



Test Report issued under the responsibility of:

TÜVNORD

TEST REPORT IEC 62619 Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and batteries, for use in industrial applications	
Report Number.....	BL-DG2640015-301
Date of issue	2026-05-21
Total number of pages	57
Name of Testing Laboratory preparing the Report	Dongguan BALUN Testing Technology Co., Ltd.
Applicant's name	Hansol EnergyON co., Ltd.
Address	140 Gwahaksaneop 1-ro, Oksan-myeon, Heungdeok-gu, Cheongju-si, Chungcheongbuk-do, Republic of Korea
Test specification:	
Standard	IEC 62619:2022
Test procedure	CB Scheme
Non-standard test method	N/A
TRF template used	IECEE OD-2020-F1:2022, Ed.1.5
Test Report Form No.	IEC62619B
Test Report Form(s) Originator	UL Solutions (Demko)
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Test item description..... :	Energy storage system	
Trademark(s) :		
Manufacturer :	Same as applicant.	
Model/Type reference :	HSES-100kW-215kWh-1	
Ratings :	768V, 280Ah, 215kWh	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
☒	CB Testing Laboratory:	Dongguan BALUN Testing Technology Co., Ltd.
Testing location/ address..... :		Refer to page 3
Tested by (name, function, signature)..... :		Leon Chen (Engineer) <i>Leon Chen</i>
Approved by (name, function, signature).... :		Hui Yin (Reviewer) <i>Hui Yin</i>
☐	Testing procedure: CTF Stage 1:	
Testing location/ address..... :		
Tested by (name, function, signature)..... :		
Approved by (name, function, signature).... :		
☐	Testing procedure: CTF Stage 2:	
Testing location/ address..... :		
Tested by (name + signature) :		
Witnessed by (name, function, signature) . :		
Approved by (name, function, signature).... :		
☐	Testing procedure: CTF Stage 3:	
☐	Testing procedure: CTF Stage 4:	
Testing location/ address..... :		
Tested by (name, function, signature)..... :		
Witnessed by (name, function, signature) . :		
Approved by (name, function, signature).... :		
Supervised by (name, function, signature) :		

List of Attachments (including a total number of pages in each attachment): This report contains 57 pages, incl. ANNEX 1: PHOTOS with 20 pages.	
Summary of testing:	
Tests performed (name of test, test clause and date test performed): cl.7.2.3.3 Edge and corner drop test (battery system) (2025-12-31) cl. 8.2.2 Overcharge control of voltage (battery system) (2024-11-21) cl. 8.2.3 Overcharge control of current (battery system) (2024-11-21) cl. 8.2.4 Overheating control (battery system) (2024-11-22) Cell PC-0B1-72174L4-AH were CB approved according to IEC 62619:2022, Certificate No.: JPTUV-145694, Report No.: CN23861I 001. Cell LFP71173207/280Ah were CB approved according to IEC 62619:2022, Certificate No.: JPTUV-147436-A1, Report No.: CN23CACP 002. The HSES-100kW-215kWh-1 battery system can be composed of either PC-0B1-72174L4-AH or LFP71173207/280Ah cells. For over-voltage protection, over-current protection and over-temperature protection, the safety mechanism would not be influenced by number of batteries in the system, therefore, the GM-PACK-54 battery module with one PCS and one high voltage transfer box (GM-BOX-1000) could be chosen as the representative testing unit. Number of samples required for testing: 3 battery systems (B1 for model HSES-100kW-215kWh-1, B2 for GM-PACK-54 battery module (with PC-0B1-72174L4-AH cell) with one high voltage transfer box (GM-BOX-1000) and one PCS), B3 for GM-PACK-54 battery module (with LFP71173207/280Ah cell) with one high voltage transfer box (GM-BOX-1000) and one PCS). The samples comply with the requirement of IEC 62619: 2022.	Testing location: Dongguan BALUN Testing Technology Co., Ltd. 1. Room 104, 204, 205, Building 1, No. 6, Industrial South Road, Songshan Lake District, Dongguan, Guangdong Province, China 2. No. 59, Xianghe Third Road, Dalang Town, Dongguan, Guangdong Province, China

Summary of compliance with National Differences (List of countries addressed):

N/A

☐ The product fulfils the requirements of _____**Use of uncertainty of measurement for decisions on conformity (decision rule) :**

☒ No decision rule is specified by the IEC standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty ("simple acceptance" decision rule, previously known as "accuracy method").

☐ Other: (to be specified, for example when required by the standard or client, or if national accreditation requirements apply)

Information on uncertainty of measurement:

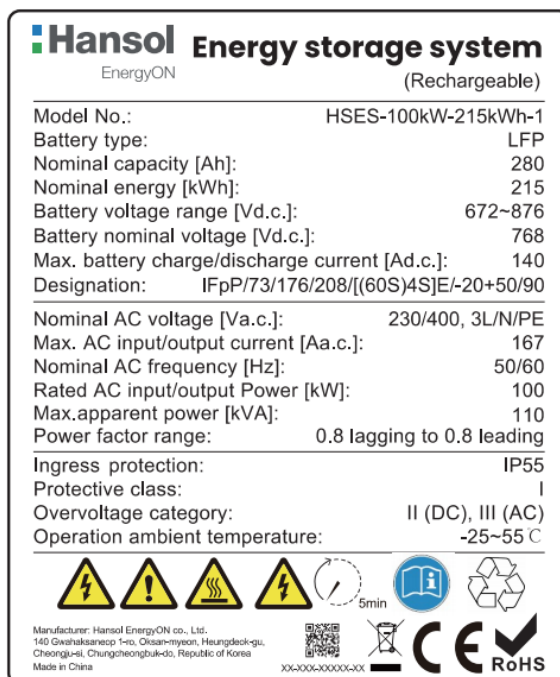
The uncertainties of measurement are calculated by the laboratory based on application of criteria given by OD-5014 for test equipment and application of test methods, decision sheets and operational procedures of IECEE.

IEC Guide 115 provides guidance on the application of measurement uncertainty principles and applying the decision rule when reporting test results within IECEE scheme, noting that the reporting of the measurement uncertainty for measurements is not necessary unless required by the test standard or customer.

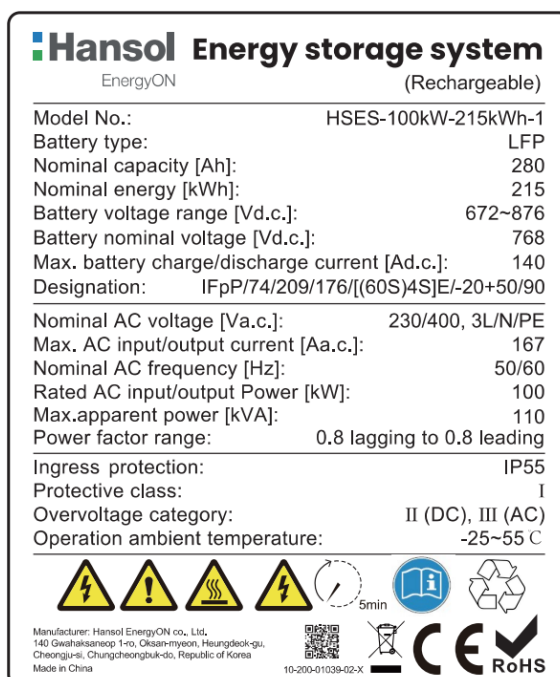
Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



Label of battery system with model HSES-100kW-215kWh-1 (with LFP71173207/280Ah cell)



Label of battery system with model HSES-100kW-215kWh-1 (with PC-0B1-72174L4-AH cell)



Battery Polarity



SN Code

Remark:

1. Example of SN code: 60MAS0404C2G001
 - Bit 1~2, brand and factory codes
 - Bit 3~7, product model codes
 - Bit 8, product hierarchy (region) code
 - Bit 9~11, production date codes (4 represents 2024, C represents December, 2 represents the 2nd)
 - Bit 12, production line codes
 - Bit 13~15, serial numbers

Test item particulars:	
Classification of installation and use:	To be defined in final product
Supply Connection	DC connector
.....:	See page 8: General product information and other remarks for details.
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing:	
Date of receipt of test item	2024-09-29 (BL-DG2491908-301) 2025-12-11 (BL-DG2491908-301 A1) 2026-04-02
Date (s) of performance of tests	2024-11-20 to 2024-11-26 (BL-DG2491908-301, in test location 1) 2025-12-31 (BL-DG2491908-301 A1, in test location 1) 2026-04-02 (in test location 2)
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.	
Throughout this report a ☐ comma / ☒ point is used as the decimal separator.	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC60335-1:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided:	☐ Yes ☒ Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies): FOXESS CO., LTD. No.939, Jinhai Third Road, New Airport Industry Area, Longwan District, Wenzhou, Zhejiang, China	

General product information and other remarks:

The Energy storage system is used in energy storage applications.

The battery module of model GM-PACK-54 composed of 60 lithium-ion cells (60S). The battery system of model HSES-100kW-215kWh-1 consists of 4 GM-PACK-54 battery modules, one PCS, and one high voltage transfer box (GM-BOX-1000). There are two types of appearance for the battery system, one with MSD and the other without MSD.

For over-voltage protection, over-current protection and over-temperature protection, the safety mechanism would not be influenced by number of batteries in the system, therefore, the GM-PACK-54 battery module with PCS and high voltage transfer box (GM-BOX-1000) could be chosen as the representative testing unit.

List of subsystem

Subsystem	Component Function
Battery Rack	The battery Rack consists of 4 battery modules GM-PACK-54 and 1 high-voltage box GM-BOX-1000 connected in series.
-High-voltage Box	The High-voltage Box of the energy storage system in the high-voltage power circuit management unit for battery systems. It serves as the intermediary unit connecting the battery cluster and the energy storage converter.
-Battery pack	The battery module of model GM-PACK-54 composed of 52 lithium-ion cells 52S (cell LFP71173207/280Ah or PC-0B1-72174L4-AH).
PCS	It can convert the variable DC power generated by the battery into stable mains AC power or convert the mains power into DC power to charge the battery.
Battery management system	The BMS is responsible for battery-level control within the battery module, including cell voltage and temperature signal monitoring, equalization control, and state-of-charge (SOC) estimation, including system contactor control, alarm signal output, and external device input and output. The BMS summarizes the state information of all cells in the series battery pack, including voltage, current, temperature, and SOC, and communicates with the PC via RS485, RM485 or CAN for system configuration and fault diagnosis.
Energy management system	EMS is responsible for collecting the status and data of all devices in the energy storage system, receiving the charge and discharge requests of the energy storage system, and generating control strategies according to the control requirements to control the operation of the system.
Thermal management system	The entire thermal management system uses liquid cooling to control the temperature of the Battery System. The integrated liquid-cooled unit and reasonable liquid duct design are used to realize the effective temperature control of the internal battery core of the battery system, so that the working environment of the energy storage system is within the best range, and the service life of the entire system is prolonged and the operation is safe and reliable.
Fire protection system	Includes an aerosol base fire extinguishing system, strobe and horn annunciators, as well as temperature and smoke sensors.

The main features of the battery system of model HSES-100kW-215kWh-1 are shown as below:	
Product information	Energy storage system
Model	HSES-100kW-215kWh-1
System	
Nominal mass	(2400±100)kg
External dimensions	W*D*H: (1040±5) mm×(1500±5) mm×(2200±5) mm
Storage temperature range	-30°C~60°C
Nominal capacity	280Ah
Recommend charging method declared by the manufacturer	Charging the battery with 140A constant current until 3.5V, then constant voltage until charging current reduces to 0.05C
Recommend discharging method declared by the manufacturer	Discharging the battery with 140A constant current to discharge cut-off voltage 672V
DC parameters	
Nominal voltage	768V
Nominal Charge Current	140A
Maximum Charge Current	140A
Nominal Discharge Current	140A
Maximum Discharge Current	140A
Maximum Charge Voltage	876V
Cut-off Voltage	672V
Upper charge temperature	55°C
Lower charge temperature	0°C
Upper discharge temperature	55°C
Lower discharge temperature	-25°C
AC parameters	
Nominal AC voltage	230/400V, 3L/N/PE
Max. AC input/output current	167A
Nominal AC frequency	50/60Hz
Rated AC input/output Power	100kW
Max. apparent power	110kVA
Power factor range	0.8 lagging to 0.8 leading

The main parameters of the battery module GM-PACK-54, as well as the internal cells LFP71173207/280Ah and PC-0B1-72174L4-AH are shown in the table below:			
Product information	Rechargeable Li-ion Battery Module	Cell inside the battery	Cell inside the battery
Model	GM-PACK-54	LFP71173207/280Ah	PC-0B1-72174L4-AH
Nominal capacity	280Ah	280Ah	280Ah
Nominal voltage	192V	3.2V	3.2V
Nominal Charge Current	140A	140A	140A
Maximum Charge Current	140A	280A	280A
Nominal Discharge Current	140A	140A	140A
Maximum Discharge Current	140A	280A	280A
Maximum Charge Voltage	219V	3.65V	3.8V
Cut-off Voltage	168V	2.5V	2.0V
Upper charge temperature	55°C	60°C	60°C
Lower charge temperature	0°C	0°C	0°C
Upper discharge temperature	55°C	60°C	60°C
Lower discharge temperature	-25°C	-30°C	-30°C
Storage temperature range	0°C~35°C	-30°C~60°C	-40°C~60°C
Recommend charging method declared by the manufacturer	Charging the battery with 140A constant current until 3.5V, then constant voltage until charging current reduces to 0.05C	Charging the cell with 140A constant current until the voltage reaches 3.65V till charging current drops to 14A, at 25±2°C	Charge at constant current 140A until voltage reaches 3.8V, then charge at constant voltage 3.8V till current is 14A
Recommend discharging method declared by the manufacturer	Discharging the battery with 140A constant current to discharge cut-off voltage 168V	Discharging the cell with 140A constant power to end off discharging voltage 2.5V, at 25±2°C	Discharge at constant current 140A until voltage reaches 2.0V
Nominal mass	(395±5)kg	(5.43±0.2)kg	(5.5±0.3)kg
External dimensions	(808±5) mm×(1303±5) mm×(253±5) mm (W*D*H)	72.15mm (max)×175.20mm (max)×207.61mm (max) (T*W*H)	(71.72±2) mm ×(174.26±2) mm ×(207.11±2) mm (T*W*H)
Remark: The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.			

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
4	PARAMETER MEASUREMENT TOLERANCES		P
	Parameter measurement tolerances		P

5	GENERAL SAFETY CONSIDERATIONS		P
5.1	General		P
	Cells and batteries are safe under conditions of both intended use and reasonably foreseeable misuse... :	Clause 6, Clause 7, 8.1, and 8.2. See also table 5.1 for Critical components information	P
	Reduce the risk of injuries from moving parts		P
5.2	Insulation and wiring		P
	Voltage, current, altitude, and humidity requirements		P
	Adequate clearances and creepage distances between connectors and live parts at different voltages or between live parts and non-current-carrying accessible parts		P
	Protect from hazardous live parts, including during installation		P
	The mechanical integrity of internal connections	Wires and cables used are certified.	P
5.3	Venting		P
	Pressure relief function	Explosion-proof safety valve for venting exists.	P
	Encapsulation used to support cells within an outer casing		P
5.4	Temperature/voltage/current management		P
	The design prevents abnormal temperature-rise	Overcharge, over current and overheating proof circuit used in this battery. See tests of clause 8.	P
	Voltage, current, and temperature limits of the cells	See above.	P
	Specifications and charging instructions for equipment manufacturers	The charging limits specified in the user manual.	P
5.5	Terminal contacts of the battery pack and/or battery system		P
	Polarity marking(s)	See page 6.	P
	Polarity marking not provided for keyed external connector		N/A

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
	Capability to carry the maximum anticipated current	DC connector complied with the requirements.	P
	External terminal contact surfaces		P
	Terminal contacts are arranged to minimize the risk of short circuits		P
5.6	Assembly of cells, modules, or battery packs into battery systems		P
5.6.1	General		P
	Independent control and protection method(s)	Battery system has independent control and protective functions, and BMS is integrated into battery system.	P
	Recommendations of cell operating limits, mounting advice, storage conditions and other design recommendations by the cell manufacturer		P
	Batteries designed for the selective discharge of a portion of their series connected cells		N/A
	Protective circuit component(s) and consideration to the end-device application		P
5.6.2	Battery system design		P
	The voltage control function		P
	Maximum charging/discharging current of the cell are not exceeded		P
5.7	Operating region of lithium cells and battery systems for safe use		P
	The cell operating region..... :	Information mentioned in manufacturer's specifications.	P
	Designation of battery system to comply with the cell operating region	Information mentioned in manufacturer's specifications.	P
5.8	System lock (or system lock function)		P
	Non-resettable function to stop battery operation	Non-resettable protect function provided in the BMS security mechanism.	P
	Manual with procedure for resetting of battery operation	Information mentioned in maintenance manual.	P
	Emergency battery final discharge	Not for such application.	N/A
5.9	Quality plan		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Manufacturing quality plan (for example: ISO9001, etc.) prepared and implemented	Complied. ISO 9001: 2015 certificate provided. Certificate No. 201838, issued by DCI, valid until: 2027-11-19.	P
	The process capabilities and the process controls		P

6	TYPE TEST CONDITIONS		P
6.1	General		P
6.2	Test items		P
	Cells or batteries that are not more than six months old (See Table 1 of IEC 62619)		P
	Capacity confirmation of the cells or batteries		P
	Default ambient temperature of test, 25 °C ± 5 °C	Test complied.	P

7	SPECIFIC REQUIREMENTS AND TESTS		P
7.1	Charging procedure for test purposes		P
	The battery discharged to a specified final voltage prior to charging	B1: Final voltage: 672V, B2, B3: Final voltage: 168.0V	P
	The cells or batteries charged using the method specified by the manufacturer	Discharging and charging are carried out in an ambient temperature of 25°C ± 5°C.	P
7.2	Reasonably foreseeable misuse		P
7.2.1	External short-circuit test (cell or cell block)	CB approval cell used.	N/A
	Short circuit with total resistance of 30 mΩ ± 10 mΩ at 25 °C ± 5 °C		N/A
	Results: no fire, no explosion		N/A
7.2.2	Impact test (cell or cell block)	CB approval cell used.	N/A
	Cylindrical cell, longitudinal axis impact		N/A
	Prismatic cell, longitudinal axis and lateral axis impact		N/A
	Results: no fire, no explosion.		N/A
7.2.3	Drop test (cell or cell block, and battery system)		P
7.2.3.1	General		N/A

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
7.2.3.2	Whole drop test (cell or cell block, and battery system)	CB approval cell used.	N/A
	Description of the Test Unit..... :		—
	Mass of the test unit (kg)..... :		—
	Height of drop (m)..... :		—
	Results: no fire, no explosion		N/A
7.2.3.3	Edge and corner drop test (cell or cell block, and battery system)	Battery system applied.	P
	Description of the Test Unit..... :	Battery system.	—
	Mass of the test unit (kg)..... :	B2: 498.5kg, B3:489.5kg	—
	Height of drop (m)..... :	0.025m.	—
	Results: no fire, no explosion	No fire, no explosion.	P
7.2.4	Thermal abuse test (cell or cell block)	CB approval cell used.	N/A
	Results: no fire, no explosion		N/A
7.2.5	Overcharge test (cell or cell block)	CB approval cell used.	N/A
	For those battery systems that are provided with only a single protection for the charging voltage control		—
	Results: no fire, no explosion..... :		N/A
7.2.6	Forced discharge test (cell or cell block)	CB approval cell used.	N/A
	Cells connected in series in the battery system..... :		N/A
	Redundant or single protection for discharge voltage control provided in battery system..... :		N/A
	Target Voltage..... :		N/A
	Maximum discharge current of the cell, I_m :		N/A
	Discharge current for forced discharge, 1.0 I_t :		N/A
	Discharging time, $t = (1 I_t / I_m) \times 90$ (min.)..... :		N/A
	Results: no fire, no explosion..... :		N/A
7.3	Considerations for internal short-circuit – Design evaluation		N/A
7.3.1	General		N/A
7.3.2	Internal short-circuit test (cell)	CB approval cell used.	N/A
	Samples preparation procedure: In accordance with Clause A.5 and A.6 of IEC 62133-2:2017		N/A

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
	Tested per 7.3.2 b) in an ambient temperature of 25 °C ± 5 °C.		N/A
	The appearance of the short-circuit location recorded by photograph or other means		—
	The pressing was stopped - When a voltage drop of 50 mV was detected; or		N/A
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) was reached		N/A
	Results: no fire.....		N/A
7.3.3	Propagation test (battery system)		N/A
	Method to create a thermal runaway in one cell ... :		N/A
	Results: No external fire from the battery system, no battery case rupture		N/A

8	BATTERY SYSTEM SAFETY (CONSIDERING FUNCTIONAL SAFETY)		P
8.1	General requirements		P
	Functional safety analysis for critical controls	Relevant documents provided by the client which indicate analysis for functional safety has been done according to IEC 60730-1 (Annex H).	P
	Conduct of a process hazard analysis for both the cell manufacturing process and the battery system manufacturing process		P
	Conduct of risk assessment and mitigation of the battery system	FMEA table has been submitted.	P
8.2	Battery management system (or battery management unit)		P
8.2.1	Requirements for the BMS		P
	The safety integrity level (SIL) target of the BMS	Suitable for Class B control according to IEC 60730-1:2022, Annex H.	P
	The charge control evaluated by tests in clauses 8.2.2 to 8.2.4	Relevant tests (8.2.2, 8.2.3 and 8.2.4) have been performed and successfully passed.	P
8.2.2	Overcharge control of voltage (battery system)		P
	The exceeded charging voltage applied to the whole battery system	963.6V.	P

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Clause	Requirement + Test	Result - Remark	Verdict
	The exceeded charging voltage applied to only a part of the battery system, such as the cell(s)..... :		N/A
	Results: no fire, no explosion..... :	See Table 8.2.2.	P
	The BMS terminated the charging before exceeding the upper limit charging voltage		P
8.2.3	Overcharge control of current (battery system)		P
	Results: no fire, no explosion..... :	See Table 8.2.3.	P
	The BMS detected the overcharging current and controlled the charging to a level below the maximum charging current		P
8.2.4	Overheating control (battery system)		P
	The cooling system, if provided, was disconnected		P
	Elevated temperature for charging, 5 °C above maximum operating temperature..... :	60°C	P
	Results: no fire, no explosion..... :	See Table 8.2.4.	P
	The BMS detected the overheat temperature and terminated charging		P
	The battery system operated as designed during test		P

9	EMC		P
	Battery system fulfil EMC requirements of the end-device application..... :	The Energy storage system has passed the CE-EMC certification in accordance with EN IEC 61000-6-2: 2019 and EN IEC 61000-6-4: 2019. Certificate No.: NE1105260103, Report No.: TWR2604034 001, issued by TUV NORD Taiwan Co., Ltd.	P

10	INFORMATION FOR SAFETY		P
	The cell manufacturer provides information about current, voltage and temperature limits of their products	Included in datasheet.	P
	The battery system manufacturer provides information regarding how to mitigate hazards to equipment manufacturers or end-users.	Written in instruction manual.	P

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

11	MARKING AND DESIGNATION (REFER TO CLAUSE 5 OF IEC 62620)		P
	The marking items shown in Table 1 in IEC 62620 indicated on the cell, battery system or instruction manual.	The battery is marked in accordance with IEC 62620, also see pages 5 to 6.	P
	Cell or battery system has clear and durable markings		P
	Cell designation		N/A
	Battery designation		P
	Battery structure formulation		P

12	PACKAGING AND TRANSPORT		N/A
	Refer to Annex D		N/A

ANNEX A	OPERATING REGION OF CELLS FOR SAFE USE		P
A.1	General		P
A.2	Charging conditions for safe use		P
A.3	Consideration on charging voltage		P
A.4	Consideration on temperature		P
A.5	High temperature range		P
A.6	Low temperature range		P
A.7	Discharging conditions for safe use		P
A.8	Example of operating region		P

ANNEX B	PROCEDURE OF 7.3.3 PROPAGATION TEST BY LASER IRRADIATION		N/A
B.1	General		N/A
B.2	Test conditions		N/A
B.2.1	Cell test (preliminary test)		N/A
	The cell fully charged according to the manufacturer recommended conditions..... :		—
	Laser irradiation point on the cell..... :		—
	Output power of laser irradiation..... :		—

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict
	Tested in an ambient temperature of 25 °C ± 5 °C		N/A
	Repeat of cell test for 3 times		N/A
B.2.2	Battery system test (main test)		N/A
	The battery system fully charged according to the manufacturer recommended conditions		—
	Target cell to be laser irradiated		—
	The irradiation point on the target cell same or similar as that on the cell test		
	Output power of laser irradiation.....		—
	Tested in an ambient temperature of 25 °C ± 5 °C		N/A

ANNEX C	PROCEDURE OF 7.3.3 PROPAGATION TEST BY METHODS OTHER THAN LASER		N/A
C.1	General		N/A
C.2	Test conditions:		N/A
	– The battery fully charged according to the manufacturer recommended conditions		—
	– Target cell forced into thermal runaway		—
	– A specially prepared sample (e.g. a heater or a hole for nail penetration provided) used for ease of testing.....		—
C.3	Method used for initiating the thermal runaway. 1) Heater (Heater, Burner, Laser, Inductive heating) 2) Overcharge 3) Nail penetration of the cell 4) Combination of above methods 5) Other methods.....		—

ANNEX D	PACKAGING AND TRANSPORT		N/A
	The materials and pack design chosen in a way as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of environmental contaminants		N/A
	Regulations concerning international transport of secondary lithium batteries		N/A

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

5.1	TABLE: Critical components information					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾	
General						
Enclosure	Lucky Harvest CO., LTD.	SGCC	1040*1500*2200mm , metal sheet	IEC 62619:2022	Tested with appliance	
Emergency stop	Schneider	XB2BS542C	24Vd.c., 5mA, IP65, -25°C to 70°C	IEC/EN 60947-5-1	CQC CN54453	
Anti-explosion valve on back side	Zhejiang Baignai Electric CO., LTD	BN-F550	93*79*24mm, IP67, 10kPa relief threshold	IEC 62619:2022	Tested with appliance	
Material of Anti-explosion valve	Nan Ya Plastics (Hui Zhou) Corp LTD	PP+GF30	f1, -40°C to 125°C, V-0	UL 94 UL 746	UL E235269	
Internal						
Red pillar of AC terminal	Zhejiang keluoyi Electric Power Co., Ltd	M6-25	Dielectric strength: 12KV/mm, V-0, 150°C	UL 94	UL E55519	
AC wire	Wuxi Xinhongye Wire & Cable Co., Ltd	10269	1/0AWG, VW-1, 1000V, 105°C	UL 758	UL E248566	
PCS module	Hansol EnergyON co., Ltd.	M-PCS-100	660-900Vd.c., 230/400Va.c., 100kW, IP20, class I, -25°C to 60°C, ≤3000m	IEC 62477-1:2012+AMD1:2016 EN 62477-1:2012+A1:2017 EN62477-1:2012+A12:2021	TUV NORD 44 799 26 406749 - 163	
EMS module	Zhejiang LnXall IoT Tech. Co., Ltd.	Combo-V1 2.0, Combo-V1-Ext	24Vd.c., 5A, 65W, 60°C	IEC 62619:2022	Tested with appliance	
	GOLD ELECTRONIC	ESCCU 1002564G	24Vd.c., 400mA, 10W, 60°C	IEC 62619:2022	Tested with appliance	
	Oriental Conifers Technology	SRB-3630	24Vd.c., 2.5A, 60W, 60°C	IEC 62619:2022	Tested with appliance	

IEC 62619						
Clause	Requirement + Test		Result - Remark		Verdict	
5.1	TABLE: Critical components information					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾	
Air-cooled Chiller	Shenzhen Envicool Technology Co., Ltd.	EMW30HFNC1 A	220~240Va.c., 9.4A, 1.5kW, IPX5, -40°C to 70°C	EN 60335-1 EN 60335-2-40 EN62233	TUV AM 50632900 0001	
Foam on Pipe of air-cooled chiller (Nylon tube)	shanghai yanNan auto parts co., ltd	Nylon	Ø12mm*1mm and Ø29mm*2mm	IEC 62619:2022	Tested with appliance	
material of Nylon tube	EMS-CHEMIE AG	Grilamid L 25 A NZ PA	Thk 0.5mm, HB, 65°C	UL 746, UL 94	UL E53898	
Insulation tape for Nylon tube	HEBEI YONGLE TAPE Co., Ltd.	PVC 808, 810	Flame Retardant, 80°C	UL 510, UL746	UL E174965	
Dehumidifier	Andes (Zhejiang) Energy Technology Co., Ltd	ADSBD-500ML	24Vd.c., 2.5A, 55W -40°C to 70°C, V-0	UL 60335-1, UL 60335-2-40	UL-US-2414393-0 (SA46221)	
	Zhuzhou Gongchuang Technology Co., Ltd.	JY-760A	24Vd.c., 60W, -25°C to 75°C	EN 60335-1 EN 60335-2-40	TUV SUD N8A 126711 0001	
Door switch monitor	CHINT	NKX3-23/KM1	24Vdc, 0.2A, 70°C	IEC 62619:2022	Tested with appliance	
Frog alarm	Apollo Fire Detectors Limited	55000-316	24Vd.c., 10mA, 60°C	EN 54-7	LPCB certificate 010q/48	
Temperature alarm	Apollo Fire Detectors Limited	55000-121	24Vd.c., 10mA, 65°C	EN 54-5	LPCB certificate 010q/42	
Fault alarm	Hosiden Besson Limited	958CHL1000 9-30V dc	24Vd.c., 40mA, 70°C	EN 54-3	LPCB certificate 539c/01	
LED light	Guangdong Xingshengdi technology Co., Ltd.	XD933V(X)f(1)	base 200*122*2mm, cover 200*60*0.5mm, V-0, f(1), 125°C	UL 746, UL 94	UL E342846	

IEC 62619					
Clause	Requirement + Test		Result - Remark		Verdict
5.1	TABLE: Critical components information				P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾
Aerosol extinguishing device	Hubei Jiandun Fire Technology Co., Ltd.	JAD300-U01	24Vd.c., 2A initial, stainless steel case, 300g of aerosol forming compound, -40°C to 60°C	BS EN 15276	BSI KM781135
Water flooding sensor	Shenzhen EJHAuto-Control Equipment Co.,Ltd	WLD2100	24Vdc±20%, 1A @ 30Vdc / 0.5A @ 125Vac, 0°C to 60°C	IEC 62619:2022	Tested with appliance
PE bonding wire for EMS	Xinya Electronic Co., Ltd.	10269	16AWG, 1000V, 105°C, VW-1	UL 758	UL E170689
PE bonding wire for liquid cooled chiller	XINYA ELECTRONIC Co., Ltd.	10269	16AWG, 1000V, 105°C, VW-1	UL 758	UL E170689
PE bonding wire for PCS converter	WUXI XINHONGYE WIRE & CABLE Co., Ltd.	10269	2AWG, 1000V, 105°C, VW-1	UL758	UL E248566
	WONDERFUL HI-TECH Co., Ltd.	10269	2AWG, 1000V, 105°C, VW-1	UL 758	UL E77981
PE bonding wire for cabinet door	Xinya Electronic Co., Ltd.	10269	10AWG, 1000V, 105°C, VW-1	UL 758	UL E170689
IP54 Filter net on front door	Shenzhen Guozhi Hui Fu Polymer Material Co., LTD.	GZPA66	Polyurethane filter cotton, specification 30PP1, cotton thickness 10mm, V-0, 644*608*12mm	UL 94619	UL E231052
Key components for battery module					
Anti-explosion valve	Huizhou Voir Science&Technology Co., Ltd.	VE-M482V-00-111	φ50.7*27.5mm, Al 6063 X5, 4kPa relief threshold	IEC 62619:2022	Tested with appliance
- Aluminium Alloy	Huizhou Qi De Metal Materials Co., LTD.	6063	-40°C to 125°C, V-0	IEC 62321-4 IEC 62321-5 IEC 62321-7-1 IEC 62321-6 IEC 62321-8	SGS SZXEC23001 518309

IEC 62619						
Clause	Requirement + Test		Result - Remark		Verdict	
5.1	TABLE: Critical components information					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾	
Battery terminal, B+, B-	Amphenol Technology (Shenzhen) Co., Ltd.	C10-793986-0100/C10-793986-1102	1500V, 250A, 125°C	UL 4128	UL E496781	
Battery wire between each module	Wuxi Xinhongye Wire & Cable Co., Ltd.	UL3817 1/0AWG	1/0AWG, 105°C, 3000V	UL 758	UL E248566	
Battery wire between PCS	Wuxi Xinhongye Wire & Cable Co., Ltd.	UL3817	1/0AWG, 3000V, 125°C, VW-1	UL 758	UL E248566	
BMU	Hansol EnergyON co., Ltd.	X5-BMU	Hardware version: V1.1, 150°C	IEC 62619:2022	Tested with appliance	
Insulating paper	Nantong Huapu Photoelectric Material Co., Ltd	HPC-EFR87X	V-0, 80°C 1095*177*1mm	UL 746	UL E508063	
Mica insulation paper covering the module	TAIWAN UNION TECHNOLOGY CORP	TU-662	V-0, 130°C 205*175*1mm	UL 94 UL 746	UL E189572	
lead wire for cell voltage sample	WONDERFUL PHOTOELECTRICITY(DONGGUAN) CO.,LTD	1569	300V, 24AWG, 105°C, HB	UL 758	UL E77981	
	WUXI XINHONGYE WIRE&CABLE CO.,LTD.	1569	300V, 24AWG, 105°C, HB	UL 758	UL E248566	
Wire for NTC	TAIZHOU RISHUN ELECTRIC APPLIANCE DEVELOPMENT Co., Ltd.	4413	300Va.c., 22AWG, 105°C	UL 758	UL E237675	
	Suzhou Dian Hang Electronic Co., Ltd.	4413	300Va.c., 22AWG, 150°C	UL 758	UL E354173	

IEC 62619					
Clause	Requirement + Test		Result - Remark		Verdict
5.1	TABLE: Critical components information				P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾
Battery MSD (manual stop device) terminal	Amphenol Technology (Shenzhen) Co., Ltd.	TSJ-R350BL-B+TSJ-P350BL	1500Vd.c., 350A, 85°C	EN61984, 2PFG	TUV R50590903
	Amphenol Technology (Shenzhen) Co., Ltd.	MCMSDM0 MCMSDM1 MCMSDFRS01	1500Vd.c., 350A, 85°C	EN 61984	TUV AN 50580746 0001
	Zhejiang Bsb Electrical Appliances CO., LTD.	B-MSD-M350-00-Z B-MSD-M350-00-T	1500Vd.c., 350A, 85°C	UL 4128	UL E530979
Key components for BMU board in Battery module					
Module terminal (J1, J2, J3, J4)	Hongru Connector CO., LTD.	M20091R	125Vd.c, 3A, V-0, -55°C to 105°C	UL 94	UL E304945
Chip (AFE) (U2, U5, U8, U11)	Analog Devices, Inc	ADBMS1818AS WAZ	U-Regu ADI ADBMS1818ASWAZ -RL 64-Lead LQFP_EP, -40°C to 85°C	IEC 62619:2022	Tested with appliance
	Analog Devices, Inc	LTC6813ILWE-1#3ZZTRPBF	ADI LTC6813ILWE-1#3ZZTRPBF 64-Lead Plastic eLQFP -40°C to 85°C	IEC 62619:2022	Tested with appliance
Transformer (T2, T68)	Pulse Electronic CO., LIMITED	HXE2019HLT	1:1 150uH, -40°C to 125°C	UL 746, UL 60950-1	UL E493645
	BOURNS (XIAMEN) LTD	SM91534AL-E	1:1 150uH, -40°C to 125°C	UL-US-2019667-2	UL E515965
PCB	TONGLING ONBOLE PCB Co., Ltd.	M1	BCU, BMU, DCDC, V-0, 130°C, min thickness 0.1mm	UL 796 UL 94	UL E488128
NTC	ISTEC	SK 103xy	10kΩ@25°C.110°C	UL 1434	UL E340044

IEC 62619						
Clause	Requirement + Test		Result - Remark		Verdict	
5.1	TABLE: Critical components information					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾	
Fuse	Advanced Surgetech Materials Ltd.	A372102-350 YW	250Vd.c., 350A, breaking 50kA, arc voltage limits 1200Vd.c.	IEC 60269-1 IEC 60269-7	TUV R50612208 0001	
Key components for High voltage transfer box (GM-BOX-1000)						
Black start button	Yijia Industrial Electrical Co., Ltd.	YJ-GQ22AF-20/SQ2/DZ	24V/18A, Rated insulated Voltage 1000V	EN 60947-5-1:2017	TUV SUD B 121522 0004 Rev.00	
220V AC Aux-in terminal	Guangdong Hongru Technology Co, Ltd.	P32508-1×4-A-B	600V AC/DC, 15A AC/DC, -40℃ to 105℃	UL 1977	UL E304945	
AC wire	Wuxi Xinhongye	1015	600V, 10AWG, 105℃	UL 758	UL E248566	
HV-DC terminal	Amphenol Technology (Zhuhai) Co., Ltd	C10-766397-0102, C10-766397-1101	1500Vd.c., 250A, -40℃ to 125℃	UL 4128	UL E496781	
HV-DC wire	WUXI XINHONGYE;	10269	20AWG, 1000V, 105℃	UL 758	UL E248566	
Liquid-out voltage terminal	Handa Power	HDC-32i2f3	600V, 32A, IP68, 110℃	EN 61984	TUV SUD B 113788 0006	
Liquid-out voltage wire	WUXI XINHONGYE WIRE & CABLE Co., Ltd.	10269	12AWG, 600V, 105℃, VW-1	UL 758	UL E248566	
Liquid switch	NOARK Electric (shanghai) Co., Ltd	Ex9BN D16	400Va.c., 16A, 2P, 6kA, 70℃	IEC/EN 60898-1	TUV SUD N8A 075006 0060	
	Shanghai Liangxin Electrical Co., Ltd.	NDB1-63 D16	400Va.c., 16A, 2P, 6kA, 70℃	EN 60898-1 EN 60898-2	TUV AN 50606682	
24V AC/DC module	Guangzhou MORNSUN Technology Co., Ltd	LM75-23B24R2	99*82*30mm, input 80V to 305Va.c., output 24Vd.c., 3.2A, 75W, -40℃ to 85℃	IEC 62368-1	UL CB DK-134156-UL	

IEC 62619						
Clause	Requirement + Test		Result - Remark		Verdict	
5.1	TABLE: Critical components information					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾	
	MEAN WELL Enterprises Co., Ltd.	LRS-75-24	99*85*30mm, input 85V to 264Va.c., output 24Vd.c., 3.2A, 75W, -40°C to 85°C	IEC 62368-1	TUV RH CB JPTUV-136628	
24V AC/DC module	Guangzhou MORNSUN Technology Co., Ltd	LM200-20B24R2	159*97*30mm, -40°C to 85°C, input: 180V to 264Va.c., output: 24Vd.c., 8.8A, 200W	IEC 62368-1	UL CB DK-136861-UL	
	ATAZ Guangzhou Science & Technology Co.,Ltd.	AM200-B24	Input: 200V to 240Va.c., output: 24Vd.c., -40°C to 85°C, 8.8A, 200W	IEC 62368-1	UL CB DK-157699-UL	
Transformer swtich	NOARK Electric (shanghai) Co., Ltd	Ex9BN D10	400Va.c., 10A, 2P, 6kA, 70°C	IEC/EN 60898-1	TUV SUD N8A 075006 0060	
	Shanghai Liangxin Electrical Co., Ltd.	NDB1-63 D10	400Va.c., 10A, 2P, 6kA, 70°C	EN 60898-1 EN 60898-2	TUV AN 50606682	
Transformer	Huizhou baohui electronics technology Co., Ltd.	319-24-012D	N1/N2/N3, 300Ts/218Ts/314Ts, class B, 3000Va.c. isolation	IEC/EN 62477-1	Test with appliance	
-wire	Dong Guan Yida Industrial Co., Ltd.	xPEW/155, QZ-x/155	0.8Φ primary winding, 1.0Φ secondary winding, 155°C	UL 1441	UL E344055	
	Sihui Henghui Electrical Appliances Co., Ltd.	*PEW/155	0.8Φ primary winding, 1.0Φ secondary winding, 155°C	UL 1441	UL E337948	
-bobbin	Nantong Orient Plastics Co., Ltd.	PBT3080 G(zz)	V-0, 130°C	UL 746, UL 94, UL 60695-11-10	UL E332375	

IEC 62619						
Clause	Requirement + Test		Result - Remark		Verdict	
5.1	TABLE: Critical components information					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾	
-tape	Jingjiang Yahua Pressure Sensitive Glue Co., Ltd.	CT280	130°C	UL 510	UL E165111	
-tube	Dongguan Yongchao Insulation Material CO LTD	YC-15-25-40-70	600V, 200°C	UL 1441	UL E325767	
	Dongguan Ling Free Hardware Plastics Product Co., Ltd.	LFGS-001	600V, 200°C	UL 1441	UL E520027	
-press board	Xinfeng Gehillie Electrical Materials CO LTD	DMD-F	155°C	UL 1446	UL E322743	
	Xuchang Weidu District Yaan Insulating Material Plant	DMD	155°C	UL 1446	UL E310670	
Key components for BCU board in High voltage transfer box (GM-BOX-1000)						
Chip (MCU) (U39)	GigaDevice Semiconductor Inc.	GD32F470ZKT 6	LQFP144, -40°C to 85°C, 32-bit	UL 758	UL E353532	
Chip (U9)	MICROCHIP	MCP2515	2.7V to 5.5Vd.c., 5mA, -40°C to 85°C	EN 60947-2	TUV R 50604688	
Relay (Ray1, Ray2, Ray3)	Xiamen Hongfa Electroacoustic Co. Ltd.	HFD3-V/5-SR	125Va.c., 0.5A, 5Vdc, -40°C to 85°C	DIN EN 61810-1 VDE 0435-201	VDE 40018867	
Opto-coupler (U8, U18, U24)	NOVOSENSE	NSI1050DDBR	CI/Cr: 8mm, 7000V impulse, -40°C to 125°C	EN IEC 60747-17 VDE 0884-17	VDE 40050121	
Opto-coupler (U19, U26)	NOVOSENSE	NSi83085A-DSWR	CI/Cr: 8mm, 7000V impulse, -40°C to 125°C	EN IEC 60747-17 VDE 0884-17	VDE 40050121	
Opto-coupler (U33)	NOVOSENSE	NSi8100W	CI/Cr: 8mm, 7000V impulse, -40°C to 125°C	EN IEC 60747-17 VDE 0884-17	VDE 40050121	

IEC 62619					
Clause	Requirement + Test			Result - Remark	Verdict
5.1	TABLE: Critical components information				P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾
Y cap (CY1, CY2, CY3, CY9)	TDK CORPORATION	CD45-B2GA471K-NKA	470pF, Y1, 400V, -55°C to 125°C	EN 60384-14	UL ENEC-01048
Transformer (T24, T30, T37, T53)	Pulse Electronic CO., LIMITED	PH9384.034NL T	TX Pulse Ferrite, 3000Va.c. isolation, Cl/Cr: 7mm, 150°C	UL 60950-1	UL E133523
	Pulse Electronic CO., LIMITED	PH9384.012NL T	TX Pulse Ferrite, 3000Va.c. isolation, Cl/Cr: 7mm, 150°C	UL 60950-1	UL E133523
-Alternative Transformer (T24, T30, T37, T53)	Sumida Automation CO., LTD	PS20-180-3T4	300uH, 4000Va.c., Cl/Cr: 9mm, -40°C to 125°C	IEC 62619:2022	Tested with appliance
-Case	Wah Hong Industrial CORP	WH-9100	V-0, -40°C to 125°C, 600V Min	UL 746 UL 94	UL E150608
-Wire	Elektrisola	FIW	4000Va.c., 125°C	UL 1446	UL E494267
	Matsuda Electrician				UL E469976
Transformer (TX16)	PULSE ELECTRONIC CO., LIMITED	PGG6457.034NL	Cl/Cr: 13mm, 4200Va.c., -40 C to 125 °C	IEC 62619:2022	Tested with appliance
-Triple Insulated Wire	New England Electric Co., Ltd	WaaTcccPxxxx+xxxxxxx+	1500V, 180°C	UL 2353, UL 60950-1	UL E205791
-case	SUMITOMO BAKELITE Co., Ltd.	PM-9630	V-0, 150°C	UL 746 UL 94	UL E41429
-Silicone	Dow Corning Co., Ltd.	1-2577 or equivalent	V-0, 130°C	UL 746 UL 94	UL E81611

IEC 62619					
Clause	Requirement + Test		Result - Remark		Verdict
5.1	TABLE: Critical components information				P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾
BCU	Hansol EnergyON co., Ltd.	X5-BCU	overcharge/discharge detection voltage for each cell: 2.8V to 3.64V, Charge/discharge overcurrent detection current: 167A, High temperature discharging/charging protection: > 56°C, Low temperature charging protection: <-1°C, Low temperature discharging protection: <-26°C, Software and hardware versions: R1.003_V1.3.03/V1.2	IEC 62619:2022	Tested with appliance
PCB	TONGLING ONBOLE PCB Co., Ltd.	M1	BCU, BMU, DCDC, V-0, 130°C, min thickness 0.1mm	UL 796 UL 94	UL E488128
Key components for DC/DC board in High voltage transfer box (GM-BOX-1000)					
DCDC module (U1)	Guangzhou MORNSUN Technology Co., Ltd	PV40-27B24R2	89.00*63.50*25.00mm, input: 200Vd.c.~1200Vd.c., output: 24Vd.c., 1.67A, 40W, -40°C to +125°C	UL 1741	UL E492461
	MEAN WELL Enterprises Co., Ltd.	DDRH-45-24P	89.00*63.50*25.00mm, input: 150Vd.c. to 1500Vd.c., output: 24Vd.c., 1.87A, 45W, -40°C to 80°C	IEC 62109-1	DEKRA CB NL-101993

IEC 62619						
Clause	Requirement + Test		Result - Remark		Verdict	
5.1	TABLE: Critical components information					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾	
Relay (RY1)	xiamen Hongfa Electroacoustic Co. Ltd.	HFD39/24	1000Vdc, 30mA, 1H, 24Vdc, -40°C to 85°C	IEC/EN 60947-4-1	TVU R 50588457	
X capacitor (X1)	Fengming Electronic Technology Co., Ltd	SKMJ-PN	0.22uF,1600V, -40°C to 85°C	UL 810	UL E215893	
Fuse (FU1)	ADVANCED SURGETECH MATERIALS LTD	HV110.PV3.5A	1000V, 3.5A, -40°C to 90°C	UL 248-19	UL E364962	
Key components for Cell LFP71173207/280Ah						
Cell	Xiamen Hithium New Energy Technology Co., Ltd	LFP71173207/280Ah	3.2V 280Ah 896Wh	IEC 62619:2022	TUV RH CB JPTUV-147436-A1	
-Cell Case	Changzhou Red Fairy Precision Technology Co., LTD	71173	Thickness*Width*Length: 0.6mm x 173.6mmx203.7mm, Aluminium	--	--	
-Positive Electrode	HuNan YuNeng New Energy Battery Material Co. Ltd	RMRCMZJA0001C001	Lithium (3.2%) Fe (25.3%) P (13.9%) + Oxygen (57.6%), Thickness*Width*Length: 6µm * 187.5mm *17036mm	--	--	
-Negative Electrode	Guangdong Kaijin New Energy Technology Co., Ltd	RMRCMFJA0001C001	C (100%), Thickness*Width*Length: 13µm * 190.5mm *17399mm	--	--	
-Separator	Shenzhen Zhongxing New Material Technology Co. Ltd	RMRCMGMA0001C001	Shutdown temperature: 130°C, Thickness*Width*length: 16µm * 197.0mm *37103mm	--	--	
-Electrolyte	Tianci High-tech Materials Co., Ltd	RMRCMELA0001C001	DMC:DEC:EC=2:3:5	--	--	

IEC 62619						
Clause	Requirement + Test		Result - Remark		Verdict	
5.1	TABLE: Critical components information					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾	
Key components for Cell PC-0B1-72174L4-AH						
Cell	BatteroTech Corporation Limited	PC-0B1-72174L4-AH	3.2Vd.c, 280Ah	IEC 62619:2022	TUV RH CB JPTUV-145694	
-Electrolyte	Guangzhou Tianci Materials Technology Co., Ltd.	TC-E8087-F2	LiPF6, DMC, EMC, EC	--	--	
-Separator	Advanced Electronic Technology Ltd.	9μm+3μmCCS ×W196.5mm	PE, 16900mm×196.5mm×0.012mm, for one core, total four cores	--	--	
-Positive electrode	BatteroTech Corporation Limited	SM-CEC-72174L4-AH	LFP, Conductive Additive PVDF Collector: Aluminum Foil, Size: 16200mm×187.5mm×0.162mm, for one core, total four cores	--	--	
-Negative electrode	BatteroTech Corporation Limited	SM-AEC-72174L4-AH	Carbon, Conductive Additive Collector: Copper Foil, Size: 16460mm×190.5mm×0.120mm, for one core, total four cores	--	--	
-Positive electrode pole	Jiangxi BSL New Energy Technology Co., LTD	--	Material: Aluminum, diameter: φ17mm	--	--	
-Negative electrode pole	Jiangxi BSL New Energy Technology Co., LTD	--	Material: Aluminum, diameter: φ17mm	--	--	

IEC 62619					
Clause	Requirement + Test		Result - Remark		Verdict
5.1	TABLE: Critical components information				P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾
-Venting hole	Jiangxi BSL New Energy Technology Co., LTD	--	Deflated pressure: 0.6±0.2MPa	--	--
-Insulation tap	Dongguan Xinmei Electronic Material Co., Ltd	--	PET, width: 71.5mm, Thickness: 0.03mm	--	--
-Case	Jiangxi BSL New Energy Technology Co., LTD	72174204 Al 3003 L173.6*W71.5* H204mm	Aluminum, Thickness: 0.6mm	--	--
Supplementary information:					
1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.					
2) License available upon request.					

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

7.2.1	TABLE: External short-circuit test (cell or cell block)					N/A
Sample No.	Ambient (at 25°C ± 5°C)	OCV at start of test (V dc)	Resistance of Circuit (mΩ)	Maximum Case Temperature Rise ΔT (°C)	Results	
Supplementary information: A – No fire or Explosion B – Fire C – Explosion D – The test was completed after 6 h E – The test was completed after the cell casing cooled to 20% of the maximum temperature rise F – Other (Please explain): ____						

7.2.5	TABLE: Overcharge test (cell or cell block)					N/A
Sample No.	OCV at start of test (V dc)	OCV at end of test (V dc)	Measured Maximum Charging Current (A)	Measured Maximum Charging Voltage (V dc)	Max. Cell Case Temperature (°C)	Results
Supplementary information: Results: A – No fire or Explosion B – Fire C – Explosion D – Test concluded when temperature reached a steady state condition E – Test concluded when temperature returned to ambient F – Other (Please explain): ____						

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

7.2.6	TABLE: Forced discharge test (cell or cell block)				N/A
Sample No.	OCV before applying reverse charge (V dc)	Target Voltage (V dc)	Measured Reverse Charge Current It (A)	Total Time for Reversed Charge Application (min)	Results
Supplementary information: Results: A – No fire or Explosion B – Fire C – Explosion D – Other (Please explain): ____					

7.3.2	TABLE: Internal short-circuit test (cell)				N/A
Sample No.	OCV at start of test, (V dc)	Particle location ¹⁾	Maximum applied pressure (N)	Results	
Supplementary information: ¹⁾ Identify one of the following: 1: Nickel particle inserted between positive and negative (active material) coated area. 2: Nickel particle inserted between positive aluminium foil and negative active material coated area. Results: A – No fire or explosion B – Fire C – Explosion D – Test concluded when 50 mV voltage drop occurred prior to reaching force limit E – Test concluded when 800/400 N pressure was reached and 50 mV voltage drop was not achieved F – Test was concluded when fire or explosion occurred G – Other (Please explain): ____					

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

7.3.3	TABLE: Propagation test (battery system)					N/A
Sample No.	OCV of Battery System Before Test (V dc)	OCV of Target Cell Before Test (V dc)	Maximum Cell Case Temperature (°C)	Maximum DUT Enclosure Temperature (°C)	Results	
Method of cell failure ¹⁾		Location of target cell		Area for fire protection (m ²)		
Supplementary information:						
1) Cell can be failed through laser exposure, applied heat, overcharge, nail penetration or combinations of these failures or other acceptable methods. See supporting documentation for details on cell failure method						
2) If the battery system has no outer covering, the manufacturer is required to specify the area for fire protection.						
Results:						
A – No fire external to DUT enclosure or area for fire protection or no battery case rupture						
B – Fire external to DUT enclosure or area for fire protection						
C – Explosion						
D – Battery case rupture						
E – Other (Please explain): ____						

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

8.2.2	TABLE: Overcharge control of voltage (battery system)					P
Sample No.	OCV at start of test for Cell/Cell Blocks (V dc)	Maximum Charging Current (A)	Max. Charging Voltage (V dc)	Max. Voltage of Cell/Cell Blocks (V dc)	Results	
B1	3.171	140	858.4	3.639	A, D, F	
			Charge Voltage Applied Battery System: 1)			
			Whole	Part		
			963.6V	/		
Supplementary information: 1) The exceeded voltage can be applied to only a part of the system such as the cell(s) in the battery system per Figure 6 of IEC 62619, if it is difficult to do it in using the whole battery system. Results: A – No Fire or Explosion B – Fire C – Explosion D – The voltage of the measured cells or cell blocks did not exceed the upper limit charging voltage E – The voltage of the measured cells or cell blocks did exceed the upper limit charging voltage F – All function of battery system did operate as intended during the test. G – All function of battery system did not operate as intended during the test. H – Other (Please explain): ____						

8.2.3	TABLE: Overcharge control of current (battery system)				P
Sample No.	OCV at start of test (V dc)	Max. Charging Current (A)	Max. Charging Voltage (V dc)	Results	
B1	770.0	168	789.8	A, D, F	
Supplementary information: Results: A – No fire or Explosion B – Fire C – Explosion D – Overcurrent sensing function of BMU did operate and then charging stopped E – Overcurrent sensing function of BMU did not operate and then charging stopped F – All function of battery system did operate as intended during the test. G – All function of battery system did not operate as intended during the test. H – Other (Please explain): ____					

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

8.2.4	TABLE: Overheating control (battery system)			P
Model No.	OCV at start (SOC 50%) of test (V dc)	Maximum Charging Current (A)	Maximum Charging Voltage (V dc)	
B1	797.9	140	814.8	
Maximum Specified Temperature of Battery System (°C)		Maximum Measured Cell Case Temperature (°C)	Results	
55.0		56.1	A, D, F	
Supplementary information:				
Results:				
A – No fire or Explosion				
B – Fire				
C – Explosion				
D – Temperature sensing function of BMU did operate and then charging stopped				
E – Temperature sensing function of BMU did not operate and then charging stopped				
F – All function of battery system did operate as intended during the test.				
G – All function of battery system did not operate as intended during the test.				
H – Other (Please explain): _____				

IEC 62619			
Clause	Requirement + Test	Result - Remark	Verdict

9	TABLE: EMC					P
Standard used for EMC test:						
Sample No.	EMC Test Item	Battery Condition	EMC Test Level/ Parameters	Compliance Criteria	Results	
--	--	--	--	--	--	
--	--	--	--	--	--	
--	--	--	--	--	--	
--	--	--	--	--	--	
--	--	--	--	--	--	
--	--	--	--	--	--	
--	--	--	--	--	--	
--	--	--	--	--	--	
Supplementary information: Battery Condition During EMC test 1 – In Operation Mode, [] Supplied at ____, [] Load at ____ 2 – In non-operation Mode, Battery state of charge (SOC) before test at around ____ Compliance Criteria and Test Results: A – No fire or Explosion B – Fire C – Explosion D – Battery system did operate as intended during the test. E - All function of battery system did operate as intended after the test. F - All function of battery system did not operate as intended during the test, (Please explain): ____ G - Other (Please explain): ____ Remark: The Energy storage system has passed the CE-EMC certification in accordance with EN IEC 61000-6-2: 2019 and EN IEC 61000-6-4: 2019. Certificate No.: NE1105260103, Report No.: TWR2604034 001, issued by TUV NORD Taiwan Co., Ltd.						

ANNEX 1: PHOTOS

Model type: HSES-100kW-215kWh-1



Front view of battery system

Model type: HSES-100kW-215kWh-1



Inside view of battery system (with MSD)

Model type: HSES-100kW-215kWh-1



Inside view of battery system (without MSD)

Model type: GM-PACK-54



Side view of battery module (with MSD)



Side view of battery module (with MSD)

Model type: GM-PACK-54



Inside view of battery module (with MSD)



Side view of battery module (without MSD)

TRF No. IEC62619B

Model type: GM-PACK-54



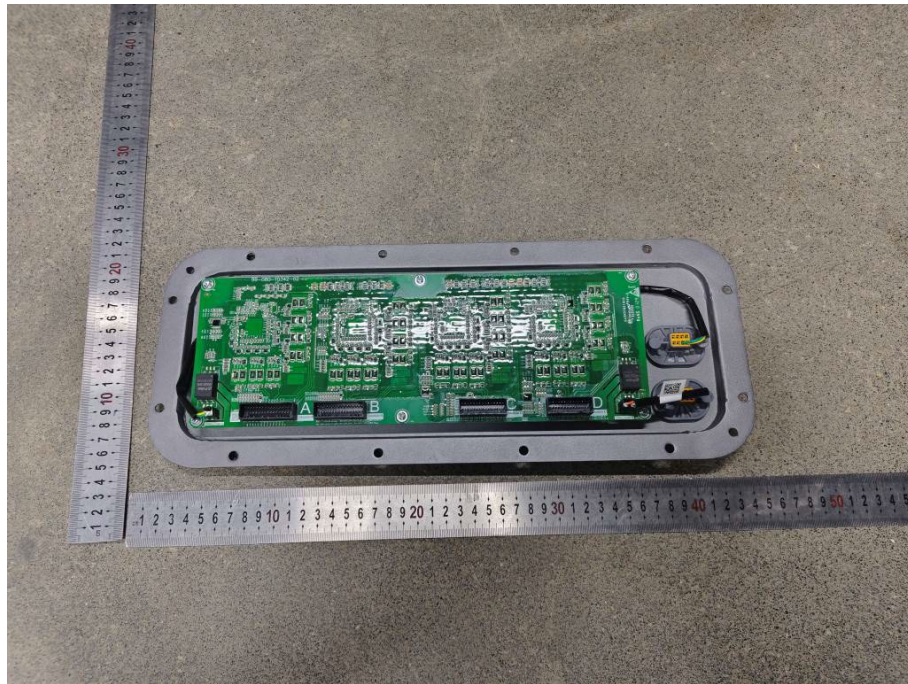
Side view of battery module (without MSD)



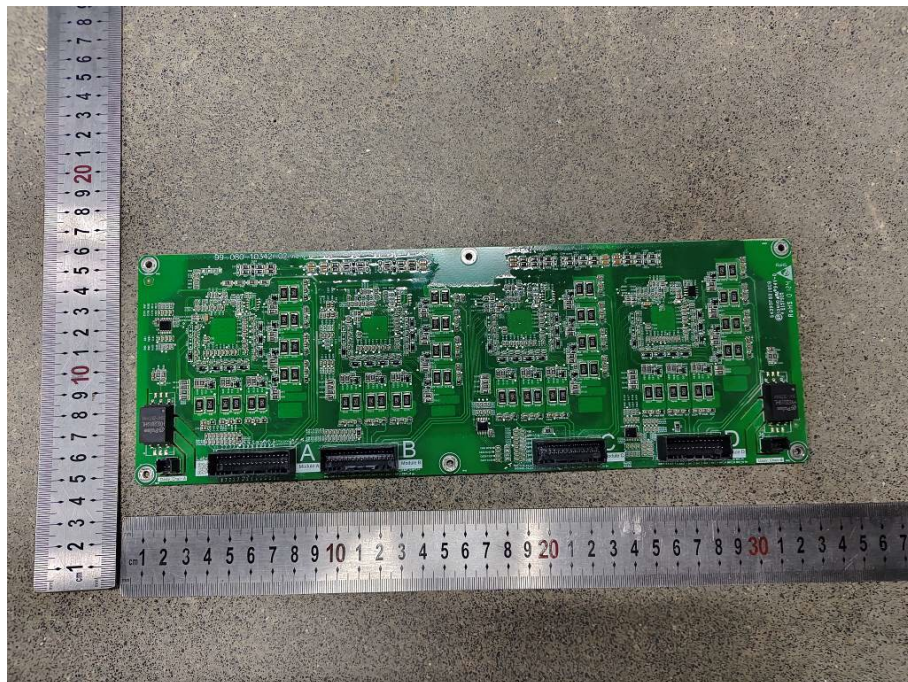
Inside view of battery module (without MSD)

TRF No. IEC62619B

Model type: GM-PACK-54



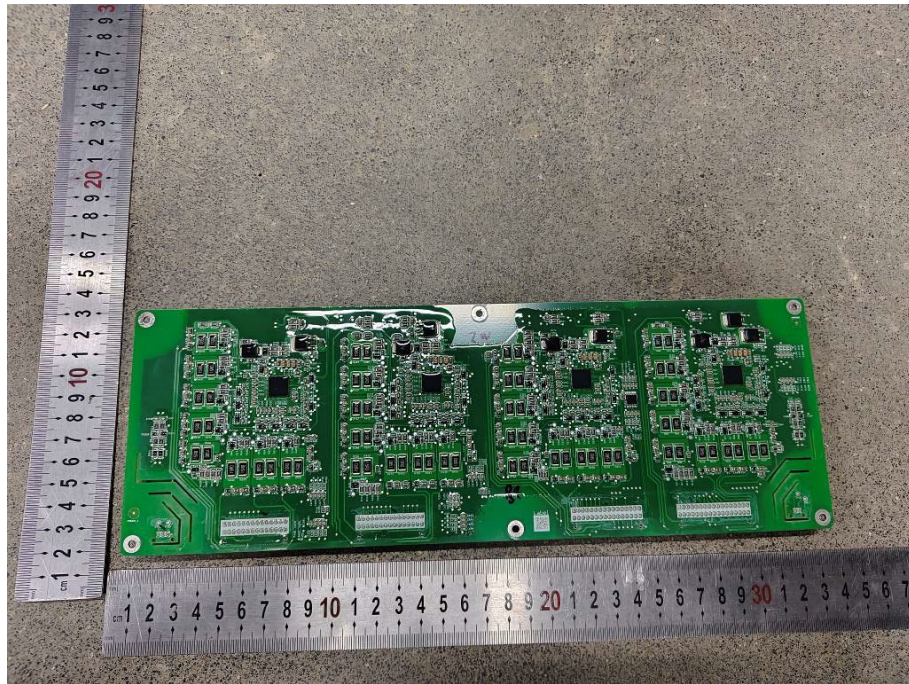
BMU board of battery module



BMU board of battery module

TRF No. IEC62619B

Model type: GM-PACK-54



BMU board of battery module

Model type: M-PCS-100

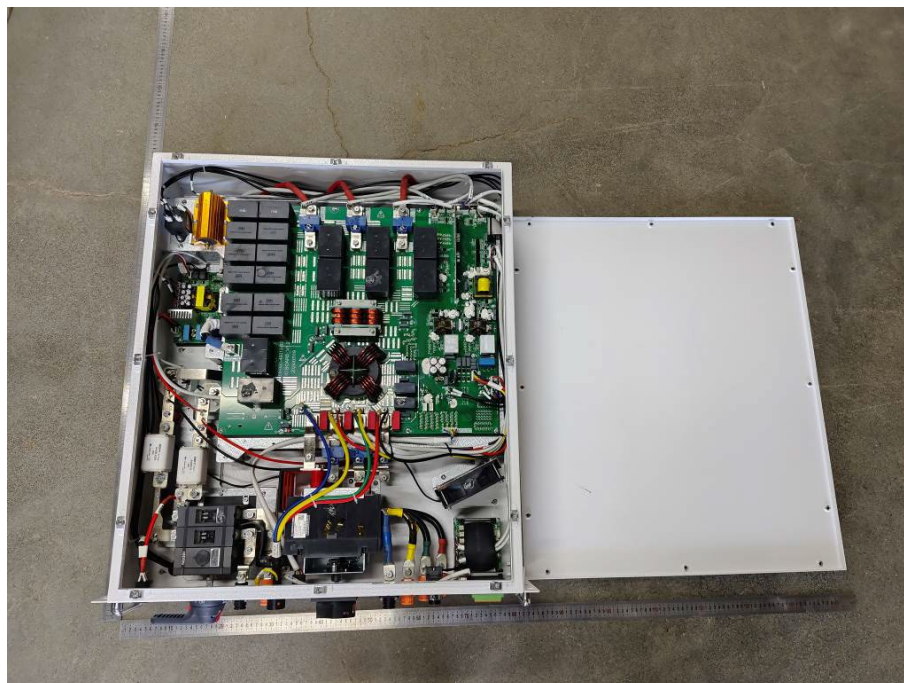


Side view of control box

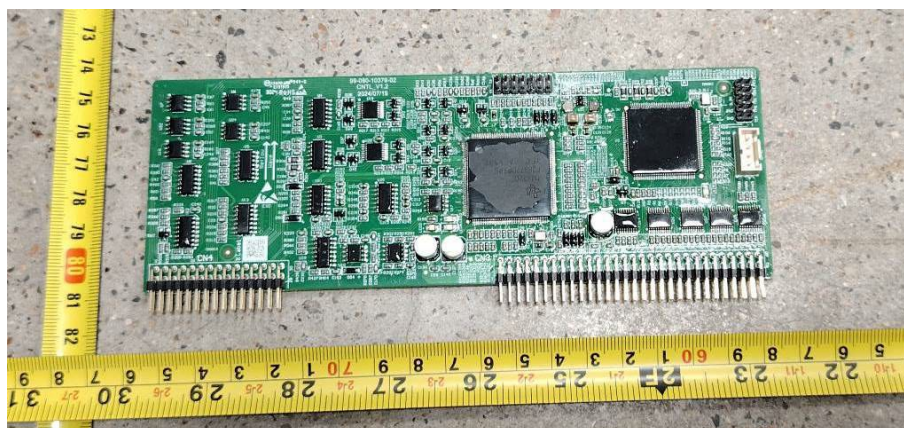


Side view of control box

Model type: M-PCS-100



Inside view of PCS

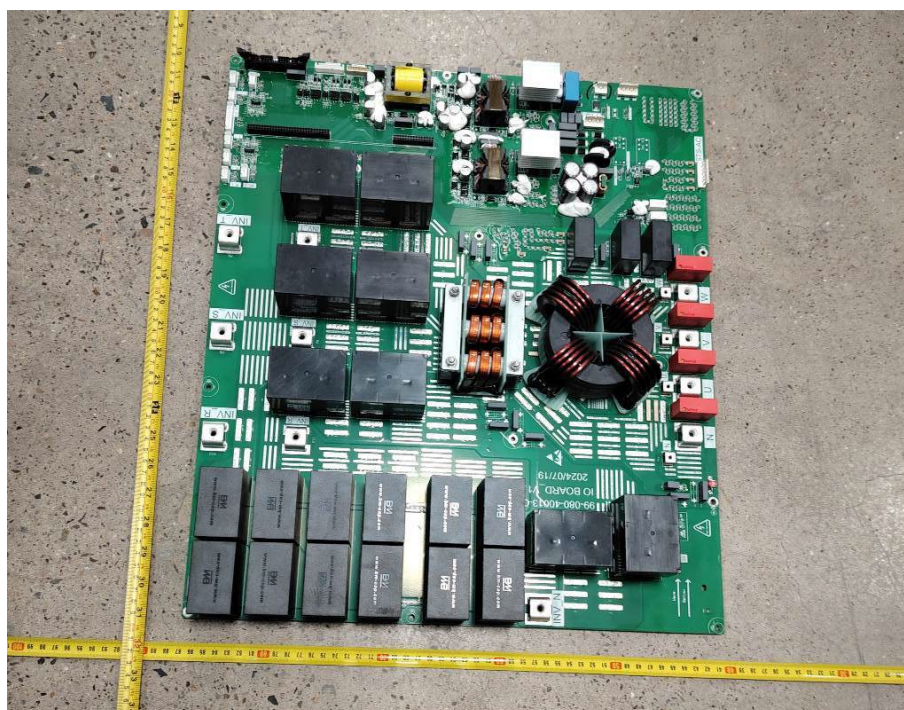


Control board of PCS

Model type: M-PCS-100

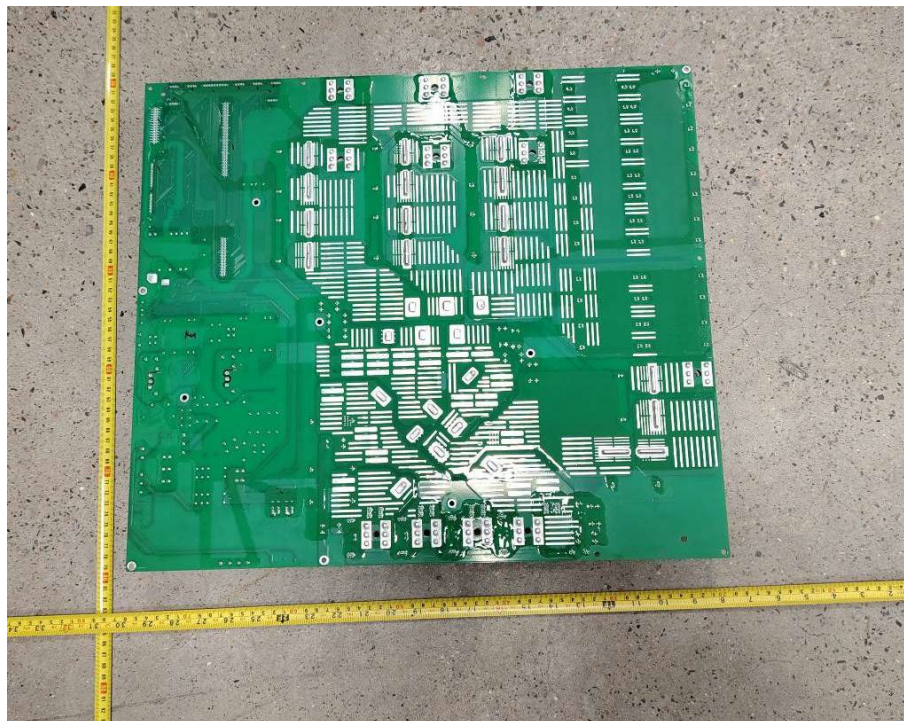


Control board of PCS

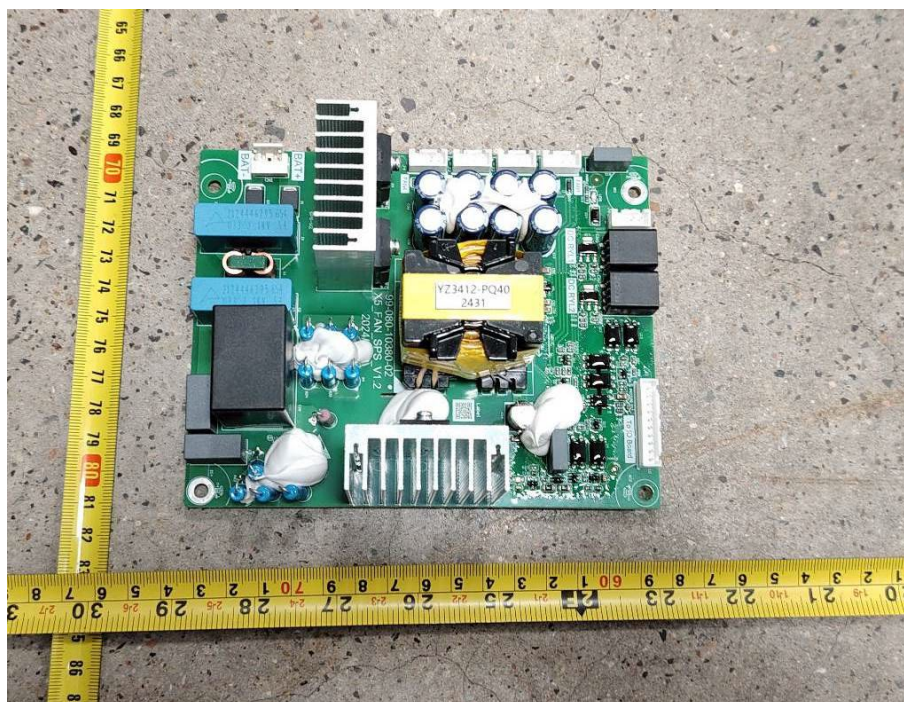


IO board of PCS

Model type: M-PCS-100



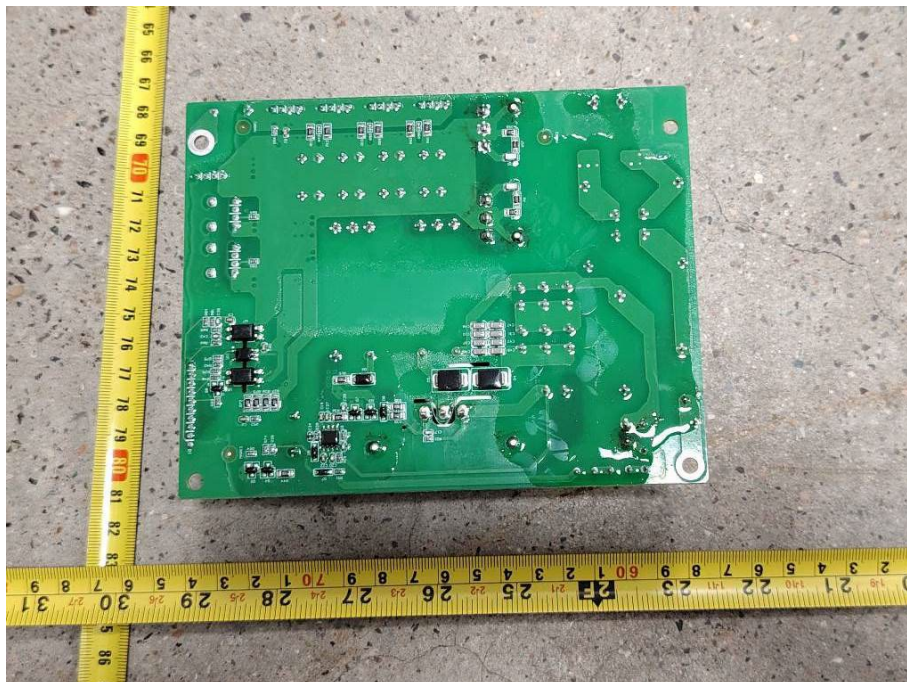
IO board of PCS



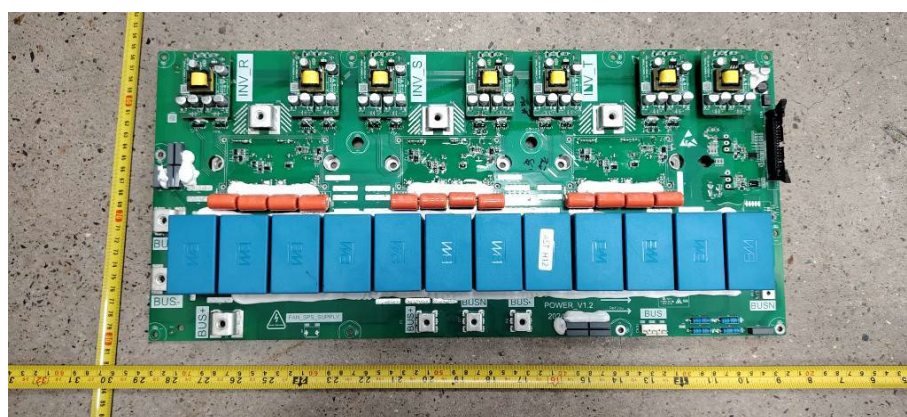
Fan power board of PCS

TRF No. IEC62619B

Model type: M-PCS-100

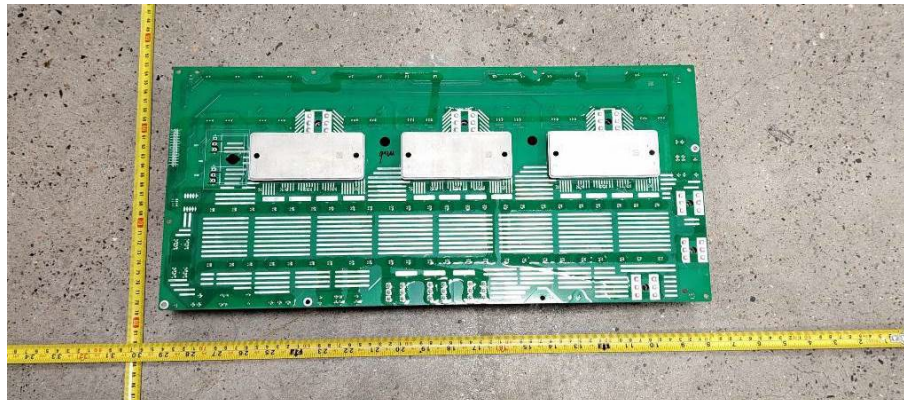


Fan power board of PCS



Power board of PCS

Model type: M-PCS-100

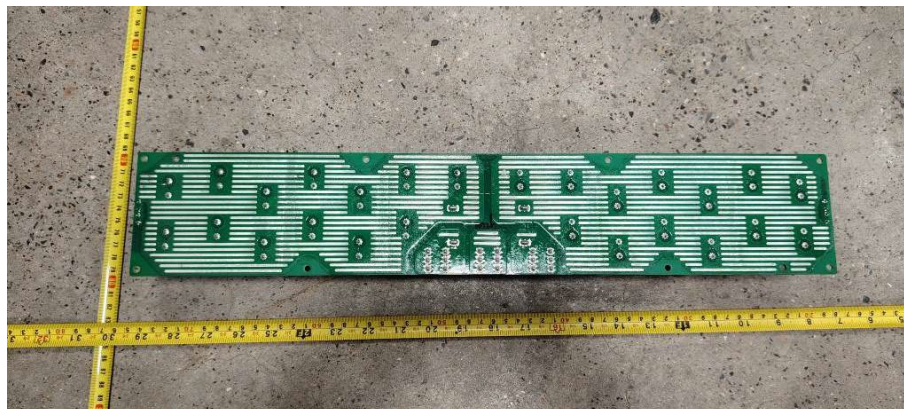


Power board of PCS

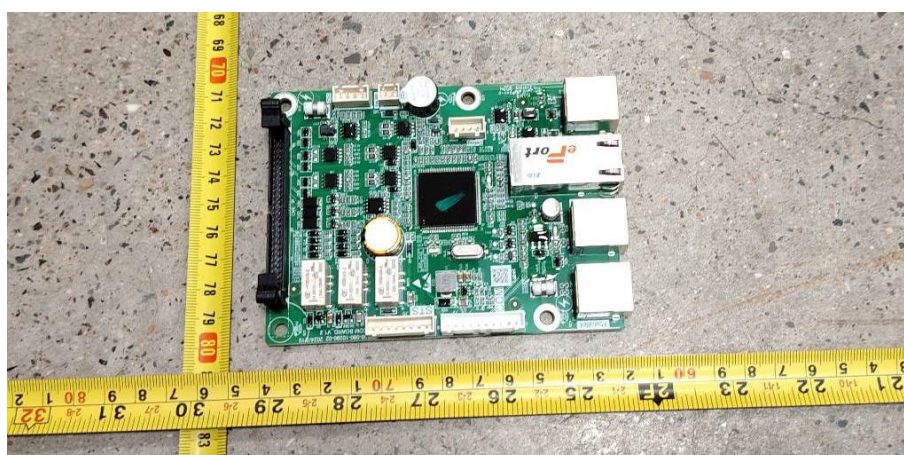


Bus capacitor board of PCS

Model type: M-PCS-100

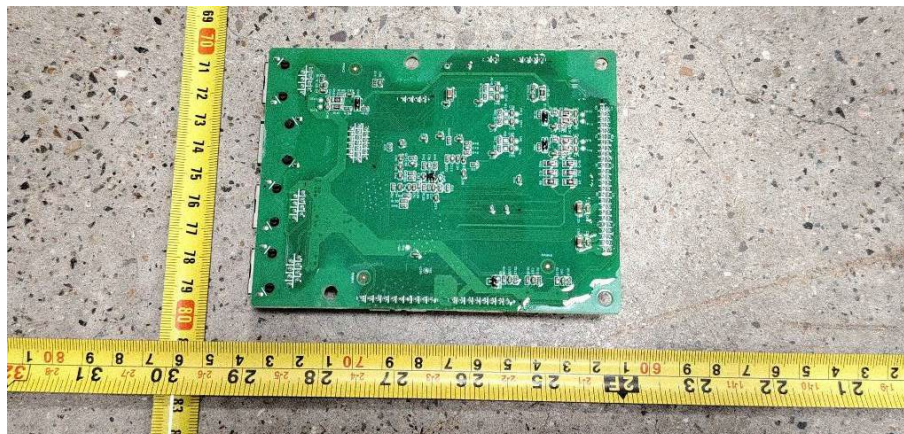


Bus capacitor board of PCS

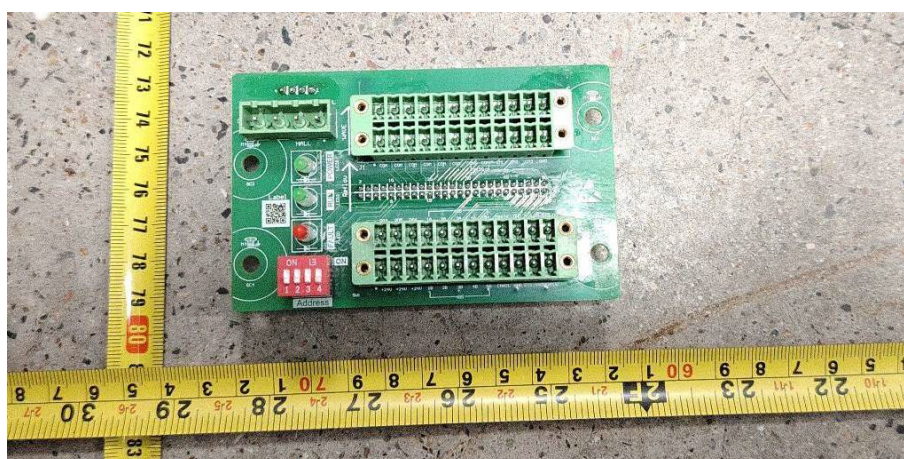


Communication board of PCS

Model type: M-PCS-100

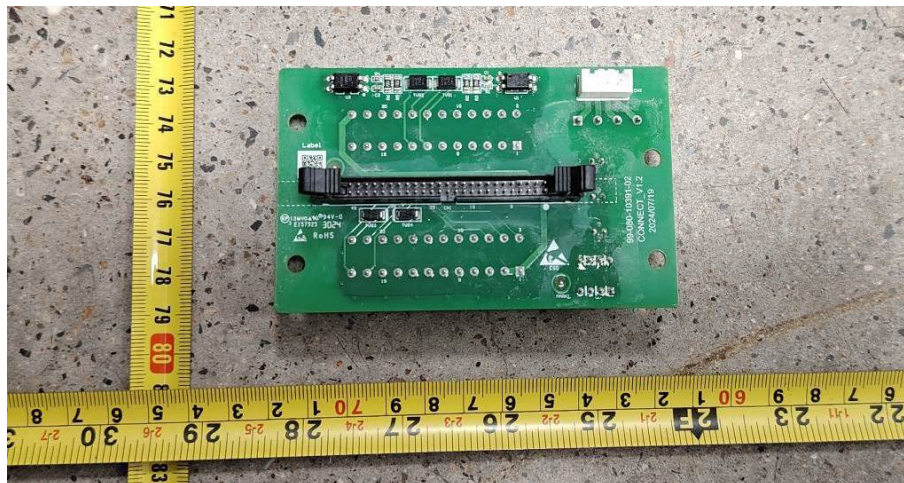


Communication board of PCS



Connect board of PCS

Model type: M-PCS-100



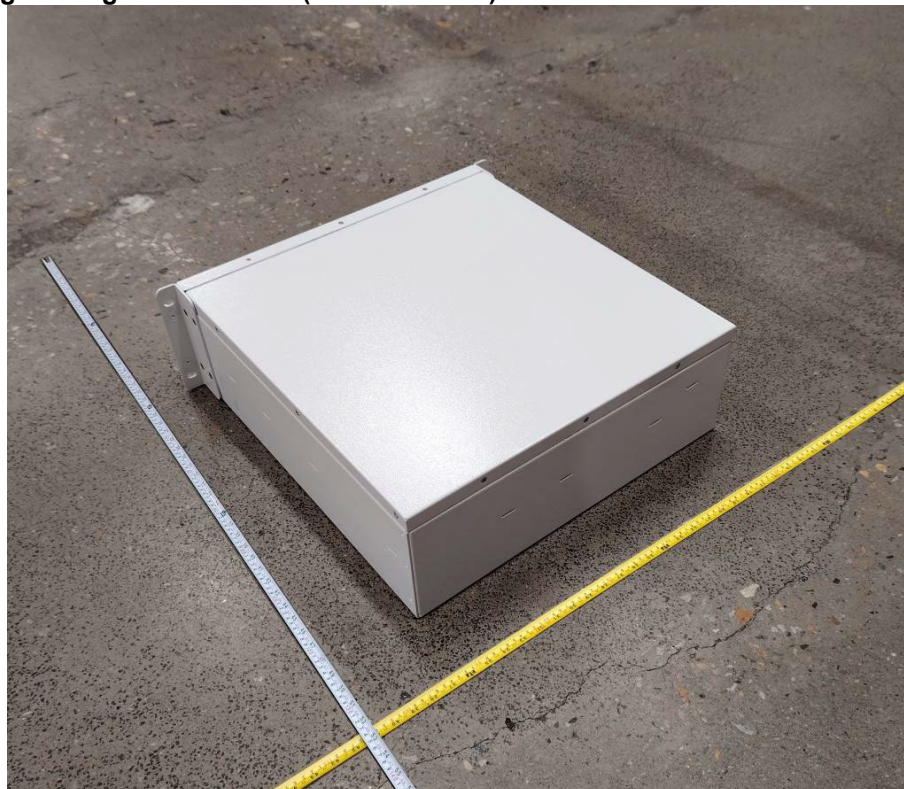
Connect board of PCS

Model type: High voltage transfer box (GM-BOX-1000)

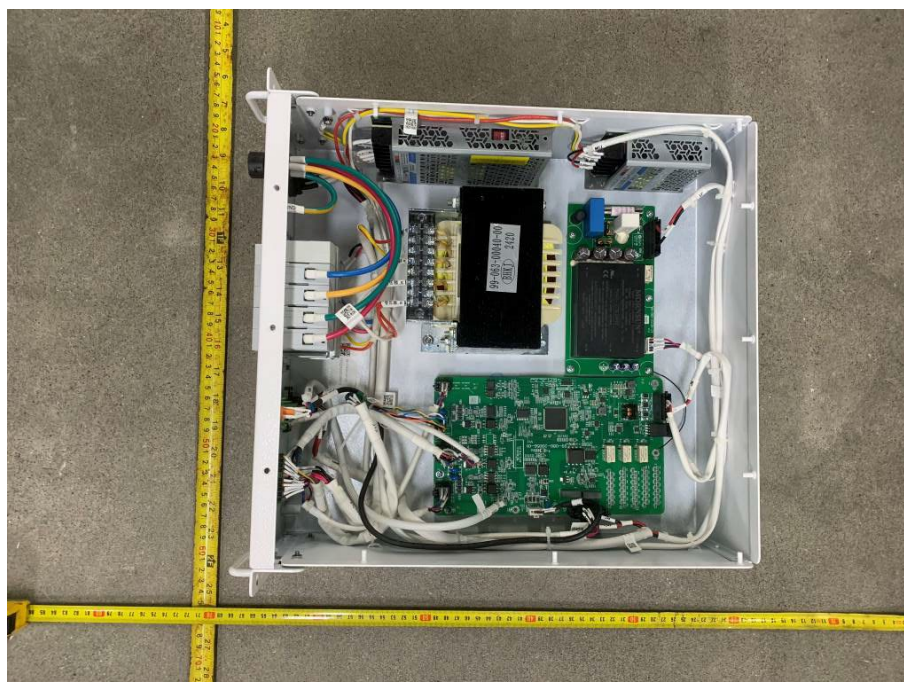


Side view of High voltage transfer box (GM-BOX-1000)

Model type: High voltage transfer box (GM-BOX-1000)

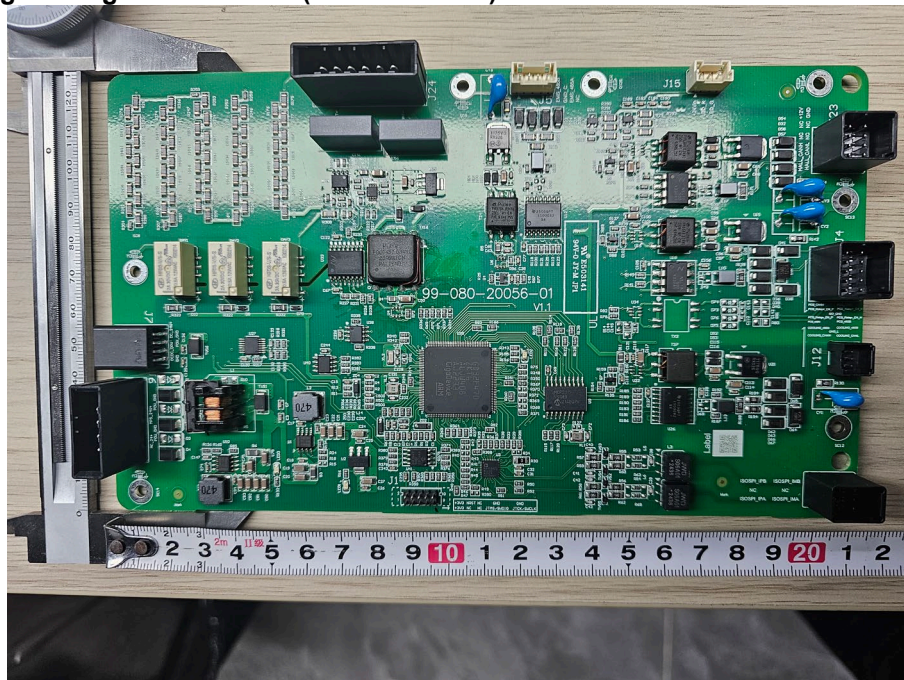


Side view of High voltage transfer box (GM-BOX-1000)

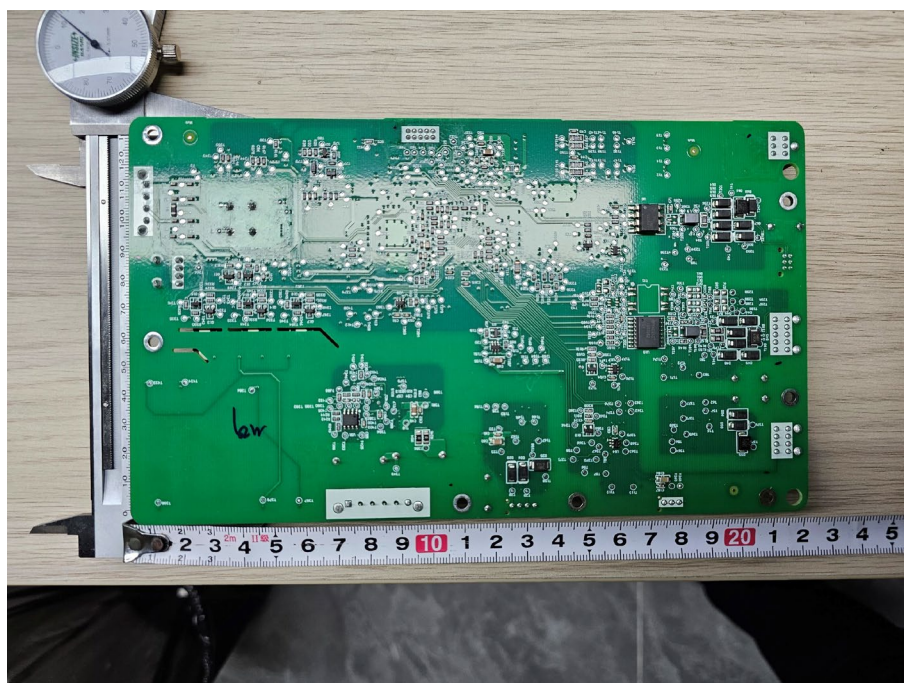


Inside view of High voltage transfer box (GM-BOX-1000)

Model type: High voltage transfer box (GM-BOX-1000)

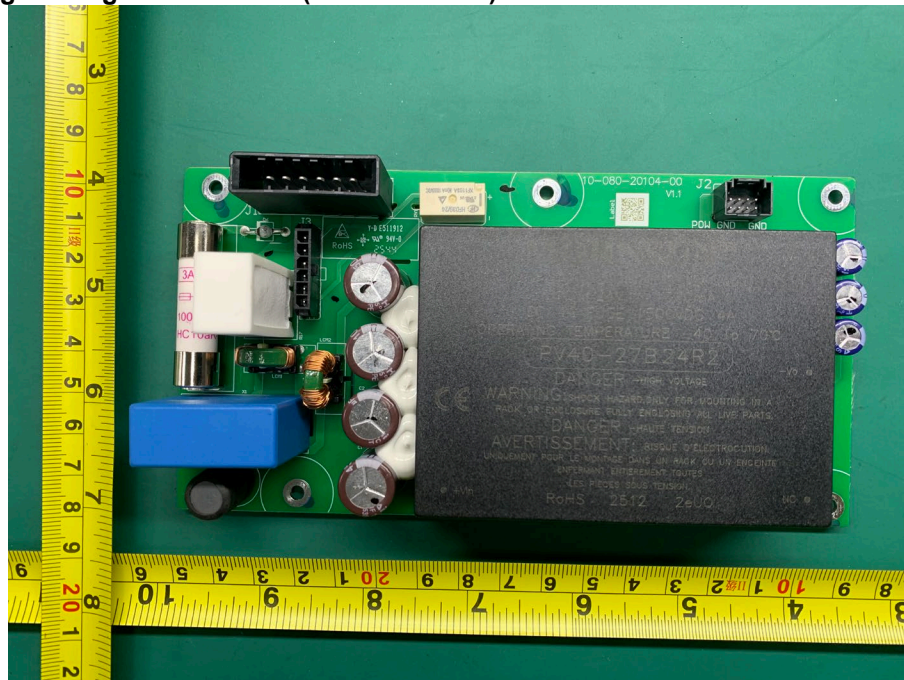


BCU board of High voltage transfer box (GM-BOX-1000)



BCU board of High voltage transfer box (GM-BOX-1000)

Model type: High voltage transfer box (GM-BOX-1000)



DCDC board of high voltage transfer box (GM-BOX-1000)

-- End of Report --