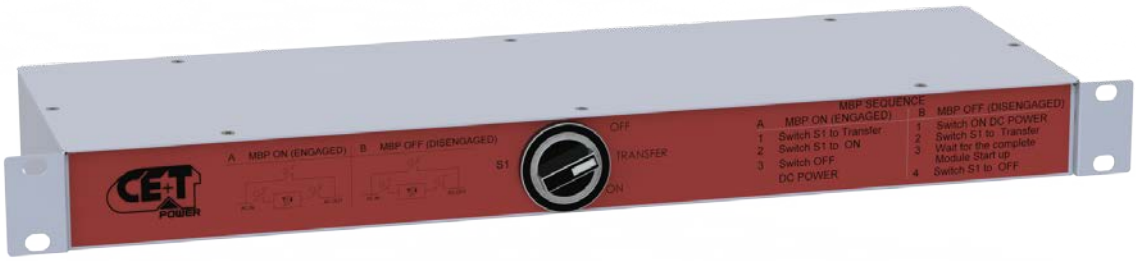
SYSTEM MANUAL

TSI Manual Bypass Rack 10A -1U
T306730006

TSI_MBP Rack_10A_ User Manual_Rev0- -17.01.13



Tables of contents

0 Safety Recommendations

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 Manual Bypass Rack is not supplied with internal disconnect devices.
Refer to Manual - chapter 3 for safe installation and access to the system.

TSI MBP Rack can reach hazardous leakage currents if grounding is not made according to safety recommendations. Refer to Manual –§ 3.4.2.

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.

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

1

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

The information provided in this manual covers single phase Manual Bypass Rack 10A 1U Unit, their basic functions, operating procedures, options available. It also includes information on electrical connections, cabling, mechanical installation, Commissioning and troubleshooting the equipment. Only detailed requirements of the MBP units are described herein, and installation must be carried out in accordance with this manual.

Refer to the associated TSI Y-1 manual for Inverter operating instructions. Electrical installation must also carefully follow local legislation and regulations. Only qualified personnel should conduct these installations as failure to acknowledge electrical hazards could prove to be fatal.

1.1. Overview:

1.1

Many different kinds of sensitive electrical equipment can be protected by an Uninterruptible Power Supply (UPS)/Inverter including computers, workstations, process control systems, telecommunications systems etc. The purpose of the MBP unit is to provide an extra level of protection in allowing for the replacement of a Inverter without powering down the loads connected. The MBP can work with single phase TSI INVERTER.

To prevent power line problems from reaching critical systems causing damage to software, hardware, and equipment malfunctions, the UPS maintains constant voltage, isolating critical load output and cleaning the utility AC power. When a UPS fails or needs maintenance, many times it is necessary to turn off the UPS and disconnect it from incoming electrical circuits. With the MBP installed between the incoming Utility and the UPS, you can replace the UPS and/or Batteries without dropping the load. You simply switch the MBP Unit from UPS power to Utility power and remove the UPS while the load connected to the MBP Unit continues to operate temporarily from Utility power.

1.2 Product Description:

1.2

The Manual Bypass Rack Unit (MBP) is designed to operate with a single phase TSI Y-1 Inverter up to 10Amps in output capacity.

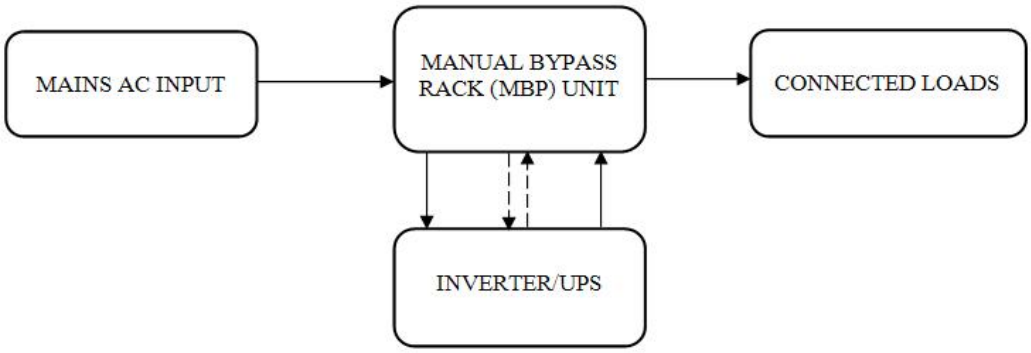
The MBP Unit allows you to replace or upgrade the Y-1 Inverter Module without losing power to the protected equipment.

Key Features :

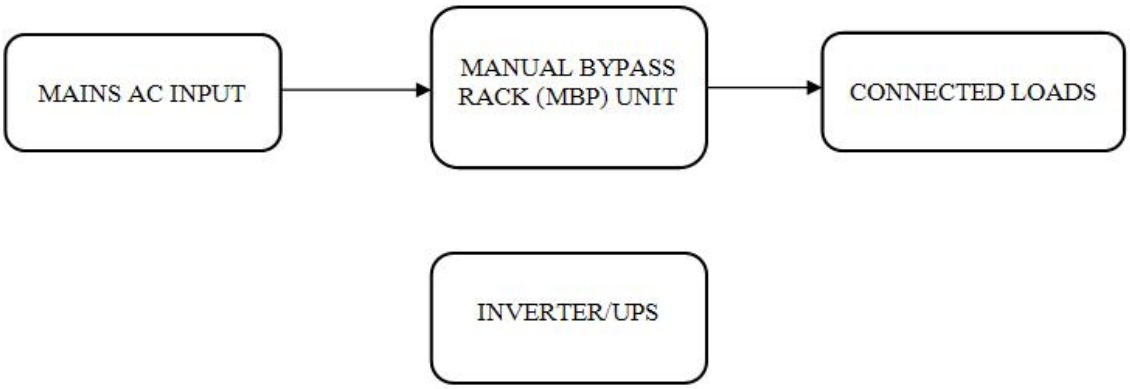
- Design for 19 "rack mount, 1U space requirements.
- The MBP unit is equipped with 10A rated Cam Rotary Switch of S1.
- The MBP sequence is explained in the Front plate.
- IEC Snap in connectors for Mains In/Out provided at Rear panel.
- TSI IN/OUT, Remote On/Off Cabling for connection to TSI is available with labels
- Enclosure IP 20

The MBP unit provides an isolation path of power for Inverter system for preventive maintenance or service. There are both normal and Bypass modes of operation as described as below

1. Under normal operation, the Mains AC Input flows through the MBP unit to the Inverter/UPS and then out to the Connected Loads.



2. Under maintenance operation, the Mains AC Input flows through the MBP unit to the connected Loads – the UPS is not in the circuit.



2 Product Constitution

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

TSI Manual Bypass Rack for the Bypass of UPS/TSI Inverter.
Part Description and Number:

Manual Bypass Rack 10A – 1U	**T306730006**

2.1 TSI MBP Rack Identification Plate

2.1

2.2 Package Includes

2.2

- Manual Bypass Rack 10A-1U
- IEC Connectors
- Electrical Schematic

- IEC Connector –EMO 40 - 1 No
- IEC Connector – EMI 40 - 1 No

The DESCRIPTION and PART NUMBER are essential information when you contact Manufacturer to get help in commissioning or in troubles or when item is sent back for repair.

3 Installation

3

Caution:

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

3.1 Overview

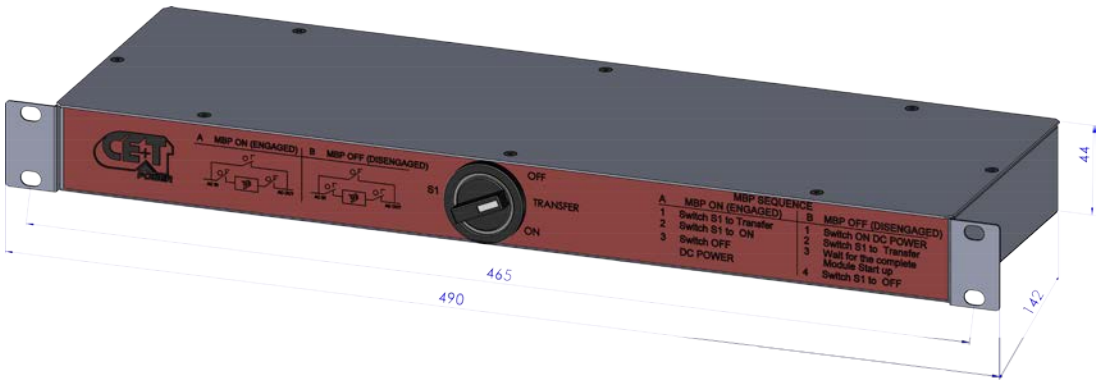
3.1

The Manual Bypass Racks are foreseen to be recessed into an electrical cabinet of 19” standard.

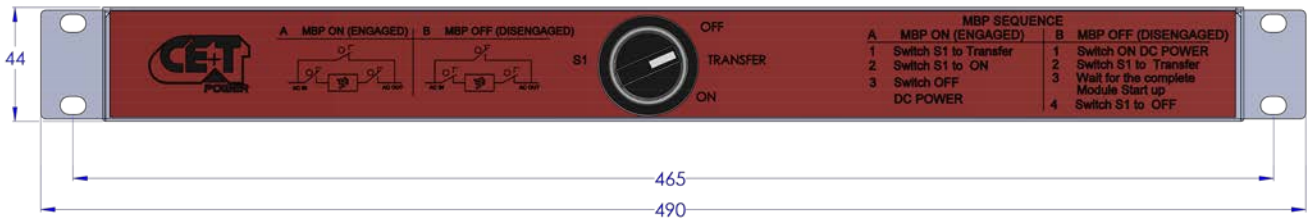
3.2 System dimensions

3.2

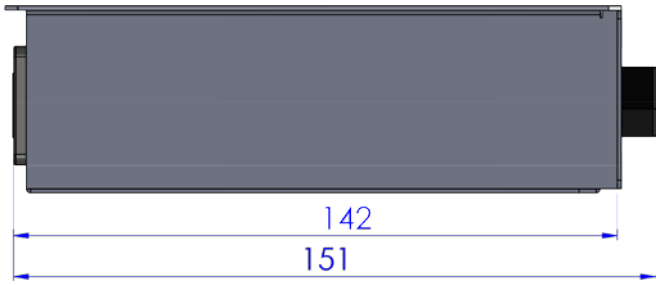
The picture shows the front, side and rear view of the MBP Rack.



ISOMETRIC VIEW



FRONT VIEW



SIDE VIEW

REAR VIEW

3.3

3.3 Fixing

A full range of accessory is ready made to allow easy integration of the TSI MBP in almost any kind of standard cabinets. Among other we provide fixing set for:

- 19” – 600mm depth cabinets (most standard solution, which is supplied by default)
- 19” – 800mm depth cabinets
- ETSI – 600 mm depth cabinets

Mounting Steps:

1. Install the MBP in a suitable horizontal location in the rack rail using four (4) user-provided mounting screws set.(M6x16 & Picot Washer)

3.4 Wiring

3.4

Caution:

The TSI MBP Rack does not include any protecting and/or disconnecting devices on AC input. Before any intervention on the TSI MBP Rack, operator has to make sure that power is removed from 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.

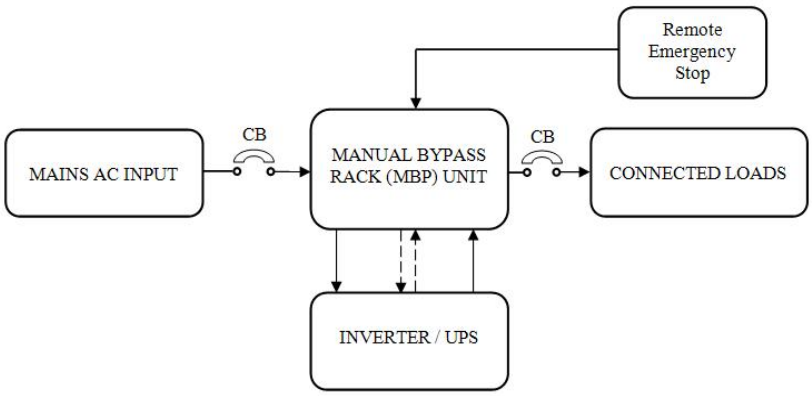
The insulation cover of conductors must meet the local and international standards and the cross section must be related to the upstream protections.

CONNECTOR DETAILS OF MANUAL BYPASS RACK

3.4.1 Disconnecting and protecting devices

3.4.1

Recommended wiring with breakers:



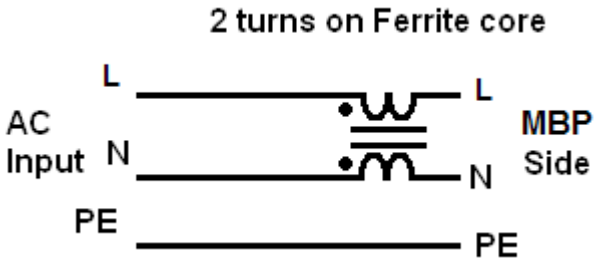
3.4.1.1. AC Input Connection

IEC Plug EMO-40 available along with the MBP kit should be used by the customer to connect the AC mains input. IEC Socket is available in the rear panel. Refer the below table for wire size.

Description	AC breaker	Cable size	Connector	Cable kit
Mains Input	10A C curve	3 x 2,5 mm^2	IEC	-

3.4.1.1.1 Ferrite Core

Ferrite core is placed inside the MBP Rack unit on the AC input. The customer doesn't need to connect the ferrite core which is present along with the Y-1 Module if equipped with MBP.



3.4.1.2 AC Output Connection

Caution:

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

The Y-1 Module is not hot plug device
➔Prior any handling of the Y-1 unit, wait a few minutes (min 5 minutes) for complete discharge of internal capacitors that have been energized

IEC Plug EMI-40 available along with the MBP kit should be used by the customer to connect the AC Output. IEC Socket is available in the rear panel. Refer the below table for wire size.

Description	AC breaker	Cable size	Connector	Cable kit
Mains/TSI Output	10A C curve	3 x 2,5 mm^2	IEC	-

3.4.1.3. TSI Input/Output Connection

For the Y-1 Modules to be connected on the MBP Rack, wires are provided with cable markers for direct connection. Refer the below table for wire colour & size.

Description	Cable colour	Cable size	Identification No	Cable kit
TSI Lin	Brown	1 x 2,5 mm^2	L1	
TSI Nin	Blue	1 x 2,5 mm^2	N	
TSI Lout	Grey	1 x 2,5 mm^2	L2	
TSI Nout	Blue	1 x 2,5 mm^2	N	

3.4.1.4. Remote Connection

Remote On/Off wires from the MBP Rack are connected to the Y-1 Module Remote connector. Refer the below table for wire colour & size.

Description	Cable colour	Cable size	Identification No	Cable kit
R I/O-1	Green	1 x 0,5 mm^2	1	
R I/O-2	Black	1 x 0,5 mm^2	2	
R I/O-3	Blue	1 x 0,5 mm^2	3	

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

4 Use of Manual Bypass

The manual by pass operates via manually operated switches that create a by-pass from mains input via output AC distribution. Inverter modules are by-passed and possible to remove without impacting the load. When in by-pass modules have no AC supply, DC is still present.

The manual by-pass is “Make before Break”

NOTE! When the system is in by-pass the load is subjected to mains disturbances.

Caution:

Maintenance By-Pass has to be manipulated by trained people only. The situation must be previously checked by trained person who has to take all preventive action.

Equipment does not require any particular maintenance, but when environment is dirty, before cleaning, inverters can be removed only after action on Manual By-Pass.

Caution:

-Commercial AC must be present and in phase before operating MBP
-The inverter will be in overloaded while MBP procedure, depending on voltage network and output inverter voltage setting. Power will reactive.

Caution:
Follow the correct sequence mentioned in the front sticker of MBP Switch

Caution:
MANUAL BY_PASS RACK disconnects all AC voltage on the Modules but has no action on the DC feeding on inverter and on remote alarm terminal.

MBP OFF :(Disengaged)

1. Check that both AC input and output breakers are switched off.
2. Check that maintenance by-pass switch, is in position “MBP ON sequence”
3. Switch ON DC power -Inverter starts up initially
4. Switch ON the AC input Breaker. Output of MBP is available with this main input supply.
5. Switch S1-Transfer -Mains AC input is connected to Inverter.
6. Wait for the complete module starting.
   After starting TSI OUTPUT is ready for connecting to the load
7. Switch S1-OFF - Output of MBP is connected to TSI OUTPUT Supply
   -.Mains input is cut off from the output.

MBP ON:(Engaged)

1. Switch S1-Transfer - Mains input is ready for connecting to the output
2. Switch S1-ON - TSI OUTPUT available at the output connector is diverted to the Mains input supply.
   - AC Supply to the inverter is cut off.(Inverter may be ON due to DC)
3. Switch OFF DC Supply - Inverter shut downs.

Now the output is from MAINS input, so protection required for this supply has to be carried out.

Note: A closed contact is achieved when MBP is always engaged.

5 Troubleshooting

5

-No power output:
Check if inverter working properly.
Check Mains input supply
Check if Manual By-Pass sequence is not engaged
Check if the AC output breaker is ON
Check if no short circuit is present on the output
Check status on inverter
Refer Y-1 operating manual for additional troubleshooting

6 Commissioning

6

Caution:

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.

Care must be taken to prevent dust, which can damage electronic components, by reducing the ESD distances. If necessary, remove dust by using industrial tools such as industrial vacuum cleaner.

DO NOT use any cleaning equipment using any liquid or insert metallic tools inside the equipment.

6.1 Installation control

6.1

The following certificate has to be left to the customer

The scope of this document is to provide a general guide for the contractor person that install and start up one Y-1 inverter. Please refer to the operation manual for more details.

Write OK or N/A (Not Available) in the column	OK or N/A
Cabinet is properly placed and stable	
Cabinet is installed in a dry area or protected against water	
Cables support are properly fixed	
AC Mains input connected to the input through AC Breaker unit	
Positive wire « + » connected to DC input + terminal (check individual connection)	
Negative wire « - » connected to DC input – terminal (check individual connection)	
Check cross section and breaker protection for AC input and output cables	
AC input connection properly done (L+N+PE) on input terminal of Inverter and other end connected to Mains Input Socket of MBP Rack	
AC output connection properly done (L+N+PE) on output terminal of Inverter and other end connected to Load/TSI Output Socket of MBP Rack	
PE connection properly done even if mains is not connected	
MBP Rack Output connected to the load output through AC Breaker unit	
R I/O connected to the remote on/off connector of the Inverter	

Inverter module are correctly installed and fixed into the rack	
Inverter cabinet is correctly connected to EARTH	
Neutral N is connected to EARTH (**If required!)**	
Check or turn OFF manual by pass switch S1	

6.2 Commissioning

6.2

Unplug all inverters except one inverter per phase (Just pull off the inverter from the shelf, to interrupt electrical contacts)	
Check the commercial AC before close breaker .Switch ON the commercial AC	
Turn S1 to OFF Position Manual by-pass	
Check if inverters are working (Green led)	
Check the DC power supply and switch ON the DC breakers	
Plug in inverters Modules	
Check output voltage (on bulk output or on breaker)	
Check if inverters are working properly	
Check if system has no alarm (Disable the alarm if any)	
Read configuration file and review all parameters. Some parameters must be adapted according to the site (LVD, load on AC, AC threshold level)	
Switch OFF AC and check if system is working on DC	
Turn S1 to ON Position 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	
Test on load (if available)	

6.3 Alarm test

6.3

DEFAULT	
Switch ON AC input and DC input and check that no alarm are present	
Turn S1 to ON Position Manual by-pass (AC IN)	
Switch OFF AC input (commercial power failure) and check the alarm according to the configuration	
Switch OFF DC input (DC power failure) and check that the alarm according to the configuration	

7 Technical Data sheet

GENERAL	
Connection I/O	IEC connector
Protected against inversion of polarity	
Enclosure	IP20

AC INPUT SPECIFICATIONS	
Nominal voltage (AC)	230V 1P
Voltage range (AC)	185-265 V
Frequency	50 Hz
Connector	IEC
Connections	3x 2.5mm²

AC OUTPUT SPECIFICATIONS	
Nominal voltage (AC)	230 V
Voltage range (AC)	200-240 V
Frequency	50 Hz
Nominal current	20 A
Connector	IEC
No.of outputs	1
Connections	3x 2.5mm²

ENVIRONMENT	
Altitude above sea	<1500m
Ambient temperature (**)	n x 1500VA -20 to 50 °C Pmax at 100% LOAD Derating up to 65°C
Storage temperature	-40 to 70 °C
Relative humidity	95% , non condensing

Performance	
Transfer Switch type	Cam Rotary type, Break Before Make, Rated at 10A.

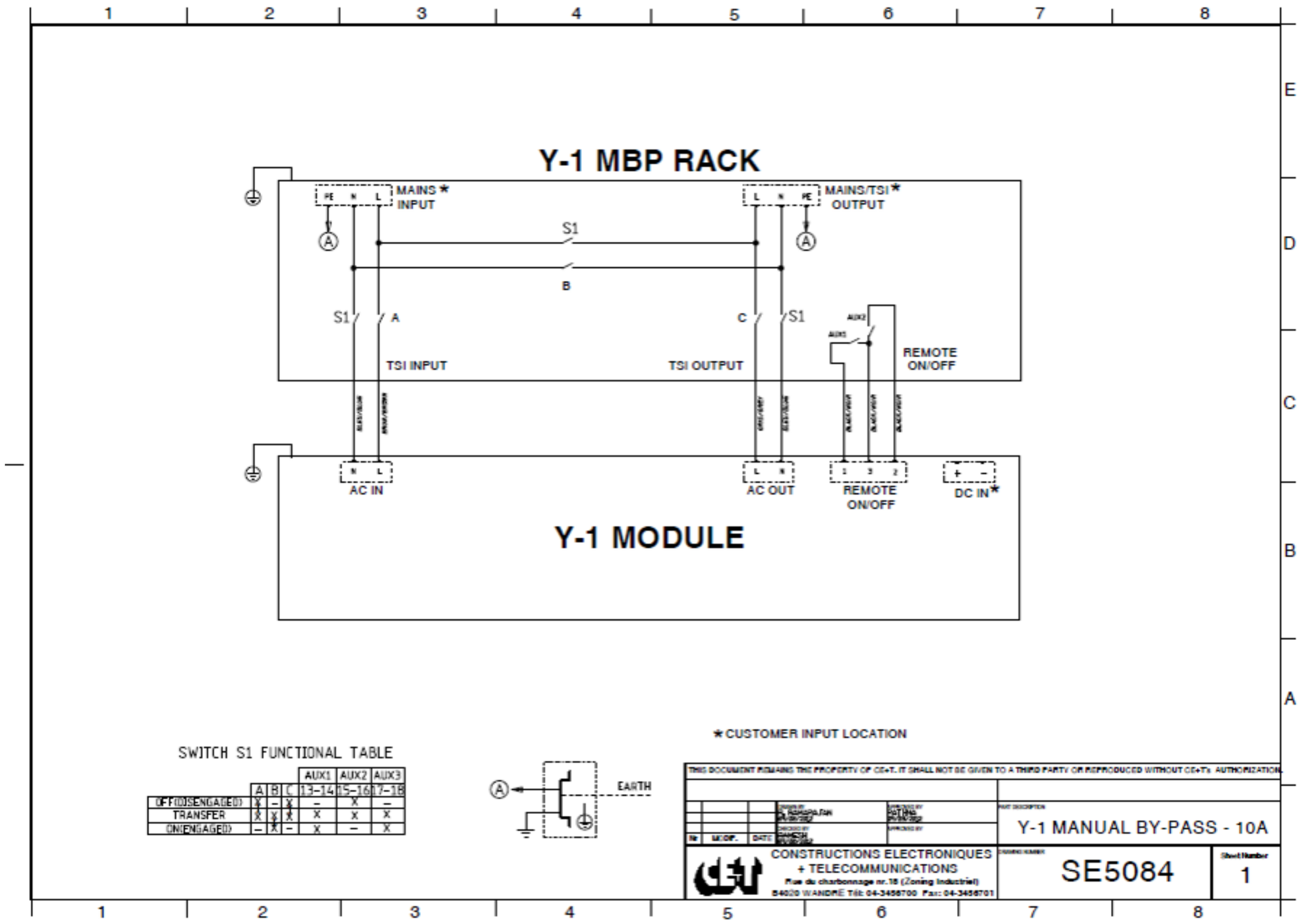
SIGNALING	
Remote On/OFF	Cables on Rack

WEIGHT & DIMENSIONS	
Width	19” Cabinet
Depth	142.0mm
Height	44mm ➔1 U
Weight	2.3 Kg
Material (casing)	Coated steel

SHIPPING LIST

1. MBP Rack Unit.
2. IEC Plugs.
3. User Manual

8 Schematic Drawing



	A	B	C	AUX1 13-14	AUX2 15-16	AUX3 17-18
OFF(DISENGAGED)	X	–	X	–	X	–
TRANSFER	X	X	X	X	X	X
ON(ENGAGED)	–	X	–	X	–	X