



ELETRONICA PROFESSIONALE
PROFESSIONAL ELECTRONICS



TPS/M/D

EN

USER MANUAL

READ AND SAVE
THESE INSTRUCTIONS

LEGGI E CONSERVA
QUESTE ISTRUZIONI

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Thank you for purchasing the TPS generator.

TPS/M is an high performance variable voltage generator (amplitude and frequency) in order to simulate and electrical line for test for different application (laboratory , test line, production line)

Responsability:

Elettrotest disclaims any responsibility for damage to people or things caused by an improper use of its products .

Mandatory

- **Verify voltage, power and frequency compatibility between TPS range and electrical specification of equipment under test (EUT).**
- **Electrical components of the system must be suitable for the rated voltage and current of TPS model (paragraph 1.2)**
- **The electrical components, which by construction cannot support external influences (of the generator in all its range), can only be used on condition that adequate additional protection has been provided with automatic disconnection protection.**

Notes:

This manual lists precautions and information about operating procedure of device.
The content of this manual is subject to change without prior notice because of continuing improvements on the instrument's
Should you have any questions or find any error please contact us by email.
Copying or reproducing all or any part of the contents of this document is strictly prohibited, without Elettrotest permission

Version:

This manual is written for **TPS firmware version 10124** and higher



SAFETY WARNINGS

The manufacturer urges users to read the user manual for our products before installation. The installation must be carried out by qualified technical staff. The non-observance of the warnings in this manual can cause electric shocks, even fatal ones.

Please find some general safety warnings below.

- This equipment must be connected to the mains supply using the appropriate safety devices.
- TPS must be connected to safety ground through the correct connections. The non-observance or the degradation of this earth connection can lead to electric shocks, even fatal ones. As regards the correct connection modes, please refer to the information contained in paragraph 4.
- Disconnect TPS from the mains before any work on the equipment and on the connected power loads.
- Before touching the load or the output connector make sure that the power supply on the device has been disconnected for at least 5 minutes. This is the time necessary in order for the capacitors inside the device to discharge. The non-observance of this discharge time can lead to electric shocks, even fatal ones.
- Avoid heavy shocks to the equipment (especially during transport) or exposure to extreme weather conditions.
- Any damage to the product due to transportation, incorrect installation or improper use is not covered by the guarantee supplied by the manufacturer.
- Do not use the equipment in explosive environments or in the presence of dust, acids or corrosive and/or inflammable gases.
- Tampering with or dismantling any component in the equipment will void the warranty automatically.
- Do not operate or store under conditions where condensing may occur or where conductive debris may enter in the case.
- Keep the ventilation holes on the front and rear free from obstruction.
- **Do not make dielectric strengths test on the input or output of the equipment. Contact Elettrotest if you need to do specific test**



ELECTRIC RISK

There are dangerous voltages inside TPS and over the output connector.

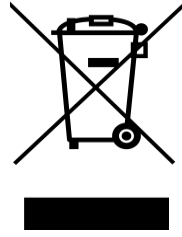
The non-observance of the warnings suggest in this manual can lead to electric shocks, even fatal ones.



OVERHEATING RISK

In the case of a ventilation system failure, the metal parts of the inverter may reach high temperatures (in some cases higher than 70°C).

DISPOSAL



INFORMATION FOR USERS ON THE CORRECT HANDLING OF WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)

In reference to European Union directive 2012/19/EU issued on 24 July 2012 and the related national legislation, please note that:

- WEEE cannot be disposed of as municipal waste and such waste must be collected and disposed of separately;
- the public or private waste collection systems defined by local legislation must be used. In addition, the equipment can be returned to the manufacturer at the end of its working life when buying new equipment;
- the equipment may contain hazardous substances: the improper use or incorrect disposal of such may have negative effects on human health and on the environment;
- the symbol (crossed-out wheeled bin) shown on the product or on the packaging and on the instruction sheet indicates that the equipment must be disposed of separately;
- in the event of illegal disposal of electrical and electronic waste, the penalties are specified by local waste disposal legislation.

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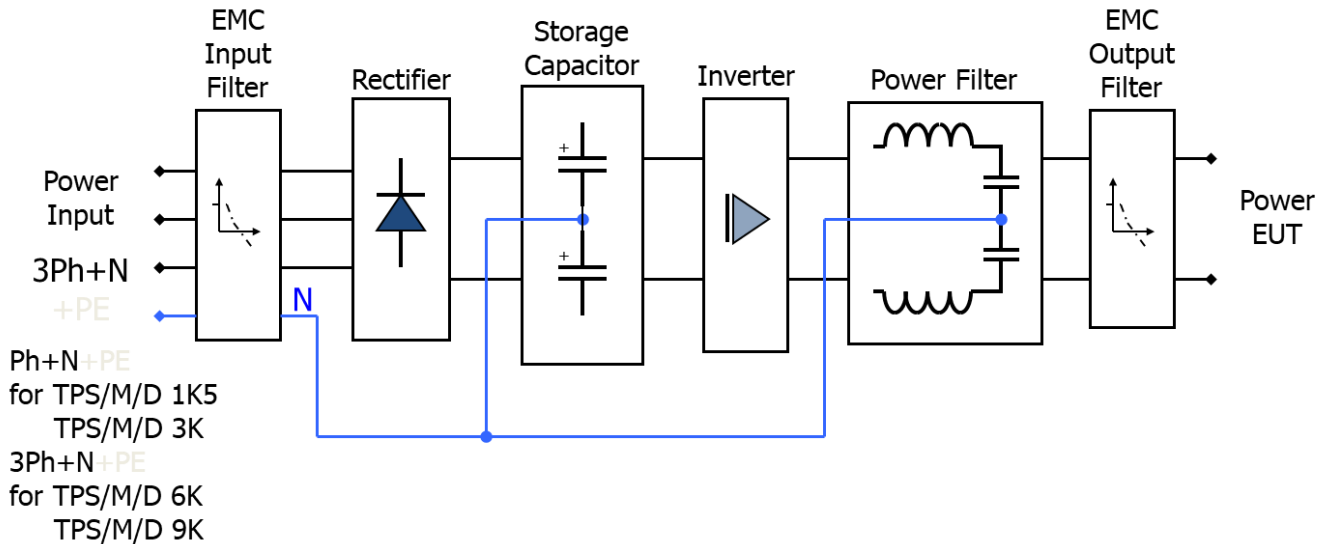
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1. INTRODUCTION

TPS is a power source that supplies sinusoidal stable voltage. Its output voltage is adjustable in frequency, amplitude and phase.

It also has the ability to generate very precise and stabilized DC voltage.



1.1. MAIN FEATURES

1.1.1. Output voltage

The output voltage is guaranteed perfectly DC or sinusoidal, with a distortion of less than 0.3% regardless of the load. The value of output voltage is kept perfectly stable within 0.1% with linear load and a full load.

The load that TPS is able to drive can vary from a pure capacity to a pure inductance.

The output voltage is adjustable with continuity from zero to full scale.

TPS can in fact provide the nominal power at various full scales and this allows the TPS to adapt himself to the disparate needs of the user, without having heavy limitations on the output current. Furthermore TPS is capable to keep the voltage stable also with time variable loads, as for example the pulsating loads. In fact TPS recovers the distortion of the waveform within 0.3 % with linear load and the amplitude of the voltage within 0.1% in less than half period.

Furthermore, TPS can bear a short circuit for an indefinite time without suffering any consequence.

1.1.2. Output frequency

In AC configuration TPS allows the regulation of the output frequency from 10 to 80Hz at maximum voltage.

This output frequency can be regulated with continuity within the above mentioned range of frequencies and it has a stability of 0.01% with respect to the set frequency.

1.1.3. User interface

TPS is intended to have a user friendly interface. It is also featured the possibility of a host computer control, thus allowing to perform tests automatically. TPS allows various usage selections: wires drop compensation, working frequency. Furthermore, TPS gives the user clear information on the status of the output. Set voltage and set frequency are monitored and the output voltage is read with a precision of 0.3%.

The user is also warned in case of over current obtainable by the TPS, or in case of high loss in the wires, that should not exceed 5% of the set voltage.

We underline again that TPS automatically limits the maximum allowed current, avoiding damages to the equipment; the only consequence is that, in this case, it is not guaranteed the precision of the output waveform neither the accuracy of the output voltage.

The user can set the output voltage through the LCD touchscreen, the same possibility is valid for the setting of the frequency and the phase.

The above possibility makes the TPS very flexible in those applications where it is requested a continuous variation of the two regulated magnitudes, around a given values.

1.1.4. General performances

All the following features are valid within the range of the normal operating limits; they are not valid during the limitation of the output current

PARAMETER	VALUE
Distortion of the output waveform ⁽¹⁾	<0.3%
Stability of the output voltage	<0.1%
Accuracy of the output voltage	<0.5%
Recovery-time of the output waveform	<200us
Maximum compensated drop on wires	5% f.s.
Recovery time of RMS	<200ms

⁽¹⁾With linear load.

1.1.5. General specifications

The voltage is referred phase to neutral, with neutral connected to the earth.

PARAMETER	VALUE
Output Frequency Range	DC or 10Hz - 80Hz ⁽¹⁾
Phase Resolution	1°
Frequency Resolution	0.02Hz
Frequency Precision and Time Stability	100ppm
Output Voltage ⁽²⁾	300Vac - 300Vdc
Output Voltage Resolution	0.025% f.s. (12 bit f.s.)
Operating Temperature	0°C - 35°C

⁽¹⁾ Frequency can be increased up to 320 Hz at lower performance than the nominal.

⁽²⁾ The RPS works at constant output current so if you decrease the voltage you decrease also the maximum power.

1.2. MODELS

The following tables show all the characteristics of both types:

	TPS/M/D 1K5	TPS/M/D 3K	TPS/M/D 6K	TPS/M/D 9K				
DIMENSION / WEIGHT								
Height	191 mm	191 mm	281 mm	281 mm				
Width ⁽¹⁾	471 mm	471 mm	471 mm	471 mm				
Depth	513 mm	513 mm	513 mm	513 mm				
Weight ⁽¹⁾	25 Kg	29 Kg	39 Kg	44 Kg				
GENERAL								
Operating Temperature	0°C - 35°C							
User Interface	7" Touch Screen Display							
Communication Interface	RS232, RS485 , ETHERNET							
Communication Protocol	Elettrotest, SCPI, Modbus RTU , Modbus TCP/IP							
Protection	Overtemperature, Overvoltage, Undervoltage, Inverter							
Current Limitation	Programmable and selectable from PEAK & AVG							
Efficiency	Better than 88% at full power							
INPUT								
Input Voltage ⁽²⁾	230Vac ± 10% 1PH		400Vac ± 10% 3PH +N					
Input Frequency	47-63Hz							
Input Current	Continuous	12A	25A	16A line 27A neutral	24A line 41A neutral			
	Max	24A	50A	32A line 54A neutral	48A line 82A neutral			
3-PHASE ISOLATED OUTPUT								
Range	150V	300	150V	300	150V	300	150V	300
Output Voltage AC (Line to Neutral)	0 - 150	0 - 300	0 - 150	0 - 300	0 - 150	0 - 300	0 - 150	0 - 300
Output Voltage DC (Line to Neutral)	-	0 - 300	-	0 - 300	-	0 - 300	-	0 - 300
Output DC Offset	<50 mVdc							
Output Noise	<1000 mVrms							
Maximum Output Power AC	1500 VA	1500 VA	3000 VA	3000 VA	6000 VA	6000 VA	9000 VA	9000 VA
Maximum Output Power DC	-	1500W	-	3000W	-	6000 W	-	9000 W
Maximum Output Current Continuous	9.33A	4.67A	18.7A	9.3A	38.1A	19.0A	60.2A	30.1A
Maximum Output Current Inrush (for 3 secs)	18.7A	9.3A	37.3A	18.7A	76.2A	38.1A	123.6A	61.8A
Output Frequency	DC & 10 - 80 ⁽³⁾ Hz							
Output Voltage Stability	<0.1%							
Output Voltage Accuracy (respect the full range voltage)	<0.5%							
THD ⁽²⁾	<0.3%							
Recovery-Time of Output Waveform	<200 μs							
Maximum Compensated Drop (respect setting voltage)	5%							
Recovery-Time of Drop on Wires	<200 ms							

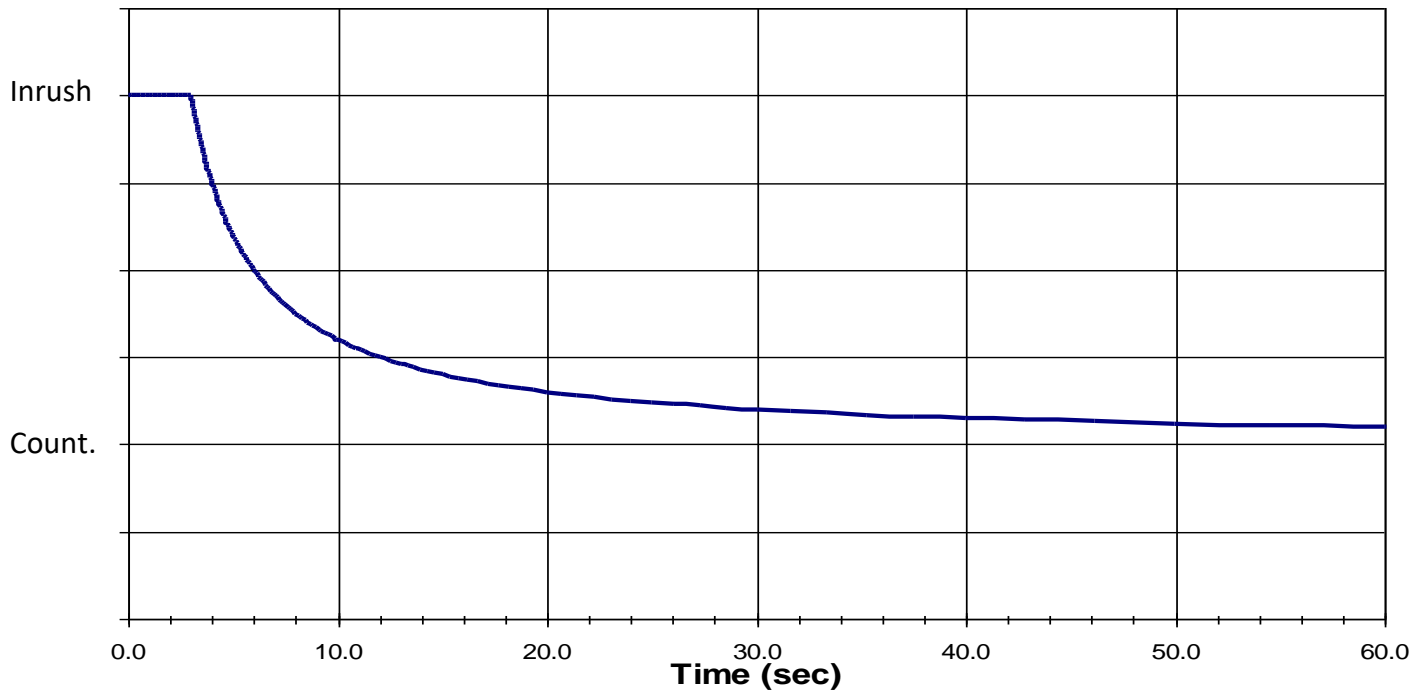
⁽¹⁾ current derating required for voltage > 300Vdc, see the attached figure

⁽²⁾ at nominal voltage with linear load

⁽³⁾ Frequency can be increased up to 320 Hz at lower performance than the nominal.

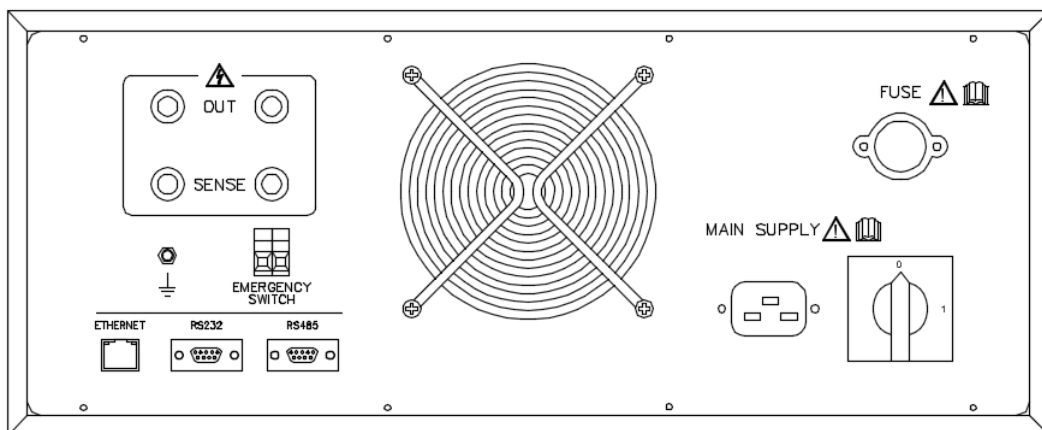
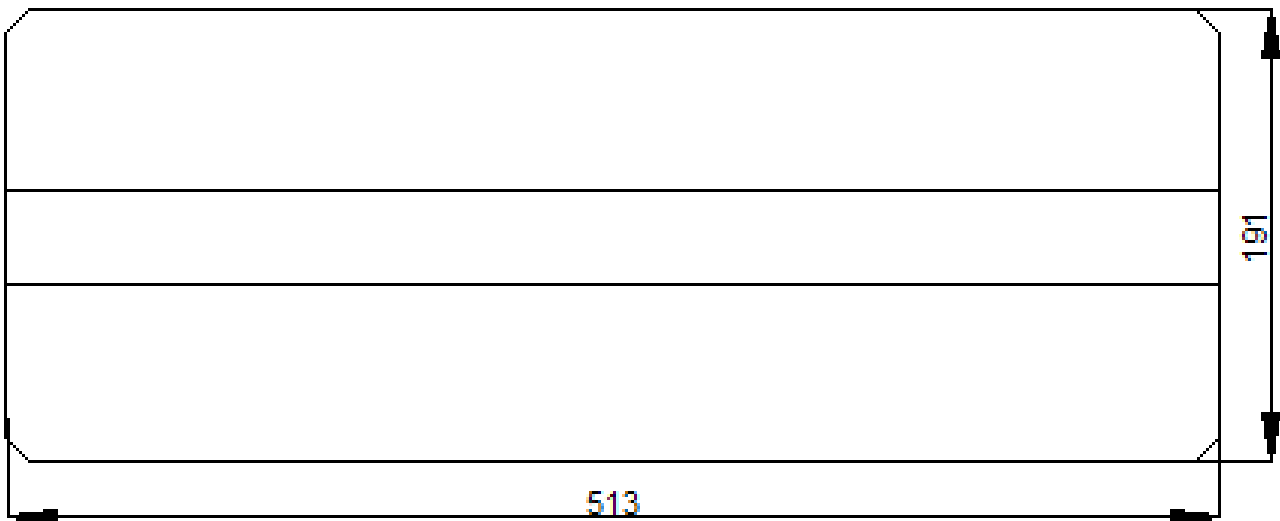
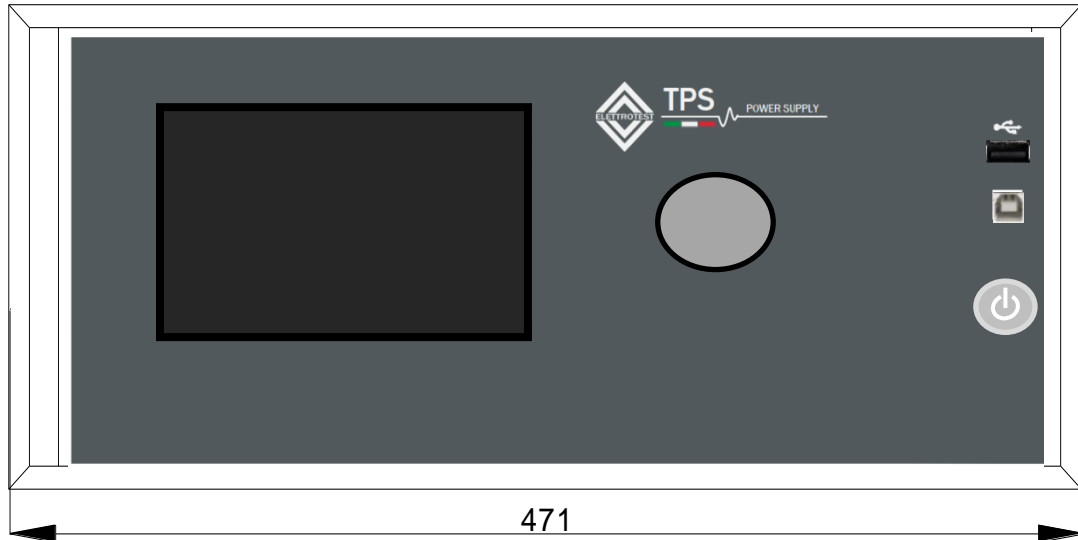
1.3. TECHNICAL SPECIFICATIONS

1.3.1. INRUSH CURRENT VS TIME

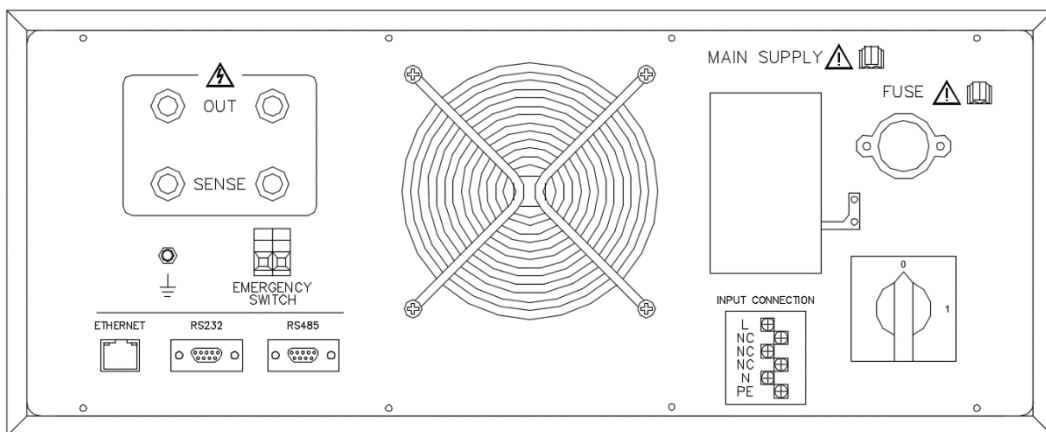
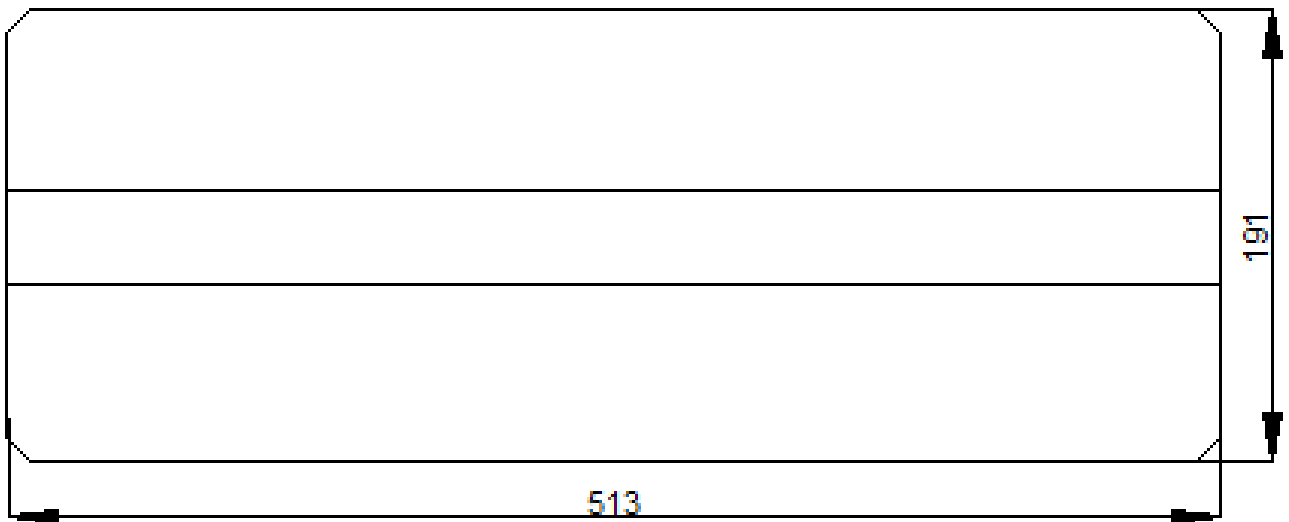
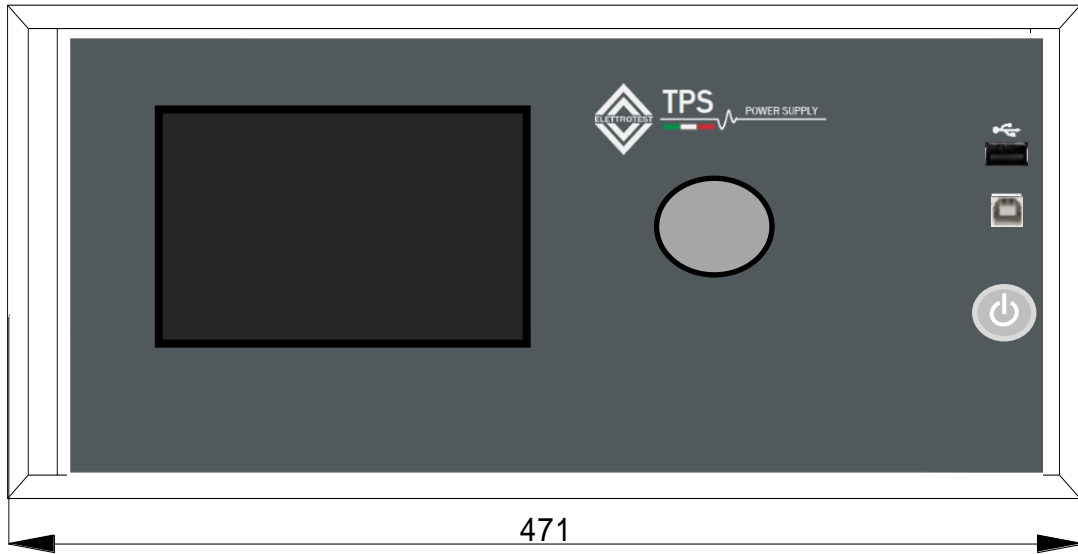


1.4. MECHANICAL DRAWINGS

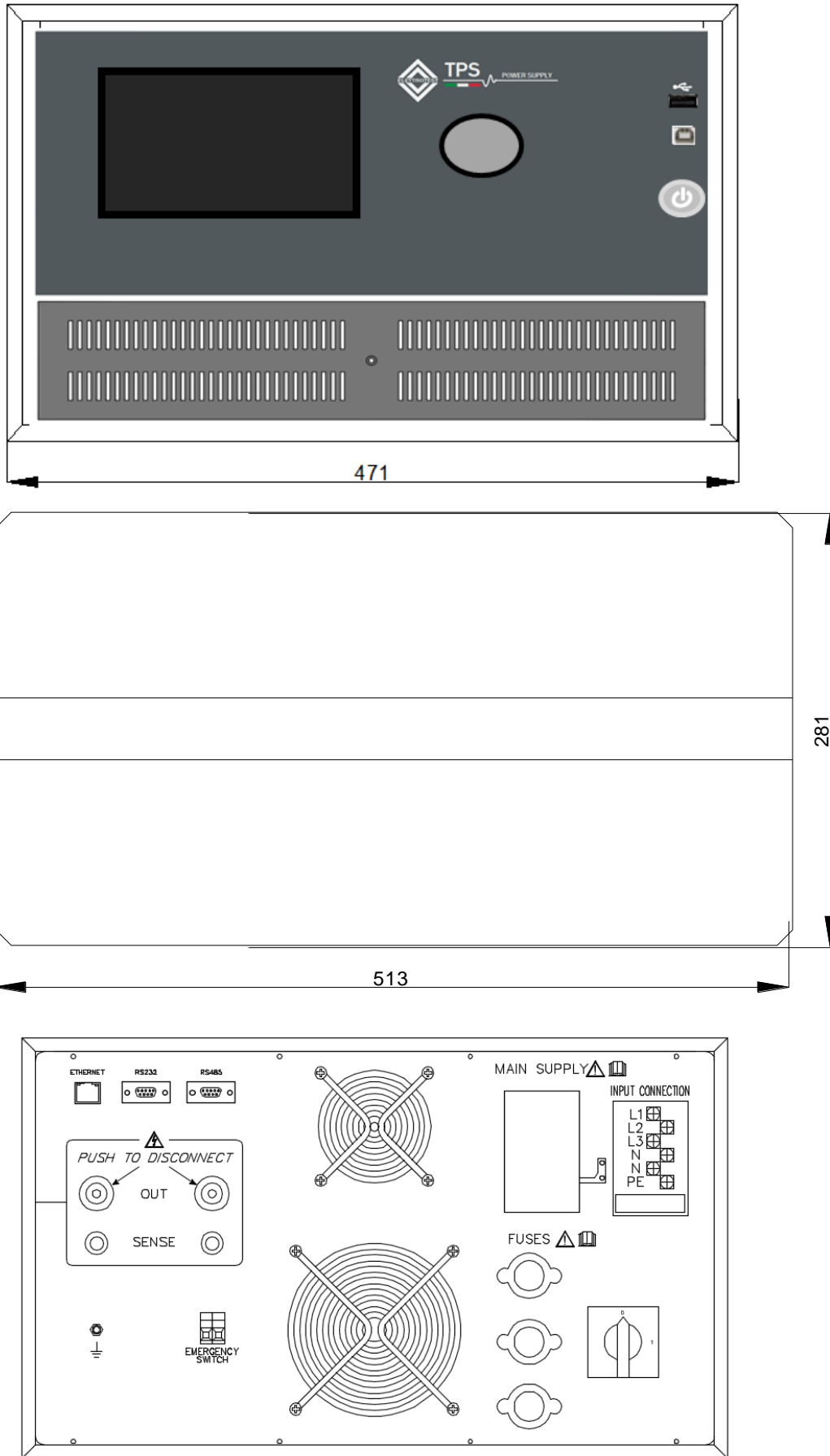
1.4.1. TPS/M/D 1K5



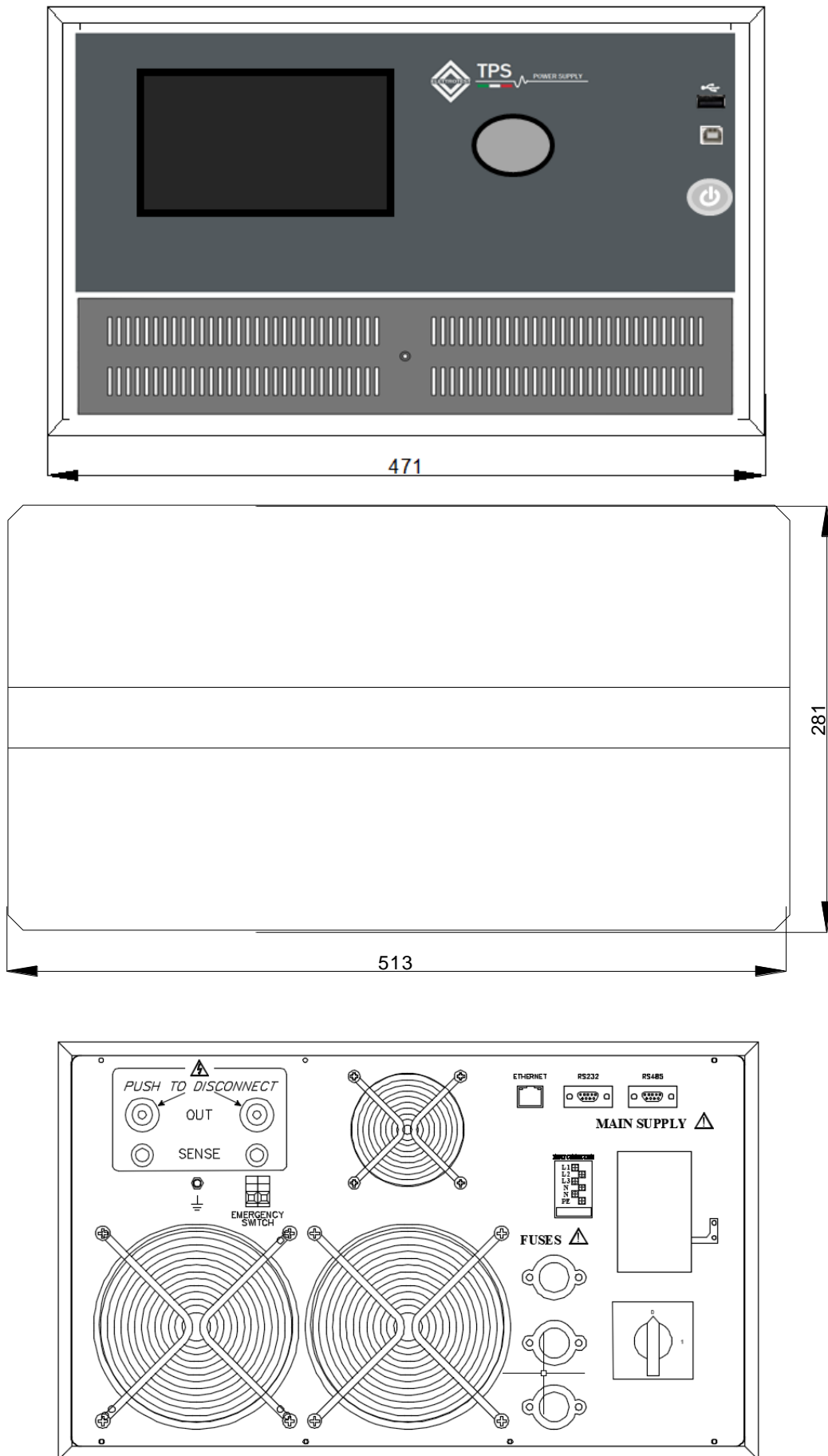
1.4.2. TPS/M/D 3K



1.4.3. TPS/M/D 6KVA

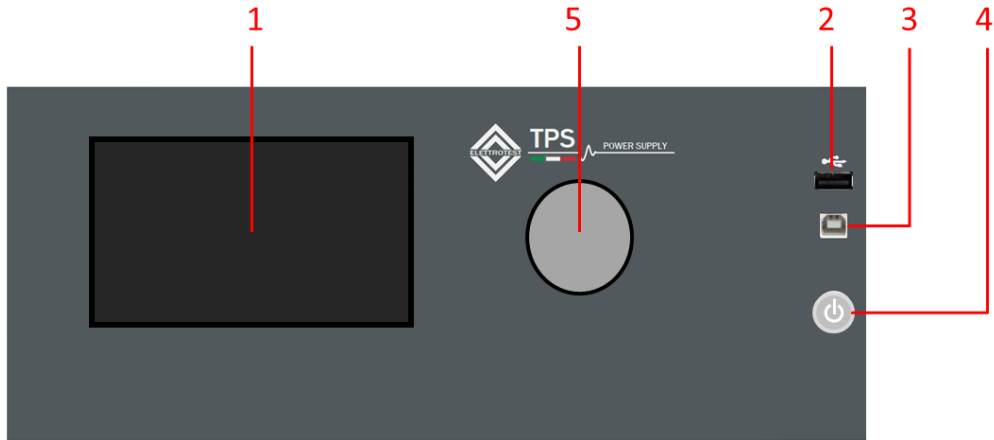


1.4.4. TPS/M/D 9KVA



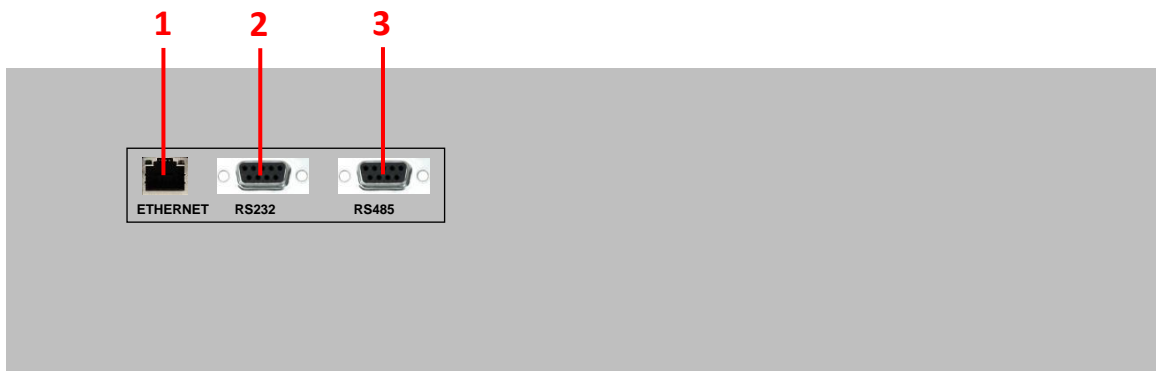
1.5. NOTES FOR USERS

1.5.1. FRONT PANEL



Item	Name	Description
1	Touch Screen	Input programming data or options by using touch screen interface
2	USB Type A Interface	USB Type A for storage key
3	USB Type B Interface	USB type B for upgrade firmware
4	Power Switch	Press this button to switch on/off power part
5	Knob	Rotate to change the selected data

1.5.2. COMMUNICATIONS REAR PANEL



Item	Name	Description
1	Ethernet Interface	This interface is used for remote control via Ethernet cable
2	RS232 Interface	This interface is used for remote control via RS232 cable
3	RS485 Interface	This interface is used for remote control via RS485 cable

You can select the interface from the touch panel

2. INSTALLATION



2.1. GENERAL NOTES

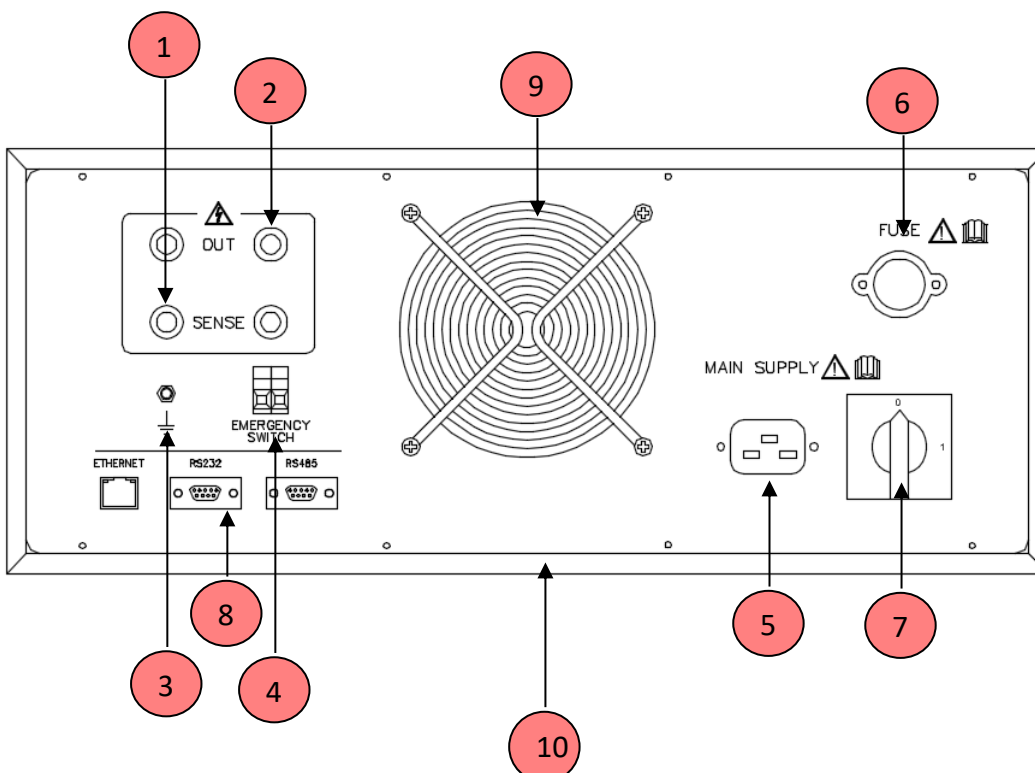
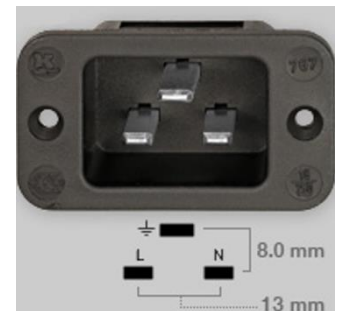
2.1.1. INSPECTION

After unpacking the product, please inspect any damage that may have occurred during the shipment. Save all packing materials in case the product has to be returned one day. If any damage is found, please file a claim with the carrier immediately. Do not return the product to the factory without obtaining the prior Return Merchandise Authorization (RMA) acceptance from ELETTROTEST S.P.A.

2.1.2. POWER CABLING

2.1.2.1.1. TPS/M/D 1K5

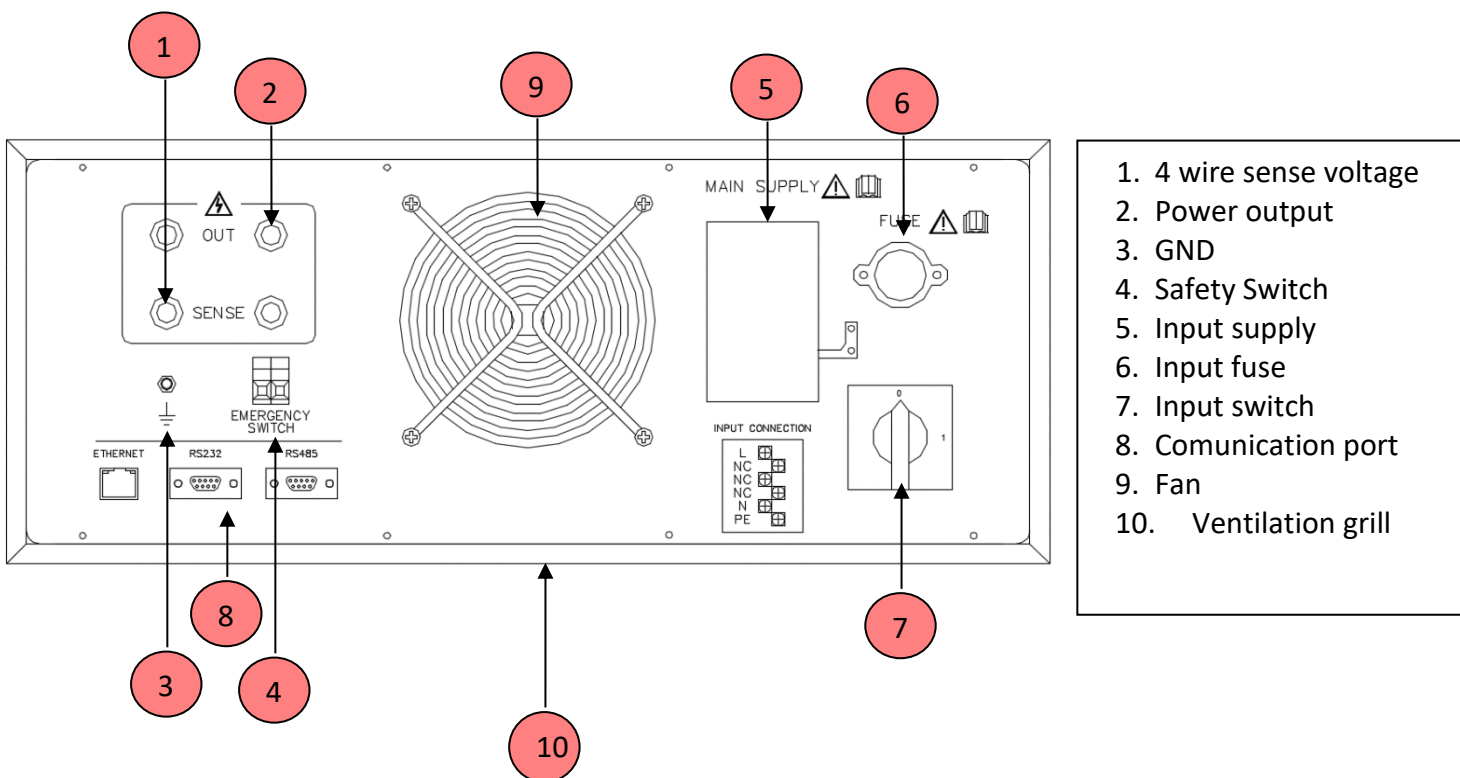
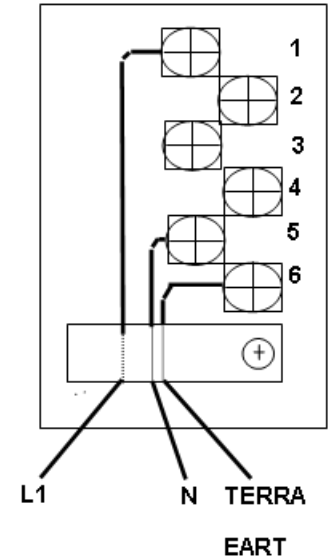
- Use the cable supplied with the machine.
- Pay attention to the polarity of the cable.
- Make sure that the phases are connected with the indicate sequence otherwise you can have an alarm.
- Connect cable load with appropriate dimension and put the ferrite core on the load cable with 3 turns close to TPS/M/D
- Optionally: Connect the sense wires
- Keep free under and lateral area for ventilation



1. 4 wire sense voltage
2. Power output
3. GND
4. Safety Switch
5. Input supply
6. Input fuse
7. Input switch
8. Communication port
9. Fan
10. Ventilation grill

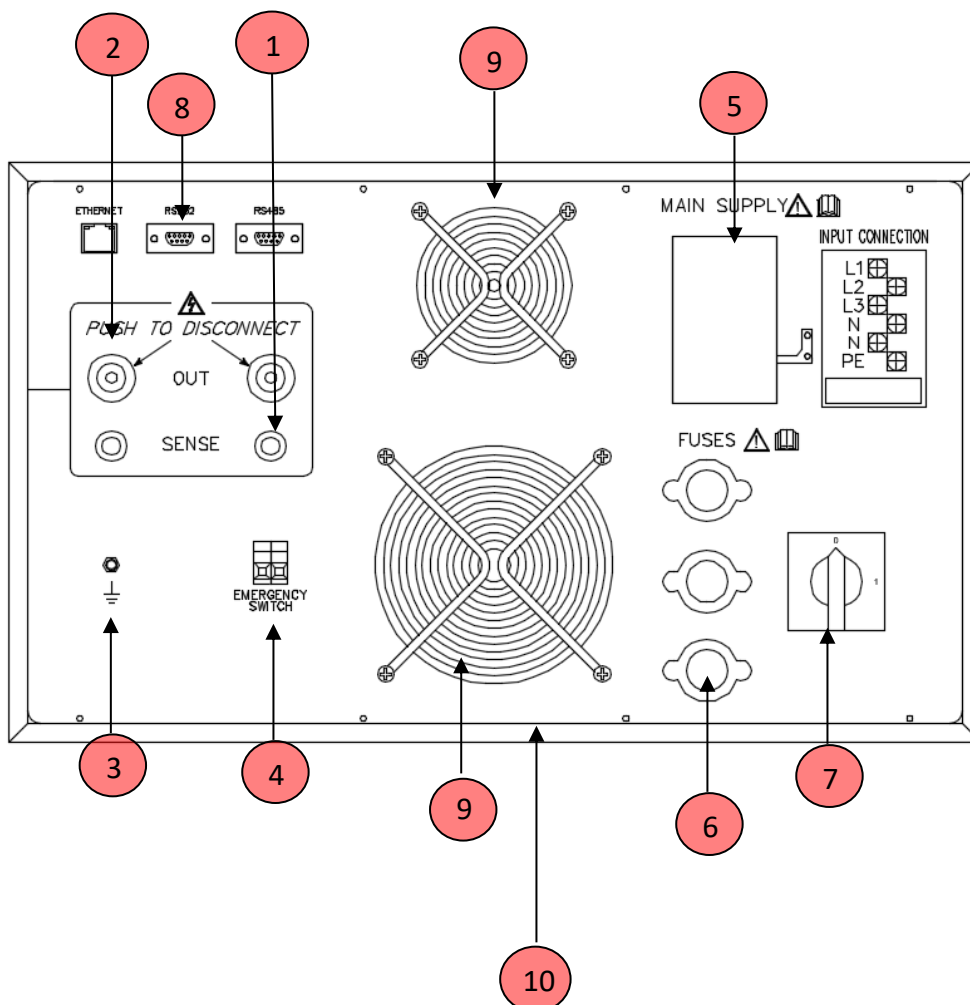
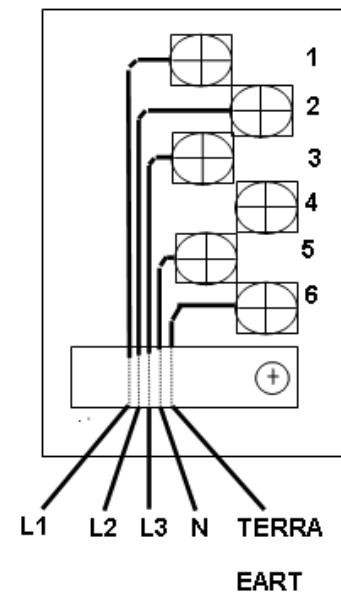
2.1.2.1.2. TPS/M/D 3K

- Open the back terminal working on the two lateral hooks with a screwdriver.
- Open the cable glands.
- Join one supplying cable 2P+G of suitable section 3*2.5mmq.
- Make sure that the phases are connected with the indicate sequence.
- Connect cable load with appropriate dimension.
- Reclose the cable glands.
- Reclose the terminal cover securing it on the two lateral hooks.
- Connect cable load with appropriate dimension and put the ferrite core on the load cable with 3 turns close to TPS/M/D
- Optionally: Connect the sense wires
- Keep free under and lateral area for ventilation



2.1.2.1.3. TPS/M/D 6K

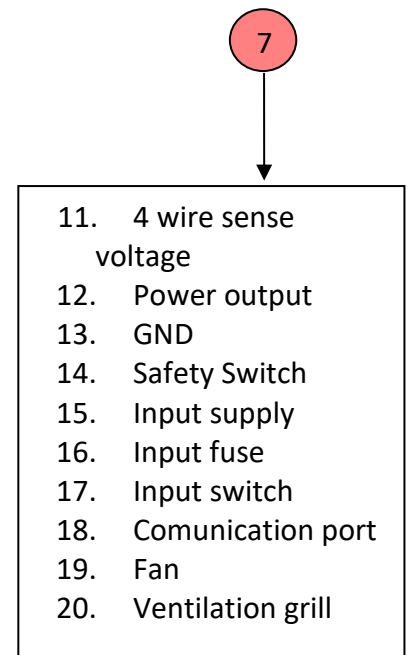
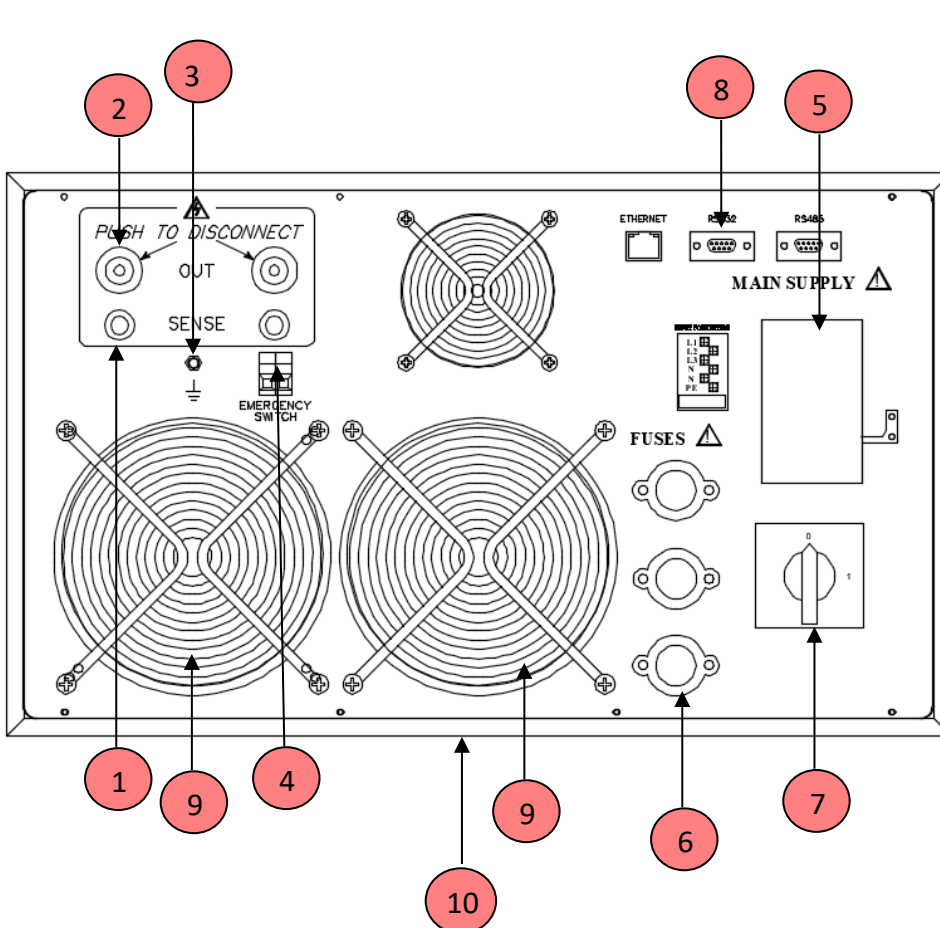
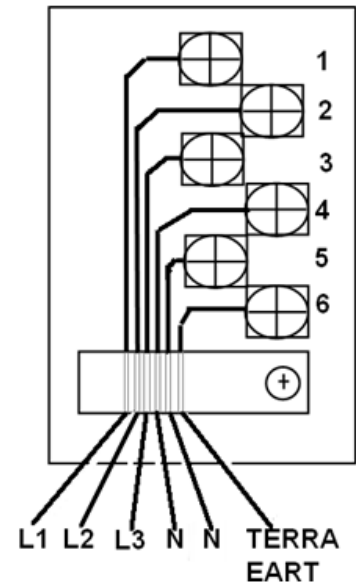
- Open the back terminal working on the two lateral hooks with a screwdriver.
- Open the cable glands.
- Join one supplying cable 3P+N+G according to the indications.
- Make sure that the phases are join with the indicate sequence
- 1 – phase L1
- 2 – phase L2
- 3 – phase L3
- 4 - free
- 5 - N
- 6 - Eart
- On the back terminal are marked in a suitable way neutral and ground.
- Use a cable of suitable section (max 5*6mm²)
- Make sure that the phases are joined with the indicate sequence.
- Reclose the cable glands.
- Connect cable load with appropriate dimension and put the ferrite core on the load cable with 3 turns close to TPS/M/D
- Reclose the terminal cover joining it on the two lateral hook



1. 4 wire sense voltage
2. Power output
3. GND
4. Safety Switch
5. Input supply
6. Input fuse
7. Input switch
8. Communication port
9. Fan
10. Ventilation grill

2.1.2.1.4. TPS/M/D 9K

- Open the back terminal working on the two lateral hooks with a screwdriver.
- Open the cable glands.
- Join one supplying cable 3P+N+G according to the indications.
- Make sure that the phases are join with the indicate sequence
- 1 – phase L1
- 2 – phase L2
- 3 – phase L3
- 4 - N
- 5 - N
- 6 - Eart
- On the back terminal are marked in a suitable way neutral and ground.
- Use a cable of suitable section (max 5*6mm²)
- Make sure that the phases are joined with the indicate sequence.
- Reclose the cable glands.
- Connect cable load with appropriate dimension and put the ferrite core on the load cable with 3 turns close to TPS/M/D
- Reclose the terminal cover joining it on the two lateral hook



2.2. PROTECTION DEVICE

2.2.1. GENERAL DIAGRAM

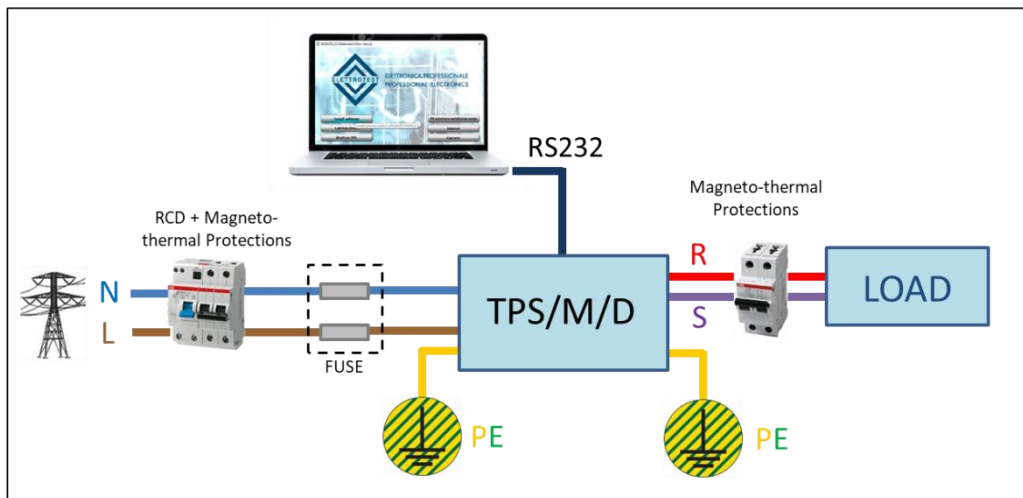


Mandatory

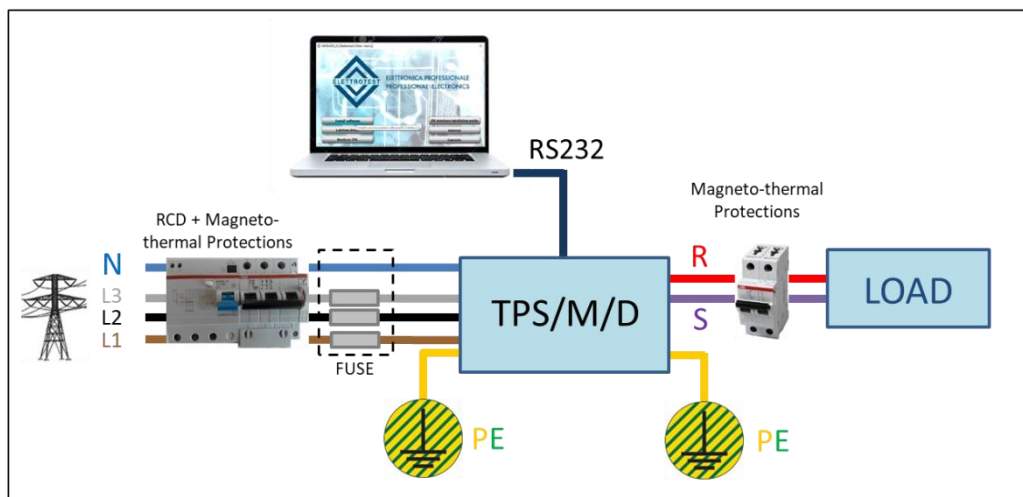
Safety protection (Magneto-thermal and differential) are mandatory according to the nominal TPS characteristic.

An additional adequate protection **must be add** when electrical components (cable, Equipment under test – EUT) cannot support TPS performance.

SINGLE PHASE INPUT



THREE PHASE INPUT



2.2.2. RCD PROTECTION

A residual-current device (RCD), or residual-current circuit breaker (RCCB), is a device that instantly breaks an electric circuit to prevent serious harm from an ongoing electric shock.

It's recommended to **use B type** RCD with a earth leakage current of **30 mA** according to the nominal input characteristic (see section 1.2). The machine can absorb more than 100mA at high frequency, be secure the RCD has the filter for high frequency.

2.2.3. MAGNETO-THERMAL PROTECTION

The Magneto-thermal circuit breaker protect the line from short circuits. Generally depends on the load and on the connection (section and length of the cable).

It is recommended to use a magneto-thermal protection with **type C** curve according to the nominal characteristic (see section 1.2).

2.2.4. LINE FUSES

Fuses can be used to protect power line of the TPS. It's recommended to use delayed fuses according to the nominal input characteristic (see section 1.2).

2.2.5. INTERNAL FUSES TPS/M/D 1K5

Item	Name	Description	Size	Current	Type	Voltage
1	F1	Mainline Input	10x38	16A	GL	500V
2	F2	Safety Circuit	5x20	1.25A	AT	250V
3	F4	Aux Supply	5x20	3.15A	AT	250V

The layout may be different and depends the model design

2.2.6. INTERNAL FUSES TPS/M/D 3K

Item	Name	Description	Size	Current	Type	Voltage
1	F1	Mainline Input	10x38	25A	GL	500V
2	F2	Safety Circuit	5x20	1.25A	AT	250V
3	F4	Aux Supply	5x20	3.15A	AT	250V

The layout may be different and depends the model design

2.2.7. INTERNAL FUSES TPS/M/D 6K

Item	Name	Description	Size	Current	Type	Voltage
1	F1, F2, F3	Mainline Input	10x38	16A	GL	500V
2	F4	Input Aux supply	10x38	1A	AM	400V
2	F5	Aux Supply	5x20	3.15A	AT	250V
3	F6	Safety Circuit	5x20	1.25A	AT	250V

The layout may be different and depends the model design

2.2.8. INTERNAL FUSES TPS/M/D 9K

Item	Name	Description	Size	Current	Type	Voltage
1	F1, F2, F3	Mainline Input	10x38	25A	GL	500V
2	F4	Input Aux supply	10x38	1A	AM	400V
2	F5	Aux Supply	5x20	3.15A	AT	250V
3	F6	Safety Circuit	5x20	1.25A	AT	250V

The layout may be different and depends the model design

2.2.9. ACCESSORY TPS/M/D 1K5

Item	Description	Pcs
1	FUSE 10x38 16A GL 500V	2
2	FUSIBILE 5x20 3.15A AT 250V	2
3	FUSIBILE 5x20 1.25A AT 250V	2
4	MULTICONTACT KT425-SL RED	2
5	MULTICONTACT KT425-SL BLACK	2
6	MULTICONTACT LS425-SL	4
7	Input cable	1
8	Ferrite Bead	1
9	USB KEY	1

2.2.10. ACCESSORY TPS/M/D 3K

Item	Description	Pcs
1	FUSE 10x38 25A GL 500V	2
2	FUSIBILE 5x20 3.15A AT 250V	2
3	FUSIBILE 5x20 1.25A AT 250V	2
4	MULTICONTACT KT425-SL RED	2
5	MULTICONTACT KT425-SL BLACK	2
6	MULTICONTACT LS425-SL	4
7	Ferrite Bead	1
8	USB KEY	1

2.2.11. ACCESSORY TPS/M/D 6K

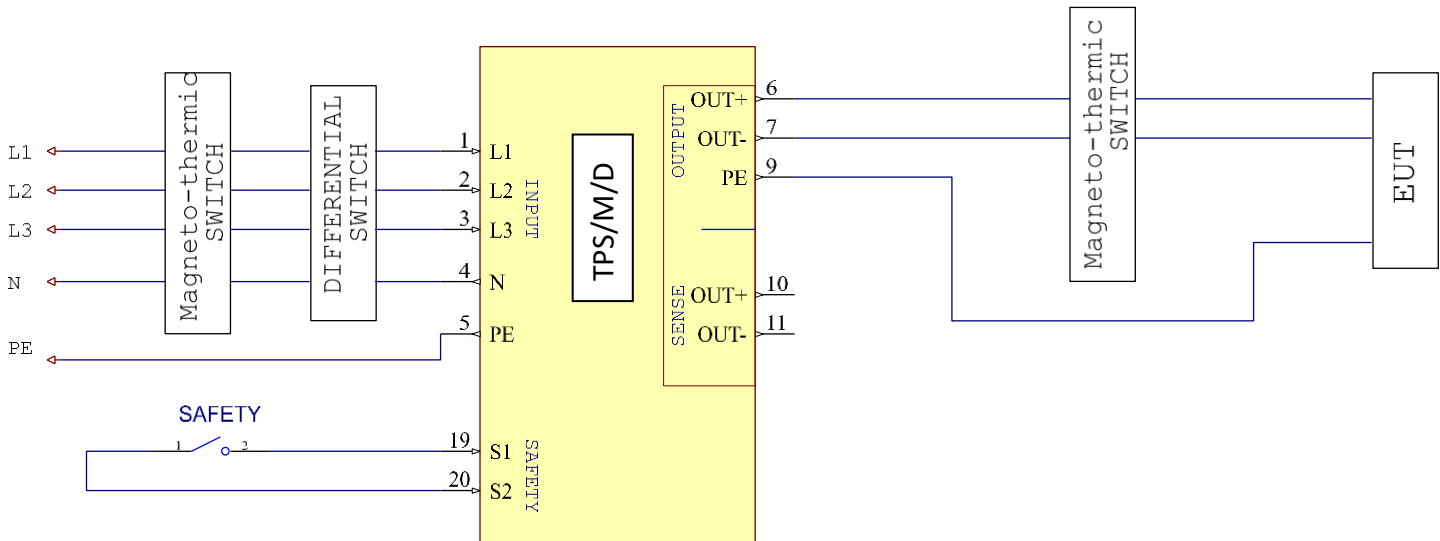
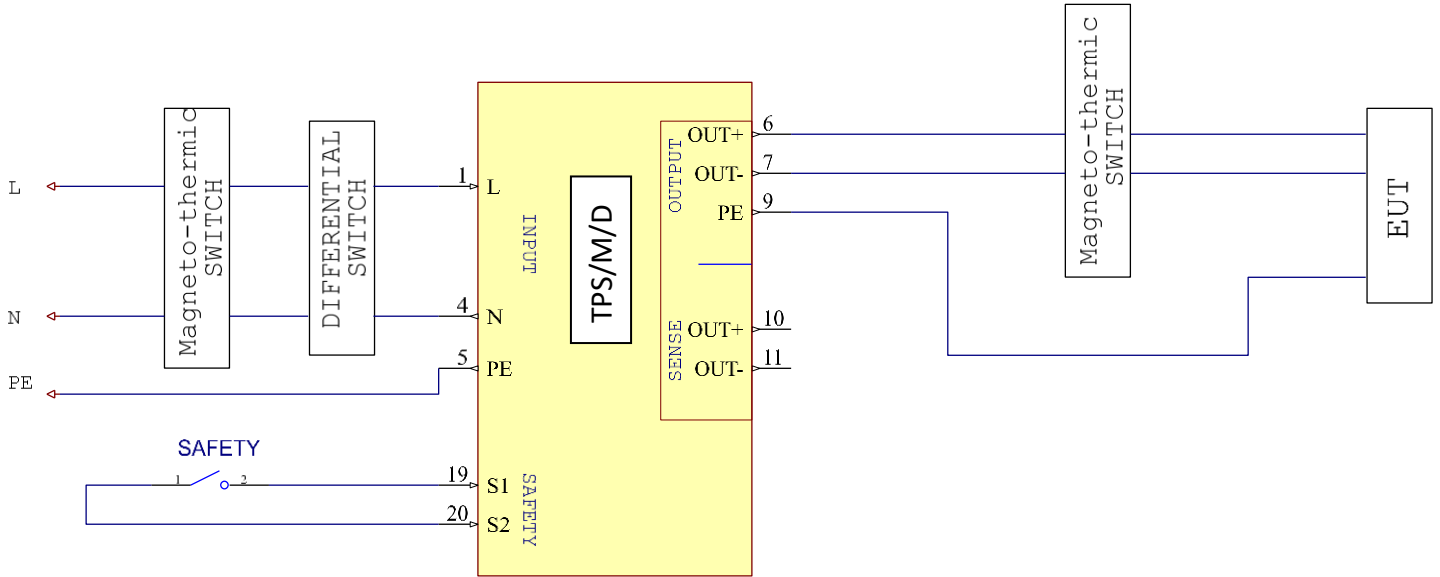
Item	Description	Pcs
1	FUSE 10x38 16A GL 500V	2
2	FUSIBILE 5x20 3.15A AT 250V	2
3	FUSIBILE 5x20 1.25A AT 250V	2
4	MULTICONTACT KT425-SL RED	1
5	MULTICONTACT KT425-SL BLACK	1
6	MULTICONTACT LS425-SL	2
7	MULTICONTACT KBT6-AR-N/10-S RED	1
8	MULTICONTACT KBT6-AR-N/10-S BLACK	1
9	Ferrite Bead	1
10	USB KEY	1

2.2.12. ACCESSORY TPS/M/D 9K

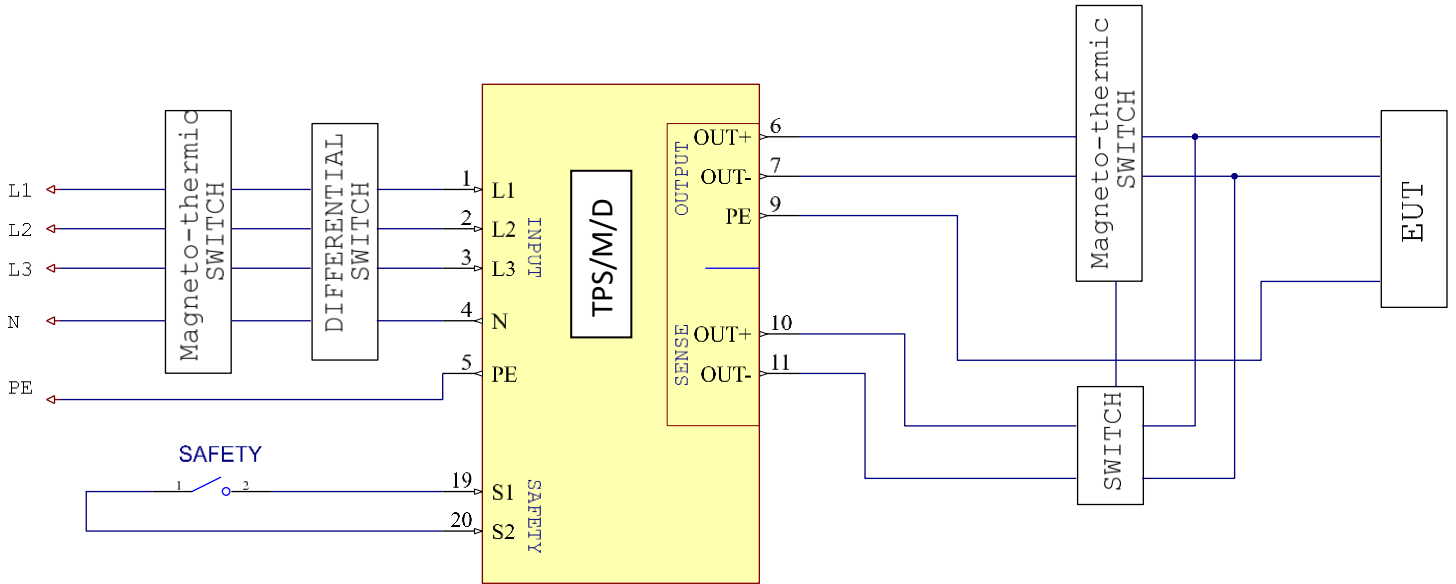
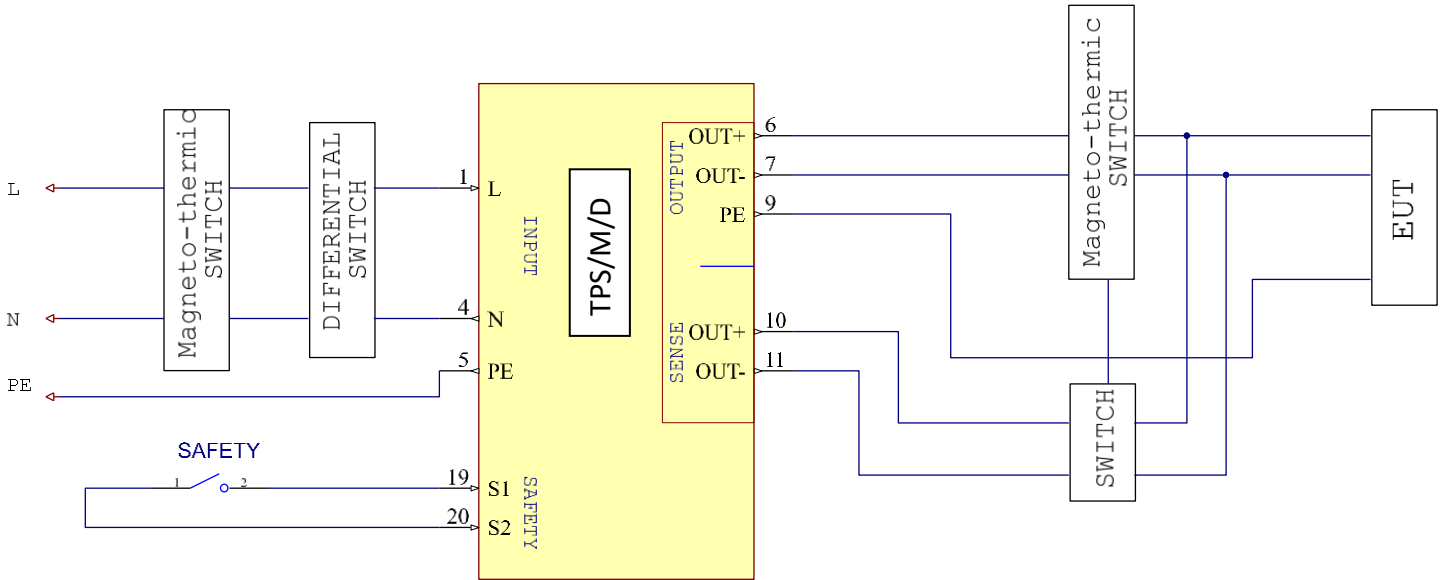
Item	Description	Pcs
1	FUSE 10x38 25A GL 500V	2
2	FUSIBILE 5x20 3.15A AT 250V	2
3	FUSIBILE 5x20 1.25A AT 250V	2
4	MULTICONTACT KT425-SL RED	1
5	MULTICONTACT KT425-SL BLACK	1
6	MULTICONTACT LS425-SL	2
7	MULTICONTACT KBT6-AR-N/10-S RED	1
8	MULTICONTACT KBT6-AR-N/10-S BLACK	1
9	Ferrite Bead	1
10	USB KEY	1

2.3. WIRING DIAGRAM

2.3.1. 2 WIRE CONFIGURATION



2.3.2. 4 WIRE CONFIGURATION



3. REMOTE CONTROL

3.1. Control software

TPS can be remotely controlled via RS232, RS485, TCP/IP communication according to a copyrighted free protocol or SCPI. For further details on protocol, see the specific manual.

3.2. RS232 serial cable

Use a serial cable according to the standard defined in the figure below.

WIRING CONNECTION			
PC		TPS	
DB9 Poles Female		DB9 Poles Male	
2	↔	2	
3	↔	3	
5	↔	5	

3.3. RS485 pinout

It is 2 wire configuration

DB9 Poles Female	
1:	B
2:	A
5:	GND

4. LOCAL OPERATION

The product can support local operation or remote operation enabled via complete communication interfaces, such as RS232, RS485, Ethernet.

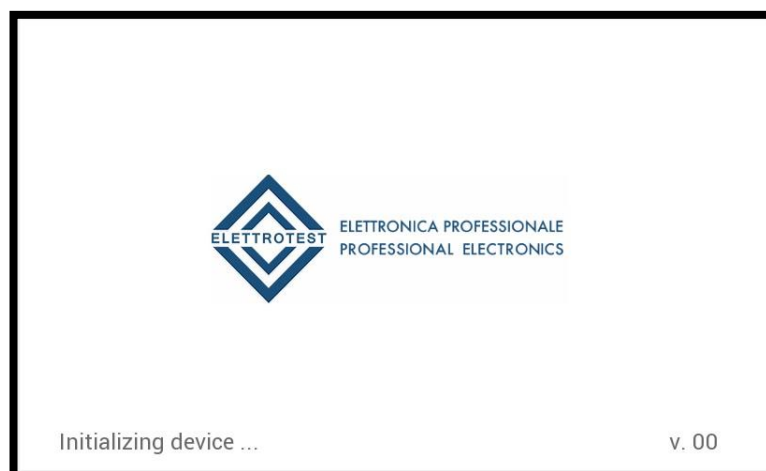
In this section, the local operation enabled via the 7-inch touch screen on the front panel will be described.

The product is configured for local operation when it is turned on.

4.1. POWER ON

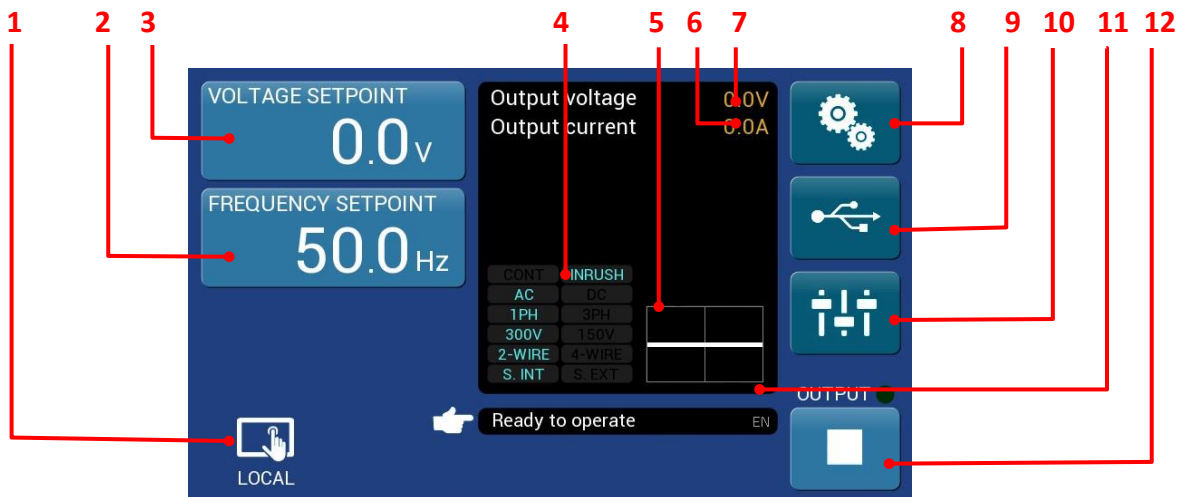
Apply power to the unit and turn the ON/OFF switch (see section 1.4) in position 1; in this condition the touch screen on the front panel will light up and:

- if the power switch (see section 1.5.1) is in position OFF, TPS will not start and the user must press it to start the boot process
- if the power switch (see section 1.5.1) is in position ON, will be displayed the boot page with logo and the revision of firmware installed and the start up procedure will be completed with the home page view




4.2. HOME PAGE

When the user turns on the TPS, the touchscreen shows the HOME PAGE after the startup procedure. The TPS starts at the factory default configuration (for the first start) or at the last stored setting.



Item	Name	Description
1	Local/Remote Icon	Displays if the TPS is in Local or Remote mode
2	Frequency Setpoint button	Allows to set the frequency value
3	Voltage Setpoint button	Allows to set the voltage value
4	Mode display	Display the set up mode of the TPS, when you push it you go to OPERATION SETTINGS
5	Wave display	Displays the waveform (AC or DC)
6	Output Current	Displays the value of output current
7	Output Voltage	Displays the value of output voltage
8	General Settings button	Allows access to the settings menu page
9	USB button	Allows access to the USB menu page
10	Slide button	Allows access to special functions page
11	Information bar	Displays information for the user
12	Output button	Allows to enable the output


4.3. VOLTAGE SETPOINT

By clicking on the button , the “VOLTAGE SETPOINT” button will be colored to confirm the choice and a numeric keyboard will appear to manually set the voltage value.



Then press “Enter” to confirm the new setting.


4.4. FREQUENCY SETPOINT

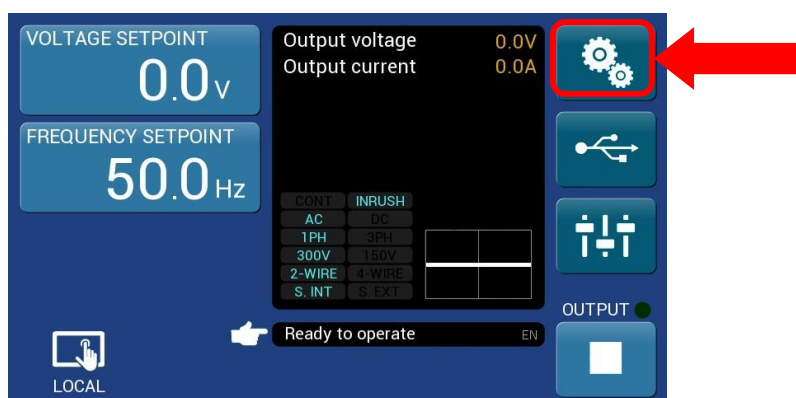
By clicking on the button , the “FREQUENCY SETPOINT” button will be colored to confirm the choice and a numeric keyboard will appear to manually set the frequency value.

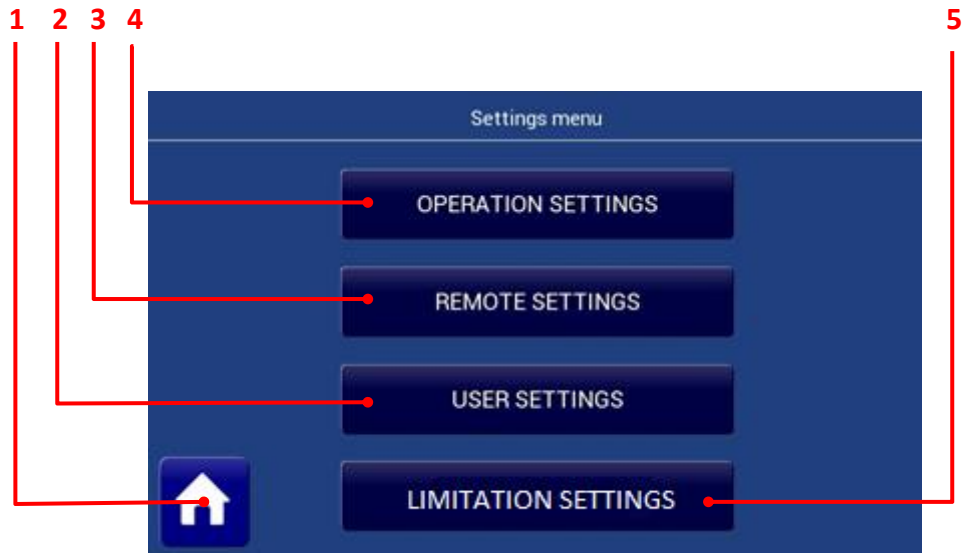


Then press “Enter” to confirm the new setting.

4.5. SETTINGS MENU


By clicking on the button , allows to access the Settings Menu page

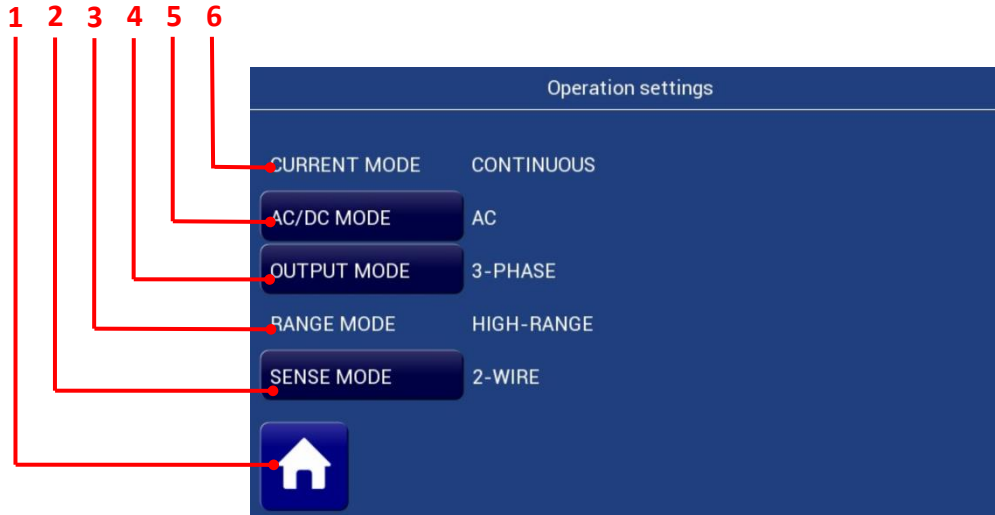




Item	Name	Description
1	Home button	Allows to come back to the Home page
2	User Setting button	Allows to access the User Settings page
3	Remote Setting button	Allows to access the Remote Settings page
4	Operation Setting button	Allows to access the Operation Settings page
5	Limitation Settings button	Allows to access the Limitation Settings page

4.5.1. OPERATION SETTINGS

By clicking on the general OPERATION SETTING button  , allows to access the Operation setting menu page



Item	Name	Description
1	Home button	Allows to come back to the Home page
2	SENSE BUTTON	Allow to change the sense mode from <ul style="list-style-type: none"> • 2-WIRE • 4-WIRE
3	RANGE MODE BUTTON	Allow to change the range <ul style="list-style-type: none"> • 150V • 300V
4	OUTPUT MODE BUTTON	THIS MACHINE HAS ONLY 1PH MODE
5	AC/DC MODE BUTTON	Allow to change the AC/DC mode from <ul style="list-style-type: none"> • DC • AC
6	CURRENT MODE	THIS MACHINE HAS ONLY INRUSH MODE

4.5.1.1.1. SENSE MODE

The output voltage's stabilization behave in the same way in both the configurations on the TPS output terminals (2 wire) and on a possible long distance outlet (4 wire), to eliminate the fall in voltage due to cable connections. To operate the long distance stabilization first connect the opposite terminals on the back of the machine following the indications at the voice INSTALLATION. The choice of the kind of long distance stabilization can be operated by pushing the buttons SENSE, the 4WIRE and 2WIRE configuration is indicated with a LED. Note that the TPS corrects voltage drop on wires up to 5% of set voltage to prevent any overheating of the line, exceeded this limit, the TPS does not guarantee that the value of output voltage is equal to the voltage setting and It displays an error signal (see VOLTAGE ALARMS).

4.5.1.1.2. OUTPUT MODE


If the machine has this options you can select 1-phase or 3-phase. In 1-phase mode the machine supply all the power in only one phase.

The output power is variable to type of the load, for resistive load the is nominal power, for inductor load is greater of the nominal power, for capacitor load is less of the nominal power.

4.5.1.1.3. AC/DC

The TPS is able to supply AC and DC voltage with the limit you can find on the chart 1.6, each phase are independent so it is possible to supply three different AC or DC voltage for each phase.

4.5.2. REMOTE SETTINGS


By clicking on the general REMOTE SETTING button , allows to access the settings menu page, this page depends from the serial output (ETHERNET / RS232 / RS485), down there is a table with the available protocol in the different interface

		Port			
		RS232	RS485	Ethernet Virtual Com	Ethernet TCP Server
Protocol	Elettrotest	✓ 1200/9600/19200	✓ 1200/9600/19200	✓ (Baud rate select by Moxa driver interface)	✓ (protocol encapsulated on TPC communication)
	SCPI	✓ 1200/9600/19200	✓ 1200/9600/19200	✓ (Baud rate select by Moxa driver interface)	✓ (protocol encapsulated on TPC communication)
	Modbus RTU	✓ 1200/9600/19200	✓ 1200/9600/19200	✓ (Baud rate select by Moxa driver interface)	✓ (protocol encapsulated on TPC communication)
	Modbus TCP/IP	✗	✗	✗	✓

4.5.2.1.1. ETHERNET settings

Remote settings


SERIAL OUTPUT	ETHERNET	OPERATION MODE	TCP SERVER
PROTOCOL	MODBUS TCP	IP ADDRESS	192.168.1.2
		SUBNET MASK	255.255.255.0
		GATEWAY	192.168.1.1



4.5.2.1.2. RS 232 settings

Remote settings

SERIAL OUTPUT	RS232
PROTOCOL	ELETTROTEST
BAUD RATE	9600 bps



4.5.2.1.3. RS485 settings

Remote settings

SERIAL OUTPUT	RS485
PROTOCOL	MODBUS RTU
BAUD RATE	9600 bps
ADDRESS	1




4.5.3. USER SETTINGS

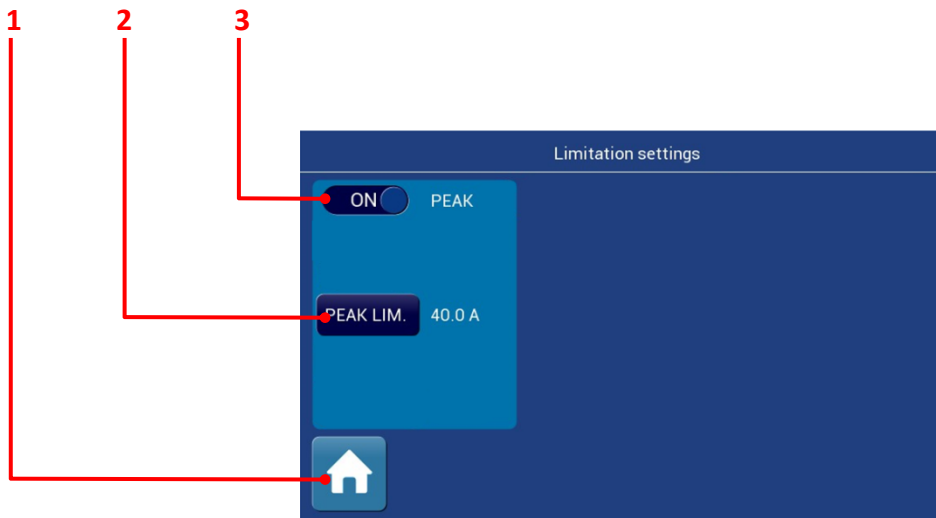
By clicking on the general USER SETTING button  , allows to access the settings menu page



Item	Name	Description
1	Home button	Allows to come back to the Home page
2	Screensaver button	Allows to enable screensaver on the display, after 3 minutes without touching the display
3	Sound Feedback button	Allows to enable o disable sound feedback
4	Brightness button	Allows to change the display brightness
5	Language button	Allows to change the menu language
6	Theme button	Allows to change the interface colours

4.5.4. Output current limit

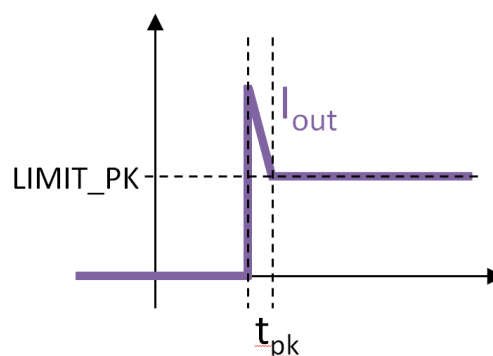
By clicking on the general LIMITATION SETTINGS button , allows to access the limit settings page

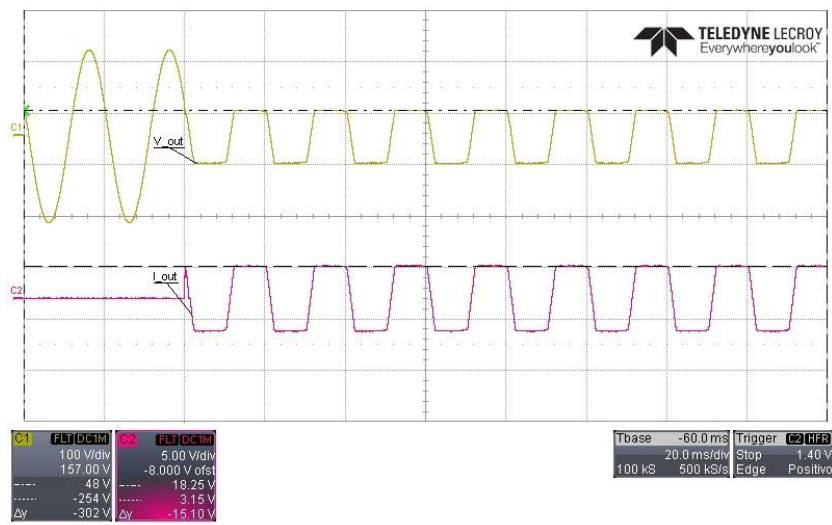
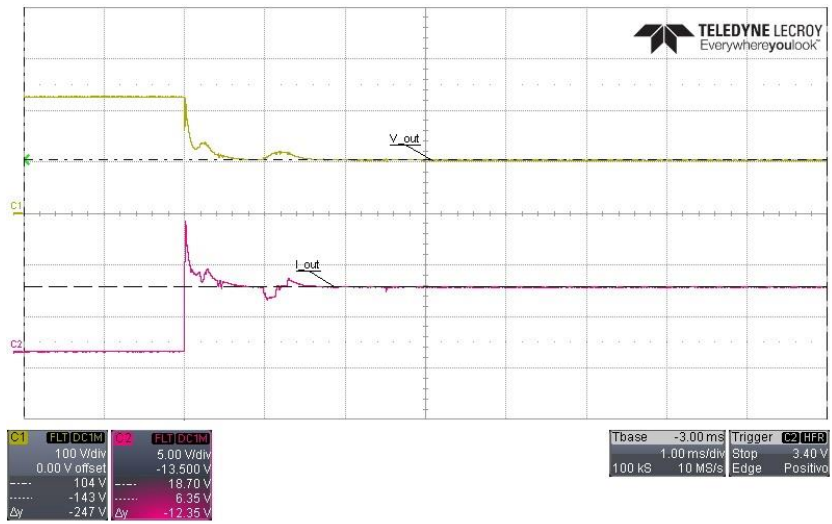


Item	Name	Description
1	Home button	Allows to come back to the Home page
2	PEAK LIM.	Value of peak limit
3	PEAK	Enable or disable the peak limit

4.5.4.1.1. Peak limit

Output current is limited instantaneously without delay at the limitation set. Only an initial transient peak remains, due to the output capacitor discharge.

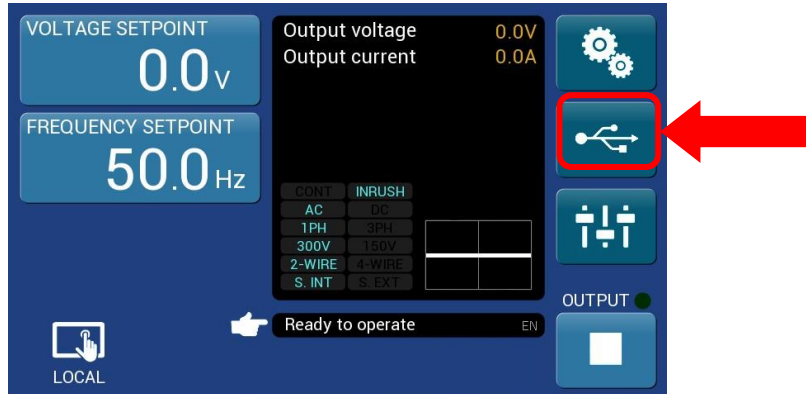





Limitations is enable both AC and DC mode

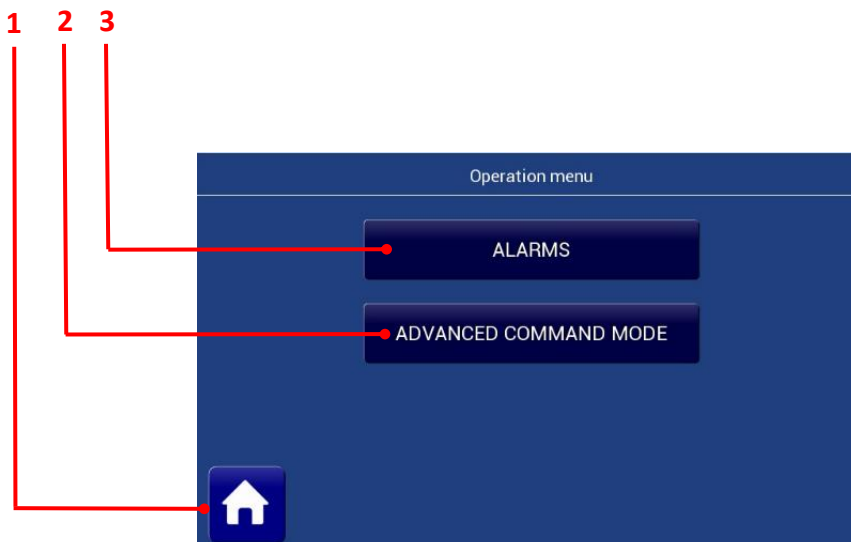
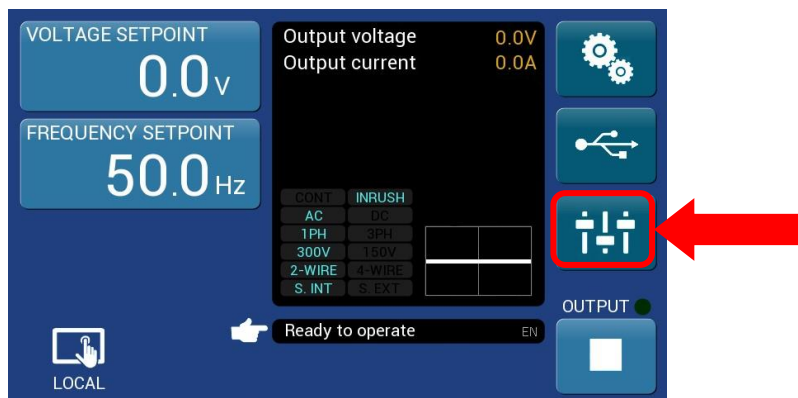
4.6. USB STORE

When you have inserted the USB key on the front panel connection and you press the button you can create a new file XXXXX.txt with a note into the header. After inserting the name and the note the TPS start to store every second different parameter divided by “;”, pay attention before remove the usb press the usb button. Check [Table of the data saved on the usb](#)



4.7. OPERATION MENU

By clicking on the button  , allows to access the Operation menu page

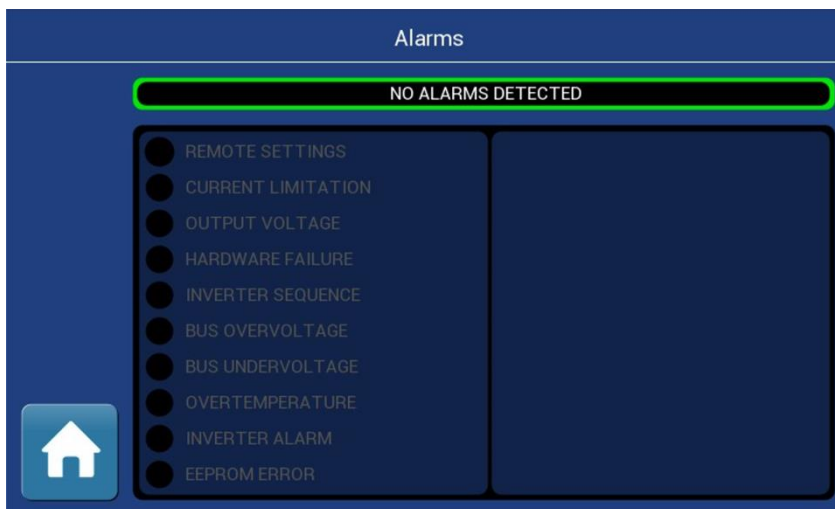


Item	Name	Description
1	Home button	Allows to come back to the Home page
2	Advanced command mode ⁽¹⁾	Allows to access the Advanced command mode page
3	Alarms button	Allows to access the Alarm page

⁽¹⁾ Only for Elettrotest use.

4.7.1. ALARMS

By clicking on the button , allows to access the Alarms page



4.7.1.1. REMOTE SETTING

The alarm appears when there is problem with the communication board

REMOTE SETTING ALARM does not cause any stop.

4.7.1.2. CURRENT LIMITATION

TPS works a control of the output current and this allows it to support for an indefinite time the output short circuit. In case of loads that absorb a current superior than the nominal one TPS works a limitation of the same current. In case of current limitation the output wave is no more guaranteed and so it will show an harmonic distortion.

Not linear loads with an overload less than the nominal one but with a very high crest factor current allow the current defence.

CURRENT ALARM does not cause any stop.

4.7.1.3. VOLTAGE ALLARM

TPS controls, in addition to the harmonic distortion, the RMS value of the output voltage both in 2WIRE and in 4WIRE configuration.

If the output voltage is not equal to the set value, a special alarm is generated (MAX DV OUTX).

VOLTAGE ALARM does not cause any stop.

4.7.1.4. INVERTER COMMUNICATION

The alarm appears when there is problem on the communication between the inverter and the display.

4.7.1.5. BUS OVERVOLTAGE & UNDERVOLTAGE

TPS can work with network voltage variations of $\pm 10\%$, if these limits are exceeded TPS stops and show the alarm.

If the network voltage is too low TPS stops and the **UNDERVOLTAGE** alarm is on.

If the network voltage is too high TPS stops and the **OVERVOLTAGE** alarm is on.

If the supply phases have been inverted, both the UNDERVOLTAGE and OVERVOLTAGE alarms are generated. Check **POWER CABLING and invert the phases on the input connector.**

4.7.1.6. OVERTEMPERATURE

The alarm appears in case of high temperature inside of TPS. TPS stops and the **OVERTEMPERATURE** alarm is active

4.7.1.7. INVERTER ALARM

In case of bad operations of the overload sections (inverter) TPS stops and the **INVERTER** alarm is active

5. TABLE OF THE DATA SAVED ON THE USB

Item	Name	Description
1	Standby/Ready/Failure	0= Standby, 1= Ready, 2= Failure,
2	Output	0=OFF, 1=ON
3	Output mode DC	0 = AC, 1= DC
4	Output mode mono-phase	0 = 1PH, 1= 3PH
5	4-wire sense	0 = 2 wire 1 = 4 wire
6	Voltage setpoint L1	Set voltage of L1 [V]
7	Voltage setpoint L2	Set voltage of L2 [V]
8	Voltage setpoint L3	Set voltage of L3 [V]
9	Voltage setpoint ALL	Set voltage of all the phase together [V]
10	Frequency setpoint	Set frequency for all the phases [Hz]
11	Phase setpoint L1	Set phase of L1[deg]
12	Phase setpoint L2	Set phase of L2[deg]
13	Phase setpoint L3	Set phase of L3[deg]
14	Voltage output L1	Measured output voltage of L1 [V]
15	Voltage output L2	Measured output voltage of L2 [V]
16	Voltage output L3	Measured output voltage of L3 [V]
17	Current output L1	Measured output current of L1 [A]
18	Current output L2	Measured output current of L2 [A]
19	Current output L3	Measured output current of L3 [A]
20	Fail L1	0 = no blocking alarm, 1= blocking alarm
21	Fail L2	0 = no blocking alarm, 1= blocking alarm
22	Fail L3	0 = no blocking alarm, 1= blocking alarm
23	Alarms L1	Alarm of the L1 line
24	Alarms L2	Alarm of the L2 line
25	Alarms L3	Alarm of the L3 line
26	Uptime [day]	The number of days from the turn on
27	Uptime [hour]	The number of hours from the turn on
28	Uptime [min]	The number of minutes from the turn on
29	Uptime [sec]	The number of seconds from the turn on
30	Running [day]	The number of days with the output active from the last turn on of the machine
31	Running [hour]	The number of hours with the output active from the last turn on of the machine
32	Running [min]	The number of minutes with the output active from the last turn on of the machine
33	Running [sec]	The number of seconds with the output active from the last turn on of the machine

34	Total [day]	The total number of days the machine is turn on
35	Total [hour]	The total number of hours the machine is turn on
36	Total [min]	The total number of minutes the machine is turn on
37	Total [sec]	The total number of seconds the machine is turn on
38	Total runnig [day]	The total number of days the machine is turn on with the output active
39	Total running [hour]	The total number of hours the machine is turn on with the output active
40	Total running [min]	The total number of minutes the machine is turn on with the output active
41	Total running [sec]	The total number of seconds the machine is turn on with the output active

6. GUARANTEE

The instrument is guarantee for one year in all his mechanical and electronic components.

Naturally are not admitted handlings not anticipated in the present handbook.

The instrument has consigned complete of CERTIFICATE of CALIBRATION, that guarantees the integrity of the same.

Such document must accompany the apparatus in case of periodic verification always.

Elettrotest Spa is committed to a program of continuous improvement of products and information to the customer.

Therefore, the company reserves the right to make changes to the documentation and specifications without notice and assumes no responsibility for any incorrect information.

Rel.	Date	Descriptions
00_	31/08/21	First emission