

GRID TIE INVERTER



**MANUAL
GRID TIE INVERTER**
STARTER-KIT FOR SMALL URBAN
WINDTURBINES UP TO MAX 1000
WATT
TYPE: UWT-I-250 ST-KIT

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GRID TIE INVERTER STARTER-KIT FOR SMALL URBAN WINDTURBINES TO MAX 1000 WATT TYPE: UWT-I-250 ST-KIT

DEAR CUSTOMERS

May we take this opportunity to thank you for purchasing this Grid Tie Inverter starter kit (GTISK). We strongly recommend that you carefully study the operating instructions before attempting to operate the unit and you note the listed precautions.

SAFETY INFORMATION:

This unit should only be used in accordance with the power line specification as marked on the inverter and AP-box. AC110 V or 240 V, 60 or 50 Hz. The DC input of the AP-box should never exceed 52 V Above 52 V DC the Dumpload will be switched on. The DC-input of the inverter is adjusted at 54 V DC. In this way the AP-box will be switched earlier than the inverter and gives protection to the connected inverter or inverters. When the Dumpload is switched on he slows down the speed of the windturbine. During this period the inverters are functioning normally till the Dumpload is shut down the windturbine below 17 V DC. At 17 V DC the speed of the windturbine is low enough to switch off the Dumpload. Make sure that you take care of safety measures as described in the manual of your own windturbine. Your dealer can advice about several combinations that will perform well. For other windturbines you should make sure that all safety requirements are made before connecting the windturbine to the installed starter-kit. The maximum power of the windturbine should comply with the configuration as explained in the manual. If in doubt, always ask your dealer.

CAUTION:

When this GTI is plugged into the Wall outlet, do not place your eyes close to the openings to look into the inside if this GTI of AP-box. Do not open covers or attempt to repair this product by yourself. Always refer servicing to qualified personnel.

WARNING:

To reduce the risk of fire or electric shock, do not expose the equipment to rain or moisture.
To reduce the risk of fire, electric shock, use the recommended accessories only.

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PRECAUTIONS:

Please read this precautions before operating this unit.

POWER CORD PROTECTION

To avoid malfunction of this product against electric shock, fire or personal injury, please observe the following.

- 0 Hold the plug firmly when connecting or disconnecting the AC power supply to this unit.
- 0 Do not connect or disconnect the AC power when your hands are wet.
- 0 Keep the AC power cord away from heating appliances.
- 0 Never put heavy object on the power cord.
- 0 Do not attempt to repair or reconstruct the power cord in any way.

PLACEMENT

Avoid placing the unit in areas of:

- 0 Direct sunlight

- 0 High temperature (over 35 Deg. Cel. or -10 Deg. Cel.) or high humidity (over 90%)
- 0 High level of dust

The internal parts may be damaged as a result.

FOREIGN OBJECTS

- 0 Touching internal parts of this units is dangerous and may damage the GTI, AP-box, Diode Box and Dumpload. Never attempt to disassemble the units.
- 0 Do not put any foreign object into the units.

KEEP AWAY FROM WATER / MAGNETIC FIELDS

- 0 Keep the units away from flower vases, tubs, sinks, etc. If liquids are spilled into the units, serious damage will occur.
- 0 Do not place magnetic objects (such as speakers or permanent magnetic material) close to the units

IMPORTANT

Before you switch on the equipment, please refer to the installation manual below.

WALL MOUNTING

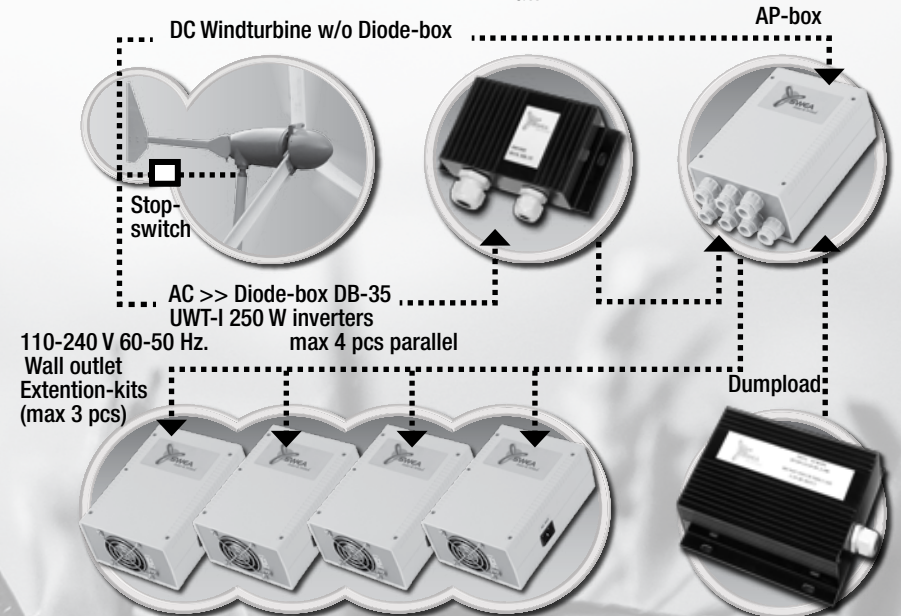
- 0 Place the unit in vertical position to the wall. Inverter: fan must be located below. All units should be placed to the wall with a minimum distance of 10 cm at all sides. AP-box: cable inlets must be located below. Diode-box: cable inlet must be located below. Dumpload: Cable inlet must be above or below. Use NOT at the left or right site. The air must flow through the holes from bottom to top to cool down the Dumpload in a proper way.
- 0 Do not place the unit close or above heating devices.
- 0 The units may be used in-house only. They are NOT water resistant.

CONDENSATION

Moister may form on the units in the following conditions:

- 0 Immediately after a heart has be turned on.
- 0 In a steamy or very humid room.
- 0 When the units are moved from a cold environment to a warm one. If moister formed inside this units, it may not operate properly. In this case, turn the power off and wait about one hour for the moister to evaporate.

Installation diagramme Starter-kit with 3 pcs. Extension-kits. Windturbine 250-500-750-1000 Watt.



GETTING STARTED:

1. Table of contents
2. Features
3. Connection to the Grid and Windturbine

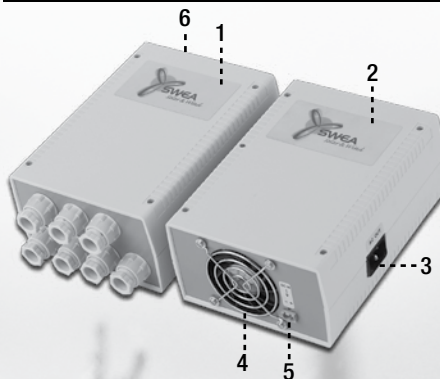
I. TABLE OF CONTENTS:

In the UWT-I-Starter-kit is included:

- 1x UWT-I-250 Grid Tie inverter 250 W 110-240 V AC 60-50 Hz (Delivery is 110V-60 Hz or 240 V-50 Hz depending of your country) CPU Green is default installed into the unit (Ask for the 250 W extension-kit UWT-I-250-XT-KIT when you have a larger windturbine than 250 W)
- 1x AP-box with 110-240 V 60-50 Hz / 24 V AC or 12 V DC adapter
- 1x Diode-box DB-25 with stop switch
- 1x Dumpload DL-2-100 2 x 100 Watt
- 1x Power cable. Suitable in your country
- 1x Set mounting material
- 1x Manual
- 1x Stop-switch (at AP-box)

2. FEATURES: GRID TIE INVERTER UWT-I-250 STARTER KIT

2.1 GRID TIE INVERTER UWT-I-250 WATT



- 1: AP-box
- 2: Grid Tie Inverter UWT-I-250 Watt
- 3: Power out 110-240 V AC to the Grid. 60-50 Hz (wall outlet)
Standard 110-240 V power cord is included
- 4: Fan
- 5: DC power in
- 6: Stop-switch

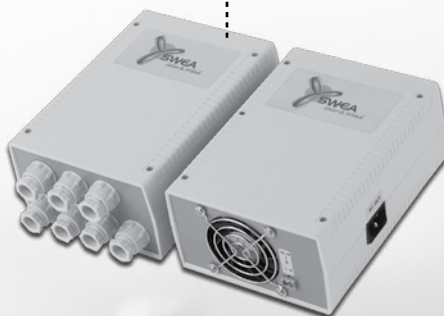
UWT-I-250 STARTER-KIT

This Grid tie inverter connects your windturbine to the grid without using of batteries. Only windturbines can be used which has a power out of 24-36-48 V AC or DC. Maximum 4 pcs Grid Tie Inverters can be parallel installed with one Starter-Kit.

The following windturbines can be installed:
 AC- DC Windturbines of max 250 Watt max 24-36-48 V (loaded)
 1 x Starter kit UWTI-I-ST-KIT :
 AC- DC Windturbines of max 250-500 Watt max 36-48 V (loaded)
 1 x Starter kit UWTI-I-ST-KIT + 1 x UWT-I-250 Watt XT-KIT:
 AC- DC Windturbines of max 500-750 Watt max 36-48 V (loaded)
 1 x Starter kit UWTI-I-ST-KIT + 2 x UWT-I-250 Watt XT-KIT:
 AC- DC Windturbines of max 750-1000 Watt max 36-48 V (loaded)
 1 x Starter kit UWTI-I-ST-KIT + 3 x UWT-I-250 Watt XT-KIT

2.2 AP-BOX WITH 24 V AC/ 12 V DC ADAPTOR

AP-box with cable outlets



First install the AP-box. The AP-box is a connecting and safety box for your total installation. Total 4 pcs Grid Tie inverters UWT-I-250 can be connected. (up to 1000 Watt) The AP-box must ALWAYS be installed. Together with the internal safety items and together with the Dumpload it will protect your electronics and also your wind turbine. Above 52 V DC in the windturbine will be loaded by the Dumpload automatically. **INSTALL ALWAYS A FUSE IN SERIES WITH THE Windturbine.** 250 Watt: 8 Amp. 250-500 Watt: 20 Amp. 500-750 Watt: 25 Amp, and 750-1000 Watt: 35 Amp.

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AIR-X 24-48 V

AIR-X 24 V or 48 V DC out windturbines can also be connected. The AP-box will start up wind turbines which need battery power. When the power out of the windturbine is DC you don't have to install the Diode-box DB-25. You can connect the power out directly to the AP-box connector called: windturbine.

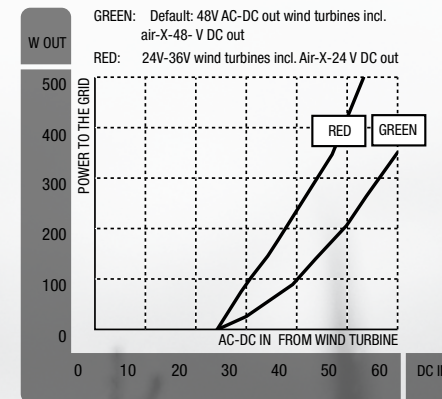
Use one or more Grid Tie Inverters when you use a windturbine larger than 250 Watt. See above 2.1.

USE OF CPU

Default installed into the UWT-I-250 Grid Tie inverter is the Green CPU. This CPU can be used together with windturbines who has power out up to max. 48 V. A CPU RED has to be installed when the power out of the windturbine is 24 V or 36 V ask your dealer.

CPU-CURVES DC-IN TO THE GENERATED POWER TO THE GRID

See below the curves for this 2 colour CPU's.



Specs Curves Default CPU

GREEN:
 Start 27,2 V
 200 W 49 V
 For windturbine
 300 W-48 V FD 2.5.300
 1 kw-48 V FD 1kw

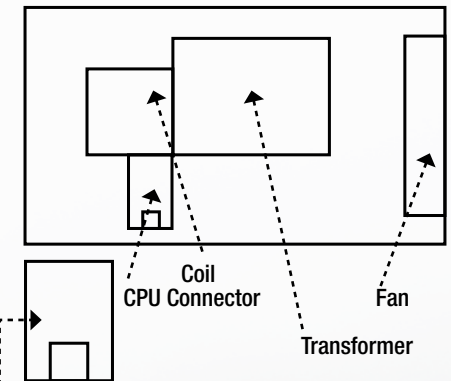
RED:
 Start 24,2 V
 200 W 36 V
 For windturbine
 200 W-24V FD 200 W
 500 W-36V FD500 W

HOW TO CHANGE CPU

Take care before starting up the system that you have installed the correct CPU for the windturbine you are using to get the best results to the grid.

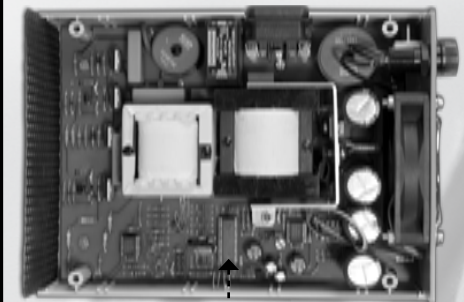
HOW TO CHANGE CPU IN THE INVERTER.

Topside inverter without upper part of the housing.



Take out first, with a small screwdriver, the CPU. Put the screwdriver between CPU and connector and push the CPU upwards.

-CPU
 Put the CPU in proper position!!!
 Look at the notch on the top site. It must be in this position placed into the inverter.



CPU that you can change

5

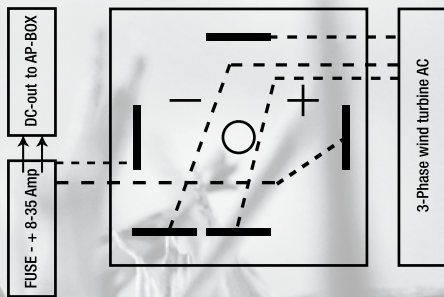
2.3. DIODE-BOX DB-25



When you want to install a 3 phase AC out windturbine, you have to use the Diode-box DB-25. The Diode-box converts 3 phase AC to DC power which can be connected to the AP-box. Maximum 25 Amp can be handled by the Diode-box. (To use for max. 1000 Watt windturbines)



Wiring diagram Diode-box DB-25 and stopswitch



FEATURES: AP-BOX 2006

The AP-box is an adaptor box between the windturbine or Diode-box, and the grid tie inverter UWT-I-250. Maximum 4 pcs UWT-I-250 grid tie inverters can be connected parallel to the AP-box. In this case it is possible to connect maximum a 1000 Watt windturbine to the total system. The adaptor power is simulating the battery power to start up the DC out AIR-X and the Bergey windturbines. This AP-box is also a safety box for when the wind speed becomes to high. De maximum Voltage of the windturbine may be 52 V DC. A Dumpload is connected via the AP-box to the windturbine to brake the wind generator to avoid damage of the inverters and the windturbine at high wind speed.

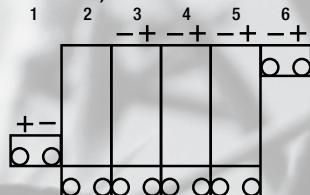
NEVER USE ANY POWERSOURCE WHICH IS NOT CURRENT LIMITED. SO DON'T CONNECT A BATTERY AS POWER INPUT TO THE AP-box OR THE INVERTER. THE PROTECTION IN THE AP-BOX AND IN THE INVERTER CAN SHORT-CIRCUIT THE DC-INPUT. USING AN UNLIMITED CURRENT POWER SOURCE MIGHT RESULT IN A FIRE HAZARD. ALWAYS USE THE CORRECT FUSE.

3. CONNECTING TO THE GRID AND WINDTURBINE

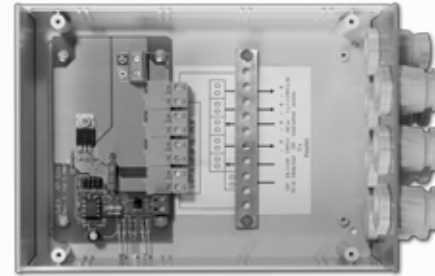
3.1 CONNECTORS INSIDE THE AP-BOX:

Connector block number:

1. Adaptor 24 V AC or 12 V DC (Use only when you connect an air-x 24-48 V windturbine who has a battery charger who needs batterypower to start up.
2. One Dumpload 200 Watt. Standard delivered with every starter kit is a Dumpload of 2x100 Watt. ALWAYS INSTALL THIS DUMPLoad! See how to install this dumpload at chapter 2.4.
- 3,5,6. Max 4 pcs UWT-I-250 W grid tie inverters. One block 2 pcs Inverters parallel connected.
4. One Diode-box with a 3-phase wind turbine or one AIR-X or Bergey 24-48 V (or other brand) Windturbine with DC output.



Led indication AP-box
 Led red: Dumpload on (brake)
 Led Yellow: Windturbine on. Power to the AP-box
 Led Green: Grid/ adapter power available.



3.2 DUMPLoad DL-2-100

The included Dumpload has to be connected to the AP-box. The AP-box will switch on the Dumpload automatically when the DC-out of the windturbine becomes higher than 52 V. The Dumpload is loading the windturbine in a way that the speed of the windturbine will go down. The time of reducing the windturbine speed is depending of the wind speed. Two resistors of 100 Watt are installed inside the Dumpload. You have to adjust the resistors to the windturbine. See below diagram.

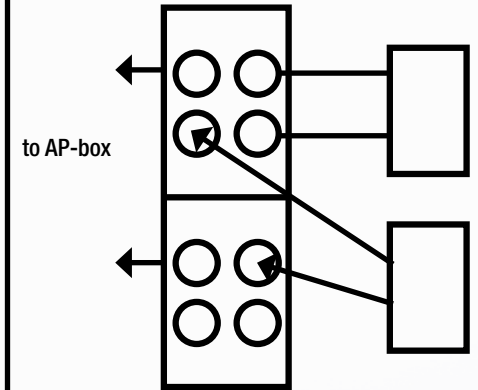


STOP-SWITCH

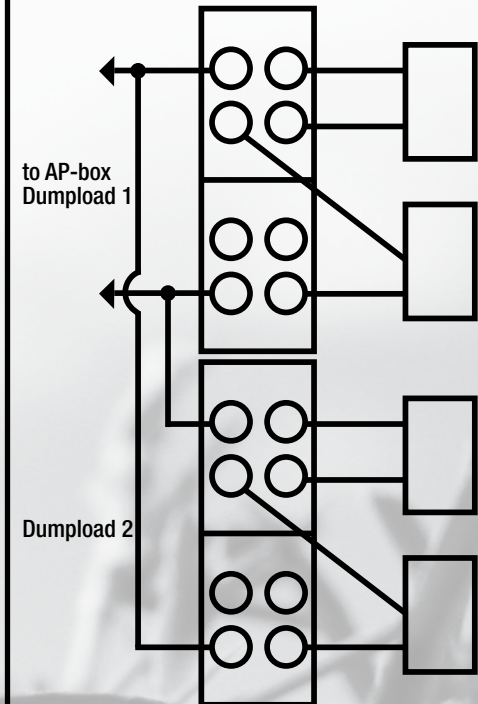
In the AP-box is build in a stop-switch. With this stop-switch we can slow down the connected wind turbine. Use this stop-switch when you want to do maintenance and when there is danger. This stop-switch is switching on the Dumpload. At hard wind situations it can take some time before the wind turbine stops. The Dumpload can become hot.

3.3 INSTALLATION INSTRUCTIONS DUMPLoad DL-2-100

200 W, 300 W and 500 Watt windturbine. 2x resistor in series



1000 W windturbine. The dumpload for the 1000 W windturbine must be bigger. One extra dumpload is necessary to slowdown the 1000 W windturbine. Ask your dealer for this extra Dumpload.

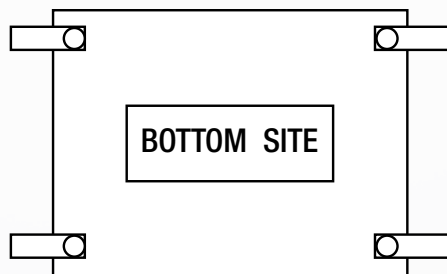


Please take care that you have made the correct choice before switch on the installation. Not connecting this Dumpload correctly can damage the inverter and the windturbine at periods of hard wind. Check the temperature of the housing before touching. Housing can be HOT. Install always the Dumpload against a temperature resistant wall.

3.4 INSTALL THE STARTERKIT TO THE WALL

Start always with a no turning windturbine (start or cut the wires of the windturbine) Install the UWT-I-250 to the wall.

Step 1: Install the 4 pcs iron plates to the bottom with the bottom screws as follows:



Inverter	UWT-I-250	1,2 kg	H-195 mm D - 80 mm	W-140 mm
AP-box + adapter	AP-box 2006	1 kg	H-195 mm D - 80 mm	W-140 mm
Diode-box	DB-35	0,3 kg	H- 80 mm D - 45 mm	W-110 mm
Dumpload	DL-2-100	1 kg	H-120 mm D - 55 mm	W-170 mm
Total	UWT-I-ST-KIT	Total incl. packing: 4,3 kg	H- 145 mm D - 225 mm	W-347 mm

Step 2: Make 4 holes in the wall and use the plugs and screws to fasten the UWT-I-250 inverter to the wall. The fan must be located to the bottom site. Put the DC power cable that comes from the AP-box with the connector that's fit into the connector DC-In of the inverter. Look at the correct site of the + and - of the cable-end. On the inverter is the + and the - labelled.

Step 3: Install the AP-box to the wall. Open the AP-box en fasten this box with the included plugs and screws to the wall.

4 holes are made in the bottom of the lower part of the housing. Connect the cables as shown on the drawing in this manual of the AP-box.

Step 4: Install the Diode-box to the wall. Open the Diode-box en fasten this box with the included plugs and screws to the wall. 2 Holes are made in the bottom of the lower part of the housing. Connect the cables as shown on the drawing of the Diode-box in this manual.

Step 5: Install the Dumpload to the wall. Open the Dump-load en fasten this box with the included plugs and screws to the wall. 4 Holes are made in the bottom of the lower part of the housing. Connect the cables as shown on the drawing of the Diode-box. Choose the correct installation of the Dumpload depending on the installed windturbine! See installation instructions of the Dumpload.

Step 6: Install the 110/240 Volt power cable into the inverter and the other site in the 110-240 V 60-50 Hz wall plug.

Step 7: Start-up system. When the windturbine, Diode-box, AP-box and Dumpload are installed the inverter starts automatically to operate when the stopswitch is switched to the position "normal operation". The windturbine start turning when there is enough wind.

Maintenance.

1. When you have to do maintenance to the system, do it only when there is no wind and the wind turbine is not turning otherwise the wind turbine is producing a dangerous Voltage. Shock hazard!! Always switch on the stop switch to stop the windturbine. Most of the windturbines are not designed to run unloaded that means no connected wires. Also take out the 110 V or 240 V power cable out of the wall outlet.

2. BRAKE THE WINDTURBINE

When you have to do maintenance on the windturbine break the wind turbine. Do this as possible at low wind speed. Also brake the windturbine when the wind speed is to high. Use the switch located at the AP-box called stop-switch. Position normal operation and position stop the wind turbine. The wind turbine stops turning when the stop-switch is in position stop the wind turbine. Dumpload is now switched on. When you have to take off the AP-box, switch on always the stopswitch on the windturbine and short-cut the wires that comes from the windturbine. Do this only when the windturbine is not turning.

Cleaning.
Clean the fan of the inverter and the top of all the installed devices regularly so the air can flow easily through the inverter and Dumpload and besides the other installed devices so they can cool down. When you do not clean regularly, the system warranty will expire.

PRODUCT SPECIFICATIONS:

Type:	UWT-I-250	Grid tie Inverter			
Output to the grid max:	200 Watt	Efficiency	>84% between 10 - 100% output		
Power consumption	+/- 0,2 W (when windturbine is not turning)				
DC - in	24-54 V				
DC - in max	54 V	DC-in>54 V	Input Shorted		
Operating temperature	-10 to max + 40 C	Devices installed at distance min 10 cm all sides.			
LED INDICATION RED	1 x blinking On 0,3 of 0,3 sec.	2 x blinking On 2 x0,3 of 1 sec.	3 x blinking On 2 x0,3 of 1 sec.	4 x blinking On 2 x0,3 of 1 sec.	5x Blinking on 2x 0,3 off 1sec.
RED	Temp. to high	Grid not available	Grid to low	Grid to high	Grid frequency to low or to high.
GREEN led blinking 1-7 x	Ready for start LED 100% on	1-7 x power to the grid 0-200 watt			

SAFETY SPECIFICATIONS:

Loss of mains test			
Main Voltage	110-240 V nom.	-20%	+ 20%
Switch-off time		< 0,1 Sec.	< 0,1 Sec.
Main frequency	60/ 50 Hz	+ 1%	- 1%
Result		No power to the grid	No power to the grid

PRODUCT SPECIFICATIONS

Type:	AP-box		Connecting
DC in	0-52 V DC		4x UWT-I-250
Dumpload on	> 52 V DC		1x windturbine 200-1000 Watt
Dumpload off	< 17 V DC		2 x Dumpload DL-2-100 parallel
Adapter	24 AC or 12 V DC	Power consumption: 0,2 Watt.	1x adapter

PRODUCT SPECIFICATIONS

Type: Dumpload	Power (W) windturbine:	Dumpload DL-2-100:
Windturbine	200-300-500 W	200 Watt 1 pc. resistor 100 W in series
Windturbine	1000 W	400 Watt 2 pcs. Dumpload parallel

POWER CONSUMPTION OF TOTAL SYSTEM

This UWT-I-250 starter kit is special designed with a low power consumption. When adapter is used the power consumption of the total system is 0,4 Watt.

I hope that everything is clear for you after reading this manual. When you have questions you can contact your local dealer.