Free-Standing Battery User Manual

Applicable models

UNIV-14.3kWhFS

This manual describes the Free-Standing Series battery. Please read this manual before installing the battery module and follow the instructions carefully during assembly.

If you have any questions, please contact your dealer immediately for advice and instructions

Contents

1 Safety Precautions

This section describes the safety information that must be observed when working with battery packs. To prevent any damages, or personal injury, and to ensure the performance of the battery packs, please read this section carefully and observe the safety precautions at all times.

1.1 Precautions

- It is very important and necessary to read the user manual carefully before installing or using the product.
- Failure to do so or to follow any of the instructions or warnings in this document can result in electrical shock, serious injury or death, and could damage the battery, or potentially rendering it inoperable.
- If the battery pack is stored for long time, it is required to charge them every six months, and the SOC should be no less than 50%.
- Please recharged the battery pack within 12 hours, after fully discharged.
- All the battery pack terminals must be disconnected before any maintenance.
- Do not use cleaning solvents to clean battery pack.
- Do not expose battery pack to flammable or harsh chemicals, or corrosive gases or liquids.
- Do not paint any part of battery pack, include any internal or external components.
- Do not expose the battery pack to direct sunlight for extended periods of time.
- Do not connect battery pack with PV solar wiring directly.
- Do not insert any foreign object into any part of the battery pack.

1.2 Warning

- Do not touch the battery pack with wet hands.
- Do not crush, drop or puncture the battery pack.
- Always dispose of the battery pack according to local safety regulations.
- Store and recharge the battery pack in a manner in accordance with this user manual.
- Ensure reliable grounding.
- Do not reverse the polarity when installing.

- Do not short circuit the terminals, remove all jewelry items that could cause a short circuit before installation and handling.
- Disconnect battery from power or loads, and then power off battery before installation and maintenance.
- The battery packs should be not stacked more than specified numbers.
- Continued operation of a damaged battery pack can result in dangerous situation.

2 Introduction

UNIV14.3kWhFS/ UNIV15kWhFS lithium iron battery is the new energy storage products developed and produced by Easyway, it can be used to support reliable high power for various types of equipment and systems.

2.1 Features

1) Dual active protection on BMS level.
2) Automatic address setting when connect in multi-group.
3) Support upgrade battery module from upper controller via RS485 communication.
4) Enable 90% depth of discharge, available for the inverter which completely follow Easyway latest protocol to operate.
5) The module is non-toxic, non-pollution and environmentally friendly.
6) Cathode material is made from LiFePO4 with safety performance and long cycle life.
7) Battery management system (BMS)has protection functions including over-discharge, over-charge, over-current and high/low temperature.
8) Flexible configuration, multiple battery modules can be in parallel for expanding capacity and power.
9) Adopted self-cooling mode rapidly reduced system entire noise.

2.2 Equipment interface instruction

2.2.1 Charge mode

When the battery string detects that the charger is connected and the best charging voltage is greater than 0.5V, when the charging current reaches the effective charging current, the charging mode is entered.

2.2.2 Discharge mode

The battery string enters discharge mode when it detects that the load is

connected and the discharge current reaches the effective discharge current.

2.2.3 Standby Mode

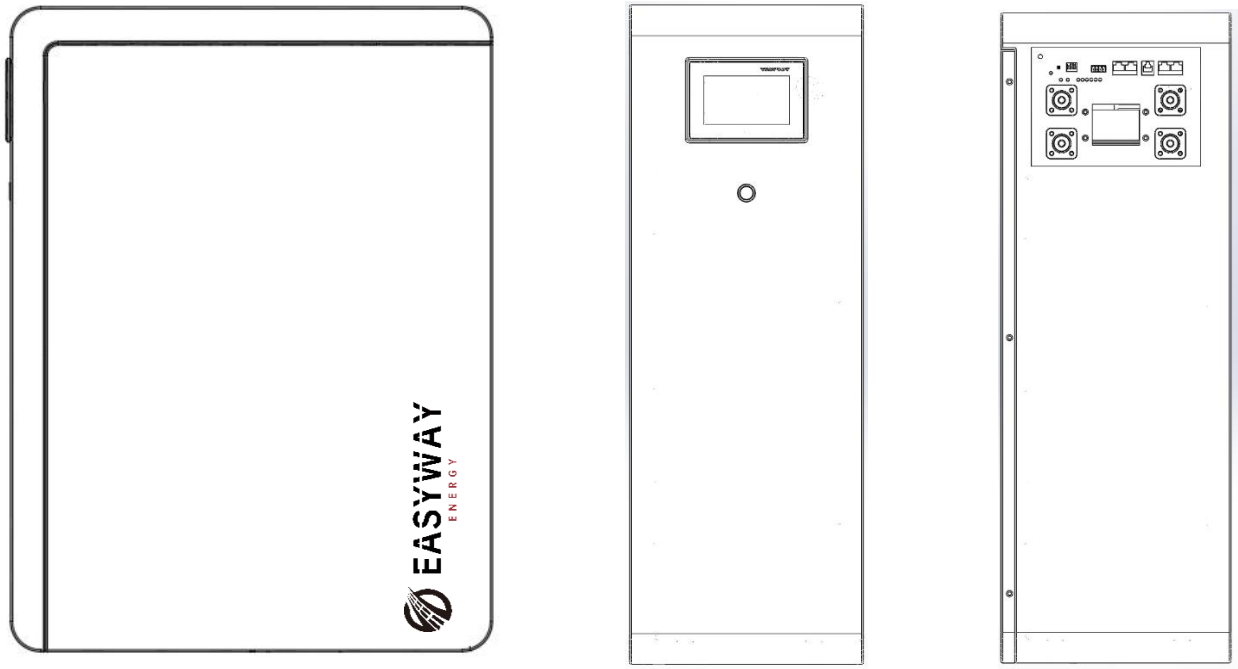
If the above two modes are not satisfied, enter the standby mode.

2.2.4 Shutdown Mode

Normal standby for 48 hours, the battery pack triggers the under voltage protection, execute the switch button or reset button to shut down, Wake-up conditions of shutdown mode: (1) charging activation; (2) 48V voltage

3 Battery System Introduction

3.1 Battery Appearance Introduction

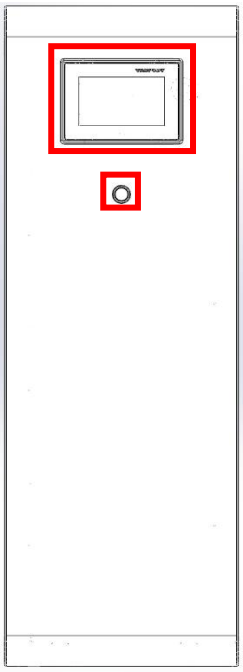


3.2 Battery Specification

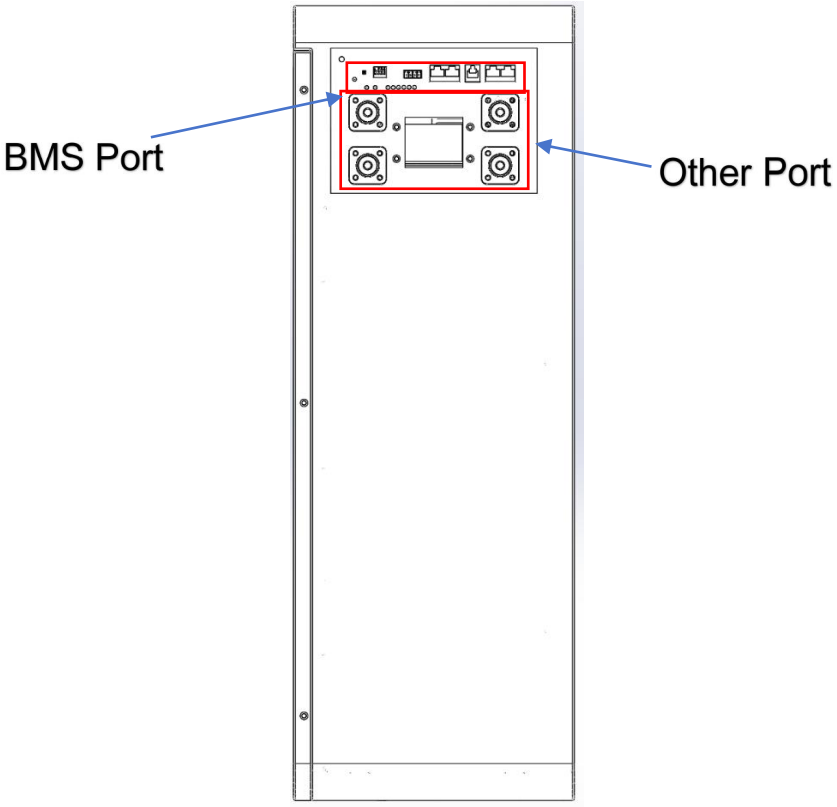
MODEL		UNIV-14.3kWhFS	
BATTERY PARAMETERS			
Total Energy (kWh)		14.33	
Useable Energy (kWh)		13.47	
Nominal Voltage (Vd.c)		51.2	
Voltage Range (Vd.c)		44.8 ~ 57.6	
Rated Capacity (Ah)		280	

Recommend Charge Current (A)		140	
Recommend Discharge Current (A)		140	
Peak Charge Current (A)		200	
Peak Discharge Current (A)	201 ~ 210A @ 1 hour 211 ~ 250A @ 10 sec		
Recommend Using DOD	90%		
Dimension (W *H* D) (mm)		560*830*270	
Weight (KG）		132	
BMS Features	Over-voltage Protection Over-current Protection Short-circuit Protection Low-voltage Protection/ Cell Balance Over Temperature Protection		
Communication	CAN/RS485/RS232		
OPERATING CONDITION			
Operate Temperature (Charge)	0℃ ~ 55℃ (32℉ ~ 131℉)		
Operate Temperature (Discharge)	-20℃ ~ 60℃ (-4℉ ~ 140℉)		
Storage Temperature	15℃ ~ 35℃ (59℉ ~ 95℉)		
IP Rating	IP20		
Cooling Type	Natural		
Operating Environment	Indoor (5% ~ 95%(RH) No Condensing)		
Altitude	＜4000 m		
CERTIFICATION AND SAFETY			
Warranty	10 Years		
Operation Life	15+ Years (25℃/77 ℉)		
Cycle Life	＞8000@25℃, 80%DOD		
Certification	CE/Cell UL 1973/UN38.3/MSDS		

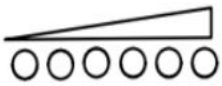
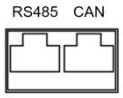
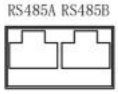
3.3 Battery Function Introduction



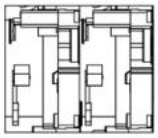
Item	Function Description
	Touchscreen. Parameters can be viewed on the screen.
	Switch. Press the switch to turn the battery on or off.



3.3.1 BMS Port description

Item	Function Description
	SOC indicator lights: Each light represents a 16.6% capacity range, increasing from left to right.
	Alarm light: If the battery has an alarm, it will emit a red light.
	Operation light: When the battery is running normally, it will flash a green light.
	Dip switch: Used for communication when batteries are connected in parallel.
	Output communication interface: used for communication with the inverter or BMS software.
	RS232 interface: used for communication with the battery management system software
	RS485 interface: used for communication between batteries in parallel
	Reset button: Used to restore factory settings.
	indicator light, used to show whether the battery is turned on.

3.3.2 Other Port description

Item	Function Description
	Output/Input port: Used for battery charging and discharging.
	Circuit breaker: Used to protect the battery in case of excessive current.
	Grounding screw: Used for grounding the product to protect personnel safety.

3.4 Communication Instructions

3.4.1 Communication with the inverter/BMS software

Note: Please read the definition of the Battery Communication interface in the

inverter's instruction manual before proceeding with this part of the operation.

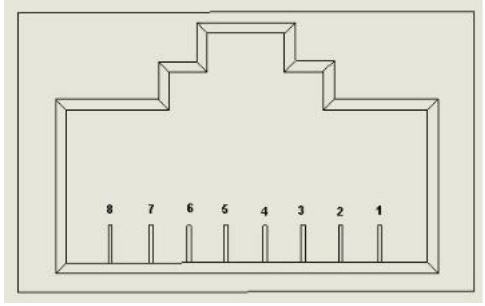
If you use RS485 communication, you need to pay attention to RS485-A and RS485-B in the definition of battery interface, if you use CAN communication, you need to pay attention to CAN_H and CAN_L in the definition of battery interface.

When the pin definition of communication between the inverter side and the battery side is the same, the communication can be done by using normal network cable.

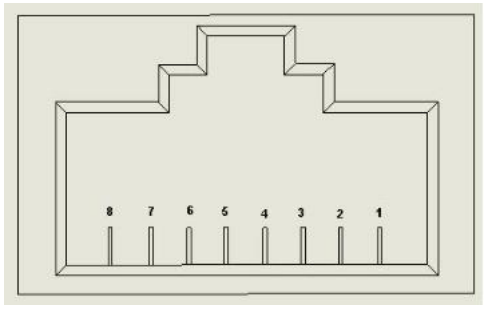
If the pin definition of communication between inverter and BMS is not the same, you need to make a special cable according to the inverter pin, otherwise the inverter will not recognize the battery.

If you have problems with this part of the communication, please contact Easyway's after-sales department or Easyway's authorized dealers.

Interface Definition



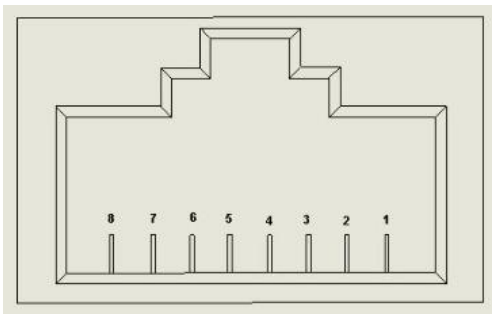
RS485	
Pin	Definition description
1/8	RS485-B
2/7	RS485-A
3/6	GND
4/5	NC



CAN	
Pin	Definition description
1/2/3/6/8	NC
4	CANH
5	CANL
7	GND

3.4.2 Communication between the batteries

Interface Definition



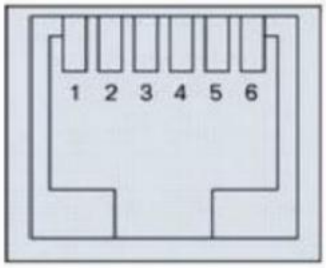
RS485	
Pin	Definition description
1/8	RS485-B
2/7	RS485-A
3/6	GND
4/5	NC

Communication between batteries can be done using the network cable

included in the battery package.

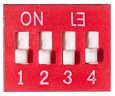
3.4.3 Communication Type RS232

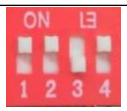
Interface Definition

	RS232	
	Pin	Definition description
	2	NC
	3	TX
	4	RX
	5	GND

3.5 Dialing Instructions

The DIP switch address set to 1 is defined as follows  （a black dot indicates the OFF state, and a blank space indicates the ON state; the same applies to the following）， Address 2  ， and other addresses follow the same logic. It is important to note that the DIP switch address on the BMS must match the DIP switch address on the host controller.

Address	DIP switch position				Example Diagram
Parallel quantity	#1	#2	#3	#4	
0	OFF	OFF	OFF	OFF	
1	ON	OFF	OFF	OFF	
2	OFF	ON	OFF	OFF	
3	ON	ON	OFF	OFF	
4	OFF	OFF	ON	OFF	
5	ON	OFF	ON	OFF	
6	OFF	ON	ON	OFF	

7	ON	ON	ON	OFF	
8	OFF	OFF	OFF	ON	
9	ON	OFF	OFF	ON	
10	OFF	ON	OFF	ON	
11	ON	ON	OFF	ON	
12	OFF	OFF	ON	ON	
13	ON	OFF	ON	ON	
14	OFF	ON	ON	ON	
15	ON	ON	ON	ON	

3.6 LED Indicator Explanation

LED Operating Status

Status	Behavior	ON/OFF	RUN	ALM	SOC					
		●	●	●	●	●	●	●	●	●
Shutdown	Sleep	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Standby	Normal	On	Flash1	OFF	Based on the battery state of SOC					
	Alarm	On	Flash1	Flash3						
Charge	Normal	On	On	OFF						
	Overvoltage alarm	On	On	OFF						
	Overcurrent alarm	On	On	OFF						
	Overvoltage protection	On	On	OFF						
	Overcurrent protection	On	Flash1	OFF						
	Temperature protection	OFF	OFF	On						

Discharge	Normal	On	Flash3	OFF	Based on the battery state of SOC						
	alarm	On	Flash1	Flash3							
	Low SOC alarm	On	Flash3	Flash3							
	Overvoltage protection	On	OFF	Flash3	OFF	OFF	OFF	OFF	OFF	OFF	
	Overcurrent protection	OFF	OFF	On	OFF	OFF	OFF	OFF	OFF	OFF	
Failure	Reverse connection short circuit	OFF	OFF	On	OFF	OFF	OFF	OFF	OFF	OFF	
	Cell/NTC				OFF	OFF	OFF	OFF	OFF	OFF	
	MOSFET Failure				OFF	OFF	OFF	OFF	OFF	OFF	

LED Indicator Flashing Explanation

Flashing state	ON	OFF
Flash1	Last 0.25S	Last 3.75S
Flash2	Last 0.5S	Last 0.5S
Flash3	Last 0.5S	Last 1.5S

Capacity Indicator Explanation

Status		Charge					
Capacity indicator		L1●	L2●	L3●	L4●	L5●	L6●
Remaining Capacity	0～18%	On	OFF	OFF	OFF	OFF	OFF
	18～34%	On	On	OFF	OFF	OFF	OFF
	34～51%	On	On	On	OFF	OFF	OFF
	51～68%	On	On	On	On	OFF	OFF
	68～84%	On	On	On	On	On	OFF
	84～100%	On	On	On	On	On	On
Status		**Disharge**					
Capacity indicator		L1●	L2●	L3●	L4●	L5●	L6●
Remaining Capacity	0～18%	On	OFF	OFF	OFF	OFF	OFF
	18～34%	On	On	OFF	OFF	OFF	OFF
	34～51%	On	On	On	OFF	OFF	OFF
	51～68%	On	On	On	On	OFF	OFF
	68～84%	On	On	On	On	On	OFF
	84～100%	On	On	On	On	On	On

4 Installation Instructions

4.1 Tools

 Wire Cutter	 Cable Ties	 Electric Screw Driver
 Screw Driver Set	 Sleeve Piece	 Multimeter

NOTE: Use properly insulated tools to prevent accidental electric shock or short circuits. If insulated tools are not available, cover the entire exposed metal surfaces with available insulated alternatives, except their tips, with electrical tape.

4.2 How to Connect The Wire