	Model	SF75150215NSH15-HV-14S1P	30000 mah	51.8 V	Ver.	1.0
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1. Scope

This specification is applied to SAFTY Lithium Ion Polymer Battery manufactured by Xi'an SAFTY Energy

Technology Co., Ltd.

2. PACKTechnical Information

Item	Rating	Note
2.1 Typical Capacity	30000 mAh	Ambient temperature
	Minimum Capacity	15A(0.5C) charge, and discharge at 15A(0.5C) down to 42V cut-off.
2.2 Nominal Voltage	51.8 V	15A (0.5C)
		15A (0.5C)
2.3 Recommended Charge Current	15000mA(0.5C)	Ambient temperature : 25±5 °C
2.4 Maximum Charge Current	15A(0.5C)	Ambient temperature : 0~-15°C
	30A(1C)	Ambient temperature : 15~25°C
	60A(2C)	Ambient temperature : 25~45°C
2.5 Limited charge voltage	60.9 V	
2.6 Charging time (Std. charge current)	≤3 hours	
2.7 Recommended Discharge Current	15000mA(0.5C)	Ambient temperature : 25±5 °C
2.8 Maximum Discharge Current	15A(0.5C)	Ambient temperature : -20~-10°C
	30A(1C)	Ambient temperature : -10~0°C
	150A(5C)	Ambient temperature : 0~60°C
	170A(5S)	Ambient temperature : 0~60°C
	47.6 V	3.4V/Cell
2.9 Discharge Cut-off Voltage	47.6 V	
2.10 PACK Impedance	≤34 mΩ	AC Impedance(1KHz)
2.11 PACK Weight	Approx. 10 kg	
2.12 Voltage as of shipment	51.8~54.6V	
2.13 Operating Temperature	0~45 °C	Charge
	-20~60 °C	Discharge
2.14 Storage Temperature	-20~45 °C	1 month
	-20~35 °C	3 month
	-20~20 °C	1 year

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	Model	SF75150215NSH15-HV-14S1P	30000 mah	51.8 V	Ver.	1.0
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2.2 Discharging temperature

The cell shall be discharged within range specified in the Product Specification.

2.3 Over-discharging

It should be noted that the cell would be at an 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 Within the range of transport voltage.

The charger shall be equipped with a device to prevent further discharging exceeding a cut-off voltage specified in the Product Specification. Also the charger shall be equipped with a device to control the recharging.

3. Storage

The cell shall be stored within range environmental condition of specification.

4 Handlinginstructions

Read and observe the following warnings and precautions to ensure correct and safe use of Li-ion batteries.

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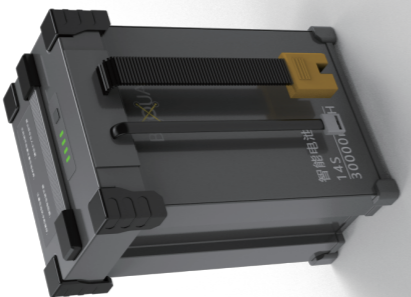
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Shandong Unid Intelligent Technology Co.,Ltd



Battery Model: SF75150215NSH15-HV-14S1P

14S30Ah Smart Battery Instruction Manual

	Model	SF75150215NSH15-HV-1451P	30000 mAh	51.8 V	Ver.	1.0
	SF75150215NSH15-HV-1451P					
1 Charging						
1.1 Charging current						
Charging current should be less than maximum charge current specified in the Product Specification.						
Charging with higher current than recommended value may cause damage to cell electrical, mechanical, and safety performance and could lead to heat generation or leakage.						
1.2 Charging voltage						
The charging voltage shall not exceed the charging limit voltage specified in this specification.						
It is very dangerous that charging with higher voltage than maximum voltage may cause damage to the cell electrical, mechanical safety performance and could lead to heat generation or leakage.						
1.3 Charging temperature						
The cell shall be charged within range in the Product Specification.						
1.4 Prohibition of reverse charging						
Reverse charging is prohibited. The cell shall be connected correctly. The polarity has to be confirmed before wiring. In case of the cell is connected improperly, the cell cannot be charged. Simultaneously, the reverse charging may cause damaging to the cell which may lead to degradation of cell performance and damage the cell safety, and could cause heat generation or leakage.						
2 Discharging						
2.1 Discharging current						
The cell shall be discharged at less than the maximum discharge current specified in the Product Specification. High discharging current may reduce the discharging capacity significantly or cause over-heat.						

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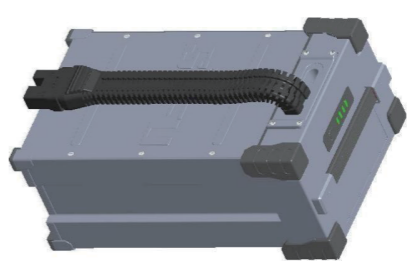
DOC.NO.SFPPS-75150215NSH15-HV-A

	Model	SF75150215NSH15-HV-1451P	30000 mAh	51.8 V	Ver.	1.0								
	SF75150215NSH15-HV-1451P													
3 Electrical Performance														
3.1 Standard test condition														
3.1.1 Standard environmental test condition														
Test should be conducted with new batteries within one month after shipment from our factory and the cells shall not be cycled more than five times before the test. Test condition shall be at 25±5 °C and ≤ 75%RH.														
3.1.2 Measuring Instrument or Apparatus														
3.1.2.1 Dimension Measuring Instrument														
The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.02mm.														
3.1.2.2 Voltmeter														
Standard class specified in the national standard or more sensitive class having inner impedance more than 10MΩ/V.														
3.1.2.3 Impedance Meter														
Impedance shall be measured by a sinusoidal alternating current method (1KHz LCR meter).														
3.1.2.4 Battery Test System														
The precision of scale of test system is demanded as follow:														
3.1.3 Standard Charge Definition														
Standard charge is defined by charging for 3 hours at 60.9V of constant voltage and 15000mA (0.5C) of constant current, 900mA (0.03C) cut-off.														
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Item tolerance</th> <th>Voltage</th> <th>Current</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td></td> <td>±0.5 %</td> <td>±0.5 %</td> <td>±0.1 %</td> </tr> </tbody> </table>							Item tolerance	Voltage	Current	Time		±0.5 %	±0.5 %	±0.1 %
Item tolerance	Voltage	Current	Time											
	±0.5 %	±0.5 %	±0.1 %											
3.1.4 Rest Period														
Unless otherwise defined, 10min rest period after full charge, 10min rest period after discharge.														
3.1.5 Standard Discharge Definition														
Standard Discharge is defined by discharging at 15A (0.5C) down to 42V.														

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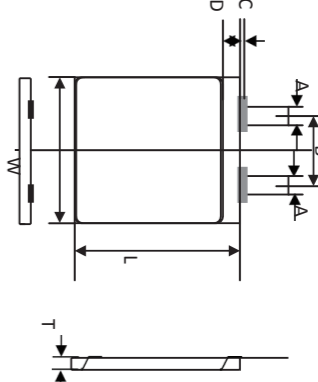
DOC.NO.SFPPS-75150215NSH15-HV-A

	Model	SF75150215NSH15-HV-1451P	30000 mAh	51.8 V	Ver.	1.0															
	SF75150215NSH15-HV-1451P																				
5.2 The finished product size and discharge characteristic curve																					
5.2.1 The battery pack size																					
																					
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Note: Photos are for reference only, specific to product the battery pack																					

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DOC.NO.SFPPS-75150215NSH15-HV-A

	Model	SF75150215NSH15-HV-1451P	30000 mAh	51.8 V	Ver.	1.0																																									
	SF75150215NSH15-HV-1451P																																														
5 Main component																																															
5.1 Cell																																															
4.1.1 Cell Description: Polymer Lithium Ion Battery																																															
4.1.2 Cell Model SF75150215NSH15-HV																																															
4.1.3 Cell Outer Dimension :																																															
																																															
unit: mm																																															
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	Model	SF75150215NSH15-HV-14S1P	30000 mAh	51.8 V	Ver.	1.0

3.2. Electrical Performance

No.	Item	Test Condition	Criteria
1	Initial Capacity(Cini)	Standard charge, and standard discharge.	≥ 28600 mAh
2	High Rate Discharge Capacity	Standard charge, and discharge at 150A(5C) down to 42V cut-off.	≥ 85% Cini
3	Temperature Characteristic ⁵	Charge: standard charge. Rest:2~4 hours at required temperature. Discharge: CC,150A(5C), 42V cut-off.	55℃: ≥90% 0℃: ≥80% Cini
4	Cycle Life	Temperature: 25±5℃ Charge: CC-CV, 60A(2C),60.9V, 0.03CmA cut-off; Discharge: CC, 150A(5C),46.2V cut-off; Discharge capacity should be no less than 80% of initial capacity.	≥ 300 week
5	Shelf Life	Standard charge and then storage at 25±5℃for 28 days, then standard charge and standard discharge.	≥ 90% Cini
		Standard charge and then storage at 60±2℃for 7 days, standard discharge. Then standard charge and standard discharge.	≥ 75% Cini
			≥ 95% Cini
			≥ 90% Cini

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A-HV-5-HVNSH15NSH15-14S1P

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	Model	SF75150215NSH15-HV-14S1P	30000 mAh	51.8 V	Ver.	1.0

4 Environmental Test

No.	Item	Test Condition	Criteria
1	Infrabar Test	After standard charge, Pack placed in 20 ±5℃ in the Vacuum box,Air pressure is less than 11.6 Kpa, Simulated altitude of 15240 m, The duration of 6h, Again a standard discharge charging cycle	No fire, no explosion, no leakage
2	Temperature cycle Test	After standard charge, Temperature range (75±2℃, ↔ (-40±2℃, 6h) ; Temperature conversion between time less than 30min; Reciprocating cycle ten times, Again a standard discharge charging cycle.	No fire, no explosion, no leakage
3	Vibration Test	After standard charge, cells are to be tested as following conditions: Amplitude:0.8mm, Frequency: 10~55Hz(sweep: 1Hz/min), Direction: X/Y/Z axis for 90~100min. The battery is to be tested in three mutually perpendicular to each axis., Again a standard discharge charging cycle.	No fire, no explosion, no leakage

	Model	SF75150215NSH15-HV-14S1P	30000 mAh	51.8 V	Ver.	1.0

Appendix

Handling Precautions and Guideline For LIP (Lithium-Ion Polymer) Rechargeable Batteries

Preface

This document of Handling Precautions and Guideline LIP Rechargeable Batteries shall be applied to the battery cells manufactured by Shandong Unid Intelligent Technology Co.,Ltd

Note (1) :

The customer is requested to contact SAFTY in advance, if and when the customer needs other applications or operating conditions than those described in this document. Additional experimentation may be required to verify performance and safety under such conditions.

Note (2) :

SAFTY will take no responsibility for any accident when the cell is used under other conditions than those described in this Document.

Note (3) :

SAFTY will inform, in a written form, the customer of improvement(s) regarding proper use and handling of the cell, if it is deemed necessary.

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A-HV-5-HSHNS1512015L7-SFPS.NO.NO.

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	Model	SF75150215NSH15-HV-14S1P	30000 mAh	51.8 V	Ver.	1.0

6 Recommended storage for a long time

- 6.1 Ambient temperature : 25℃±5℃
Relative Humidity : ≤75%
- 6.2 Please activate the battery once every 3 months according to the following method: Charge at standard charge to 60.9V, rest 10 min, then standard discharge to 3.0V/cell, rest 10 min, then standard charge to 53.9V.

7 Period of Warranty

The period of warranty is 12 months from the date of shipment. SAFTY guarantees to give a replacement in case of cells with defects proven due to manufacturing process instead of the customer's abuse and misuse.

8 Shipment

Cells shall be shipped in approximately 50% state of charge. Voltage is 51.8V~54.6V. This measuring test should be performed within one month after shipment from our factory.

9 revision

Any amendment springs from product upgrades will be reflected in the updated Regulation book. P.S: Above instructions are subjected to change without further notice.

10 Others

Any matters that this specification doesn't cover should be conferred between the customer and SAFTY.