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business streamlined

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Dear Sir/Madam

In terms of an agreement between **3SSOLAR** and East London IDZ (hereinafter referred to as ELIDZ), **3SSOLAR** is responsible for the development , service and maintenance of BBBox prototype. The ELIDZ will have sole use of the BBBox, and will install it in the Renewable Energy Centre of Excellence. The BBBox will serve as a power backup for two computer laboratories, and serve as a technology demonstrator it line with the STP's vision of stimulation new inventions. The ELIDZ is compelled to report on the installation and function of the BBBox to their shareholders and board. The report, which is the subject of this document, covers the initial test results in terms of the requirements as specified in the development of the prototype.

The product:

The BBBOX has been designed and manufactured as a battery backup solution. It is housed in a professionally built cabinet for the continued uninterrupted supply of electricity in cases were the main supply of electricity to your appliances is interrupted. This is possible due to the seamless integration between the main electricity supply and your appliances. Features include seamless integration of solar, wind or generator power.

The BBBOX design brings a solution not only to businesses but also to domestic homes. It lets your essential appliances continue to operate without any interruptions during load-shedding or sudden blackouts. Heavy loads such as air conditioning, electric geysers etc.,stay connected directly on your main electricity supply and switch off with the interruption. However all other essential appliances are connected via the BBBOX and continue to operate.

The BBBOX has an integrated UPS function, which switches in less than 20 milliseconds (guaranteed), usually in less than 9 milliseconds, from mains to battery power and back. That is fast enough to keep computers switched on and most essential appliances such as electronic cashier systems, security systems and a basic LED illumination will stay up and keep your business or household running.

The BBBOX is therefore the perfect solution for small and medium businesses, offices, medical practices, police stations or domestic households that must stay functional. The working time depends on your connected appliances and the battery capacity installed.

The BBBOX is available in output from 1.6 kW up to 5.0 kW and you can combine more boxes or add more batteries to get longer output or create a 3-Phase support. In all cases 3SSOLAR UG can deliver an individually designed BBBOX that meets your specific requirements.

Test parameters.

The BBBOx was installed to serve as a power backup for two computer laboratories. One laboratory is still under construction and therefore the BBBox could not been tested to its full capacity yet. It is envisaged that the full extent of its capability and use will be tested upon completion of the Renewable Energy Laboratory, which is scheduled for the end of March 2016. Due to the power demand of the entire building, the BBBox will not be able to be connected to main circuit.

On the interim, the BBBox was connected to the electrical circuits of the two laboratories during January 2016. The installation was held up due to the unavailability of suitable electrical sockets. The connecting Sockets of the BBBox is standard European connections, and the male connectors are not available in South Africa.

We have not experienced any natural outages since the installation and had to revert to self-induced “outages”. These self-induced outages were effected by cutting the power to the entire Renewable Energy Centre at the main distribution board.

BBBOX - TECHNICAL DATA

Box Size	24V-1,6kVA	24V-2,0kVA	48V-3,0kVA	48V-5,0kVA
INVERTER				
Input voltage range (VDC)	19 – 33 V		38 – 66 V	
Output voltage:	230 VAC ± 2% (pure Sinus)			
Frequency:	50 Hz ± 0,1%			
Cont. output power at 25 °C (VA)	1600	2000	3000	5000
Cont. output power at 25 °C (W)	1300	1600	2500	4500
Cont. output power at 40 °C (W)	1200	1450	2200	4000
Peak power (W)	3000	4000	6000	10000
Maximum efficiency (%)	94		95	
Zero-load power (W)	10	11	16	25
Zero load power in search mode (W)	3	4	5	6
CHARGER				
AC Input voltage range:	187-265 VAC			
Input frequency:	45 – 65 Hz Power factor: 1			
Charge voltage 'absorption' (V DC)	28,8		57,6	
Charge voltage 'float' (V DC)	27,6		55,2	
Storage mode (V DC)	26,4		52,8	
Charge current house battery (A)	40	50	35	70
Battery temperature sensor	Yes			
GENERAL				
Programmable relay *	Yes			
Auxiliary output	No		Yes 16 A	Yes 25 A
Protection **	a - g			
VE.Bus communication port	For parallel and three phase Operation, remote monitoring and system integration			
General purpose com. Port	No		Yes	Yes
Remote on-off	Yes			
Standard Battery Set	4 Q-Batteries AGM VRLA Deep Cycle - 12V/243Ah (C20)			
Common characteristics	Operating temp. range: -20 to +50°C			
	Humidity (non condensing) : max 95%			
	Fan assisted Cooling			
	Digital Multi Control in Front Door			

STANDARD ENCLOSURE	
Material & Colour:	Steel, light-grey RAL 7035 (other colours on request)
Protection category:	IP 43
Standard Cabinet: Weight (kg)	Approx. 430 (incl. Standard Battery Set)
Dimensions (hxwxd in mm)	1300 x 1200 x 400 (including stand)
OPTIONS	
Color Display with Battery Monitor	Data Storage and Graphic User Interface with Ethernet (optional Wi-Fi) Connection for remote monitoring and control (Android and iPhone Apps available)
Solar Charger MPPT 150/100-TR	MPPT Charger for Solar Arrays up to 5kWp
Top or Wall mounted Cooling Unit	Cooling Capacity 0,5 - 2,0kW (replace Fan Cooling)
Battery Extension Cabinet A (height in mm)	1300 x 600 x 400 (including stand)
Battery Extension Cabinet A Weight (kg)	Approx. 320 (incl. Standard Battery Set)
Battery Extension Cabinet B (height in mm)	1300 x 1200 x 400 (including stand)
Battery Extension Cabinet B Weight (kg)	Approx. 650 (incl. 2 Standard Battery Sets)
High Performance Battery Set	4 Q-Batteries VRLA Deep Cycle - 12V/275Ah (C20)
STANDARDS	
Safety	EN 60335-1, EN 60335-2-29, CE
* Programmable relay that can a.o. be set for general alarm, DC under voltage or genset start signal function	
** Protection:	
a. Output short circuit	
b. Overload	
c. Battery voltage too high	
d. Battery voltage too low	
e. Temperature too high	
f. 230VAC on inverter output	
g. Input voltage ripple too high	

Test Results.

Date	Time off	Time on	Duration	Number of PC's connected	Result
02-Feb-16	09h30	09h45	15 min	12	No power interruptions and no data losses.
03-Feb-16	11h00	13h25	2hrs 25 min	12	No power interruptions and no data losses.
10-Feb-16	08h00	12h00	4 hrs	12	No power interruptions and no data losses.
11-Feb-16	08h15	13h00	4hrs 45 min	12	No power interruptions and no data losses.
15-Feb-16	13h30	16h30	3hrs	12	No power interruptions and no data losses.
16-Feb-16	13h30	17h30	4hrs	13	No power interruptions and no data losses.
17-Feb-16	13h30	17h00	3hrs 30 min	14	No power interruptions and no data losses.
15-Feb-16 till 29-Feb-16	08h00	08h30	72 hrs	none	Batteries 100% of capacity. No draining of any power occurred.

Findings:

Although only a small sample was used for this preliminary testing, the results has shown that the “BBBox” has provided un-interrupted power supply to the computer laboratory. Seamless transition was able, and not date losses occurred.

Within this specific test parameters, it can be surmised that the “BBBOx” is possible to function as per its original design and use.

Further testing will have to be done before a conclusive result will be able to be presented. These tests could include running tests over longer periods, with increased loads.

No data was captured regards to power usages and supply, performance of the batteries, and related issues. It is advised that these tests be conducted but it will attract additional cost as it will have to be outsourced.

The BBBOz is of sound structural design and no flaws or defect could be found during a visible inspection.

It is advised that the unit is either supplied with suitable male power sockets, or be adapted for the country it is earmatked.

Business Viability:

The “BBBox” product and the entity that will be initiated appears to represent a highly profitable business venture that will generate a significant return on Equity in the short to medium term. However the primary risk at this point is the volume sensitivity of the enterprise in terms of the high initial cost. In this context it has also been recommended that consideration be given to inviting venture capitalist or additional shareholders to invest in this venture with a view to reducing the high levels of commencement

Mr. Hugo Allers

Skills Development Specialist: Prototype project manager.
East London Industrial Development Zone
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