



Eco Power

WirelessValley | No.9 East Mozhou Road | www.ecopowerpack.com
Nanjing City | Jiangning District | 211111 | +86-(0)25 87736807

EP-12.88V206AH

Battery Technical Agreement

August 2020



Technical Agreement

No.:B20080702-TA-01

STARION GROUP (named Party A from here after)

ECO POWER GROUP (named Party B from here after)

Based on the fully discussion and communication, Party A and Party B have reached this agreement, regarding to the the product Lithium Battery for Energy Storage (Model: EP-12.88V206Ah). This agreement has defined the technical specifications and the quality requirements. This agreement will also be used by Party B as the product design specification, and be used by Party A as the inspection and the test standard when receiving the product.

This agreement mainly contains 4 sections:

- *Product Specification
- *Technical Specification and Requirements
- *Clarification of the Technical Responsibility
- *Technical Service and After-Sale Service.



1. Product Specification

Table 1. Production Specification

EP-12.88V206Ah Lithium Battery includes the following:					
No	Name	Model/Spec	Unit	Qty.	Note
1	EP-12.88V206Ah Lithium Battery	EP-12.88V206Ah	set	300	

Note:

- ◆ The actual battery components will be set by the final delivery.
- ◆ This battery requires the specific Li-ion battery charger. The customer needs to procure separately.

2. Technical Specifications and Requirements

2.1 Cell Technical Parameters

Table 2. Cell Specification

No.	Item	Specification	
1	Dimension (Screw terminal)	55mm x174.6mm x217.1mm	
2		Weight	Max.4200g
3		Min. capacity	206Ah (0.5C) @ 25°C
4		Min. energy	663 Wh (0.5C) @ 25°C
5		Recommended SOC usage window	20 ~ 100%
6		Terminal	Screw terminal
7		Impedance (1kHz)	0.4mΩ
8	Voltage	Max.	3.65 V
9		Nominal	3.22 V
10		Min.	2.50 V(>0°C) /2.00V(≤0°C)
11	Current	Maximum continuous charge	206A
12		Maximum sustained discharge	206A
13	Energy density	Gravimetric	157Wh/kg
14		Volumetric	344Wh/L
15	Temp. Condition	Operation (Charge)	0 ~ 55°C



16		Operation (Discharge)	-20 ~ 55°C
17		Storage	-30 ~ 55°C
18	Self-Discharge Rate	Count after fresh cell need Standard Charge to 50%SOC and storage at 25±2°C for 3 month	≤3%
19	Cycle Life	Residual capacity≥80% initial capacity, @25°C, 1C/1C,80%DOD	2000 cycles

2.2 Battery System Technical Parameters

Table 3. Battery Specification

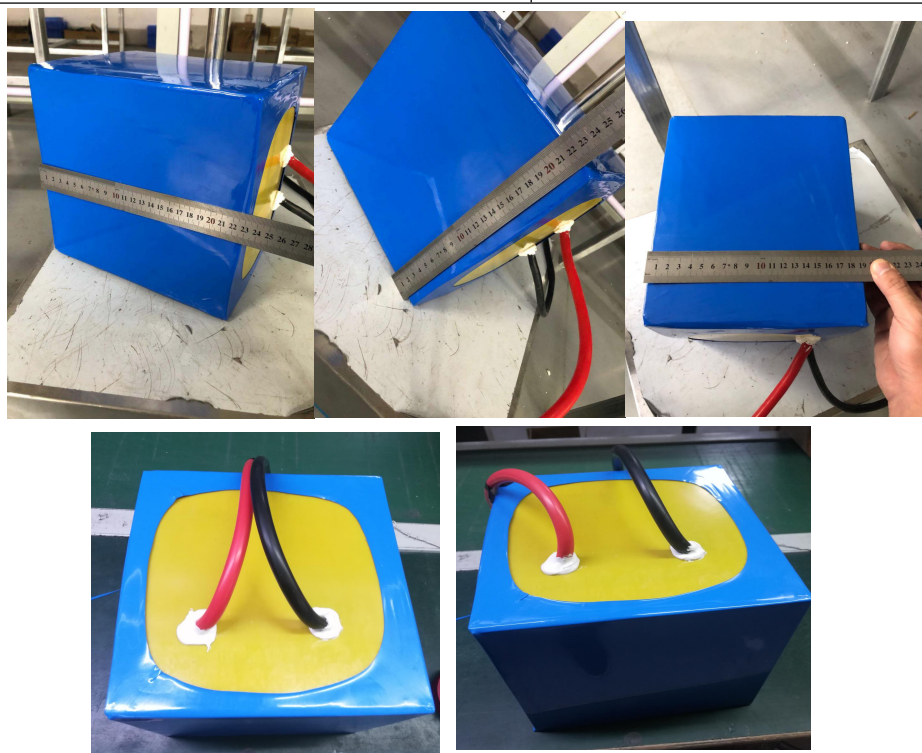
Item		Parameters
EP-12.88V206Ah Battery System	Nominal Voltage	12.88V
	Nominal Energy (@ 20±5°C 0.3C/0.3C 100%DOD)	2.653kWh
	Useful Energy(20±5°C 0.3C/0.3C 80%DOD)	≥2.122kWh
	System Maximal Continuous Charging Current	150A
	System Maximal Continuous Discharging Current	150A
	System Maximal Discharging Current (short pulse 10s)	300A
	Battery System Configuration	1 parallels in 4series of 3.22V206Ah cell
	Battery System Operating Voltage Range	10V~14.6V
	Operating Temperature Range	0~55°C
	Self-Discharge Rate (Count after fresh cell need Standard Charge to 50%SOC and storage at 25±2°C for 3 month)	≤3%
	Recommended Operating Range of SOC	20%~100%
	SOC Requirement for long period idle and storage	30% SOC
	Short term (1 month) Storage Temperature	-20°C ~45°C
	Long Term (<1 year) Storage Temperature	-20°C ~25°C
Dimension	220±5mm*230±5mm*190±5mm(W*D*H)	



Eco Power

WirelessValley | No.9 East Mozhou Road | www.ecopowerpack.com
 Nanjing City | Jiangning District | 211111 | +86-(0)25 87736807

Weight	≈18kg
Storage Humidity	<70%
Operating Humidity	<80%
Insulation Resistance	≥10MΩ
Cable length	300mm, 35mm ²
Connector	Bare cable, no connectors
Cycle Life (Residual capacity≥80% initial capacity, @25°C, 1C/1C,80%DOD)	1600 cycles



2.3 Battery System Technical Parameters

Table 4. BMS Specification

Item	Content	Criterion
Over charge Protection	Over charge detection voltage	3.65±0.05V
	Over charge release voltage	3.55±0.05V
	Continuous charge current	150A



Over discharge protection	Over discharge detection voltage	2.35±0.1V
	Over discharge release voltage	2.55±0.1V
	Continuous discharge current	150A
	Pulse discharge current (10S)	300A
Over current protection	Over current detection current	400 + 50A
	Release condition	Cut load
	Detection delay time	300 μ s
Temperature protection	Charging high temperature protection	55℃
	Charging low temperature protection	0℃
	Disharging high temperature protection	55℃
	Disharging low temperature protection	-20℃
Bleed	Bleed Start Point	3.59
	Bleed Current	35mA
Power consumption	Operation	45±10mA
	Sleep	45±10mA

3. Clarification of the Technical Responsibility

3.1 The System Plan and the Requirements

(1) As the product provider, Party B is responsible for the design of the battery integration. Party A should be aware the technical characteristics of the LiFePO4 battery. When a problem happens, to root cause and further resolve the issue, Party A should also consider the factors of the other associated system components, such as the load.

(2) When there is problem on the battery, the personnel of Party A should respond immediately. The battery should not put in operation before the problem is solved.



3.2 Other Requirements

The battery 's charging and discharging outlets are designed as “shared” , which means the outlet for the charge and the outlet for the discharge are the same.

4. Technical Service and After-Sale Service

4.1 During the product integration, Party B is responsible of the battery installation and test. After the completion, Party B will transfer all the product and all the required documents for the usage and maintenance.

4.2 When operating maintaining the system, in order to avoid the damage of the system and further to avoid the safety problem, Party A must strictly follow the instructions described in the user manual and the associated technical documents. For the non-stated issues related to the design, installation, test, and maintenance, please refer to the corresponding standards.

4.3 During the period of warranty, for any system and components damages or failures, Part B will provide the repair or replacement for free.

4.4 Safety Responsibility: Party A and Party B agree to work together to assure no safety problems will happen during the operation.

(1) To assure the safety of the product, Party A is required to provide the necessary caution and process, to prevent fire, theft, etc. It is absolutely prohibited to disassemble the partial components or the whole system.

(2) In order to achieve the safety and reliability, Party A should provide Party B all the electric and structural schematics of the usage/operation environment. During the design and the application of the associated connections (charging circuit, discharging



circuit, install and fasten certain devices and components, etc.), Party A must follow the electric and structural agreement with Party B. It is absolutely prohibited to conduct any applications besides the specified environment and parameters, for example, power-on order, invalid operations so that the parameters are out of the specified capabilities which may result in electric problems and accidents; or no fasten or fasten in the inappropriate way, inappropriate operation environment so that it surpasses the mechanical tolerance which can also cause problems and accidents.

(3) When conducting the test of voltage, internal resistance, capacity, operating test, and the charge/discharge cycle test on the product provide by party A, Party A (and the customers of Party A) must not conduct any test which might cause damages in the battery, such as over-charge, over-discharge, abuse, short circuit, or any other test out of the specified range and parameters stated in the Specification Document. If damages have been caused by conducting the above mentioned test, Party B is not responsible of the damages.

5. Requirements for Storage and Maintenance

5.1 If the system is not put into operation, the battery should be stored in the environment under temperature 5~35 °C , and the humidity below 70%. The storage room must be in good vent, dry, and clean condition. All of the relays must be in the OFF conditions.

5.2 During the usage and operation, the system must be kept far away from source of fire, heat, and water. If there is any battery leakage, or strange smell, stop the operation immediately. And it must notify the appropriate personnel for the appropriate



handling.

5.3 That battery cannot be put up side down or side way. It is prevented to any mechanical impact or press. It is prohibited to expose the battery under strong sunshine and rain.

5.4 During the storage, party A needs to inspect the battery voltages twice a month. and fill up the table of “Battery Voltage Tracking Document”. A detailed record must be made.

5.5 If the system is not in usage for a long time, the battery must be fully charged and discharged every month. It is recommended to charge the battery with the current rate of 0.3C. The detailed record must be made.

5.6 During the battery storage, the SOC should be adjusted to 30%.

5.7 Around the battery system, please store some effective dry powder, dry ice extinguisher, or fire hazard sand hole.

6. Non-disclosure Responsibility

Both parties are liable for not disclosing any part or the whole of this agreement.

7. About This Agreement

This technical agreement is the non-separable part of the business contract agreed and signed by both parties.

8. Copies

This agreement has 2copies. Each party keeps one copy. The agreement takes in effect with/after the signatures and seals.



Eco Power

WirelessValley | No.9 East Mozhou Road | www.ecopowerpack.com
Nanjing City | Jiangning District | 211111 | +86-(0)25 87736807

Party A:

STARION GROUP

Signature/Stamp:

Date:

Party B:

ECO POWER GROUP

Signature/Stamp

Date:

2020.8.11

