

# **B-TEC LITHIUM**

## **Owner's Manual**



**Enerdrive B-TEC Lithium LiFePO<sub>4</sub>, Lithium Ion Phosphate Prismatic Cell Battery with Smart Phone Monitoring**

- EPL-100BT-12V-G2 • EPL-125BT-12V-G2 • EPL-200BT-12V-G2**



For safe and optimum performance, the Enerdrive LiFePO4 Lithium Ion 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 assumes no responsibility for errors or omissions. Note as well that specifications and product functionality may change without notice.

### **Important**

Please be sure to read and save the entire manual before using your Enerdrive LiFePO4 Lithium Ion 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-G2  
EPL-125BT-12V-G2  
EPL-200BT-12V-G2

### **Document Part Number**

Enerdrive B-TEC G2 Manual (Rev. 2.1)  
April 2020

### **Support Contact Information**

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# **B-TEC LITHIUM**

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## **TABLE OF CONTENTS**

<b>SECTION 1 - QUICK START GUIDE</b>	<b>4</b>
<b>SECTION 2 - CHARGING</b>	<b>5</b>
<b>SECTION 3 - DISCHARGING (USING THE BATTERY)</b>	<b>6</b>
<b>SECTION 4 - PROTECTING YOUR BATTERY</b>	<b>7</b>
<b>SECTION 5 - RESTARTING YOUR BATTERY</b>	<b>8</b>
<b>SECTION 6 - USING THE BLUETOOTH BATTERY MONITOR APP</b>	<b>9</b>
<b>SECTION 7 - WARNINGS</b>	<b>10</b>
<b>SECTION 8 - FAQ</b>	<b>11</b>
<b>SECTION 9 - BATTERY SPECIFICATIONS</b>	<b>13</b>
<b>SECTION 10 - WARRANTY &amp; SUPPORT INFORMATION</b>	<b>16</b>

## Section 1 - Quick Start Guide

**Step 1.** Connect the Positive (Red) and Negative (Black) cables to the battery, ensuring you are using cable that is of adequate size for the demands of the system, and well crimped and protected termination lugs.

**Example;**

1000W Inverter - at least Gauge 2 (35mm<sup>2</sup>)

2000W Inverter - at least Gauge 00 (70mm<sup>2</sup>)

### Cable Conversion Guide

Standard	Unit												
AWG	0000	000	00	0	1	2	4	6	8	10	12	14	16
Diameter (mm)	11.68	10.40	9.27	8.25	7.35	6.54	5.19	4.11	3.26	2.59	2.05	1.63	1.29
Cross Section (mm <sup>2</sup> )	107.1	84.9	67.5	53.5	42.4	33.6	21.2	13.3	8.4	5.3	3.3	2.1	1.3

The spring washers must be used on the battery terminal bolts - they apply pressure to the lugs for a secure connection. There is no need to over-tighten the bolts, simply ensure there is no movement of the cables. Make sure the main Battery Cable lug is mounted directly onto the Battery terminal with no washers between them.

**Step 2.** Your charger/s need to be programmed for Lithium, with a charging voltage of 14.0 -14.6 Volts and Float 13.5 - 13.6 Volts.

Do not use a lead-acid charger if you want the best out of your battery. These chargers can damage the battery if left connected and will void your warranty.

**Step 3.** Fully charge the battery and it is ready for use.

\*Note: The above is a "Quick Start" guide, detailed information follows.

## **Section 2 - Charging**

Lithium batteries need to be charged slightly differently to other batteries.

To ensure they live a long life and provide maximum capacity, you must use a charger with a lithium setting - this includes:

- AC Chargers
- DC to DC Chargers
- Solar Controllers

If your charger allows, set the charge voltage from 14.0 -14.6 Volts and Float 13.5 - 13.6 Volts. and proceed with charging. We recommend charging at the lower end of the voltage scale for maximum longevity of the battery.

It is recommended that the charging current for the 100Ah & 125Ah batteries should be 40 Amps or less, and for the 200Ah battery, 60 Amps or less. You can charge at higher currents, but the recommended 60 Amps or less is recommended. See **Section 9 - Battery Specifications**.

**\*Note:**

You can charge a lithium battery with a non-lithium charger, but these chargers can deliver too much or too little voltage and may not cut off when the battery is full. Enerdrive recommends the use of a Lithium profiled charger that meets the batteries voltage specifications.

*DO NOT* use a charger with a "Pulse Stage" or "Equalisation Mode". This will damage the battery and void warranty.

*DO NOT* connect this battery to a start battery with a VSR (Dual Battery System or "Voltage Sensitive Relay"). The voltage of the Lithium battery may keep the VSR switched on resulting in it discharging into the start battery and possible damage to the Lithium BMS system. The battery is not covered by warranty if installed in this manner.

### Section 3 - Discharging (using the battery)

The Enerdrive B-TEC Lithium Battery can deliver a maximum of 100 Amps for the 100 & 125Ah battery and 200 Amps for the 200Ah battery for 30 minutes due to the high power, high quality Battery Management System (BMS) and prismatic Lithium cells inside the battery. For this to happen, you MUST USE cable of the correct guage.

*Consider current like plumbing...*

*The thicker the pipe (cable) the more current can flow through it.*

These are recommended wire guages and approximate current specifications for cable lengths shorter than 1-2 meters:

Guage 2	35mm <sup>2</sup>	100 Amps
Guage 0	50mm <sup>2</sup>	150 Amps
Guage 00	70mm <sup>2</sup>	200 Amps

A 2000W inverter will draw approximately 170-180 Amps through the cables connected between it and the battery - this will NOT be achieved with undersized wire.

# **B-TEC LITHIUM**

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## **Section 4 - Protecting Your Battery**

Lithium batteries cannot be protected effectively by monitoring voltage due to their ability to maintain a higher voltage for much longer than AGM or flooded/sealed batteries.

“State of Charge” (SOC%) percentage is the most accurate and effective method of disconnecting loads from the battery - this requires a battery monitor which uses a “shunt” to measure the current going into (Charging) and coming out of (Discharging) the battery.

### ***Example;***

200 Amp Battery	Fully Charged	State of Charge = 100%
	50 Amps used	State of Charge = 75%
	100 Amps used	State of Charge = 50%

It is recommended that Lithium batteries not be discharged below 20% State of Charge or the battery life may be shortened.

As an added layer of protection, the Enerdrive B-TEC Lithium Battery also has a built-in low voltage disconnect circuit. If this occurs, please refer to **Section 5 - Restarting Your Battery.**

## Section 5 - Restarting Your Battery

We strongly recommend keeping the battery charged to avoid activating the internal low battery voltage disconnect.

If your DC system shuts down, the battery may require re-starting. Please use the following procedure:

1. Turn off ALL DC and AC loads
2. Connect charging source/s and switch ON
3. Hold the "Reset" button on top of the battery for 5-10 seconds
4. Release and wait 7 seconds
5. Power should now be restored and charging will commence
6. When the SOC (State of Charge) is above 20%, loads can be switched on if required



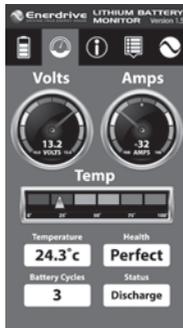
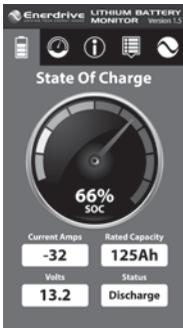
By continuously tripping the low voltage disconnect of the battery you may cause damage to sensitive electronic equipment that is attached to the battery. I.E. battery chargers, solar controllers, inverters, stereo equipment etc - all of which are not covered under the battery warranty.

# B-TEC LITHIUM

## Section 6 - Using the Smart Phone Battery Monitor

The Enerdrive B-TEC Lithium Battery incorporates a Smart Phone Monitoring system. By downloading the Android™ or Apple® app to your smart phone or tablet, you can monitor the following information:

- Battery Capacity
- Battery Voltage
- Battery Current (Amps)
- Battery State of Charge (SOC)
- Battery State of Health (SOH)
- Battery Status
- Individual Cell Voltage
- Battery Temperature
- Battery Cycles
- Battery Alarms
- Battery Event Information



- \* Red light is only an indicator, not a fault condition.
- \* The default password is 1234 (this allows you to change the Bluetooth name of the battery).
- \* A notification will only appear in the notifications page if under alarm condition.

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## Section 7 - Warnings

Please read and follow the cautions listed on the battery before installation. Improper use may cause heat, fire, rupture, damage or capacity deterioration of the battery. Enerdrive Pty Ltd is not responsible for any accidents caused by the usage without following our specification.



### **WARNING!**

#### **Failure to follow these instructions may result in early battery failure or possible personal injury.**

- Do not use the battery for cranking/starting applications.
- Do not series connect the battery.
- Do not dispose of in fire.
- The battery must be installed far away from heat sources, high voltage, and avoid exposed sunlight for long periods of time.
- Do not throw the battery into water.
- Do not connect the positive and negative terminals of battery together.
- Do not ship or store battery together with metal.
- Do not disassemble the battery. Battery warranty will be voided if the case is opened.
- Do not drop, impact or puncture the battery.
- Do not allow the battery to sit in a discharged state  $\leq 11.50V$
- When the battery capacity is low ( $\leq 15\%$  SOC), please charge the battery.
- Please use the matched or suggested charger that contains a Lithium charge profile for this battery. Failure to install the correct battery charger will void all warranty.
- If the battery emits a peculiar smell, heating, distortion or appears to have any abnormality during operation or storage, please stop using the battery and take it out of service. Contact Enerdrive for further details
- If the battery leaks and gets into eyes or on skin, do not wipe. Rinse with clean water and seek medical attention immediately.

#### **Low Battery Voltage Disconnect**

The battery has a low voltage disconnect incorporated for self protection. If the battery is drawn down to the internal low voltage disconnect set point ( $\leq 2.8V$  per cell) the battery will disconnect.

# B-TEC LITHIUM

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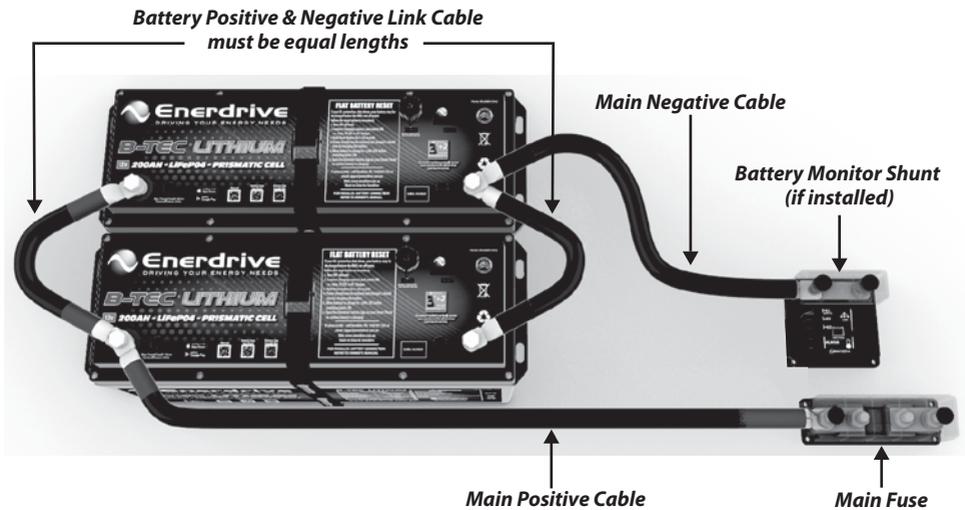
## Section 8 - FAQ

**Q: Can I parallel B-TEC batteries?**

**A.** The short answer is yes.

The long answer is - if you are drawing large currents, the maximum current delivered will be limited to the maximum instantaneous discharge capacity of one battery. for the 100 & 125Ah batteries this is 100 Amps and for the 200Ah battery, 200 Amps. With low to medium current draw installations (the vast majority of applications) you may never see an issue and your storage capacity will be greatly increased - I.E. 2 x 200 Amp = 400 Amp capacity.

When installing, ensure they are fully charged, separately - then let sit for 30 minutes before connecting together. When connecting in parallel - take the positive from Battery 1, and the negative from Battery 2 to your system as per the diagram below.



The Smart Phone App will only show the information from one battery at a time - not both. This is another advantage of a separate Battery Monitor - it will show the total system environment.

Ultimately for larger AH systems, the best solution is to use the Enerdrive "Pro Series" battery system - see our website or contact us for details.

**Q: Can I series connect B-TEC batteries to achieve higher voltage?**

**A:** No. Enerdrive offers higher voltage Lithium solutions - contact us for details.

**Q: Can I use an Inverter with my B-TEC battery?**

**A:** Of course! We recommend an inverter size of 1000 watts maximum for the 100 & 125Ah batteries and 2000 watts maximum for the 200Ah battery.

**Q: Can I install the B-TEC battery in a wet area?**

**A:** It is not recommended - the best environment is a dry, cool, well ventilated area.

**Q: Can I install the B-TEC battery on its side or end?**

**A:** No.

# B-TEC LITHIUM

## Section 9 - Battery Specifications

Enerdrive B-TEC Lithium Battery Technical Data			
Normal Specification	EPL-100BT-12V-G2	EPL-125BT-12V-G2	EPL-200BT-12V-G2
Nominal Voltage	12.8V	12.8V	12.8V
Nominal Capacity	100Ah	125Ah	200Ah
Cycle Life (DOD-80% under controlled conditions)	≤2000 Cycles		
<b>Standard Charge Specification (Lithium profile charger required)</b>			
Battery Charge Temperature	0 - 45°C		
Normal Charge Voltage CV/CC*	14.20 - 14.60V	14.20 - 14.60V	14.20 - 14.60V
Standby (Float) Voltage	13.50 - 13.80V	13.50 - 13.80V	13.50 - 13.80V
Maximum Charge Current	60A @ 25°C for 30 mins	80A @ 25°C for 30 mins	150A @ 25°C for 30 mins
Recommended Charge Current for Maximum Life	≤33A	≤40A	≤60A
<b>Standard Discharge Specification</b>			
Battery Discharge Temperature	-20 - 60°C		
Battery Output Voltage Range	11.20 - 14.60V	11.20 - 14.60V	11.20 - 14.60V
Maximum Discharge Current	100A @ 25°C ± 5°C for 30 mins	100A @ 25°C ± 5°C for 30 mins	200A @ 25°C ± 5°C for 30 mins
Pulse Discharge Current	450A for 1.0s		
Discharge Cut-off Voltage	≤11.20V	≤11.20V	≤11.20V
<b>Circuit Protection</b>			
The battery is supplied with a LifePO4 Battery Management System (BMS) that can monitor and optimise each single prismatic cell during charge and discharge, to protect the battery pack from overcharge, over discharge and short circuit. Overall, the BMS helps to ensure safe and accurate operation of the battery.			
<b>Over-Charge Protection</b>			
Over-Charge Protection Per Cell	3.90V ± 0.03V		
Over-Charge Release Per Cell	3.60V ± 0.05V		
Over-Charge Release Method	Discharge below release voltage		
<b>Over-Discharge Protection</b>			
Over-Discharge Protection Per Cell	2.80V ± 0.05V		
Over-Discharge Release Per Cell	3.20V ± 0.05V		
Over-Discharge Release Method	Apply Charge/Voltage ≥12.8V	Apply Charge/Voltage ≥12.8V	Apply Charge/Voltage ≥12.8V
Battery Manual Reset Button	Yes	Yes	Yes
<b>Over Current Protection</b>			
Discharge Over Current	110A for 30s - 450A for 1s	110A for 30s - 450A for 1s	220A for 30s - 450A for 1s
Protection Reset Time	5s Auto Release		
Over Current Release Method	Disconnect Load		
<b>Over Temperature Protection</b>			
Battery Discharge Over Temperature	Protection to 65°C ± 5°C		
	Release at 50°C ± 5°C		
Battery Charge Over Temperature	Release at 55°C ± 5°C		
	Release at 45°C ± 5°C		
Short Circuit Protection	Auto release after 5s		
<b>Mechanical Characteristics</b>			
Dimensions	Length 318mm	Length 318mm	Length 505mm
	Width 165mm	Width 165mm	Width 172.5mm
	Height 215mm	Height 215mm	Height 265mm
Weight	Approx 12.6 kg	Approx 15.0 kg	Approx 25.0 kg
<b>Storage Information</b>			
Temperature & Humidity Range	≤30 days -20°C to 35°C, 45 to 75% RH	≤30 days -20°C to 35°C, 45 to 75% RH	≤30 days -20°C to 35°C, 45 to 75% RH
	≤30 days -20°C to 35°C, 45 to 75% RH	≥30 days -10°C to 30°C, 45 to 75% RH	≥30 days -10°C to 30°C, 45 to 75% RH
Self-Discharge Rate	≤3% Per Month	≤3% Per Month	≤3% Per Month

\* CV/CC, Constant Voltage – Constant Current Lithium Charge Profile

## Section 10 - Warranty & Support Information

### 1-3 Year Limited Warranty

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

The limited warranty is the only one that applies to this unit, and it sets forth all the responsibilities of Enerdrive. There is no other warranty, other than described herein. Any implied warranty of merchantability of fitness for a particular purpose on this unit is limited in duration to the duration of this warranty.

Enerdrive Pty Ltd warrants its B-TEC Lithium Battery (hereafter referred to as "Battery") to be free of defects in material and workmanship for the following Applicable Warranty Period:

- 2 years for; commercial & industrial applications in cycling and non-cycling applications
- 3 years for; pleasure marine and automotive applications in cycling and non-cycling applications.
- An additional 24 months Pro-Rata support service is included in the battery for pleasure, marine and automotive applications. The pro-rated price is calculated as a percentage of the current suggested retail price. Pro-Rata Support Service applicable to original end user only.

The battery is warranted, to the original purchaser only, to be free of defects in materials and workmanship for the stated warranty period above from the date of purchase without additional charge. The warranty does not extend to subsequent purchasers or users other than OEM applications.

Enerdrive does not warrant the battery for use in any residential system sold with the intent or purpose of a "Tariff Adjustment Program" of any type.

### Return and/or Repair Policy

If you are experiencing any problems with your unit, please contact our customer service department at [support@enerdrive.com.au](mailto:support@enerdrive.com.au) or Phone 1300 851 535 before returning product to retail store. After speaking to a customer service representative, if products are deemed non-working or malfunctioning, the product may be returned to the purchasing store within 30 days of original purchase. Any defective unit that is returned to Enerdrive within 30 days of the date of purchase will be replaced free of charge.

If such a unit is returned more than 30 days but less than the states warranty period, Enerdrive will repair the unit or, at its option, replace it, free of charge. If the unit is repaired, new or reconditioned replacement parts may be used, at manufacturer's option. A unit may be replaced with a new or reconditioned unit of the same or comparable design. The repaired or replaced unit will then be warranted under these terms for the remainder of the warranty period. The customer is responsible for the shipping charges on all returned items back to Enerdrive.

# **B-TEC LITHIUM**

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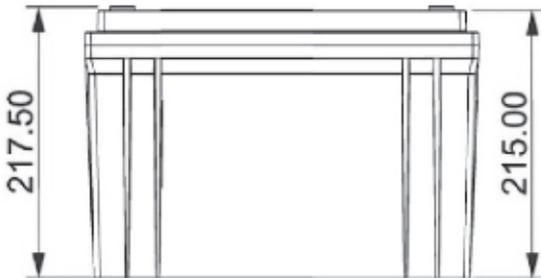
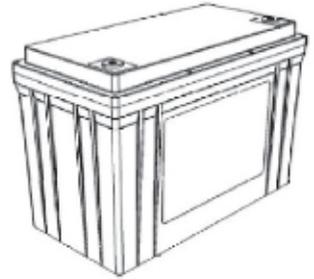
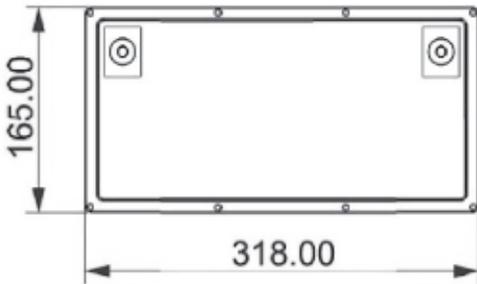
## **Limitations**

This warranty does not cover damage or defects resulting from normal wear and tear (including chips, scratches, abrasions, discolouration or fading due to usage or exposure to sunlight), accidents, damage during shipping to our service facility, alterations, unauthorized use or repair, neglect, misuse, abuse, failure to follow instructions for care and maintenance, acts of god, fire and flood.

If your problem is not covered by this warranty, contact our Support Team at [support@enerdrive.com.au](mailto:support@enerdrive.com.au) or phone 1300 851 535 for general information if applicable.

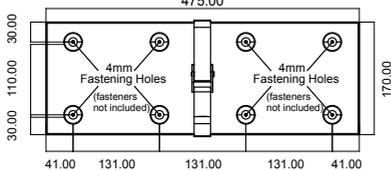
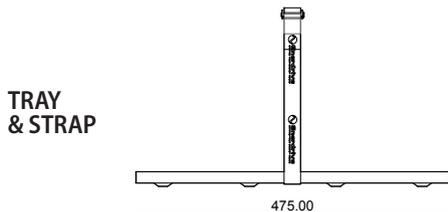
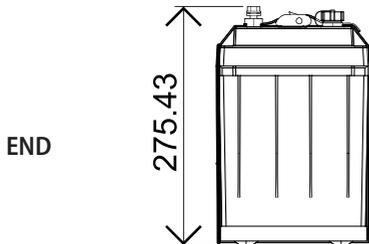
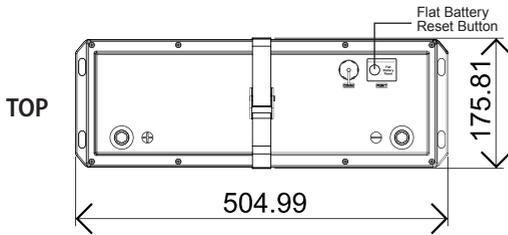
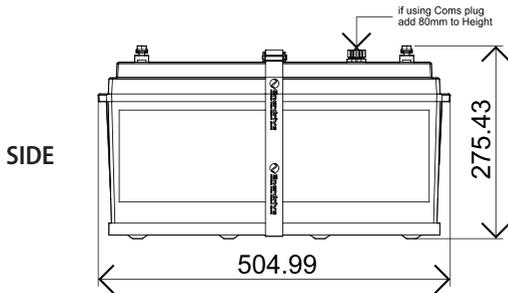
**This Battery IS NOT designed for, nor should it be fitted into an engine bay or other area subject to high heat. Damage WILL occur and not be covered by Enerdrive Warranty.**

**DIMENSIONS - EPL-100BT-12V-G2 & EPL-125BT-12V-G2**

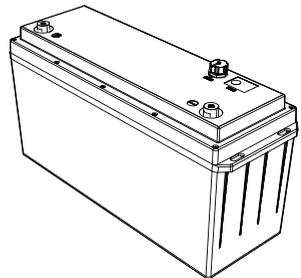


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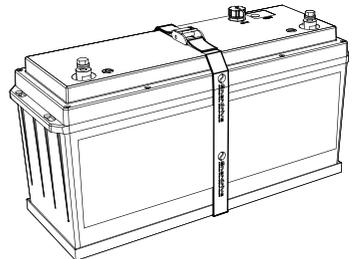
## DIMENSIONS - EPL-200BT-12V-G2



EPL-200BT-12V-G2  
without Tray & Strap



EPL-200BT-12V-G2  
with Tray & Strap





**ENERDRIVE PTY LTD**

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