

BLUE NOVA energy

User Manual

52V RacPower Range

**BN52V-100-5.2k BP
with CAN communication**

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Approved by	J.P. Verster

A. DOCUMENT SCOPE

Congratulations on purchasing a high quality BlueNova® product.

This document covers structural information, installation instructions, troubleshooting, safety & maintenance instructions, storage guidelines as well as emergency & first aid procedures specific to:

- **BlueNova® 52V RacPower** product range, consisting of BN52V-100-5.2k

If you are unsure whether this document is applicable to your battery, or if you have any questions or comments, kindly contact BlueNova® Technical Support:

☎ Office: +27 21 205 2000 ✉ E-mail: support@bluenova.co.za

Please do not discard this document as it contains valuable information that might have to be referenced at a later stage.

B. STRUCTURAL OVERVIEW

The BlueNova® 52V RacPower range has been designed to be installed in 19" (11U) server racks. The weight & dimensions of each enclosure in this range is listed below:

		Dimensions (L x W x H)	Weight (net)
1	BN52V-100-5.2k BP RacPower	435 x 480 x 150mm	41kg

Note: The dimensions above are the dimensions of the main chassis (excluding the front panel) in each case. For a more detailed overview of dimensions, please see latest product data sheets.

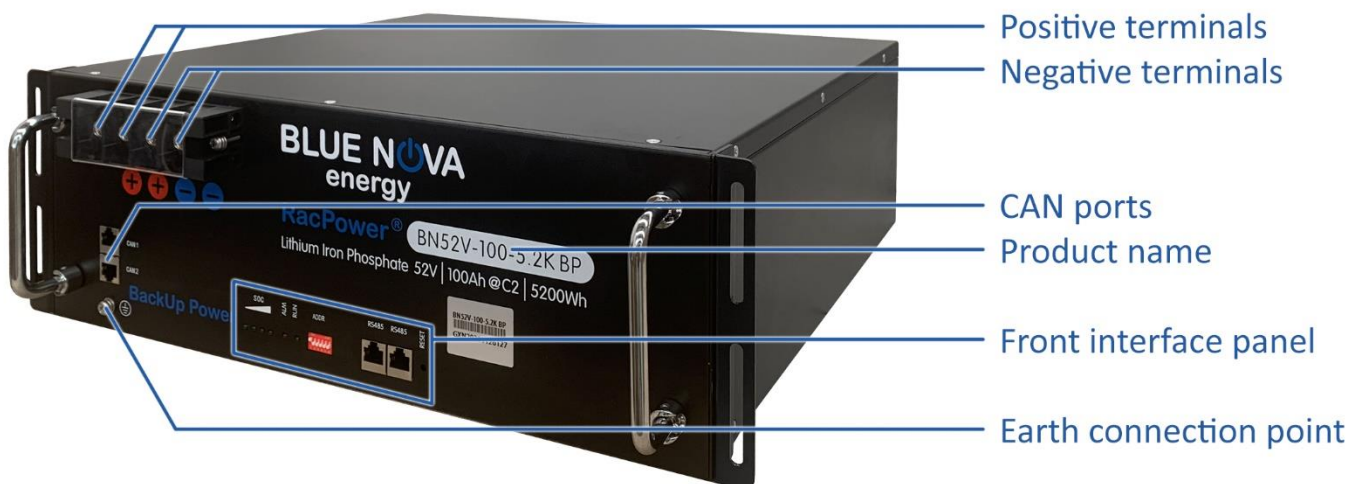


Diagram: BN52V-50-5.2k RacPower

C. FRONT INTERFACE PANEL

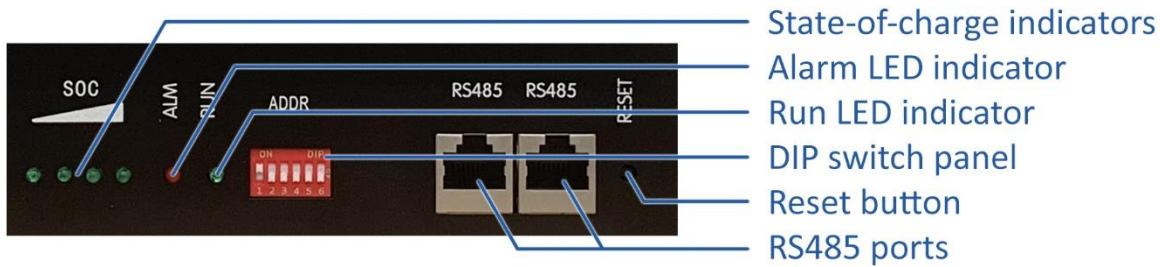


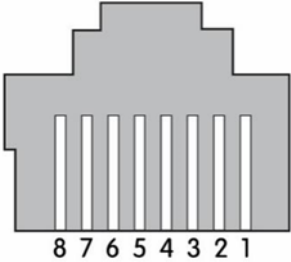
Diagram: Front Interface Panel (BN52V-100-5.2k)

SYSTEM START / SHUT DOWN / RESET:





FUNCTION	OPERATION
Start	Keep the RESET button depressed for 3 seconds while the battery is off. LED's on the panel will then flash from left to right.
Shut down	Keep the RESET button depressed for 3 seconds while the battery is on. LED's on the panel will then flash from right to left.
Reset	Press the RESET button for 6 seconds while the battery is on.

COMMUNICATION PORTS:

COMPONENT	FUNCTION / DESCRIPTION
RS232 (RJ11)	Not active
CAN Ports (RJ45 x 2)	Serial communication via CAN Bus. PIN configuration as follows: <ul style="list-style-type: none"> - 7 : CAN-H - 8 : CAN-L
RS485 Ports (RJ45 x 2)	Pin configuration as follows: <ul style="list-style-type: none"> - 1/8 : A - 2/7 : B - 3/6 : GND - 4/5 : NC



STATE-OF-CHARGE:

COMPONENT	FUNCTION / DESCRIPTION
State-of-charge indicator	   
	<div style="display: flex; justify-content: space-around;"> <div>0% – 25% SoC</div> <div>25% – 50% SoC</div> <div>50% – 75% SoC</div> <div>75% – 100% SoC</div> </div>

D. INSTALLATION

1. VOLTAGE-BASED INSTALLATION

The following values highlighted in blue must be set on the inverter/charger:

Parameter	Cell V	Value	Comment
V _{high set}	3.53 V	56.4 V	Typical bulk/absorption charge setpoint.
V _{float}	3.44 V	55.0 V	Floating voltage set point.
V _{reconnect}	3.06 V	49.0V	Mains or generator must reconnect to charge batteries.
V _{low set}	2.9 V	46.5V	Inverter must switch off the load.

- Maximum Continuous Charge Current limit = 50 A
- Recommended Charge Current = 10 A
- Maximum discharge Current limit = 100 A
- Recommended discharge current limit = 50 A

IMPORTANT: Inverter/charger voltage calibration

Some inverters/chargers have been known to return inaccurate results when measuring voltage. In such cases, the inverter/charger should be calibrated as follows:

Compare the voltage values displayed by the inverter/charger with that of a calibrated voltmeter. If the actual voltage differs by more than 100mV from that measured by the inverter/charger, apply this difference to the highlighted values above (i.e. if actual voltage = 56V while inverter voltage = 56.5V, the voltage difference = 0.5V should be subtracted from each of the set values above).

Note: Some inverters/chargers have pre-programmed lead-acid related algorithms & functionalities such as *auto-desulfation* and *equalisation*. These functionalities should be disabled, where possible.

2. PARALLEL CONNECTION

Address	DIP Switch Number				Inverter Protocol configuration			Master / Slave (CAN)	Definition (RS485)
	#1	#2	#3	#4	#5	#6	Inverter		
1	ON	OFF	OFF	OFF	OFF	OFF	Victron250	Master	Pack1
2	OFF	ON	OFF	OFF	OFF	OFF	Victron250	Slave 1	Pack2
3	ON	ON	OFF	OFF	ON	OFF	Victron500, SMA, Studer	Slave 2	Pack3
4	OFF	OFF	ON	OFF	ON	OFF	Victron500, SMA, Studer	Slave 3	Pack4
5	ON	OFF	ON	OFF	OFF	ON	Victron500, SMA, Studer	Slave 4	Pack5
6	OFF	ON	ON	OFF	OFF	ON	Goodwe	Slave 5	Pack6
7	ON	ON	ON	OFF	ON	ON	Reserved	Slave 6	Pack7
8	OFF	OFF	OFF	ON	ON	ON	Reserved	Slave 7	Pack8
9	ON	OFF	OFF	ON	ON	ON	Reserved	Slave 8	Pack9

Note:
Ensure to have the same protocol configuration on all parallel units.

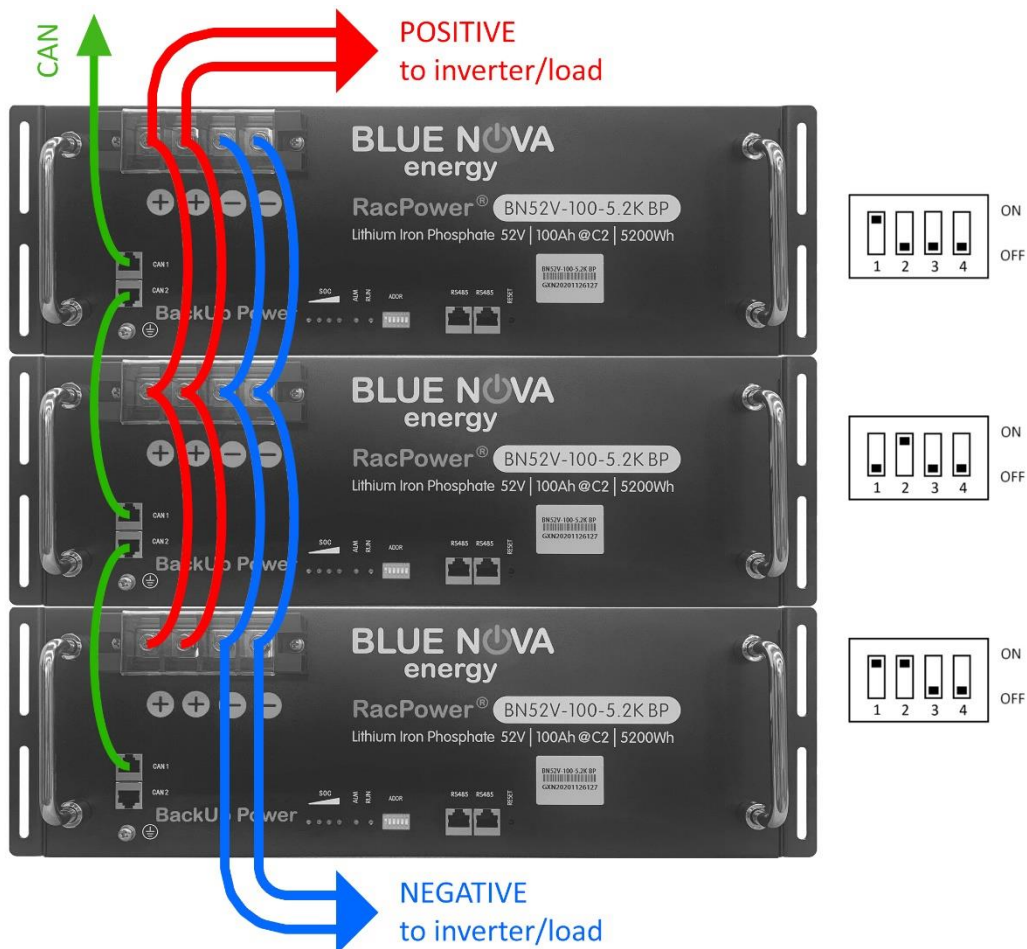


Diagram: Parallel Connection

BlueNova® 52V RacPower batteries can be connected in parallel to each other to increase overall capacity **ONLY IF ALL** the requirements below are met:

- a. The nominal voltage of all parallel-connected batteries is the same (52V), and
- b. The installed capacity for all batteries is the same, and
- c. Each battery is operating within its warranty period.

A total of 6 units can be connected in parallel, for total installed capacity of 31.2kWh @C2, 25°C.

2.1 PARALLEL CONNECTION: STEP-BY-STEP INSTRUCTIONS

1. Ensure that all units are grounded by connecting each chassis to GROUND from the rear right panel. Wire diameter should be equal to or exceed 1mm².
2. Connect the **POSITIVE** terminals of the first (top) unit to the second unit, then from the second unit to the third etc. as illustrated above. Wire diameter should be equal to or exceed 8mm².
3. Connect the **NEGATIVE** terminals of the first (top) unit to the second unit, then from the second unit to the third etc. as illustrated above. Wire diameter should be equal to or exceed 8mm².
4. Configure the dip switches for the master battery and slave batteries respectively.
5. Connect the RS485 ports of all parallel batteries with each other with a straight 1-to-1 pin RJ45 cable.

2.2 SWITCHING ON PARALLEL CONFIGURATIONS

1. After the system has been fully installed ensure that all the battery units are switched off. All LED's on the front panel should be off.
2. Switch on the first (master) unit. The rest of the batteries will then switch on automatically.

E. MAINTENANCE

1. General Guidelines

- a. Do not short circuit the battery terminals.
- b. Do not use the battery without a BlueNova® approved integrated BMS solution.
- c. Do not disassemble, pierce, cut or in any way physically alter any part of the battery.
- d. Do not burn, incinerate or otherwise subject the battery to extreme heat.

2. Storage Instructions

- Ensure that the battery is switched off when stored.
- Disconnect the communication cable.
- Always store batteries in a cool and well-ventilated area – ideally $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$.
- Store away from moisture and heat.
- Do not store batteries upside down for overly long periods.
- Check the open circuit voltage of stored batteries at least once per month. Recharge batteries sufficiently and frequently enough to prevent the open circuit voltage falling below 40V.
- The battery needs to be charged every 6 months if out of use.
- Ensure that the stored battery's state of charge is always above 50%. 100% SOC is optimal.
- Don't place more than 6 units on top of each other.

F. TROUBLESHOOTING

Please cross-reference the behaviour of the battery's LED indicators with the table below to determine whether your battery is operating correctly. Kindly contact BlueNova Technical Support for assistance if necessary.

Battery Status	State	SOC Indicators				RUN LED	ALM LED
		●	●	●	●	●	●
Off	Sleep mode	OFF	OFF	OFF	OFF	OFF	OFF
Stand by	Normal	Indicates state-of-charge				ON	OFF
	Warning	Indicates state-of-charge				ON	Flash 2
	Protection	Indicates state-of-charge				OFF	ON
Charging	Normal	Indicates state-of-charge				Flash 1	OFF
	Warning	Indicates state-of-charge				Flash 1	Flash 2
	Protection	Indicates state-of-charge				OFF	ON
Discharging	Normal	Indicates state-of-charge				Flash 2	OFF
	Warning	Indicates state-of-charge				Flash 2	Flash 2
	Protection	Indicates state-of-charge				OFF	ON
BMS Failure	Sleep mode	OFF	OFF	OFF	OFF	Flash 2	

Flash 1: LED flashes once every second / **Flash 2** – LED flashes once every 2 seconds

G. EMERGENCY & FIRST AID

1. In case of fire

- Evacuate danger zone. Open ventilation in the room if possible.
- Extinguish fire with a CO2 fire extinguisher.
- After the fire has been extinguished, immerse any remaining smoking cells completely in water. Wear protective gear during this procedure.

2. Skin contact

- a. Wash the affected area immediately with soap and water.
- b. If irritation persists, seek medical attention.

3. Eye contact

- a. Rinse eyes immediately with clean water continuously for at least 15 minutes.
- b. Seek medical attention immediately afterwards.

4. Ingestion

- a. Refrain from taking any emetic or vomit-inducing medicine.
- b. Seek medical attention immediately.