



**HD48-20(48V20Ah)**  
**Lithium-ion Battery Pack Specification**

DOC NO. : HD/PK23-0701-6

REV :                     A.0

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DATE:             2024-01-27

# **Lithium-ion(NCM) Battery Pack**

## **Specification**

**Model No. : HD48-20(48V20Ah)**

<b>Designed</b>	<b>Checked</b>	<b>Approved</b>
Tian Gao	Yehao Han	Anson Zhao



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### 1. Preface

This specification describes the type and size, performance, technical characteristics, warning and caution of the HD48-20(48V20Ah) Lithium-ion rechargeable battery pack. The specification only applies to HD48-20(48V20Ah) Lithium-ion rechargeable battery pack supplied by Haidi Energy Technology Co.,Ltd.

### 2. Product and Model

2.1 Product: HD48-20(48V20Ah) Lithium-ion(NCM) Battery Pack

2.2 System Configuration:

Standard pack:HD18650-3.6V-3000mAh-3.6V-13S6P



Charge	Cannon head
Discharge	Two hole socket



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### 3. Battery Pack Specifications

Items	Standard	Comments
Nominal voltage	48V	13S
Typical capacity	20Ah	At 0.2C discharge rate
Max continuous discharge current	25A	
Discharge cut-off voltage	About 39V	
Charge input voltage	54.6±0.05V	Charge mode: CC/CV , Use a constant current, constant voltage(CC/CV)
Charge current	≤5A	
Inner resistance	≤90mΩ	Between positive and negative polar
Operation temperature range	Charge/ Discharge	0°C ~ +45°C/-20°C ~ +60°C
	Discharge	When the environment temperature is higher than 45°C , please pay attention to ventilation and heat rejection.
Storage temperature range	0°C ~ 40°C ( Capacity 80% )	Recommended long-term storage temperature is 15~25°C
Humidity	5%≤RH≤85%	
Cabinet Material	aluminium alloy	
Total Weight	5.00±0.20Kg	
Size ( L*W*H )	146.1*88*394.5±1mm	
Protection function	Over charge protection、Over discharge protection、Over current protection、Short circuit protection, Temperature protection.	

### 4. Standard Test Conditions

All test in this specification should be in standard atmospheric conditions: temperature:

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Security rating: ☐Top secret☐ Confidential ☒Secret☐ Ordinary



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25± 5°C, relative humidity: 65±20%.

### 5. Characteristics

#### 5.1 Standard charge

Charge the battery with the Battery special test cabinet, supply 54.6voltage, constant-current 0.2C(A) current until current down to 0.02C ( A ) .

#### 5.2 Standard discharge

Discharge the battery at 0.2C ( A ) to 39 V or battery cut off voltage.

#### 5.3 Electrical Performance

Test Items	Test Methods	Test Standards
Capacity retention rate	After standard charge under 5.1 specified conditions, store the cells for 28 days, then discharge at 0.2C ( A ) to cut-off voltage.	Capacity retention rate≥80%
Cycle Life	1) Standard charge at 0.2C ( A ) , 2) Rest 0.5~1 h 3) Discharge at 0.2C to cut off voltage 4) Capacity retention rate≥80%	>500cycles @ 100% DOD; >800cycles @ 90% DOD; >1000cycles @ 80% DOD;



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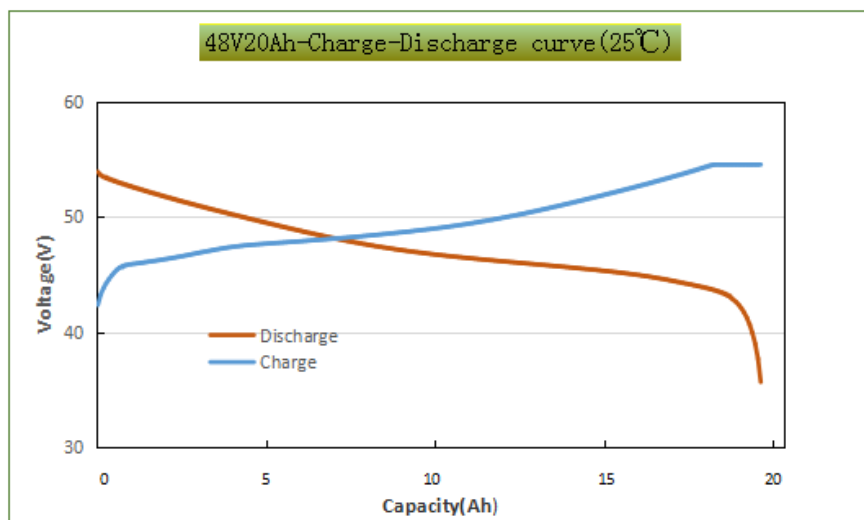
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### 6.Characteristics Curve



### 7. Cautions

- 7.1 Charging current should not be more than maximum charge current specified in the Product Specification , Charging current bigger than recommended current may damage the battery;
- 7.2 Discharging current should be no more than maximum discharge current specified in the Product Specification ; Discharging current bigger than recommended discharge current may damage the battery;
- 7.3 It should be noted that the cell would be possible to be at a over-discharged state by its self-discharge characteristics in case the cell is not used for long time. In order to prevent over-discharging, the cell shall be charged periodically to maintain between 46.8V and 49.4V ( Recommended 3 months one cycle ) .Over-discharging may causes loss of cell performance, characteristics, or battery functions;
- 7.4 Please charge the battery within 12 hours after use;
- 7.5 Battery storage environment follow the above conditions and in standard atmosphere, should be without strong magnet, no power, no static;
- 7.6 Do not reverse the polarity of the battery pack for any reason;
- 7.7 Do not short circuit the battery pack;
- 7.8 Do not reverse polarity charging;
- 7.9 Battery packs can be combined in series or in parallel according to the specification;



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7.10 Do not immerse the battery pack in water or sea water, or get it wet;

7.11 Do not disassemble battery;

7.12 Do not expose the battery to extreme heat or flame;

7.13 Please use a compatible charger for charging;