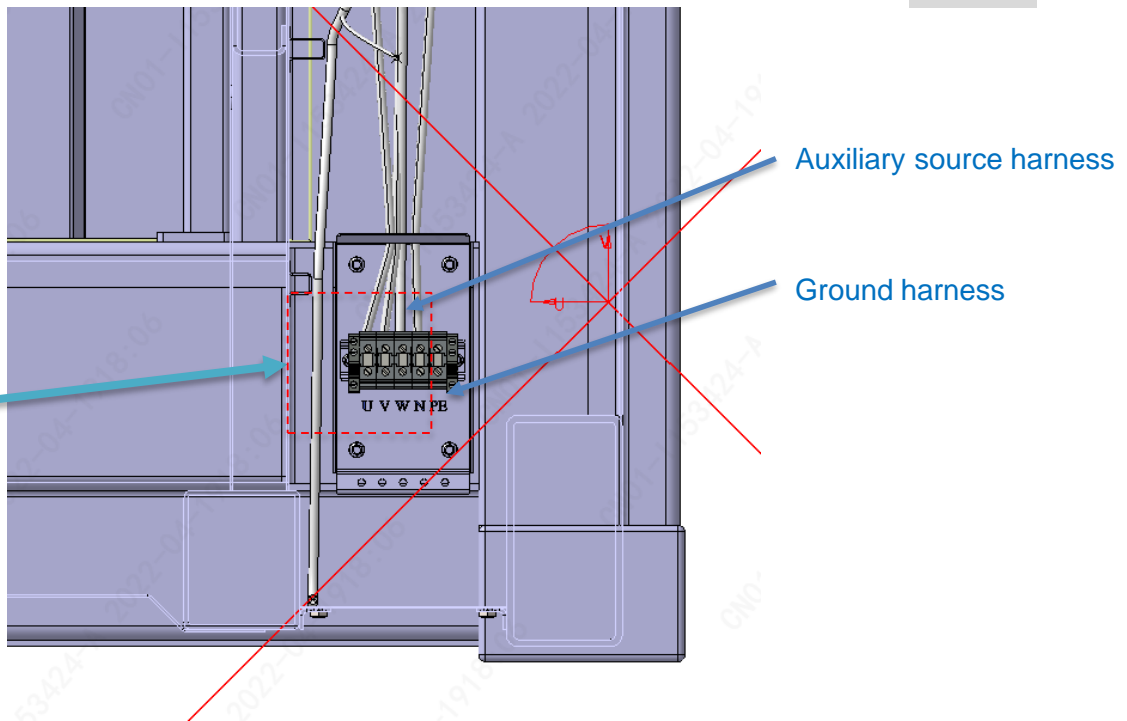
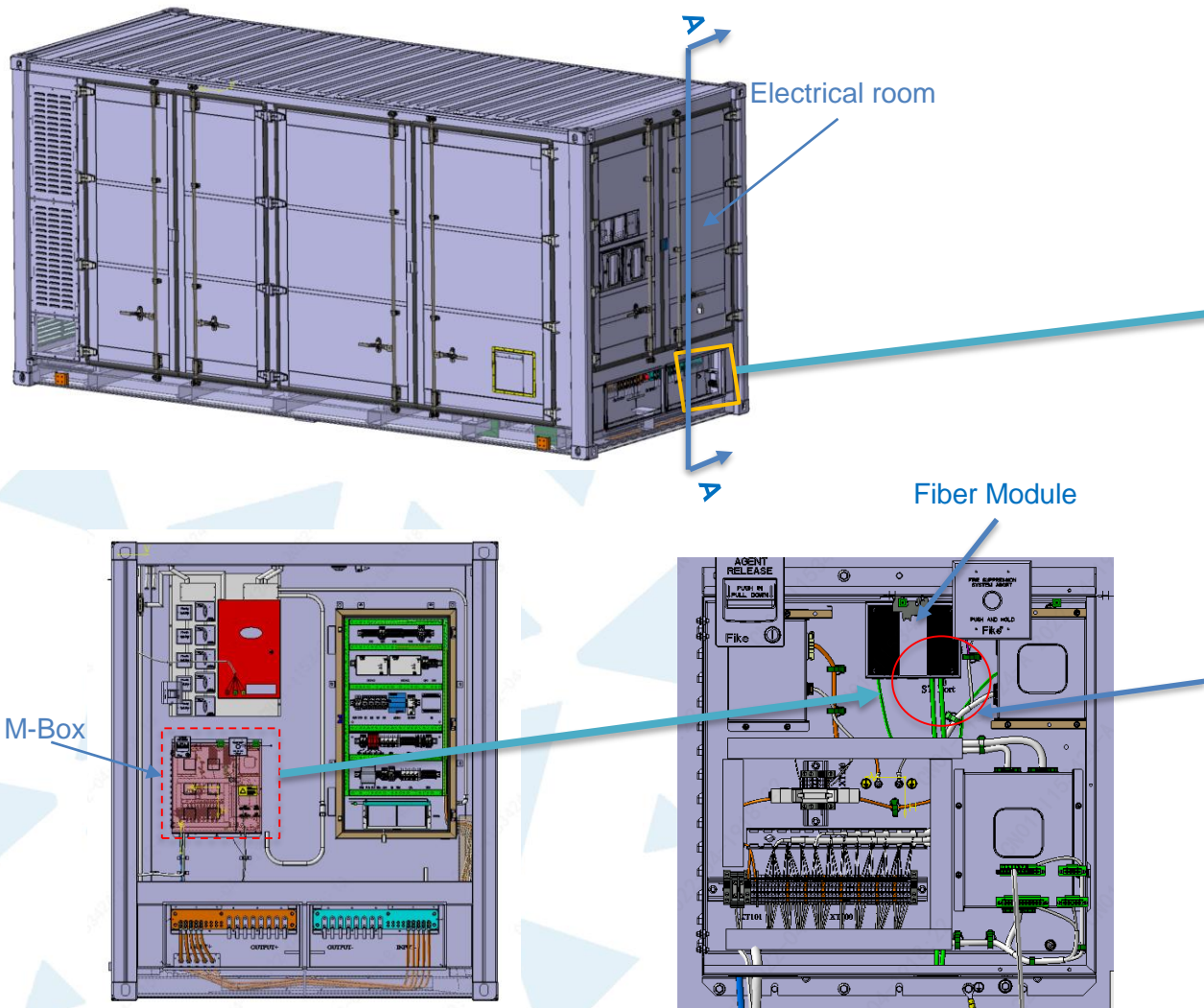
Bottom View



Installation: External power cable connection

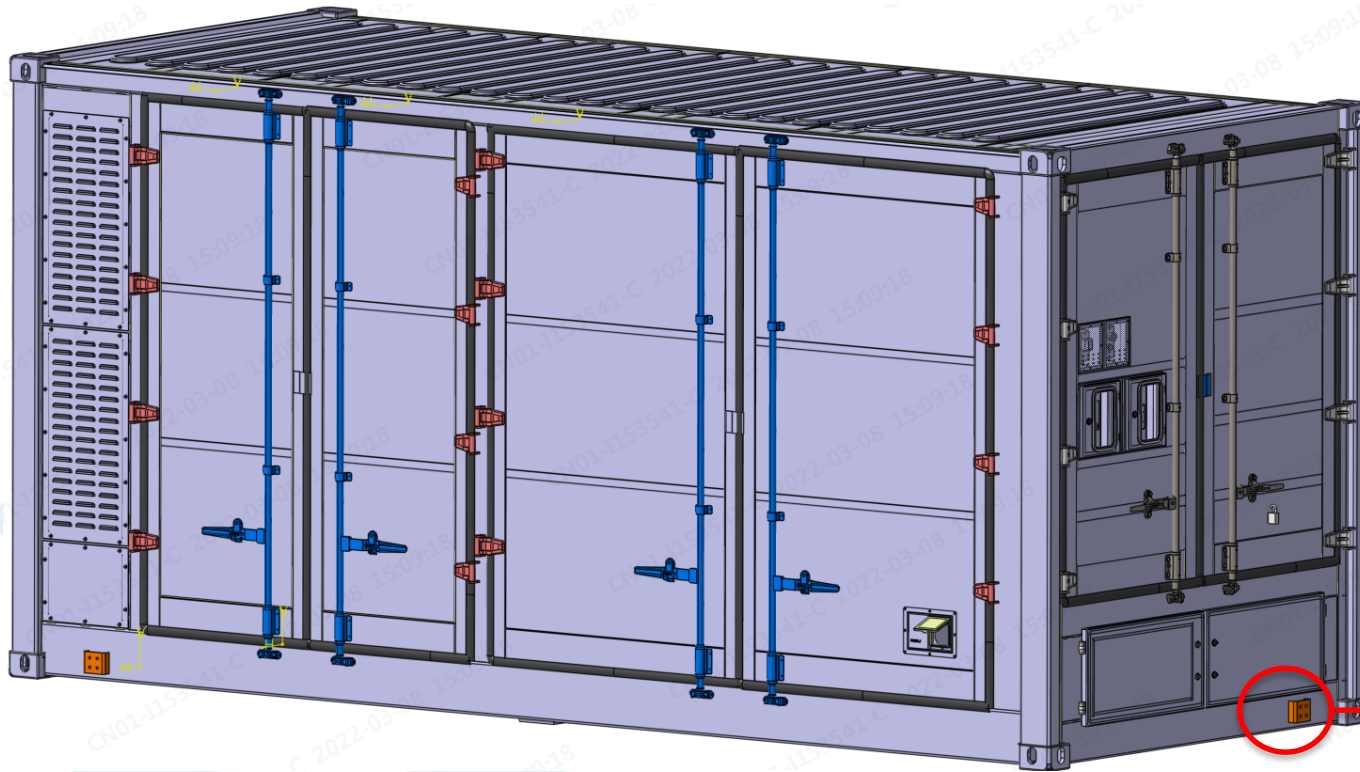


A-A



Due to the current uncertainty about the turning radius of the fiber optic harness, we need to continue to check whether the fiber optic harness can go from the fiber optic module interface to the terminal block where the auxiliary source harness is located

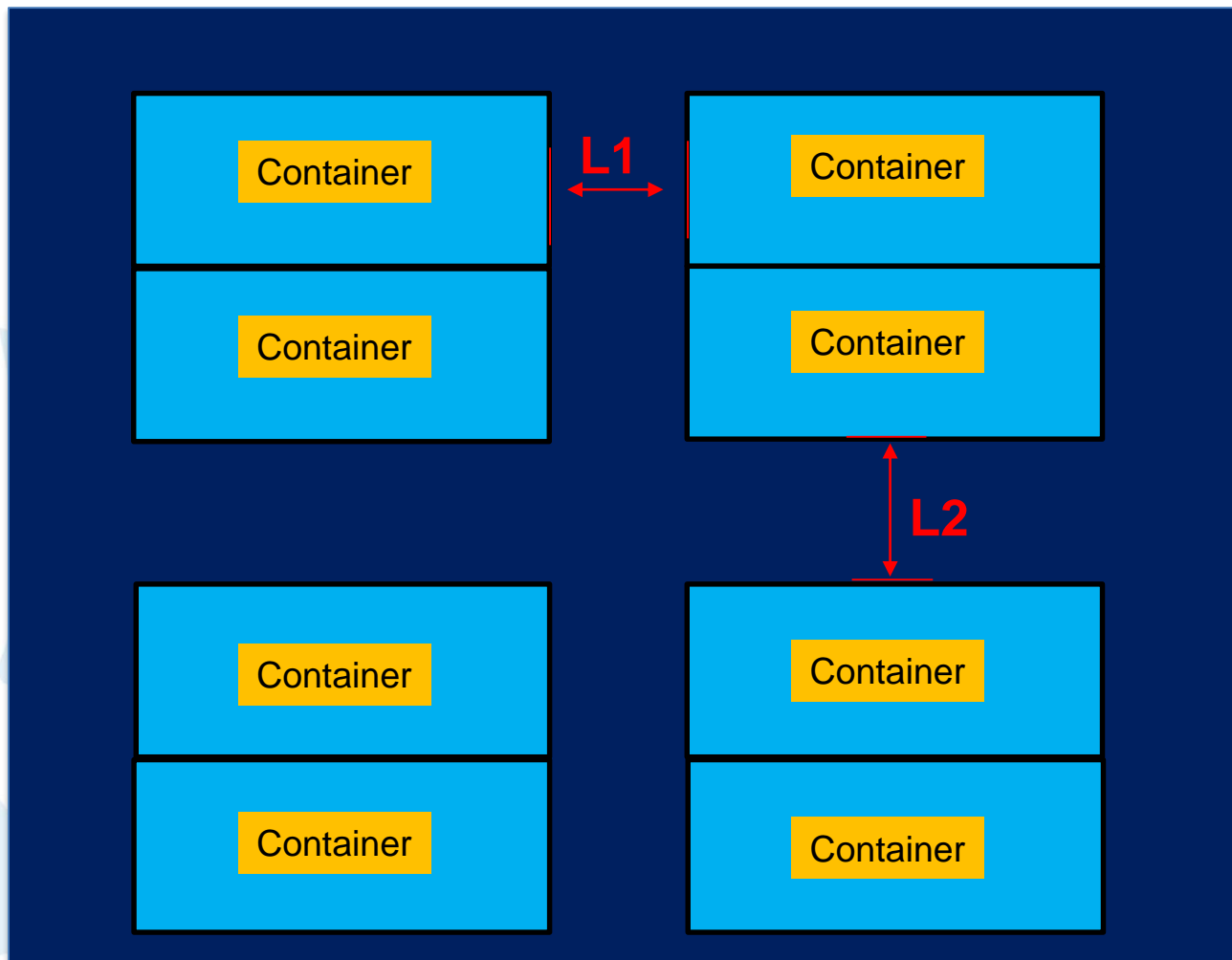
Installation: Grounding point



Earth point: Copper bar

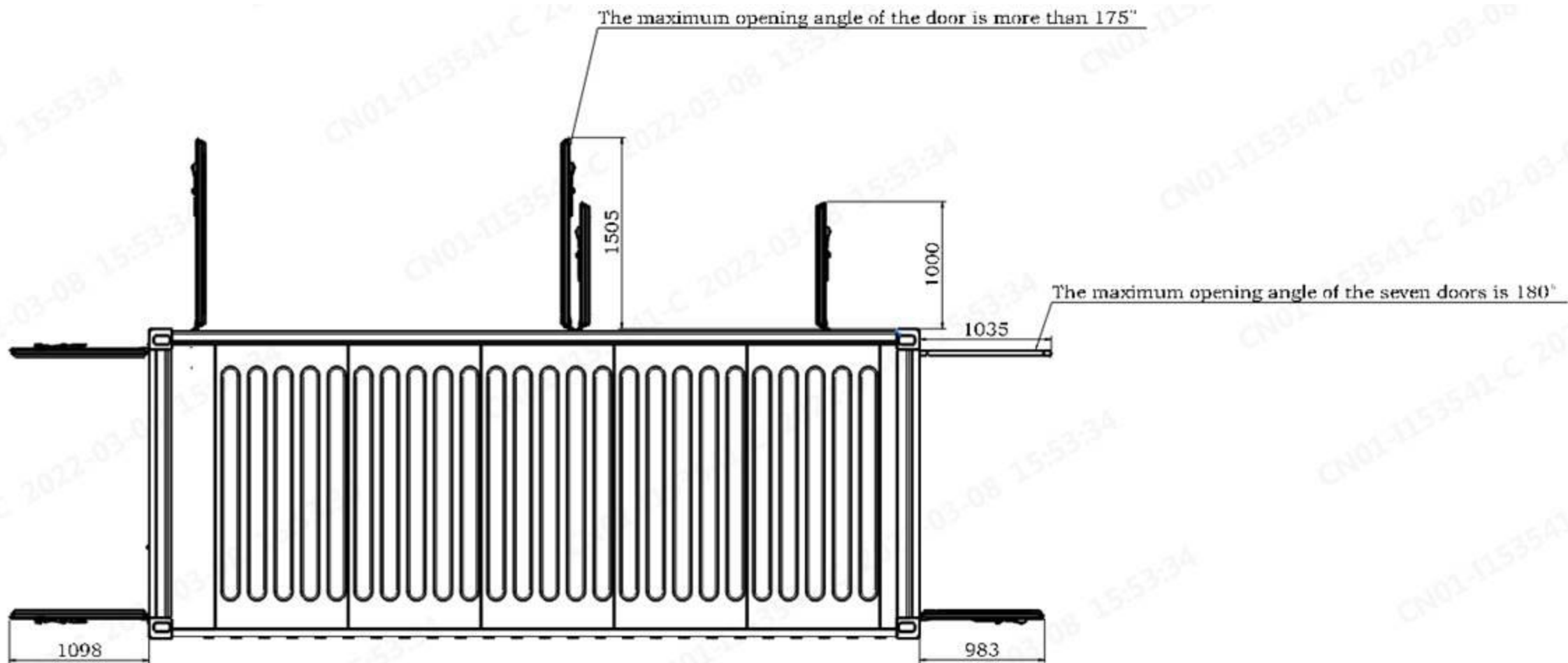


To avoid the hot air interaction for two containers, And to maintain the container, the minimum distance must be followed :



L1:3.0M

L2:3.5M



CATL

Web: <http://www.catlbattery.com>
E-mail: sales@catlbattery.com



INVERTER

TECHNICAL CHARACTERISTICS

FREEMAQ PCSK 690V

	FRAME 1	FRAME 2	
NUMBER OF MODULES	4	6	
REFERENCES	FP2445K	FP3670K	
AC	AC Output Power (kVA/kW) @50°C ^[1]	2445	3670
	AC Output Power (kVA/kW) @40°C ^[1]	2530	3800
	Max. AC Output Current (A) @50°C	2047	3070
	Max. AC Output Current (A) @40°C	2117	3179
	Operating Grid Voltage (VAC)	690V ±10%	
	Operating Grid Frequency (Hz)	50/60 Hz	
	Current Harmonic Distortion (THDi)	< 3% per IEEE519	
	Power Factor (cosine phi) ^[2]	0.5 leading..0.5 lagging	
	Reactive power compensation	Four quadrant operation	
DC	DC Voltage Range (full power)	976V-1310V / 976V-1500V (optional)	
	Maximum DC voltage	1500V	
	DC Voltage Ripple	< 3%	
	Max. DC continuous current (A)	2646	3969
	Max. DC short circuit current (A)	180kA / 5ms	
	Battery Technology	All type of batteries (BMS required)	
	Battery Connections	Up to 18 positive and 18 negative connections	
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η) ^[3]	98.87%	98.93%
	Euroeta (η) ^[3]	98.48%	98.65%
	Max. Power Consumption (kVA)	8	10
CABINET	Dimensions [WxDxH] (ft)	12 x 7 x 7	
	Dimensions [WxDxH] (m)	3.7 x 2.2 x 2.2	
	Weight (lbs)	12125	12677
	Weight (kg)	5500	5750
	Type of ventilation	Forced air cooling	
ENVIROMENT	Degree of protection	NEMA 3R / IP55	
	Permissible Ambient Temperature	-35°C to +60°C, >50°C / Active Power derating (>50°C)	
	Relative Humidity	4% to 100% non condensing	
	Max. Altitude (above sea level)	2000m / >2000m power derating (Max. 4000m)	
	Noise level ^[4]	< 79 dBA	
CONTROL INTERFACE	Communication protocol	Modbus TCP	
	Power Plant Controller	Optional. Third party SCADA systems supported	
	Keyed ON/OFF switch	Standard	
PROTECTIONS	Ground Fault Protection	Insulation monitoring device	
	Humidity control	Active Heating	
	General AC Protection & Disconn.	Circuit Breaker	
	General DC Protection & Disconn.	DC switch ^[5]	
	Overvoltage Protection	AC and DC protection (type 2)	
CERTIFICATIONS	Safety	UL1741, CSA 22.2 No.107.1-16, IEC62109-1, IEC62109-2	
	Utility interconnect ^[6]	UL 1741 SA - Feb. 2018, IEEE 1547.1-2005	

[1] Values at 1.00•Vac nom and cos Φ= 1.Consult Power Electronics for derating curves.

[2] Consult P-Q charts available: $Q(kVar)=\sqrt{(S(kVA))^2-P(kW)^2}$.

[3] Consult Power Electronics for the extended DC voltage range option efficiency data.

[4] Readings taken 1 meter from the back of the unit.

[5] Battery short circuit disconnection has to be done on the battery side.

[6] Consult Power Electronics for other applicable standards / grid codes.

TECHNICAL CHARACTERISTICS

FREEMAQ PCSK 660V

	FRAME 1	FRAME 2	
NUMBER OF MODULES	4	6	
REFERENCES	FP2340K	FP3510K	
AC	AC Output Power (kVA/kW) @50°C ^[1]	2340	3510
	AC Output Power (kVA/kW) @40°C ^[1]	2420	3630
	Max. AC Output Current (A) @50°C	2047	3070
	Max. AC Output Current (A) @40°C	2117	3175
	Operating Grid Voltage (VAC)	660V ±10%	
	Operating Grid Frequency (Hz)	50/60 Hz	
	Current Harmonic Distortion (THDi)	< 3% per IEEE519	
	Power Factor (cosine phi) ^[2]	0.5 leading..0.5 lagging	
	Reactive power compensation	Four quadrant operation	
DC	DC Voltage Range (full power)	934V-1310V / 934V-1500V (optional)	
	Maximum DC voltage	1500V	
	DC Voltage Ripple	< 3%	
	Max. DC continuous current (A)	2646	3969
	Max. DC short circuit current (A)	180kA / 5ms	
	Battery Technology	All type of batteries (BMS required)	
	Battery Connections	Up to 18 positive and 18 negative connections	
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η) ^[3]	98.84%	98.90%
	Euroeta (η) ^[3]	98.48%	98.65%
	Max. Power Consumption (kVA)	8	10
CABINET	Dimensions [WxDxH] (ft)	12 x 7 x 7	
	Dimensions [WxDxH] (m)	3.7 x 2.2 x 2.2	
	Weight (lbs)	12125	12677
	Weight (kg)	5500	5750
	Type of ventilation	Forced air cooling	
ENVIROMENT	Degree of protection	NEMA 3R / IP55	
	Permissible Ambient Temperature	-35°C to +60°C, >50°C / Active Power derating (>50°C)	
	Relative Humidity	4% to 100% non condensing	
	Max. Altitude (above sea level)	2000m / >2000m power derating (Max. 4000m)	
	Noise level ^[4]	< 79 dBA	
CONTROL INTERFACE	Communication protocol	Modbus TCP	
	Power Plant Controller	Optional. Third party SCADA systems supported	
	Keyed ON/OFF switch	Standard	
PROTECTIONS	Ground Fault Protection	Insulation monitoring device	
	Humidity control	Active Heating	
	General AC Protection & Disconn.	Circuit Breaker	
	General DC Protection & Disconn.	DC switch ^[5]	
	Overvoltage Protection	AC and DC protection (type 2)	
CERTIFICATIONS	Safety	UL1741, CSA 22.2 No.107.1-16, IEC62109-1, IEC62109-2	
	Utility interconnect ^[6]	UL 1741 SA - Feb. 2018, IEEE 1547.1-2005	

[1] Values at 1.00•Vac nom and cos Φ= 1. Consult Power Electronics for derating curves.

[2] Consult P-Q charts available: $Q(kVar)=\sqrt{(S(kVA))^2-P(kW)^2}$.

[3] Consult Power Electronics for the extended DC voltage range option efficiency data.

[4] Readings taken 1 meter from the back of the unit.

[5] Battery short circuit disconnection has to be done on the battery side.

[6] Consult Power Electronics for other applicable standards / grid codes.

TECHNICAL CHARACTERISTICS

FREEMAQ PCSK 645V

	FRAME 1	FRAME 2	
NUMBER OF MODULES	4	6	
REFERENCES	FP2285K	FP3430K	
AC	AC Output Power (kVA/kW) @50°C ^[1]	2285	3430
	AC Output Power (kVA/kW) @40°C ^[1]	2365	3550
	Max. AC Output Current (A) @50°C	2047	3070
	Max. AC Output Current (A) @40°C	2117	3178
	Operating Grid Voltage (VAC)	645V ±10%	
	Operating Grid Frequency (Hz)	50/60 Hz	
	Current Harmonic Distortion (THDi)	< 3% per IEEE519	
	Power Factor (cosine phi) ^[2]	0.5 leading..0.5 lagging	
	Reactive power compensation	Four quadrant operation	
DC	DC Voltage Range (full power)	913V-1310V / 913V-1500V (optional)	
	Maximum DC voltage	1500V	
	DC Voltage Ripple	< 3%	
	Max. DC continuous current (A)	2646	3969
	Max. DC short circuit current (A)	180kA / 5ms	
	Battery Technology	All type of batteries (BMS required)	
	Battery Connections	Up to 18 positive and 18 negative connections	
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η) ^[3]	98.81%	98.87%
	Euroeta (η) ^[3]	98.43%	98.60%
	Max. Power Consumption (kVA)	8	10
CABINET	Dimensions [WxDxH] (ft)	12 x 7 x 7	
	Dimensions [WxDxH] (m)	3.7 x 2.2 x 2.2	
	Weight (lbs)	12125	12677
	Weight (kg)	5500	5750
	Type of ventilation	Forced air cooling	
ENVIROMENT	Degree of protection	NEMA 3R / IP55	
	Permissible Ambient Temperature	-35°C to +60°C, >50°C / Active Power derating (>50°C)	
	Relative Humidity	4% to 100% non condensing	
	Max. Altitude (above sea level)	2000m / >2000m power derating (Max. 4000m)	
	Noise level ^[4]	< 79 dBA	
CONTROL INTERFACE	Communication protocol	Modbus TCP	
	Power Plant Controller	Optional. Third party SCADA systems supported	
	Keyed ON/OFF switch	Standard	
PROTECTIONS	Ground Fault Protection	Insulation monitoring device	
	Humidity control	Active Heating	
	General AC Protection & Disconn.	Circuit Breaker	
	General DC Protection & Disconn.	DC switch ^[5]	
	Overvoltage Protection	AC and DC protection (type 2)	
CERTIFICATIONS	Safety	UL1741, CSA 22.2 No.107.1-16, IEC62109-1, IEC62109-2	
	Utility interconnect ^[6]	UL 1741 SA - Feb. 2018, IEEE 1547.1-2005	

[1] Values at 1.00•Vac nom and cos Φ= 1.Consult Power Electronics for derating curves.

[2] Consult P-Q charts available: $Q(kVar)=\sqrt{(S(kVA))^2-P(kW)^2}$.

[3] Consult Power Electronics for the extended DC voltage range option efficiency data.

[4] Readings taken 1 meter from the back of the unit.

[5] Battery short circuit disconnection has to be done on the battery side.

[6] Consult Power Electronics for other applicable standards / grid codes.

TECHNICAL CHARACTERISTICS

FREEMAQ PCSK 630V

		FRAME 1	FRAME 2
NUMBER OF MODULES		4	6
REFERENCES		FP2235K	FP3350K
AC	AC Output Power (kVA/kW) @50°C ^[1]	2235	3350
	AC Output Power (kVA/kW) @40°C ^[1]	2310	3465
	Max. AC Output Current (A) @50°C	2047	3070
	Max. AC Output Current (A) @40°C	2117	3175
	Operating Grid Voltage (VAC)	630V ±10%	
	Operating Grid Frequency (Hz)	50/60 Hz	
	Current Harmonic Distortion (THDi)	< 3% per IEEE519	
	Power Factor (cosine phi) ^[2]	0.5 leading...0.5 lagging	
	Reactive power compensation	Four quadrant operation	
DC	DC Voltage Range (full power)	891V-1310V / 891V-1500V (optional)	
	Maximum DC voltage	1500V	
	DC Voltage Ripple	< 3%	
	Max. DC continuous current (A)	2646	3969
	Max. DC short circuit current (A)	180kA / 5ms	
	Battery Technology	All type of batteries (BMS required)	
	Battery Connections	Up to 18 positive and 18 negative connections	
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η) ^[3]	98.79%	98.85%
	Euroeta (η) ^[3]	98.42%	98.59%
	Max. Power Consumption (kVA)	8	10
CABINET	Dimensions [WxDxH] (ft)	12 x 7 x 7	
	Dimensions [WxDxH] (m)	3.7 x 2.2 x 2.2	
	Weight (lbs)	12125	12677
	Weight (kg)	5500	5750
	Type of ventilation	Forced air cooling	
ENVIROMENT	Degree of protection	NEMA 3R / IP55	
	Permissible Ambient Temperature	-35°C to +60°C, >50°C / Active Power derating (>50°C)	
	Relative Humidity	4% to 100% non condensing	
	Max. Altitude (above sea level)	2000m / >2000m power derating (Max. 4000m)	
	Noise level ^[4]	< 79 dBA	
CONTROL INTERFACE	Communication protocol	Modbus TCP	
	Power Plant Controller	Optional. Third party SCADA systems supported	
	Keyed ON/OFF switch	Standard	
PROTECTIONS	Ground Fault Protection	Insulation monitoring device	
	Humidity control	Active Heating	
	General AC Protection & Disconn.	Circuit Breaker	
	General DC Protection & Disconn.	DC switch ^[5]	
	Overtoltage Protection	AC and DC protection (type 2)	
CERTIFICATIONS	Safety	UL1741, CSA 22.2 No.107.1-16, IEC62109-1, IEC62109-2	
	Utility interconnect ^[6]	UL 1741 SA - Feb. 2018, IEEE 1547.1-2005	

[1] Values at 1.00•Vac nom and cos Φ= 1. Consult Power Electronics for derating curves.

[2] Consult P-Q charts available: $Q(kVar)=\sqrt{(S(kVA))^2-P(kW)^2}$.

[3] Consult Power Electronics for the extended DC voltage range option efficiency data.

[4] Readings taken 1 meter from the back of the unit.

[5] Battery short circuit disconnection has to be done on the battery side.

[6] Consult Power Electronics for other applicable standards / grid codes.

TECHNICAL CHARACTERISTICS

FREEMAQ PCSK 615V

	FRAME 1	FRAME 2	
NUMBER OF MODULES	4	6	
REFERENCES	FP2180K	FP3270K	
AC	AC Output Power (kVA/kW) @50°C ^[1]	2180	3270
	AC Output Power (kVA/kW) @40°C ^[1]	2255	3380
	Max. AC Output Current (A) @50°C	2047	3070
	Max. AC Output Current (A) @40°C	2117	3173
	Operating Grid Voltage (VAC)	615V ±10%	
	Operating Grid Frequency (Hz)	50/60 Hz	
	Current Harmonic Distortion (THDi)	< 3% per IEEE519	
	Power Factor (cosine phi) ^[2]	0.5 leading..0.5 lagging	
	Reactive power compensation	Four quadrant operation	
DC	DC Voltage Range (full power)	870V-1310V / 870V-1500V (optional)	
	Maximum DC voltage	1500V	
	DC Voltage Ripple	< 3%	
	Max. DC continuous current (A)	2646	3969
	Max. DC short circuit current (A)	180kA / 5ms	
	Battery Technology	All type of batteries (BMS required)	
	Battery Connections	Up to 18 positive and 18 negative connections	
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η) ^[3]	98.79%	98.84%
	Euroeta (η) ^[3]	98.41%	98.57%
	Max. Power Consumption (kVA)	8	10
CABINET	Dimensions [WxDxH] (ft)	12 x 7 x 7	
	Dimensions [WxDxH] (m)	3.7 x 2.2 x 2.2	
	Weight (lbs)	12125	12677
	Weight (kg)	5500	5750
	Type of ventilation	Forced air cooling	
ENVIROMENT	Degree of protection	NEMA 3R / IP55	
	Permissible Ambient Temperature	-35°C to +60°C, >50°C / Active Power derating (>50°C)	
	Relative Humidity	4% to 100% non condensing	
	Max. Altitude (above sea level)	2000m / >2000m power derating (Max. 4000m)	
	Noise level ^[4]	< 79 dBA	
CONTROL INTERFACE	Communication protocol	Modbus TCP	
	Power Plant Controller	Optional. Third party SCADA systems supported	
	Keyed ON/OFF switch	Standard	
PROTECTIONS	Ground Fault Protection	Insulation monitoring device	
	Humidity control	Active Heating	
	General AC Protection & Disconn.	Circuit Breaker	
	General DC Protection & Disconn.	DC switch ^[5]	
	Overvoltage Protection	AC and DC protection (type 2)	
CERTIFICATIONS	Safety	UL1741, CSA 22.2 No.107.1-16, IEC62109-1, IEC62109-2	
	Utility interconnect ^[6]	UL 1741 SA - Feb. 2018, IEEE 1547.1-2005	

[1] Values at 1.00•Vac nom and cos Φ= 1.Consult Power Electronics for derating curves.

[2] Consult P-Q charts available: $Q(kVar)=\sqrt{(S(kVA))^2-P(kW)^2}$.

[3] Consult Power Electronics for the extended DC voltage range option efficiency data.

[4] Readings taken 1 meter from the back of the unit.

[5] Battery short circuit disconnection has to be done on the battery side.

[6] Consult Power Electronics for other applicable standards / grid codes.

TECHNICAL CHARACTERISTICS

FREEMAQ PCSK 600V

		FRAME 1	FRAME 2
NUMBER OF MODULES		4	6
REFERENCES		FP2125K	FP3190K
AC	AC Output Power (kVA/kW) @50°C ^[1]	2125	3190
	AC Output Power (kVA/kW) @40°C ^[1]	2200	3300
	Max. AC Output Current (A) @50°C	2047	3070
	Max. AC Output Current (A) @40°C	2117	3175
	Operating Grid Voltage (VAC)	600V ±10%	
	Operating Grid Frequency (Hz)	50/60 Hz	
	Current Harmonic Distortion (THDi)	< 3% per IEEE519	
	Power Factor (cosine phi) ^[2]	0.5 leading...0.5 lagging	
	Reactive power compensation	Four quadrant operation	
DC	DC Voltage Range (full power)	849V-1310V / 849V-1500V (optional)	
	Maximum DC voltage	1500V	
	DC Voltage Ripple	< 3%	
	Max. DC continuous current (A)	2646	3969
	Max. DC short circuit current (A)	180kA / 5ms	
	Battery Technology	All type of batteries (BMS required)	
	Battery Connections	Up to 18 positive and 18 negative connections	
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η) ^[3]	98.78%	98.84%
	Euroeta (η) ^[3]	98.39%	98.56%
	Max. Power Consumption (kVA)	8	10
CABINET	Dimensions [WxDxH] (ft)	12 x 7 x 7	
	Dimensions [WxDxH] (m)	3.7 x 2.2 x 2.2	
	Weight (lbs)	12125	12677
	Weight (kg)	5500	5750
	Type of ventilation	Forced air cooling	
ENVIROMENT	Degree of protection	NEMA 3R / IP55	
	Permissible Ambient Temperature	-35°C to +60°C, >50°C / Active Power derating (>50°C)	
	Relative Humidity	4% to 100% non condensing	
	Max. Altitude (above sea level)	2000m / >2000m power derating (Max. 4000m)	
	Noise level ^[4]	< 79 dBA	
CONTROL INTERFACE	Communication protocol	Modbus TCP	
	Power Plant Controller	Optional. Third party SCADA systems supported	
	Keyed ON/OFF switch	Standard	
PROTECTIONS	Ground Fault Protection	Insulation monitoring device	
	Humidity control	Active Heating	
	General AC Protection & Disconn.	Circuit Breaker	
	General DC Protection & Disconn.	DC switch ^[5]	
	Overvoltage Protection	AC and DC protection (type 2)	
CERTIFICATIONS	Safety	UL1741, CSA 22.2 No.107.1-16, IEC62109-1, IEC62109-2	
	Utility interconnect ^[6]	UL 1741 SA - Feb. 2018, IEEE 1547.1-2005	

[1] Values at 1.00•Vac nom and cos Φ= 1. Consult Power Electronics for derating curves.

[2] Consult P-Q charts available: $Q(kVar)=\sqrt{(S(kVA))^2-P(kW)^2}$.

[3] Consult Power Electronics for the extended DC voltage range option efficiency data.

[4] Readings taken 1 meter from the back of the unit.

[5] Battery short circuit disconnection has to be done on the battery side.

[6] Consult Power Electronics for other applicable standards / grid codes.

TECHNICAL CHARACTERISTICS

FREEMAQ PCSK 530V

	FRAME 1	FRAME 2
NUMBER OF MODULES	4	6
REFERENCES	FP1875K	FP2820K
AC	AC Output Power (kVA/kW) @50°C ^[1]	2820
	AC Output Power (kVA/kW) @40°C ^[1]	2915
	Max. AC Output Current (A) @50°C	3070
	Max. AC Output Current (A) @40°C	3175
	Operating Grid Voltage (VAC)	530V ±10%
	Operating Grid Frequency (Hz)	50/60 Hz
	Current Harmonic Distortion (THDi)	< 3% per IEEE519
	Power Factor (cosine phi) ^[2]	0.5 leading..0.5 lagging
	Reactive power compensation	Four quadrant operation
DC	DC Voltage Range (full power)	750V-1310V / 750V-1500V (optional)
	Maximum DC voltage	1500V
	DC Voltage Ripple	< 3%
	Max. DC continuous current (A)	2646
	Max. DC short circuit current (A)	180kA / 5ms
	Battery Technology	All type of batteries (BMS required)
	Battery Connections	Up to 18 positive and 18 negative connections
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η) ^[3]	98.84% (preliminary)
	Euroeta (η) ^[3]	98.56% (preliminary)
	Max. Power Consumption (kVA)	8
CABINET	Dimensions [WxDxH] (ft)	12 x 7 x 7
	Dimensions [WxDxH] (m)	3.7 x 2.2 x 2.2
	Weight (lbs)	12125
	Weight (kg)	5500
	Type of ventilation	Forced air cooling
ENVIROMENT	Degree of protection	NEMA 3R / IP55
	Permissible Ambient Temperature	-35°C to +60°C, >50°C / Active Power derating (>50°C)
	Relative Humidity	4% to 100% non condensing
	Max. Altitude (above sea level)	2000m / >2000m power derating (Max. 4000m)
	Noise level ^[4]	< 79 dBA
CONTROL INTERFACE	Communication protocol	Modbus TCP
	Power Plant Controller	Optional. Third party SCADA systems supported
	Keyed ON/OFF switch	Standard
PROTECTIONS	Ground Fault Protection	Insulation monitoring device
	Humidity control	Active Heating
	General AC Protection & Disconn.	Circuit Breaker
	General DC Protection & Disconn.	DC switch ^[5]
	Overvoltage Protection	AC and DC protection (type 2)
CERTIFICATIONS	Safety	UL1741, CSA 22.2 No.107.1-16, IEC62109-1, IEC62109-2
	Utility interconnect ^[6]	UL 1741 SA - Feb. 2018, IEEE 1547.1-2005

[1] Values at 1.00•Vac nom and cos Φ= 1.Consult Power Electronics for derating curves.

[2] Consult P-Q charts available: $Q(kVar)=\sqrt{(S(kVA))^2-P(kW)^2}$.

[3] Consult Power Electronics for the extended DC voltage range option efficiency data.

[4] Readings taken 1 meter from the back of the unit.

[5] Battery short circuit disconnection has to be done on the battery side.

[6] Consult Power Electronics for other applicable standards / grid codes.

TECHNICAL CHARACTERISTICS

FREEMAQ PCSK 500V

		FRAME 1	FRAME 2
NUMBER OF MODULES		4	6
REFERENCES		FP1770K	FP2660K
AC	AC Output Power (kVA/kW) @50°C ^[1]	1770	2660
	AC Output Power (kVA/kW) @40°C ^[1]	1830	2750
	Max. AC Output Current (A) @50°C	2045	3070
	Max. AC Output Current (A) @40°C	2113	3175
	Operating Grid Voltage (VAC)	500V ±10%	
	Operating Grid Frequency (Hz)	50/60 Hz	
	Current Harmonic Distortion (THDi)	< 3% per IEEE519	
	Power Factor (cosine phi) ^[2]	0.5 leading...0.5 lagging	
	Reactive power compensation	Four quadrant operation	
DC	DC Voltage Range (full power)	708V-1310V / 708V-1500V (optional)	
	Maximum DC voltage	1500V	
	DC Voltage Ripple	< 3%	
	Max. DC continuous current (A)	2646	3969
	Max. DC short circuit current (A)	180kA / 5ms	
	Battery Technology	All type of batteries (BMS required)	
	Battery Connections	Up to 18 positive and 18 negative connections	
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η) ^[3]	98.78% (preliminary)	98.84% (preliminary)
	Euroeta (η) ^[3]	98.39% (preliminary)	98.56% (preliminary)
	Max. Power Consumption (kVA)	8	10
CABINET	Dimensions [WxDxH] (ft)	12 x 7 x 7	
	Dimensions [WxDxH] (m)	3.7 x 2.2 x 2.2	
	Weight (lbs)	12125	12677
	Weight (kg)	5500	5750
	Type of ventilation	Forced air cooling	
ENVIROMENT	Degree of protection	NEMA 3R / IP55	
	Permissible Ambient Temperature	-35°C to +60°C, >50°C / Active Power derating (>50°C)	
	Relative Humidity	4% to 100% non condensing	
	Max. Altitude (above sea level)	2000m / >2000m power derating (Max. 4000m)	
	Noise level ^[4]	< 79 dBA	
CONTROL INTERFACE	Communication protocol	Modbus TCP	
	Power Plant Controller	Optional. Third party SCADA systems supported	
	Keyed ON/OFF switch	Standard	
PROTECTIONS	Ground Fault Protection	Insulation monitoring device	
	Humidity control	Active Heating	
	General AC Protection & Disconn.	Circuit Breaker	
	General DC Protection & Disconn.	DC switch ^[5]	
	Overvoltage Protection	AC and DC protection (type 2)	
CERTIFICATIONS	Safety	UL1741, CSA 22.2 No.107.1-16, IEC62109-1, IEC62109-2	
	Utility interconnect ^[6]	UL 1741 SA - Feb. 2018, IEEE 1547.1-2005	

[1] Values at 1.00·Vac nom and cos Φ= 1. Consult Power Electronics for derating curves.

[2] Consult P-Q charts available: $Q(kVar)=\sqrt{(S(kVA))^2-P(kW)^2}$.

[3] Consult Power Electronics for the extended DC voltage range option efficiency data.

[4] Readings taken 1 meter from the back of the unit.

[5] Battery short circuit disconnection has to be done on the battery side.

[6] Consult Power Electronics for other applicable standards / grid codes.

TECHNICAL CHARACTERISTICS

FREEMAQ PCSK 480V

	FRAME 1	FRAME 2
NUMBER OF MODULES	4	6
REFERENCES	FP1700K	FP2550K
AC	AC Output Power (kVA/kW) @50°C ^[1]	2550
	AC Output Power (kVA/kW) @40°C ^[1]	2640
	Max. AC Output Current (A) @50°C	3070
	Max. AC Output Current (A) @40°C	3175
	Operating Grid Voltage (VAC)	480V ±10%
	Operating Grid Frequency (Hz)	50/60 Hz
	Current Harmonic Distortion (THDi)	< 3% per IEEE519
	Power Factor (cosine phi) ^[2]	0.5 leading..0.5 lagging
	Reactive power compensation	Four quadrant operation
DC	DC Voltage Range (full power)	679V-1310V / 679V-1500V (optional)
	Maximum DC voltage	1500V
	DC Voltage Ripple	< 3%
	Max. DC continuous current (A)	3969
	Max. DC short circuit current (A)	180kA / 5ms
	Battery Technology	All type of batteries (BMS required)
	Battery Connections	Up to 18 positive and 18 negative connections
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η) ^[3]	98.84% (preliminary)
	Euroeta (η) ^[3]	98.56% (preliminary)
	Max. Power Consumption (kVA)	10
CABINET	Dimensions [WxDxH] (ft)	12 x 7 x 7
	Dimensions [WxDxH] (m)	3.7 x 2.2 x 2.2
	Weight (lbs)	12125
	Weight (kg)	5500
	Type of ventilation	Forced air cooling
ENVIROMENT	Degree of protection	NEMA 3R / IP55
	Permissible Ambient Temperature	-35°C to +60°C, >50°C / Active Power derating (>50°C)
	Relative Humidity	4% to 100% non condensing
	Max. Altitude (above sea level)	2000m / >2000m power derating (Max. 4000m)
	Noise level ^[4]	< 79 dBA
CONTROL INTERFACE	Communication protocol	Modbus TCP
	Power Plant Controller	Optional. Third party SCADA systems supported
	Keyed ON/OFF switch	Standard
PROTECTIONS	Ground Fault Protection	Insulation monitoring device
	Humidity control	Active Heating
	General AC Protection & Disconn.	Circuit Breaker
	General DC Protection & Disconn.	DC switch ^[5]
	Overvoltage Protection	AC and DC protection (type 2)
CERTIFICATIONS	Safety	UL1741, CSA 22.2 No.107.1-16, IEC62109-1, IEC62109-2
	Utility interconnect ^[6]	UL 1741 SA - Feb. 2018, IEEE 1547.1-2005

[1] Values at 1.00•Vac nom and cos Φ= 1.Consult Power Electronics for derating curves.

[2] Consult P-Q charts available: $Q(kVar)=\sqrt{(S(kVA))^2-P(kW)^2}$.

[3] Consult Power Electronics for the extended DC voltage range option efficiency data.

[4] Readings taken 1 meter from the back of the unit.

[5] Battery short circuit disconnection has to be done on the battery side.

[6] Consult Power Electronics for other applicable standards / grid codes.

TRASFORMATORE



Project Manager: CONCEPCION JARQUE
Phone number: 56797
E-Mail: concepcion.jarque@es.abb.com

Sales order: 101526147/10
Item: 1LES009287-000

Customer PO: 4500257150

Rated Power (kVA)	3510	Customer especification		Vector group.	Dy1
Forced power (kVA)		Tapping	B SPCTAPS	Freq. (Hz)	60
HV(V)	34500/	LV (V)	660	Altitude (m)	1000
HV conect. a (V)					
Cooling system:	AN/AF	Wo at 100% un (W)	8000	3rd LV Winding	
Standard:	IEEE C57.12.01	Wc (120 °C) (W)	27500	Power (kVA):	
Installation:	Indoor	Wt tolerance (W)		LV (V):	
C/E/F Class:	C2/E2/F1	Short circuit voltage%	8.50	Terminal Position LV3:	
		Power/Pressure noise level (db(a))	/71	Ucc (HV/LV3) (%):	
		Ucc (HV/LV) (%)		Ucc (LV/LV3) (%):	

	HV	LV
Winding material	AL	AL
Winding manufacturing	Encapsulated	Impregnated
Insulation material class	H	H
Highest voltage for primary (kV)	34.5	2.5
Whitstand volt at ind. freq 50hz, 60sg (kV)	70	10
Lighting pulse withstand volt 1.2/50 (kV)	150	20
Maximum ambient temperature (°C)	50	
Winding temperature rise (K)	115	115
Terminals positions	DOWN	UP

IP00

Approx. dimensions IP00 (LxWxH)(mm)	2370x1050x1800
Approx. weight (Kg)	5770
Max. dimensions IP00 (LxWxH)(mm)	2370x1050x1800
Max. weight (Kg)	
Wheels	YES
Distance between wheels(mm)	820
Wheels locking device	
Jacking points	
Antivibration device	
Seismic zone	
Finishing	C2H
Bolt and nuts	Zinc coating
Color	RAL 7035

Enclosure

Protection degree	
Approx. dim (LxWxH) (mm)	
Approx. Weight (Kg)	
Max. dimensions (LxWxH) (mm)	
Max weigh (Kg)	
Panel options	
HV connections entry	
LV connections entry	
Cable box	
Finishing	
Bolt and nuts	
Painting	
Flat packed	

TECHNICAL COMMENTS

L5381F

Application: Solar

Nominal rated power @50°C AF: 3510kVA

Nominal rated power @40°C AF: 3630kVA

Guaranteed values at 3510 kVA AF and 660 V

X(%) = 8.464

R(%) = 0.783

X/R = 10.809

Tapping: 39864/38915/37966/37031/36130/35300/34500/33628/32775 V

Voltage class primary winding: LI 150 / AC 70 / Um 34.5 kV

Voltage class secondary winding: LI 20 / AC 10 / Um 2.5 kV

Vector group Dy1 (upper connection)

Terminal position (HV/LV): Down / top

Sound pressure LPA at 2m <71 dB

Height 1800mm without wheels

AF Ventilation (*): IMPORTANT: it is considered a minimum ventilation speed through the transformer ventilation conduits of 1.5 m/s by means of air extraction system from Power Electronics.

Electrostatic screen reinforced to withstand dV/dt: 5kV

Maximum voltage variation ±10%. Voltage and frequency variation combination will not exceed 10% on the most adverse scenario.

Application: Solar



Project Manager: CONCEPCION JARQUE
Phone number: 56797
E-Mail: concepcion.jarque@es.abb.com

Sales order: 101526147/10
Item: 1LES009287-000

Customer PO: 4500257150

Accessories

Temperature control unit		Tag plate							
T ³ control send in advance									
Dial thermometer									
Temperature sensors	PT100P	Rating plate	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">Language</th> <th style="width: 10%;">Qty.</th> <th style="width: 30%;">Material</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Inglés/English</td> <td style="text-align: center;">1</td> <td style="text-align: center;">Aluminum</td> </tr> </tbody> </table>	Language	Qty.	Material	Inglés/English	1	Aluminum
Language	Qty.	Material							
Inglés/English	1	Aluminum							
Temperature sensors at core									
Additional set of sensors									
Fans + control unit									
Fans forecast		Documents	Inglés/English						
Force power when fans required		Drawings for approval							
Terminal box		Required date for drawings							
Current transformer									
Earthing screen HV/LV									
Plug-in connector									
Busbar									
Earthing Bullet HV									
Earthing Bullet LV									
LV Copper Terminals	NO								
OLTC	NO								
Anticondensation heaters									
Package									

Witness	Tests
Factory acceptance test	
Routine test	
Temperature rise test	
Lightning impulse test	
Noise level test	
Ability to w. short circuit	

GENERAL COMMENTS