



D~CORE

Instruction Manual

Copyright Version 1.0

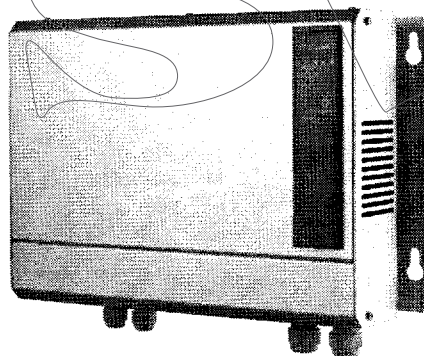
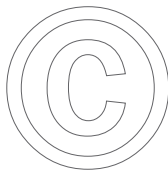
Pure Sine Wave Inverter

Model 12/1000, 12/1200

Model 12/1000-A, 12/1200-A

Model 24/1200, 24/1500

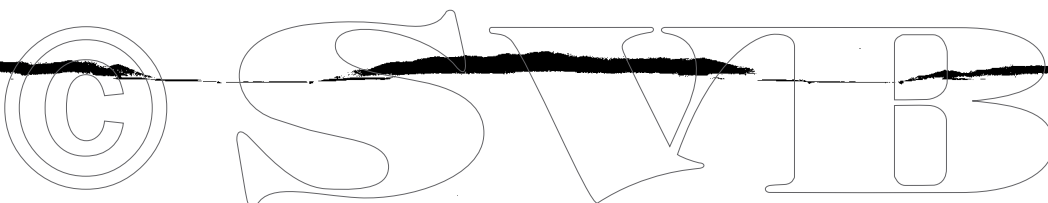
Model 24/1200-A, 24/1500-A



PSWIB

Thanks for your choice in purchasing our D-Core Pure Sine Wave inverter, which are designed to be your best companion in sailing, at home, in office, traveling or outdoor camping

- 1 General information
 - 1.1 About TBB
 - 1.2 Use of this manual
 - 1.3 Guarantee
 - 1.4 Disclaimer
 - 1.5 Warning
- 2 Safety instruction
 - 2.1 Symbol
 - 2.2 Safety instruction
 - 2.3 General Precaution
 - 2.4 Precaution regarding battery handling
- 3 Installation
 - 3.1 Preparation
 - 3.2 Environment
 - 3.3 Mounting
 - 3.4 Connection



- 4 Operation
 - 3.5 Introduction
 - 3.6 Feature
 - 3.7 LED Indicator
 - 3.8 Switching ON/OFF
 - 3.9 Remote Controller
 - 3.10 D.C. Input voltage and operation range
- 4 Trouble Shooting
- 5 Technical Data
- 6 EC Declaration of Conformity

1 GENERAL INFORMATION

1.1 About TBB

TBB Power is a dedicated designer and manufacturer of sophisticated and environmentally rugged power electronics equipment for mobile, industrial and solar market. With belief of "ursuit of perfection", we will offer market high quality products.

1.2 USE OF THIS MANUAL

This manual serves as a guide line for the operation, maintenance and possible trouble shooting of the D-CORE inverter. It is therefore obligatory that every one who may get involved with this inverter (either installation or end-user) must read through this manual and follow the instruction.

The installation of D-CORE inverter must be carried out by qualified professional who familiar with the locally applicable standards and taking into consideration the safety requirement.

Please keep this manual well for future reference after installation.

1.3 GUARANTEE

The guarantee period is two years.

1.4 DISCLAIMER

- Damage happened due to application or usage not in accordance with instructions specified in this manual is out of guarantee.
- Loss or damage, whether direct, indirect, consequential or incidental, which might arise out of use of this inverter
- Possible error in the manuals and result thereafter

1.5 WARNING

- The modification to the inverter may be carried out only after written permission of TBB Power
- This equipment is not designed for any life-retaining equipment

2 SAFETY INSTRUCTION

2.1 Symbol



CAREFUL!



DANGEROUS if not follow instruction!

All these symbols are applicable for all chapters of this manual

2.2 Safety Instruction

- Use D-Core inverter in a well ventilated area with protection against rain, moisture, dust and non-condensing circumstances
- User must be familiar with this manual and follow all instructions.
- All cables selected must meet the minimum gauges required in this manual and connection must be secured. Smaller gauges, loose connection, broken cables are not allowed to use



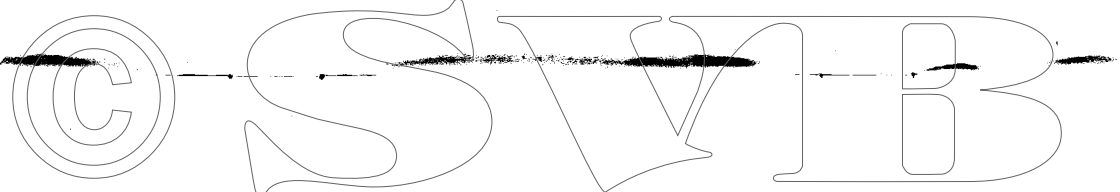
Never use inverter in circumstance where there is danger of gas or dust explosion



As dangerous voltages and temperature exist within the inverter, only qualified and authorized maintenance personnel are permit to open it



Always switch off the main and disconnect DC and AC load before carrying out maintenance.



2.3 General Precaution

- Protect DC wiring with a fuse
- ALWAYS properly ground the inverter before operation. Connect the inverter's earth terminal to the central ground or chassis.
- Turn off the unit and disconnect the AC load before connecting or disconnecting the pure sine wave inverter to battery
- DO NOT pull cable
- DO NOT allow cable to be led through sharp edges!
- Check DC cable in regular basis. Immediate correction must be carried out in case of damage.
- Store the D-CORE inverter in a cool, dry place

2.4 Precaution regarding battery handling



Batteries contain aggressive acids.

Avoid the contact with the battery fluid agent. If a contact with battery fluid agent should occur, then rinse the affected parts of the body or clothing etc. with plenty fresh water. It is imperative to seek medical treatment from a doctor with injuries caused by acid.

- Do not put metal tool on the battery; spark and short circuit might lead to explosion
- Remove off ALL personal metal items such as rings, bracelets, necklaces and watches while working with batteries. Batteries can cause short-circuit current high enough to make metal melt and could cause severe burn



3 INSTALLATION

3.1 PREPARATION

- Inspection : unit must be delivered with unbroken package together manuals and all other accessories
- Tools : screw driver, M8 screw, multi-meters, DC cable

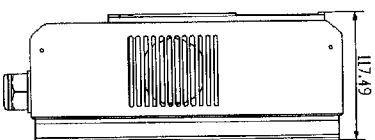
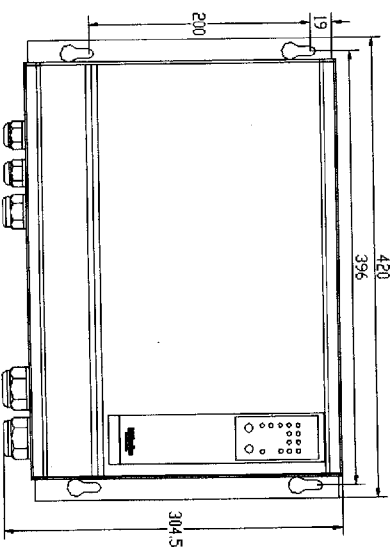
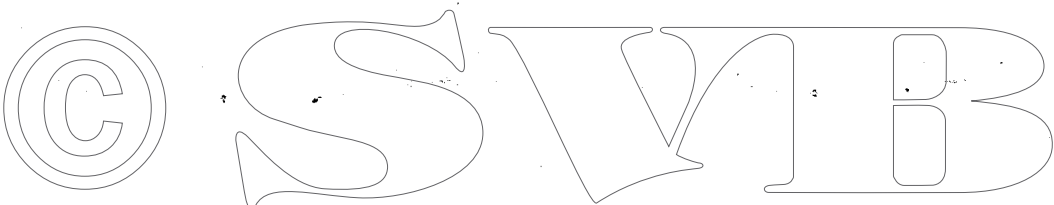
3.2 ENVIRONMENT

- Dry, well ventilated and dust free situation
- Relative humidity : 0% - 95% , non-condensing
- Altitude : up to 1500m, degrading over 1500m



- DONOT locate the inverter in the same compartment as battery
- Locate the inverter as close as possible to the DC distribution in order to keep the battery cables short.
- Do not obstruct the air flow and keep it away from any kind of water

3.3 MOUNTING



- To mount the D-CORE inverter, follow the following steps:
- Determine the mounting point
 - Drill the holes on mounting wall
 - Mount the inverter with four screw and fasten all screws securely

3.4 CONNECTION



Cut off power before doing connection

3.4.1 OPENING THE FRONT PANEL

Remove the three screws from the front side then you can take away the front panel from the cabinet. Then, you can approach all terminals and cable glands.

3.4.2 AC WIRING AND EARTH WIRING



- For safe installation it is necessary to insert a (earth leakage) switch in the inverter output



Check whether the voltage from the inverter is same as the connected equipment



The earth wire offers protection only if the inverter cabinet is connected to the earth. Connect the inverter's earth terminal to the chassis.

- To connect the D-CORE inverter, switch off the inverter and open the front cabinet. The AC input was the left hand terminal block (in Green colour) and AC output was the right hand terminal block (in BLUE colour).
- Connect the AC input to the AC input terminal block. (ONLY for models with suffix A)
- Connect the AC output to the AC output terminal block
- Connect the 1.5mm² 2.5mm² wire, brown wire to terminal L, the blue wire to terminal N and the green/yellow to terminal PE.

3.4.3 DC WIRING



Keep the cable length as short as possible, this will keep the system efficiency as high as possible.



Mark the cable with red or black isolation tape at both ends to avoid mistake



For model with suffix A, without a proper battery connected, the inverter can not be switched on

Recommended size of battery cable

cable gauges	12V-1000	12V-1200	24V-1200	24V-1500
	25mm ²	35mm ²	16mm ²	16mm ²

- Connect the cable clamp.
- Pull the battery cable through the glands at the bottom side of the inverter
- Connect the negative cable to the negative connection bolt (left) and positive cable to the positive bolt (right) of the inverter.
- Cut the cable to right length (Keep the length to the minimum)
- Connect the negative cable to the negative battery pole and positive cable via DC fuse to the positive red pole of battery



Double check the polarity of DC INPUT, the reverse polarity might damage the inverter and is out of guarantee.

3.4.4 CONNECTING THE REMOTE CONTROLLER

The remote controller of D-CORE offer complete information for the operation of inverter, of which is same to that of central display. Detail information please refer to :

4.4... Remote Controller

Connect cable to inverter

Please connect the cable in red colour into socket marked with red and connect the cable in blue colour into socket marked with blue.

Connect cable to remote controller

Please connect the cable in red colour into socket marked with red and connect the cable in blue colour into socket marked with blue.

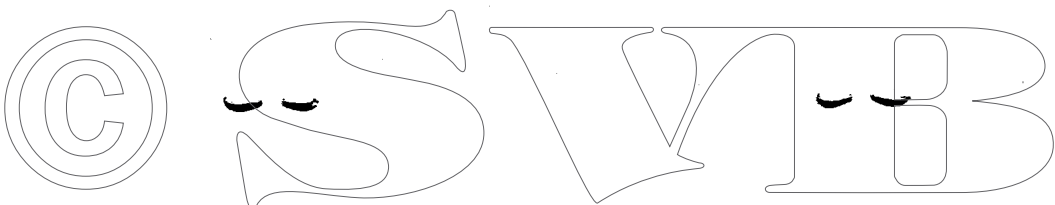
3.4.5 AUTOMATIC SWITCHING WITH SHORE POWER/GENSET

(ONLY for models with suffix A)

Only models with suffix A are equipped with ATS inside, of which you can to use inverter with shore power to build up an uninterrupted power.



Model(s)(without suffix-A) are not equipped with ATS inside. It is NOT allowed to use this to connect with shore power even with hand switch or simple replay switching system. It will damage the inverter and this kind of damage is not covered by the warranty



4 OPERATION

4.1 INTRODUCTION

The D-CORE inverter is a fully automatic high efficiency inverter which was developed base on SPWM High Frequency technology with micro-processor controlled. The inverter converts DC voltage to 230V AC, 50Hz. The output was a pure sine waveform which can guarantee a reliable and trouble free operation of any equipment.

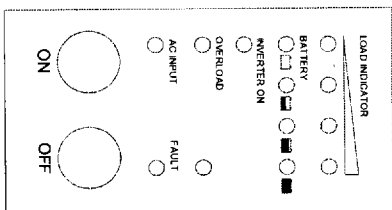
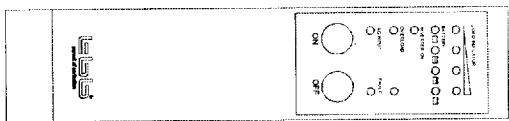
A key feature of D-CORE inverter was its outstanding overload capability. With 200% within 5sec, you can easily cover the need of high power at starting stage for inductive load such as fridge, hair dryer even washing machine and air conditioner. With 120% overload capability, it can satisfy your emergent energy requirement.

Thanks to high frequency technology, the D-CORE inverter has a very high efficiency. And, it is being protected against short cut, overload and overtemp.

4.2 Features

- Dual core: 2pcs CPU controlled to be faster and precise
- Total isolation between DC and AC improving safety
- Small, light weight and quiet
- True Pure sine wave output (with THD<3%). For the goodness of your hardware for longer life, any AC appliance (including computer) can be connected without interference such as buzzing sound or lines on TV
- Real AC power: Any appliance can be connected from computer to flat screen TV, electric kettle to coffee maker, fridge to microwave, everything function properly
- High Peak power: The D-Core inverter can provide as much as 300% peak power for appliances which need high initial surge electricity for starting
- Outstanding overload capability: The D-Core inverter has super overload capability satisfy the occasional need of extra power during operation for various appliances and applications, of which can help you to reduce your initial investment
- Quick Dynamic response time: The feature ensures to protect your appliances when the load changes
- High ambient design: Full power output up to 40C
- ATS-automatic transfer switch: Optional build in fast automatic transfer switch (transfer time<5ms) make the inverter to be able to be easily incorporated into a system with shore power or generator power achieving seamless transfer
- Remote control: Plenty information on the Remote control
- Complete protection: Against under/over voltage, output short cut, overload, inverter overtemp

4.3 LED Indicator



Brief introduction

- Load indicator: **GREEN** light when there is output
 ■ telling you the present load condition so you can choose to connect more load or be careful
- Battery capacity: **GREEN** light
 ■ telling you the present battery energy situation for you to choose the load to want to continue to use.
- Inverter on: **GREEN** light
 ■ There is output of inverter
- Overload: **GREEN / RED** light
 ■ overload happened (not necessarily mean output cutoff)
- AC Input: **GREEN** light
 ■ there is AC available and inverter was at standby situation
 - (ONLY for model with suffix A)
- Fault: **RED** light
 ■ there is fault happened, output cut off.

4.4 SWITCHING ON/OFF



Before switching on the inverter, please switch off the load first.



For model with suffix A, please double check if there is battery connected. Without it, the inverter can not be switched on.



In case of no use for a long time, cut off the DC and AC

THE CENTRAL PANEL WORKS IN PARALLEL WITH REMOTE CONTROLLER. YOU CAN USE EITHER OF THEM TO CONTROL THE UNIT

Switching ON

(For normal models)

Push the ON button on front panel, the green Inverter On light lights up. Then inverter will start. If you use a remote controller, push the ON button on remote controller, the green Inverter On light lights up. Then, the inverter will start.

(For model with suffix A)

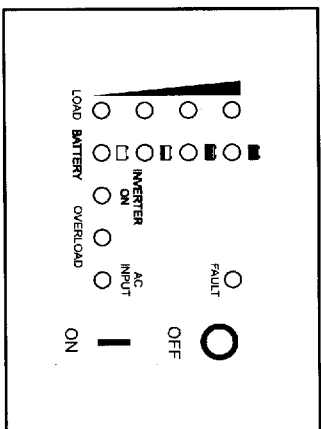
Push the ON button on front panel, if there is AC available, the green AC INPUT light lights up. If there is no AC available, the green Inverter On light lights up. If you use a remote controller, if there is AC available, the green AC INPUT light lights up when AC available. If there is no AC available, the green Inverter On light lights up.

Switching OFF

(For ALL models)

Push the OFF button on front panel, the green Inverter On/AC Input goes off. Then inverter will stop. If you use a remote controller, push the OFF button on remote controller, the green Inverter On/AC Input light go off. Then, the inverter will stop.

4.5 REMOTE CONTROLLER



For your convenience, D-CORE inverter remote controller offers complete information relating to your inverter operation, which is same to that of the central panel.

The remote controller is connected to the inverter through a cable.

Detail information please refer to: 4.2 LED indicator

4.6 DC Input voltage and operation range

rated voltage	12V	24V
Power on voltage	10.5V - 14.8V	21V - 29.5V
High voltage disconnect	14.8V	29.5V
Low voltage warning	11V	22V
Low voltage disconnect	10.5V	21V

Notice:

- To protect battery, D-CORE inverter can only be powered ON while battery voltage fall into Power On Voltage
- When battery voltage fell to level of warning point, audible alarm will be started and it will continue output until the voltage fall under the disconnect point

5 TROUBLE SHOOTING

Common Failure

Display	Output	Reason	What to do
<i>for ALL models</i>			
Fault Flashing Overload lights up, Beep alarm every 1 sec	YES	Overload happened but within the allowed overload capability	reduce the overload, the inverter is not recommended to work under overload condition for long time
Overload flashing, Failure lights up, Long Beep Alarm	NO	Overload happened but beyond the allowed overload capability	remove the overload, switch off inverter and then switch on again
Inverter ON flashing, Beep Alarm every 2sec	YES	Low battery alarm	charge the battery or replace the battery
All lights go off during working	NO	Low battery cutoff	charge the battery or replace the battery
Load light 4 flashing Fault lights up Long beep alarm	NO	Battery high voltage	check battery and replace right one
Failure ON, Overload lights up Long beep alarm	NO	Inverter shut down due to overtemp	wait to cool down and restart. If same issue happens, please contact distributor
Failure On Load light 2,3,4 lights up Overload lights up Long beep alarm	NO	Inverter shut down due to shortcut	check if there is short cut happen and correct it.

6 TECHNICAL DATA

D-CORE Pure Sine Wave Inverter

Model (A--with ATS)	12/1000 12/1000-A	12/1200 12/1200-A
Part no. (A--with ATS)	T30101 T30101-A	T30102 T30102-A
Function of the apparatus	Conversion of a DC voltage to a pure AC sine wave voltage	
Technology	High Frequency	

Output (AC)

Output (AC) voltage (V)	230+/- 3%
Output waveform	True sine wave
THD(mix load)-total harmonic distortion	<3%
Frequency (Hz)	50+/- 0.1%
Continuous output power at up to 40C(VA)	1000
Cos φ	0.8
P10 - 10min overload capability	120%
P5 - 5sec overload capability	200%
Peak power	300%
Dynamic response time	from 0% to 100% load change, 40ms
Max efficiency(%)	90%
ATS	5ms

Input (DC)

Nominal battery voltage(VDC)	12
Under voltage alarm (V)-bb alarm	11+/- 0.2
Under voltage shut down (V)	10.5+/- 0.2
Over voltage shut down (V)	15+/- 0.2
Current (nominal load) (A)	84
Minimum DC fuse (A)	120
Minimum DC cable (mm ²)	25
Recommended battery capacity	>100AH
	>120AH

Protection

In event of short circuit	long beep alarm and shutdown
In event of inverter overtemp	long beep alarm and shutdown
In event of low battery voltage	short beep alarm and shutdown
In event of high battery voltage	long beep alarm and shutdown

ONLY for models with suffix A

All lights go off when switch ON	NO	There is AC input available, but inverter was cut off because there is no battery connected	connect a right voltage battery to inverter
All flashing except for batt lights. Beep alarm	NO	There is AC input available, but inverter was cut off because there is LOW battery connected	connect a right voltage battery to inverter
AC Input flashing, Inverter ON lights up	YES	There is AC input available, but due to unstable AC inverter was switched ON	Not necessary
Fault flashing AC Input lights up, Overload lights up, Short beep alarm	YES	Overload happen at AC input condition, but within the overload capability	remove the overload, the inverter was not recommended to work under overload condition for long time
Fault lights up, Overload lights up, Long beep alarm	NO	Overload happen at AC input condition, but beyond the overload capability	remove the overload, switch off inverter and then switch on again

If you can not correct a problem with the aid of the above table, please contact your local distributor or contact us at: service@tbbpower.com

Environment

Operating temp	-20 to 50C
Storage temp	-20 to 50C
Cooling	forced fan
relative humidity	<95%, non-condensing
Protection	IP20

Mechanical Data

Dimension (MM)	300*420*110
Weight (KGS)	4

D-CORE Pure Sine Wave Inverter

Model (A--with ATS)	24/1200 24/1200-A	24/1500 24/1500-A
Part no. (A--with ATS)	T30201 T30201-A	T30202 T30202-A
Function of the apparatus	Conversion of a DC voltage to a pure AC sine wave voltage	
Technology	High Frequency	

Output (AC)

Output (AC) voltage (V)	230+/- .3%
Output waveform	True sine wave
THD(mix load)-total harmonic distortion	<3%
Frequency (Hz)	50+/- 0.1%
Continuous output power at up to 40C(VA)	1200
Cosφ	0.8
P10 - 10min overload capability	120%
P5 - 5sec overload capability	200%
Peak power	300%
Dynamic response time	from 0% to 100% load change, 40ms
Max efficiency(%)	90%
ATS	5ms

Input (DC)

Nominal battery voltage(VDC)	24
Under voltage alarm(V)-bb alarm	22+/- 0.5
Under voltage shut down (V)	21+/- 0.5
Over voltage shut down (V)	30 +/- 0.5
Current (nominal load) (A)	50
Minimum DC fuse (A)	70
Minimum DC cable (mm2)	16
Recommended battery capacity	>120AH
	>150AH

Protection

In event of short circuit	long beep alarm and shutdown
In event of inverter overtemp	long beep alarm and shutdown
In event of low battery voltage	short beep alarm and shutdown
In event of high battery voltage	long beep alarm and shutdown



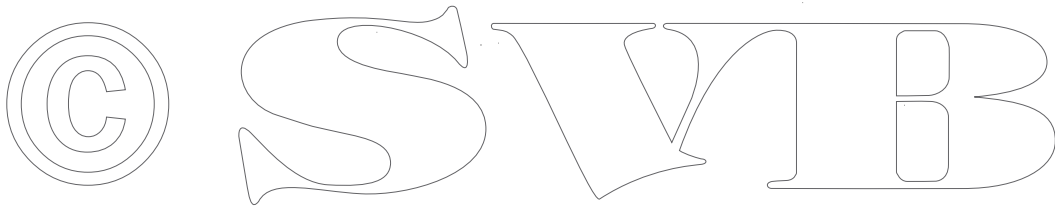
D-CORE®

Environment

Operating temp	-20 to 50C
Storage temp	-20 to 50C
Cooling	forced fan
relative humidity	<95%, non-condensing
Protection	IP20

Mechanical Data

Dimension (MM)	300*420*110
Weight (KGS)	4



TBB Power Co., Ltd
Web : www.tbbpower.com
