

TSI Y-ONE - 230VAC

User Manual V7.4

BEYOND THE INVERTER

THE NEW GENERATION OF POWER CONVERTERS

- » **DUAL INPUT INVERTER**
The Commercial Power as default source
- » **AC BACKUP IN A DC ENVIRONMENT**
Leverage your existing DC infrastructure
- » **ONE STOP SHOP**
Wide output power range
- » **HARSHEST AC INPUT CONDITIONS**
Without compromising the quality of the AC output

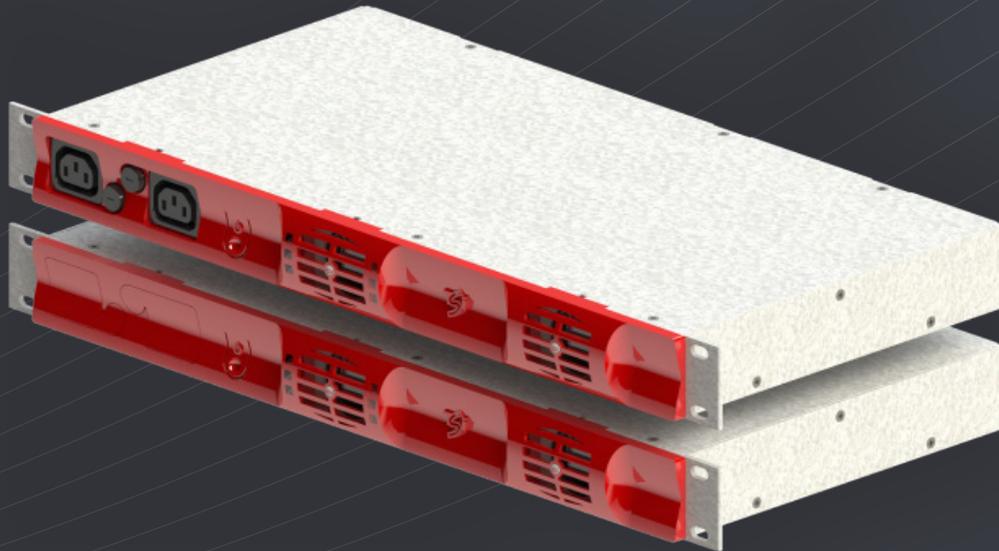


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Release Note:

Version	Release date (DD/MM/YYYY)	Modified page number	Modifications
7.0	02/05/2013	-	First release of the Manual.
7.1	18/08/2014	10 and 15	IEC socket fuse details
7.2	11/01/2016	23	Fan replacement procedure
7.3	25/09/2017	-	Added REG mode features information (where applicable).
7.4	21/12/2017	19	Relay details



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CE+T at a glance

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



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Abbreviations

2. Abbreviations

TSI	Twin Sine Innovation
EPC	Enhanced Power Conversion
REG	Regular
DSP	Digital Signal Processor
AC	Alternating current
DC	Direct current
ESD	Electro Static Discharge
MET	Main Earth Terminal
MBP	Manual By-pass
TCP/IP	Transmission Control Protocol/Internet Protocol
USB	Universal Serial Bus
PE	Protective Earth (also called Main Protective Conductor)
N	Neutral
PCB	Printed Circuit Board
TRS	True Redundant Structure

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** – Risk of electric shock. This Inverter / UPS receives power from more than one source. Disconnection of the AC source and DC source is required to de-energize this unit before servicing.
- Maximum operating ambient temperature is 50° C (122° 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.
- The inverter rack is a dual input power supply. The complete system shall be wired in a way that both input and output leads can be made powerless in a single action.
- REG systems can be seen as independent power sources. To comply with local and international safety standards N (output) and PE shall be bonded.
- EPC 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/EN62040-1-1 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 60 seconds.
- 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 according to -instructions herein -by skilled technician -according to local safety regulation.
- 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

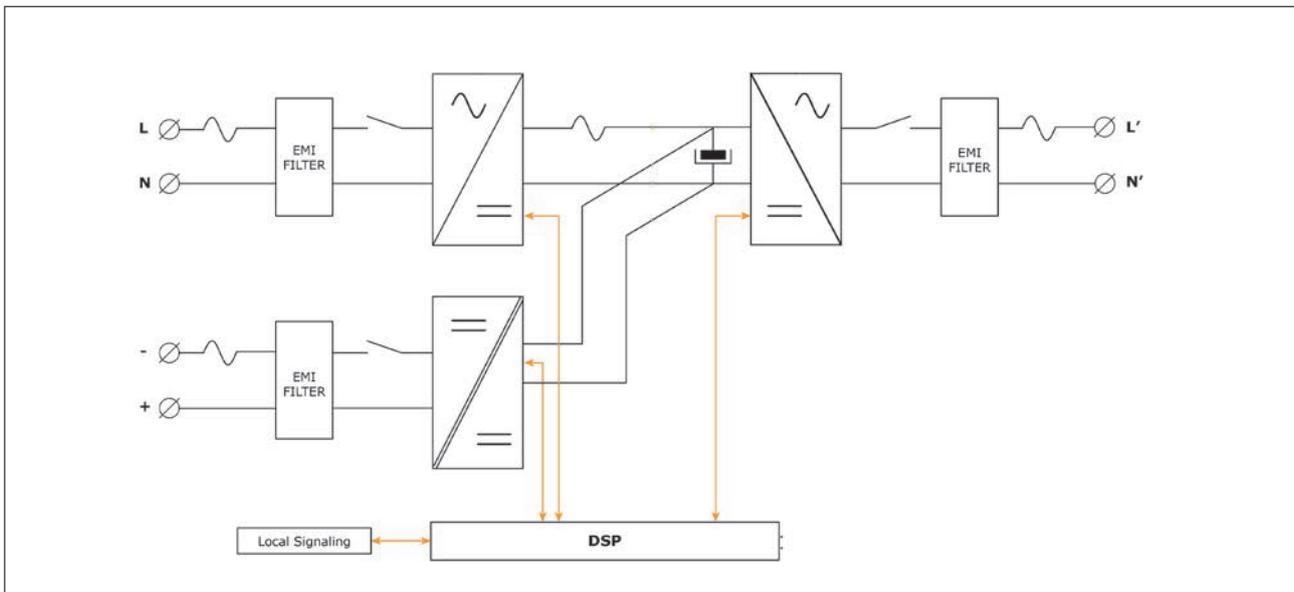
- Isolation test must not be performed without instructions from the manufacturer.

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

4. TSI TECHNOLOGY ¹

Inverter modules carrying the TSI logo and the EPC mark are triple port converters (AC in, DC in, AC out). Sinusoidal output is converted from Mains or/and DC.

The block diagram here below gives an explicit description of the topology and operation.



The module is built around the following sub-converters

- AC to DC at input
- DC to DC at input
- DC to AC at output

The energy can flow either from the AC source or the DC source under the control of the local DSP controller. Thanks to internal energy buffering, the output sine wave is constant and disturbance free regardless of the active source.

The TSI can handle continuous over load of 110%, It can also handle overload capacity upto 150% for 15 seconds.

The TSI output Voltage, Frequency, and Mode can be selected and controlled by selector switches and Front (ON/OFF),remote (ON/OFF) respectively.

The TSI has a PFC alarm (major and Minor) to indicate the status of system.

The TSI can be deliver full power up to 50°C (122°F) ambient and in higher ambient DSP automatic derating the power.

The functionality is included always conditioned output, high efficiency and 0ms source transfer time.

1) Information and data given in this chapter intend to for an overview on the technology. Detailed features and parameters for each individual module type of the range may differ and should be referred in the dedicated data sheet.

4.1 On-line Mode

DC is the primary source of supply whilst Mains (AC) works as the secondary source of supply. Switching time between DC input and AC input is 0 ms (source transfer). The power delivered by the DC source (usually a battery, but it could be any other type of DC generator) is converted to provide regulated and transient free power to the load. In case of short circuit at the load side, the boost is automatically and timely energized to trip downstream protective devices.

4.2 Safe mode

Safe mode use DC as primary source of supply while Mains (AC) is in standby.

Mains (AC) is normally disconnected through internal inlet relay and is only connected when down stream clearance is required (boost) or if DC is unavailable.

The transfer between DC and AC results in typical transfer time of 10 ms.

Typically the safe mode is used in extremely harshed environments such as railways. Under such conditions it provides extra isolation against disturbances carried by the Mains.

4.3 EPC-mode

Mains input (AC) is the primary source whilst DC works as backup.

The TSI is designed to operate on Mains on permanent basis and to deliver output voltage conditioned with low THD.

There is no physical difference on the output sine wave whether the source is AC (or) DC. If the Mains is out of tolerance or goes down, the converter seamlessly switches to DC and the converter operates in "Back-up mode" (Switching time back and forth is 0 ms).

As soon as the Mains returns in to valid range, the EPC mode is automatically resumed.

The EPC mode offers higher efficiency (up to 96% depending on the model) without compromising the purity of the output sine wave.

Note: REG modules

Inverter modules carrying the TSI logo together with REG mark are modules working only with DC input . Sinusoidal output is converted from DC and the module operates as a traditional inverter. EPC mode and the boost are not available with REG modules.

5. Description

TSI Y-One is a standalone Inverter with following capacities

- Standalone model 1500 VA*
- Standalone model 800 VA**
- Standalone model 500 VA**

230Vac and 48Vdc as Input and 230Vac as Output fitted with Enhanced Power Conversion (EPC) mode

* EPC model

** EPC and REG model

TSI Y-One comes with two possible output configurations as follows.

- Bulk output at rear terminal.
- 2 x IEC socket at front output, protected with following fuse.

a) 500 VA and 800 VA	5 amps fast acting fuse (5 x 20 mm).
b) 1500 VA	10 amps fast acting fuse (5 x 20 mm).



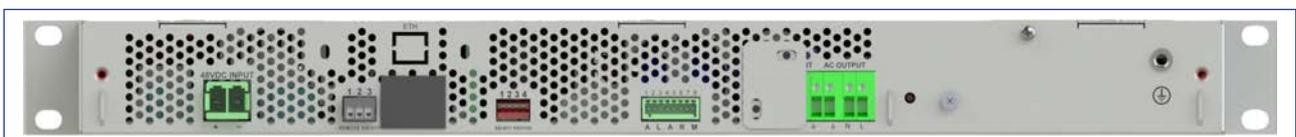
Y-One Front View - Bulk Output



Y-One Front View - 2 X IEC Socket



Y-One Rear View (EPC)



Y-One Rear View (REG)



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Description

5.1 Typical load

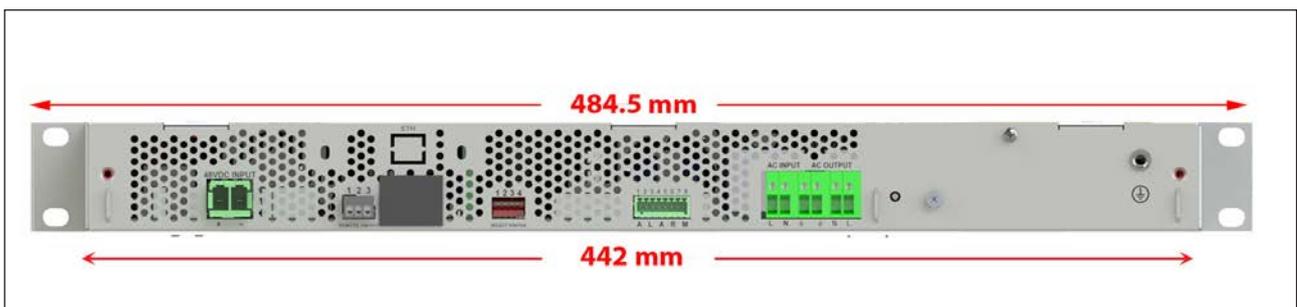
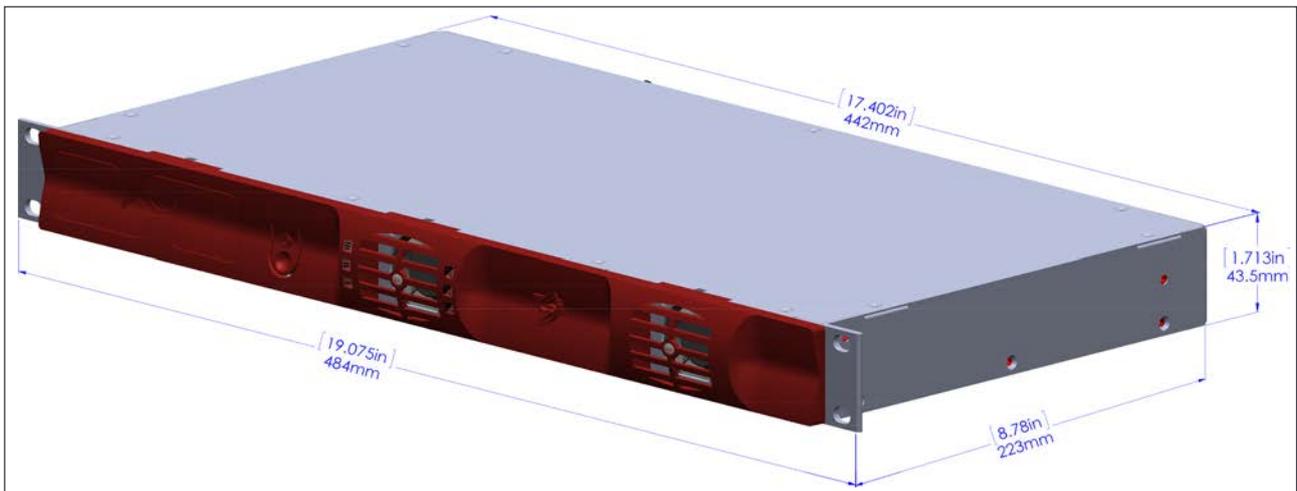
- Resistive
- Inductive and resistive
- Capacitive and resistive
- Non linear load with a maximum crest factor of 2.5 for Y-One

6. 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 Y-One is foreseen to be recessed into an electrical cabinet of 19" and 1U height standard. Product weight is 9 Lbs (4 kg)

6.1 Y-One dimensions



6.1.1 Mounting KIT

Make sure that you have received the right accessories for Y-One which consist 4 number of M6 x 16 mm Screws with spring and plate washer.

6.1.1.1 Mounting steps:

STEP A:

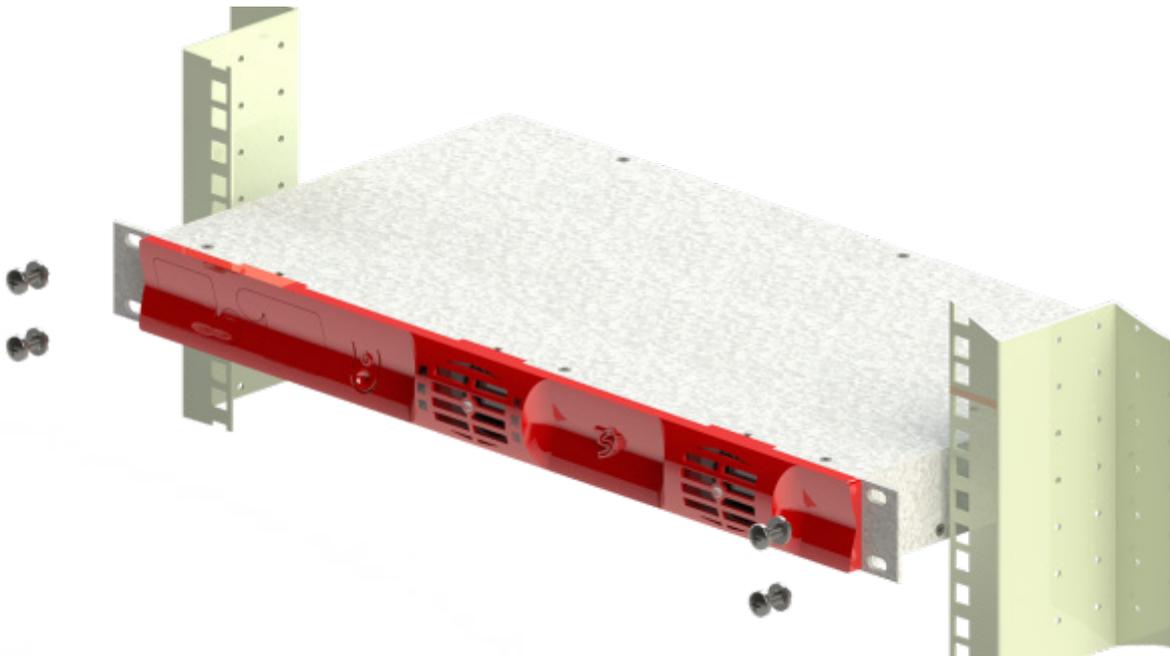
Insert the Y-One module inside the cabinet horizontally.

STEP B:

Fix the brackets and slider on the frame, using supplied bolts.

STEP C:

Do it for all 4 corners



6.2 Wiring

Caution:

The TSI Y-One has internal fuses on both DC & AC inputs.

Those devices do not protect the upstream cables connected to DC & AC inputs and upstream breakers or fuses shall be set up in accordance with AC & 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.

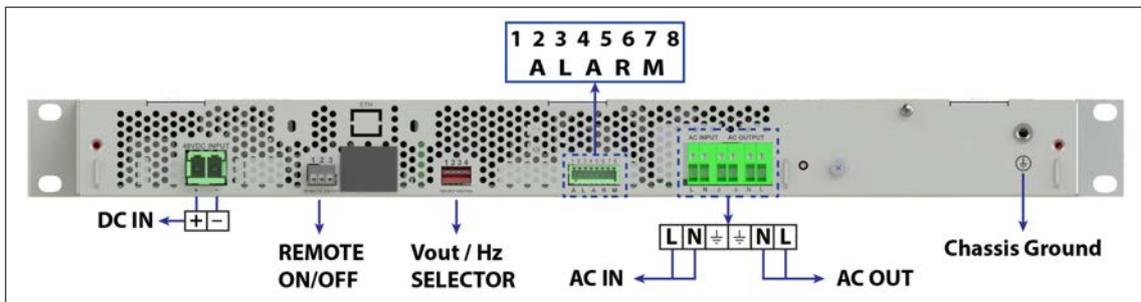
Before any intervention on the TSI Y-One inputs, operator has to make sure that power is switched off on both DC leads and AC input mains.

Some safety labels are stuck on the TSI Y-One. They must not be removed.

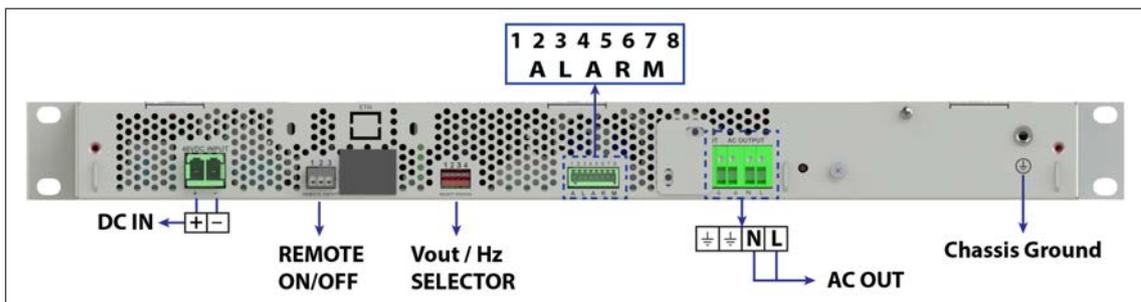
It is strongly recommended to install external surge arrestors upstream to the AC input terminal at the cabinet & the room/building levels with related energy ratings.

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

6.2.1 EPC Model - Rear View



6.2.2 REG Model - Rear View



NOTE: In REG models, AC IN connector will not be present, this location is covered with a mechanical part. This mechanical part should not be removed.

In both Y-One EPC and Y-One REG models:

- DC and AC 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.

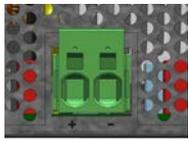
6.2.3 Disconnecting and protecting devices

6.2.3.1 DC input connection

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

- It must be installed close enough to permit easy “Break Before Make”.
- Appropriate type can be chosen within the table here below.
- Y-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 40VDC	DC breaker	Cable size	Max size*
	500 VA	11.2 A	16 A	2.5 mm ²	1 x 2.5 mm ² per pole
	800 VA	17.9 A	20 A	2.5 mm ²	1 x 4 mm ² per pole
	1500 VA	33 A	40 A	10 mm ²	1 x 10 mm ² per pole

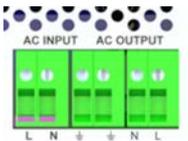
The +DC_48V supply could be earthed (this earth connection must be made upstream of the shelf) or work in float mode.

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

* Module with SN below 100 are foreseen with 2 X 2.5 mm² per pole terminal.

6.2.3.2 AC input connection

AC input connection only exists whenever Y-One system has been foreseen with static transfer switch function (EPC mode).

	Model	I in @ 230 Vac	AC breaker	Cable size	Max size*
	500 VA	1.9 A	4 A	1.5 mm ²	2.5 mm ²
	800 VA	3 A	4 A	1.5 mm ²	2.5 mm ²
	1500 VA	5.74 A	6 A	1.5 mm ²	2.5 mm ²

Y-One is supplied with 4 pin 1.5 mm² Connector: AC IN Line – Neutral – Neutral – AC OUT Line

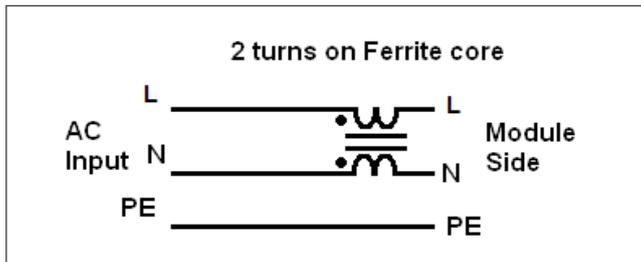
Note: AC input connection is not applicable in REG models.

6.2.3.3 Ferrite core connection

Wind 2 turn of AC input phase and neutral on supply

TUBE FERRITE (17.5x9.5x28.5 AL=2790 VHF

EMC *WURTH ELEC 742 700 9*) as shown in figure. Ensure the core is near to the inverter backside.



Note: Ferrite core correction is not applicable in REG models.

6.2.3.4 AC output distribution

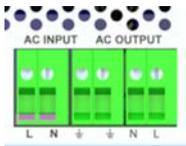
The Y-One unit should ordered with output on terminal or with output on 2 IEC socket

Caution:

The Y-One should be turned OFF by remote ON/OFF action or from front push button. Prior any intervention on AC output make sure DC input and AC input has been actually disconnected or, no output voltage is present.

Prior any handling of the Y-One, wait a few minutes (min 5 minutes) for complete discharge of internal capacitors that have been energized.

Output on terminal

	Model	I in @ 230 Vac	AC breaker	Cable size	Max size*
	500 VA	2.2 A	4 A	1.5 mm ²	2.5 mm ²
	800 VA	3.5 A	4 A	1.5 mm ²	2.5 mm ²
	1500 VA	6.8 A	10 A	1.5 mm ²	2.5 mm ²

* Output breaker are not mandatory.

Output on IEC socket

Each IEC output is protected by fast acting fuse.

- 500 VA and 800 VA 5 amps fast acting fuse (5 x 20 mm).
- 1500 VA 10 amps fast acting fuse (5 x 20 mm).

Remark:

- TSI Y-One without static transfer switch function (REG type) can be seen as independent power sources.

6.2.3.5 Replacing Fast Acting Fuse

Incase Fast Acting Fuse Failure, perform the following steps to replace Fast Acting Fuse.

Fast Acting 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 Fast Acting Fuse in the holder.



Step 4: Place the Fast Acting Fuse with holder in the slot



Step 5: By using the Flat Screw Driver gently turn the Fuse holder to 45° in clock wise direction.

Make sure Fast Acting Fuse holder is locked.



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

6.2.4 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



6.2.5 Remote Monitoring and Control

6.2.5.1 Alarm Connector

There are 2 free potential changeover contacts provided. Maximum wire size is 0.5 mm². It can be used for Alarm indication purposes. It has one Major Alarm relay and one Minor Alarm relay.

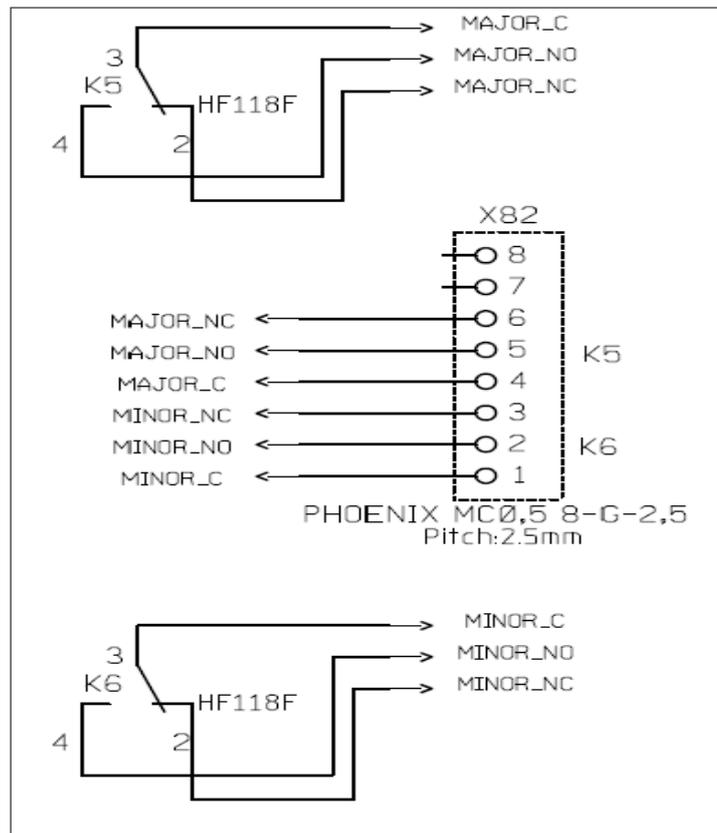


N.B. : relays are energized while idle (i.e. relays de-energized when event occur).

MAJOR and MINOR relay provide an open or close free potential contact.

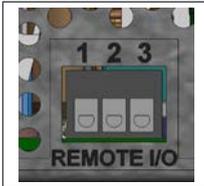
Relay characteristics:

- Maximum switching capacity: 2 A @ 30 VDC or 1 A @ 60 VDC
- Maximum switching power: 60 W
- Maximum voltage: 60 VDC
- Maximum switching current: 2 A



6.2.5.2 Remote ON/OFF

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



Changeover contacts must be used.

For transition the TSI 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 +5V (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	TSI output switched off DC-AC LED off DC-DC LED solid green AC-DC LED solid green
3	Open	Closed	System working normally
4	Closed	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!

6.2.6 Dipswitch configuration

TSI Y-One has a facility to select the output voltage and frequency. Vout / Hz Selector has four mini switches. First and second switches are for voltage selection and third switch is for frequency selection. Fourth switch is for EPC / ONLINE mode selection. This functionality is explained below



Caution:

Do not configure or change the Vout / Hz / EPC Selector while module is in working condition. It will cause severe damage to total System.

New setting will apply after a reboot or restart by ON/OFF action.

Switch 1 and Switch 2 are used to change the output level voltage

State	Switch 1	Switch 2
230V Output	Bottom	Bottom
220V Output	Top	Bottom
240V Output	Bottom	Top
Factory reserved	Top	Top

Switch 3 is used to change the output frequency (!! Input frequency must be in same range !!)

State	Switch 3
50 Hz Operation	Bottom
60 Hz Operation	Top

Switch 4 is use to change the EPC mode configuration (see TSI section for detailed explanation about EPC and On-Line EPC Mode)

State	Switch 4
EPC Mode	Bottom
On-Line EPC Mode	Top

Changing DIP switch Positions:

Inverter must be completely switched OFF by disconnecting both AC and DC sources before changing selection.

Default Factory setting done in module:

SW1	SW2	SW3	SW4	Function
Bottom	Bottom			Vout= 230V
		Bottom		50Hz
			Bottom	EPC Mode

7. Manual By-Pass

Manual By-Pass has to be operated by trained people only.

When system is in manual by-pass the load is subjected to mains voltage without active filtering.

Output alarm when system is in manual by-pass.

The manual by-pass is not possible to operate remotely.

Manual By-Pass is optional and must be ordered separately.

7.1 Pre requisites

Commercial AC must be present, and inverter must be synchronized with it before operating MBP. The upstream commercial breaker must be correctly sized to accept the overload, and if the AC is supplied by a Gen-set, the minimal required power will be twice nominal power of the inverter.

The inverter might be overloaded during MBP procedure, depending on voltage network and output inverter voltage setting.

To reduce the overload impact, the inverter power and current will be reduced from 150% to nominal value.

The by-pass switch disconnect all AC voltage on the shelves but has no action on the DC feeding on inverter and on remote alarm terminal.

7.1.1 Manual by-pass

7.1.1.1 Normal to By-pass.

1. Turn switch to OFF passing intermediate.
2. Switch DC OFF.



7.1.1.2 By-pass to Normal

1. Switch DC ON.
2. Turn switch to INERMEDIATE (mid position).
3. PAUSE, wait until the inverter modules have come to full operation (30-60 seconds).
4. Complete twist to ON.

Please note that instrucitons is printed in text (English) on front of MBP.

Manaul By Pass is applicable for only bulk output. Front IEC socket is not controlled by MBP.

8. Getting started

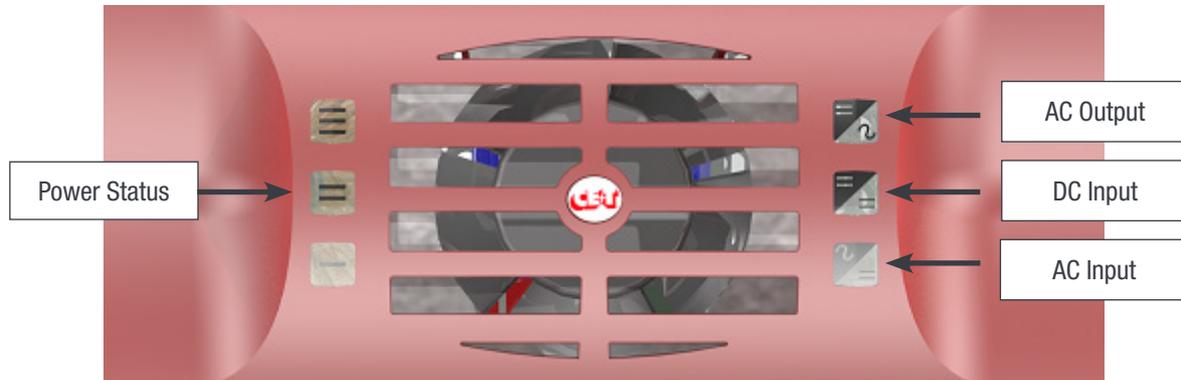
8.1 Starting procedure

1. Check that both AC input and output breakers are switched off.
2. Apply the DC and/or AC power to the system.
3. Push on the ON/OFF front touch to start the inverter.
4. Output voltage should present on terminal or IEC socket.
5. Check that system is operating under normal conditions.

Mains failure alarm detection is not available until the AC input voltage is not detected for the first time.

8.2 Front Panel LED Display

There are 6 LEDs in front panel for input output status and power level indication



8.3 LED indication- Alarm status

Status LED	LED AC/DC (in)*		LED DC/DC (in)		LED DC/AC (out)	
	Description	Alarm	Description	Alarm	Description	Alarm
OFF	Source not present.	Minor	Source not present.	Major	Forced Stop	Major
Permanent Green	Working fine	no alarm	Working fine	no alarm	Working fine	no alarm
Blinking Green	Source out of range, power available	Minor	Source out of range, power available	Major	Derating (Over Load/ Over Temperature)	Major
Blinking Orange	Source out of range, no power	Minor	Source out of range, no power	Major	Derating (Lower Vout and SC)	Major
Permanent Orange	Starting mode	no alarm	Starting mode	no alarm	Starting mode	no alarm
Blinking Orange/Red	BackFeed error	Major	Not used		BackFeed error	Major
Blinking Red	Not used	Major	Not used		Recoverable Fault	Major
Permanent Red	Module AC/DC Fault	Major	Module DC/DC Fault	Major	Not recoverable Module Fault	Major
Blinking Red Every 5 Seconds	Fan life elapsed	Minor	Fan life elapsed	Minor	Fan life elapsed	Minor

* Not applicable for REG models.

8.4 Disable alarm mains failure

AC input alarms are enabled only if AC source was available and in range (AC/DC LED permanent green) during more than 5 seconds. Before this condition happens, there is no alarm on AC input. Once AC input alarms are enabled, they can be reseted to disabled state by pressing the ON/OFF button.

Warning: this action switches off the output.

8.5 Fan Replacement

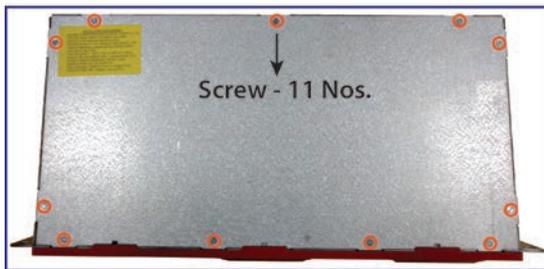
The FAN pre-alarm “FAN life elapse” has been set to 5 years.

The FAN alarms appear with the 3 LEDs status DC, AC, OUT flashing red for every 5 seconds.

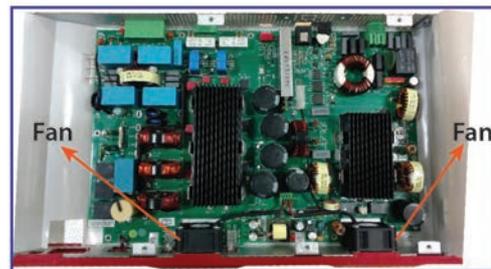
Perform the following steps to replace the fan:

1. Engage the Manual By Pass if present.
2. Disconnect the unit from any AC and DC voltages.
3. Remove the unit from the rack and let it rest at least five minutes prior to initiating the work.
4. Open the top cover of the unit by removing the screws on the top.
5. Open the Mylar sheet.

Note: Warranty Void sticker is placed on above the mylar sheet.

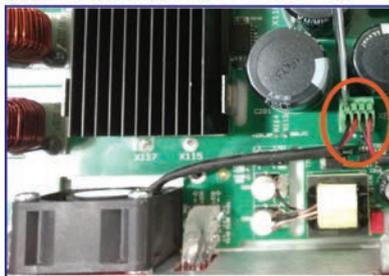


Step 4



Step 5

6. Disconnect the fan wire from the terminal, by gently pushing with the tip of a small screwdriver on the green protuberance.
7. Remove the faulty fan by removing the two screws. (Note the fan position and arrow direction in the fan)
8. Place the new fan in the correct position and direction, and tight the screws.
9. Connect the fan wire to the terminal, by gently pushing with the tip of a small screwdriver on the green protuberance.



Step 6



Step 7



Step 8

10. Close the top cover of the unit and tight all the screws.
Note: Place the Mylar sheet in exact position before tightening the screws.
11. Place the unit into the rack and start up the unit.
12. Clear the alarm by pressing the inverter ON/OFF button during 10 seconds.

9. Finishing

- Make sure that the inverter is properly fixed to the cabinet/floor.
- Make sure that the inverter is connected to Ground.
- Make sure that all DC and AC input 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.
- Cover empty inverter positions with blanks.
- Make sure that the Remote ON/OFF is appropriately wired according to local regulations.
- Make sure that the point of AC supply meets local regulations.

10. Disassembly & Disposal

10.1 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.

10.2 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.

11. 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 and have module failure when AC input recover from fault condition.

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.

11.1 Check list

DATA	
Date	
Performed by	
Site	
Inverter serial number	
ACTION	
	OK/ N.OK
Check the commercial AC before closing the AC input breaker.	
Switch ON the commercial AC	
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 ACin and check if system is working on DC	
Switch ON ACin and check if system correctly transferred load on AC	
Switch OFF system and start on AC only	
Switch OFF system and start on DC only	
Check if display working properly (if this CANDIS option is present)	
Check if TCPIP working properly (if this option is present)	
Test on load (if available)	
ALARM	
Switch OFF AC input (commercial power failure) and check the LED indication	
Switch OFF DC input (DC power failure) and check the LED indication	
Check the different digital input according to the configuration (when used)	

12. Trouble shooting

Inverter does not power up:	<ul style="list-style-type: none">Check that the inverter terminals are properly connected.Check AC input present and in range (AC breakers)Check DC input present and in range (DC breakers)Check for loose terminations
Inverter does not start:	<ul style="list-style-type: none">Check remote ON/OFF terminalCheck that Manual By-pass is in normal positionCheck the settingCheck threshold level
Inverter only run on AC or DC:	<ul style="list-style-type: none">Check the configuration and settingCheck threshold level
No output power:	<ul style="list-style-type: none">Check output breaker
No output alarm:	<ul style="list-style-type: none">Mind the default time delay (UA: 60s, NUA: 30s)

13. Maintenance

Maintenance shall only be performed by properly trained people.

13.1 Manual check

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

13.2 Optional

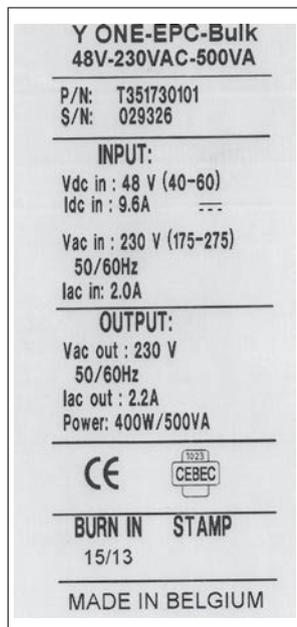
- With an infrared camera check termination hot spots
 - Tighten terminations

13.3 Manual by-pass

- If mains failure during operation the load is lost
- Perform a manual by-pass operation

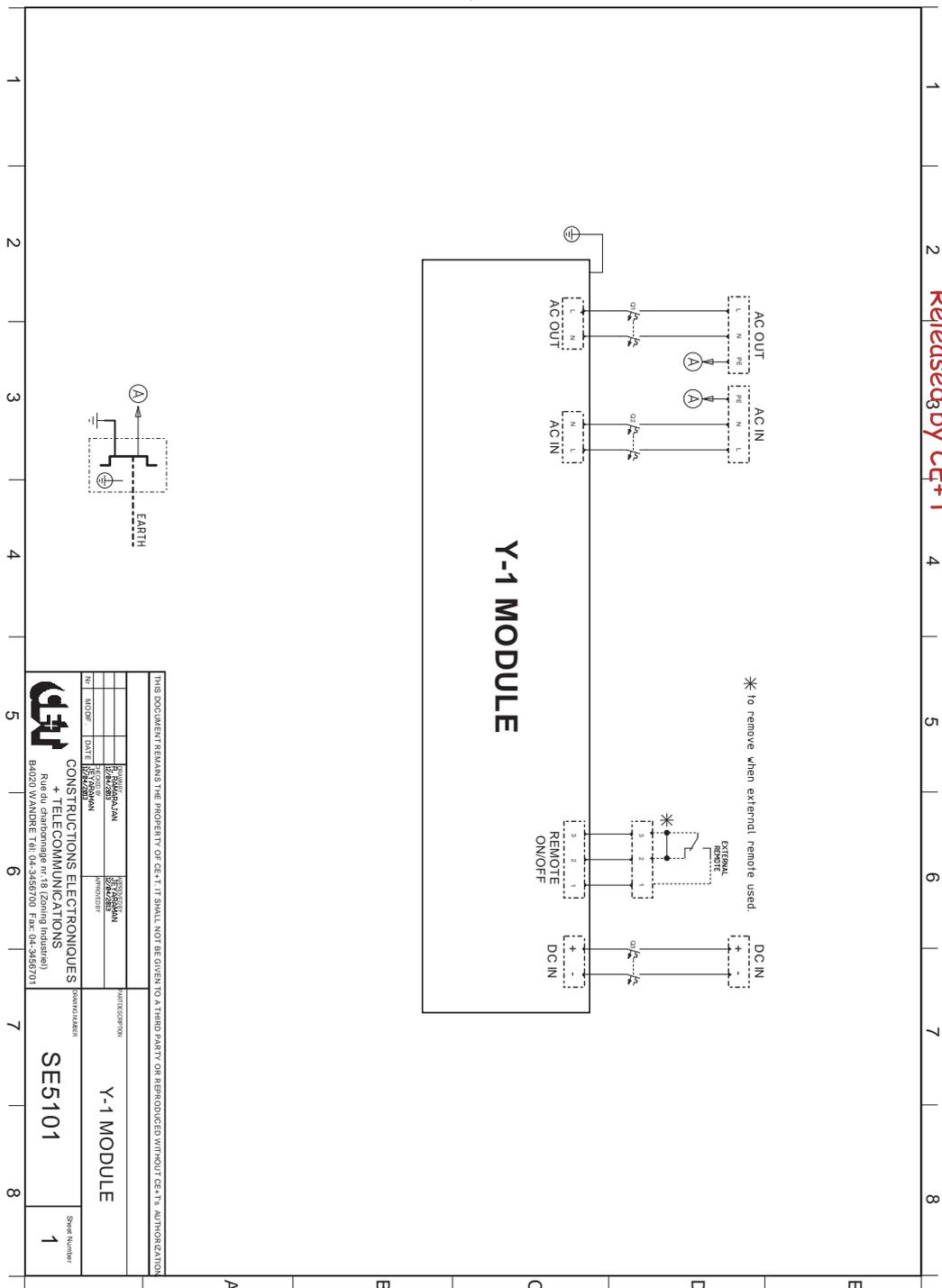
14. Defective modules

- 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)



15. Appendix

15.1 Single phase circuit diagram



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