ENERDRIVE

DOMETIC

B-TEC ULTRA

•EPL-100BT-12V-G3 •EPL-120B T-12V-G3 •EPL-200BT-12V-G3 •EPL-300BT-12V-G3

Owner's Manual

ENERDRIVE|DOMETIC B-TEC ULTRA (LiFePO4)

Lithium Iron Phosphate Battery with Smart Phone Monitoring

B-TEC ULTRA

For safe and optimum performance, the ENERDRIVE|DOMETIC B-TEC ULTRA LiFePO4 Lithium Iron Phosphate Battery with Smart Phone Monitoring must be used properly. Carefully read and follow all instructions and guidelines in this manual and give special attention to the CAUTION and WARNING statements.

PLEASE KEEP THIS MANUAL FOR FUTURE REFERENCE

Disclaimer

While every precaution has been taken to ensure the accuracy of the contents of this guide, ENERDRIVE|DOMETIC assumes no responsibility for errors or omissions. Note as well that specification and product functionality may change without notice.

Important

Please be sure to read and save the entire manual before using your Enerdrive B-TEC LiFePO4 Lithium Iron Phosphate Battery with Smart Phone Monitoring. Misuse may result in damage to the battery, and/or cause harm or serious injury. Read manual in its entirety before using the unit and save manual for future reference.

Product Number

EPL-100BT-12V-G3
EPL-120BT-12V-G3
EPL-200BT-12V-G3

Document Part Number

B-TEC ULTRA Manual (Rev 0.1)
2024

Support Contact Information

Dometic Power & Control (Enerdrive) Pty Ltd
P.O. BOX 9159, Wynnum Plaza, Queensland, Australia 4178
Ph: 1300 851 535
Warranty Returns: Reply Paid 8786, Wynnum Plaza, QLD 4178
Email: support.enerdrive@dometic.com
www.enerdrive.com.au

TABLE OF CONTENTS

1. Safety

1.1 Statement

Please read this manual carefully before installation, operation, and maintenance, and pay attention to various warning signs and statements on the equipment. After reading this manual, please keep it properly for future reference.

1.2 Specification

This manual contains symbols that should be paid special attention to during operation.

Symbol	Statement
	Precautions need to be taken during operation
	Risk of electric shock and protective measures need to be taken
	Matters that require special explanation or reminder

1.3 Critical Safety Information

Before installing, operating, or maintaining the battery, the following instructions must be read:

- **Before Installing**:
  - Carefully read the user manual before installing or using the battery. Failure to follow any instructions or warnings in this document may result in electric shock, serious injury, or damage to the battery and the entire system.
  - Check the voltage and ensure that they are within the limits of your device specifications before connecting the battery pack to your device. Failure to comply with these specifications will void your warranty.
- **During Installation**:
  - Personnel familiar with the electrical specifications of their country or region are required to install battery packs. For optimal safety, please follow the steps described in this manual.
- **Battery Operation**:
  - Do not connect batteries to different types of batteries.
  - Do not use faulty or mismatched chargers to charge the battery.
  - Follow the environmental conditions specified in the product specification.
  - If the battery is deformed, abnormally hot, or emitting an odor, immediately cut off the power and stop using it.

1.4 Battery Maintenance

1. Professional personnel should take care of the charging operation, ensure good contact between the plug and socket during the charging process, ensure normal operation of the charging equipment, and ensure good contact at all connection points of the battery pack. If there is an abnormality, it needs to be repaired before charging.
2. If there is a large amount of dust, metal shavings, or other debris on the upper cover and pole of the battery pack, clean it with a vacuum cleaner in a timely manner to avoid using water or objects soaked in water for cleaning.
3. Avoid splashing water or other conductive objects onto the battery cover and pole during charging and discharging, such as when exposed to heavy rain for use.
4. Estimate the charging and discharging time of the battery or battery pack based on its actual usage status. Pay attention to observing whether there are any abnormalities in the battery or battery pack at the end of charging and discharging, such as voltage difference issues.
5. Check whether the conductive strip, voltage collection terminal, and other nodes are loose, detached, rusted, or deformed, ensuring that the batteries used in series or parallel connection are fixed and reliable (once/3 months).

1.5 Waste Disposal

Please handle packaging and replace components in accordance with the laws and regulations of the country or region where the battery pack is located. Do not mix batteries with daily life.

2. Installation

2.1 Tools and Equipment

- **Insulating Gloves**
- **Safety Shoes**
- **Tools**

2.2 Battery Placement

Gently place the battery pack face up on the support surface, do not lay it on its side or upside down, and do not place any covers above the pack. The schematic diagram of battery pack placement is shown in Figure 1.

Figure 1: Installation and Placement Diagram

2.3 Battery Supporting Materials

Table 1: Material List

Line	Description		QTY	
1	Coms Link Cable		1	500mm long M1 2 circular communication interface at both ends
2	Battery		1	12.8V 100Ah Or 12.8V 200Ah Or 12.8V 300Ah
3	Screws		2	M8x16mm SS/Screw

3. Introduction to B-TEC ULTRA Series Batteries

3.1 Main Features

- **LiFePO4 Chemistry**: Provides excellent safety and lifespan.
- **High Reliability**: Ensures consistent performance over a wide temperature range.
- **Heat Dissipation**: Maintains high current charging and discharging for longer periods.
- **Communication Function**: Enables the battery to communicate with external devices through CAN for better battery management.

3.2 Product Appearance

Figure 2: Battery Appearance

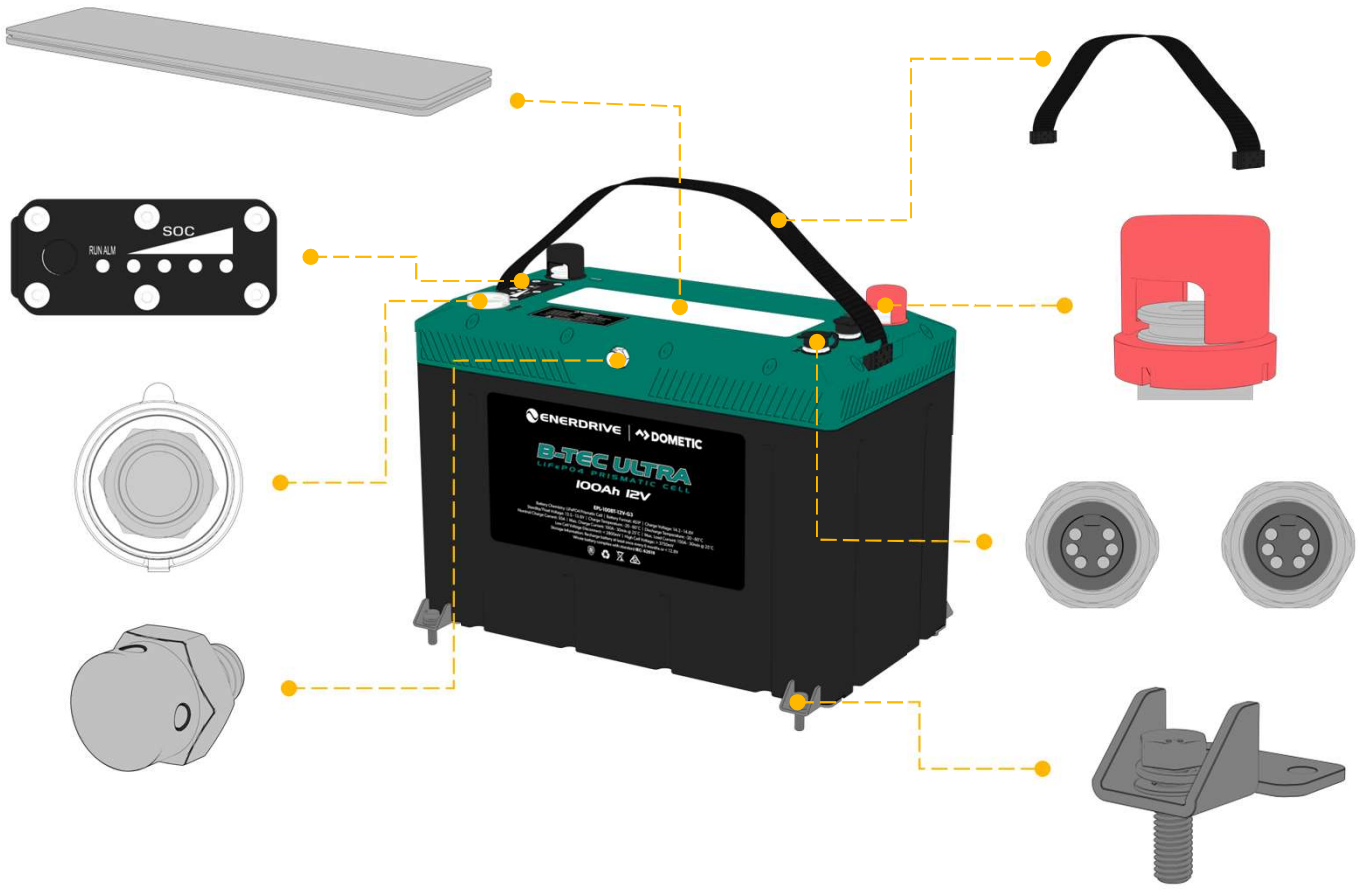


Figure 2: Battery Appearance

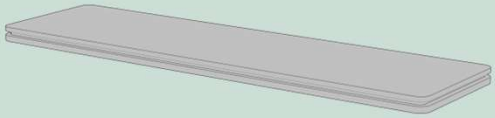
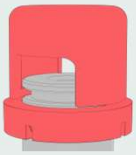
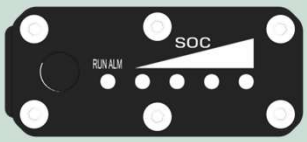
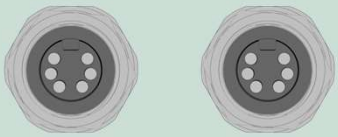
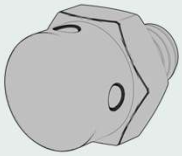
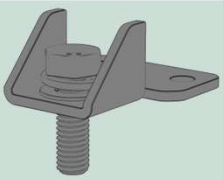
No	Image	Name	Description
1		Heat Sink	Disperse the heat inside the battery, be careful not to touch it with your hands
2		Battery Terminal	M8 Terminal in POS Red and Neg Black
3		Panel	Check the SOC running light to preliminarily determine whether the battery operates normally
4		Power Switch	When the battery is not used for a long time, it can be disconnected to reduce self-consumption
5		Labels	Carefully read the label and use the battery correctly according to the label content
6		Handle	Convenient handling of batteries
7		Coms Ports	Battery to battery communication, battery to external communication
8		Pressure Relief Valve	IP67 to prevent lithium batteries from exploding in special circumstances
9		Bracket	Convenient for fixing the battery on the ground

Table 1: Component Description

3.3 Functional Characteristics

3.3.1. Heat sink

The heat sink is a BMS cooling component for rapid heat dissipation which is beneficial for extending the operation under heavy loads and life of the BMS. At the same time, the heat sink may get hot and shouldn't be touched by hand during operation to avoid Burns

3.3.2. Battery terminal

Each battery has a positive terminal and a negative terminal. During use, be sure to identify and avoid reversing the positive and negative poles. After connecting the power line to the Battery terminal, cover it with a protective cover to avoid short circuits.

3.3.3. Display panel

The battery display panel has 1 fault/running light, 4 SOC indicator lights, and 1 button.

The Indication explanation is as follows

RUN/ALM LED: GREEN/RED

Displayed in GREEN when the battery is normal.

When there is a battery failure alarm or protection, it will display in RED.

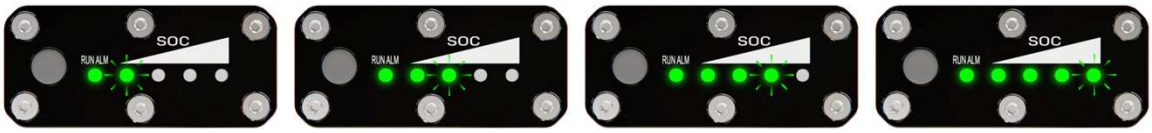
LED COLOUR		ON Solid	Flashing
GREEN		Always on during Charging & Discharging	Flashes when in Standby #1
RED		Always on when there is a Fault Condition	

Flashing Mode	LED on Time	LED off Time
#1	0.25sec	3.75sec
#2	0.5sec	0.5sec

SOC indicator lights: 4 green lights, representing different SOC according to different lighting methods.

Each LED represents 25% SOC

Status	Charge				Discharge			
SOC LED	LED 1	LED 2	LED 3	LED 4	LED 1	LED 2	LED 3	LED 4
0-25%	Blink 2	OFF	OFF	OFF	ON	OFF	OFF	OFF
25-50%	ON	Blink 2	OFF	OFF	ON	ON	OFF	OFF
50-75%	ON	ON	Blink 2	OFF	ON	ON	ON	OFF
75-100%	ON	ON	ON	Blink 2	ON	ON	ON	ON



3.3.4. Battery switch Power switch:

The battery power switch is used to turn the battery ON or OFF.

When the battery is in the ON state, it indicates that the battery BMS is in a normal state and can be charged, discharged, and connected to Bluetooth; When the battery is in the OFF state, it indicates that the battery is in a shutdown state, and cannot be charged or discharged, and cannot connect to the battery Bluetooth; The battery enters a sleep state.

When the battery is not used for a long time, placing the switch in the OFF state can reduce BMS power consumption.

The B-TEC ULTRA lithium battery is equipped with an intelligent BMS, which is designed to better protect the battery cells. From the OFF state to the ON state, the BMS performs a self-check, and the self-check time does not exceed 10 seconds. Therefore; the startup time is normal within 10 seconds.

Reset button: The battery cannot be used normally until it is activated

Usage method:
① When using the battery for the first time, place the battery power switch in the ON position;
② Short press the reset button for 1s to indicate battery SOC, and the LED will be on for 10s;
③ Long press and hold the reset button for 10s to activate the battery. After activation, the LED lights will indicate the battery SOC; RUN light flashing yellow; It is used to automatically match the battery address for networking.
For detailed purposes, please refer to the networking function.

3.3.5. Label

Labels are performance parameters displayed. During use, it is important to match/not exceed the corresponding charger and load specs according to the label parameters to avoid battery failure.

3.3.6. Handle

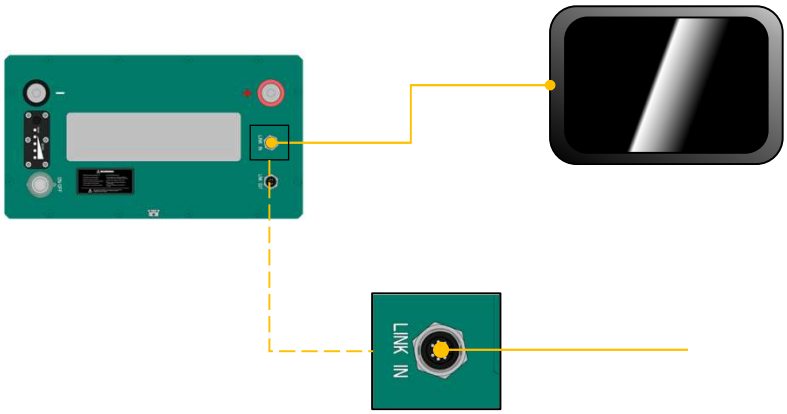
The handle is used to bear the weight of the battery. When lifting the battery, pay attention to observing the stability of the handle to avoid the battery falling off and dropping.

3.3.7. Communication port

There are two communication ports: one is Link in and the other is Link out. Pay attention during Setup/installation.

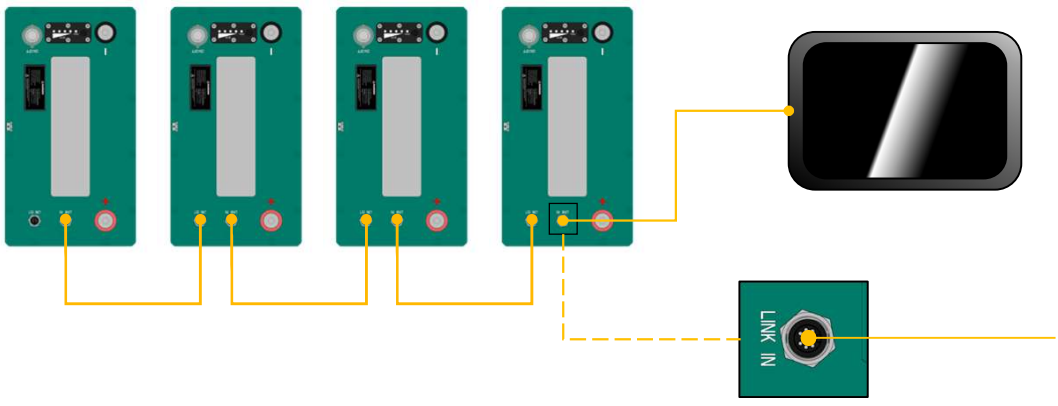
When the battery needs to communicate with external devices, a Link in needs to be connected;

A: Schematic diagram of single battery usage



B: When multiple batteries are used in series or parallel, the external device communication line needs

to be connected to the battery Link in;



3.3.8. Pressure relief valve

The waterproof Rating is IP67, because the battery is heating during charging and discharging, this can lead to thermal expansion of the Air inside the case. Adding a pressure relief valve can prevent the air pressure inside the battery box from rising which could result in failure of the IP67 Seal. Make sure that there is no other objects around the pressure relief valve.

3.3.9. Installation bracket

Install the bracket to facilitate the installation of battery in vehicles. It is recommended to use M6 stainless steel screws to secure the battery.

3.3.10 Heating Function

The B-TEC ULTRA series features a unique internal heating function that allows the battery to operate efficiently in low-temperature environments. This ensures optimal performance even in extreme conditions. This Function is automatically controlled via the BMS.

3.3.11 Communication Ports

① 2 x Communication ports with CAN communication (Input & Output)

② You can upgrade the battery firmware through the communication port;

③ It can communicate with other devices through the communication port.

NOTE: Only connect using genuine cables and Never cut a cable while connected

3.3.11 Specifications

Item	B-TEC ULTRA 12100	B-TEC ULTRA 12120	B-TEC ULTRA 12200	B-TEC ULTRA 12300
Nominal Voltage	12.8V	12.8V	12.8V	12.8V
Nominal Energy	1280Wh	1536Wh	2560Wh	3840Wh
Nominal Capacity	100Ah	120Ah	200Ah	300Ah
Internal Resistance	⇠30mΩ	⇠30mΩ	⇠30mΩ	⇠30mΩ
Max Charge Current	100A @ 25°C	100A @ 25°C	200A @ 25°C	300A @ 25°C
Max Discharge Current	150A @ 25°C	150A @ 25°C	200A @ 25°C	300A @ 25°C
Recommended Charge Current	50A	50A	100A	150A
Recommended Discharge Current	100A	100A	150A	200A
Peak/Surge Current Limit	500A-3s	500A-3s	800A-5s	1000A-5s
Short Circuit Current	1000A-500μs	1000A-500μs	1200A-500μs	1200A-500μs

4. Series and Parallel Connection of Batteries

4.1 Introduction

For different application scenarios, B-TEC ULTRA batteries can be used in series or parallel to achieve higher voltage or capacity.

The B-TEC ULTRA battery allows multiple batteries to be connected in series or parallel, as well as simultaneously connected in series and parallel.
This allows for the assembly of different voltage systems and the expansion of battery system capacity.

For example; Four x 12.8V200Ah batteries can be connected in series and parallel to form a 25.6V400Ah battery system.

When multiple sets of batteries are connected in series and parallel at the same time, in addition to external power lines, communication lines can be connected between the batteries to allow internal communication between the batteries to better obtain battery information. One battery can be set as the host/master battery, and the other batteries can be set as the slave battery. The host collects all information about other slave batteries, and can communicate with external devices such as inverters, display screens, MPPTs, etc.

Before connecting batteries in series or parallel, it is necessary to pay attention to:

a). The batteries must be of the same model. Different models, different capacities, and different voltage platforms, series and parallel connection is not allowed.

b). Ensure that all parallel wires are of the identical length.

c). 0.5C charging is recommended, that is, charging current=rated capacity of battery x 0.5C.

d). before connecting the batteries in series and parallel, the voltage of each group of batteries must remain highly consistent. It is recommended that the voltage difference between battery packs be:

Voltage difference ＜ 500mV

NOTE: It is required to charge each battery to 100% independently prior to connecting together.

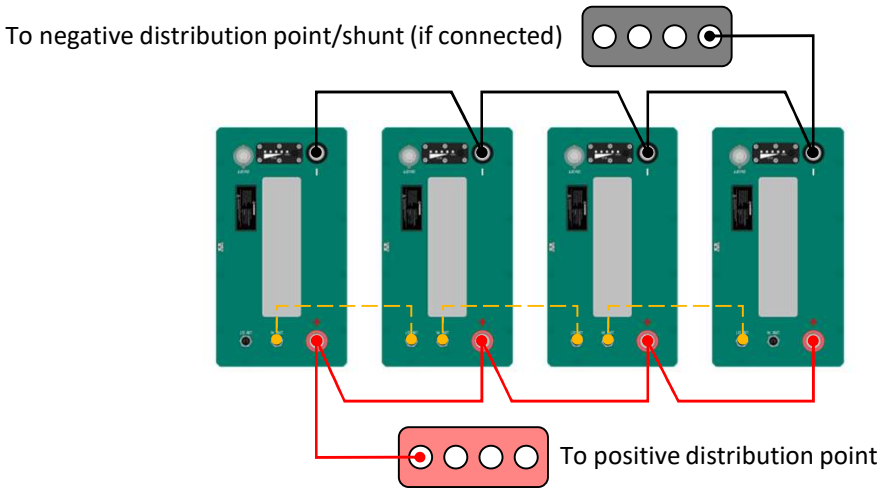
When battery batteries are connected in series and parallel, it will be charged and discharged as a whole system.

4.2 Parallel usage

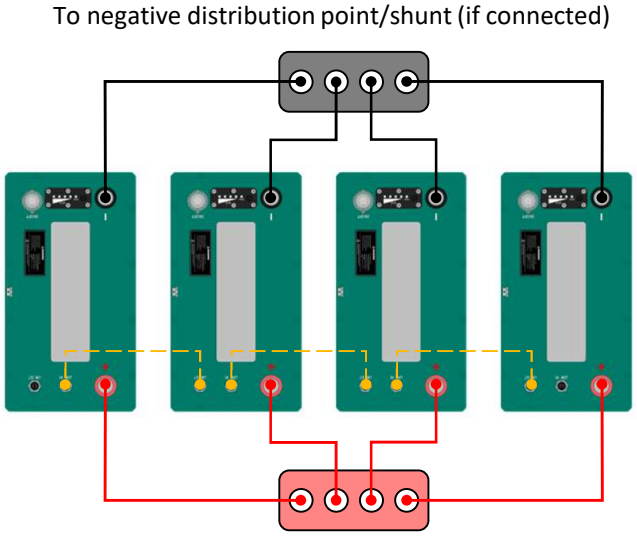
A maximum of 4 batteries should be used in parallel. Before connecting batteries in parallel, a multimeter needs to be used to test the voltage between the positive and negative terminals of the battery.

You can also check the battery voltage through the Bluetooth app to ensure that the voltage between the batteries does not exceed 0.5V, which can be connected in parallel.

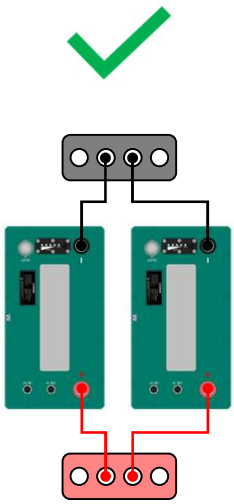
If the voltage between the batteries exceeds 0.5V, each battery needs to be fully charged separately, left for 1 hour, and then used in parallel. (this should be done as best practice)

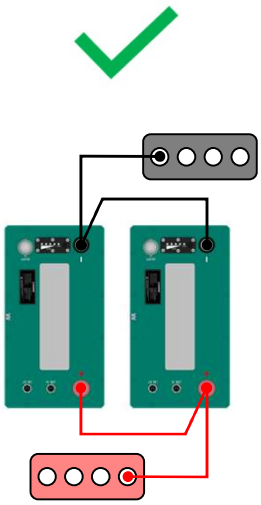


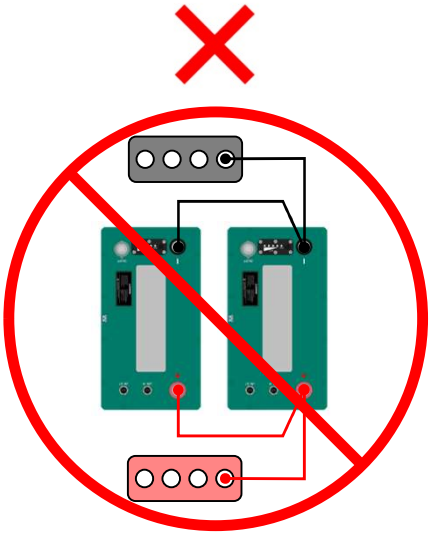
Parallel usage – typical installation 1



Parallel usage – typical installation 2







System Voltage: 12.8v
System Capacity: 100Ah + 100Ah = 200Ah

Caution! When Parallel connecting Do not connect main POS & NEG cables to the same battery, as you may Damage the battery.

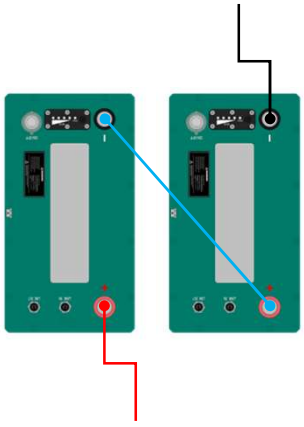
4.3 Series Connection

For higher voltage application scenarios, the B-TEC ULTRA batteries can be used in series

A maximum of 4 batteries can be used in series. Before connecting the batteries in series, a multimeter needs to be used to test the voltage between the positive and negative terminals of the battery. You can also check the battery voltage through the Bluetooth app to ensure that the voltage between the batteries does not exceed 0.5V. If the voltage between the batteries exceeds 0.5V, each battery needs to be fully charged separately, left for 1 hour, and then used in series (it is best practice to do this every time).

Series connection method: Connect the positive pole of the battery to the negative pole of the next battery, and so on.

For example, two 12.8V100Ah batteries connected in series

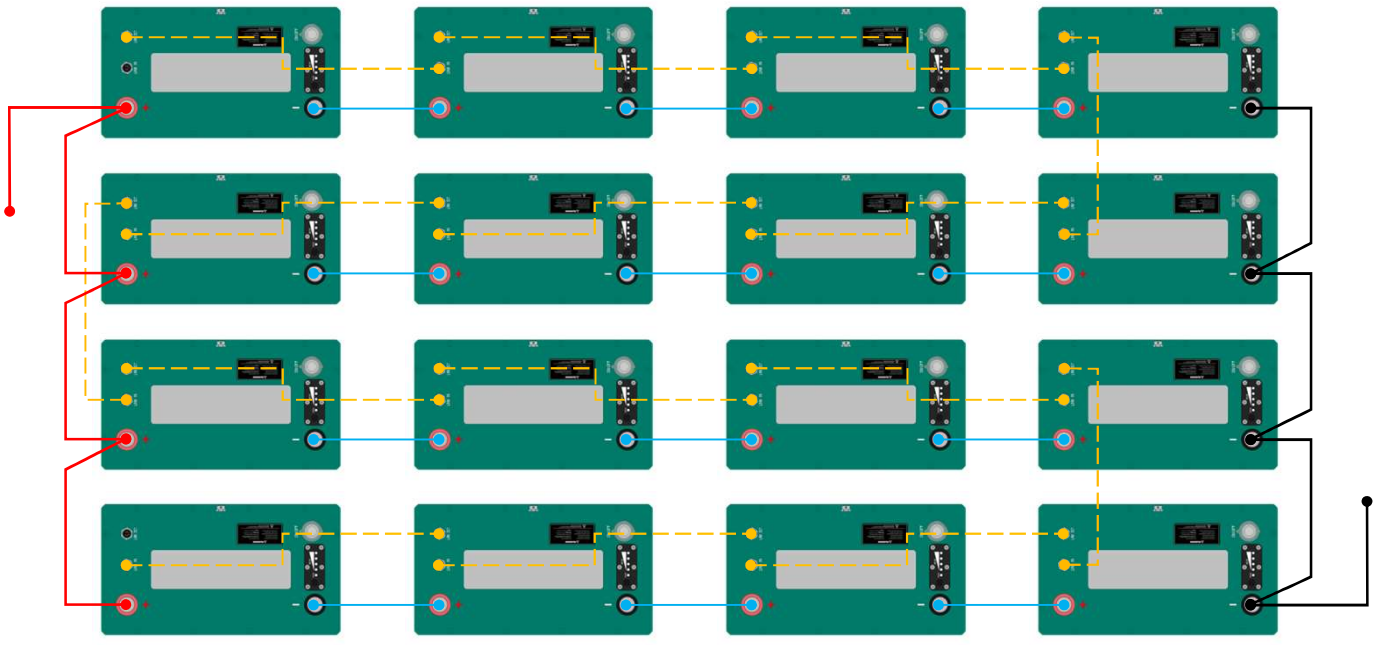


System Voltage: 12.8v x 2 = 25.6v
System Capacity: 100Ah

4.4 Simultaneous series and parallel

The B-TEC Ultra batteries allow simultaneous use of batteries in series and parallel, with a maximum support of 4 series and 4 parallel applications. The connection method is: first in series, then in parallel, which means that the batteries are connected in series to form a high voltage, and then in parallel to form a high capacity.

Voltage	Series	Max Allowed Parallel batteries
12.8v	1	16 (recommended 4)
25.6v	2	4
38.4v	3	4
51.2v	4	4



For Example: 16 x 12.8V100Ah Batteries, 4 in Series & 4 in Parallel
System Voltage: 12.8v x 4 = 51.2V
System Capacity: 100Ah x 4 = 400Ah

4.5 Battery communication

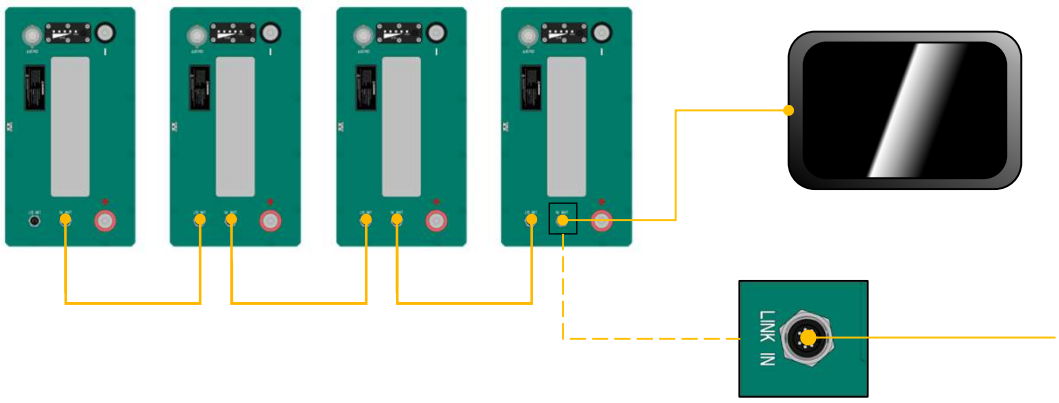
4.5.1 Communication terminal connection

The B-TEC ULTRA batteries have the function of communication networking between batteries.
When communication with external devices is needed, the networking function can be used to enable the battery to summarise information.

The battery can be used alone or used for communication networking, which is more prominent in some intelligent devices. When using this function, it is important to understand its purpose and carefully read the following instructions for correct operation.

The battery includes a Controller Area Network (CAN) bus communication interface.
Two circular M8 DIN connectors are located at the top of the battery to connect one battery's (Link in) to another battery's (Link out) using a CAN bus cable in a simple daisy link wire method.

Communication line connection method:



User can use an external communicated cable (optional) to connect to batteries and other device via CAN bus.

This allows for communication between the battery and the load or charger, making it more efficient to use the battery. This is also beneficial for understanding battery faults. If you have more questions about the CAN bus, please contact ENERDRIVE|DOMETIC for technical support.

For normal battery operation, the CAN bus function is not mandatory. The battery can automatically operate and protect itself; it does not require any CAN bus communication or external devices (such as external controllers) or other CAN bus connected batteries to operate.

NOTE: Retain the two black covers installed on the two M12 connectors to protect them from environmental influences when not in use.

4.5.2 Networking method:

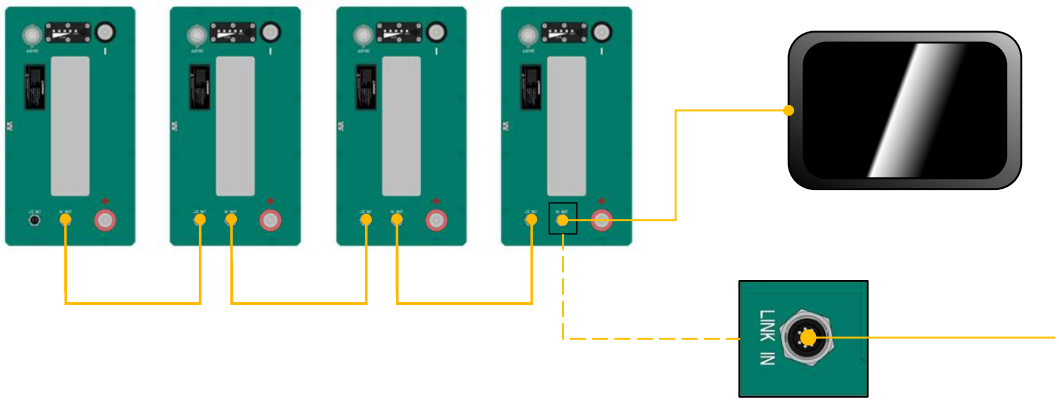
After connecting the battery through the communication cable, it is necessary to use the Bluetooth connection method through the smart APP to network the battery.
1. Equipment operation:

① Wiring: When all batteries are turned off, use the power line to connect the batteries in series and parallel (first in series and then in parallel);

Please refer to this chapter ;
4.2 Parallel Use
4.3 Series Use
4.4 Simultaneous Series & Parallel Use

② The battery connected to external devices serves as the first battery (Battery1), and we define this battery as the host, while other batteries are the slaves;

The LINK 0UT of host battery 1 is connected to the LINK IN of slave battery 2,
Connect the LINK OUT of slave battery 2 to the LINK IN of slave battery 3; and so on.



③ Turn on the battery power switch: switch from OFF to ON

④ Matching address: After pressing the host battery 1 reset button for >10 seconds, the indicator light will start running. After all the indicator lights are OFF, it means that the internal address allocation of the battery is completed;

Attention !
The battery must be connected to the power line in a series first and then in parallel mode; The communication line should first connect the first cluster of series connected batteries, and then connect the second cluster of series connected batteries, cannot mix; The matching address must be selected battery1 as the host, and long press and hold the reset button for > 10sec.

PLEASE NOTE: DO NOT select or press the reset button of other slave batteries during this setup. This step is particularly important as improper operation may result in battery networking failure.

5. Charging requirements

We recommend using a charging source with specific lithium charging settings to meet the following charging requirements to achieve the optimal performance and lifespan of ENERDRIVE|DOMETIC B-TEC ULTRA battery/Batteries.

System Voltage	Recommended Charge Voltage	Recommended Float Voltage	Max. Charge Current	Recommended Charge Current	Operational Temperature
12V	14.2V	13.5V~13.8V	1C	0.5C	Charge: 0~60°C
24V	28.4V	27.0V~27.6V			
36V	42.6V	40.5v~41.4v			Discharge: -20~65°C
48V	56.8V	54.0V~55.2v			

Note: Batteries with heating function need to be heated before switching to charging mode.

5.1 AC-DC charger

Check if the AC-DC battery charger you plan to use has a dedicated lithium charging setting that meets the above charging requirements. Many battery chargers are only designed to charge Lead–acid battery and may not have appropriate lithium charging settings.

5.2 Photovoltaic charging

Check if the solar regulator you plan to use has a dedicated lithium charging setting that meets the above charging requirements. The ENERDRIVE|DOMETIC B-TEC ULTRA batteries must be charged using a solar regulator with a lithium charging settings. However, it must be set with a maximum charging voltage of no more than 14.6V for a single battery (58.4V on a series 48V system). After the battery is fully charged, it must return to the recommended floating voltage.

Note: Charging to the Maximum voltage of 14.6V can cause batteries to trip the High voltage protection cutting the path for the solar and sometimes cause spiking of the system with solar voltage.

5.3 Charging with an AC generator through a DC-DC charger

Check if the DC-DC charger you plan to use has a dedicated lithium charging setting that meets the above charging requirements. The ENERDRIVE|DOMETIC B-TEC ULTRA batteries must be charged using a DC-DC Charger with a lithium charging settings. However, it must be set with a maximum charging voltage of no more than 14.6V for a single battery (58.4V on a series 48V system). After the battery is fully charged, it must return to the recommended floating voltage.

Note: Charging to the Maximum voltage of 14.6V can cause batteries to trip the High voltage protection cutting the path for the chargers and sometimes cause spiking of the system with solar voltage.

5.4 Recommended charging voltage

We strongly recommend a dedicated charger for lithium-ion batteries to better fully charge the battery.

At the same time, according to the actual situation, AGM chargers can also be used to charge the battery, which can achieve varying degrees of effect.

5.5 Passive balance function

When the battery is charged close to SOC 100%, due to the chemical characteristics of lithium batteries, the voltage difference between the cells will gradually expand. In order to ensure that each cell has the same capacity, slightly higher capacity cells will be consumed, which can allow the remaining cells to catch up.

6. Battery recycling

ENERDRIVE|DOMETIC lithium-ion batteries are recyclable and should not be treated as household waste or landfill waste. If you need assistance in recycling batteries, please contact ENERDRIVE|DOMETIC

7. Transportation and Storage

• During transportation, there should be no severe vibration, impact, or compression, and it should be protected from sunlight and rain.

• Handle with care during loading and unloading, and strictly prevent falling, rolling, and heavy pressure.

• If the battery is going to be stored for long periods, the battery should be stored in a dry, clean, dark and well-ventilated indoor environment. The recommended storage temperature range is 15~35 ℃.

• The storage area is free of harmful gases, flammable and explosive materials, and corrosive chemicals.

• Batteries should be stored and transported at close to 50% SOC.

• If not used for a long time, the battery needs to be charged every 6 months according to the specifications.

• Stacking batteries in cartoons should not exceed 6 layers in the Upright position.

8. Warnings and reminders

Please carefully read the battery specifications or instructions before use. Improper use may cause the battery to heat up, catch fire, rupture, damage, or decrease capacity. ENERDRIVE|DOMETIC shall not be responsible for any accidents caused by not following our operating instructions.

Warning!

• The battery must be kept away from heat sources, high voltage, and directly exposed to sunlight.
• Do not throw the battery into water or fire.
• Do not invert the two terminals when using the battery.
• Do not connect the positive and negative poles of the battery to the conductors.
• Do not strike, throw, or step on the battery.
• Do not disassemble the battery without the manufacturer's permission and guidance.
• Do not mix batteries of different capacities and brands;

Reminder:

• It is recommended to fully charge the battery every month to correct the battery SOC.
• When the battery is over discharged, please charge the battery in a timely manner (≤ 2 days).
• Please use a dedicated lithium battery charger to charge the battery.
• Please stop using the battery when it emits odor, heat, deformation, or any abnormalities occur
• Please place the battery away from children or pets.
• If the battery pack electrolyte leaks, please avoid contact with liquids or leaked gases. If the battery pack electrolyte leaks, please take the following steps immediately:

① **Inhalation of gas:** Evacuate personnel from the contaminated area and seek medical attention as soon as possible.

② **Eye contact:** Rinse eyes with water for 15 minutes and seek medical attention as soon as possible.

③ **Skin contact:** Thoroughly rinse the exposed area with soap and water to ensure there are no chemicals or soap residues on it and seek medical assistance as soon as possible.

④ **Swallowing:** Try to induce vomiting and seek medical attention as soon as possible.

⑤ **Fire:** Please use carbon dioxide fire extinguishers instead of liquid fire extinguishers to extinguish the fire

B-TEC ULTRA

ENERDRIVE

DOMETIC

Dometic Power & Control (Enerdrive) Pty Ltd
P.O. BOX 9159, Wynnum Plaza, Queensland, Australia 4178
Ph: 1300 851 535
Email: support.enerdrive@dometic.com
www.enerdrive.com.au