ESS BATTERY

Selection Guide

Shenzhen Atess Power Technology Co.,Ltd

Department of Technical Support

Type of Battery

ATESS ESS Battery has two types: type one is BC/BR—T, type two is BR—R, shown as the figure below：

	Type One	Type Two
serial number	BC/BR—T	BR—R
Module	38.4V, 200Ah / 76.8V 100Ah	51.2V 280Ah
Cell Rated Energy	7.68kWh	14.336kWh

ATESS ESS Battery is lithium iron phosphate with our own BMS. Please read below conditions carefully before configure the battery with PV or Inverter:

1. The battery charge and discharge cut-off voltage must meet HPS battery voltage range: 352V – 600V
2. The battery charge and discharge cut-off voltage must meet PCS battery voltage range:

   For PCS100 and PCS250，voltage range：500V – 820V

   For PCS500 and PCS630，voltage range：600V – 900V
3. When configure with HPS, the maximum battery voltage must at least 50V lower than the MPPT voltage of PV strings
4. When configure with PCS, the minimum battery voltage must higher than the MPPT voltage of PV strings
5. Ensure that the maximum discharge power of battery is higher than the rated power of inverter (sum in parallel if apply). If the maximum battery discharge power of battery is lower than the rated power of inverter, needs to negotiation with client.

Type One

BC/BR—T series: General Information

	Modules	Rated Energy	Voltage Range	Inverter Range
BC/BR45T	6	46.08 kWh	403.2V -- 525.6V	HPS30
BC/BR50T	7	53.76 kWh	470.4V -- 613.2V	HPS50
BC/BR60T	8	61.44 kWh	537.6V -- 700.8V	HPS15K –HPS40K
BC/BR75T	10	76.8 kWh	336V -- 438V	HPS30 – HPS150
BC/BR100T	14	107.52 kWh	470.4V -- 613.2V	HPS, PCS100, PCS250
BR138T	18	138.24 kWh	604.8V -- 766.8V	PCS100 – PCS630
BR145T	19	145.92 kWh	638.4V -- 832.2V	PCS100 – PCS630

Note: BC/BR45T – BC/BR60T: 76.8V & 100Ah,
BC/BR75T – BC/BR145T: 38.4V & 200Ah
BC means outdoor with battery cabinet, IP54
BR means indoor or container with battery rack, IP20

Type Two

BR—R series: General Information

	Modules	Rated Energy	Voltage Range	Inverter Range
BR114R	8	114.688kWh	358.4V - 460.8V	HPS30 – HPS150
BR129R	9	129.024kWh	403.2V - 518.4V	HPS30 – HPS150
BR143R	10	143.36kWh	448V - 576V	HPS30 – HPS150
BR157R	11	157.696kWh	492.8V - 633.6V	HPS30 – HPS150
BR172R	12	172.032kWh	537.6V - 691.2V	PCS100, PCS250
BR186R	13	186.386kWh	582.4V - 748.8V	PCS100 – PCS630
BR200R	14	200.704kWh	627.2V - 806.4V	PCS100 – PCS630
BR215R	15	215.04kWh	672V - 864V	PCS500, PCS630

Note: BR—R series: 51.2V & 280Ah
BR means indoor with rack, IP20. Outdoor needs container.

Selection Process

Type One: BC/BR—T series

This BC/BR—T series has passive balancing (TPB) mode and active balancing (TAB) mode, warranty period varies according to each mode, shown as the figure below:

	Balancing	Warranty	
TPB	Passive Balancing	0.5C	5 Years
		1C	5 Years
TAB	Active Balancing	0.5C	10 Years
		1C	5 Years

Step One

Determine the battery capacity

Load Capacity：	Average load * Backup time
Battery Capacity：	Load / 0.8(80% DOD) / 0.95(Efficiency) / 0.99(Line loss)
For example： The known average load is 80kWh, and backup time is 4 hours. Load Capacity： 80kWh * 4hrs = 320kWh Battery Capacity： 320kWh / 0.8 DOD / 0.95 / 0.99 = 425.3kWh	

Step Two

Calculate the number of battery racks

No. of Racks：	Battery Capacity / Rated Energy of rack（Round up the number）
Rated Power：	No. of Racks * Rated Energy of rack
For example：The known battery capacity is 425.3kWh，the chosen rated energy of rack is 107.52kWh (BR100T) No. of Racks：425.3kWh / 107.52kWh = 3.95，round up to 4（Racks） Rated Power：4 * 107.52kWh = 430.08kWh	
Note: If the project has multiple different solutions, select the most suitable one.	

Step Three

Battery rack (Master/Slave)

No. of Racks	Rack（Master/Slave）
1	One master
2	One master and one slave
≥3	All slaves

Step Four：

Battery Master Cabinet

No. of Racks	No. of Cabinet
Racks＜3	NULL
3≤Racks≤9	One Batt-Master Cabinet 9R
9＜Racks≤15	One Batt-Master Cabinet 15R
15＜Racks	Configure multiple combined of 9R and 15R, or discuss with Client
Note: If battery module 1C is configured, the battery rack and battery cabinet must be 1C	

Step Five:

Battery module - 0.5C/ 1C

Battery Capacity value ≥ Inverter Power value * 2	Choose 0.5C
Note: If battery module 0.5C is configured, the battery rack and battery cabinet must be 0.5C	
Inverter Power value*1＜Battery Capacity value＜Inverter Power value*2	Choose 1C
Note: If battery module 1C is configured, the battery rack and battery cabinet must be 1C	

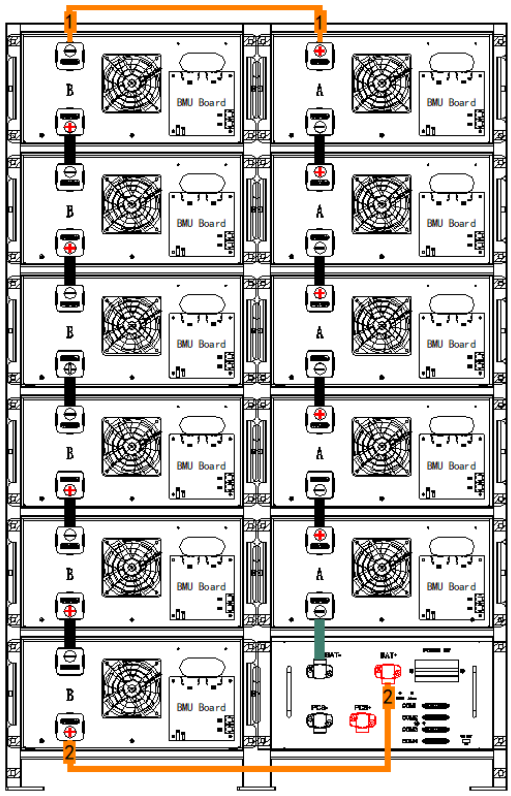
Step Six

Rack and Inverter

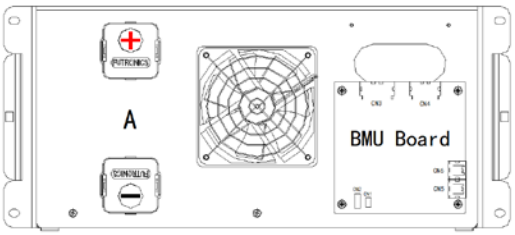
Rack	Inverter
BC/BR45T	HPS30
BC/BR50T	HPS50
BC/BR60T	HPS15KTL – HPS40KTL
BC/BR75T	HPS30 – HPS150
BC/BR100T	HPS, PCS100, PCS250
BR138T	PCS100 – PCS630
BR145T	PCS100 – PCS630

Type Two: BR—R series

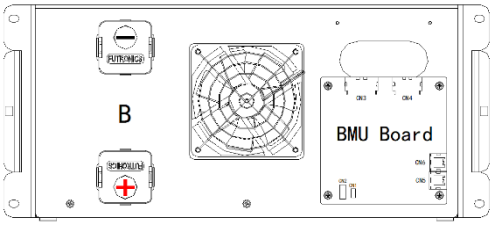
Each battery rack is composed of two kinds of battery modules -- A and B. The battery modules in the left column of the battery rack are B modules, and in the right column of the battery rack are A modules, as shown in the following figure：



Battery modules A and B are almost same except only differences are the positive and negative positions of the modules. As shown in the picture below:



ESS-BM-51.2V-280R-A



ESS-BM-51.2V-280R-B

When the number of module in one battery rack is even, the number of module A is the same as the number of module B.

For example: the total number of module BR200R is 14

The number of module A is 7， and the number of module B is 7

When the number of module of one battery rack is odd, the number of module A is one less than the number of module B.

For example: the total number of module BR129R is 9

The number of module A is 4, and the number of module B is 5

Shown as the figure below:

	BR114R	BR129R	BR143R	BR157R	BR172R	BR186R	BR200R	BR215R
A	4	4	5	5	6	6	7	7
B	4	5	5	6	6	7	7	8
Total	8	9	10	11	12	13	14	15

Note: this BR—R series battery only has passive balancing (TPB) mode

Step One

Determine the battery capacity

Load Capacity:	Average load * Backup time
Battery Capacity:	Load / 0.8 (80% DOD) / 0.95 (Efficiency) / 0.99 (Line loss)
For example: The known average load is 100kWh, and backup time is 4 hours. Load Capacity: 100kWh * 4hrs = 400kWh Battery Capacity: 400kWh / 0.8 DOD / 0.95 / 0.99 = 531.63kWh	

Step Two

Calculate the number of battery racks

No. of Racks:	Battery Capacity / Rated Energy of rack（Round up the number）
Rated Power:	No. of Racks * Rated Energy of rack
For example: The known battery capacity is 531.63kWh, the chosen rated energy of rack is 143.36kWh (BR143R) No. of Racks: 531.63kWh / 143.36kWh = 3.7, round up to 4（Racks） Rated Power: 4 * 143.36kWh = 573.44kWh	
Note: If the project has multiple different solutions, select the most suitable one.	

Step Three

Battery rack (Master/Slave)

No. of Racks	Rack（Master/Slave）
1	One master
2	One master and one slave
≥3	All slaves

Step Four

Battery DC Cabinet

No. of Racks	No. of Cabinet
Racks＜3	NULL
3≤Racks≤9	One Batt-Master Cabinet 9R
9＜Racks≤15	One Batt-Master Cabinet 15R
15＜Racks	Configure multiple combined of 9R and 15R, or discuss with Client
Note： BR—R series must configure with 1C battery cabinet	

Step Five

Battery module - 0.5C/ 1C

Battery Capacity value ≥ Inverter Power value * 2	Choose 0.5C
Note： If battery module 0.5C is configured, the battery rack must be 0.5C and battery cabinet must be 1C. This BR—R series only has 0.5C battery module, if 1C battery module is needed, please use BC/BR—T series	

Step Six

Rack and Inverter

Rack	Inverter
BR114R	HPS30 - 150
BR129R	HPS30 - 150
BR143R	HPS30 - 150
BR157R	HPS30 - 150
BR172R	PCS100, PCS250
BR186R	PCS100 – PCS630
BR200R	PCS100 – PCS630
BR215R	PCS500, PCS630