

# Technical Specification of LiFePO4 Battery Pack (12.8V 150Ah)

File#: Version A

Effective Date: July 1, 2019

Model	R-LFP12.8V150Ah
Specification	12.8V 150Ah
Prepared By	Huang cheng qian
Checked By	Xie zuo wen
Approved By	Xie zuo wen

## Shenzhen Ritar Power Co., Ltd

10th Floor, Tower C, 1st Building, Shenzhen Software Industrial Base, Xuefu Road 81, Nanshan District, Shenzhen, Guangdong, China

File Name	Technical specification of LiFePO4 (12.8V 150Ah)	Version	А	Page	2/9			
File #	RT-RD-LFP12150A-1	Controlled #		Issuance Date	2019.07.01			
	Contents							
1. Scope					3			
2. Mechani	cal Design	••••••						
3. Battery	Pack Basic Performance		••••••	••••••	4			
4. Main Pe	rformance		•••••		5			
5. PCM (P	rotection circuit Management )	••••••	•••••••••		7			
6. Storage	6. Storage and Transportation Requirement8							
7. Notes fo	7. Notes for Battery Usage							
8. Attachm	8. Attachment9							

File Name	Technical specification of LiFePO4 (12.8V 150Ah)	Version	А	Page	3/9
File #	RT-RD-LFP12150A-1	Controlled #		Issuance Date	2019.07.01

## 1. Scope

This document described Lithium Iron Phosphate Battery  $(12.8V \ 150Ah)$ , including mechanical design, basic performance, test method and notes for use. The product applies to storage system.

## 2. Mechanical Design

- 2.1 Battery specification: 12.8V150Ah
- 2.2 Battery dimension: L×W×H=483mm×170mm×240mm
- 2.3 Cell Model: 3.2V 50Ah
- 2.4 Combination Method: 4S3P



File N	lame	Technical specification of LiFePO4 (12.8V	ation 8V 150Ah)		Version	А	Page	4/9	
File	File # RT-RD-LFP12150A-1			C	Controlled #		Issuance Date	2019.07.01	
3. Batte	ery Pa	ck Basic Performan	ce	•					
#		Item	Paramet	er	Remark				
1		Rated Capacity	150Ah		$23^{\circ}\text{C} \pm 5^{\circ}\text{C}, 0.33\text{C}$ constant current discharging, 10V cut off				
2		Rated Voltage	12.8V		Battery mo	dule rated	voltage		
3	S	Standard Charge Current	30A (0.2)	C)	$0^{\circ}\mathbb{C} \sim 45^{\circ}\mathbb{C}$ , charge to 14 voltage) current $\leq 0$ .	0.2C CC 4.6V, then charge, cu 05C.	(Constant curr CV(constant ut off when char	ent) rging	
4		Max Charge Current	75A		0°C~45°C				
5	Cha	rge Cut Off Voltage	14.6V						
6	St	andard Discharge Current	30A (0.2	C)	-20°C~+60° Current)	C, 0.2CC	CC (Constant		
7	N D	Max Continuous	100A		$25^{\circ}C \pm 3^{\circ}C$ , continuous 100A discharge		urge		
8	D	vischarge Cut Off Voltage	10V						
9	Ma	x Pulse Discharge Current	120A		$25^{\circ}C \pm 3^{\circ}C$	; ≤1S			
10	Wo	orking Temperature (charge)	0°C~45°	Ċ	During char temperature	rge, battery e should no	$\gamma$ and ambient of exceed 45 °C.		
11	Wo	rking Temperature (discharge)	-20°C~55	С,	Battery can range with	work at sp capacity lo	becified temperates in tolerance.	iture	
12	St	orage temperature	-20°C~4	5℃	(short tern	n) With	in 1 month		
14		orage temperature	-10°C~3	5℃	(long term	) With	nin 1 year		
13		Battery Weight	$17\pm0.5$	Kg					
14	В	attery Impedance	≤35mΩ	<u>)</u>	AC 1KHz i	mpedance	nce with half electricity		

File N	ame Technica of LiFe	l specification PO4 (12.8V 150A	DAh)		ersion	А	Page	5/9
File	# RT-RD-LH	# RT-RD-LFP12150A-1		Controlled # Iss		Issuance Date	2019.07.01	
4. Ma 4.1	ain Performan Battery pack	ce main performa	ance pa	aramete	er			
#	It	em	Star	ndard		Tes	st Method	
	Discharge	0.33C	10	)0%	Test Temp 0.2C cons	perature: 2 stant current	$5^{\circ}C \pm 3^{\circ}C$ ; Ch charge to 14.6V	arge:
1	Rate Character	0.5C	≥ <u>9</u>	95%	discharge	transfer to constant voltage, cut off when current $\leq 0.05C$ Discharge: 0.33C/0.5C constant current discharge cut off @10V.		
		55 °C	≥ <u></u>	95%	Charge: 0.2C constant current charge to 14.6V,			
	Canacity &	45 °C	≥ <u></u>	95%	transfer to	constant voltage, cut off when current		
2	Temperature	25°C	10	)0%	Solution = 10.5C constant current discharge			
	Character	O°O	$\geq \epsilon$	65%	cut off at 10V; 2hours interval for the temperature.			8
		-10°C	$\geq 3$	50%				
3	Life Cycle Character		≥300	Otimes	After finit minutes re current di the next c to 80% of cycles is c	sh the stand est, in $25 \pm 1$ scharge to 1 ycle ,end w f the initial of defined as the	ard charging and $5^{\circ}$ C, 0.3C const 0.0V cutoff , and the the capacity of capacity. The nurse cycle life of the the construction of the cycle life of the the capacity.	30 ant hen start lecrease nber of e battery
	Storage	25℃ 6months	≥ <u></u> 9	95%				
4	Character (Recoverable	45°C 3 months	≥90%		Charge b storage	attery with	n 60%~75% cap	eacity for
	capacity)	60°C 1 month	≥ <u></u>	90%				

File Name		Technical specification of LiFePO4 (12.8V 150Ah)		V	Version	А	Page	6/9	
File	#	RT-RD-	LFP12150A-1	Coi	ntrolled #		Issuance Date	2019.07.01	
4.2	Ambi	ent Chai	racter						
#		Item	Standard		Test Method				
1	S dan Vil	teady np heat test	StandardNo fire, No explosion,Noleakage. Dischargecapacity cannot be lowerthan 60% of initialcapacityNo fire, No explosion,No		After standard charge, test as below: Temp: 40°C±5°C; Relative Humidity: 90% ~95%; Standing time: 48h; take out and place for 2h at room temperature. Then discharge with 1C till cut off voltage After standard charge, fix to vibration machine and vibrate 30minuntes each at XYZ direction. Frequency Sweeping Rate: 1oct/min; Vibration Frequency: 10Hz~30Hz;			: 90% for 2h at C till cut achine ection.	
					Displaceme Vibration I Displaceme	ent amplitud Frequency: ent amplitud	e (Single): 0.38 30Hz~55Hz; e (Single): 0.19	mm; mm₀	
3	Low No fire, No explosion,N Pressure leakage.		No	Under $25 \pm 3^{\circ}$ C ambient temperature, put cell into vacuum cabinet, and reduce internal pressure gradually to not high than 11.6kPa (Simulated altitude 15240m) keen 6 Hours.			put cell pressure plated		
4	Drop Test No fire, No explosion, leakage.		No	Under the of free fall from of 5 cm this direction.	condition of om a height o ck, repeat 3	shipment, the batt of 1 m to a concre times from X, Y,2	tery is te floor Z axis		

#### 4.3 Safety Performance

#	Item	Standard	Test Method
1	Over Charge Test	No fire, No explosion	After standard charge,Under $25^{\circ}C \pm 3^{\circ}C$ ambient temperature for 1h.Then under the same temperature,0.5C constant current charge to 5V(the simple cell).
2	Over Discharge Test	No fire, No explosion	After standard charge,Under $25^{\circ}C \pm 3^{\circ}C$ ambient temperature for 1h.Then under the same temperature,0.3 C constant current discharge to 0V(the simple cell).
3	Heat shock	No fire, No explosion	Put battery in hot cabinet, temperature is up with $5^{\circ}$ /min $\pm 2^{\circ}$ C/min rate to $130^{\circ}$ C $\pm 2^{\circ}$ C and keep for 30mins
4	High Temperature Test	No fire, No explosion, Capacity recovery cannot less than 80%	After standard charge, place battery in 85°C for 4h.
5	Short Circuit	No fire, No explosion	After standard charge, Under $25^{\circ}C \pm 3^{\circ}C$ ambient temperature for 1h. Then put the battery by external short circuit for 10 min, the outside line resistance should be less than 100 m $\Omega$ .

	File N	Name	Technica of LiFe	l specification PO4 (12.8V	n 150Ah)	Version	А	Page	7/9
	Fil	File # RT-RD-LFP12150A-1			Controlled #		Issuance Date	2019.07.01	
:	5. PO 5.1	CM (Pi l Prote	rotection ection Pa	Circuit M rameter	anagemen	t)			
	#		Iten	1		Description		Value	Unit
					Cell Over Voltage	charge Detection	37	00±30	mV
					Cell Over Voltage	charge Release	35	50±50	mV
	1	Over	Charge F	Parameter	Battery p Detection	ack Over charge Voltage	14	.8±0.05	V
					Battery P Release V	ack Over charge /oltage	14	.2±0.1	V
					Over Cha Delay Tir	rge Voltage Prote ne	ction 1	±0.5	S
					Cell Ove Voltage	er discharge Detect	tion 23	50±30	mV
					Cell O <sup>r</sup> Voltage	ver discharge Rele	ase 25	00±50	mV
	2	C	Over Discharge Parameter		Battery pack over discharge Detection voltage			4±0.05	V
					Battery Pack over discharge release voltage			±0.1	V
					Over discharge Voltage Protection Delay Time			0.5	S
	2		D - 1	Balance Voltage				/	V
	3		Balance		Balance Current			/	mA
					Charge C	over Current Protect	ction	75±5	А
	4	Cha	arge Over Parame	Current ter	Short circ charging	cuit at protection port		/	
					Discharge Protection	over current		200	А
	5	Disc Para	harge Ov meter	er Current	Discharg Protection	e over current n Delay Time		20~80	mS
					Short ci dischargi	rcuit protection at ng port		/	
	6	Short	circuit p	rotection rel	ease			/	
				Charge	High tem	perature protection	n	55	°C
		Tem	perature	8	Low tem	perature protection	1	-5	°C
	7	Prot	ection	Discharge	High tem	perature protection	n	75	°C
					Low tem	perature protection	1	-20	°C
	8	Consumption			Sleep mo	de		500	uA

File Name	Technical specification of LiFePO4 (12.8V 150Ah)	Version	А	Page	8/9
File #	RT-RD-LFP12150A-1	Controlled #		Issuance Date	2019.07.01

## 6. Storage and Transportation Requirement

	Item	Requirement		
Storage	Less than 1month	-20 °C ~+45 °C		
Temperature	Less than 6 month	-10℃~+35℃		
Humidity		<70%RH		
Storage SOC		60~75% SOC		
Transportation	nsportation Battery should be in the condition of less than 30% charged by packaging boxes, should prevent violent vibration and impact due the transit or extrusion, prevent from rain and direct sunlight, suit for cars, trains, ships, aircraft and other transportation vehicles			

#### 7. Notes for Battery Usage

#### 7.1 Prohibition

For avoiding battery leakage, heat radiating, explosion, below prevent tips should be taken care of:

- a) Prohibition of disassemble or re-assembly;
- b) Prohibition of short circuited battery;
- c) Prohibition to use near hot source;
- d) Prohibition of dumping of battery into water, ocean or getting battery wet;
- e) Prohibition of charging near fire or under sunlight;
- f) Charge with specified charge according to charging requirement;
- g) Prohibition of inserting nail into battery, hammering or stepping on by foot;
- h) Prohibition of throwing;
- i) Prohibition to use with damaged or deformed battery;
- j) Prohibition of direct welding on battery pack;
- k) Prohibition of charging opposite or over discharging;
- 1) Prohibition of charge opposite or opposite connection;
- m) Prohibition to use to unspecified equipment;
- n) Prohibition to direct touch with leaking battery.

File Name	Technical specification of LiFePO4 (12.8V 150Ah)	Version	А	Page	9/9
File #	RT-RD-LFP12150A-1	Controlled #		Issuance Date	2019.07.01

## 7.2 Attentions

a) Prohibit of using battery in sunlight, otherwise will cause over hot, firing, or function failure, life reducing;

b) Prohibit use near static place which over 15.2V;

c) Prohibit charge at temperature below  $0^{\circ}$ C or above  $60^{\circ}$ C;

d) When use at first time, if has corrosion, or bad smell, or any other abnormal, please do not use.

## 7.3 Delivery requirements

#	Item	Parameter	Remark
1	Capacity	≥150Ah	0.33C discharge
2	Rated Voltage	12.8V	
3	Battery Impedance	≤35mΩ	AC impedance
4	Insulation impedance	≥50MΩ /500V	Between the output terminals and case
5	Delivery capacity requirements	≦30% SOC	Voltage range 12.8V-14.6V

## 8.Attachment :Charge and discharge curve of cell

Curve of cell charging and discharge

