

e-one - 230 VAC

User Manual V1.1

BEYOND THE INVERTER

THE NEW GENERATION OF POWER CONVERTERS

- » EASY TO INSTALL
- » COMPACT DESIGN
- » HIGH EFFICIENCY
- » WIDE OPERATING TEMPERATURE RANGE
- » SHORT DEPTH ALLOWS 300 MM RACK INTEGRATION



Table of content

1. CE+T at a glance	4
2. Abbreviations	5
3. Warranty and Safety Conditions	6
3.1 Handling.....	7
3.2 Surge and transients	7
3.3 Other.....	7
4. Description	8
4.1 Typical load	8
5. Installation	9
5.1.1 Mounting KIT	10
5.2 Wiring	12
5.2.1 REG Model - Front View.....	12
5.2.2 Disconnecting and protecting devices.....	13
5.2.3 Grounding	15
5.2.4 Remote Monitoring and Control	15
6. Getting started	17
6.1 Starting procedure	17
6.2 LED indication- Alarm status	17
7. Finishing	18
8. Disassembly & Disposal	19
8.1 Disassembly.....	19
8.2 Disposal	19
9. Commissioning	20
9.1 Check list.....	21
10. Trouble shooting.....	22
11. Maintenance	23
11.1 Manual check.....	23
11.2 Optional	23
12. Defective modules	24
13. Appendix.....	25
13.1 Single phase circuit diagram	25

Release Note:

Version	Release date (DD/MM/YYYY)	Modified page number	Modifications
1.0	13/09/2017	-	First release of the Manual.
1.1	05/10/2017	-	Amendment and correction.

1. CE+T at a glance

CE+T Power designs, manufactures and markets a range of products for industrial operators with mission critical applications, who are not satisfied with existing AC backup systems performances, and related maintenance costs.

Our product is an innovative AC backup solution that unlike most used UPS's

- Maximizes the operator's applications uptime;
- Operates with lowest OPEX;
- Provides best protection to disturbances;
- Optimizes footprint.

Our systems are:

- Modular
- Truly redundant
- Highly efficient
- Maintenance free
- Battery friendly

CE+T power puts 60+ years expertise in power conversion together with worldwide presence to provide customized solutions and extended service 24/7 - 365

2. Abbreviations

REG	Regular
DSP	Digital Signal Processor
AC	Alternating current
DC	Direct current
ESD	Electro Static Discharge
MET	Main Earth Terminal
USB	Universal Serial Bus
PE	Protective Earth (also called Main Protective Conductor)
N	Neutral
PCB	Printed Circuit Board

3. Warranty and Safety Conditions*

WARNING:

The electronics in the power supply system are designed for indoor, clean environment.

When installed in dusty and/or corrosive environment, outdoor or indoor, it is important to:

- Install an appropriate filter on the enclosure door, or on the room's air control system
- Keep the enclosure door closed during operation
- Replace the filters on a regular basis.

Important Safety Instructions and Save these Instructions.

- The inverter system/rack can reach hazardous leakage currents. Earthing must be carried out prior energizing the system. Earthing shall be made according to local regulations.
- Prior to any work conducted to a system/unit make sure that AC input voltage and DC input voltage is disconnected.
- **CAUTION** – Risk of electric shock. Capacitors store hazardous energy. Do not remove cover until 5 minutes after disconnecting all sources of supply.
- **CAUTION** – Disconnection of the DC source is required to de-energize this unit before servicing.
- Maximum operating ambient temperature is 40° C (104° F).
- AC and DC circuits shall be terminated with no voltage / power applied.
- Some components and terminals carry high voltage during operation. Contact may result in fatal injury.
- Warning labels must not be removed.
- Never wear metallic objects such as rings, watches, bracelets during installation, service and maintenance of the product.
- Insulated tools must be used at all times when working with live systems.
- When handling the system/units pay attention to sharp edges.
- ESD Strap must be worn when handling PCBs and open units.
- The inverter system/rack is not supplied with internal disconnect devices on input nor output.
- REG systems can be seen as independent power sources. To comply with local and international safety standards N (output) and PE shall be bonded.
- By-Pass system that have no AC input wired and connected to comply with local and international safety standards N (output) and PE shall be bonded. The bonded between N output and PE must be removed once the AC input is being connected.

* These instructions are valid for most CE+T Products/Systems. Some points might however not be valid for the product described in this manual.

Warranty and Safety Conditions

- The safety standard IEC/EN62040-1 requires that, in case of output short circuit, the inverter must disconnect in maximum 5 seconds. However, if the parameter is set at a value > 5 seconds, an external protection must be provided in order that the short circuit protection operates within 5 seconds. Default setting is 60s.
- The equipment must be installed and commissioned by skilled technicians according to instructions in this manual.
- Local regulations must be adhered.
- The manufacturer declines all responsibilities if equipment is not installed, used or operated according to the instructions herein by skilled technicians according to local safety regulations.
- Warranty does not apply if the product is not installed, used and handled according to the instructions in the manuals.
- CE+T cannot be held responsible for disposal of the Inverter system and therefore the customer must segregate and dispose the materials which are potentially harmful to the environment, in accordance with the local regulations in force in the country of installation.
- If the equipment is dismantled, to dispose of the products it consists of, you must stick to the local regulations in force in the country of destination and in any case avoid causing any kind of pollution.
- System is designed for installation in an IP20 or IP21 environment. When installed in a dusty or humid environment, appropriate measures (air filtering ...) must be taken.

3.1 Handling

- The cabinet shall not be lifted using lifting eyes.
- Remove weight from the cabinet by unplugging the inverters. Mark inverters clearly with shelf and position for correct. This is especially important in three phase configurations.
- Empty inverter positions must not be left open. Replace with module or cover.

3.2 Surge and transients

The mains (AC) supply of the modular inverter system shall be fitted with suitable Lightning surge suppression and Transient voltage surge suppression for the application at hand. Manufacturer's recommendations of installation shall be adhered. It is advisory to select device with alarm relay for function failure.

Indoor sites are considered to have a working lightning surge suppression device in service.

- Indoor sites: Min Class II.
- Outdoor sites: Min Class I + Class II or combined Class I+II.

3.3 Other

- Isolation test must not be performed without instructions from the manufacturer.

To download the latest documentation and software, please visit our website at www.cet-power.com

4. Description

e-one is a standalone Inverter with following capacity

- 1000 VA - REG Model

48 Vdc as Input and 230 Vac as Output.

e-one comes with output configuration as follows.

- 1 x IEC Socket output at Front terminal.
 - a) 1000 VA 5 A fuse (5 x 20 mm).



e-one Front View - 1 X IEC Socket

4.1 Typical load

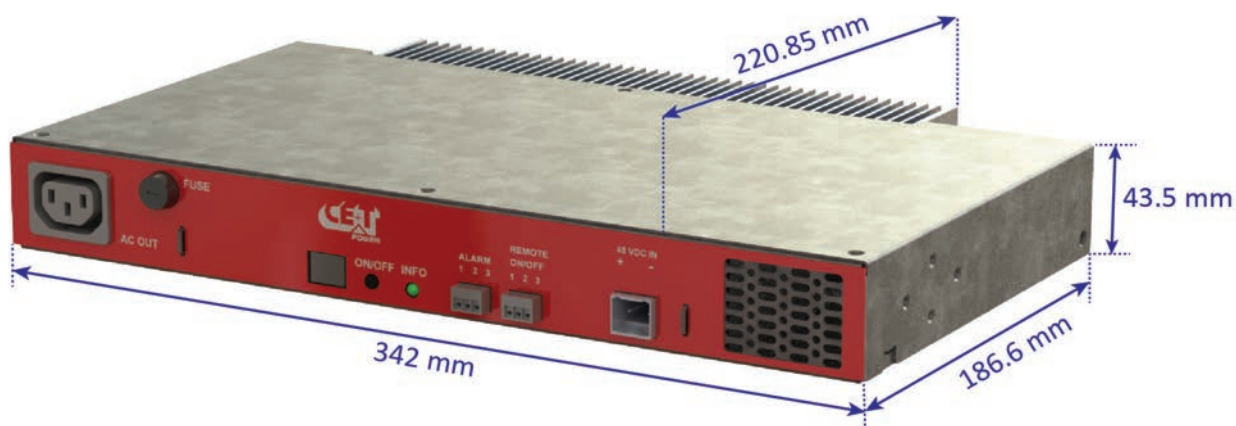
- Resistive
- Inductive and resistive
- Capacitive and resistive
- Non linear load with a maximum crest factor of 2.5 : 1

5. Installation

System is designed for installation in an IP20 or IP21 environment. When installed in a dusty or humid environment, appropriate measures (air filtering ...) must be taken.

The e-one is foreseen to be recessed into an electrical cabinet of 19" and 1U height standard or wall mounted. Product weight is 7 Lbs (3 kg).

5.1 e-one dimensions



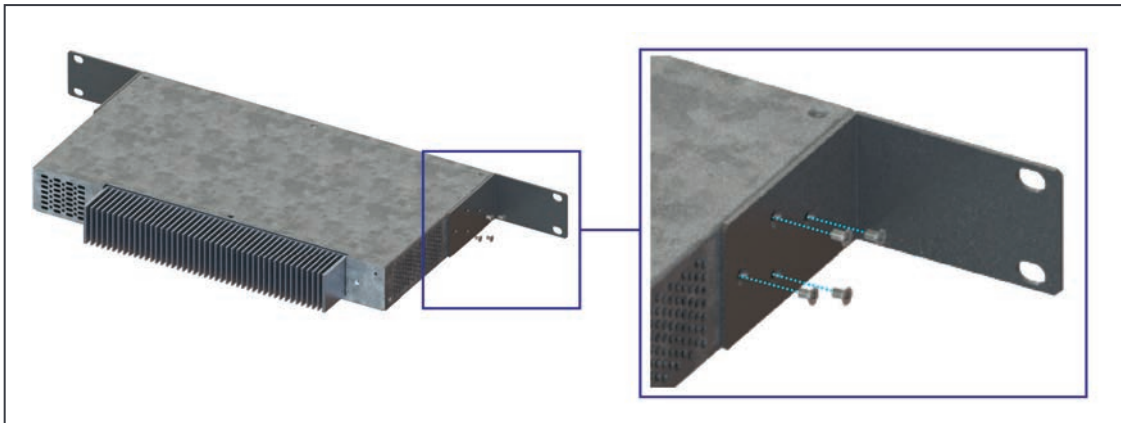
Installation

5.1.1 Mounting KIT

Make sure that you have received the right accessories for e-one which consist of L Clamps's and Screws.

5.1.1.1 Rack Mounting steps:

STEP A: Fix the brackets on both sides of the e-one module with M3 screws.

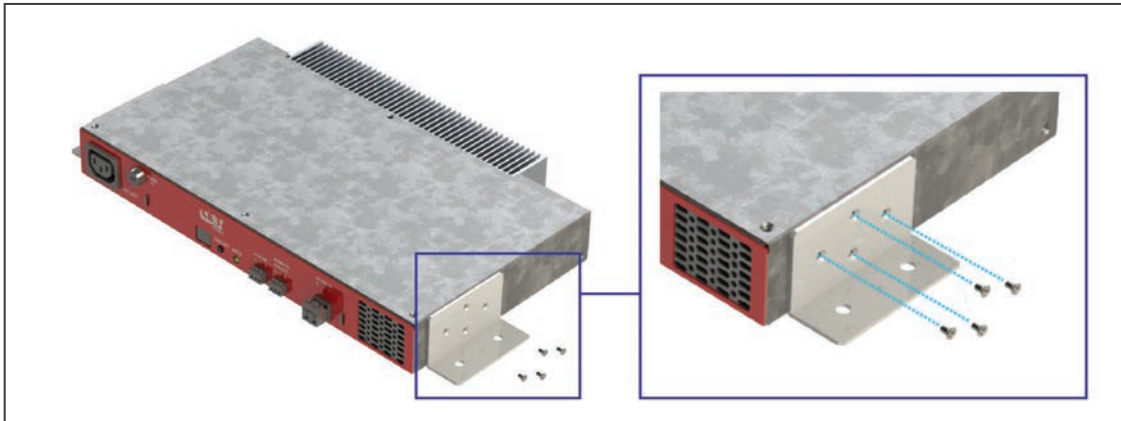


STEP B: Place the e-one module inside the cabinet horizontally and fix with the screws.

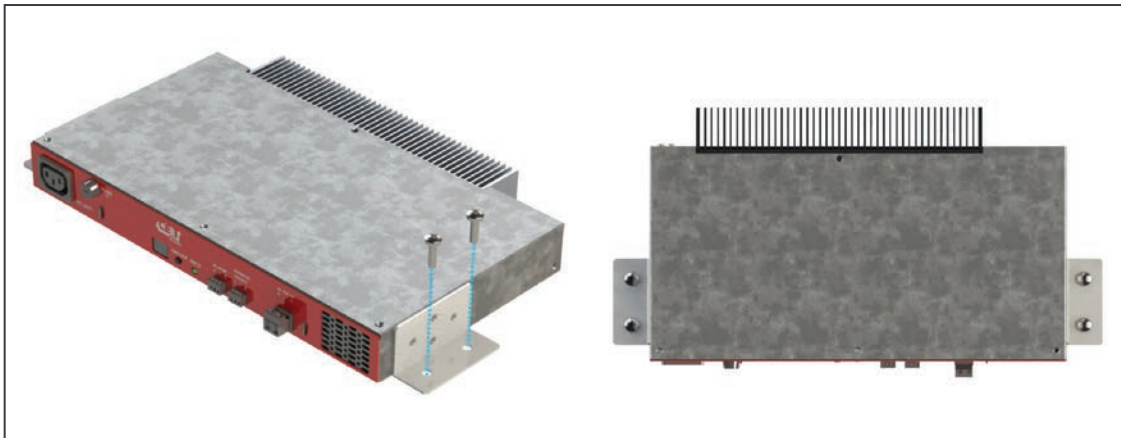


5.1.1.2 Wall Mounting steps:

STEP A: Fix the brackets on both sides of the e-one module with M3 screws.



STEP B: Place the e-one module on the wall and fix with the screws.



5.2 Wiring

Caution:

The e-one has internal fuses on DC inputs.

Those device do not protect the upstream cables connected to DC inputs and upstream breakers or fuses shall be set up in accordance with DC wires ratings, to meet the local national electrical code standard.

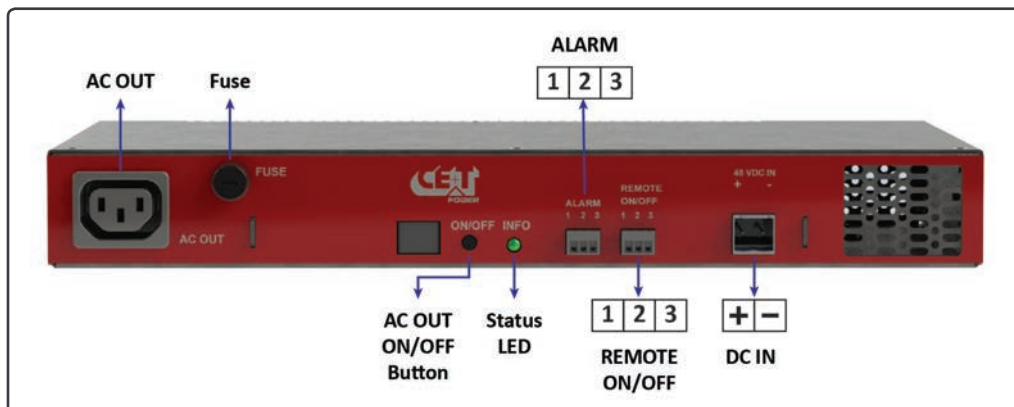
All breakers, cables and wires should be classified for min 90°C (194°F) operation. Matching respectively Line / Neutral feeder to Line / neutral input connections is required.

Before any intervention on the e-one input, operator has to make sure that power is switched off on DC leads.

Some safety labels are stuck on the e-one. They must not be removed.

The insulation cover of conductors must meet the local and international standards and the cross section must be related to the upstream protections.

5.2.1 REG Model - Front View



In e-one REG models:

- DC conductors connected to screw terminals must be tied with torque between 1.2 and 1.5 Nm.
- Ground conductors connected to copper plates with bolts must be tied with torque between 5 and 7 Nm.


5.2.2 Disconnecting and protecting devices

5.2.2.1 DC input connection

Integrator must provide branch circuit protection with breaking capacity related to short circuit capacity of upstream DC source.

- DC Breaker must be installed close enough to permit easy “Break Before Make”.
- Appropriate type can be chosen within the table here below.
- e-one is supplied with safety labels, which must be applied to the breaker in a visible way.

The insulation cover of connecting cables must meet the local and international standards and the cross section related to the upstream protections.

	Model	DC input current at 40 VDC	DC breaker	Cable size	Max size
	1000 VA	22 A	25 A	4 mm ²	1 x 6 mm ² per pole

The +DC 48V supply could be earthed (this earth connection must be made upstream of the shelf) or work in float mode.

Adapt the breaking capacity of your breaker in relation to your installation (length cable, battery capacity).

5.2.2.2 AC output distribution


The e-one unit has 1 IEC socket on output.

Caution:

The e-one should be turned OFF by remote ON/OFF action. Prior any intervention on AC output make sure DC input has been actually disconnected or, no output voltage is present.

Prior any handling of the e-one, wait a few minutes (minimum 5 minutes) for complete discharge of internal capacitors that have been energized

Output on terminal

	Model	Iout @ 230 Vac	Cable size	Max size*
	1000 VA	4.35 A	1.5 mm ²	2.5 mm ²

* Output breaker are not mandatory.

Output on IEC socket

IEC output is protected by 5 amps fuse (5 x 20 mm).

Remark: e-one without static transfer switch function (REG type) can be seen as independent power sources.

Installation

5.2.2.3 Replacing Fuse

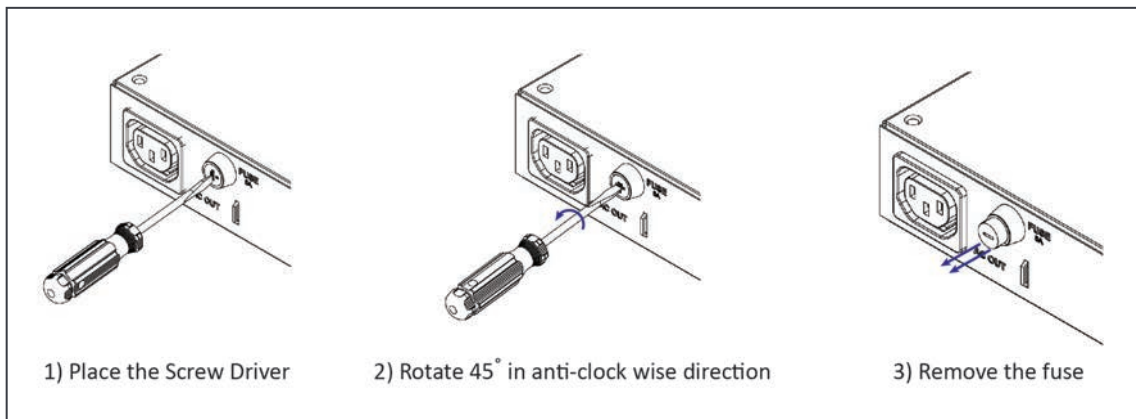
Incase Fuse failure, perform the following steps to replace fuse.

Fuse Details:

Manufacturer	Manufacturer Part Number	Current Rating	Voltage Rating AC	Fuse Size/Group
Schurter	0034.3124	5 A	250 VAC	5 mm x 20 mm

Fuse will be present at front left side of the system.

- Step 1.** By using the Flat Screw Driver gently turn the Fuse holder to 45° in anti clock wise direction. The Fuse Holder automatically ejects from the slot. (Fuse holder will not go beyond 45°).
- Step 2.** Remove the Fuse holder from the slot.
- Step 3.** Replace the appropriate new Fuse in the holder.
- Step 4.** Place the Fuse with holder in the slot.
- Step 5.** By using the Flat Screw Driver gently push and turn the Fuse holder to 45° in clock wise direction. Make sure Fuse holder is locked.



Warning: Risk of electric shock, do not replace the Fuse in system running condition.

5.2.3 Grounding

Caution:

Current leakages can reach hazardous values.

For your personal, SAFETY earth connections must be done before energizing the system.

Earth connection must be done to the point referenced with symbol
Input ground must be connected to the appropriate terminal



5.2.4 Remote Monitoring and Control

5.2.4.1 Alarm Connector

There is one free potential changeover contact provided. Maximum wire size is 0.5 mm². It can be used for Alarm indication purposes. It has one Major Alarm relay.

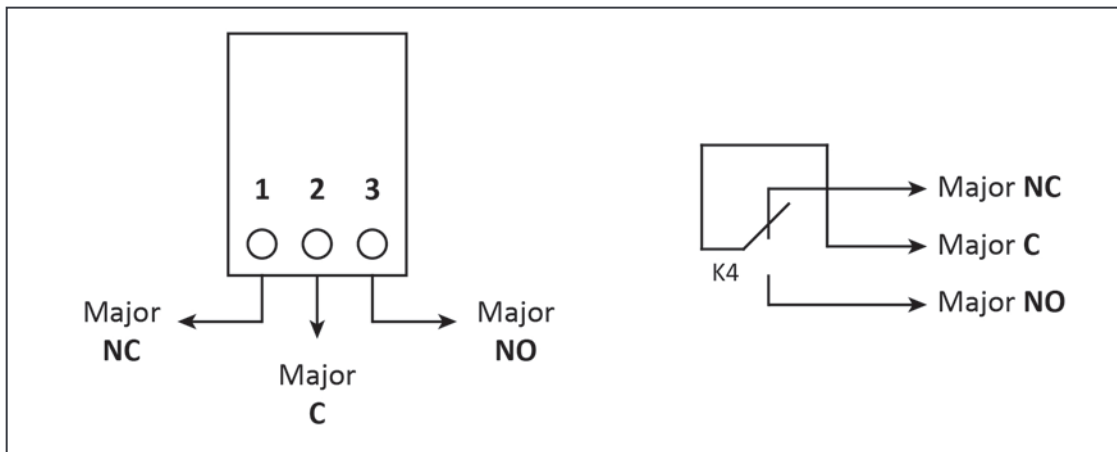
N.B. : relays are energized while idle (i.e. relays de-energized when event occur).

MAJOR relay provide an open or close free potential contact



Relay characteristics:

- Maximum switching capacity: 1 A @ 60 VDC
- Maximum switching power: 30 W
- Maximum voltage: 60 VDC
- Maximum switching current: 1 A



5.2.4.2 Remote ON/OFF

e-one system can be remotely activated or stopped (stand-by mode).



Changeover contacts must be used.

For transition, the system checks actually that one input is released whilst the other is short circuited.

If both transitions are not picked up the inverter does not change its operating status.

The voltage present on terminal 1 and 3 is +5 V (galvanically insulated). Care should be taken to avoid connecting any external voltage on terminal 1 to 3. Maximum wire size is 1 mm²

Functional table for remote ON/OFF function

States	Pin 1-3	Pin 2-3	System status
1	Open	Open	System working normally
2	Closed	Open	Output switched OFF LED OFF
3	Open	Closed	System working normally

The 3 wires must be used for the redundancy on the remote ON/OFF. Use NO/NC relay contact.

Warning: If remote ON/OFF not used, pin 2 and 3 MUST be bridged together!

6. Getting started

6.1 Starting procedure

1. Check that AC output breakers are switched off.
2. Apply the DC power to the system.
3. Output voltage should present on IEC socket.
4. Check that system is operating under normal conditions.

6.2 LED indication- Alarm status

There is one LED at front for input output status.



S. NO	Status LED	Description
1	OFF	No Output
2	Permanent GREEN	Working Fine
3	Blinking GREEN	DC Source Out-of-range
4	Blinking ORANGE	Output Power / VA Derating
5	Slow - Blinking RED	Short-circuit Sequence
6	Fast - Blinking RED	Module Over-Temperature and Output OFF
7	Permanent RED	Output OFF due to Permanent Short-Circuit
8	Blinking RED - ORANGE	Output Voltage Out of range
9	Blinking RED- GREEN	Load Power too High and Output OFF

7. Finishing

- Make sure that the inverter is properly fixed to the cabinet.
- Make sure that the inverter is connected to Ground.
- Make sure that all DC and AC output breakers are switched OFF.
- Make sure that all cables are according to recommendations and local regulations.
- Make sure that all cables are strained relieved.
- Make sure that all breakers are according to recommendation and local regulations.
- Make sure that DC polarity is according to marking.
- Re tighten all electrical terminations.
- Make sure that no inverter/controller positions are left open.
- Make sure that the Remote ON/OFF is appropriately wired according to local regulations.

8. Disassembly & Disposal

8.1 Disassembly

Switch off the upstream and downstream protective elements to stop the function of Inverter system.

- Disconnect the wires from the terminals.
- Ensure that all the cables (including PE, communication etc) are removed.
- Check that all the cables are moved away from the system.
- Unscrew the system from the mounting position.
- Dismantle the system completely and segregate the materials.
 - Enclosure & accessories.
 - Cables.
 - Wound components.
 - PCBA etc.

8.2 Disposal

CE+T cannot be held responsible for disposal of the Inverter system and therefore the customer must segregate and dispose the materials which are potentially harmful to the environment, in accordance with the local regulations in force in the country of installation.

If the equipment is dismantled, to dispose of the products it consists of, you must stick to the local regulations in force in the country of destination and in any case avoid causing any kind of pollution.

9. Commissioning

The DC breaker is a protection device. When modules are plugged in a system please make sure the corresponding DC breaker is engaged in the ON position. Failure to observe this rules will result not to have all module operating when running on DC.

Installation and commissioning must be done and conducted by trained people fully authorized to act on installation.

It is prohibited to perform any isolation test without instruction from manufacturer.

Equipments are not cover by warranty if procedures are not respected.

9.1 Check list

DATA	
Date	
Performed by	
Site	
Inverter serial number	
ACTION	
	OK/ N.OK
Check if inverters are working (Green led)	
Check the DC power supply and switch ON the DC breakers	
Check output voltage (on bulk output or on breaker)	
Check if inverter is working properly	
Check if system has no alarm	
Switch OFF system and start on DC only	
Test on load (if available)	
ALARM	
Switch OFF DC input (DC power failure) and check the LED indication	

10. Trouble shooting

Inverter does not power up:	Check that the inverter terminals are properly connected. Check DC input present and in range (DC breakers) Check for loose terminations
Inverter does not start:	Check remote ON/OFF terminal Check the setting Check threshold level
Inverter only run on AC or DC:	Check threshold level
No output power:	Check output breaker

11. Maintenance

Maintenance shall only be performed by properly trained people.

11.1 Manual check

- Validate input voltage (DC input, AC output) with multi-meter
- Replace dust filter (if present)
- Take a snap shot of the inverter

11.2 Optional

- With an infrared camera check termination hot spots
 - Tighten terminations

12. Defective modules

- A repair request should follow the regular logistics chain:
End-user => Distributor => CE+T Power.
- Before returning a defective product, a RMA number must be requested through the <http://my.cet-power.com> extranet. Repair registering guidelines may be requested by email at repair@cet-power.com.
- The RMA number should be mentioned on all shipping documents related to the repair.
- Be aware that products shipped back to CE+T Power without being registered first will not be treated with high priority! (Label shown here is only for representation)

EONE 48V-230VAC-1000VA	
-REG	
P/N : T551730211	S/N : 000001
DC Input : 48V (40-60) 18.9A	CE
AC Output : 230Vrms ~ 4.3Arms 50 Hz	
Output Power : 800W 1000VA	www.cet-power.com
	MADE IN CE+T PSI
BURN IN : 10/17	STAMP :

13. Appendix

13.1 Single phase circuit diagram

