Test Report

Report No.	:	**1811C60350513001**
Applicant	:	**Bulltron GmbH**
Address	:	**Bei den Linden 7a, 21449 Radbruch, Germany**
Product Name	:	**LiFePO4 Battery**
Report Date	:	**2026-07-24**

Guangdong Anbotek Testing Co., Ltd.

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TEST REPORT

EN IEC 62619: 2022

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		
Reference No.	1811C60350513001	
Compiled by (+ signature)	Fajun Chen	Fajun Chen
Approved by (+ signature)	Rob Sun	Rob Sun
Date of issue	2026-07-24	
Contents	23 pages(including 5 page of photos)	
Testing laboratory		
Name	Guangdong Anbotek Testing Co., Ltd.	
Address	Building C, No. 76, Huifeng 4th Road, Zhongkai High-tech Zone, Huizhou, Guangdong, China	
Testing location	Guangdong Anbotek Testing Co., Ltd.	
Client		
Name	Bulltron GmbH	
Address	Bei den Linden 7a, 21449 Radbruch, Germany	
Test specification		
Standard	EN IEC 62619: 2022	
Test procedure	Compliance with EN IEC 62619: 2022	
Non-standard test method	N.A.	
Test item		
Description	LiFePO4 Battery	
Trade mark(s)	bulltron	
Model and/or type reference	12.8V 230Ah	
Name and address of Manufacturer	same as applicant	
Name and address of factory	same as manufacturer	
Rating(s)	12.8Vdc, 230Ah, 2944Wh	

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Particulars: test item vs. test requirements

Ambient temperature ·····: 25°C ± 5°C.

Test case verdicts

Test case does not apply to the test object ·····: N (.A.)

Test item does meet the requirement·····: P (ass)

Test item does not meet the requirement·····: F (ail)

Testing

Date of receipt of test item ·····: 2026-06-26

Date(s) of performance of test·····: 2026-06-26 to 2026-07-07

Tests performed (name of test and test clause):

cl.7.2.3 Drop test (battery system)

cl.8.2.2 Overcharge control of voltage (battery system)

cl.8.2.3 Overcharge control of current (battery system)

cl.8.2.4 Overheating control (battery system)

The component cell (LF230) was evaluated according to IEC 62619:2022 by TÜV Rh certificate No.: JPTUV-153712-M1

The samples comply with the requirement of EN IEC 62619: 2022.

General remarks

This test report shall not be reproduced except in full without the written approval of the testing laboratory.

The test results presented in this report are only relevant to the test sample.

"(see remark #)" refers to a remark appended to the report.

"(see appended table)" refers to a table appended to the report

Throughout this report a dot is used as the decimal separator.

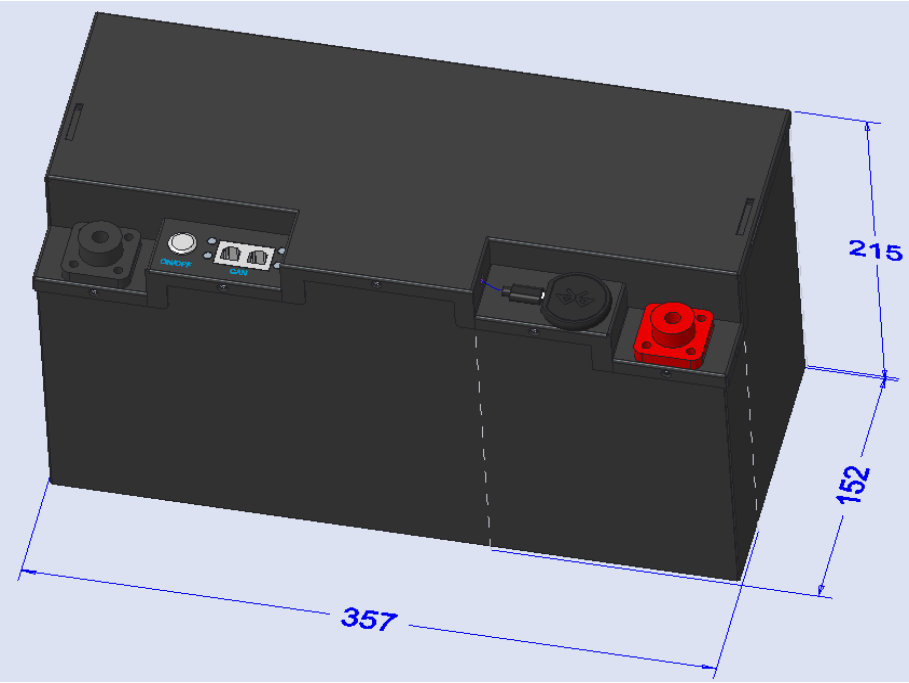
The product fulfils the requirements of IEC 62619: 2022

The data in this report will be synchronized with the corresponding national market supervision and management departments and cross-border e-commerce platforms as required by regulatory agencies

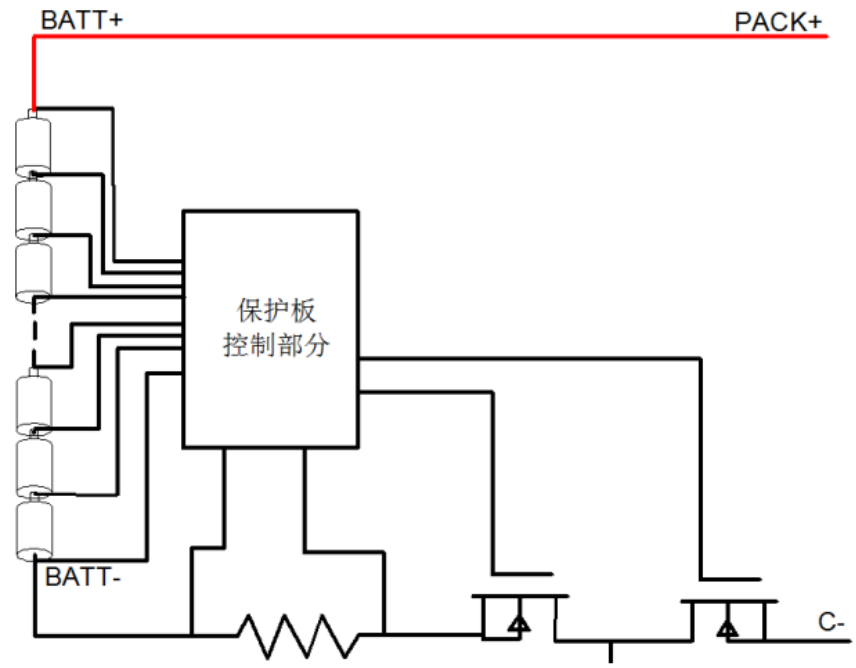
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Battery module dimension diagram (unit:mm)



Circuit diagram:



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Copy of marking plate:

The artwork below may be only a draft.

Bulltron GmbH	
Product name	LiFePO4 Battery
Model type	12.8V 230Ah
Nominal voltage	12.8Vdc
Rated capacity	230Ah
Rated Energy	2944Wh
Max. charge/discharge current	150A/150A
Battery designation	IFpP54/174/207/[4S]E/-30+40/95
Date	YYYYMMDD



WARNING

- Do not disassemble or the battery in any way.
- Do not use the battery for purposes not described in its documentation.
- Do not drop, strike, puncture, or step on the battery.
- In case of electrolyte leakage, keep leaked electrolyte away from contact with eyes or skin, immediately clean with water and seek help from a doctor.
- Do not put the battery into a fire. Do not use it or leave it in a place near fire, heaters, or high temperature sources.
- Do not submerge the battery in water, or expose it to moisture.
- Do not allow the terminals to contact exposed wire or metal.
- The battery is heavy and can cause injury if not handled safely.
- Keep out of reach of children or animals.



Date of code: YYYYMMDD
Remark(s):
YYYY: Represent Year of manufacture, eg: 2025, 2026..... ;

MM: Represent month of manufacture, eg: 01~12 ;

DD: Represent Day of manufacture, eg: 01~31 ;

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General product information and other remarks:

This battery is constructed with 4PCS lithium-ion cells (4S1P), and has overcharge, over-discharge, over current and short-circuits proof circuit.

The main features of the cell and battery are shown as below:

Product name	Cell	Battery
Model Name	LF230	12.8V 230Ah
Capacity (Ah)	230	230
Nominal voltage (V)	3.2	12.8
Nominal charge current (A)	115	75
Maximum continuous charge current (A)	230	150
Nominal discharge current (A)	115	150
Maximum continuous discharge current (A)	230	150
Maximum Charge Voltage (V)	3.65	14.6
Upper limited charging voltage (V)	3.85	14.6
End-of-discharge Voltage (V)	2.5 (T > 0℃), 2.0 (T ≤ 0℃)	10
Charge temperature range (°C)	-10 to 65	0 to 60
Discharge temperature range (°C)	-35 to 65	-20 to 60
Recommend charging method declared by the manufacturer	Charge the battery at constant current 115A until voltage reaches 3.65V, then charge at constant voltage 3.65V till charge current is 11.5A	Charge the battery at constant current 75A until voltage reaches 14.6V, then charge at constant voltage 14.6V till charge current is 11.5A
Nominal mass (Kg)	4.14±0.124	Approx. 24.824
Structure	☐Cylindrical ☒Prismatic	4 series & 1 parallel
External dimensions (mm)	T*W*H (53.85±0.50)×(173.93±0.50)×(207.20±0.50)	T*W*H 357 × 152 × 215

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EN IEC 62619: 2022			
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 ..:	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		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 Li-ion battery and/or battery system**		**P**
	Polarity marking(s)		P
	Polarity marking not provided for keyed external connector		P
	Capability to carry the maximum anticipated current	DC connector complied with the requirements.	P

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EN IEC 62619: 2022			
Clause	Requirement + Test	Result - Remark	Verdict
	External terminal contact surfaces		P
	Terminal contacts are arranged to minimize the risk of short circuits		P
5.6	**Assembly of cells, modules, or Li-ion batterys 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	No such design.	N
	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
5.9	**Quality plan**		**P**
	Manufacturing quality plan (for example: ISO9001, etc.) prepared and implemented .....:	Manufacturing quality plan provided.	P
	The process capabilities and the process controls		P

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EN IEC 62619: 2022			
Clause	Requirement + Test	Result - Remark	Verdict
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 IEC62619)		P
	Capacity confirmation of the cells or batteries		P
	Default ambient temperature of test, 25 °C ± 5 °C	Tests were carried out in an ambient temperature of 25±5°C.	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	Final voltage: 10V.	P
	The cells or batteries charged using the method specified by the manufacturer .....:	The method mentioned in manufacturer's specifications.	P
7.2	**Reasonably foreseeable misuse**		**P**
7.2.1	External short-circuit test (cell or cell block)	CB approved cell used.	N
	Short circuit with total resistance of 30 mΩ ± 10 mΩ at 25 °C ± 5 °C		N
	Results: no fire, no explosion		N
7.2.2	Impact test (cell or cell block)	CB approved cell used.	N
	Cylindrical cell, longitudinal axis impact		N
	Prismatic cell, longitudinal axis and lateral axis impact		N
	Results: no fire, no explosion.		N
7.2.3	Drop test (cell or cell block, and battery system)		P
7.2.3.1	General		P
7.2.3.2	Whole drop test (cell or cell block, and battery system)		N
	Description of the Test Unit .....:		—
	Mass of the test unit (kg) .....:		—
	Height of drop (m).....:		—
	Results: no fire, no explosion		N
7.2.3.3	Edge and corner drop test (cell or cell block, and battery system)	Battery system applied.	P

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EN IEC 62619: 2022			
Clause	Requirement + Test	Result - Remark	Verdict
	Description of the Test Unit .....:	Battery module.	—
	Mass of the test unit (kg) .....:	24.824kg.	—
	Height of drop (m).....:	0.1m.	—
	Results: no fire, no explosion		P
7.2.4	Thermal abuse test (cell or cell block)	CB approved cell used.	N
	Results: no fire, no explosion		N
7.2.5	Overcharge test (cell or cell block)	CB approved cell used.	N
	For those battery systems that are provided with only a single protection for the charging voltage control		—
	Results: no fire, no explosion .....:		N
7.2.6	Forced discharge test (cell or cell block)	CB approved cell used.	N
	Upper limit charge voltage of the cell .....:		N
	Cells connected in series in the battery system.....:		N
	Redundant or single protection for discharge voltage control provided in battery system .....:		N
	Target Voltage .....:		N
	Maximum discharge current of the cell, I_m .....:		N
	Discharge current for forced discharge, 1.0 It.....:		N
	Discharging time, t = (1 It / I_m) x 90 (min.).....:		N
	Results: no fire, no explosion .....:		N
7.3	**Considerations for internal short-circuit – Design evaluation**		N
7.3.1	General		N
7.3.2	Internal short-circuit test (cell)	CB approved cell used.	N
	Samples preparation procedure: In accordance with Clause A.5 and A.6 of IEC 62133-2:2017		N
	Tested per 7.3.2 b) in an ambient temperature of 25 °C ± 5 °C.		N
	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
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) was reached		N

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EN IEC 62619: 2022			
Clause	Requirement + Test	Result - Remark	Verdict
	Results: no fire.....:		N
7.3.3	Propagation test (battery system)		N
	Method to create a thermal runaway in one cell ....:		N
	Results: No external fire from the battery system or no battery case rupture.....:		N
8	**BATTERY SYSTEM SAFETY (CONSIDERING FUNCTIONAL SAFETY)**		**P**
8.1	**General requirements**		**N**
	Functional safety analysis for critical controls		N
	Conduct of a process hazard analysis for both the cell manufacturing process and the battery system manufacturing process		N
	Conduct of risk assessment and mitigation of the battery system		N
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		N
	The charge control evaluated by tests in clauses 8.2.2 to 8.2.4		P
8.2.2	Overcharge control of voltage (battery system)		P
	The exceeded charging voltage applied to the whole battery system	16.94V	P
	The exceeded charging voltage applied to only a part of the battery system, such as the cell(s).....:		N
	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		N
	Elevated temperature for charging, 5 °C above maximum operating temperature .....:	65°C.	P

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EN IEC 62619: 2022			
Clause	Requirement + Test	Result - Remark	Verdict
	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**		**N**
	Battery system fulfil EMC requirements of the end-device application		N
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
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 page 4.	P
	Cell or battery system has clear and durable markings		P
	Cell designation		P
	Battery designation	IFpP54/174/207/[4S]E/ -30+40/95	P
	Battery structure formulation	4S1P.	P
12	**PACKAGING AND TRANSPORT**		**N**
	Refer to Annex D		N
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

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EN IEC 62619: 2022			
Clause	Requirement + Test	Result - Remark	Verdict
A.5	High temperature range	Charging high temperature limit 60°C.	P
A.6	Low temperature range	Charging low temperature limit 0°C.	P
A.7	Discharging conditions for safe use	-20°C to 60°C.	P
A.8	Example of operating region		P
ANNEX B	**PROCEDURE OF 7.3.3 PROPAGATION TEST BY LASER IRRADIATION**		**N**
B.1	**General**		**N**
B.2	**Test conditions**		**N**
B.2.1	Cell test (preliminary test)		N
	The cell fully charged according to the manufacturer recommended conditions .....:		—
	Laser irradiation point on the cell .....:		—
	Output power of laser irradiation .....:		—
	Tested in an ambient temperature of 25 °C ± 5 °C		N
	Repeat of cell test for 3 times		N
B.2.2	Battery system test (main test)		N
	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
ANNEX C	**PROCEDURE OF 7.3.3 PROPAGATION TEST BY METHODS OTHER THAN LASER**		**N**
C.1	General		N
C.2	Test conditions:		N
	– 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 .....:		—

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EN IEC 62619: 2022			
Clause	Requirement + Test	Result - Remark	Verdict
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**
	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
	Regulations concerning international transport of secondary lithium batteries		N

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5.1	TABLE: List of critical components				P
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity[1])
Cell	EVE POWER Co., Ltd.	LF230	3.2V, 230Ah	IEC 62619: 2022	TÜV Rh certificate No.: JPTUV-153712-M1
Supplementary information: 1) Provided evidence ensures the agreed level of compliance. See OD-2039.					

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7.2.1	TABLE: External short-circuit test (cell or cell block)				N
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**
C1	--	--	--	--	--
C2	--	--	--	--	--
C3	--	--	--	--	--

Supplementary information:

Results:

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
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**
C16	--	--	--	--	--	--
C17	--	--	--	--	--	--
C18	--	--	--	--	--	--

Supplementary information:

Results:

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):___

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7.2.6	TABLE: Forced discharge test (cell or cell block)				N
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**
C19	--	--	--	--	--
C20	--	--	--	--	--
C21	--	--	--	--	--

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
Sample No.	**OCV at start of test, (V dc)**	**Particle location [1)]**	**Maximum applied pressure, (N)**	**Results**
C22	--	--	--	--
C23	--	--	--	--
C24	--	--	--	--
C25	--	--	--	--
C26	--	--	--	--

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): __

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7.3.3	TABLE: Propagation test (battery system)	N

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 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): __

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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**
B2	2.827	150	14.71	3.691	A, D, F

	Charge Voltage Applied Battery System: 1)	
	Whole	**Part**
	16.94V	/

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**
B2	11.48	180	12.64	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): ____

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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**
B2	13.11	75	14.45
Maximum Specified Temperature of Battery System, °C		**Maximum Measured Cell Case Temperature, °C**	**Results**
60.0		63.3	A, D, F

Supplementary information:

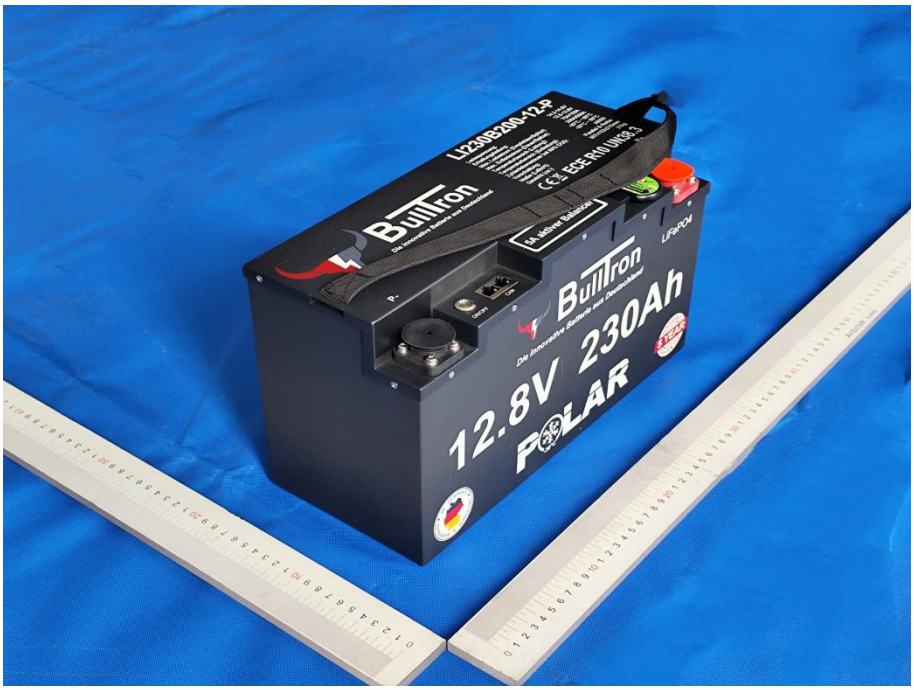
Results:
A – No fire or Explosion
B – Fire
C – Explosion
D – Temperature sensing function of BMU did operate and then charging stopped
E – Temperature sensing function of BMU did not operate and then charging stopped
F – All function of battery system did operate as intended during the test.
G – All function of battery system did not operate as intended during the test.
H – Other (Please explain): ____

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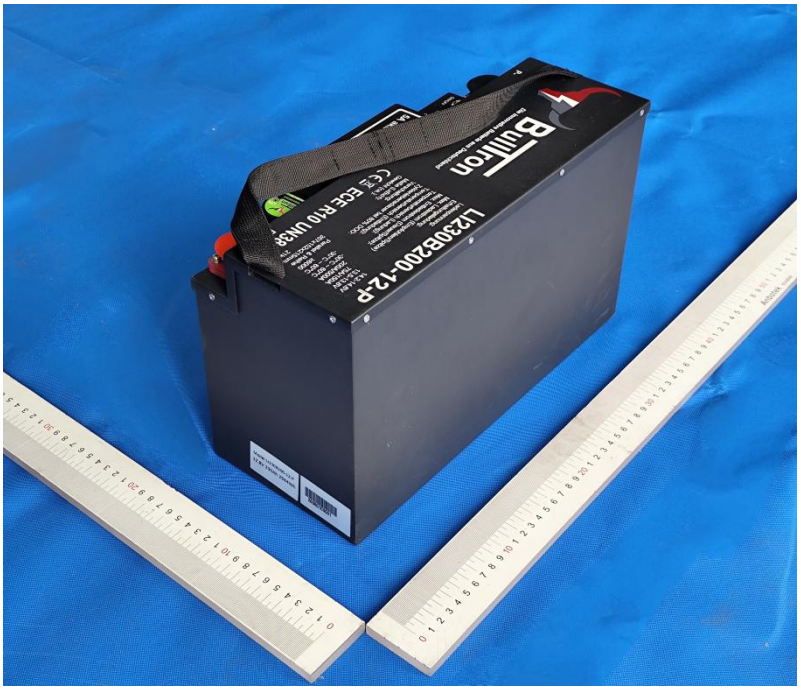
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ANNEX 1: PHOTOS

Model type: 12.8V 230Ah



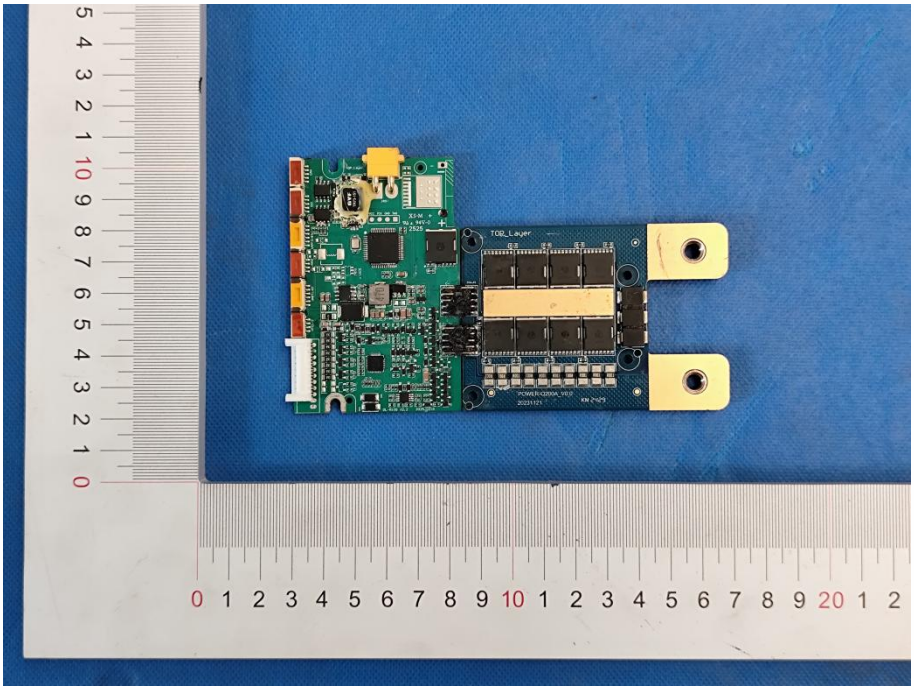
Overview of battery 12.8V 230Ah



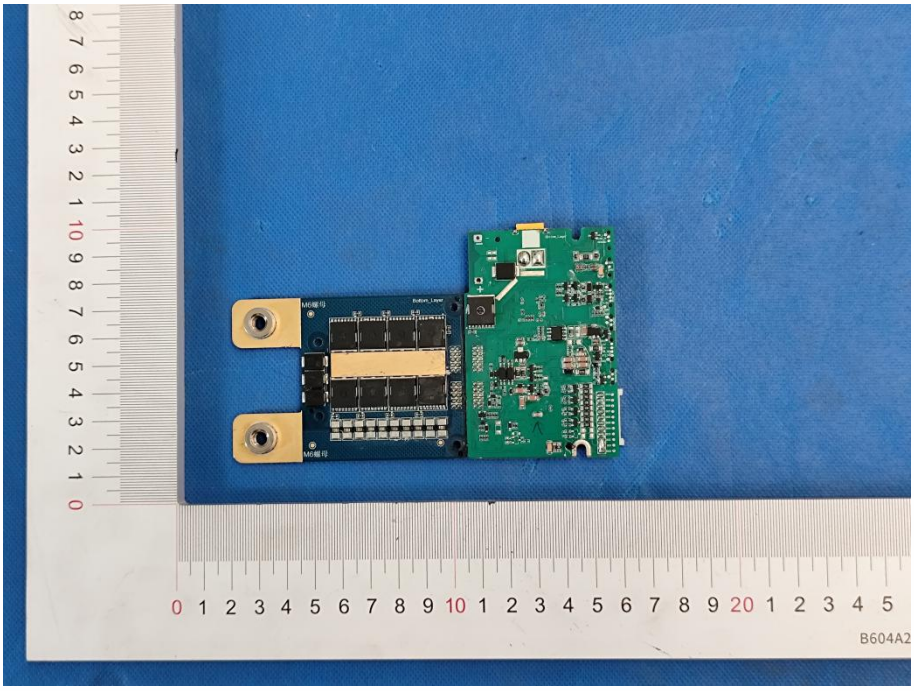
Overview of battery 12.8V 230Ah

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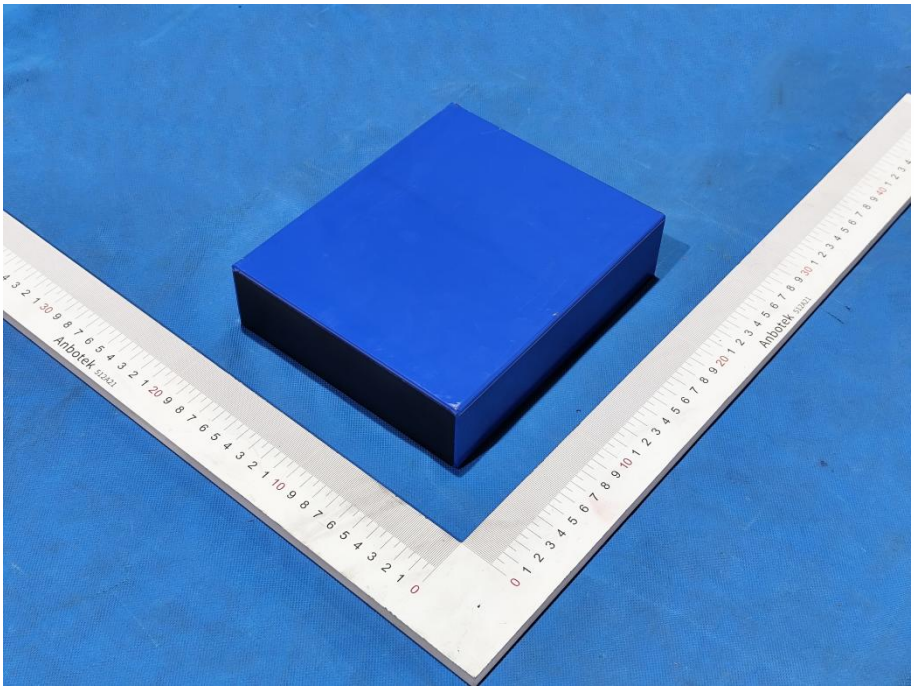
BMS main board of the EUT



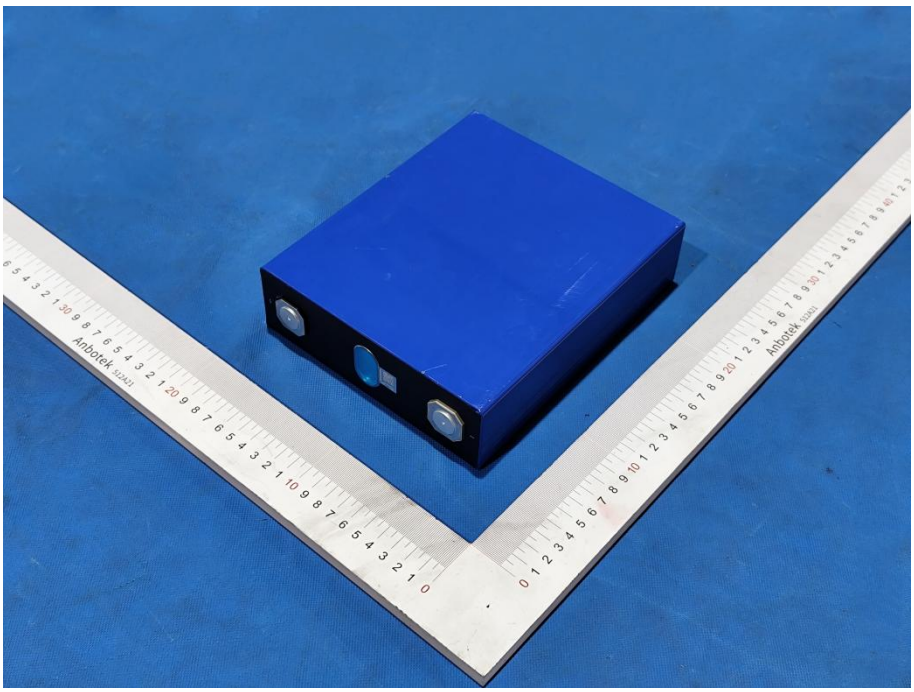
BMS main board of the EUT

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View of cell



View of cell

End of the report

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