

BELTTT[®]

BAP Series Pure Sine Wave Inverter

USER MANUAL



Ver:007

Table of contents

1 About this manual	3
1.1 Purpose	3
2 Safety Instructions	3
3 Operation	5
3.1 Performance Introduction	5
3.2 Product Overview	5
3.3 Inverter Appearance and Function Introduction	6
3.4 AC Output Port Wiring Diagram	7
3.5 Diagram of Connecting the Remote Control Panel	7
3.6 LCD Status Monitor and Press Function Introduction	8
4 Installation	8
4.1 Installation and Connection Steps	8
4.2 Inverter Connected to Electrical Load Equipment	9
4.3 Disassembly Steps	9
5. Detailed Product Parameters	10
6. LCD Status Codes and Troubleshooting	11
7. Others	13
7.1 Operating Environment	13
7.2 Load Selection and Starting Surge	13
7.3 About Enhanced Mode	14

1. About This Manual

1.1 Purpose

To ensure reliable service to you, the inverter must be installed and used properly. Please read the installation and operating instructions before installation and use. Please pay special attention to the warnings and warning instructions in this manual. Cautionary statements are made about certain usage conditions and practices that may cause damage to the inverter. Clear warnings are given about certain usage conditions and practices that may cause personal injury. Please read all instructions before using the inverter.

Please read this instruction manual carefully to facilitate correct use. Especially before use, please remember to read the details of "Safety Precautions" to ensure safe use. After reading the instruction manual, please keep it together with the warranty certificate for future reference.

2. Safety Instructions



(These safety precautions must be read and memorized)

In order to avoid injury to you and others, the following safety precautions are listed and must be observed. Please refer to the instructions for the meanings of the various symbols.



WARNING:

Please read carefully, as the following may result in personal injury.



Flammable Gas

- Ensure that no flammable gases are present, as sparks may occur, before connecting the battery.
- Avoid storing them in areas where flammable gases may accumulate.



No parallel with Grid

Do not connect the output in parallel with the grid, as may damage the inverter and even cause an electric shock.



Not for use by minors

The inverter produces high voltage, creating a risk of electric shock.

**No disassembly**

Unauthorized disassembling or modifying of the inverter may lead to safety incidents such as equipment failure, fire, or electrical shock.

**No rods or other metal**

Do not put rods or metal in the openings or jacks of the inverter. This may cause electric shock and harm the inverter's internal parts.

**Avoid wet hands**

No touch inverter with wet hands, a risk in electric shock and personal safety.

**Keep out of fire and hot places**

Operation in fire and hot places can lead to fire and explosion.

**No wrestling**

Dropping or hitting the inverter can cause harm and create safety risks.

**Installation**

Have to evaluate the battery and cables before install.

**Protective Grounding Required**

Before operating the inverter, connect the chassis grounding terminal to the designated protective grounding point using a properly sized copper grounding conductor.

**Waterproof and damp proof**

Please pay attention to moisture and waterproof, the inverter may cause short circuit, fire and electric shock.

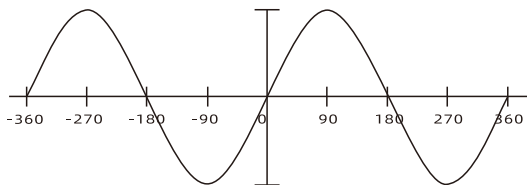
**Please insert fully**

Insert the plug of the load completely into the output of the inverter. Failure to insert the plug fully may result in electric shock and overheating, or even a fire accident. Do not use damaged plugs, power sockets, power cords.

3. Operation

3.1 Performance Introduction

An inverter is a power supply that converts direct current (batteries, solar cells, wind turbines, etc.) into alternating current. Because of the high frequency inverter used in power conversion technology, ferrite transformer to replace the old bulky silicon steel transformer. This is why the inverter of our company is lighter weight and less bulky than other inverters that have similar rated power. While inverting mode, inverter will output pure sine wave which is really same as public power supply. If the power of the appliances is not exceed the power of the inverter it can drive those basically.



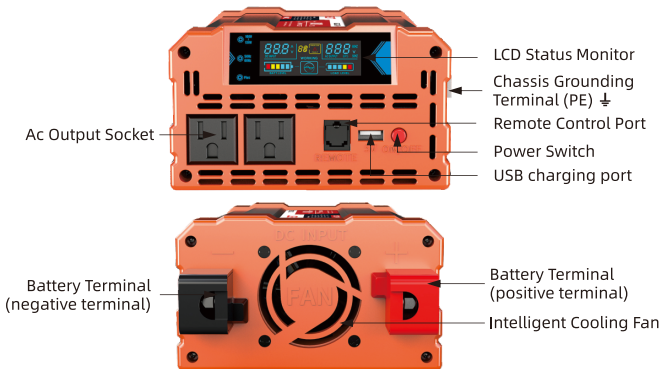
Pure sine wave

3.2 Product Overview

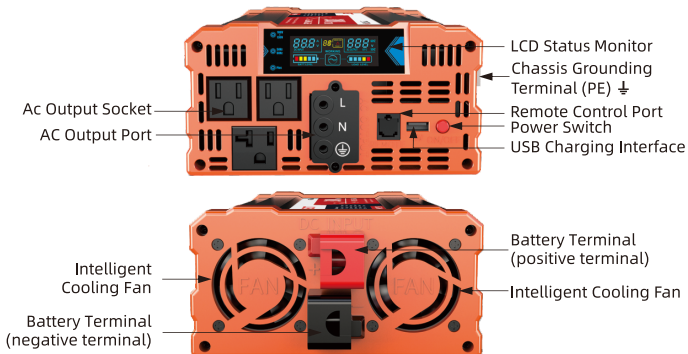
- AC output 100v-130v via LCD setting
- 50HZ/60HZ via LCD setting
- Enhanced power via LCD setting
- Remote + cable 7 Meter with lcd display (optional)
- AC output socket+Wiring output
- Fault code via LCD
- Compatible with properly configured 12 V or 24 V battery systems that meet the inverter's voltage and discharge-current requirements.

3.3 Inverter Appearance and Function Introduction

BAP1000A/BAP1500A/Front and rear panels



BAP2000A/BAP3000A/BAP2000B/BAP3000B Front and rear panels



3.4 AC Output Port Wiring Diagram



1 Remove screws from the terminal of AC output.



2 Remove the AC cover to expose the wiring holes.



3 Insert the three terminal wires into the corresponding wiring holes. Finally secure the wires with a screwdriver.



4 After inserting the cable, use a screwdriver to tighten the terminal screws.

3.5 Diagram of Connecting the Remote Control Panel



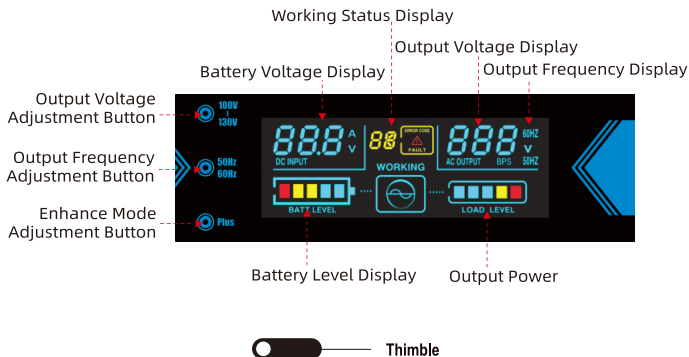
Note: Add a switch between pin3&pin4, which is used to control the inverter on/off.

Remote Control Panel (optional)

BAP series inverters support remote control panel connection, and the connecting cable can be up to 7 meters long. The inverter can be turned on and off through the remote control panel, and the working status of the inverter can be understood through the monitor of the remote controller.

The product panel is for reference only, please refer to the actual product.

3.6 LCD Status Monitor and Press Function Introduction



1. Use the thimble to press and hold the output voltage adjustment button (there are "100~130V" next to the button) for 5 seconds to enter the output voltage setting. The output voltage can be set to 100~130Vac. Each press increases 5Vac, automatically saved in 3 seconds, the default voltage depends on the sales area;

2. Use the thimble to press and hold the "50Hz-60Hz" button for 5 seconds to enter the output frequency setting. The output frequency can be set to 50/60Hz. It will be automatically saved in 3 seconds. The default frequency depends on the sales area;

3. Use the thimble to press and hold the "Plus" button for 5 seconds to enter the mode setting. You can set the normal mode and ENHANCE (enhanced) mode. It will be automatically saved in 3 seconds and the default enhanced mode. Output voltage will be reduced to running higher power loads when on Enhanced Mode, recommended for emergency situations.

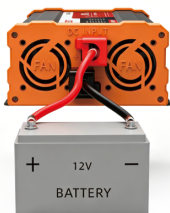
4. Installation

4.1 Installation and connection steps

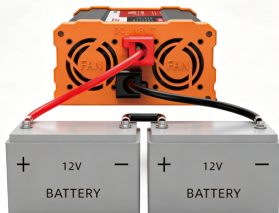
1. Turn off the power switch of the inverter.
2. Connect the inverter chassis grounding terminal to the designated protective grounding point.

3. Connect the positive terminal of the battery to the red terminal of the inverter with the red DC cable.
4. Connect the negative terminal of the battery to the black terminal of the inverter with the black DC cable.
5. Plug the power supply of the load appliance into the output socket of the inverter.
6. Turn on the power switch of the inverter to use.

NOTICE: In a negative-ground vehicle system, connect the positive (+) cable first and the negative (-) cable last. When disconnecting, remove the negative (-) cable first, followed by the positive (+) cable. This helps prevent a short circuit if the positive terminal or a metal tool accidentally touches the vehicle chassis.



The 12V inverter
is connected to the battery



The 24V inverter
is connected to the battery

4.2 Inverter Connected to Electrical Load Equipment



Load equipment

4.3 Disassembly steps

1. First turn off the power switch of the inverter.
2. Pull out the power plug of the load.
3. Remove the black DC cable.
4. Remove the red DC cable.

Note: Product images are for reference only. Slight color difference may exist due to shooting and display device, please refer to the actual product.

5. Detailed Product Parameters

12V Models

Parameter	BAP1000A	BAP1500A	BAP2000A	BAP3000A
1. Electrical Parameters				
Rated Power	1000W	1500W	2000W	3000W
Peak Power	2000W	3000W	4000W	6000W
AC Output Voltage	Default 120Vac, 100-130Vac (Adjustable)			
Frequency	Default 60Hz, 50Hz/60Hz (Adjustable)			
Waveform	Pure Sine Wave			
Battery Voltage	12Vdc			
Voltage Range	9.5V-15.7Vdc			
DC Current	97A	134.1A	194.6A	288.1A
No-Load Loss	≤0.8A	≤1A	≤1A	≤1.6A
Max Efficiency	91%	90%	93%	93%
Shutdown Mode Current	≤1mA			
Fan Operation Mode	Temperature and Power Control Mode			
Fuse	40A*3Pcs	45A*4Pcs	45A*6Pcs	45A*9Pcs

2. Physical Specifications

USB Output	5Vdc / 2.1A			
Operating Temperature / Humidity	0-40°C / 10-90% RH			
Net Weight (lb)	4.4	5.2	7.7	9.8
Gross Weight (lb)	6.0	7.3	11.2	14.0
Product Size (in)	11.0 × 6.2 × 3.5	12.2 × 6.2 × 3.5	14.8 × 7.7 × 3.9	17.0 × 7.7 × 3.9
Packing Size (in)	12.8 × 8.3 × 6.0	14.0 × 8.3 × 6.0	16.7 × 9.8 × 6.8	17.9 × 9.8 × 6.8

All specifications are measured at the nominal input voltage and an ambient temperature of 25°C.

24V Models

Parameter	BAP2000B	BAP3000B
1. Electrical Parameters		
Rated Power	2000W	3000W
Peak Power	4000W	6000W
AC Output Voltage	Default 120Vac, 100-130Vac (Adjustable)	
Frequency	Default 60Hz, 50Hz/60Hz (Adjustable)	
Waveform	Pure Sine Wave	
Battery Voltage	24Vdc	
Voltage Range	19V-31Vdc	
DC Current	92.8A	138.8A
No-Load Loss	≤0.7A	≤0.9A
Max Efficiency	93%	92%
Shutdown Mode Current	≤1mA	
Fan Operation Mode	Temperature and Power Control Mode	
Fuse	35A*4Pcs	30A*9Pcs

2. Physical Specifications

USB Output	5Vdc / 2.1A	
Operating Temperature / Humidity	0-40°C / 10-90% RH	
Net Weight (lb)	7.7	9.8
Gross Weight (lb)	11.2	14.0
Product Size (in)	14.8 × 7.7 × 3.9	17.0 × 7.7 × 3.9
Packing Size (in)	16.7 × 9.8 × 6.8	17.9 × 9.8 × 6.8

All specifications are measured at the nominal input voltage and an ambient temperature of 25°C.

6. LCD Status Codes and Troubleshooting

12V Models Follow the recommended action for the code shown on the LCD.

Code	Status	Inverter Response	Recommended Action	Trigger / Recovery
ok	Normal	Normal AC output	No action required	—
01	Battery Low Voltage Protection	AC output shuts off automatically. Buzzer sounds once per second.	Reduce load and recharge the battery. Check battery terminals, DC cables and charging connection. Restart after battery voltage recovers.	Trigger: 9.5 VDC (± 0.3 V) Recovery: 12.0 VDC (± 0.3 V)
02	Battery High Voltage Protection	AC output shuts off automatically. Buzzer sounds once per second.	Verify the battery system matches the inverter input-voltage rating. Check the battery and any external charger for overvoltage. Restart after voltage returns to normal.	Trigger: 15.7 VDC (± 0.3 V) Recovery: 15.3 VDC (± 0.3 V)
03	Output Short Circuit Protection	AC output shuts off automatically. Buzzer sounds once per second.	Turn off the inverter and disconnect AC loads. Check output wiring and connectors for a short circuit or abnormal connection. Correct the issue, then restart.	—
04	High Temperature Protection	AC output shuts off automatically. Buzzer sounds once every 2 seconds.	Turn off loads and let the inverter cool. Check that vents are clear and the cooling fan operates normally. Restart after cooling and avoid high ambient temperatures.	—
05	Overload Protection	Normal Mode: If output voltage drops below 90 V, AC output shuts off after 10 seconds; buzzer sounds once per second. Enhanced Mode: If output voltage drops below 80 V, AC output shuts off after 10 seconds; buzzer sounds once per second.	Reduce or disconnect loads. Confirm the continuous power and startup power of all connected appliances are within the inverter rating. Remove the overload, then restart.	—
06	Battery Low Voltage Alarm	AC output remains on. Buzzer sounds once every 2 seconds.	Reduce or turn off loads and recharge the battery.	Trigger: 10.0 VDC (± 0.3 V) Recovery: 11.0 VDC (± 0.3 V)
07	High Temperature Alarm	AC output remains on. Buzzer sounds.	Reduce load. Check the fan, vents, and ambient temperature. If the warning continues, turn off the inverter and allow it to cool before reuse.	—
08	Overload Warning	AC output remains on. Buzzer sounds.	Reduce load immediately. Verify continuous and startup power are within the inverter rating. If the warning continues, disconnect the affected load.	—
09	Output Overvoltage Protection	Abnormally high AC output voltage is detected. AC output shuts off and the buzzer sounds. This may indicate an internal circuit fault.	Turn off the inverter and disconnect all loads, then restart once. If the code returns with no load connected, stop use and contact Customer Support. Do not repeatedly restart.	—
10	High Temperature Warning	The inverter reduces AC output voltage because its internal temperature is too high.	Reduce or turn off load. Check the fan, vents, and ambient temperature. Allow the inverter to cool before continuing use.	—
CCB	Carrying Capacity Boost	Output voltage is below normal. The inverter initially continues AC output with no buzzer. After a period, it shuts off AC output and the buzzer sounds.	Reduce load until output voltage returns to normal. This mode does not increase rated continuous power and is not intended for long-term overload. If voltage does not recover, stop use and inspect the system.	—

24V Models Follow the recommended action for the code shown on the LCD.

Code	Status	Inverter Response	Recommended Action	Trigger / Recovery
ok	Normal	Normal AC output	No action required	—
01	Battery Low Voltage Protection	AC output shuts off automatically. Buzzer sounds once per second.	Reduce load and recharge the battery. Check battery terminals, DC cables and charging connection. Restart after battery voltage recovers.	Trigger: 19.0 VDC (± 0.5 V) Recovery: 24.0 VDC (± 0.5 V)
02	Battery High Voltage Protection	AC output shuts off automatically. Buzzer sounds once per second.	Verify the battery system matches the inverter input-voltage rating. Check the battery and any external charger for overvoltage. Restart after voltage returns to normal.	Trigger: 31.0 VDC (± 0.5 V) Recovery: 30.0 VDC (± 0.5 V)
03	Output Short Circuit Protection	AC output shuts off automatically. Buzzer sounds once per second.	Turn off the inverter and disconnect AC loads. Check output wiring and connectors for a short circuit or abnormal connection. Correct the issue, then restart.	—
04	High Temperature Protection	AC output shuts off automatically. Buzzer sounds once every 2 seconds.	Turn off loads and let the inverter cool. Check that vents are clear and the cooling fan operates normally. Restart after cooling and avoid high ambient temperatures.	—
05	Overload Protection	Normal Mode: If output voltage drops below 90 V, AC output shuts off after 10 seconds; buzzer sounds once per second. Enhanced Mode: If output voltage drops below 80 V, AC output shuts off after 10 seconds; buzzer sounds once per second.	Reduce or disconnect loads. Confirm the continuous power and startup power of all connected appliances are within the inverter rating. Remove the overload, then restart.	—
06	Battery Low Voltage Alarm	AC output remains on. Buzzer sounds once every 2 seconds.	Reduce or turn off loads and recharge the battery.	Trigger: 20.0 VDC (± 0.5 V) Recovery: 22.0 VDC (± 0.5 V)
07	High Temperature Alarm	AC output remains on. Buzzer sounds.	Reduce load. Check the fan, vents, and ambient temperature. If the warning continues, turn off the inverter and allow it to cool before reuse.	—
08	Overload Warning	AC output remains on. Buzzer sounds.	Reduce load immediately. Verify continuous and startup power are within the inverter rating. If the warning continues, disconnect the affected load.	—
09	Output Overvoltage Protection	Abnormally high AC output voltage is detected. AC output shuts off and the buzzer sounds. This may indicate an internal circuit fault.	Turn off the inverter and disconnect all loads, then restart once. If the code returns with no load connected, stop use and contact Customer Support. Do not repeatedly restart.	—
10	High Temperature Warning	The inverter reduces AC output voltage because its internal temperature is too high.	Reduce or turn off load. Check the fan, vents, and ambient temperature. Allow the inverter to cool before continuing use.	—
CCB	Carrying Capacity Boost	Output voltage is below normal. The inverter initially continues AC output with no buzzer. After a period, it shuts off AC output and the buzzer sounds.	Reduce load until output voltage returns to normal. This mode does not increase rated continuous power and is not intended for long-term overload. If voltage does not recover, stop use and inspect the system.	—

7. Others

7.1 Operating Environment

For best results, place the inverter on a flat surface such as the ground, car floor, or other solid surfaces. Allow the inverter power cord to be easily secured. The working place should meet the following criteria:

1. Keep dry do not let the inverter contact with water or other liquids, and make sure that the inverter away from moisture or water.
2. Keep the inverter in a cool environment with a temperature between 0°C (non-condensing) and 40 °C. Do not place the inverter next to heating vents or other heat generating equipment. Keep the inverter out of direct sunlight as much as possible.
3. Keeping the surrounding area free from objects blocking it ensures the free flow of air. Do not put anything on the inverter while it is working. The inverter's fan is used to help dissipate heat.
4. Do not use the inverter near flammable materials or in places where flammable gases can gather.

5. Battery Voltage, Capacity, and Current Requirements

The battery system must provide the correct DC input voltage and sufficient continuous and surge current to operate the inverter and connected loads. Use a fully charged battery or battery bank with adequate capacity and discharge capability. For lithium batteries, make sure the battery management system (BMS) can support both the inverter's continuous input current and startup surge current. Estimate the required battery current using the following formula:

Battery current (A) $\approx$ AC load power (W) $\div$ Battery voltage (V) $\div$ Inverter efficiency

For example, a 1000 W load may draw approximately 93 A from a 12 V battery system or 46 A from a 24 V battery system, assuming 90% inverter efficiency. Actual current may be higher during appliance startup, at low battery voltage, or due to cable and connection losses.

7.2 Load Selection and Starting Surge

The rated power shown on an appliance label normally indicates its operating power. Some appliances may require significantly more power for a short time during startup. Before connecting an appliance, make sure both its continuous power and startup surge requirements are within the inverter's ratings.

1. Resistive loads, such as incandescent lamps and heating appliances, generally have low startup surge and are easier for the inverter to operate.
2. Motor and compressor loads, such as refrigerators, air conditioners, pumps, and some power tools, may require several times their normal operating current during startup.
3. Electronic loads, such as TVs, computers, and chargers, may also draw a brief inrush current when switched on.

Check the appliance label or manufacturer's specifications for its starting watts, surge current, or Locked Rotor Amps (LRA). The inverter's surge rating must be sufficient to start the appliance. Actual compatibility may vary according to the appliance design, battery condition, cable size, and connection quality.

If an appliance does not start within a few seconds, makes an unusual sound, or causes the inverter to enter overload protection, turn off the appliance immediately. Do not repeatedly attempt to start an incompatible load.



Caution

WARNING – Reverse Polarity and Fuse Protection

Always verify the battery polarity before connecting the DC cables. Connect the battery positive terminal to the inverter positive terminal and the battery negative terminal to the inverter negative terminal.

Reverse-polarity connection may blow the internal or external DC fuse and may permanently damage the inverter. Damage caused by reverse polarity may not be repairable by replacing a fuse.

**Caution**

A properly rated external DC fuse or circuit breaker must be installed in the positive battery cable, as close to the battery as practical. This external protection is required to protect the DC cable against short circuits.

Do not open the inverter or attempt to replace internal fuses yourself. Dangerous voltage may remain inside the inverter even after it has been turned off. If the inverter does not operate after a fault, stop using it and contact qualified service personnel or BELTTT Customer Support.

7.3 About Enhanced Mode

PLUS Mode we also call Enhancement Mode or CCB Mode.

Before introducing our Plus mode, let's introduce some knowledge. The same appliance, we input different voltage, his actual power is not the same. We input lower voltage and his actual power is lower. but it can insist on working. For example, an incandescent lamp with a rated voltage of 120V and a rated power of 200W, when inputting 120V, the power of the incandescent lamp is 200W. When inputting a voltage of 100V, its actual power is only 138.9W, and you just feel that the light is dimmer. This is better than not having the bulb.

Based on this phenomenon we developed the Enhanced Mode. Power grid voltage fluctuations and line drops are common in everyday electricity usage. The Enhanced Mode is designed to improve operational compatibility under low AC input voltage conditions (down to 80V) by intelligently stepping down and stabilizing output to keep non-sensitive equipment running.

⚠ CAUTION & LOAD RESTRICTIONS:

Supported Loads: This mode is strictly designed for resistive loads only (e.g., incandescent lights, heating elements, basic resistive heaters).

Prohibited Loads: DO NOT use Enhanced Mode with motor-driven appliances, compressors, or sensitive electronics (including refrigerators, air conditioners, power tools, TVs, or medical devices). Operating motor-driven or capacitive equipment under low voltage may cause overheating, performance degradation, or permanent damage to the connected appliances.

Standard Operation: For sensitive and motor-driven loads, please operate the inverter under standard nominal voltage conditions to ensure safety and equipment longevity.

Our answers to the questions you may have are as follows

1. What is the specific difference between Plus mode and normal mode?

PLUS mode is when we actively step down the output voltage of the inverter in case of overload, so that the actual power of your appliance becomes smaller, and we can carry more loads, PLUS mode is when we step down the voltage as low as 80V, and the inverter protects itself when it is lower than 80V. Normal mode is where we just slightly reduce the output voltage in case of overload, we reduce the output voltage to 90V so that you can come and shut down your inverter.

2. Is there any advantage of Plus mode in terms of performance or system protection?

The advantage of the Plus mode is that you can use more loads without breaking the power supply and avoid the inconvenience of inverter protection.

3. In what situations is it recommended to use Plus mode instead of normal mode?

When you use a load greater than 1.2 times the rated power.

4. Does Plus mode affect the life of the battery or inverter in any way?

PLUS mode does not increase the input current, but reduces the output voltage. There is no damage to the battery. There is also no harm to the inverter itself. We added this feature on the premise of safety and reliability.

5. Are there additional settings that can be adjusted in Plus mode?

There is no need to make any settings in Plus mode.

This product is covered by a 1-year limited warranty from the date of purchase.
For warranty service or product support, please contact the BELTTT Customer
Support Team through: Your Amazon order page

Service E-mail: support@belttt.com
Official website: www.beltttpower.com/amazon-support
Amazon: www.amazon.com/belttt

Please have your order number, product model, and a brief description
of the issue ready when contacting us.

