B.O.B

User Manual

Bainbridge Technologies

Contents

About this Manual

This manual lists the features of the BTBOB1000, BTBOB2000 and BTBOB3000 (Trade Mark 1474529) also referred to as Black Out Buster or (B.O.B.). This manual is to be read in its entirety before connecting to a wall socket.

Disclaimer

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General Instructions

This User Guide contains important safety and operation instructions. Read and keep this User Guide for later reference. The B.O.B. has been designed as a “plug and play” system, and requires qualified personnel to install the batteries.

What is B.O.B. ?

B.O.B. is a fully automated Uninterruptible power supply (UPS) that reliably detects power outages and switches to off grid power in under 15 milliseconds (when grid dip switch selected), giving power to your critical appliances. Supplied in a cabinet, B.O.B. includes a powerful inverter/charger combination unit, a power distribution unit, and AGM batteries. The inverter/charger combination unit is a true sine-wave inverter, with multi-stage charge algorithm.

How does B.O.B. work?

The charger in B.O.B. automatically starts up when AC power is presented either from the grid or generator. When power is cut, B.O.B. starts inverting power from the batteries in less than 15 milliseconds, providing power to your essential appliances. When the batteries are running low, an alarm will start beeping. When this is heard, it is time to save and back-up essential data.

Safety Instructions

Please ensure you follow all safety instructions:

CAUTION: PLEASE OBSERVE CAUTION WHEN WORKING AROUND ELECTRICAL INSTALLATIONS AND BATTERIES.
PLEASE CHECK YOUR LOCAL STATE LEGISLATION IN RELATION TO WHO CAN PERFORM ELECTRICAL INSTALLATIONS, SERVICE & REPAIR.

- Disconnect mains plug before attempting any connections.
- Please check that the AC Voltage is between 195 VAC – 260 VAC 45 - 55 Hz.
- As dangerous voltages and high temperature exist within B.O.B., only qualified and authorized maintenance personnel are permitted to open and repair it.
- Do not expose to dust, rain, snow or liquids of any type.
- B.O.B. is designed for indoor use only.
- Do not block off ventilation, otherwise B.O.B. will overheat.
- Do not place any flammable goods near B.O.B..
- Do not allow any metallic objects to come in contact with the batteries.
- Please remove any metallic jewellery while working with batteries.
- Do not smoke or allow a spark or flame in the vicinity of batteries.
- Do not connect B.O.B. to more than one AC source at a time.

Location

B.O.B. Must be installed in a Dry, Clean, Cool and well ventilated location

- Working temperature $0^{O}C$ - $50^{O}C$
- Storage temperature $-40^{O}C$ - $70^{O}C$
- Relative Humidity 0% - 95% non-condensing
- Cooling Forced air

Moving

Before Moving B.O.B. or replacing batteries

- Ensure all electrical connections to the unit are disconnected before moving.
- Power down the system by placing the System Switch and the DC breaker on the Combi Unit to their off positions. Please refer to the diagram on page 8 for location of switch and breaker.
- Remove the battery temperature sensor so it is out of the way of the batteries for removal.
- Engage the foot brakes located on the front castors.
- Disconnect the batteries and remove them from the unit
- When removing/replacing batteries use appropriate manpower or lifting devices.

Moving B.O.B. using the castors

- Ensure the path is clear from obstructions
- Press the lever on the front wheels to unlock the front castors
- When you have finished moving B.O.B. ensure the castors are re-locked

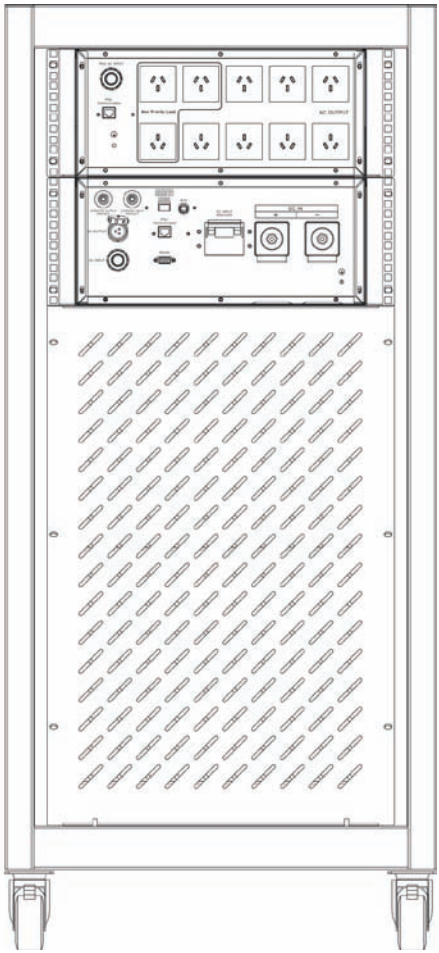
Unit Diagrams

B.O.B. Unit

The B.O.B. Unit is composed of the following parts:

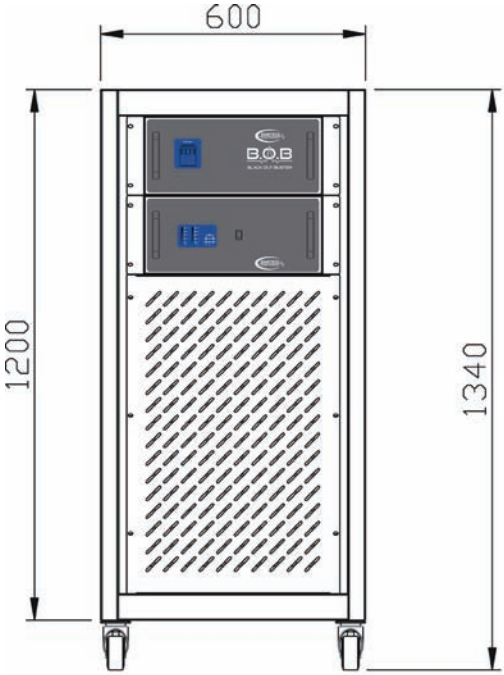
- Cabinet
- Inverter charger combination unit (Combi Unit)
- Power distribution unit (PDU Unit)
- Battery enclosure

Front view

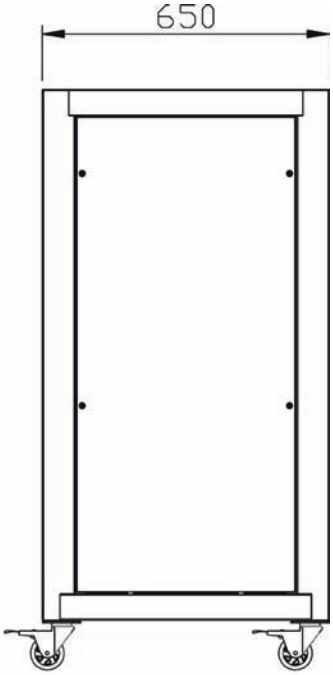


Rear view

Size



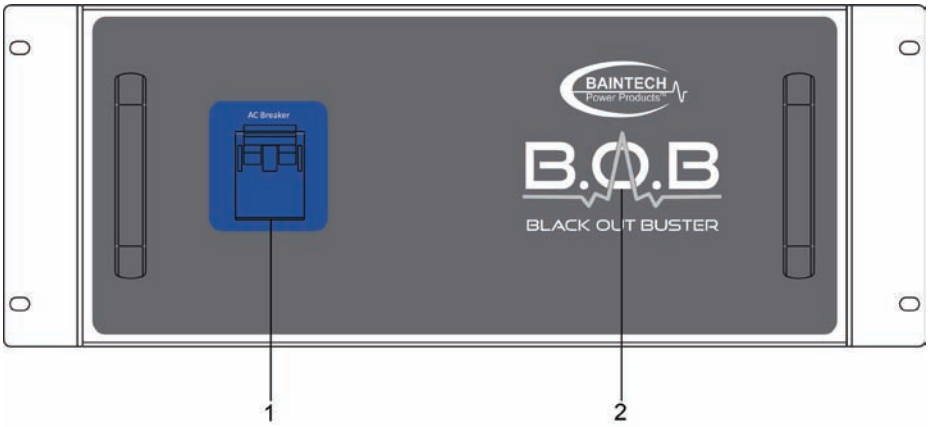
Front view



Side view

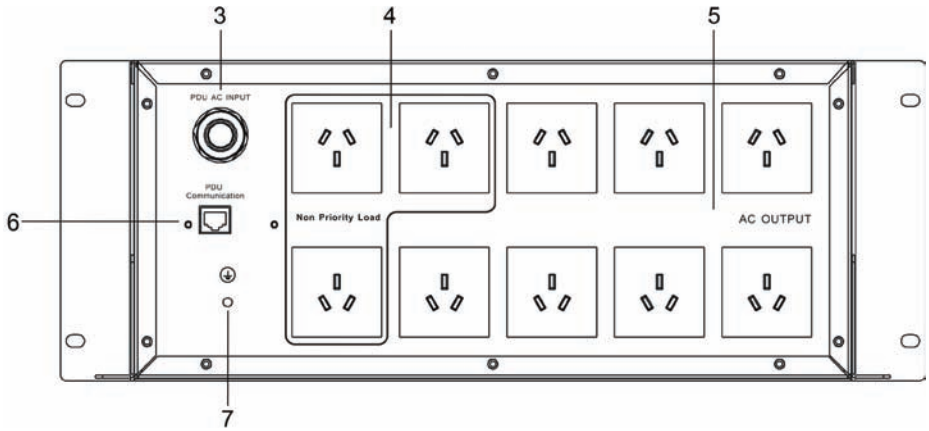
PDU Unit

PDU Unit Front Panel



1. AC Breaker (R.C.B.O. - residual-current circuit breaker with overload protection)
2. Heartbeat (status indicator)

PDU Unit Rear Panel

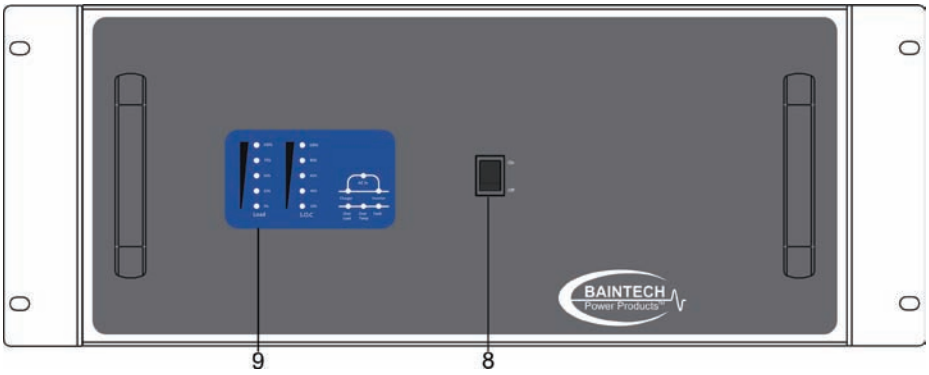


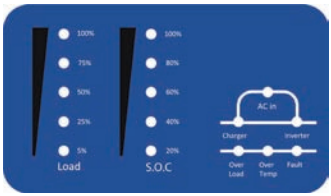
3. PDU AC Input
4. Non-essential sockets
5. Essential sockets
6. PDU communication port
7. Earth

NOTE: Number of sockets varies on each B.O.B. Model.

Combi Unit

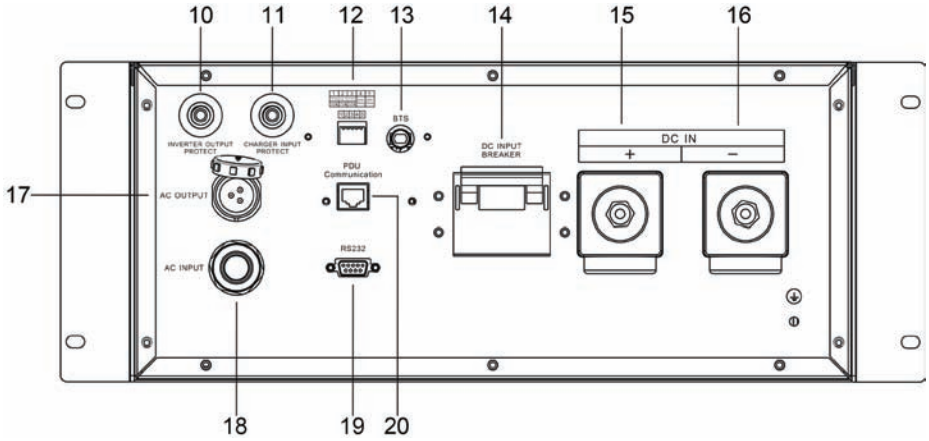
Combi Unit Front Panel





8. System Switch (on/off)
9. LED display
   - Load percentage
   - S.O.C: the state of charge of your battery
   - System status
   - Failure information

Combi Unit Rear Panel

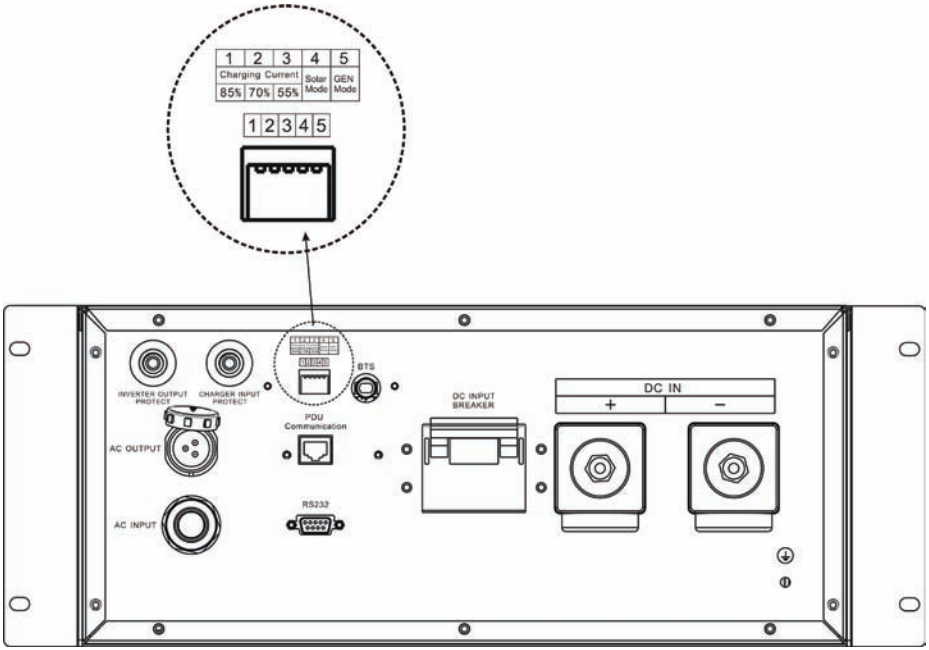


10. Inverter output protect
11. Charger input protect
12. Systems Setting dip switches
13. Battery temperature sensor connector
14. DC Input breaker
15. Positive battery connector +
16. Negative battery connector -
17. AC Output cable
18. AC Input cord with plug
19. RS232* (SERVICE ONLY)
20. PDU communication port

*used for upgrading software and can be used to read version and status information.

Pre-Installation configuration

Before the installation, you need to set configurations. Please refer to the diagram of rear panel below, for the location of the dip switch.



Charger Capacity

The charger capacity can be reduced when large loads are connected to B.O.B. Please refer to the following table on switch settings for charger capacity. The default setting is 100% (OFF-OFF-OFF).

	Dip Switch 1	Dip Switch 2	Dip Switch 3
100% capacity	OFF	OFF	OFF
85% capacity	ON	OFF	OFF
70% capacity	OFF	ON	OFF
55% capacity	OFF	OFF	ON

Solar Mode

If you want to charge your batteries from solar, you must set your B.O.B to Solar Mode by turning dips switch 4 to on. If the B.O.B is not set to solar mode your batteries will be charged from the grid not your solar panels; however if there is an outage the solar panels will kick in after B.O.B has transferred to inverter mode.

When Solar Mode is selected your batteries will be charged direct from your solar panels rather than the grid.

Under Solar mode, BOB's control algorithm will be adjusted to:

1. When battery voltage<=32V and >=LVD (Low voltage disconnect) value, it works under inverter mode.
2. When DC voltage>=32V, the unit switches to BYPASS, but no charging. When DC voltage<31.4V, back to inverter mode. In BYPASS mode the grid supplies power to the load.
3. When DC Voltage<=LVD, the unit switches to BYPASS and starts charging until Absorption charge (constant voltage) phase finishes, then back to inverter mode.

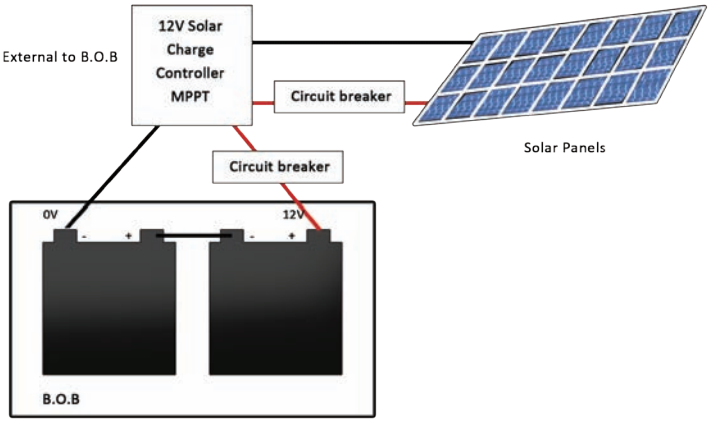
Note:
For BOB1000 (12V system) halve the above voltages, see Appendix C for LVD.

Warning:
If your priority is to maximise system running time in an outage DO NOT switch on solar mode, as the battery charge status will depend on load and solar output in solar mode. When not in solar mode the batteries are being charged by the grid.

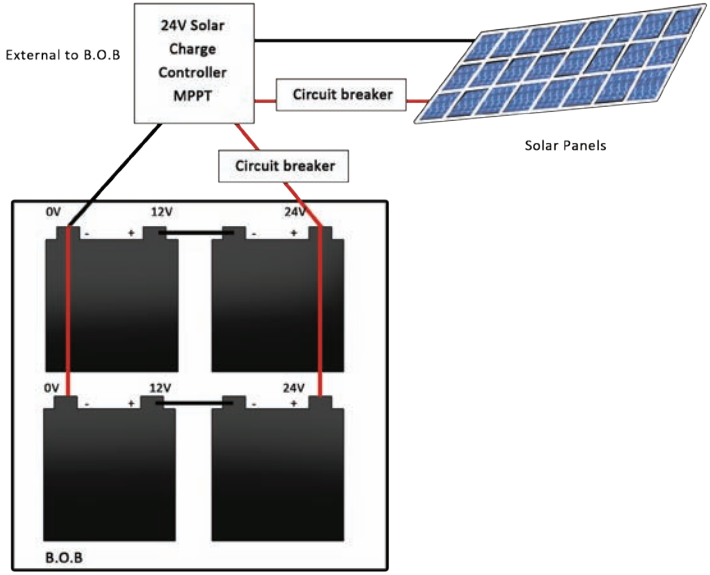
If you have selected solar mode, non-priority loads will shut down before the grid is reconnected, see Essential and non-essential loads section for more detail.

When connecting a solar panel to your B.O.B system you must connect the solar charge controller to the 0V and 12V terminals for BOB1000 and the 0V and 24V terminals for BOB2000/BOB3000. The batteries are also connected to B.O.B. in the standard configuration shown in this manual. Please observe the solar hardware manufacturer instructions and local regulations for solar installation.

BOB1000



BOB2000/30000



Generator Mode

In some applications where using a generator, the output voltage of the generator is too unstable and distorted to use the normal UPS mode and B.O.B. must be selected for GEN mode (Dip Switch 5). In this mode, B.O.B. will reduce its requirements for AC input (voltage, frequency and waveform) and transfer time from generator power to inverter power will be 2 seconds when the generator is used as mains power. This will result in appliances losing power for 2 seconds during transfer e.g., the generator is running and is suppling power to BOB and stops due to low fuel this will result in the connected loads losing power for 2 seconds and then the inverter in BOB will start up and supply power to the connected loads. If you have a generator that has good quality output you can leave the BOB set to Grid mode and the transfer time will be 15ms.

By switching on Dip Switch 5, you can set the system to work with a generator with a poor AC output.

Under GEN mode, following range will be adjusted
Voltage range : 170VAC-280VAC
Frequency range : 40Hz-70Hz
Waveform : less sensitive
Time delay: 2 seconds (when generator is used as mains power)
Charging range: 184VAC-264VAC
Charging recovery range:185V to 265V

This configuration will adjust the minimum quality of AC input which BOB will qualify and pass through to your AC appliance. Voltage or frequency variation might cause damage for particular load. Before adjusting these settings, refer to electrical rating of connected load. Failure to follow the instructions can cause damage to connected appliances.

Under GRID mode, following range will be adjusted
Voltage range : 184VAC-264VAC
Frequency range : 45Hz-65Hz
Time delay: 15ms
Charging range: 184VAC-264VAC
Charging recovery range:194V to 254V

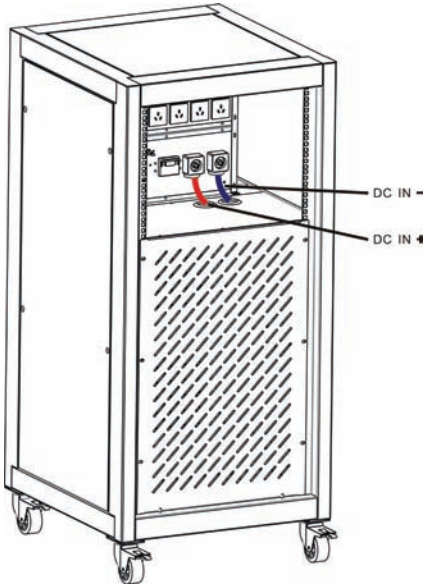
The charging range is the allowable range of AC input for the charger to work when no outage has occurred. When an outage has occurred the AC input must be between the Charging recovery range before charging will be allowed to start, this is done to protect the electronics for an unstable grid or generator connection.

Battery set-up

Please double check that the battery voltage matches the voltage of the model you are going to install. B.O.B. must be used with AGM batteries, the wrong battery can destroy equipment and void warranty.

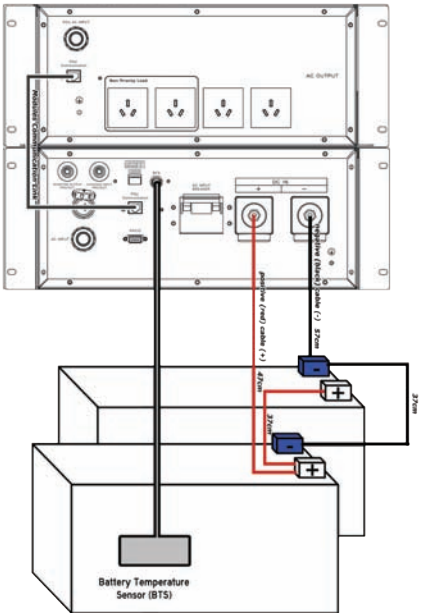
1. Ensure AC Input for the Combi unit is disconnected from the wall socket.
2. Turn Combi Unit DC Breaker (14) OFF on rear panel before connecting batteries.
3. Connect Battery Cables (included) in accordance with schematic (page 13), noting polarities (see below).
4. Fix self-adhesive Temperature Sensor (included) to the side of the battery casing and plug it into the Combi Unit Battery Temperature sensor connector (13).
5. Connect the positive cable to the Combi Unit Positive battery connector (15).
6. Connect the negative cable to the Combi Unit Negative battery connector (16).
7. DO NOT short circuit the battery cables once connected to the batteries as this may damage the cable and could start a fire.
8. Ensure that all connections are secured with a wrench.
9. Switch Combi Unit DC Breaker (14) ON to supply DC Power to B.O.B.

REVERSE POLARITY OF BATTERY CONNECTIONS WILL DAMAGE UNIT AND VOID WARRANTY

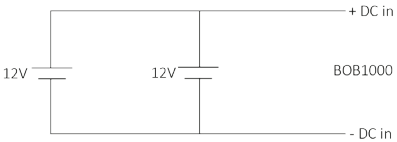


Installation Diagrams

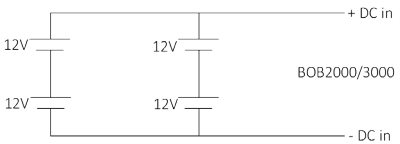
BTBOB 1000 12V DC



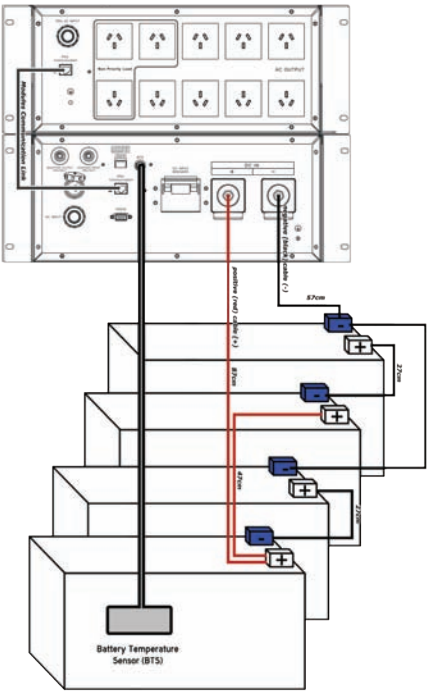
BTBOB1000 is a 12V DC system with 2 12V batteries connected in parallel



BTBOB2000/3000 is a 24V DC system with 2 strings of 2 12V batteries connected in series and the strings connected in parallel



BTBOB 2000/3000 24V DC



Batteries are connected with nut & Bolt Connection on the battery terminals

System Set-up

Please refer to the panel diagrams on page 8 and 9 during System Set up

1. Connect and hand tighten the supplied AC cable between the Combi Unit AC Output (17) and the PDU Unit AC Input (3).
2. Connect Cat5 cable between Combi Unit PDU Communications Port (20) and PDU Unit PDU Communications port (6).
3. Turn Combi Unit DC Breaker (14) ON.
4. Connect mains plug to the 10A wall socket and switch ON. WARNING: Check that the total load on the wall-socket circuit will not overload the circuit breaker in the installation
5. Turn Combi Unit System switch (8) ON.
6. Switch PDU Unit Front Panel AC Breaker (R.C.B.O.)(1) ON .
7. The PDU Unit Heartbeat (2) will now start pulsing green, indicating that the batteries are being charged. (See below for full explanation of status indicator)
   On the Combi Unit LED Display (9) the "AC In" and "Charger" LEDs will be lit up
   (If any of the fault LEDs are on switch off immediately and contact supplier).
8. Connect essential appliances to the PDU Unit Essential sockets (5).
9. Connect non-essential appliances to the PDU Unit Non-essential sockets (4).
   (see page 18 for more information on essential and non-essential loads).
10. B.O.B. is now up and running, ready to supply back-up power.

Load Connections:

The maximum input power via the B.OB. AC supply cable is 240V x 10A =2400W, which matches the allowable limit on a wall socket. When AC is reconnected after an outage a percentage of the power must be allocated to charging the batteries, so please follow the table below for determining the maximum load you will connect. For BOB 2000 and 3000 you can connect higher maximum loads by adjusting the charger capacity dipswitch settings.

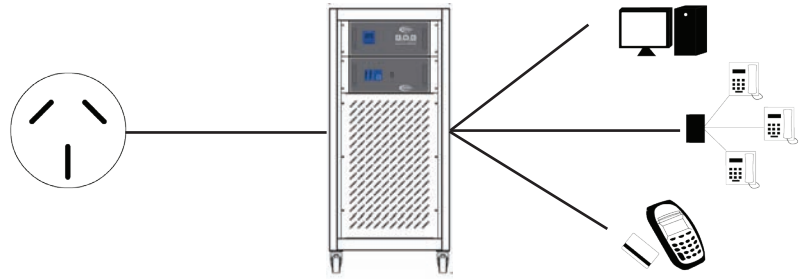
BOB1000				
Battery Charge Rate %	100	85	70	55
Charge Rate (Amps DC)	40	34	28	22
Charging Load Maximum Power (W)	480	408	336	264
Socket-outlet Power rating (W)	2400	2400	2400	2400
Maximum Connected Load (W) (Inverter rating)	1000	1000	1000	1000

BOB2000				
Battery Charge Rate %	100	85	70	55
Charge Rate (Amps DC)	40	34	28	22
Charging Load Maximum Power (W)	960	816	672	528
Socket-outlet Power rating (W)	2400	2400	2400	2400
Maximum Connected Load (W) (2400 -Charging Load)	1440	1584	1728	1872

BOB3000				
Battery Charge Rate %	100	85	70	55
Charge Rate (Amps DC)	60	51	42	33
Charging Load Maximum Power (W)	1440	1224	1008	792
Socket-outlet Power rating (W)	2400	2400	2400	2400
Maximum Connected Load (W) (2400 -Charging Load)	960	1176	1392	1608

When your system is not connected to the grid it will be in Inverter mode, so you can connect as per below.

BOB3000 Maximum Load(W): 3000
BOB2000 Maximum Load(W): 2000
BOB1000 Maximum Load(W): 1000



Mains power input
Maximum Power
2400W

Baintech BOB

Loads

WARNING:
If you increase the load when the B.O.B. is in inverter mode (outage) on the BOB 3000 and 2000 you may overload the installation input circuit breaker when the outage ends due to the charging load when the grid reconnects.

Status Indicator

B.O.B. has a built in status indicator located in the logo on the unit. The heartbeat of this logo will light up in different colours to signify different stages of B.O.B. working

Red: Batteries low
Green: Batteries full
Yellow: Inverter on
(supplying AC power from the batteries)

A battery alarm will start beeping when the Voltage reached 11.7V on a BOB 1000 and 23.4V on a BOB2000 or 3000.
When this happens the non-critical loads will be disconnected.

Testing

IT IS IMPORTANT TO SAVE AND BACK UP ANY AND ALL DATA BEFORE PERFORMING THESE TESTS

Initial Testing: Once you have completed installation of this unit (as per page 14), disconnect B.O.B. from the wall power socket. Your connected devices should remain powered up and this indicates that B.O.B. is working. Reconnect the wall socket.

Circuit Protection Testing: : Disconnect all AC loads from B.O.B. Push the Test button on the PDU Unit Front Panel AC Breaker (R.C.B.O.) (1), this will trip the RCD and disconnect power to all the appliances. If this happens then the RCD is working. Reset the RCD by turning the breaker back on. We recommend that you perform this test monthly.

System Protection

Overload Protection
If the load is more than the unit's rating for more than 60 seconds, B.O.B. will automatically shutdown and restart. This will happen three times. After the third time you need to reduce the appliance load and then turn the unit off and back on.

Overheat protection
If B.O.B.'s internal temperature is too high. The unit will switch off for overheat protection. After cooling down, the unit will switch on automatically. When the battery temp is higher than 50^{o}C, it stops charging; when decreased to 40^{o}C, it recovers automatically.

Battery over heat protection

During charging, B.O.B. will keep monitoring battery temperature and will reduce charging rate or even shut down if too high a temperature is detected. This will help to prevent thermal runaway of battery and extend the life of the battery.

Optional Extras

Cable Covers

We recommend using cable covers to keep your cables organised and safe:

- Floor Cable cover - hold cables flat to floor
- Skirting board cable cover - use double sided tape to stick to your skirting boards

Lighting

B.O.B. works with any regular light fitting and we recommend using energy saving fluorescent or LED globes to maximise your power efficiency.

Trouble Shooting

If your are experiencing any problems with B.O.B. follow the steps below to trouble shoot:

- Check if the system is plugged into wall socket (test to see if power available)
- Check if the “AC In” LED and “Charger” LED are illuminated
- Check if the PDU Unit AC Breaker (R.C.B.O.) (1) breaker is tripped
- Check if the Combi Unit System switch (8) is on
- Check for any loose power sockets at rear of B.O.B.
- Check if the Combi Unit DC Breaker (14) is on
- Check for loose battery cable connections

Service and Repair

- Service plans for B.O.B. are available as an optional extra. Contact your installer for more information
- This unit should be checked annually by your installer
- All repairs shall be carried out by qualified installers only

Specifications

Model No.	BTB.O.B. 1000	BTB.O.B. 2000	BTB.O.B. 3000
Original powder coating color	RAL7024		
AC Input Plug	10A (fits standard 10A socket)		
Nominal DC voltage	12 V DC	24 V DC	24 V DC
Inverter continuous power (W @ 25^{O}C)	1000	2000	3000
Max Charger O/P Amps	40	40	60
Inverter Output Voltage	230 V AC		
Inverter Output Volts variation %	+- 2% max		
Inverter Output Frequency	50/60hz +- 0.1%		
THD	<3%		
Protection R.C.B.O. 230 V A.C.	10 Amp 30 ma	16 Amp 30 ma	16 Amp 30 ma
M.E.N. Link protected	Yes		
DC Breaker	63A	80A	100A
Zero Load power	22W	36W	72W
Low Volt disconnect*	11 v	22 v	22 v
Low volt alarm (non essential Loads disconnect)	11.7 v	23.4 v	23.4 v
Volt Re-connect	12.8 v	25.6 v	25.6 v
Transfer time	<15ms		
Size	1340 x 600 x 650mm		
Weight Kg (excluding Batteries)	100	105	110
IEC A.C. sockets	4	8	10
Conformity	AS/NZS 62040		
Working Temperature	0^{O}C - 50^{O}C		
Storage Temperature	-40^{O}C - 70^{O}C		
Relative humidity	0%-95% non condensing		
Cooling	Forced Air		
Battery Type	AGM	AGM	AGM
Batteries: AGM 12V 200Ah	2	4	4
KW/Hrs	4.7 Kw/Hr	9.5 Kw/Hr	9.5 Kw/Hr
Load (watts)	1000	1000	1000
Time to 50% D.O.D.**	1.63 hrs	3.97 hrs	3.97 hrs
Time to 100% D.O.D**	3.26 hrs	7.94 hrs	7.94 hrs

*See Appendix B

**Time to D.O.D is an estimate with values dependent on the battery selection, age, temperature and variations in load.

Range Adjustments by mode	GEN Mode	GRID Mode
Voltage range	170VAC-280VAC	184VAC-264VAC
Frequency range	40Hz-70Hz	45Hz-65Hz
Waveform	less sensitive	N/A
Time delay	2 seconds	15ms
Charging range:	184VAC-264VAC	184VAC-264VAC
Charging recovery range	185V to 265V	194V to 254V

Loads

BOB1000

Average AC Load(W)	Time to 100% discharge (h)	Time to 50% depth of Discharge limit (h)	Battery Bank Capacity at Discharge rate (Ah)
100	42.94	21.47	429.04
200	21.52	10.76	402.70
300	13.93	6.97	386.95
400	10.10	5.05	375.70
500	7.93	3.97	367.46
600	6.32	3.16	359.91
700	5.26	2.63	353.89
800	4.47	2.23	348.63
900	3.81	1.90	343.52
1000	3.26	1.63	338.63

BOB2000

Average AC Load(W)	Time to 100% discharge (h)	Time to 50% depth of Discharge limit (h)	Battery Bank Capacity at Discharge rate (Ah)
200	39.89	19.94	426.15
400	18.60	9.30	397.34
600	13.33	6.67	385.39
800	10.15	5.07	375.86
1000	7.94	3.97	367.49
1200	6.49	3.25	360.78
1400	5.48	2.74	355.21
1600	4.73	2.37	350.45
1800	4.16	2.08	346.31
2000	3.70	1.85	342.64

BOB3000

Average AC Load (W)	Time to 100% discharge (h)	Time to 50% depth of Discharge limit (h)	Battery Bank Capacity at Discharge rate (Ah)
200	39.89	19.94	426.15
400	18.60	9.30	397.34
600	13.33	6.67	385.39
800	10.15	5.07	375.86
1000	7.94	3.97	367.49
1200	6.49	3.25	360.78
1400	5.48	2.74	355.21
1600	4.73	2.37	350.45
1800	4.16	2.08	346.31
2000	3.70	1.85	342.64
2200	3.33	1.67	339.36
2400	3.03	1.51	336.39
2600	2.77	1.39	333.68
2800	2.55	1.28	331.19
3000	2.37	1.18	328.89

Essential and non-essential loads:

Essential loads are equipment which you absolutely need to run to work e.g.:

- Critical PCs
- Electronic transaction equipment
- Essential lighting

Non-essential loads are for equipment which is not essential to your work e.g.:

- Printers
- Fax
- Non-essential lighting

When the battery voltage reaches 11.7V (12V system) or 23.4V (24V system) B.O.B. will disconnect non-essential loads. When the battery voltage reaches 11.0V (12V system) or 22V (24V system) B.O.B. will disconnect essential loads. When the non-essential loads are disconnected the Low battery Alarm will go off, you will hear a beep for 0.5 second every 5seconds.Non-essential loads reconnect when the battery voltage rises above 12.2V(B.O.B.1000) and 24.4V(B.O.B.2000 and 3000)

Load Running Time Examples

520L Pharmacy Fridge
720W
BOB1000 5 hours
BOB2000/3000 11 hours

Office PC
150W
BOB1000 27 hours
BOB2000/3000 54 hours

Server (Bainbridge)
300W
BOB1000 14 hours
BOB2000/3000 30 hours

Office PC +Eftpos machine
160W
BOB1000 26 hours
BOB2000/3000 50 hours

Office PC +Eftpos machine + Cash Register
185W
BOB1000 21hours
BOB2000/3000 42 hours

Warranty information

Baintech's Black Out Buster comes with a standard 2-year warranty.
Warranty covers B.O.B unit only. All other components' warranty as specified by the manufacturer
Please fill out the enclosed warranty registration card to register your warranty with us.

The reality of dealing with technical products is that occasionally things can go wrong. Sometimes it can be the product and sometimes it can be environmental issues like voltage spikes or problems in electrical systems. So if you are in the unfortunate situation of needing to lodge a warranty claim we have formulated this guide to help you better understand the way that Bainbridge treats and processes warranty claims and service.

CAUTION: PLEASE OBSERVE CAUTION WHEN WORKING AROUND ELECTRICAL INSTALLATIONS AND BATTERIES. PLEASE CHECK YOUR LOCAL STATE LEGISLATION IN RELATION TO WHO CAN PERFORM ELECTRICAL INSTALLATIONS, SERVICE & REPAIR.

REPAIR AUTHORITY

If you need to lodge a warranty claim for any goods please complete and return one of our Repair Authority forms and return with the goods. This form has been designed so that we can gather all the necessary information required to process your claim as quickly and efficiently as possible.
To access the Repair Authority form, please go to www.baintech.com.au/warranty

How to Obtain Service

1. Consult the Users' Guide (copy provided with your product or available for download from the products section of our website).
2. If the product still exhibits the problem, contact BAINTECH within the Warranty period and no later than 30 days after the discovery of the claimed defect (whichever is the earlier)
3. Complete the Bainbridge Repair Authority Form and return this with the goods. Please refer to the link at the top of this page, be sure to include a copy of your original proof of purchase (invoice or receipt).
4. Please remove and retain all accessories or cables that are not related to or part of the fault. To assist our technicians please include a full description of the fault and the circumstances in which the fault has occurred.
5. Return the goods along with the Repair Authority to the address shown below.
6. BAINTECH maintains serial number records (where applicable) of warranty entitlement for all products shipped and/or registered, and this will be used to validate your end warranty date. If you disagree with BAINTECH identification of warranty entitlement, you must provide proof of purchase before any warranty service can be performed.
7. IMPORTANT note: –"BAINTECH" cannot be held responsible for loss of data. In some products, repair to the goods may result in loss of the data. This may include, for example, settings or recorded data. BAINTECH recommends that you back up and secure your data prior sending the goods for repair or service.

Address for return of product:
BAINBRIDGE TECHNOLOGIES
1224 Lytton Road
Hemmant Qld 4174

BEFORE YOU SUBMIT A PRODUCT FOR REPAIR OR A WARRANTY CLAIM

Recommended Action for a Remedy

Problem	Recommended action
The product arrives damaged, incomplete, does not substantially match description or is not substantially fit for purpose.	Contact your reseller (or place of purchase).
The product has a warranty related fault that is within the warranty time frame specified on the packaging or on the Bainbridge Web Site.	Return the product to your reseller for refund or exchange, subject to and in accordance with the reseller's policy.
The product has warranty related fault after the time frame specified by the Supplier's refund/ exchange policy.	Contact BAINBRIDGE TECHNOLOGIES to determine and arrange the best service option for you.
The product has physical damage or exhibits a fault not related to the BAINTECH warranty.	Contact BAINBRIDGE TECHNOLOGIES. Service shall be at BAINTECH or its Authorised Service Provider's rates and terms then in effect.

BAINTECH Technical Centre

BAINTECH provides limited complimentary technical phone support for your product. Expert staff provides technical assistance during normal business hours, 5 days a week. Be sure to have the following information available before you call:

- Your product's model and serial number
- A description of the problem or fault

Australia : 1300 224 683
New Zealand : +61 7 3348 8082 (option 2)

WATER DAMAGE

Where applicable the product will have the International Protection or "IP" rating clearly marked on the product. This classifies the degrees of protection provided against the intrusion of solid objects (including body parts like hands and fingers), dust, accidental contact, and water in electrical enclosures. The standard aims to provide users more detailed information than vague marketing terms such as waterproof.

Example IP65: Complete protection against entry of dust & protection from a low pressure jet of water in any direction.

First Digit		Second Digit	
X	Not tested (no protection specified)	X	Not tested (no protection specified)
0	No protection provided	0	No protection provided
1	Protection against entry of objects larger than 50 square mm	1	Protection against drops of water falling vertically
2	Protection against entry of objects larger than 12 square mm	2	Protection against drops of water falling vertically when the luminaire is tilted up to 15 degrees from its normal position
3	Protection against entry of objects larger than 2.5 square mm	3	Protection from entry of water spray from angle of up to 60 degrees from vertical
4	Protection against entry of objects larger than 1.0 square mm	4	Protection from entry of water splashes or spray from any direction
5	Protection against entry of dust in sufficient quantity to prevent satisfactory operation	5	Protection from a low pressure jet of water in any direction
6	Complete protection against entry of dust	6	Protection against heavy seas or a strong jet of water in any direction
		7	Protection against immersion up to 1 metre
	NOTE: "M" or MARINE SERIES CTEK CHARGERS ARE NOT WATER PROOF. PLEASE CHECK THE "IP" RATING BEFORE RETURNING FOR WARRANTY	8	Protection against submersion over 1 metre

WHEN NO FAULT IS FOUND

The following charges will apply:-
Service fees:
Handheld Units
(CTEK, TECSUP, NITRO etc) $25.00 + GST= $27.50
Larger Units
Inverters, Inverter Chargers, Large Chargers, B.O.B, B.O.S.S $60.00 + GST=$66.00

ACTIONS WE RECOMMENDED PRIOR TO RETURNING BATTERY CHARGERS, INVERTERS & INVERTER CHARGERS

To reduce the chances of sending us a product we cannot fault, we ask that you perform the following tests prior to returning the product:

1. Battery Condition: Please check the condition of the battery (specific gravity, shorted plates etc)
2. Quality of Power Supply: Stability of Power Supply is important for the correct operation of electrical products. Voltage spikes, low or excess voltage can all affect the performance of the product.
3. Excessive Load: If you are returning an inverter that is cutting out please ensure that the load being supplied does not exceed that of the product. It is worth noting that some microwaves may say 600W but in fact draw up to 1500W when heating.

FREQUENTLY ASKED QUESTIONS & ANSWERS

Q. Is damage to my batteries caused by a defective BainTech product covered by warranty?

A. If the damage is caused by the warranty fault, The Australian Consumer Law entitles a purchaser defined as a Consumer under that Act, in the event of a major failure, to recover compensation for any other reasonably foreseeable loss or damage . Otherwise, No, because there is no way to determine whether the alleged damage is caused by the product or due to a battery fault or misuse of the battery or product.

Q. Why do you charge a service fee?

A. BainTech tries, under every circumstance, to process a warranty claim but on some occasions we will be forced to reject a claim. If this is the case, we must charge a fee to recover our time and any freight costs. It is not reasonable to expect Bainbridge to be out of pocket for products that have no fault, or are outside of Warranty terms.

Q. Will I get a new product if under Warranty?

A. The Australian Consumer Law entitles a purchaser defined as a Consumer under that Act, in the event of a major failure to a replacement product or a refund at their election. Otherwise repair or replacement is at Baintech's discretion. In such cases Typically a replacement will be provided for smaller hand held products, however this is not always the case. It is not uncommon for larger products (Victron, Sinergex etc) to be repaired. See warranty terms set out in full on our website.

Q. How long will it take to process my Warranty claim?

A. Many factors can determine the length of time that a warranty claim can take. Typically we can process a warranty within a day or two however there may be circumstances where this can take much longer. Time is difficult to predict if we cannot find the cause of or existence of a fault in a product. We always try our best to reproduce faults before denying a claim. We always assume you have taken the time to return a product to us for a reason!

PLEASE NOTE THAT MULTI STAGE CTEK CHARGERS CAN TAKE 7 TO 10 DAYS TO GO INTO THE FINAL STAGE OF CHARGE.

Q. Do I have to cover the cost of return freight?

A. If warranty terms are complied with and the product is deemed under warranty - no. If a warranty claim is rejected you must bear the cost of the freight.

Q. Do you need all the cables and accessories returned with the product?

A. No...Not unless they form part of the claim i.e. the cable gets hot, or the display panel flashes etc

Q. When you replace a product under Warranty does my warranty coverage start again?

A. NO... Bainbridge warrants replacement products or parts provided under warranty against defects in materials and workmanship from the date of the replacement or repair for ninety (90) days or for the remaining portion of the original product's warranty, whichever provides you longer coverage. All products sold are covered with statutory guarantees if sold to consumers.

GENERAL INFORMATION AND OPTION TO REPAIR

Should you be in the unfortunate situation of having a warranty claim rejected it may be optional to have the product repaired. Bainbridge has an extensive service and repair department headed by a qualified electronics engineer and in many cases we are able to repair the faulty product.

Some products are difficult or unable to be repaired due to modern manufacturing techniques this is particularly common in hand held battery chargers. Many of the larger products can be repaired and returned to service.

Baintech warrants replacement products or parts provided under this warranty against defects in materials and workmanship from the date of the replacement or repair for ninety (90) days or for the remaining portion of the original product's warranty, whichever provides you longer coverage.

For larger products such as inverters, larger chargers and inverter chargers Bainbridge may at its discretion offer the following services:

- Exchange Products – Depending on availability we may at our discretion send you an exchange product so that you can continue to function while we test and repair your product.
- Advanced Warranty – If your product is mission critical we may elect to send you a new product on the basis that delivery to you, installation and new product will at your cost however, if the defect in the product is covered by warranty we will then credit this cost back to you.
- Technical Support Network :-

BAINTECH Technical Centre

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- Your product's model and serial number
- A description of the problem or fault

Australia : 1300 224 683
New Zealand : +61 7 3348 8082 (option 2)

If the warranty service provided does not meet the offer outlined in this document, please detail your concerns to After Sales Service,
and submit your claim by letter to the address below or email: sales@BAINTECH.com.au

BAINBRIDGE TECHNOLOGIES
PO BOX 7222
Hemmant, Australia QLD 4174

What is covered under the Warranty

All products manufactured or supplied by BAINTECH to a person defined as a "Consumer" 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 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.

Warranty entitlements of purchasers that are not Consumers under the definitions in the Australian Consumer Law may be limited by the following provisions of this warranty

Subject to the above provisos and in the absence of any other specific agreement to the contrary BAINTECH will within the warranty period repair or exchange products manufactured or supplied by it either directly or through a reseller in accordance with the following terms :-

WARRANTY TERM: 90 days from the date of sale by BAINTECH or a reseller (unless a longer period is imposed by legislation including Consumer Guarantees if applicable).

WARRANTY CONDITIONS, in addition to statutory Guarantees that apply to sales to Consumers:-

1. If a product manufactured or sold by Bainbridge Technologies, fails to perform in accordance with its specification during normal and proper use due to defects in materials or workmanship by it within the Warranty period BAINTECH will repair the product or exchange the faulty parts within the product, or replace the product itself at its cost.
2. The cost of collecting and re-delivering the product will be reimbursed to the customer upon it being determined that this warranty applies (but subject to meeting the conditions set out under the "Other Conditions of Sale")
3. The decision as to whether to repair or replace the product will be at the sole discretion of BAINTECH. (except for sales to Consumers who in the case of a 'major' failure may elect a replacement or a refund)
4. Goods presented for repair may be replaced by refurbished goods or substitute goods of the same or similar type rather than being repaired. Refurbished parts may be used to repair the product (except for sales to Consumers who in the case of a 'major' failure may elect a replacement or a refund).
5. Ownership of products returned for replacement or repair under warranty, shall upon a decision being made to replace the product be deemed to be transferred to BAINTECH
6. BAINTECH obligation under this warranty is subject to the product returned being a genuine BAINTECH product and in an unaltered and unmodified condition.
7. This Warranty is valid within Australia.

International Warranty

Sales of product to purchasers outside Australia are sold on the following conditions:

1. Warranty applies as per the provisions specified above provided that, Complimentary courier pickup and return service does not apply to any service outside of Australia and New Zealand.
2. Any statutory warranties imposed by the jurisdiction in which the purchaser resides are excluded to the maximum extent allowed by law.
3. In New Zealand our products come with guarantees that cannot be excluded under the Consumer Guarantee Act 1993. This warranty applies in addition to the conditions and guarantees implied by the Consumer Guarantee Act 1993.
4. Warranty service availability, coverage and response times may vary from country to country.

The following are not covered by the Warranty

This Warranty shall not apply to nor cover any of the following circumstances or costs:

- in all sales where the law does not exclude such limitation;
- in a sale to a Consumer where the exclusion is prohibited except where the product is used for a personal domestic or household use and the product is not used for those purposes:

1. BAINTECH will take reasonable steps to provide product service and provide replacement parts where it is commercially prudent and possible to do so.
2. Repaired or exchanged items are warranted for the longer of the balance of the original product Warranty or 90 days from the date of service completion (whether warranty service or otherwise) on the same terms and conditions as the original warranty.
3. This Warranty is personal to the person or organisation that acquires the product from a BAINTECH or an authorised Reseller and may not be transferred to a subsequent owner (other that as provided in the Australian Consumer law)
4. If Courier Pickup and Return is required for your product, you are required to contact BAINTECH to arrange this service using BAINTECH designated freight carrier. BAINTECH will not accept charges or liability for any freight arranged by you. Please ensure that the product is sufficiently padded and boxed for transport.
5. BAINTECH does not accept any responsibility for damaged product in transport due to inappropriate packaging. This courier service is only applicable between your location and BAINTECH and may not be available in some areas. Transport time varies depending on location.
6. In sales to persons who are not defined as Consumers under the Australian Consumer Law and in sales to Consumers where products are NOT used for personal domestic or household purposes, BAINTECH liability is limited to the actual cost of repair or replacement of the product and does not extend to any other loss of whatsoever nature or howsoever incurred including any form of consequential damage or loss .
7. In the event of the product being incapable of repair or replacement BAINTECH may in its absolute discretion elect to refund the purchase price (actually paid by the customer) of the product in full discharge of its liability under this warranty.(except for sales to Consumers who in the case of a 'major' failure may elect a replacement or a refund).

8. Non-authorised disassembly of any product or attempted repair by persons not accredited or authorised by BAINTECH will void its warranty. This includes removal of covers or the replacement of internal fuses.
9. BAINTECH will not be responsible for any failure to perform its warranty obligations due to causes beyond it's control, (force majeure) including, without limitation, fires, floods, earthquakes, explosions, accidents, acts of public enemy, wars, rebellions, insurrections, sabotage, epidemics, quarantine restrictions, labour disputes, labour shortages, transportation embargoes or failures or delays in transportation, inability to secure raw materials or machinery for the manufacture of their products and delivery of their services, acts of God, acts of any government or any agency thereof (including denials or onerous restrictions on required export licenses), and judicial actions.
10. If there is no fault found with the product a service fee will apply, plus any return freight charges, prior to the product being released. If the product is out of warranty the service fee will be included in the quote for repair. If the quote for repair is denied then the service fee will apply plus freight before the goods are released
(Explanation- Occasionally BAINTECH will receive a product that it cannot fault. Even after hours of testing some products will not fail. If the product cannot be faulted we cannot process a warranty or repair, and we are entitled to recover our time and costs.)

BAINBRIDGE TECHNOLOGIES Technical Centre

BAINBRIDGE TECHNOLOGIES provides limited complimentary technical phone support for your product. Expert staff can provide technical assistance during normal business hours, 5 days a week. Be sure to have the following information available before you call:

- Your product's model and serial number
- A description of the problem or fault

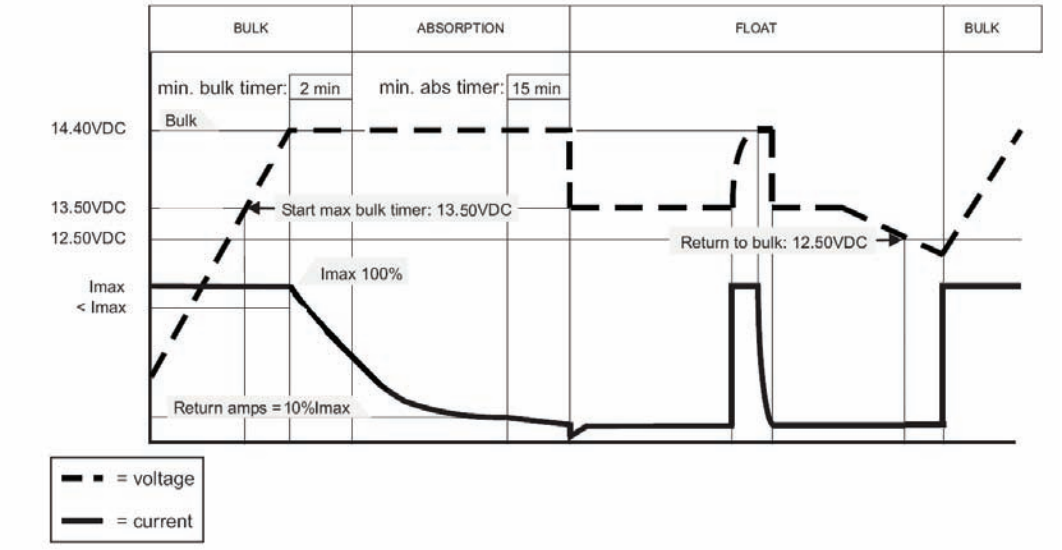
Australia : 1300 224 683
New Zealand : +61 7 3348 8082 (option 2)

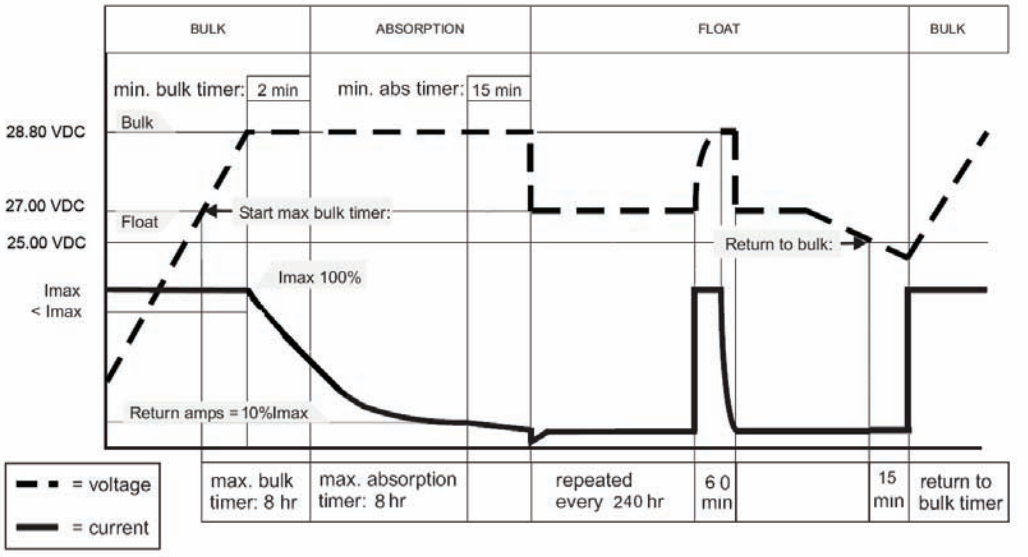
If the warranty service provided does not meet the offer outlined in this document, please detail your concerns to After Sales Service, and submit your claim by letter to the address below or email: sales@baintech.com.au

Bainbridge Technologies
P. O. Box 7222
Hemmant. Qld. 4174

Appendix

Appendix A





Maximum Bulk time= 8hrs
Max absorption time=8hrs
The max float time is 10 days. If the unit enters inverter mode or the battery voltage drops below 12.5V, it exits floating.

Appendix B

SOC LEDs when Charging:

20% led on	Bulk Mode (constant current)
20% and 40% leds on	Bulk Mode (constant current) and the batt volt>12.8V
20%,40%and 60% leds on	Absorption Mode (Constant voltage)
20%,40%,60% and 80% leds on	After 1hrs of Absorption Mode (Constant voltage) or the charging current<50% of nominal charging current
20%,40%,60% ,80% and 100% leds on	Float(Mode)

SOC LEDs when discharging:

20% led flashing	BatV <11V
20% led on	BatV >= 11V and <11.6V
20% and 40% led on	BatV >= 11.6V and <12V
20%,40%and 60% leds on	BatV >= 12V and <12.4V
20%,40%,60% and 80% leds on	BatV >= 12.4V and <12.8V
20%,40%,60% ,80% and 100% leds on	BatV >= 12.8V

Load LEDs when Charging:

chg level = chg I/Rating I

When charging the BOB is connected to the grid and the load is provided by the grid.

5% led on	Chg level>=5% and <15%
5% and 25% leds on	Chg level>=15% and <40%
5%,25%and 50% leds on	Chg level>=40% and <65%
5%,25%,50% and 75% leds on	Chg level>=65% and <90%
5%,25%,50% ,75% and 100% leds on	Chg level>=90%:

Load LEDs when in inverter mode:

When in inverter mode the grid is disconnected and the load is supported by the batteries

5% led on	Load>=5% and <25%
5% and 25% leds on	Load level>=25% and <50%
5%,25%and 50% leds on	Load level>=50% and <75%
5%,25%,50% and 75% leds on	Load level>=75% and <100%
5%,25%,50% ,75% and 100% leds on	Load level>=100%:

Appendix C

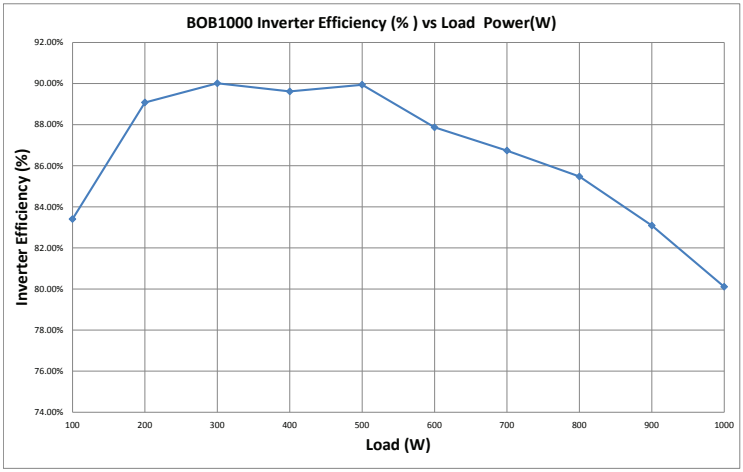
The following table indicates the voltage at which the B.O.B. shuts down for given loads.

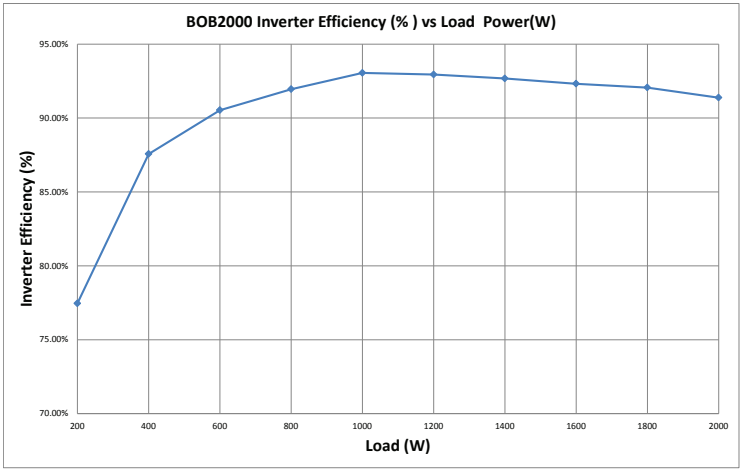
Load percentage %	Low Voltage Disconnect (V)	Low Voltage Disconnect (V)
	BOB1000	BOB2000/3000
>90%	10.6	21.2
80 to 90%	10.7	21.4
20 to 90%	10.8	21.6
10 to 20%	10.9	21.8
0 to 10%	11v	22

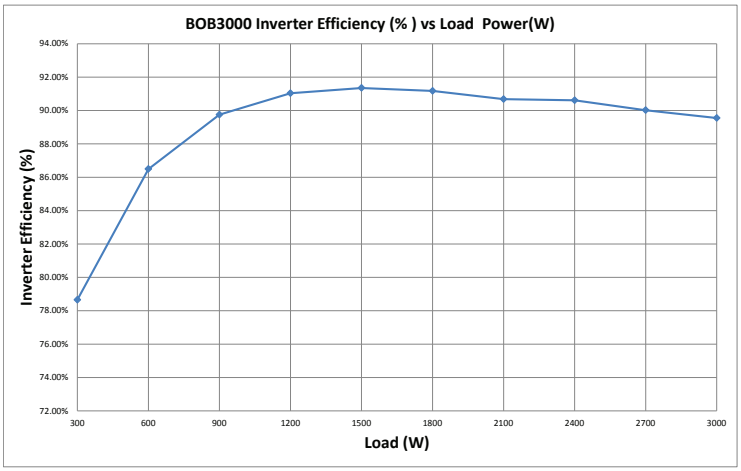
Appendix D

Status	Item	AC in	Inverter	Over temp	Over-load	Charger	Fault	Beep
AC mode	CC	√	×	×	×	√	×	×
	CV	√	×	×	×	√	×	×
	Floating	√	×	×	×	√	×	×
	Stop chg	√	×	×	×	×	×	×
Inv mode	Inv mode	×	√	×	×	×	×	×
Alarm	Batt low	×	√	×	×	×	×	beep 0.5s every 5s
	Batt high	×	√	×	×	×	×	beep 0.5s every 1s
	overload	×	√	×	√	×	×	beep 0.5s every 1s
	Inv over temp	×	√	√	×	×	×	Beep 0.5s every 1s
	Heatsink over temp	√	×	√	×	√	×	beep 0.5s every 1s
	Dc out over voltage	√	×	×	×	√	×	beep 0.5s every 1s
Fault	Fan stop	×	×	×	×	×	√	beep continuous
	Batt high	×	×	×	×	×	√	beep continuous
	Inv overload protection	×	×	×	×	×	√	beep continuous
	Over temp protection	×	×	×	×	×	√	beep continuous
	DC out over voltage	×	×	×	×	×	√	beep continuous
	Shortcut protection	×	×	×	×	×	√	beep continuous

Appendix E


BOB1000 Inverter Efficiency (%) vs Load Power(W)
Inverter Efficiency (%)
92.00%
90.00%
88.00%
86.00%
84.00%
82.00%
80.00%
78.00%
76.00%
74.00%
100
200
300
400
500
600
700
800
900
1000
Load (W)


BOB2000 Inverter Efficiency (%) vs Load Power(W)
Inverter Efficiency (%)
95.00%
90.00%
85.00%
80.00%
75.00%
70.00%
200
400
600
800
1000
1200
1400
1600
1800
2000
Load (W)


BOB3000 Inverter Efficiency (%) vs Load Power(W)
Inverter Efficiency (%)
94.00%
92.00%
90.00%
88.00%
86.00%
84.00%
82.00%
80.00%
78.00%
76.00%
74.00%
72.00%
300
600
900
1200
1500
1800
2100
2400
2700
3000
Load (W)