BR Series Energy Storage Battery

Installation Guidance

Standard Operating Procedures & Best Practices

BR114R/129R/143R/157R/172R186R/200R/BR215R*N

ATESS ENERCOLLEGE

Technical Support Document

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1 Introduction

To ensure the proper and safe installation of the ATESS BR Series Energy Storage Battery, please follow the steps provided in this guide.

2 Tools Required

The following tools are recommended for the installation process:

Torque wrench

Screwdriver

Wire stripper

Hydraulic crimper

Heat dryer

Multimeter

Insulating gloves

Forklift

SHENZHEN ATESS POWER TECHNOLOGY CO.,LTD

3 System Configuration

With the monomer 280Ah/3.2V LFP battery cell, through the reasonable configuration and box aging of the battery cell, the effective management and full utilization of the battery cell is realized; the DC input voltage requirement of the inverter is achieved by the serial connection method.

Parameter / Type	Rated voltage of PACK	Rated capacity of PACK	Quantity of PACK	Rated voltage of the system	Rated capacity of the system	Rated energy of the system	Rated energy of the system
BR114R*N	51.2 V	280Ah	8*N	409.6V	280Ah*N	114.6KWh*N	113KG
BR129R*N	51.2 V	280Ah	9*N	460.8V	280Ah*N	129.0KWh*N	113KG
BR143R*N	51.2 V	280Ah	10*N	512.0V	280Ah*N	143.3KWh*N	113KG
BR157R*N	51.2 V	280Ah	11*N	563.2V	280Ah*N	157.6KWh*N	113KG
BR172R*N	51.2 V	280Ah	12*N	614.4V	280Ah*N	172.0KWh*N	113KG
BR186R*N	51.2 V	280Ah	13*N	665.6V	280Ah*N	186.3KWh*N	113KG
BR200R*N	51.2 V	280Ah	14*N	716.8V	280Ah*N	200.7KWh*N	113KG
BR215R*N	51.2 V	280Ah	15*N	768.0V	280Ah*N	215.0KWh*N	113KG

Table 1 Battery System Specifications

4 Bill of Materials

No.	Type / Materials	BR114R *N	BR129R *N	BR143R *N	BR157R *N	BR172R *N	BR186R *N	BR200R *N	BR215R *N	Unit
1	Product inspection report	1	1	1	1	1	1	1	1	PCS
2	Product certification	1	1	1	1	1	1	1	1	PCS
3	Battery Pack-A	4	4	5	5	6	6	7	7	PCS
4	Battery Pack -B	4	5	5	6	6	7	7	8	PCS
5	High voltage box	1	1	1	1	1	1	1	1	PCS
6	Battery Pack series DC cable 1	1	1	1	1	1	1	1	1	PCS
7	Battery Pack series DC cable 2	1	1	1	1	1	1	1	1	PCS
8	Battery Pack series DC copper bar	6	7	8	9	10	11	12	13	PCS
9	BPU to battery negative copper bar	1	1	1	1	1	1	1	1	PCS
10	Battery communication line	6	7	8	9	10	11	12	13	PCS
11	BPU to battery communication line	1	1	1	1	1	1	1	1	PCS
12	BPU to display communication line	1	1	1	1	1	1	1	1	PCS
13	Display to inverter communication line	1	1	1	1	1	1	1	1	PCS
14	Battery rack	1	1	1	1	1	1	1	1	PCS
15	M6*20 hex head combination screw	64	64	64	64	80	80	80	80	PCS

Table 2 Bill of Materials

5 BR Series Energy Storage Battery Rack

Battery rack has 2 columns and 6 layers, 2 columns and 8 layers. The three views and dimensions of one of the BR114R/ BR129R/ BR143R/ BR157R battery racks are shown in Figure 1or Figure 3. BR172R/ BR186R/ BR200R/ BR215R battery racks are shown in Figure 2 or Figure 4.

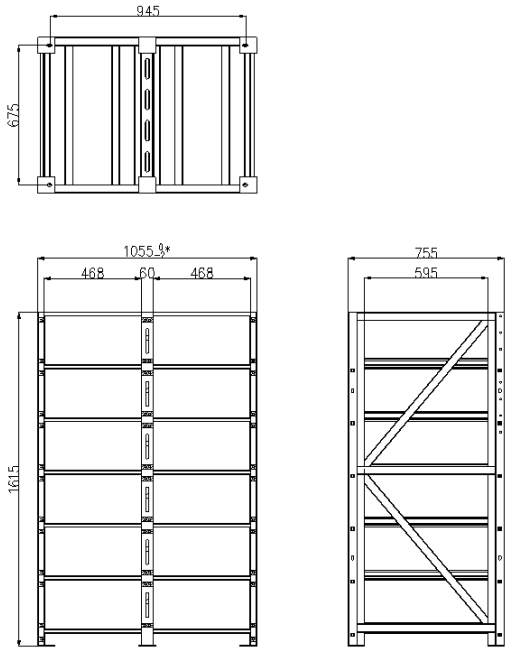


Figure 1 6 layers 2 columns battery rack-0.5C size drawing

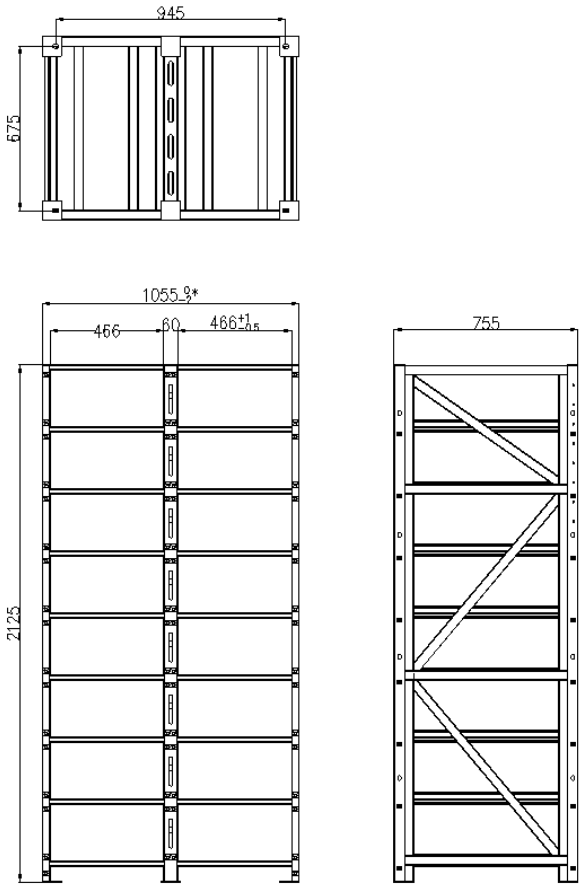


Figure 2 8 layers 2 columns battery rack-0.5C size drawing

5 BR Series Energy Storage Battery Rack

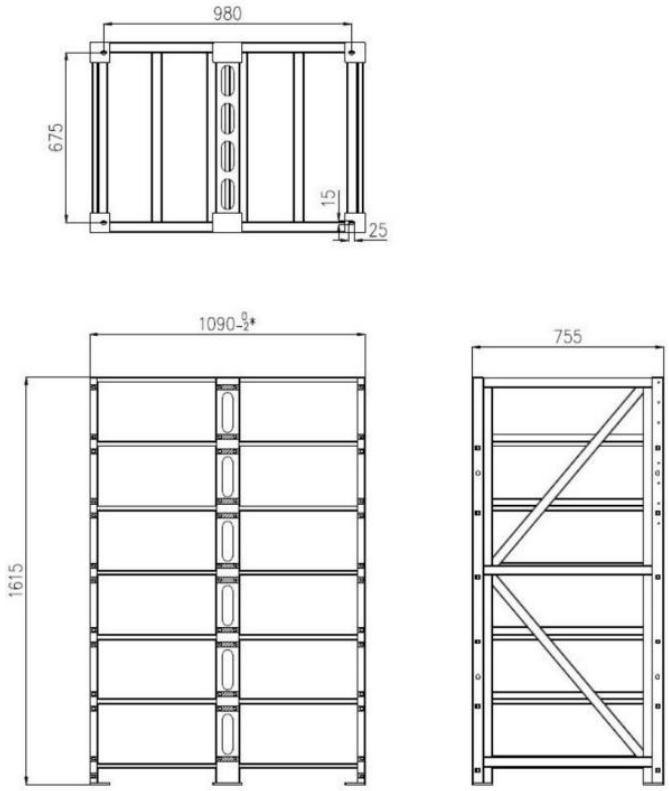


Figure 3 6 layers 2 columns battery rack-1C size drawing

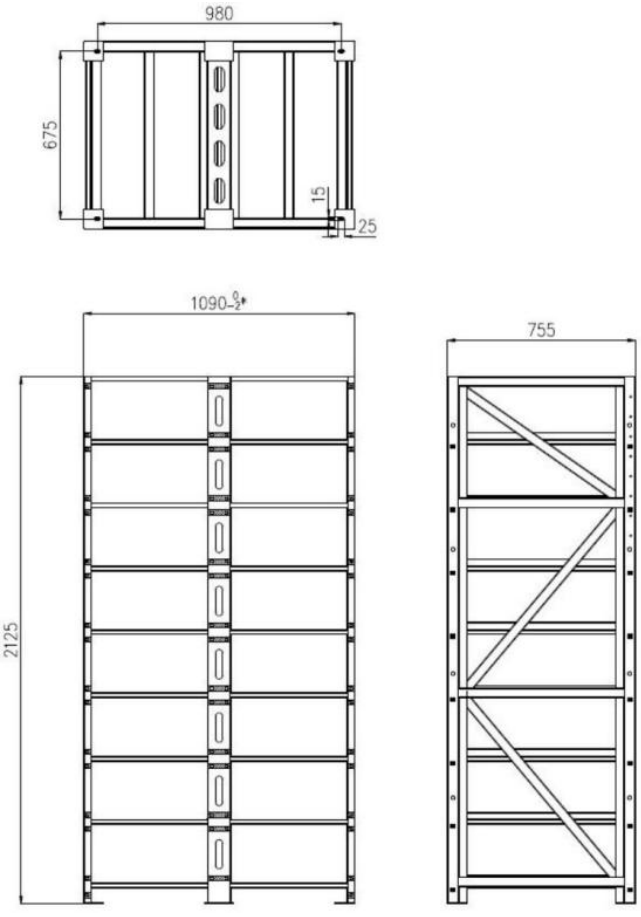


Figure 4 8 layers 2columns battery rack-1C size drawing

6 Battery Pack Front Interface

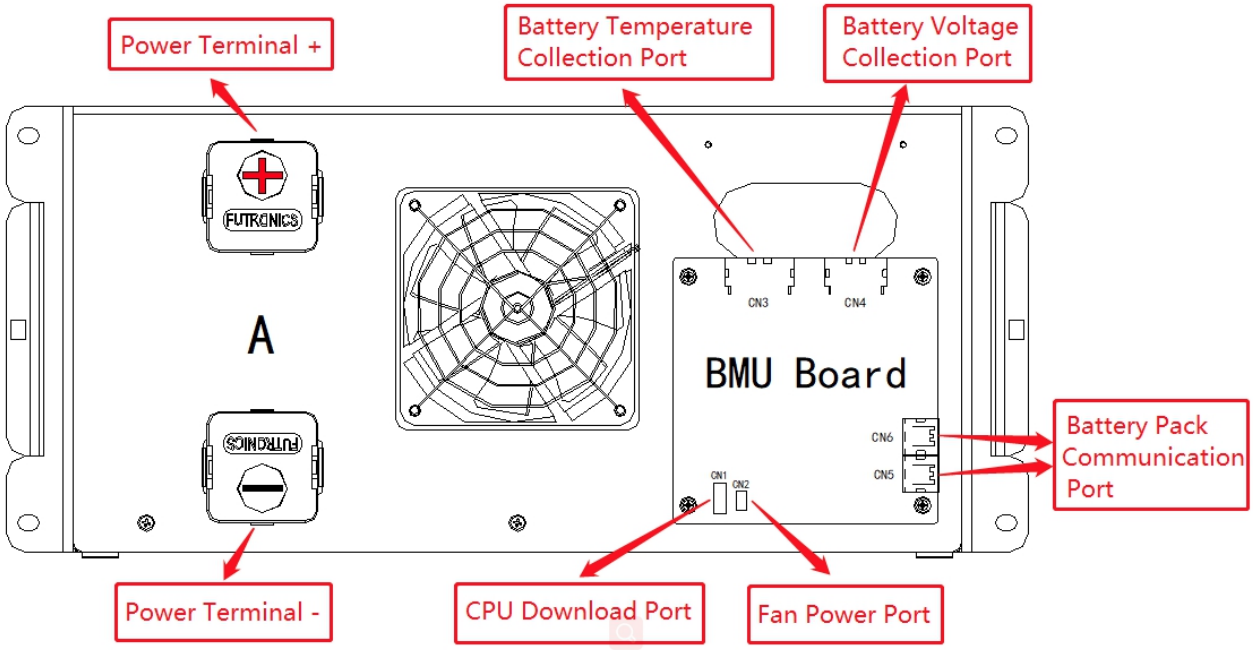


Figure 5 Battery pack-A front interface

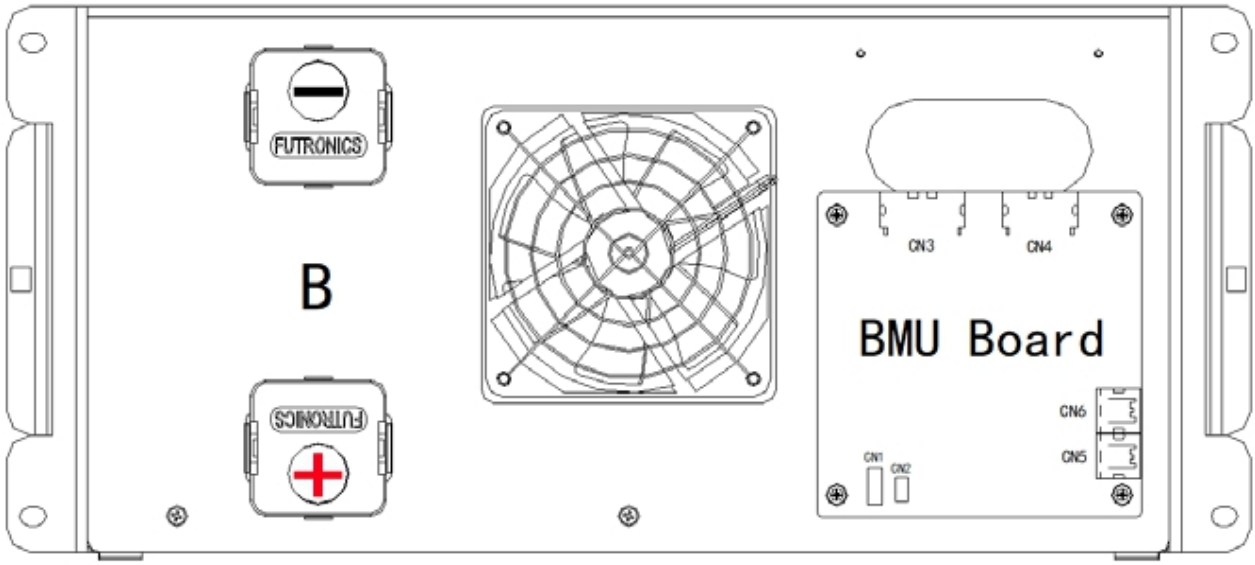


Figure 6 Battery pack-A front interface

Power Terminal +/-

To connect battery series power cables.

Battery Pack Communication Port

To connect battery series communication lines.

Battery Temperature Collection Port

Port for collecting the temperature of the battery cell in the battery pack.

Battery Voltage Collection Port

The voltage and total voltage of each cell in the battery box are collected

CPU Download Port

Used to download or update CPU programs.

Fan Power Port

Battery box fan driver input port.

Note: The difference between battery pack-A and battery pack-B is that the positive and negative ports are opposite.

7 BPU Front Interface

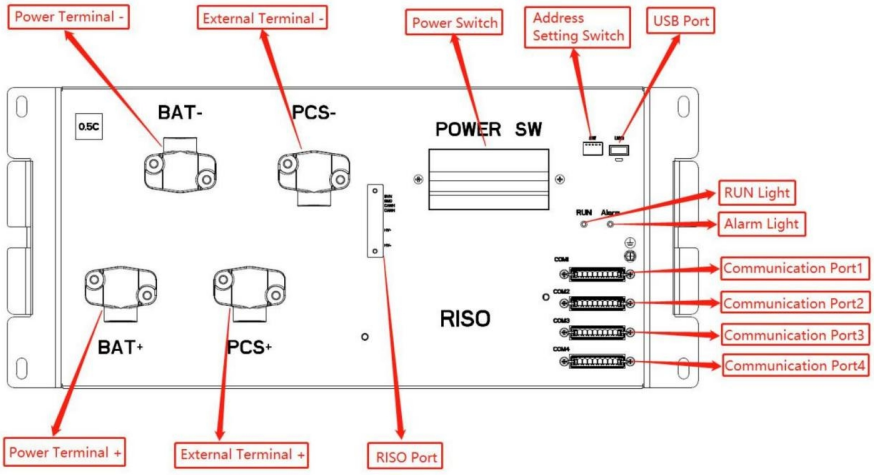


Figure 7 BPU-0.5C front interface

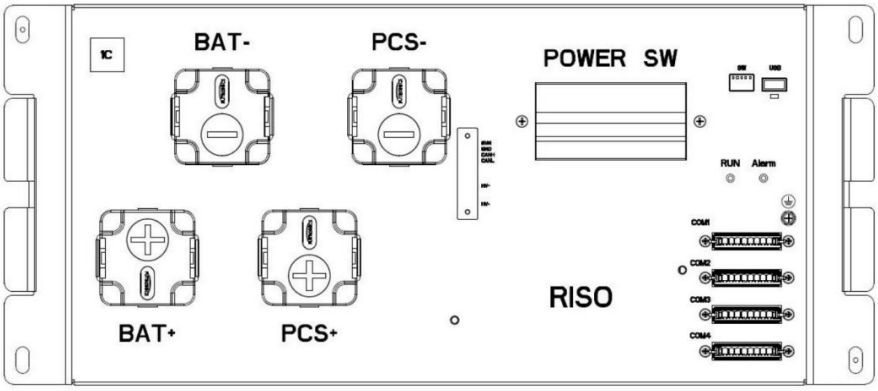


Figure 8 BPU-1C front interface

Power Switch

The battery system power output ON/OFF.

Power Terminal +/-

To connect battery series power cables/copper bar (Battery cluster). Terminals marked BAT+/ BAT- are connected to the positive and negative terminals of the first battery pack and the last battery pack respectively.

RISO Port

Test the insulation strength of the system.

Address Setting Switch

To set the address of the BPU. The dial switch is set according to the binary address, from 1 to 5 switch represents high to low, for example:only open the first switch,close 2 to 5 switch, the set address is16. Please refer to following Table 4 to set.

Communication Port 1

To connect the first battery in series communication lines.

Communication Port 2/3

To connect high voltage box series communication lines.

Communication Port 4

This is the system debugging port.

External Power +/-

To connect HPS/PCS or DC Cabinet (When having three or more parallel systems).

USB Port

Used to upgrade the BCU board code.

Run/ Alarm Light

Indicates the normal running or cannot run properly of the system.

Note: The ports of BPU-0.5 C and BPU-1C function the same, but look a little different.

8 Battery Rack installation

8.1 Battery Pack and high voltage box installation

1) Take the battery pack out of the box.

2) Distinguish battery pack A and B according to the label on the battery pack.

3) Determine the positions for installing battery pack and BPU based on Table 3, Generally, BPU and battery box-A are installed on the right, and battery box-B is installed on the left, and fix the battery pack to the battery rack with the matching M6 screws. For example, the BR157R installation diagram is shown in Figure 9.

4) **Setting the battery pack address:** As shown in the figure 10, a binary DIP switch CN7, from 1 to 5 indicates the high to low binary number. For example, only turn on the first switch, turn off switches 2 to 5, and set address 16.

8.2 Battery serial number

When installing the battery, the battery machine code in the PACK serial number and the BPU serial number must be the same and cannot be confused

S/N (Example Diagram description)

DZE0	1002P12S	2148	01	01	01	01
Battery Machine Code	Battery Modules	Year and Cycle	Battery Unit Number	Number of parallel batteries	Battery rack Number	Battery pack Number

When installing the battery, please use a forklift.

Sample Pictures: BR157R installation

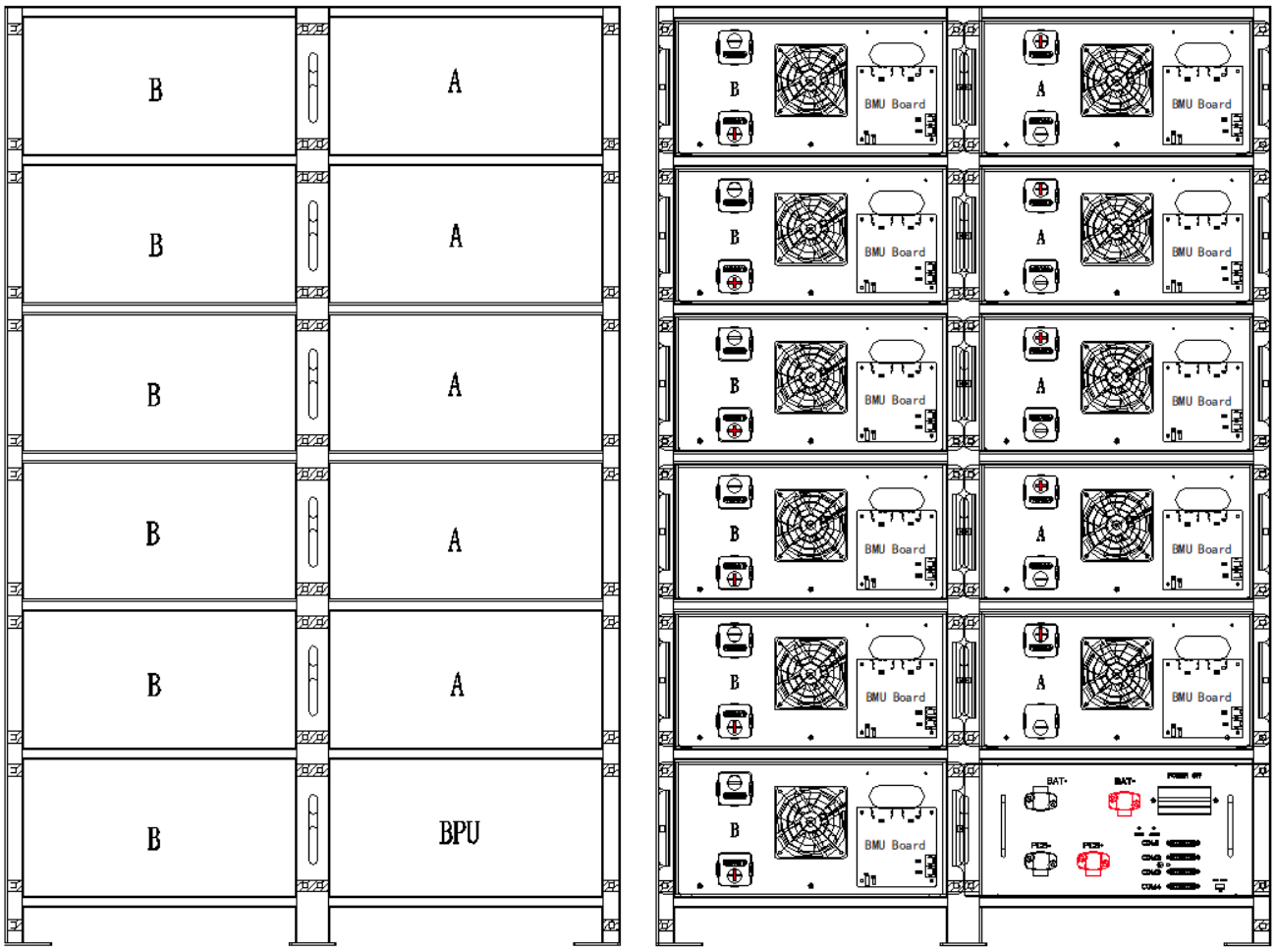


Figure 9 Battery pack and BPU-0.5C installation effect diagram

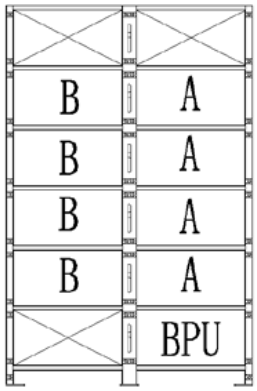
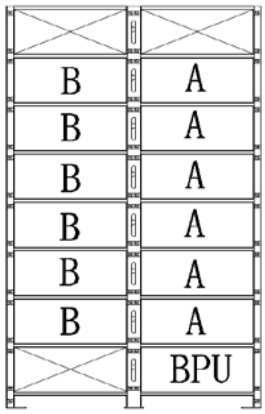
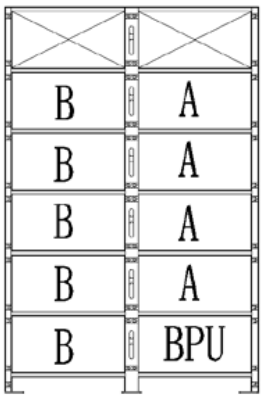
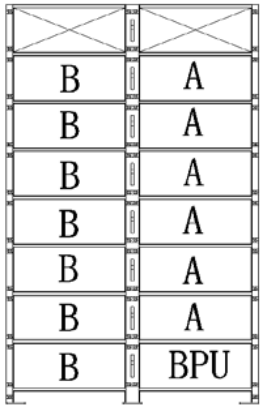
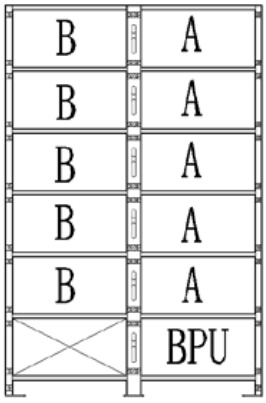
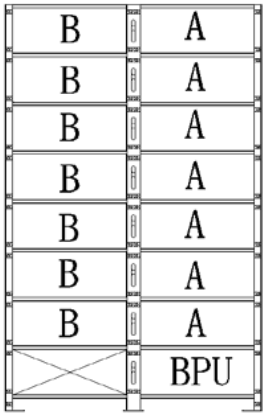
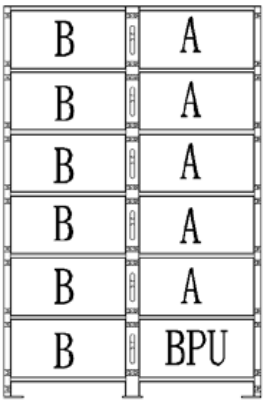
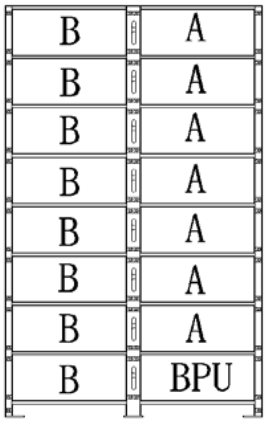
Type	Layout Diagram	Type	Layout Diagram
BR114R		BR172R	
BR129R		BR186R	
BR143R		BR200R	
BR157R		BR215R	

Table 3 Battery Rack Layout

Note: In the layout diagram, X indicates no device, A/B indicates battery pack-A/B, and BPU indicates high voltage box.

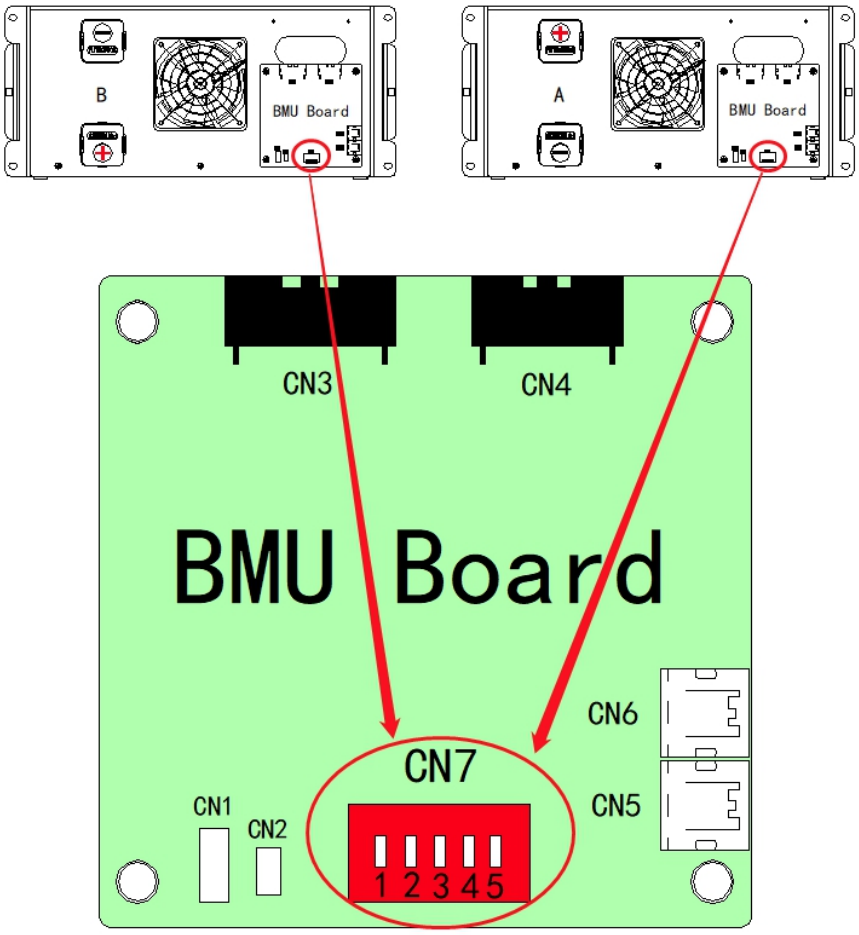


Figure 10 Battery pack address setting switch

Precautions:

- When engaging in the assembly of energy storage systems, you must wear protective shoes.
- Long sleeve shirt. It is forbidden to wear sleeveless shirts and it is forbidden to roll up the sleeves.
- Wear appropriate gloves for all personnel involved in the work.
- The battery pack weighs approximately 115kg, and it is forbidden to move by one person to prevent personal injury.
- After installing the battery pack, check the installation order and position of each battery pack. It is forbidden to mix different clusters of battery pack.
- The torque of the battery pack locking bolt is 12Nm.

Note: Please refer to following Table 4 to set the battery pack address.

Address	Address setting switch				
	1	2	3	4	5
1	X	X	X	X	ON
2	X	X	X	ON	X
3	X	X	X	ON	ON
4	X	X	ON	X	X
5	X	X	ON	X	ON
6	X	X	ON	ON	X
7	X	X	ON	ON	ON
8	X	ON	X	X	X
9	X	ON	X	X	ON
10	X	ON	X	ON	X
11	X	ON	X	ON	ON
12	X	ON	ON	X	X
13	X	ON	ON	X	ON
14	X	ON	ON	ON	X
15	X	ON	ON	ON	ON
16	ON	X	X	X	X
17	ON	X	X	X	ON
18	ON	X	X	ON	X
19	ON	X	X	ON	ON
20	ON	X	ON	X	X
21	ON	X	ON	X	ON
22	ON	X	ON	ON	X
23	ON	X	ON	ON	ON
24	ON	ON	X	X	X
25	ON	ON	X	X	ON
26	ON	ON	X	ON	X
27	ON	ON	X	ON	ON
28	ON	ON	ON	X	X
29	ON	ON	ON	X	ON
30	ON	ON	ON	ON	X
31	ON	ON	ON	ON	ON

Table 4 BPU/Battery Pack Address

8.3 Battery pack DC cable/copper bar installation

1). Take out the matching series DC cable/copper bar as shown in Figure 11. According to the label, separate the DC cables/copper bar.

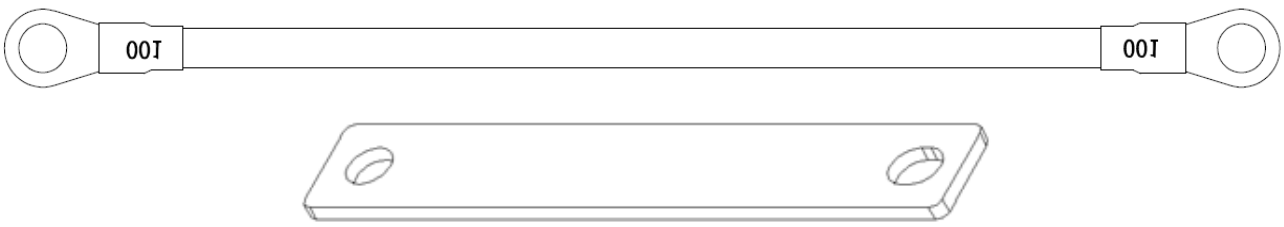


Figure 11 series DC cable and copper bar diagram

2). For example, the BR157R DC cable/copper bar connection diagram is shown in Figure 12, connect the No. 3 series copper bar to each cluster first, then connect the No. 1 serial DC cable, then connect the No. 4 serial copper bar, and finally connect the No.2 cable. Other specifications can refer to BR157R for connection.

Note: Connect from bottom to top during wiring to prevent misconnection and shorting.

Sample Pictures: BR157R installation

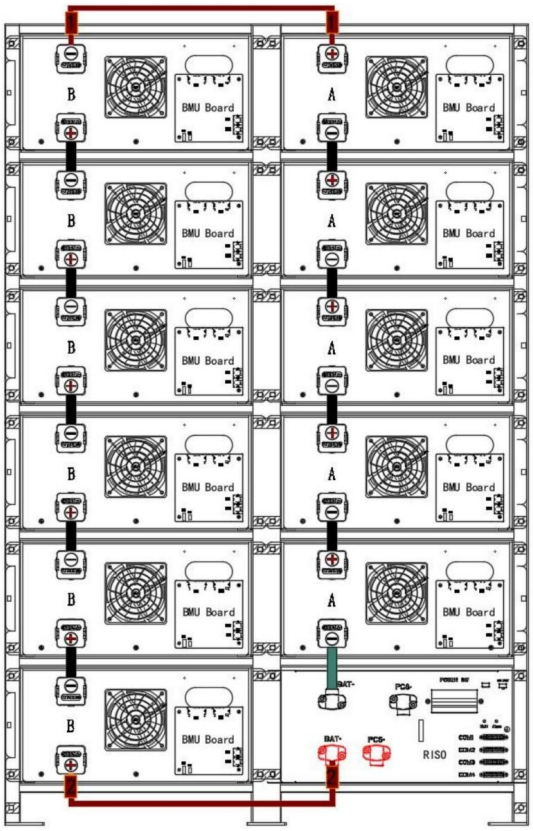


Figure 12 Battery pack DC cable/copper bar connection diagram

Precautions:

- When connecting DC cables/copper bar, connect the battery pack of each column in series, and measure the voltage of each column of battery pack with a multimeter. If there is no abnormality, then string the two columns of battery pack.
- After all the batteries in the cluster are connected in series, use an insulation meter to measure the insulation level between the positive output of the battery cluster and the battery holder, and the negative output of the battery cluster and the battery holder. The insulation level, the insulation should be greater than 100 Ω / V.
- After the DC cable and copper bar connection is completed, tap the cable plug connector with a rubber hammer to ensure that the cable is securely installed.

8.4 Battery pack communication line installation

1). Take out the matching battery pack communication line as shown in Figure 13.

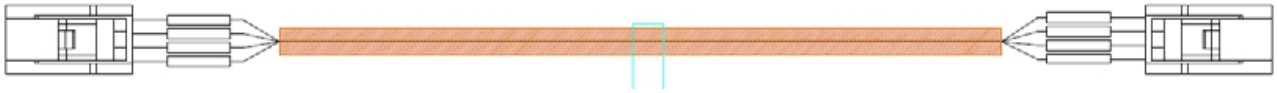


Figure 13 Schematic diagram of the battery pack communication line

2). Refer to Figure 14 to distinguish two kinds of communication lines.

3). For example, the BR157R communication line installation diagram is shown in Figure 14, other specifications can refer to BR157R for connection.

Sample Pictures: BR157R installation

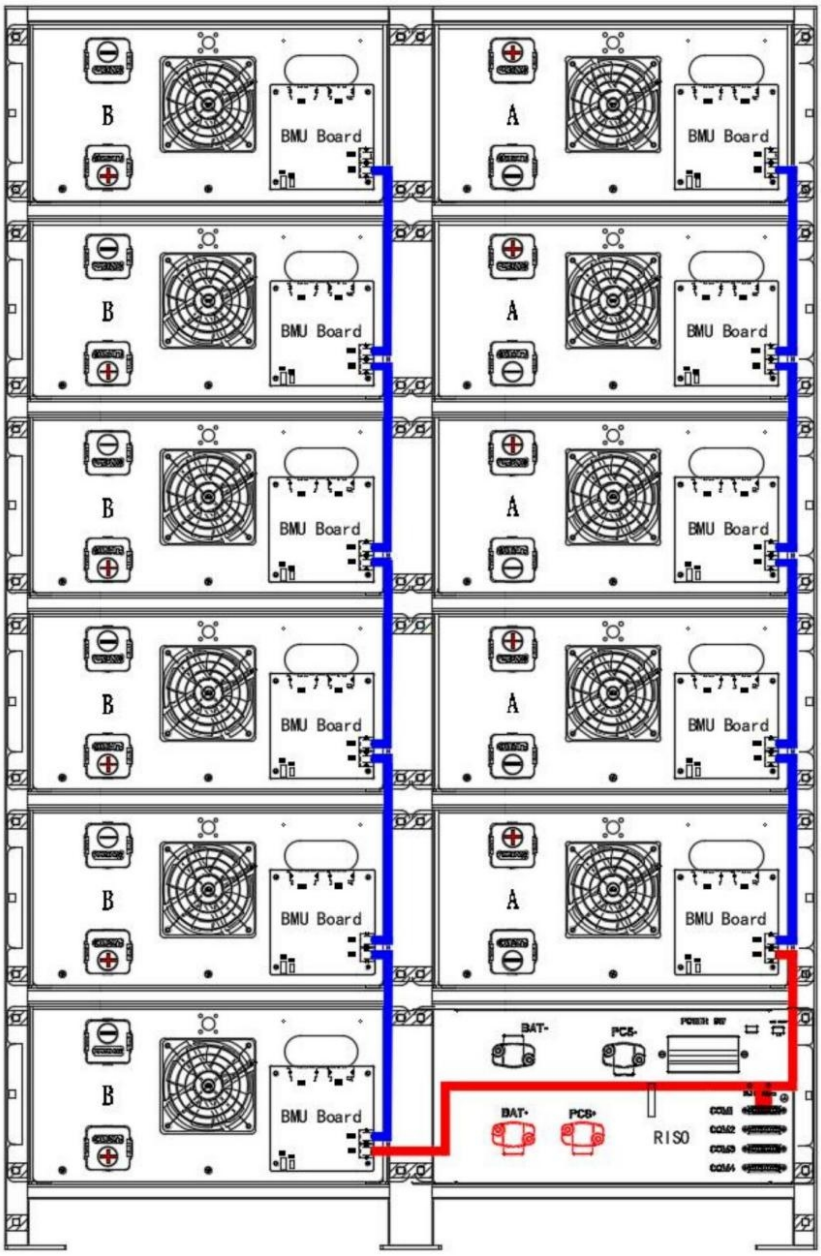


Figure 14 Battery pack communication line installation diagram

9 BR Series Energy Storage and HPS/PCS wiring instructions

Sample Pictures: BR157R installation

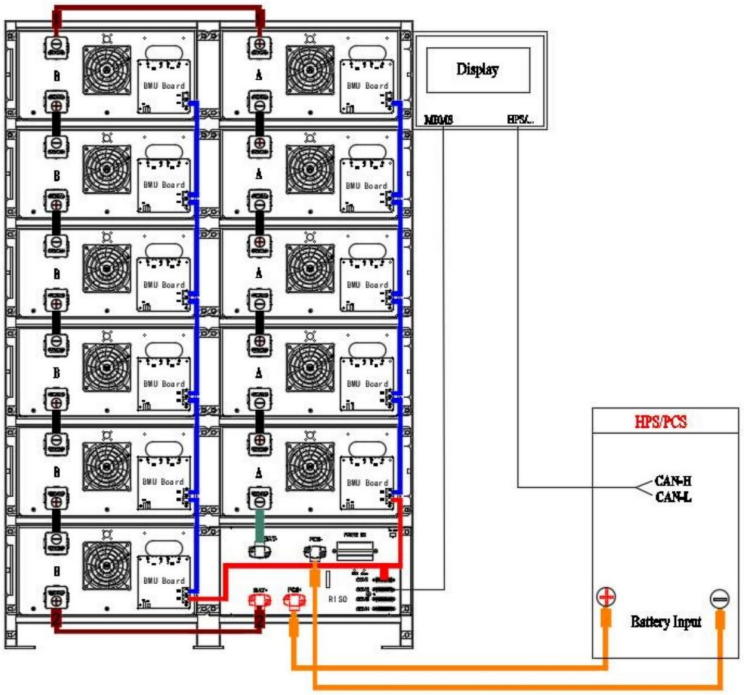


Figure 15 Battery energy storage system BPU-0.5C wiring diagram

Ports MBMS and HPS/Shine master of the display screen are respectively connected to COM2 of the BPU and CAN communication input of the inverter. After the power line and communication line inside the battery rack are connected install the inverter according to the inverter manual, and the output end of the BPU connects to the battery input end of the inverter. As shown in Figure 15, the connection diagram between BR157R and inverter is presented, other specifications can refer to BR157R for connection.

Post-installation check

After the installation of the energy storage system is completed, post-installation inspection is required:

- The battery holder and the battery pack are aligned with the mounting holes, the screws are tightened, and the torque meets the requirements (12Nm);
- The battery module number and installation location are the same;
- Field wiring is consistent with the factory wiring diagram.

Precautions:

Check whether each communication line interface is secure and whether a single small wire harness is loose before installation.

Check that the cables of each interface are tight after installation.

10 Caution

This equipment contains potentially hazardous voltages. Do not attempt to disassemble the unit.

- To avoid personal injury due to energy hazard, remove wristwatches and jewelry when repairing. Use tools with insulated handles.
- Repair are to be performed only by qualified technical personal authorized by ATESS.