

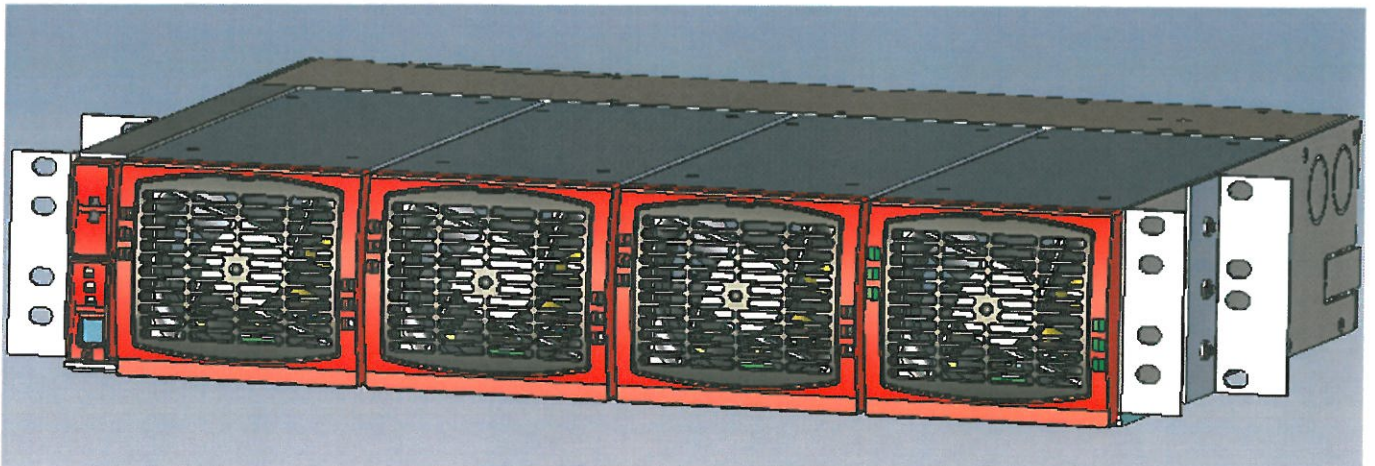


INSTALLATION MANUAL

MEDIA inverter 120VAC

TSI MEDIA shelf 4 modules V.2.1

10.06.13



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The present equipment is protected by several international patents and trademarks.**



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0 Safety Recommendations

0

Your safety is our major concern.

Read carefully all safety aspects listed in this manual prior any intervention on the appliance.

The manufacturer declines all responsibilities if equipment has not installed by skilled technician and in a proper way according to local safety regulation and as it is described herein.

TSI rack is not supplied with internal disconnect devices and it is dual input power supply. Refer to chapter 3 for safe installation and access to the system.

TSI rack can reach hazardous leakage currents if grounding is not made according to safety recommendations. Refer to § 2.2.



Caution:

For your easiness, the following picto will appear to highlight safety advices
Prior any handling of the shelf, wait a few minutes (min 5 minutes) for complete discharge of internal capacitors that have been energized

1 Introduction

This document applies to the TSI System. For product description, please refer to related document.

Please check that operating manual version you are reading is corresponding to TSI version running in your installation.

TSI MEDIA shelf for 4 modules:

Based on MEDIA module

1 500 VA 120Vac – 48Vdc
Fitted with or without Enhanced Power Conversion (EPC) mode

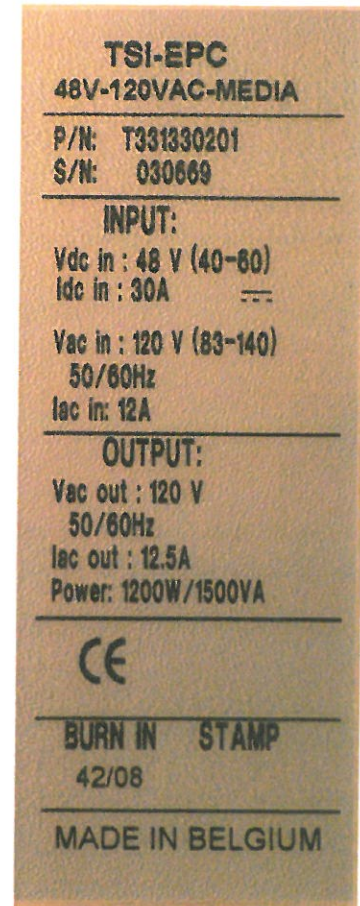
Single phase:

1.5 KVA to 6 KVA without redundancy

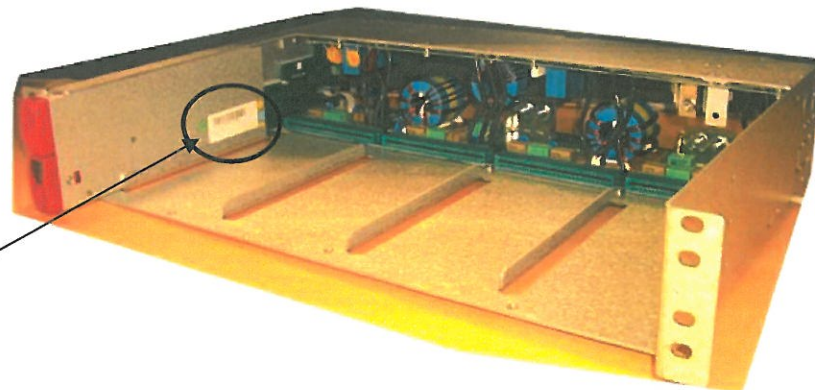
Identification plate:

Identification Plates are located

on Module



On the shelf
(Behind the T1S Monitor)



On the monitoring:

The PART NUMBER, SERIAL NUMBER and BURN IN DATE are essential information when you contact CE+T to get help in commissioning or in troubles or when item is sent back for repair.

2 System Technical Description

Certificates and testing details are available on request.

2.1 EMC standards

2.1

ETSI EN 300 132-2 (date 2003 – 01)

2.2 Safety Standards

2.2

The power supply system fulfils the mentioned international and national safety standards according to grounding, fire protection and other safety matters:

IEC EN60950-1 (date 2001 – 10) for inverter
& for the shelf(ves)

2.3 Environment

2.3

Operating temperature	-25°C to + 50°C
Storage Temperature	-40°C to + 70°C no condensing.
Packaging	Conform to NEBS GR63
Vibration	IEC 721-3-3
Shock	IEC 721-3-2
Audible noise	< 35dB (A)
Cooling	Forced convection

Since inverter modules are forced cooling good air circulation has to be guaranteed.
TSI racks can be stacked with other equipments provided that airflow is kept free.

2.4 Typical load

2.4

- Resistive
- Inductive and resistive
- Capacitive and resistive
- Non linear load with a maximum crest factor of 3 for TSI MEDIA 120V

CAUTION:

Due to constant power load behavior, overload capabilities should be sometimes de-rated.

3 Installation



Caution:

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

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

3.1 Overview

3.1

Information is coming

3.2 System dimensions

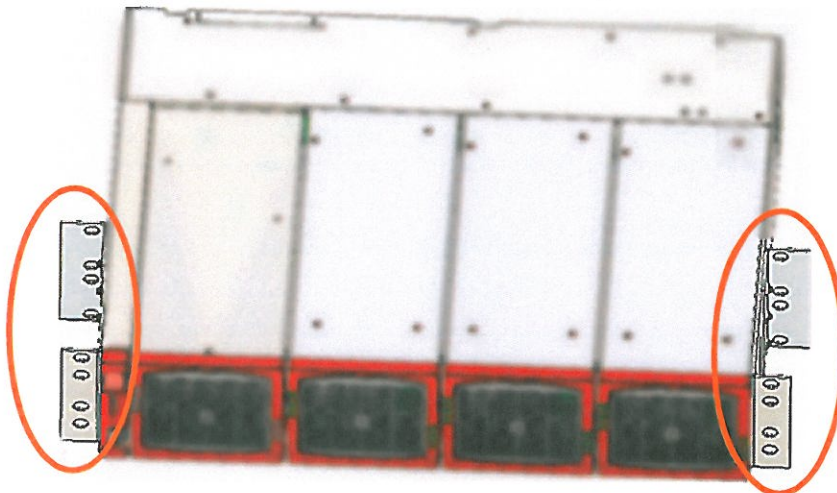
3.2

MEDIA type shelf: 305 mm x 480 mm x 2U High (12 " x 19 " x 2U High)

3.3 Fixing

3.3

A full range of accessory is ready made to allow easy integration of the TSI MEDIA in almost any kind of standard cabinets from 400mm or 500mm depth. + Relay Rack fixation 5" ; 6 " + front



3.4 Wiring



Caution:

The TSI Rack does not include any protecting and/or disconnecting devices neither on DC input nor on AC input. These would be installed outside the shelf. Before any intervention on the TSI Rack, operator has to make sure that power is removed from both DC leads and AC input mains.

All breakers, cables and wires must be CE and classified for min 90°C (194°F) operation

All DC cables and alarm cables as well must be kept minimum 10mm away AC cables

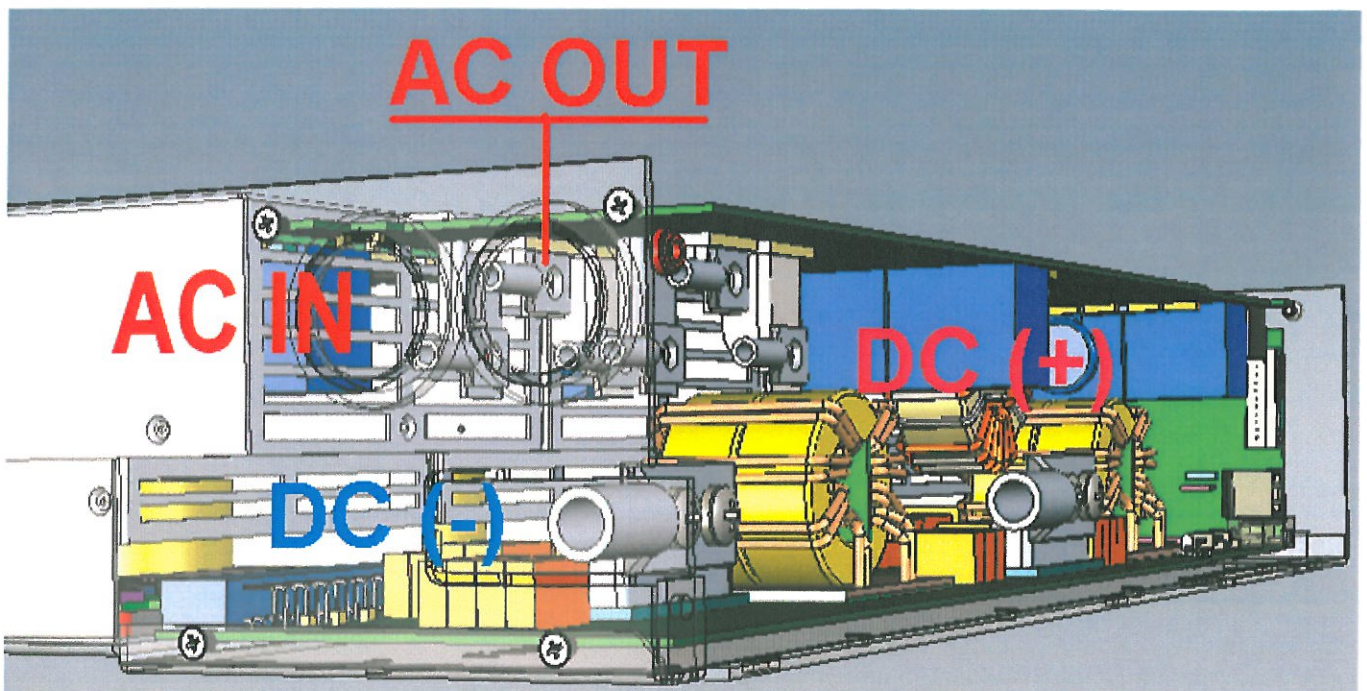
Some safety labels are stuck on the TSI rack. They must not be removed.

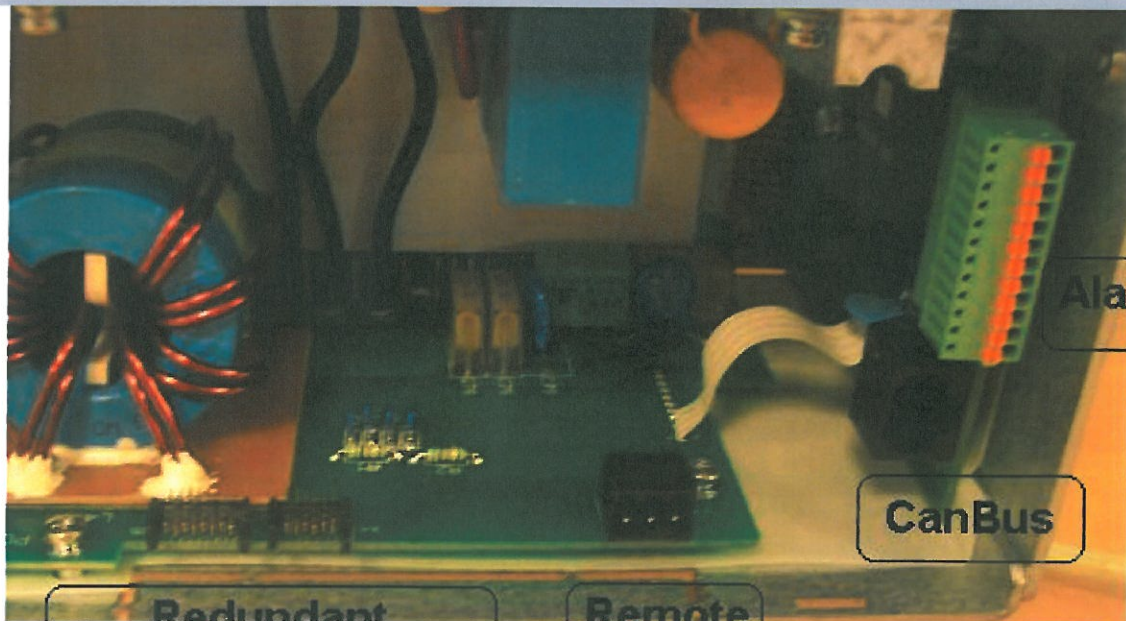
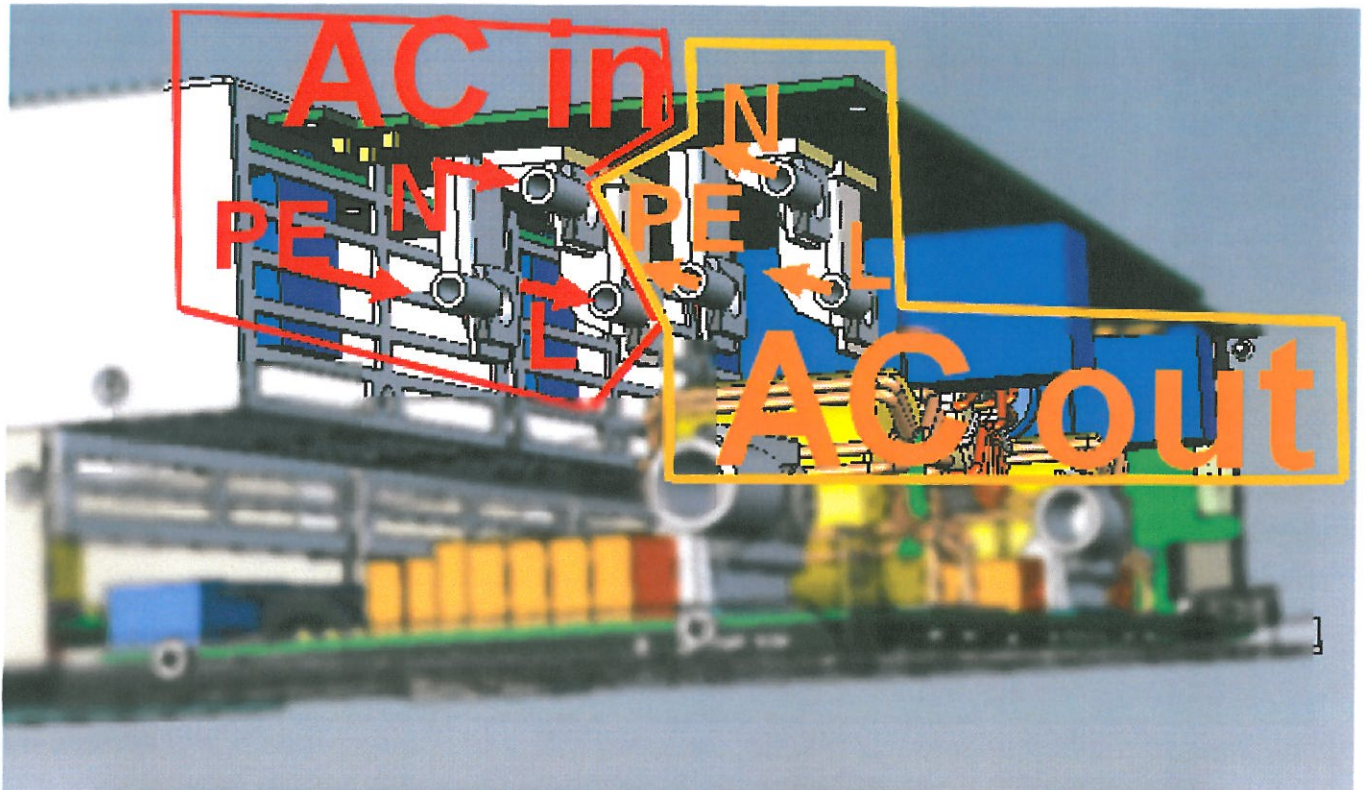
Respect Line and Neutral connection.

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

DC and AC conductors connected to screw terminals must be tied with torque between 1,2 and 1,5 Nm.

DC and ground conductors connected to copper plates with bolts must be tied with torque between 5 and 7Nm.





**Redundant
communication Bus**

**Remote
ON/OFF**

Alarms

CanBus

3.4.1 Disconnecting and protecting devices



SECURITY & SAFETY

Caution:

When several Shelves are mounted in the cabinet, cables sizes (section in mm²) and the breakers capacity must be adapted

3.4.1.1 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.
- ⇒ TSI 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.

DC input current at 40VDC	DC breaker	Cable size	Screws size
144A (By MEDIA module)	150A or 175A by Inverter	Min1/0 AWG inverter	2xM6 x 12mm by shelf

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

MEDIA is individual feeding by default.

Common feeding can be achieved with appropriate bus bar or daisy chain wiring.

Optional accessories will be provided with commercial versions.

3.4.1.2 AC input connection

For single-phase equipment, the disconnect device shall disconnect both poles simultaneously.

Except that a single-pole disconnect device can be used to disconnect the line conductor where it is possible to rely on the identification of the neutral in the AC MAINS SUPPLY.

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

120 Vac model	AC breaker	Cable size	Screws size
48 A (MEDIA Module) @ nominal power (VA)	60A by Inverter	AWG 6	M5 x 12mm

3.4.1.3 AC output distribution



Caution:

The TSI Rack does not include any disconnect or protecting devices for AC output. Prior any intervention on AC output make sure DC input & AC Input have been actually disconnected.

But TSI pack solution includes protecting device for AC output.

The shelf is not hot plug device

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

The safety standard IEC/EN60950-1 requires that, in case of output short – circuit, the inverter must disconnect in maximum 5 seconds. Parameter can be adjusted on T2S; 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.

NB Default value is set at 60 seconds.

120 Vac model	Cable size	Screws size
50A (MEDIA shelf) @ nominal power (W)	AWG 6	M5 x 12mm

TSI rack is supplied with screw terminal: Neutral, Line and Ground.

Remark:

- ⇒ Sub-racks without static transfer switch function (REG type) can be seen as independent power sources. To comply with international safety standards Neutral and PE may have to be connected together.

3.4.2 Grounding

3.4.2



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

3.4.3

3.4.3 Remote Monitoring and Control

3.4.3.1 Introduction

The T2S is an electronic device what allows interfacing between the inverters and the external world with:

- visual information
- free potential contact information
- digital information

When several shelves are used, the T2S will be usually installed in the most upper shelf, but bare in mind that the free potential contact, the digital MODBUS and CanBus will be ONLY available on the same shelf where T2S is plugged.

We remain you that only one T2S is required for monitoring one system (Maximum 32 inverters).

3.4.3.2 Front view and description

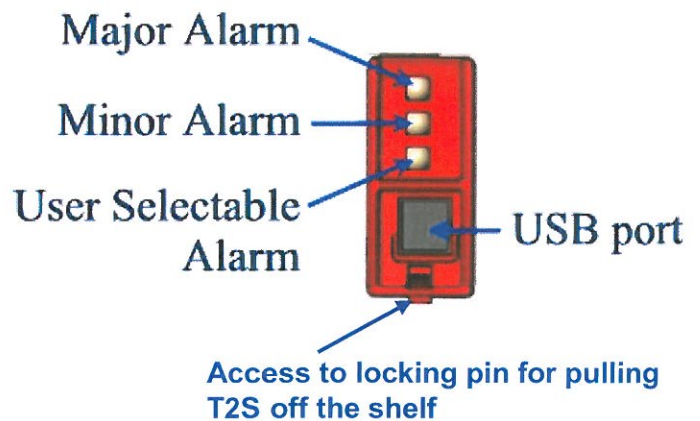
The T2S monitor allows technician to control visually when alarms are present on the system by watching the front panel.

It is known that there is **Major alarm** or **Minor alarm** or **User selectable alarm** active when corresponding LED(s) are red.

LEDs are green for no alarm and are red for related alarms.

User Selectable Alarm (refers to section 7.6 for configuration.) can be associated with any of internal operating alarm.

The LED user selectable alarm is green when the condition is done or flashing when T2S exchanging Data with TSI inverter EEPROM



3.4.3.3 Configuration

Refer to T2S operating manual

3.4.3.4 Electrical characteristics

T1S system is equipped with relays outputs for remote alarms:

- ▶ Major Alarm (contact 5-6 closed when **No** alarm)
- ▶ Minor Alarm (contact 8-9 closed when **No** alarm))

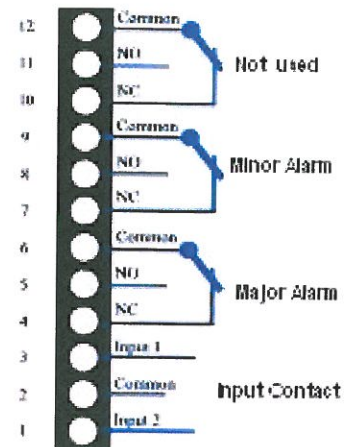
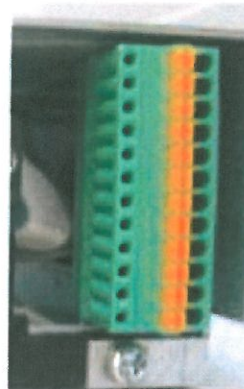
Those alarms are available on the main shelf.

They are reported on the front through the T2S.

The user selectable Alarm is only available when a higher level monitoring (T2S) is installed

There are 2 free potential changeover contacts provided. Maximum wire size is 0,5mm²

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



A) Digital input

Two external input contacts can be monitored through the T2S. They can be used for rack alarms such as “Door Opening”, “Temperature too high”, “Fan status” ...

The voltage present on terminal 1 and 3 is +5V (no galvanically insulated). Care should be taken to avoid connecting any external voltage on terminal 1 to 3.

External signals should be applied to these terminals via Volt-free contacts.

The function is activated when the 2 terminals concerned are short-circuited (i.e. when the external Volt-free contact is closed)

B) Digital output

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

Relay characteristics:

Maximum switching capacity: 2A @ 30VDC or 1A @ 60VDC

Maximum switching power: 60W

Maximum voltage: 60VDC SELV

Maximum switching current: 2A

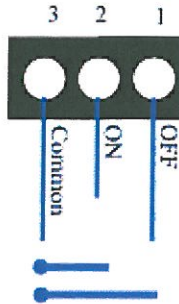
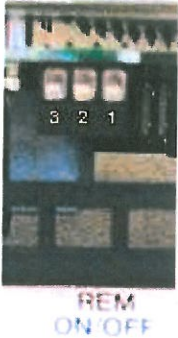
3.4.3.7 Troubleshooting

The trouble shouting system must be done by T2S monitor (see related operating manual)

If an inverter does not start because old parameters have been previously recorded, the system can be restored by unplugging the T1S.

3.4.3.8 Remote ON/OFF

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



When TSI system consists in several shelves, the remote ON/OFF can be connected on any shelf.

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	
1	Open	Open	System working normally
2	Close	Open	TSI output switched off DC AC LED off DC DC LED solid green AC DC LED solid green
3	Open	Close	System working normally
4	Close	Close	System working normally

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

State #3 should be implemented by default.
 NB: Changing status of these inputs (State #3 → State #2 → State #3) forces the TSI modules to start running without T2S

3.5 Plug in of inverters modules

3.5

(1) Slide the module in

(2) Push firmly till the connection is properly engaged

(3) Close the cover and latch the module in place
If too hard redo step (2)

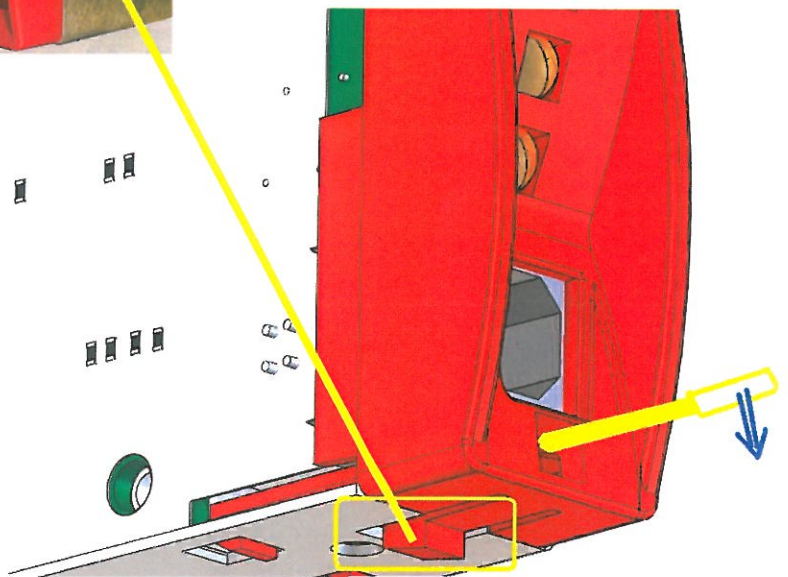
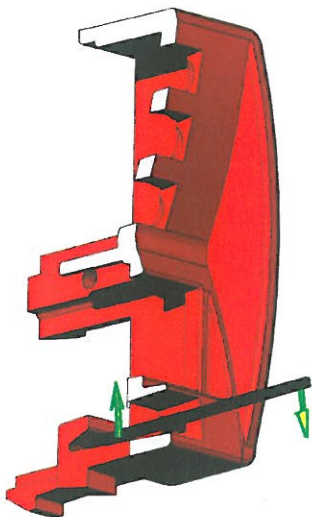
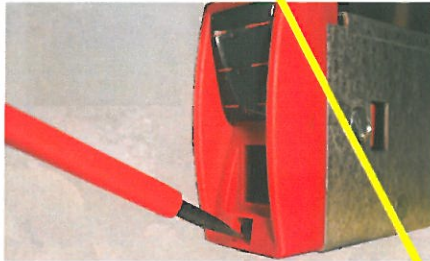
(4) Check that the cover is properly closed



3.6

3.6 Pulling T2S Monitoring off the shelf

The T1S is **locked** in the shelf by a **lock pin**. For pulling the T1S off the shelf, insert a small flat screwdriver in the square hole under the USB port and lift up the lock pin. The T1S is released and so can be removed from the shelf.



3.7 Module TSI replacement

Thanks to the modularity concept, it is very easy to replace any module. The replacement can be done while the system is under operation = "hot swap solution".

→ So to replace a module you are not supposed to switch down the load neither to access inside the TSI rack. Nevertheless if you decide to do so, remind that because of the AC input connection, **the TSI rack is a dual power supply system.**



(1) Use screwdriver to release the latch

(2) Open the cover completely

(3) User the cover as a handle to remove the module

1. Identify the damaged module.
2. Release the module and slide it out of the rack as described here above.
3. Replace the damaged unit by the new one.
4. Push it firmly and latch it again.
5. if it is requested, change the module address (by using T2S monitor)
6. Check that normal operation is recovered.

The TSI inverter is hot swappable.

When new module is inserted it automatically adapt to working set of parameters.

These values are exchanged by communication within inverters connected together.

When a new module is inserted in a running stack it automatically takes the next available address.

Normal operation is so resumed.



Caution:

When the module is removed energized terminations are accessible inside the shelf.

Keep hands off and insert blank module without delay.

6 Defective module sheet

We kindly remind you that there is a procedure for returning module to our address you can see on the web site: www.tsimodule.com

1. The first step is to ask to CE+T in WANDRE for a **RMA** (Return Module Authorization) **Number**.
2. The second step is to fill up the enclosed form.

The scope of this sheet is to receive as much information to identify the reasons and gives to the user a report on what happened in this faulty case. Further to this it will help our service and quality departments to improve the quality of our products. Please fill this document carefully and return it with the defect unit or FAX.

Configuration	Answers
ACin & ACout Data – (1PH/3PH / ...)	
Number of inverters installed in the system	
Module type and model	
Serial number	

Fault description : Please, describe the fault conditions, type of load, and output current

Message Error from T2S monitor (If any):

Message on CanDis display (if present) :

Contractor :

Date :	Contact :	Visa :
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