

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

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)
2.3 Recommended Charge Current	15000mA(0.5C)	Ambient temperature : 25±5 ℃
2.4 Maximum Charge Current	15A(0.5C)	Ambient temperature : 0~15℃
	30A(1C)	Ambient temperature : 15~25℃
	60A(2C)	Ambient temperature : 25~45℃
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 ℃
2.8 Maximum Discharge Current	15A(0.5C)	Ambient temperature : -20~-10℃
	30A(1C)	Ambient temperature : -10~0℃
	150A(5C)	Ambient temperature : 0~60℃
	170A(5S)	Ambient temperature : 0~60℃
2.9 Discharge Cut-off Voltage	47.6 V	3.4V/Cell
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℃	Charge
	-20~60℃	Discharge
2.14 Storage Temperature	-20~45℃	1 month
	-20~35℃	3 month
	-20~20℃	1 year

CONFIDENTIAL

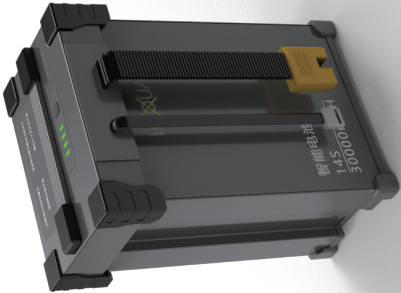
1

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

A-AH-51HSH5120515L-SFPS-ON'DOC

CONFIDENTIAL

Shandong Unid Intelligent Technology Co.,Ltd



Battery Model: SF75150215NSH15-HV-14S1P

14S20Ah Smart Battery Instruction Manual

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

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.

CONFIDENTIAL

10

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

History of revision

Rev.	Description	Date	Prepared by
A0	First issue	2020/12/2	Xiujian Zhao

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

Caution!

Do not use or store the battery where is exposed to extremely hot, such as under window of a car in direct sunlight in a hot day. Otherwise, the battery may be overheated. This can also reduce battery performance and/or shorten service life.

If the battery leaks and electrolyte gets in your eyes, do not rub them. Instead, rinse them with clean runningwater and immediately seek medical attention. If left as is, electrolyte can cause eye injury.

Use the battery only under the specification of cell. Failure to do so can result in reduced performance or a shorten service life.

CONFIDENTIAL

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

CONFIDENTIAL

12

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

CONFIDENTIAL

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

CONFIDENTIAL

11

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

Contents

1 Scope 1

2 PACK Technical Information 1

3 Electrical Performance 2

4 Environmental Test 4

5 Main component 5

6 Recommended storage for a long time7

7 Period of Warranty7

8 Shipment7

9 Revision7

10 Others7

Appendix8

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

Danger!

- Do not immerse the battery in water or allow it to get wet.
- Do not use or store the battery near sources of heat such as a fire or heater .
- Do not use any chargers other than those recommended by SAFTY.
- Do not reverse the positive(+) and negative(-) terminals.
- Do not connect the battery directly to wall outlets or car cigarette -lighter sockets.
- Do not put the battery into a fire or apply direct heat to it.
- Do not short-circuit the battery by connecting wires or other metal objects to the positive(+) and negative (-) terminals.
- Do not pierce the battery casing with a nail or other sharp object, break it open with a hammer, or step on it!
- Do not strike, throw or subject the battery to physical shock.
- Do not directly solder the battery terminals.
- Do not attempt to disassemble or modify the battery in any way .
- Do not place the battery in a microwave oven or pressurized container.
- Do not use the battery in combination with primary batteries(such as dry-cell batteries) or batteries of different capacity, type or brand.
- Do not use the battery if it gives off an odor ,generates heat, becomes discolored or deformed, or appears abnormal in any way. If the battery is in use or being recharged, remove it from the device or charger immediately and discontinue use.

CONFIDENTIAL

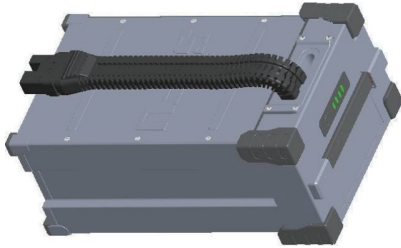
BRUAV		Model	Ver.	1.0
		SF75150215NSH15-HV-14S1P	30000 mAh 51.8 V	
1 Charging 1.1 Charging current Charging current should be less than maximum charge current specified in the Product Specification. Charging with higher current than recommended value may cause damage to cell electrical, mechanical, and 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.				

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

5.2 The finished product size and discharge characteristic curve

5.2.1 The battery pack size

Item	Specification values	Note
T		
W		
L		



Item	Specification values	The number
The charge plug	XT90I	1PCS
The discharge &communicati on plug	QS-10	1PCS
Discharge line	The silicone line 6AWG	1 black and1red
Charge line	The silicone line 12AWG	1 black and1red

Note: Photos are for reference only, specific to product the battery pack

CONFIDENTIAL

6

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

BRUAV		Model	Ver.	1.0								
		SF75150215NSH15-HV-14S1P	30000 mAh 51.8 V									
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 °Cand ≤ 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 10MQ/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><tr><td>Item</td><td>Voltage</td><td>Current</td><td>Time</td></tr><tr><td>tolerance</td><td>±0.5 %</td><td>±0.5 %</td><td>±0.1 %</td></tr></table>					Item	Voltage	Current	Time	tolerance	±0.5 %	±0.5 %	±0.1 %
Item	Voltage	Current	Time									
tolerance	±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.												

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

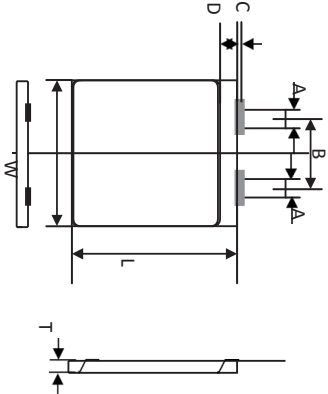
5 Main component

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

Item	Description		Dimension
T	Cell thickness		≤ 7.6
	Initial	After Cycle	≤ 8.2
W	Cell width		≤ 150
L	Cell length		≤ 216
A	Cell tab width		40 ± 0.1
	Cell tab width		40 ± 0.1
B	Cell tab Pitch		75.5 ± 1
C	Cell tab glue		0.2 ~ 3
D	Cell top sealant length		10 ± 0.5
	Cell folded		Double side

CONFIDENTIAL

5

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

CONFIDENTIAL

2

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

CONFIDENTIAL

5

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

CONFIDENTIAL

6

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

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

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 cutoff; 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

CONFIDENTIAL 3 DOC.NO.SFPS-75150215NSH15-HV-A

A-AH-5-1SHS15L50215L7-SFPS-75150215NSH15-HV-A 4 CONFIDENTIAL

Model		Ver.		1.0
SF75150215NSH15-HV-14S1P		30000 mAh		51.8 V
4 Environmental Test				
No.	Item	Test Condition	Criteria	
1	Infrabar Test	After standard charge, Pack placed in 20±5 °C 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 °C, 6h) ↔ (-40±2 °C, 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		Ver.	1.0
	SF75150215NSH15-HV-14S1P	30000 mAh	51.8 V	

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 conditons.				
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.				

CONFIDENTIAL 8 DOC.NO.SFPS-75150215NSH15-HV-A

A-AH-5-1SHS15L50215L7-SFPS-75150215NSH15-HV-A 7 CONFIDENTIAL

Model		Ver.	1.0
SF75150215NSH15-HV-1451P		30000 mAh	51.8 V
6 Recommended storage for a long time			
6.1 Ambient temperature : 25°C±5°C			
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.			