



**PRODUCT
SPECIFICATION**

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ECN NO.:

Specification

Model:6LH3L7

Product Design Preparation	Product Design Approval	Sales Approval	Project engineering approval	Quality Assurance Approval
Longfei Yang	Guobao Wang		Yiwen Yao	Xinyong Lin

Customer Confirmation	Sign one's name	Date
	Customer code :	
	Corporate seal :	

Confidential: () Level 3 Private () Level 2 High Confidentiality (V) Level 1 Low Confidentiality

--- CATL Confidential ---



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Update Log

Edition	Description	Date	Acknowledgment state
1.0		2018/05/16	New release



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Customer requirements

Model: 6LH3L7

Version: 1.0

Customers are required to document their requirements and communicate them with CATL in advance. If the customer has specific applications or operational conditions differing from those described in this document, CATL may customize product design and production according to the customer's particular requirements.

	Special requirements	Standard
1		
2		
3		
4		
5		

customer code : _____ sign : _____ date : _____

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Terminology	Definition
Product	In this specification, the term 'product' refers to the 240Ah 3.2V rechargeable lithium iron phosphate (LFP) energy storage battery manufactured by CATL.
Client	Refers to the buyer in the CATL EV Product Sales Contract.
CATL	Refers to the seller in the CATL EV Product Sales Contract.
PN	To differentiate batteries for various application scenarios or conditions, CATL assigns a material code to its 240Ah 3.2V rechargeable lithium battery.
Ambient temperature	The ambient temperature of the battery. The temperature tolerance is $\pm 2^{\circ}\text{C}$.
Battery Management System (BMS)	An effective tracking and control system for customers to monitor and record the operational parameters of products throughout their service life. The parameters tracked and recorded include, but are not limited to, voltage, current, temperature, etc., to control product operation and ensure that the operating environment and conditions comply with the specifications outlined in this manual.
Cell temperature	The cell temperature is measured by a temperature sensor connected to the battery, with the selection of the sensor and measurement circuit jointly determined by CATL and the customer.
Fresh battery status	The status within 7 days from the battery manufacturing date.
C-Rate charging rate	The charge rate is the ratio of the charging current to the battery capacity measured by the battery management system. For example, if the battery capacity is 240Ah and the charging current is 240A, the charge rate is 1C. If the battery capacity drops to 192Ah and the charging current is 192A, the charge rate is still 1C.
Cycle recurrence	A battery cycle is defined as a complete charge-discharge process according to the specified standards. A cycle includes a brief normal charging or regenerative charging and discharging process. During charging, only normal charging may occur without regenerative charging. Discharging can be composed of partial discharges.
Date of manufacture	The manufacturing date of the battery. The date code on the top sticker of each battery indicates the manufacturing date.
Open Circuit Voltage (OCV)	The voltage of the battery is measured when no load or circuit is connected.
Recoverable capacity	The battery capacity is determined by measuring under standard charge-discharge conditions specified in Sections 2.2 and 2.3 of this specification, with the average value of three measurements selected.
Product supply agreement	The transaction terms for the products specified in this specification, jointly agreed upon by CATL and its customers.
Standard charging	The charging mode described in 2.2 of this specification.
Standard discharge	The discharge mode described in Article 2.3 of this specification.



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Charging status (SOC)	The ratio of actual charge to full charge indicates the battery's state of charge. A 100% SOC means the battery is fully charged to 3.65V, while a 0% SOC means it is completely discharged to 2.5V.
Temperature rise	The temperature rise of the cell during charging or discharging processes, as specified in this specification.
Measurement unit	"V" (Volt), a unit of voltage "A" (Ampere) A, unit of electric current "Ah" (Ampere-Hour) is a unit of load. Wh (Watt-Hour) is a unit of energy. Ω (ohm), unit of resistance "m Ω " (milliohm) is a unit of resistance. °C (Degree Celsius), a temperature unit "mm" (Millimeter), a unit of length "s" (second), time unit Hz (Hertz), a unit of frequency



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1. Scope of Application

Clauses and subclauses	Content	Remarks
Product model	6LH3L7	Limited to energy storage applications
Product status	SOP	

2. Product Electrical Performance Specifications

2.1 Essentials

No.	Parameter	Size of product	Condition
2.1.1	Cell capacity	$\geq 240\text{Ah}$	$25\pm 2^\circ\text{C}$, 1C, new battery condition
2.1.2	Discharge energy	$\geq 768\text{Wh}$	$25\pm 2^\circ\text{C}$, 1C, new battery condition
2.1.3	Operating voltage range	2.5~3.65V 2.0~3.65V	Temperature $T > 0^\circ\text{C}$ Temperature $T \leq 0^\circ\text{C}$
2.1.4	Battery internal resistance (1KHz)	$0.15\pm 0.05\text{m}\Omega$	New battery at 40% SOC state
2.1.5	Ship capacity	Charging status: $96\pm 1\text{Ah}$	1C current discharge
2.1.6	Working temperature (charging)	$0 - 60^\circ\text{C}$	Refer to Section 2.2
2.1.7	Working temperature (discharge)	$-30 - 60^\circ\text{C}$	Refer to Section 2.3
2.1.8	Cycle life	≥ 3500 recurrence	$25\pm 2^\circ\text{C}$, fresh cell with 300Kgf clamping force, 240A charge-discharge, capacity decay to 192Ah
2.1.9	Storage life	≥ 10 years	$25\pm 2^\circ\text{C}$, stored at 100% SOC after standard charging, with capacity decay to 192Ah
2.1.10	Battery weight	$5.10\pm 0.20\text{kg}$	N.A.
2.1.11	Cell size	Refer to Section 9 of this specification	At a pressure of 300 Kgf

2.2 Charging mode/parameters

2.2.1 Standard charging conditions (mode)

No.	Parameter	Size of product	Condition
2.2.1.1	Standard charging current	120A	$25\pm 2^\circ\text{C}$
2.2.1.2	Standard charging voltage	The maximum voltage of a single cell is 3.65V	NA

2.2.1.3 Standard charging mode The 120A constant current charges the battery up to 3.65V, then maintains constant voltage at 3.65V until the current drops below 12A.

2.2.1.4 Standard charging temperature $25\pm 2^\circ\text{C}$ Cell temperature



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2.2.2 Other charging conditions (modes)

Cell temperature/°C		0	2	5	7	10	12	15	20	25	45	48	55	60
Maximum charging current (C)	0%~<80% SOC	0	0.116	0.116	0.372	0.372	0.5	0.5	1.0	1.0	1.0	0.8	0.279	0
	≥80%~100% SOC	0	0.116	0.116	0.372	0.372	0.5	0.5	0.75	0.8	0.8	0.8	0.279	0

2.3 Discharge mode/parameter

No.	Parameter	Size of product	Condition
2.3.1	Standard discharge current	120A	25±2°C
2.3.2	Maximum continuous discharge current	240A	N.A.
2.3.3	Standard discharge temperature	25 ± 2°C	Cell temperature
2.3.4	Discharge temperature range	-30 - 60°C	If the cell temperature exceeds the discharge temperature range, discharge shall be stopped.
2.3.5	Discharge cutoff voltage	2.5V	Temperature T>0°C
		2.0V	Temperature T≤0°C

2.4 high and low temperature discharge capacity

No.	Parameter	Size of product	Condition (cell surface temperature)
2.4.1	55°C discharge capacity	≥240Ah	New battery condition, 55°C, 1C, 2.0V~3.65V
2.4.2	-20°C discharge capacity	≥168Ah	New battery condition, -20°C, 1C, 2.0V~3.65V

2.5 self-discharge performance of battery

No.	Parameter	Size of product	Condition
2.5.1	Self-discharge rate	≤ 3.0% every 30 days	Three months after shipment, the battery cell should reach a 50% state of charge under standard charging conditions and be stored at 25°C.

3. Cell Temperature Rise

In this specification, temperature rise is defined as the difference between the battery's surface temperature after discharge and before discharge. Measurements should be conducted in a room with stable ambient temperature and sufficient space. Each battery temperature measurement must use a calibrated temperature sensor capable of recording time data.

No.	Parameter	Size of product	Condition
3.1	Continuous discharge temperature rise	≤10°C	The battery discharges in standard mode.
3.2	Temperature rise during pulsed discharge	≤5°C	Under any charging condition, each battery discharges at 480A for 10 seconds.

4. Safety and Reliability



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This product complies with the testing requirements specified in GBT 31485-2015.

Safety testing must be conducted with CATL's approval and under professional supervision; otherwise, it is strictly prohibited.



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5. Product Life Termination Management

5.1 To ensure battery safety, customers must implement an effective tracking system to monitor and record the internal resistance of each battery. The measurement and calculation methods for internal resistance require mutual discussion and agreement between the customer and CATL. If the internal resistance of a battery in use exceeds 100% of its initial value, the battery must be discontinued. Failure to comply with this requirement will exempt CATL from its product quality warranty obligations under the sales agreement and this specification.

5.2 Refer to 2.1.8 Cycle Life for cell life assessment criteria.

6. Application Conditions

Customers must strictly comply with the following battery-related application conditions:

6.1 The customer shall install a battery management system to closely monitor, manage, and protect each battery.

6.2 The client shall provide CATL with detailed design specifications, system features, framework, data formats, and other relevant information for the battery management system, enabling CATL to conduct design evaluations and establish a battery management record.

6.3 Customers must not modify or alter the design and framework of the battery management system without CATL's approval, as such actions may compromise the battery's performance.

6.4 Customers must retain complete battery operation monitoring data for reference in product quality liability allocation. CATL shall not assume product quality warranty liability if the complete monitoring data within the battery system's service life is not available.

6.5 The battery management system must meet the following fundamental testing and control requirements:

No.	Parameter	Size of product	Protective action
6.5.1	Charge termination	3.65V	Stop charging when the battery voltage reaches 3.65V
6.5.2	First stage overcharge protection	$\geq 3.8V$	Stop charging when the battery voltage reaches 3.8V
6.5.3	Second stage overcharge protection	$\geq 4.0V$	The charging process terminates when the battery voltage reaches 4.0V, and the battery management system (BMS) locks until technicians resolve the issue.
6.5.4	Discharge off	2.5V	Discharge termination occurs when the battery voltage reaches 2.5V, at which point the current is reduced to its minimum.
6.5.5	First level over discharge protection	Minimum 2.0V	Stop discharging when the battery voltage reaches 2.0V, and reduce the current to the minimum.
6.5.6	Second level over discharge protection	Minimum 1.8V	When the battery voltage drops below 1.8V, the battery management system will lock until the technician resolves the issue.
6.5.7	Short-circuit protection	Short circuits are not permitted	During a short circuit, the overcurrent device disconnects the battery (circuit).
6.5.8	Overcurrent protection	Refer to Section 2.3 Discharge Requirements	Battery management system controls discharge current to meet specifications
6.5.9	Overheat protection	Refer to Sections 2.2 to 2.3	Charging/discharging shall be terminated when the temperature exceeds the specifications in this manual.
6.5.10	Protection due to prolonged charging time	Charging time within 8 hours	If the charging time exceeds 8 hours, the charging will be terminated.

6.6 Prevent batteries from reaching over-discharge conditions. When the battery voltage drops below 1.8 volts, permanent internal damage may occur, at which point CATL's product quality warranty liability becomes invalid. According to Section 2.3.5 of this specification, if the actual discharge cutoff voltage falls below the standard threshold, the system minimizes internal energy consumption and extends the sleep duration before recharging. Customers must train users to recharge promptly to prevent battery degradation.



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The account is in the released state.

6.7 The battery must not be charged under low-temperature conditions prohibited by this specification (including standard charging, fast charging, emergency charging, and regenerative charging), as this may cause unexpected capacity reduction. The battery management system (BMS) should operate at the minimum charging and regenerative charging temperatures. Charging below the specified temperature limits is strictly prohibited, and CATL shall not be held liable for quality assurance in such cases.

6.8 The design of the battery box must fully address the heat dissipation of the cells. CATL shall not be liable for any damage to the cells or batteries caused by inadequate heat dissipation in the battery box.

6.9 The design of the battery case must fully address waterproofing and dustproofing requirements for the cells, and it must meet the waterproofing and dustproofing standards specified by national regulations. CATL shall not be liable for any damage to the cells or batteries (e.g., corrosion or rust) caused by these issues.

7. Security Protection

7.1 Do not immerse batteries in water.

7.2 Batteries must not be placed in flames or exposed to high temperatures exceeding those specified in Sections 2.1.6 and 2.1.7 of this specification, as this may cause fires. Under normal operating conditions, the cell temperature must not exceed 60°C. If the cell temperature exceeds 60°C, the battery management system (BMS) must shut down the battery and terminate its operation.

7.3 Short-circuiting between the positive and negative terminals of the battery is strictly prohibited, as it may cause severe electric shock and high temperatures, potentially leading to personal injury or fire. Since the battery's positive and negative terminals are enclosed within a plastic protective casing, adequate safety measures must be implemented during the assembly and connection of the battery system to prevent short-circuiting.

7.4 Connect the battery terminals strictly according to the labeled polarity and instructions. Reverse charging is strictly prohibited.

7.5 Overcharging of batteries is strictly prohibited, as it may cause overheating and fire hazards. During battery installation and operation, both hardware and software must implement multiple overcharge failure safety protections. The minimum protection requirements are specified in Sections 6.5.3 and 7.11 of this specification.

7.6 According to Clause 6.5.9 of this specification, normal charging shall terminate after completion. If the charging duration exceeds the reasonable time limit, the battery may overheat, potentially causing thermal runaway and fire. A timer must be installed for protection. Should the charging current reach overcharge and fail to terminate, the timer will activate to stop the charging process, as specified in Clause 7.11 of this specification.

7.7 The customer should securely mount the battery on a solid surface and properly secure the power cord to prevent friction-induced arcs and sparks.

7.8 Plastic encapsulation of batteries or electrical connections made with plastic are strictly prohibited. Incorrect electrical connections may cause overheating during battery operation.

7.9 In the event of electrolyte leakage, avoid contact with the skin and eyes. If contact occurs, wash the affected area thoroughly with large amounts of clean water and seek medical assistance. It is strictly prohibited for any person or animal to ingest any components of the battery or substances contained within the battery.

7.10 Protect the battery from mechanical vibrations, impacts, and pressure shocks, as these may cause internal short circuits, leading to high temperatures and fires.

7.11 During battery charging, improper termination may occur, such as exceeding the permitted charging duration, terminating the process due to excessively high voltage or current. These phenomena are defined as "improper termination of charging." When such occurrences happen, they may indicate electrical leakage in the battery system or component failures. Continuing charging without identifying and resolving the root cause could lead to battery overheating or fire hazards. When the aforementioned phenomena occur, the battery management system should activate its automatic lockout function to prohibit subsequent charging and notify the user to return the vehicle equipped with the battery to the dealer for system maintenance. Charging may only be resumed after the battery has undergone comprehensive inspection by certified technicians, with the root cause identified and thoroughly resolved and improved.



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8 Risk Warning

8.1 Warning Statement

Warn

Batteries pose potential hazards, and appropriate protective measures must be taken during operation and maintenance!

Incorrect operation of the test procedures described in this specification may result in severe personal injury and property damage!

The correct tools and protective equipment must be used when handling batteries.

Battery maintenance must be performed by a person with battery expertise and safety training.

Failure to comply with the above warnings may lead to a variety of disasters.

8.2 Danger Type:

Customers are aware of the following potential hazards during battery use and operation:

8.2.1 Operators may be injured by chemicals, electric shocks, or electric arcs during operation. Although the human body reacts differently to direct current (DC) and alternating current (AC), both DC voltages above 50 volts and AC currents pose equally severe hazards. Therefore, operators must adopt conservative postures during operation to avoid electric current injuries.

8.2.2 There is a chemical risk from the electrolyte in the battery.

8.2.3 When handling batteries and selecting personal protective equipment, customers and their employees must consider the above potential risks to prevent accidental short circuits that may cause arcs, explosions, or thermal runaway.

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9 Cell Drawing

