3.5 Connection for Series Mode

Figure 2 shown four batteries connected in series to form a cluster, and two clusters parallel system connection diagram.

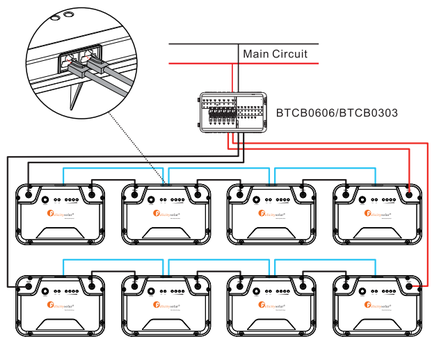


Figure 2

4. OPERATION

Once the batteries are connected well, press power button to enable the output of the battery pack.

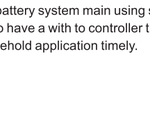


4.1 Switch Power

1.Switch on: press power button to switch on the battery, then the battery will do self-inspection before enable output. The LED will show the SOC.

2.Switch off: press and hold power button for 1 to3 seconds, the battery will shut down directly.

Description for Communication port:

Picture	PIN	Description
	1	Trigger-GND
	2	Trigger-VCC
	3	CANL-PCS
	4	CANH-PCS
	5	RS485-B
	6	RS485-A
	7	CANL
	8	CANH

4.2 Description for LED

RUN LED: Indicates normal battery operating status(remains on during normal run)

ALM LED: Indicates battery fault status (illuminates when fault occurs)

SOC of the battery is shown by the LED

●●●●	●●●○	●●○○
100%	75%	50%
●○○○	●○○○	
25%	Flashing SOC<10%	

Note: The battery need to be fully charged for at least once in one month to ensure the accurate SOC calculation.

4.3 Status LED or SOC LED (Mode or SOC)

BATTERY MODE	Status LED		SOC				REMARK
	RUN LED	ALM LED	LED1	LED2	LED3	LED4	
POWER OFF	OFF	OFF	OFF	OFF	OFF	OFF	
POWER ON	ON	OFF	ON	ON	ON	ON	
STANDBY	Slow Flash	OFF	SOC				
NORMAL	ON	OFF	RUNNING/SOC				
DISCHARGE	ON	OFF	SOC				
CHARGE	ON	OFF	RUNNING				
LOWPOWER	FLASH	OFF	LED1 FLASH				
FAULT	OFF	ON	ON	OFF	OFF	OFF	C01
			OFF	ON	OFF	OFF	C02
			ON	ON	OFF	OFF	C03
			OFF	OFF	ON	OFF	C04
			ON	OFF	ON	OFF	C05
			OFF	ON	ON	OFF	C06
			ON	ON	ON	OFF	C07
			OFF	OFF	OFF	ON	C08
			ON	OFF	OFF	ON	C09
			OFF	ON	OFF	ON	C10
			ON	ON	OFF	ON	C11
			OFF	OFF	ON	ON	C12
			ON	OFF	ON	ON	C13
			OFF	ON	ON	ON	C14

4.4 Fault Code Table

Fault Code	Fault Information	Trouble Shooting
C01	Battery overvoltage	Restart the unit, If the error happens again, please return to repair center.
C02	Battery undervoltage	Restart the unit, If the error happens again, please return to repair center.
C03	Cell overvoltage	Restart the unit, If the error happens again, please return to repair center.
C04	Cell undervoltage	Restart the unit, If the error happens again, please return to repair center.
C05	Charge overcurrent	Restart the unit, If the error happens again, please return to repair center.
C06	Discharge overcurrent	Restart the unit, If the error happens again, please return to repair center.
C07	MOS overtemperature	1. The inner temperature is over the limitation. 2. Check whether the ambient temperature is too high.
C08	Output short circuit	1.Check whether a short circuit occurs,and power off the unit. 2.If check is ok,restart the unit, If the error happens again, please return to repair center.
C09	Cell ovetemperature	Restart the unit, If the error happens again, please return to repair center.
C10	Cell undertemperature	Restart the unit, If the error happens again, please return to repair center.
C11	AFE communication lost	Restart the unit, If the error happens again, please return to repair center.
C12	Abnormal output impedance	Restart the unit, If the error happens again, please return to repair center.
C13	Parallel failed	1. Please check if single unit is installed to parallel system. 2. If this error happens during parallel installation, please check wires connectiotn. If they are connected correctly, please funish parallel installation first, and then restart the unit. 3. If the problem remains, please contact your installer.
C14	Output loss	1. Please check whether the circuit breaker is closed; 2. Please check whether the fuse is normal; 3. Restart the unit, If the error happens again, please return to repair center.

5. EMERGENCY SITUATIONS

Felicity cannot guarantee battery absolute safety.

5.1 Fire

In case of fires, make sure that the following equipment is available near the system.

- SCBA (self-contained breathing apparatus) and protective gear in compliance with the Directive on Personal

Protective Equipment 89/686/EEC.

- NOVEC 1230, FM-200, or dioxide extinguisher

Batteries may explode when heated above 120°C. KEEP FAR AWAY from the battery if it catches fire.

5.2 Leaking Batteries

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. If one is exposed the leaked

substance, immediately perform the cations described below.

- Inhalation: Evacuate the contaminated area, and seek medical attention.
- Contact with eyes: Rinse eyes with running water for 5 minutes, and seek medical attention.
- Contact with skin: Wash the affected area thoroughly with soap and water, and seek medical attention.
- Ingestion: Induce vomiting, and seek medical attention.

5.3 Wet Batteries

If the battery pack is wet or submerged in water, do not let people access it, and contact your supplier for help.

5.4 Damaged Batteries

Damaged batteries are not fit for use and are dangerous and must be handled with the utmost care. It may

leak electrolyte or produce flammable gas. If the battery pack seems to be damaged, pack it in its original

container, and then return it to your supplier.

5.5 Warranty

Products that are operated strictly in accordance with the user manual are covered by the warranty. Any

violation of this manual may void the warranty.

Limitation of Liability

Any product damage or property loss caused by the following conditions, Felicity does not assume any direct

or indirect liability.

- Product modified, design changed or parts replaced.
- Changed, or attempted repairs and erasing of series number or seals;
- System design and installation are not in compliance with standards and regulations;
- The product has been improperly stored in end user's premises;
- Transport damage (including painting scratch caused by movement inside packaging during shipping). A

claim should be made directly to shipping or insurance company.

Felicitysolar®

Make life full of hope

USER MANUAL

LiFePO4 Battery System for Households



In order to prevent improper operation before use, please carefully read this manual.

358-010586-00

1.ABOUT THIS MANUAL

1.1 Purpose

This manual describes the introduction, installation, operation and emergency situations of the battery bank.

Please read this manual carefully before installations and operations.

Keep this manual for future reference.

1.2 Scope

This manual provides safety and installation guidelines as well as information on tools and wiring.

1.3 Safety Instructions

WARNING: This chapter contains important safety and operating instructions. Read and keep this manual for future reference.

1.Before using the unit, read all instructions and cautionary markings on the unit, the batteries and all appropriate sections of this manual.

2. CAUTION –-- To reduce risk of injury,damage,even burst. please use it following using manual. In case of causing personal
3. Do not disassemble the battery. Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of fire.
4. To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
5. CAUTION – Only qualified personnel can install this device with inverter.
6. For optimum operation of this battery, please follow required spec to select appropriate cable size.
7. Be very cautious when working with metal tools on or around batteries. A potential risk exists to drop a tool to spark or short circuit batteries or other electrical parts and could cause an explosion or fire.
8. Please strictly follow installation procedure.
9. **GROUNDING INSTRUCTIONS** - This System should be connected to a permanent grounded wiring system. Be sure to comply with local requirements.
10. Warning!! Only qualified service persons are able to service this device.
11. Battery should be installed indoor and kept away from water, high temperature mechanical force and flames.
12. Do not install the battery in any environment of temperature below 0°C or over 55°C,and humidity over 80%.
13. Do not put any heavy objects on the battery.
14. **It is prohibited to use in series more than 4, otherwise it will cause battery damage!**

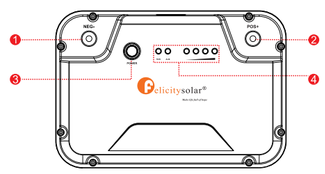
2. INTRODUCTION

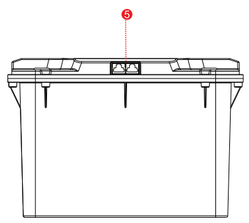
The battery system main using solar power system for family house. It also have a with to controller the battery easily and protect our Household application timely.

2.1 Features

LiFePO4: Higher safe performance and longer cycle life.
Multiple Protection: Built-in smart BMS and Fuse.
Flexible Installation: Floor-Mounted.
Wide Compatibility: Compatible with leading inverter brands.
High Scalability: Energy up to 20.48kWh.
Long Warranty: 5 Years.

2.2 Product Overview





1. Battery Negative -
2. Battery Positive +
3.Power Button
4. LED display
5. Communication port

2.3 Specifications

Model	FLA12100PG2
Energy	1.28kWh
Battery Type	LiFePO4
Nominal Voltage	12.8V
Operating Voltage	11.2-14.4V
Max.Continuous Charge/Discharge Current[1]	100A
Peak Charge/Discharge Current(15s)	150A
Max.Charge/Discharge Power	1,250W
Depth of Discharge(DOD)	≥ 95%
Scalability	Up to 16 units in parallel(20.48kWh)
Max. Series Connections	4 Units
Communication	RS485 / CAN
Protection Level	IP21
Cycle Life[2]	≥ 6,000 Cycles
Charging Temperature Range	0-55 °C
Discharging Temperature Range	-20-55 °C
Display	LED
Installation	Floor-Mounted
Protection	Built-in smart BMS, Fuse
Warranty	5 Years
Net Weight	10.3kg
Gross Weight	12.3kg
Product Dimension	295×201×199mm
Package Dimension	357×263×261mm
[1] Max. continuous charge/discharge current is affected by temperature and SOC	
[2] Test conditions: 0.2C Charging/Discharging @25°C, 80% DOD.	

2.4 Recommended Settings

Lithium battery pack is not same as lead-acid battery, so for the devices which you connect with the battery pack for charging or discharging, such as inverters, MPPT charger controllers or UPS, please implement pre-settings as recommended settings as below before you launched them.

Setting	FLA12100PG2
Max. Charging Voltage	14.4V
Floating Charging Voltage	14.4V
Max. Charging Current	100A*N
Cut-off Voltage	12V

Notes: "N" means the number of battery packs connected in parallel.

3. INSTALLATION

3.1 Unpacking and Inspection

Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items inside of package.



NO	NAME	SPECIFICATION
1	User manual	User manual
2	Warranty Card	Warranty Card
3	Power Cable	25mm², allows for charging and discharging up to 120A,used for connecting to external PCS
4	RS485 cable	Battery terminal:5B6A PCS terminal:5B6A
5	Communication cable	Used for Communication among batteries
6	Battery terminal protective cover	Prevent accidental contact with terminals

3.2 Mounting the Unit

Consider the following points before selecting where to install:

- Do not mount the battery on flammable construction materials.
- The recommended installation position is to be adhered to the wall vertically.
- Be sure to keep other objects and surfaces as shown in the right diagram to guarantee sufficient heat dissipation and to have enough space for removing wires.

Please follow below steps to implement battery connection:

1. Assemble battery ring terminal based on recommended battery cable and terminal size.
2. Connect all battery packs as units requires. It's suggested to connect at least 2 sets for inverter larger than 1.5KVA in parallel connection.

3.3 Instructions for Series or Parallel Use

Series Mode	Series Number	2 series, up to 8 parallels 4 series, up to 4 parallels
	Warnings	**1. It is prohibited to connect communication cables to inverters or MPPT !** **2.It is prohibited to use in series more than 4, otherwise it will cause battery damage!** 3. It is strongly recommended to connect communication cables to batteries, as this can help improve consistency between batteries. 4.Please ensure the battery capacity is consistent and the battery voltage difference is less than 0.5V before using in series.
	Connection Diagram	Shown in **3.5 Connection for Series Mode**
Parallel Mode	Parallel Number	Up to 16 parallels
	Warnings	1. Please ensure the battery voltage difference is less than 1.5V before parallel connection.
	Connection Diagram	Shown in **3.4 Connection for Parallel Mode**

3.4 Connection for Parallel Mode

The battery support to be connected in parallel for expansion.

If you need one more battery bank to work in parallel mode, connect the battery as shown in Figure 1.

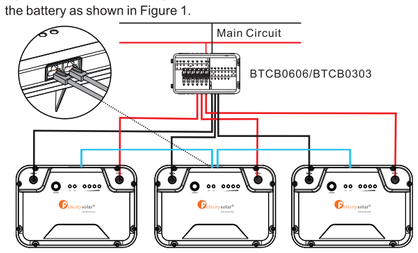


Figure 1 Shown Three Batteries Parallel System Connection Diagram

Note:After completing the above steps, arbitrarily select the positive and negative poles of one of the battery packs to output. After confirming the correct connection of the inverter, controller and battery, you can turn on any of the switches and use the battery group happily.

For pure off grid system ,the PV awake wire need to be connected with MPPT charge controller if the battery pack is charged by solar panels only . The connection diagram as below :

