BATTERIELEKTRONIK

ENERGY CONVERSION SAFETY

INSTRUCTION MANUAL

ERGON-MED series

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INTRODUCTION

Enersine is a young and dynamic company based on a professional staff with more than 15 years of experience in the energy conversion field.
Projecting and manufacturing know-how achieved in several years turn into the Enersine strength.
This feature allows Enersine to become a worldwide reference in the production of energy conversion equipment under 10KVA power, signed by the Made in Italy reliability.

All products are completely projected and manufactured inside the company by high specialized and qualified technical staff allowing the full control of the production processes and the high quality of the equipment.
The well-known skills to face the most critical demands and to implement special products on the customers' requirements, mark out the company core business.

Enersine produces several kind of energy equipment dedicated to different applications and fields:

- HIGH SAFETY uninterruptible power supplies – ERGON series
- MEDICAL uninterruptible power supplies – ERGON-Med series
- MEDICAL isolating transformers – TMed series
- LIGHT uninterruptible power supplies – BLAZE, INTERSINE AND COSMO series
- INDUSTRIAL sine wave inverters – SINE and MICRON series
- EMERGENCY light devices – LIDE series
- DC power supplies – ALGON series
- FREQUENCY converters 50/60Hz – CONV series
- Three-phase ups systems – TRITON series

A skilled, dynamic and above all flexible staff allows the company to give prominence to a direct high-qualified relation able to support any commercial and technical request.
Enthusiasm, energy, openness and great availability will be at the basis of the relationship with Enersine staff.

A professional after-sale and customer care service will be at full disposal for all customers in order to solve any type of requests skillfully and with high efficiency.

As an independent manufacturer, Enersine is committed to constant technological innovations, in order to implement new complete lines and products to be the right answer to niche and special markets.

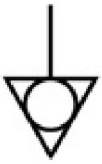
SYMBOLOGY DESCRIPTION
EQUIPMENT AND INSTRUCTION MANUAL

GENERAL DANGER

FOLLOW THE INSTRUCTIONS

DANGEROUS VOLTAGE

DO NOT TOUCH



EQUIPOTENTIAL CONNECTION

GROUND CONNECTION

RECYCLING

ATTENTION

Respect all the cautions and safety instructions written in the present manual.

Keep the present manual

Read carefully the following instructions before installing the unit or carrying out any other operation.

Respect all the safety instructions during installation or disinstallation processes since the unit works with dangerous voltages and currents.

WARNING:
ANY MODIFICATION IS PERMETTED ON THE UNIT WITHOUT THE MANUFACTURER AUTHORIZATION.

All not authorized modifications shall lose the unit safety and warranty.

Any lack on the procedures and the rules non-observance on unit implant set up, automatically dispense the manufacturer with any responsibility in case of damages to persons or properties.
The manufacturer declines every responsibilities for unsuitable use or improper installation by the user.

All damages due to improper use, wrong maintenance processes or not authorized intervetions will dispense the manufacturer with any responsibility.

SAFETY INSTRUCTIONS

Take care of the following safety instructions before using the unit:

- The unit has passed all the test indicated in the electromagnetic compatibility according to the EN 60601-1-2; however, in case of particularly critical applications or with extremely sensible loads, the unit could generate disturbs or in turn, it could undertake interferences from the medical devices applied.

- If the unit is unpacked in a cool place, take care of condensation processes. If condensation is present wait until the unit is totally dry before its use.

  Warning: electrical shocks

- Do not touch the unit with wet hands or feet.

  Warning: electrical shocks

- Install the unit in a suitable environment, without humidity (0-70% tolerance), with proper temperature (0-35°C tolerance) and with not excessive dust. Do not install the unit with direct sunlight or next to heat source, they can compromise the correct functioning. Do not install the unit to altitude more than 2000mt.

- Do not use the unit in environment with high oxygen concentration (>25% in the air at 1atm)

WARNING:
To avoid electrical shocks, this unit should be connected to mains supply with ground connection implants.

- Arrange connection cables making attention to leave the way clear without any possibility to tread on them. Do not stretched, bent, pressed or twisted the cables and do not place them over.

Use homologated cable to connect the unit

- Before connecting the plug into the mains socket take care that the cables or the plug are not damaged. In this case please contact the manufacturer for spare parts to avoid any problem. Anyway do not proceed with the unit installation.

- Electrical cables should be periodically checked.
  Take care do not pull the mains supply cable to disconnect the unit.

  Warning: cable break risk and electric shock.

- Arrange the Emergency Power Off device where required.

- Do not connected equipment that can overload the units.

- Do not move the unit during normal functioning to avoid cables or devices disconnection.

- Do not open the unit cover.
  Any intervention on the unit done without authorization can compromise the correct unit functioning and the warranty decline dispensing the manufacturer with any responsibilities.

- Do not obstruct the ventilation holes to avoid unit damages or dangerous short circuits that can compromise the unit functioning.

- To avoid electrical shocks

  Take care that in the unit are built in hermetic lead batteries and some internal sections work under voltage also without the mains supply or even if the unit is off.

- The units should not be installed with the following environmental conditions presence:

  - high dust level
  - lack of ventilation
  - extreme humidity or easy flooding
  - fumes or corrosive substances
  - burner gas
  - direct sunlight and heat surfaces
  - high temperature level (normal environment temperature 25°C)
  - atmospheric agents

Unit cleaning

To clean the unit is suggested to use dry clothes.
To avoid excessive dust on the ventilation holes from time to time blow through the ventilation openings.
Do not pour liquids into the unit
Do not use spray to clean the unit. If necessary put it on the dry cloth for removing the dust.

Unit waste

The ups cannot be wasted without consulting Authorized Organizations defined by your country Norms.
For more information, please contact the manufacturer.

EMERGENCY PROCEDURES

Our equipment have a high safety level thanks to the technical characteristics, but even though they can produce dangerous voltages also without mains supply.

When smokes, fire or other dangerous events will occur on the unit or on the connected devices, switch off immediately the unit following these instructions:

- push the EPO button, if present
  or
- switch off the unit through the on/off on the frontal panel
  or
- remove the battery fuse, if present
  or
- disconnect the power supply cable

If necessary to totally disconnect the unit, please follow the instructions written in the "INSTALLATION PROCEDURE".

UNPACKING AND CONTROLS

Unpacking and first unit check should be done by authorized personnel.
Unit handling should be managed with extreme caution. In order to avoid any damages or injuries take care that people or thinks are not standing around the dedicated areas.

During goods receiving, take care that the original packaging is integral and undamaged checking the external box, then verify the internal parts and preserve the original packaging for future uses.

If the packaging is broken or damaged, please collect the unit with reservation and contact the manufacturer.

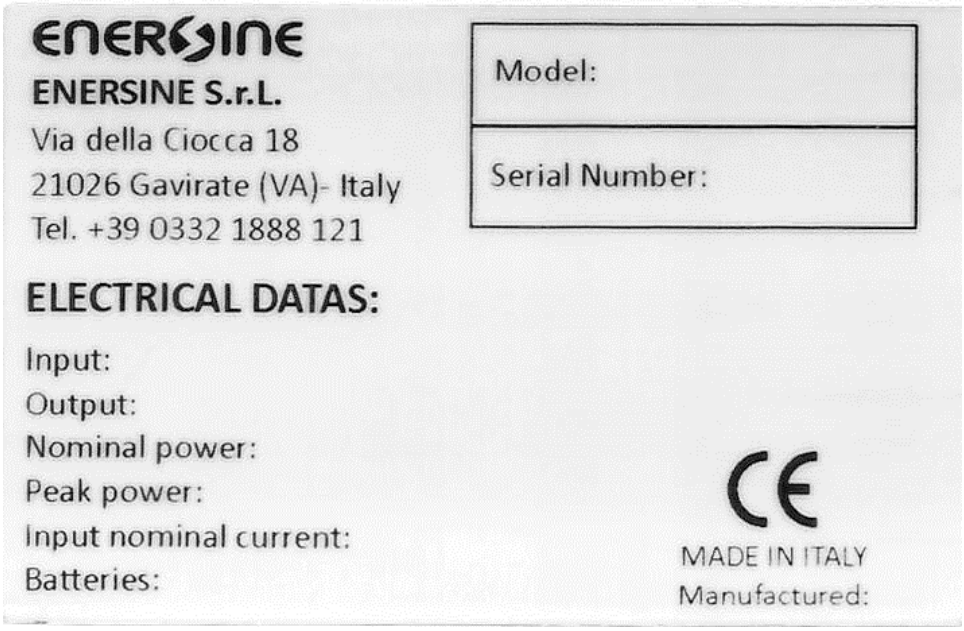
If the unit do not have the original safety features and it has visible defects and/or damages and/or unexpected functioning, disable the unit and contact the manufacturer explaining the problem.

The storage time should be not more than 12 months.

UNIT MODEL IDENTIFICATION

All the units are provided of an identification label on the rear panel on which it is written the following details:

- company details
-
- model
- serial number
- electrical data
- manufacturing date



DECLARATION OF CONFORMITY ERGON-MED 4-12

L'azienda	**Enersine S.r.l.**
The company	***Enersine S.r.l.***

DICHIARA CHE I PRODOTTI
DECLARES THAT THE PRODUCTS

Identificazione del prodotto	**ERGON-MED 12**	**ERGON-MED 9**	**ERGON-MED 6**	**ERGON-MED 4**
Product identification	***ERGON-MED 12***	***ERGON-MED 9***	***ERGON-MED 6***	***ERGON-MED 4***
Descrizione del prodotto	Gruppi di continuità			
Product description	*Uninterruptible power supplies*			

SONO CONFORMI ALLE PRESCRIZIONI TECNICHE
CONTENUTE NELLE SEGUENTI NORME DI PRODOTTO:
ARE COMPLIANT ACCORDING TO THE TECHNICAL REQUIREMENTS
OF THE FOLLOWING PRODUCT STANDARDS:

DIRETTIVA DEL PARLAMENTO EUROPEO E DEL CONSIGLIO: 2007/47/CE ***EU COUNCIL DIRECTIVE: 2007/47/CE***
EN60601-1-2 (2007)
Whole Norm application
EN60601-1 (2006)
Whole Norm application

DIRETTIVA DEL PARLAMENTO EUROPEO E DEL CONSIGLIO: 2014/30/EU ***EU COUNCIL DIRECTIVE: 2014/30/EU***
EN62040-2 (2006-11)
Uninterruptible Power Supplies *Part 2: "Electromagnetic Compatibility" (EMC)*

DIRETTIVA DEL PARLAMENTO EUROPEO E DEL CONSIGLIO: 2014/35/EU ***EU COUNCIL DIRECTIVE: 2014/35/EU***
EN62040-1:2008-11 **EN62040-1/IEC:2009-02**
Uninterruptible Power Supplies *Part 1: "General and safety requirements"*

Enersine S.r.l.
Alessandra Prato
Managing Director

DECLARATION OF CONFORMITY ERGON-MED 15-18

L'azienda	**Enersine S.r.l.**
The company	***Enersine S.r.l.***

DICHIARA CHE I PRODOTTI
DECLARES THAT THE PRODUCTS

Identificazione del prodotto	**ERGON-MED 15**	**ERGON-MED 18**
Product identification	***ERGON-MED 15***	***ERGON-MED 18***
Descrizione del prodotto	Gruppi di continuità	
Product description	*Uninterruptible power supplies*	

SONO CONFORMI ALLE PRESCRIZIONI TECNICHE
CONTENUTE NELLE SEGUENTI NORME DI PRODOTTO:
ARE COMPLIANT ACCORDING TO THE TECHNICAL REQUIREMENTS
OF THE FOLLOWING PRODUCT STANDARDS:

DIRETTIVA DEL PARLAMENTO EUROPEO E DEL CONSIGLIO: 2007/47/CE ***EU COUNCIL DIRECTIVE: 2007/47/CE***
EN60601-1-2 (2007)
Whole Norm application
EN60601-1 (2006)
Whole Norm application

DIRETTIVA DEL PARLAMENTO EUROPEO E DEL CONSIGLIO: 2014/30/EU ***EU COUNCIL DIRECTIVE: 2014/30/EU***
EN62040-2 (2006-11)
Uninterruptible Power Supplies *Part 2: "Electromagnetic Compatibility" (EMC)*

DIRETTIVA DEL PARLAMENTO EUROPEO E DEL CONSIGLIO: 2014/35/EU ***EU COUNCIL DIRECTIVE: 2014/35/EU***
EN62040-1:2008-11 **EN62040-1/IEC:2009-02**
Uninterruptible Power Supplies *Part 1: "General and safety requirements"*

Enersine S.r.l.
Alessandra Prato
Managing Director

UNIT TEST REPORT SAMPLE

TEST CERTIFICATE

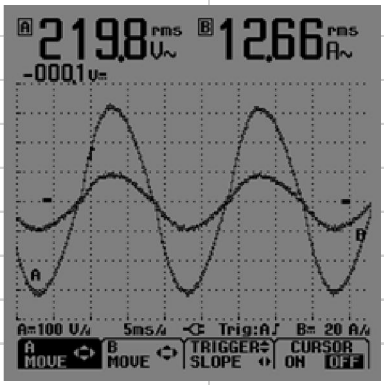
DATE					PAGE - 1
MODEL		SERIAL NUMBER			
Tipology	Ups on line				

GENERAL DETAILS					
Input Voltage		Output Voltage		Output Current	
Input Frequency		Output Frequency		Output peak power	
Battery voltage					
Battery type					

CONTROLS PROVIDED

MAINS CONNECTED

LOAD 0%



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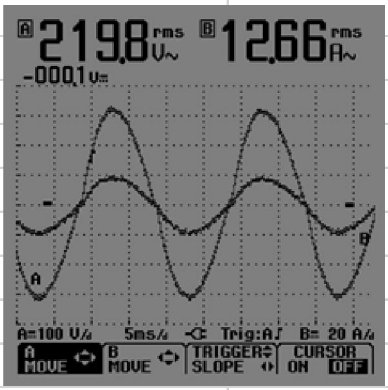

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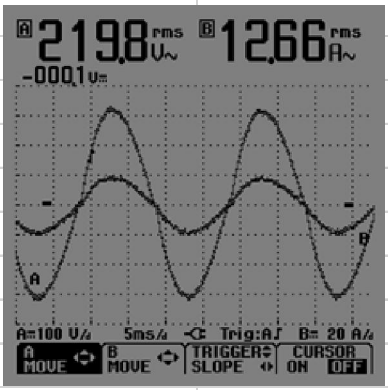

BATTERY MODE

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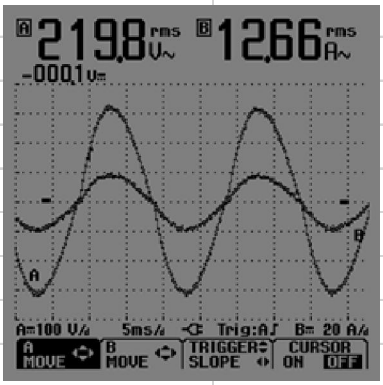

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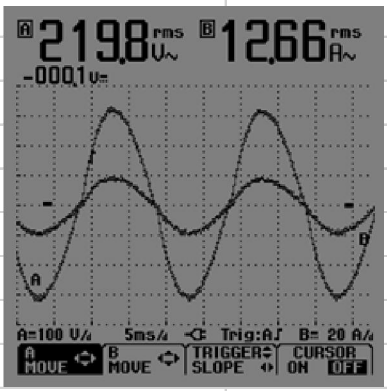

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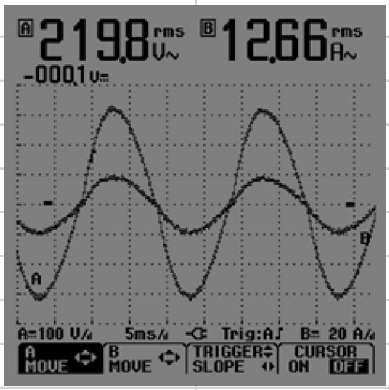


TEST CERTIFICATE

DATE			PAGE - 2
MODEL		SERIAL NUMBER	
Tipology	Ups on line		

INPUT MAINS - DETAILS	
Nominal voltage	
Minimum voltage	
Maximum voltage	
Frequency	

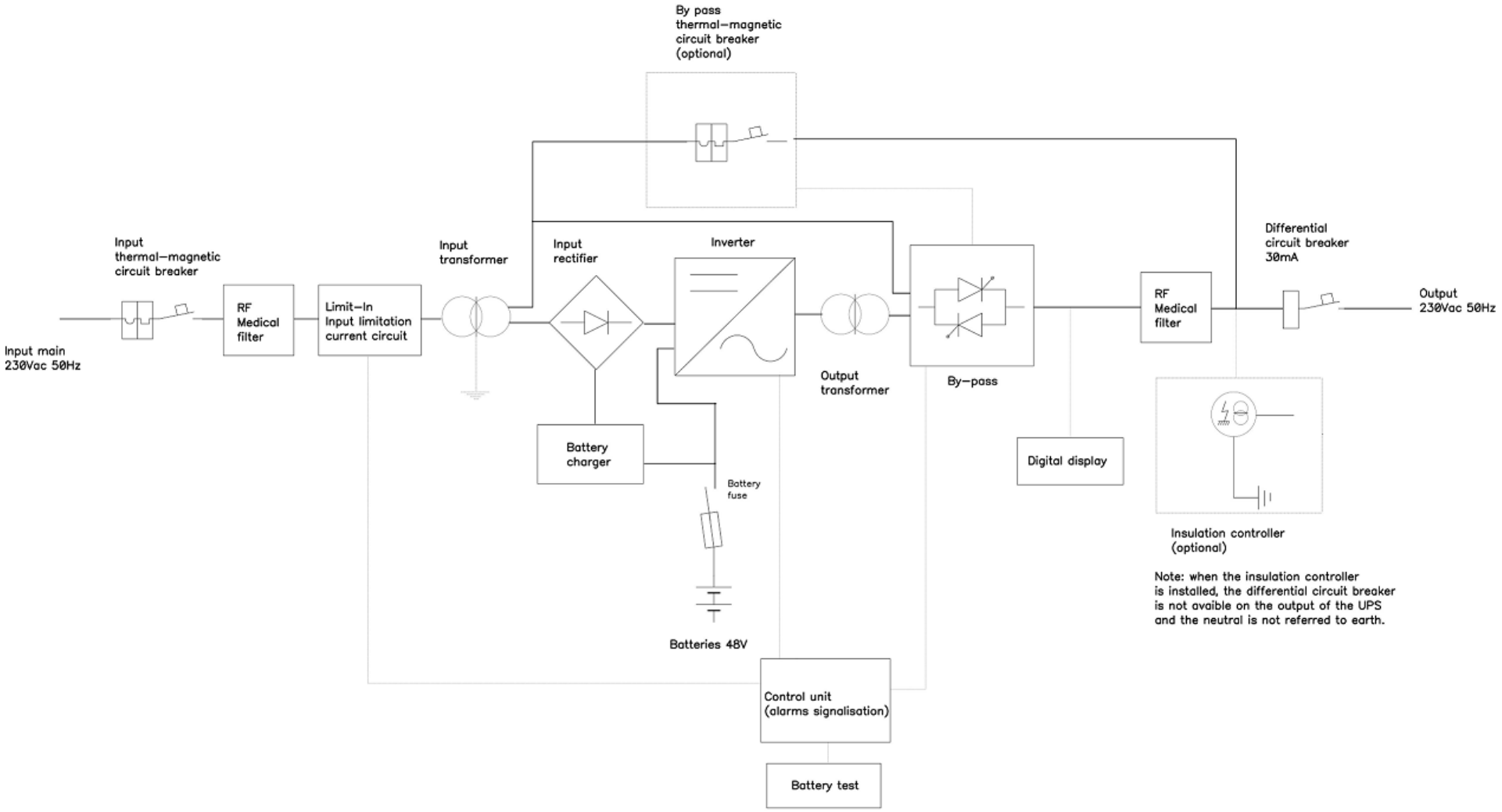
BATTERY - DETAILS	
Battery charger voltage	
Battery charger current	
Battery low alarm voltage	
Battery discharge voltage	

CONTROLS PROVIDED		
Controls	**Checked**	**NOT available**
Cables control		
Pilot board calibration		
Battery charger calibration		
Battery mode check		
By-pass mode check		
LED alarms check		
Remote alarms check		
Display check		
Battery test check		
Automatic switches check		
Earth leakage switch check		
Insulation controller check		
Ventilation check		
Electrical datas label check		
Identification labels check		

TESTED BY

TECHNICAL FEATURES AND BLOCK SCHEME

Technical features / MODEL		ERGON-MED 2	ERGON-MED 4	ERGON-MED 6	ERGON-MED 9	ERGON-MED 12	ERGON-MED 15	ERGON-MED 18
POWER	Active nominal power	400W	900W	1350W	2100W	3000W	3375W	4050W
	Output current (linear load)	1.9A	3.9A	5.8A	9.1A	13A	14.6A	17.6A
	Peak power for 5"	800W	1400W	2200W	3200W	4000W	5500W	6000W
INPUT	Voltage range	230Vac single-phase +/-10%						
	Frequency range	50Hz +/-5% (max speed 0,5Hz per second)						
	Toroidal insulation transformer	6000V of galvanic isolation + electrostatic shield between primary and secondary						
	Protections	Circuit breaker 6A	Circuit breaker 10A	Circuit breaker 10A	Circuit breaker 16A	Circuit breaker 16A	Circuit breaker 20A	Circuit breaker 25A
	Connections	Integrated Schuko cable (Terminals as option)					Terminals	
	Limit-in	Input current limiter						
OUTPUT	Voltage (V)	230Vac single-phase						
	Frequency	50Hz +/- 0,01% (with quartz mains phased)						
	Toroidal insulation transformer	4000V of galvanic isolation						
	Wave form	Sinusoidal, generated by microprocessor in mains phased						
	Soft-start	Serial						
	Connections	Nr. 1 multi standard socket (Terminals as option)					Terminals	
	Electrical protection	Earth leakage switch 30mA (insulation controller with output breaker option)						
	Electronic protection	Overload – Short circuit						
	Linear load distortion	<5%						
	Not linear load distortion	<8%						
	Static voltage variation	<1%						
	Dynamic voltage variation	+/- 3%						
BY-PASS	Automatic static switch	6000V of galvanic isolation + electrostatic shield						
TECHNOLOGY	On-line	Double conversion PWM with microprocessor						
	Inverter	"SELV" low voltage						
	Switching time	Without switching time						
	Inverter efficiency	>82%						
BATTERIES	Voltage	24V	48V					
	Type	Hermetic, sealed-lead acid batteries						
	Number/Capacity	2x 9Ah	4x 9Ah	4x 9Ah	8x 9Ah	8x 9Ah	4x 24Ah	4x 33Ah
	Expected life	10 years						
	Fuses	10x38 32AT	10x38 32AT	10x38 32AT	22x58 80AT	22x58 80AT	22x58 100AT	22x58 100AT
	Max recharging current	1.2A	1.8A	1.8A	1.8A	1.8A	5A	5A
	Typical back-up time (70% load)	20 min.	20 min.	12 min.	15 min.	8 min.	12 min.	12 min.
SIGNALS	Optics and acoustics	Mains ON, battery mode, battery low, danger temperature, stop temperature, overload, by-pass mode, insulation fault, battery test						
	Remote contacts	Remote on/off, Mains failure, battery low, GENERAL ALARM (danger temperature, stop temperature, overload/short circuit, insulation fault (if present), battery test)						
ENVIRONMENT CONDITIONS	Stocking temperature	-10°C a +60°C						
	Functioning temperature	0°C a +40°C						
	Noise level	27dB	32db	32db	32db	32db	37db	37db
CABINET	Tower	243x585x482h	243x585x482h	243x585x482h	243x585x482h	243x585x482h	355x782+53x765h	355x782+53x765h
	Weight - Kg.	30	35	45	60	80	70+60	77+70
	Protection degree	IP20						


By pass
thermal–magnetic
circuit breaker
(optional)
Input
thermal–magnetic
circuit breaker
Input main
230Vac 50Hz
RF
Medical
filter
Limit–In
Input limitation
current circuit
Input
transformer
Input
rectifier
Inverter
Output
transformer
By–pass
Differential
circuit breaker
30mA
RF
Medical
filter
Output
230Vac 50Hz
Battery
charger
Battery
fuse
Batteries 48V
Digital display
Insulation controller
(optional)
Note: when the insulation controller
is installed, the differential circuit breaker
is not avaible on the output of the UPS
and the neutral is not referred to earth.
Control unit
(alarms signalisation)
Battery test

SECTIONS FEATURES

SECTIONS	DESCRIPTION
RFI INPUT FILTER	Double stage filter applied in order to reduce the inverter harmonics. Compliant to the medical requirement with earth leakage current less than 500µA
INPUT CIRCUIT BREAKER	A thermic-magnetic bipolar type circuit breaker to protect input line from current increases due to any anomaly. When the nominal current is exceeded the breaker occurs stopping the unit supply. Curve type C.
INPUT PEAK POWER LIMIT-IN CIRCUIT	This circuit allows the transformer core low magnetization. It is controlled from the pilot board to allow the battery test. In this case a power relay will stop the mains supply and the unit will work in battery mode till the final order from the pilot board at the end of the test.
INPUT TOROIDAL TRANSFORMER	Toroidal transformer with 6000V of galvanic insulation and electrostatic shield between primary and secondary winding. It provides the low voltage to the rectifier and protect from any electric discharge. The secondary winding is dedicated to the by-pass section.
RECTIFIER	Rectifier used to create the continuous voltage to supply the inverter and battery charger.
BATTERIES	Hermetic lead batteries with 99% gas recombination These batteries are selected with high quality standards and high performances because they have to sustain high discharging currents. They are connected in series of four batteries with a total voltage of 48V, also parallel connection is permitted. The Ah capacity depends on the back up time required. They are connected to a power diode that it will operate with mains failure allowing the inverter functioning.
BATTERY CHARGER	Switching type with power MOS at PWM pulse. The recharging voltage is regulated through a trimmer during testing process, the set up value is 13.7V for each battery, for a total of 55V with a battery pack of 48V. The recharging current is regulated by adding or removing power resistors. The battery charger is directly supplied from the rectifier, and it is always functioning with mains present even if the inverter is off. (pilot board off), allowing the batteries fast recharge in every condition. One tenth of the battery capacity in the optimal recharging current.
POWER BOARD SINE WAVE INVERTER	The power board convert the continuous voltage coming from the rectifier or from the batteries into alternate low voltage. Characterized from really high reliability.
PILOT CONTROL BOARD	This board is studied for the unit total control. Through a 20 poles flat cable it communicate with the power board from which is controlled the power supply, the mosfet functioning, the MOS and output currents. The pilot board also controls the by-pass and remote contact boards. It has two microprocessors: one is dedicated to creates the mains phased sine wave and it controls the signaling and alarms, the second one is dedicated to control the automatic and manual battery test.
OUTPUT TOROIDAL TRANSFORMER	Toroidal transformer with 4000V of galvanic insulation. It raised the inverter low voltage, isolating it from the load.
STATIC SWITCH BY-PASS	The by-pass board is managed from a microprocessor that communicates with the pilot and power board. Its principal function is to switch the inverter output to the isolated mains coming from the input transformer (secondary winding connected to the by-pass board). The by-pass modality will happen with the following situations: overload, over temperature, manual-by-pass using, inverter or power board fault.

RFI OUTPUT FILTER	Single-stage filter applied in order to reduce the inverter harmonics.
OUTPUT EATH LEAKAGE SWITCH	Earth leakage switch for output protection. It stops the circuit when there is an earth leakage on the ground.
MESURE DISPLAY	LCD display with blue light allows the following monitoring: output voltage and current. The board is managed by a microprocessor what control the alphanumeric display.
REMOTE CONTACTS ON TERMINALS	The remote contact board is dedicated to provide remote signal and to switch on/off the unit. It is directly controlled by the pilot board; all the contacts are carried out into a terminal connector.
OUTPUT CIRCUIT BREAKER (option together with the insulation controller)	A thermic-magnetic bipolar type circuit breaker to protect the output from current increases due to any anomaly. When the nominal current is exceeded the breaker occurs stopping the unit supply. Curve type C.
INSULATION CONTROLLER (option)	The insulation controller is a device used to permanently keep under control the insulation of single-phase or three-phase networks with neutral, which are earth insulated or without neutral. On the controller frontal panel are located the operating and fault signals, the test pushbutton and the setting level regulation. When there is an insulation fault, the unit will enable a RED LED on the frontal panel together with a continuous sound and a remote control. The insulation controller it is built instead of the earth leakage switch, before the output circuit breaker that it will remain present on the unit. It is on din rail solution and it is supplied directly from the unit output.
MANUAL BY-PASS (option)	The manual by-pass is an automatic breaker arranged on the unit rear side used to “by-pass” the system in case of unit problems. It is directly connected to the 230V input transformer secondary winding to avoid the galvanic insulation lack during manual by-pass functioning. With this solution the load is connected to the mains always through the toroidal transformer with 6000V isolation.

UNIT LAYOUT – ALL VERSIONS

TOWER VERSION
UNIT DIMENSIONS:
mm. 243x585x482h

TOWER VERSION
UNIT DIMENSIONS:
mm. 355x835x765h

WALL MOUNTED VERSION

RACK VERSION

FRONTAL PANEL DETAILS

LED	SIGNALLINGS
MAINS PRESENT	BLUE LED: mains present indication
BATTERY MODE	YELLOW LED / short intermittent sound: battery mode indication
BATTERY LOW	RED LED / long intermittent sound: battery in discharging indication RED LED / fix sound battery exhausted indication, stop output supply
DANGER TEMPERATURE	YELLOW LED / long intermittent sound: danger temperature or critical level indication. To check the unit ventilation is suggested.
STOP TEMPERATURE	RED LED / fix sound High temperature indication due to wrong unit ventilation. The unit will work in by-pass mode, providing continuity to the load
OVERLOAD	RED LED / fix sound Overload indication. The unit will work in by-pass mode, providing continuity to the load

LED	SIGNALLINGS
BY-PASS	RED LED / fix sound By-pass mode indication
INSULATION FAULT (option)	RED LED / fix sound Insulation fault indication
BATTERY STATUS	BICOLOR RED/GREEN LED Battery check status: GREEN LED – batteries OK RED LED – batteries fault

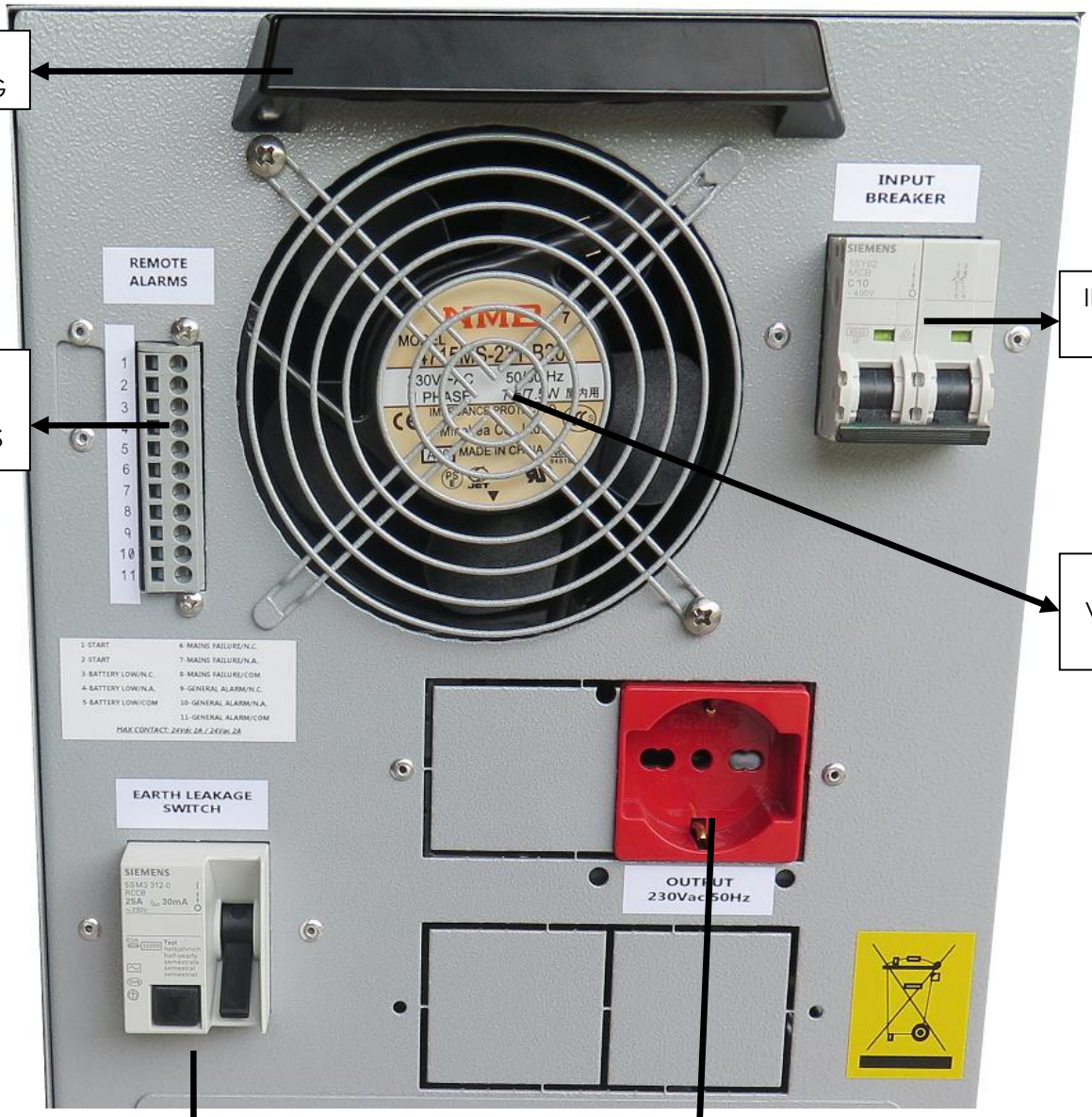
BUTTONS	SIGNALLINGS
ON/OFF	Inox button with IP67 protection degrees with blue led. Switch on/off the unit; the blue led indicated that the unit is on.
BATTERY TEST	Black button to activate the led test or battery test. PUSHED FOR 2 SECONDS: Led and acoustic check PUSHED FOR 5 SECONDS: the unit switches in battery mode yellow led "battery mode" ON blue led "mains on" OFF green led "battery test" flashing with short intermittent sound At the battery test end, the bicolor led will shows the final result: GREEN LED – batteries OK RED LED – batteries fault

MESURE DISPLAY DETAILS:
V+I OUTPUT

UNIT REAR SIDE VIEW – ALL VERSIONS

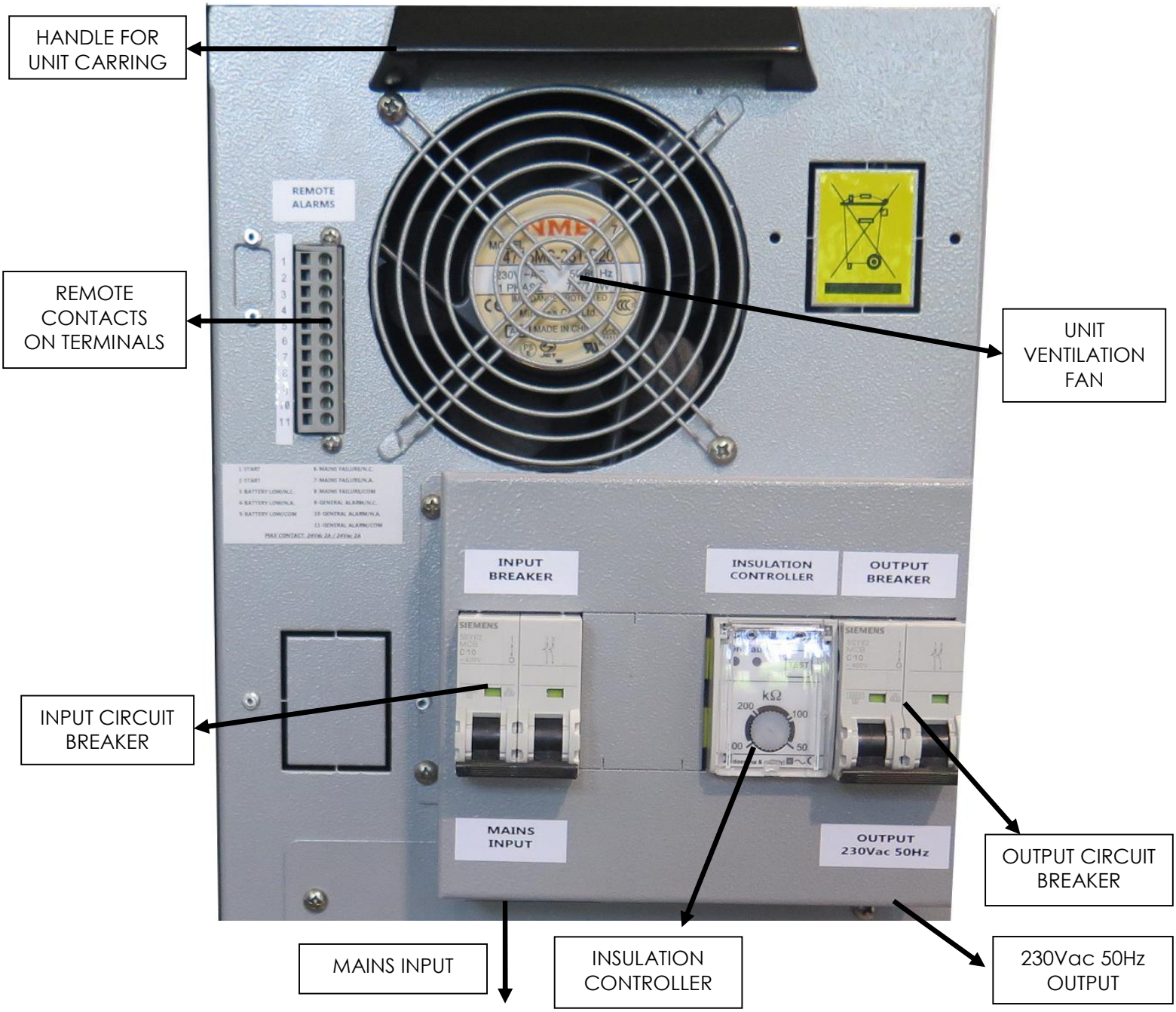
TOWER VERSION
UNIT DIMENSIONS:
mm. 243x585x482h

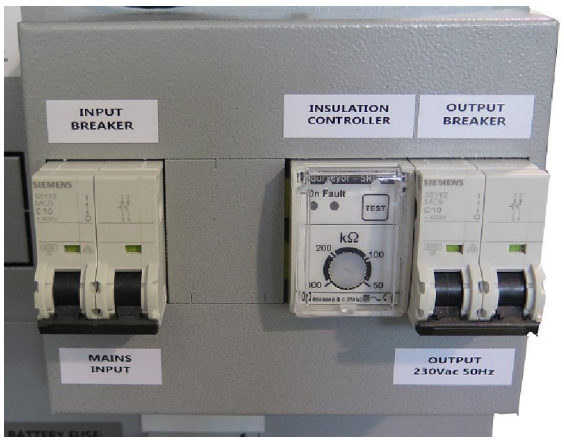
STANDARD VERSION

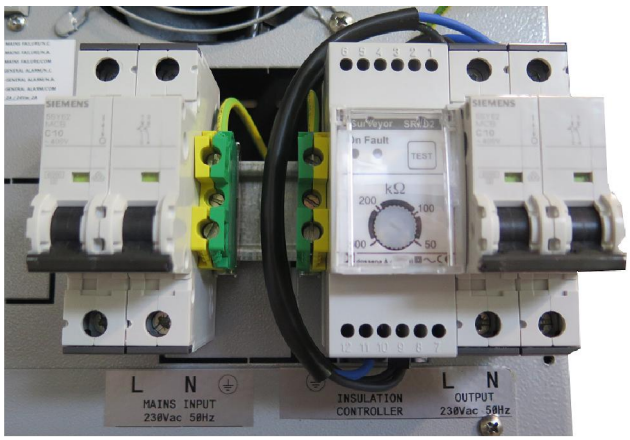

HANDLE FOR UNIT CARRING
REMOTE ALARMS
REMOTE CONTACTS ON TERMINALS
INPUT BREAKER
INPUT CIRCUIT BREAKER
UNIT VENTILATION FAN
EARTH LEAKAGE SWITCH
OUTPUT 230Vac 50Hz
EARTH LEAKAGE SWITCH
230Vac 50Hz OUTPUT

TOWER VERSION
UNIT DIMENSIONS:
mm. 243x585x482h

VERSION
TERMINALS
UNDER BREAKERS

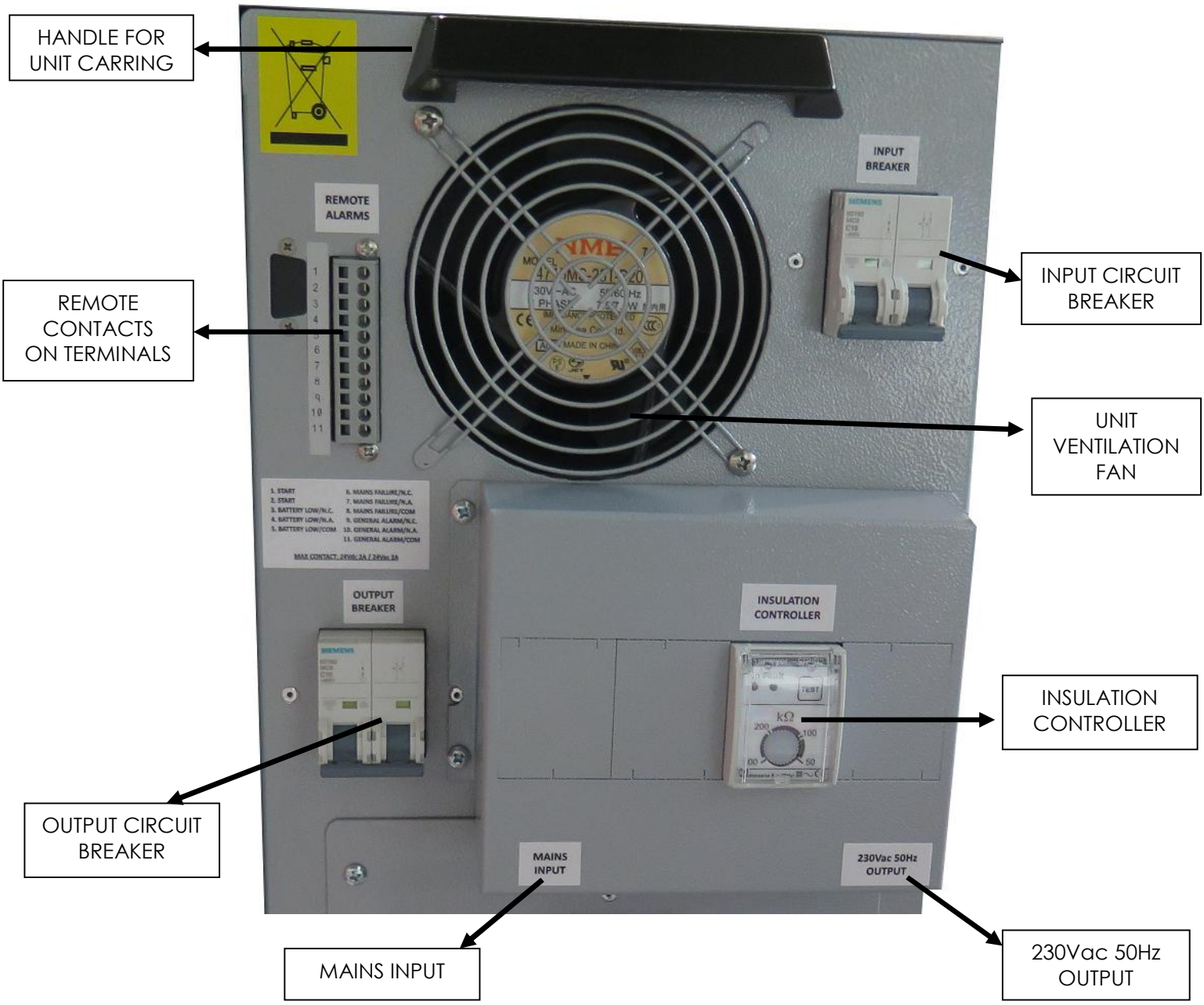

HANDLE FOR UNIT CARRING
REMOTE CONTACTS ON TERMINALS
UNIT VENTILATION FAN
INPUT CIRCUIT BREAKER
OUTPUT CIRCUIT BREAKER
MAINS INPUT
INSULATION CONTROLLER
230Vac 50Hz OUTPUT
REMOTE ALARMS
INPUT BREAKER
INSULATION CONTROLLER
OUTPUT BREAKER
MAINS INPUT
OUTPUT 230Vac 50Hz

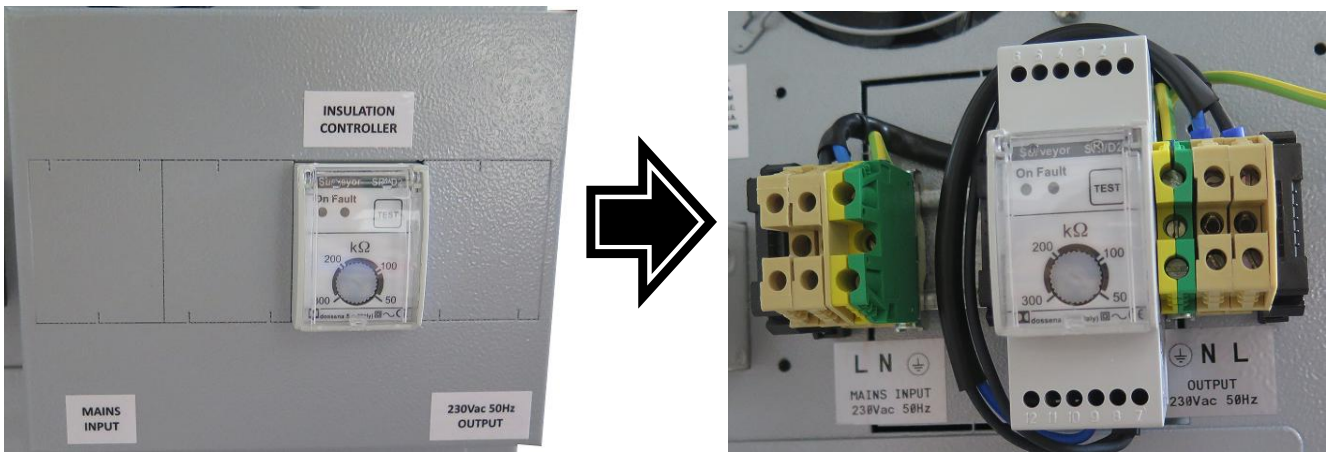

INPUT BREAKER
INSULATION CONTROLLER
OUTPUT BREAKER
MAINS INPUT
OUTPUT 230Vac 50Hz


L N
MAINS INPUT 230Vac 50Hz
INSULATION CONTROLLER
L N
OUTPUT 230Vac 50Hz

TOWER VERSION
UNIT DIMENSIONS:
mm. 243x585x482h

VERSION
IN/OUT
ON TERMINALS


HANDLE FOR UNIT CARRING
REMOTE ALARMS
INPUT BREAKER
INPUT CIRCUIT BREAKER
REMOTE CONTACTS ON TERMINALS
UNIT VENTILATION FAN
OUTPUT BREAKER
INSULATION CONTROLLER
INSULATION CONTROLLER
OUTPUT CIRCUIT BREAKER
MAINS INPUT
230Vac 50Hz OUTPUT
MAINS INPUT
230Vac 50Hz OUTPUT


INSULATION CONTROLLER
MAINS INPUT
230Vac 50Hz OUTPUT
On Fault
TEST
kΩ
L N
MAINS INPUT 230Vac 50Hz
N L
OUTPUT 230Vac 50Hz

BATTERY SECTION

BATTERY BOX
WITH
HERMETIC LEAD BATTERIES

BATTERY PACK VOLTAGE: 48Vdc

TOWER VERSION
UNIT DIMENSIONS:
mm. 355x835x765h

VERSION WITH EARTH LEAKAGE SWITCH

REAR PANEL – ELECTRONIC SECTION DETAILS

REMOTE CONTACTS ON TERMINALS

UNIT VENTILATION FAN

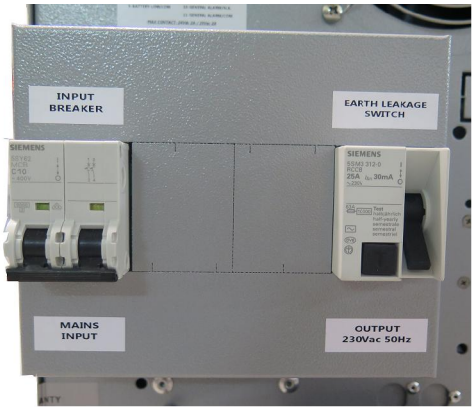
INPUT CIRCUIT BREAKER

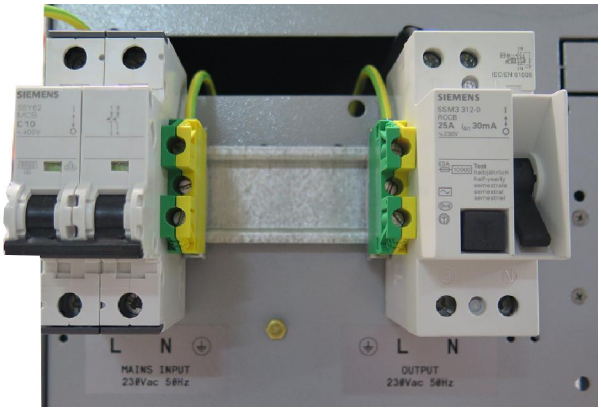
EARTH LEAKAGE SWITCH

MAINS INPUT

230Vac 50Hz OUTPUT

GROUND CONNECTION

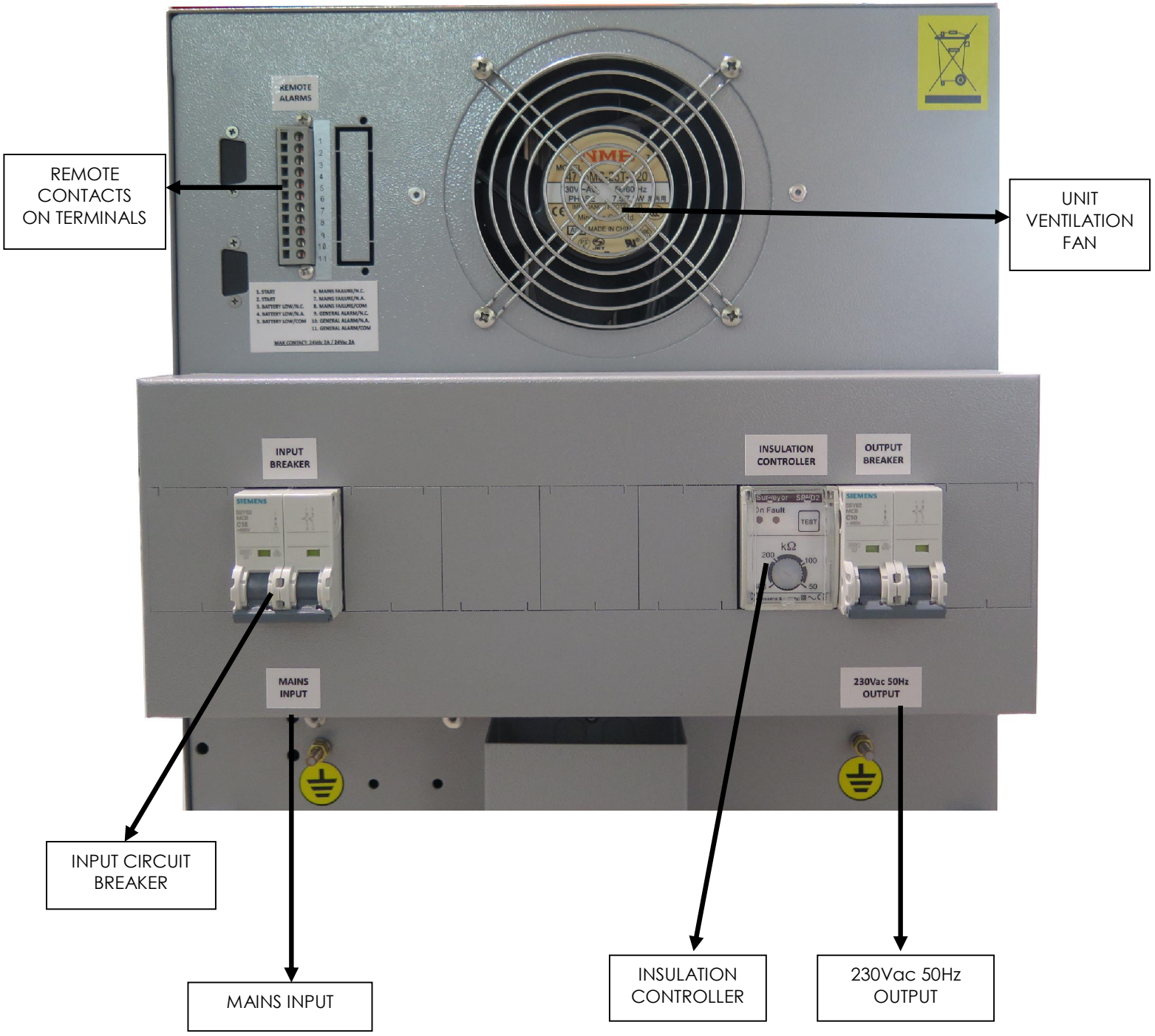


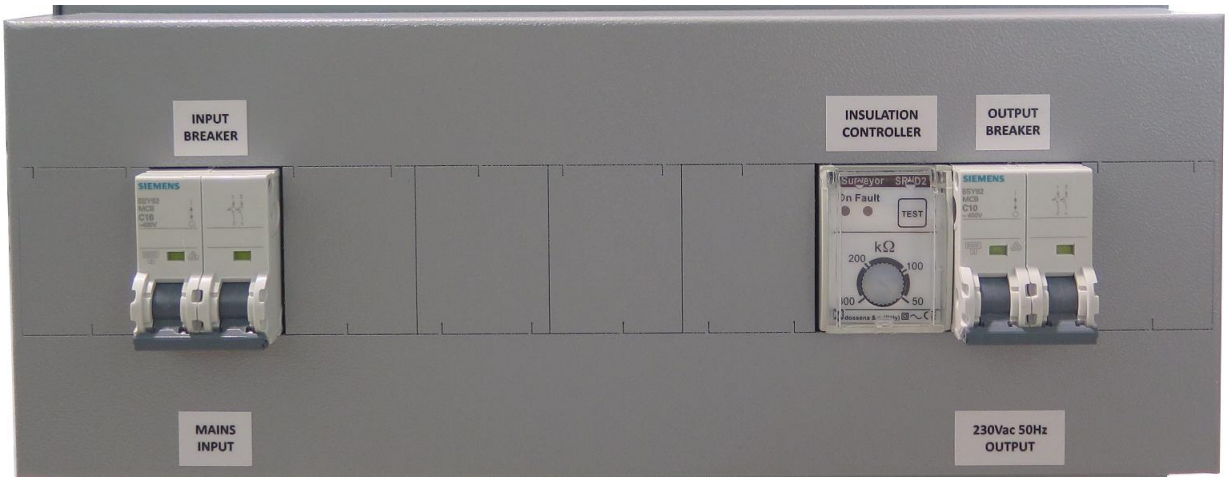


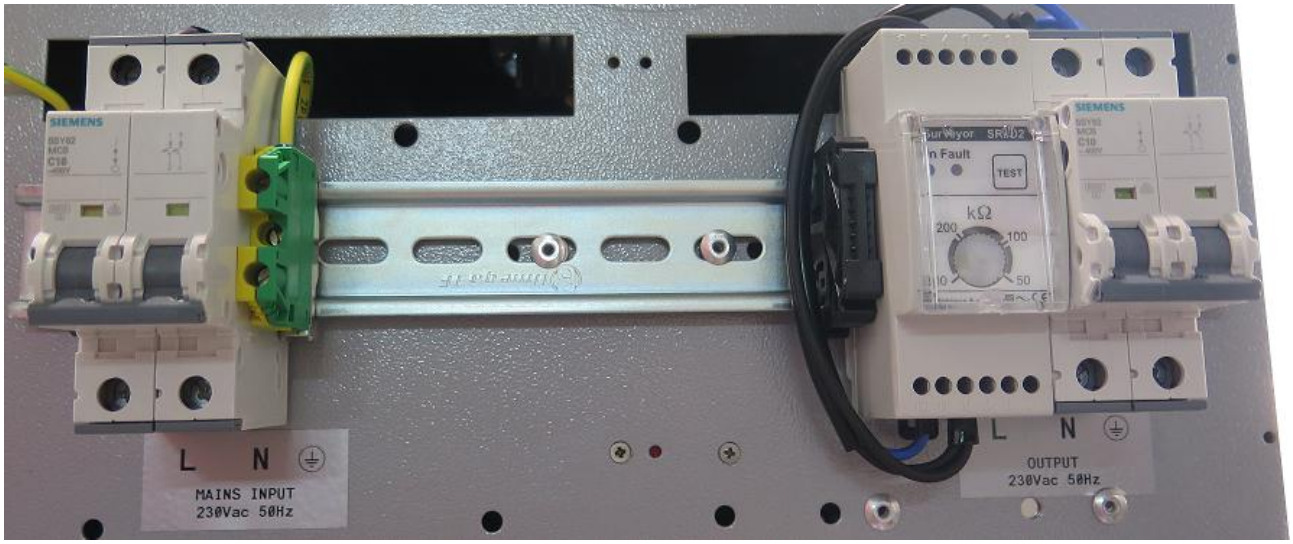
TOWER VERSION
UNIT DIMENSIONS:
mm. 355x835x765h

VERSION WITH INSULATION CONTROLLER

REAR PANEL – ELECTRONIC SECTION DETAILS




INPUT BREAKER
INSULATION CONTROLLER
OUTPUT BREAKER
MAINS INPUT
230Vac 50Hz OUTPUT


L N
MAINS INPUT
230Vac 50Hz
L N
OUTPUT
230Vac 50Hz

BATTERY SECTION – DETAILS

BATTERY FUSE

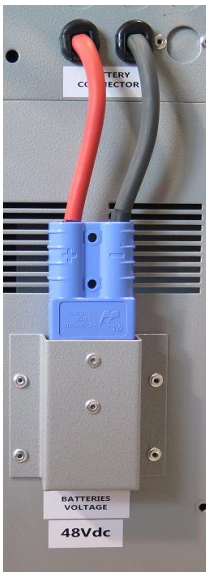
TUNNEL COVER battery pack connection

GROUND CONNECTION

BATTERY BOX
WITH
HERMETIC LEAD BATTERIES

BATTERY PACK VOLTAGE: 48Vdc

BATTERY PACK CONNECTION



1.
Connect the BATTERY PACK through the ANDERSON CONNECTOR

2.
Cover the connection with dedicated TUNNEL COVER

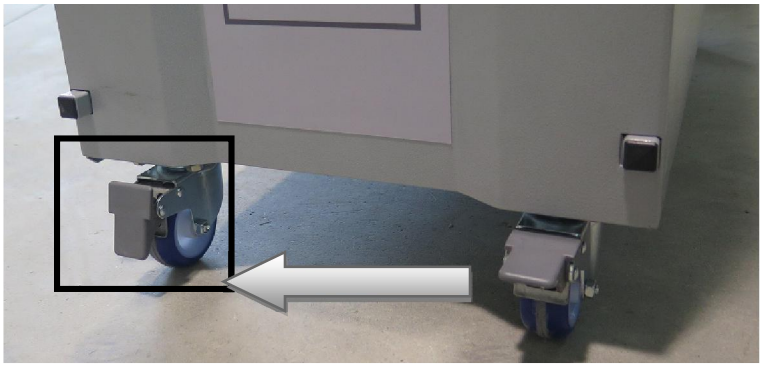
UNIT HANDLING

The unit is equipped with EXTRACTABLE HANDLES useful for an easy carrying.

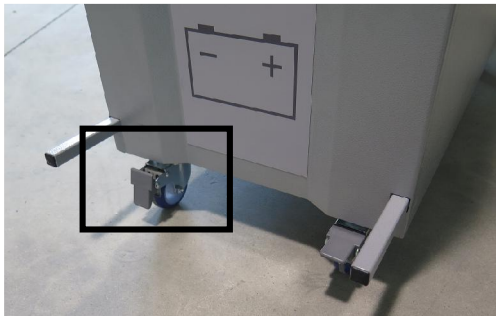
Place the electronic section OVER the battery box section.
Take care that the two sections are well fixed together

The Ergon-Med is equipped with four wheels for handle it on the ground, take care to move it carefully due to the high weight.

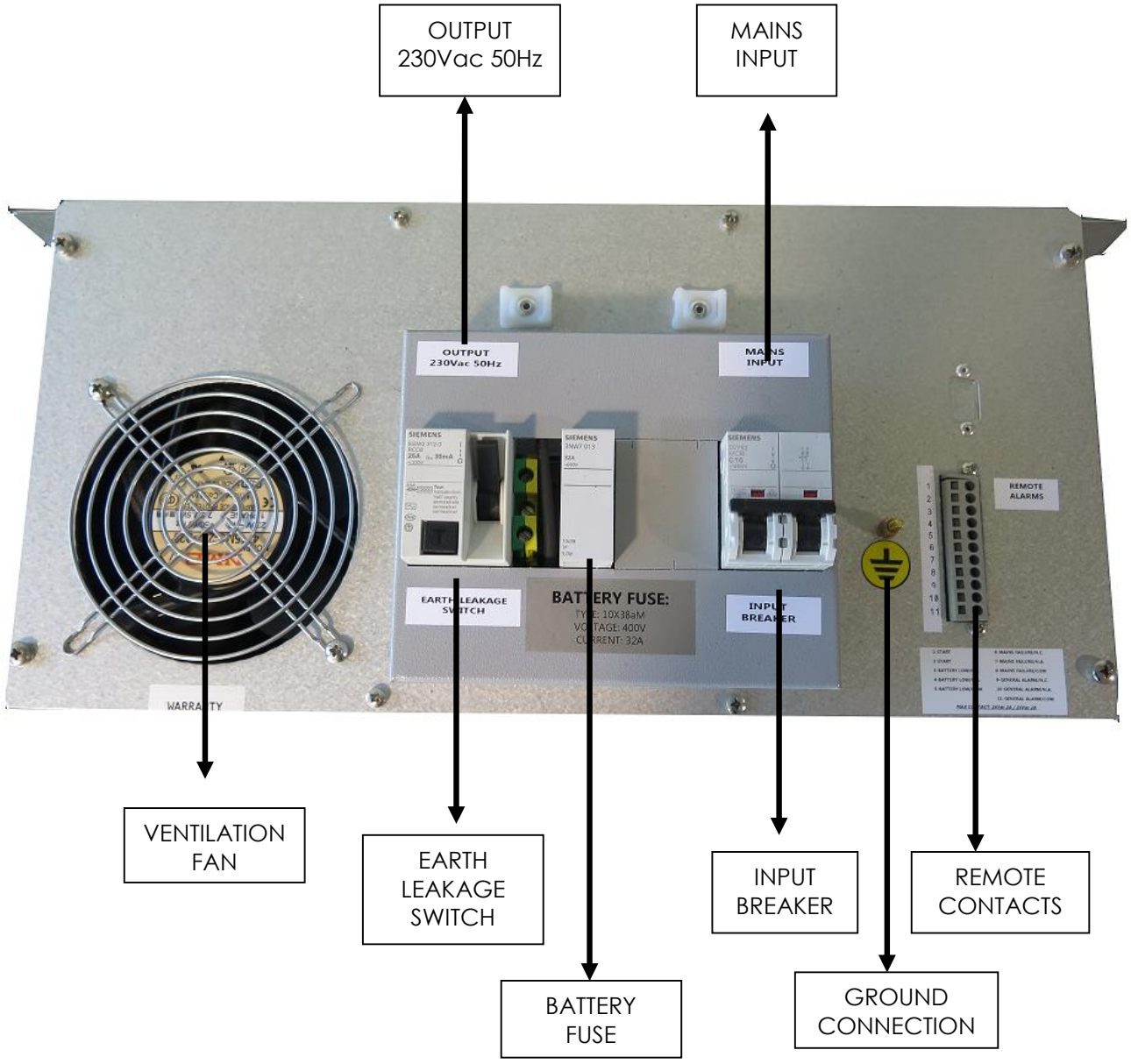
When the unit is placed in the dedicated area, block the four wheels through the related brakes:

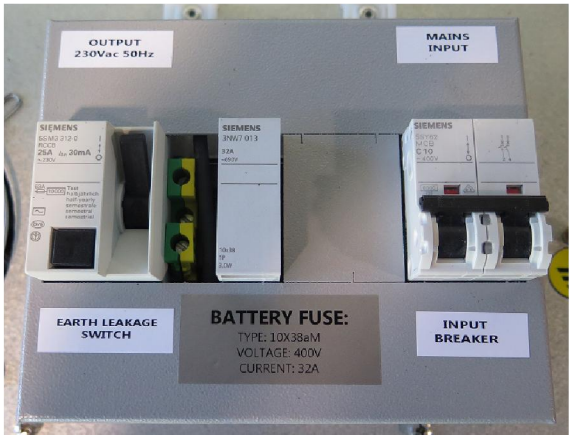


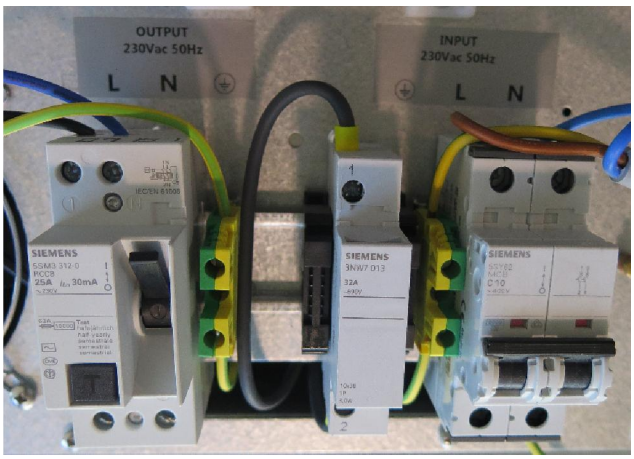
EXTRACTABLE HANDLES



WALL MOUNTED VERSION
RACK VERSION



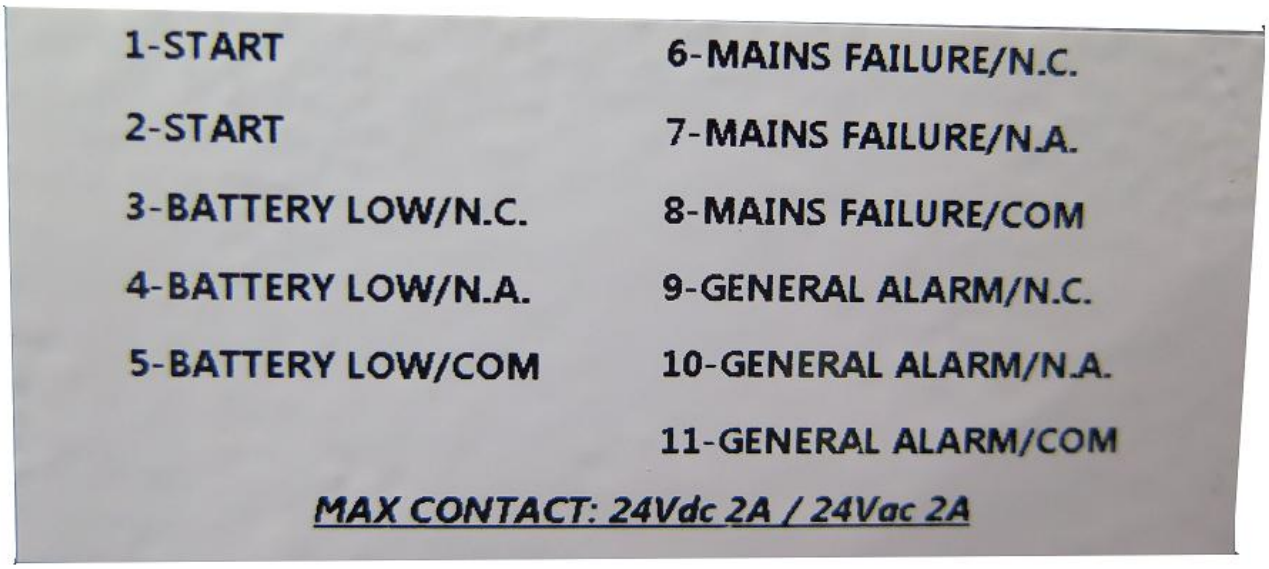




REMOTE TERMINAL CONTACTS – DETAILS

CONTATTI	DESCRIZIONE
1	START
2	START
3	BATTERY LOW NORMALLY CLOSED
4	BATTERY LOW NORMALLY OPEN
5	BATTERY LOW COMMON
6	MAINS FAILURE NORMALLY CLOSED
7	MAINS FAILURE NORMALLY OPEN
8	MAINS FAILURE COMMON
9	GENERAL ALARM NORMALLY CLOSED
10	GENERAL ALARM NORMALLY OPEN
11	GENERAL ALARM COMMON

MAX CONTACT:
24Vdc 2A
24Vac 2A



CAUTION BEFORE INSTALLING

WARNING:
DO NOT INSTALL THE UNIT IF VISIBLE DAMAGES ARE PRESENT

It is required to respect safety caution during implant installation according to in force norms.

Before proceeding with unit connection, please assure that technical data on the metallic label are matched with system input and output.

For the unit safety it is obligatory to arrange the ground connection implant.
This operation and also the installation should be performed by a qualified technician.
When ground connection lack, the manufacturer should not be considered responsible for any damage caused to things and people.
Qualified personnel such as technician/installer has to verify the implant electric current capacity moreover, it has to assure correct implant sizing checking if cable section is suitable to equipment and connected load features.
Take care to keep standard and proper colour and position of the connecting cable.

Our ERGON-MED wiring keep the following features:

Phase	Black – Brown indicated with "L1"
Neutral	Blue indicated with "N"
Earth (PE)	Yellow/Green with dedicate symbol
Positive batteries	Red with symbol "+"
Negative batteries	Black with symbol "-"

For not integrated-cable models the input and output identifications, such as other user parts (for example fuses, automatic switch, etc.) are indicated with label put on the rear side (Except for specific and customized versions).While the input and output position is indicated with label under the unit connections.
The remote contacts are indicated with labels next to the connections.

WARNING
PHASE AND NEUTRAL CONNECTIONS MUST BE STRICTLY RESPECTED.
OTHERWISE THE SYSTEM MAY NOT CORRECTLY WORK OR EVEN CAUSE DAMAGES.

COMPATIBILITY ANALYSIS

Power

The public mains connection is normally allowed because the Ergon-Med is similar to a passive load.
The supply source has to provide a higher power than the unit nominal power because it has to take care of these following features:

- power absorbed by the load located at the unit output
- unit performances
- power dedicated for battery recharge
- harmonic distortion

Generator

Please take care about the generator power sizing located at the ups input. If using a generator before the Ergon-Med, the generator has to be superior of 30% of nominal unit power. The generator frequency must have a maximum variation of +/-5% and a maximum oscillation speed of 0,5Hz/seconds. These elements are essential for the correct functioning.

Cable sizing:

Here follow the main factors that should condition the cable sizing:

- voltage
- current
- over current
- temperature
- cable placing
- cable length

In any case as general rule is correct to size the cables in order that the voltage drop is lower than 3% of the applied voltage.

POWER SUPPLY CABLE NOMINAL SECTIONS	
NOMINAL CURRENT (I) OF THE DEVICE EM (A)	**NOMINAL SECTIONS**
I ≤ 6	1,5 mm2
6 < I ≤ 10	2,5 mm2
10 < I ≤ 16	4 mm2
16 < I ≤ 25	6 mm2
25 < I ≤ 32	10 mm2
32 < I ≤ 40	16 mm2

UNIT INSTALLATION AND START-UP PROCEDURE

WARNING
THIS PROCEDURE IS ALLOWED ONLY TO TECHNICAL PERSONNEL PROVIDED WITH SPECIALIZED ELECTRIC EQUIPMENT INSTALLATION KNOWLEDGE.
THE ERGON-MED SHOULD BE INSTALLED ONLY RESPECTING THE IEC 60364-4-42 PRESCRIPTIONS.

- Set power supply with a protection to be suitable for the Ergon-Med power; the device should have a distance between the contact not less than 3mm and should be reached easily.
- Verify that the ground connection implant is adequate.
- Connect the input schuko cable to the mains, with terminals version connect through input terminals the mains cable
- Connect the load through the output socket or output terminals
  WARINING: it is suggested to connect a load power not more than the 70% of unit nominal power .
- Enable the implant circuit breaker (previously installed)
- Enable the input circuit breaker on the unit rear side
- Push the ON/OFF button on the unit frontal panel
- Check that the blue LED "main on" is ON
  If the blue LED "mains on" is not enabled do not proceed with other operations and after checking the mains presence, contact the manufacturer.
- Connect the battery fuse.
- Enable the earth leakage switch or the output breaker on the unit rear side to supply the load.
  The unit will supply the load.

AFTER-INSTALLATION CHECK AND ERGON-MED FUNCTIONING

After-installation check

In order to check the correct unit functioning after the installation, some controls are suggested:

- Output voltage and current through the LCD display on the unit frontal panel
- The load absorbed current should not be higher than the unit nominal power (check the electrical data on the unit identification label)

- Enable the manual battery test pushing for 5 seconds the black button "battery test" on the unit frontal panel. This operation let the unit pass into battery mode (blue led "mains on" OFF, yellow led "battery mode" ON with short intermittent sound)
  During the battery test, the bicolor led "battery ok/fault" is flashing, after some minutes, when the test is finished the bicolor led will show the result:
  battery ok – GREEN LED
  battery fault – RED LED
  If test result is red led "battery fault" it is suggested to charge the equipment for at least 24 hours and repeat battery test procedure. This particular anomaly could appear in case of storage, previous battery functioning and/or lasting lack of use.
  If the anomaly persists please contact the manufacturer.

  Automatic and manual battery test:
  The unit is equipped with an automatic and manual battery.
  Through a black button on the unit frontal panel is possible to activate the led test or battery test:
  PUSHED FOR 2 SECONDS → Led and acoustic check
  PUSHED FOR 5 SECONDS → the unit switches in battery mode
  yellow led "battery mode" ON
  blue led "mains on" OFF
  green led "battery test" flashing with short intermittent sound
  At the battery test end, the bicolor led will shows the final result:
  GREEN LED – batteries OK
  RED LED – batteries fault
  The automatic battery test is done every 4 months directly from the unit.
  Take care that the 4 months period is recalculated all the time is done a manual battery test.
  Minimum test time: 2,5 minutes. Depending on the unit model or back up time the duration may improve.

Unit functioning

- MAINS ON MODE
  the load is supplied through the unit, with double conversion technology in order to avoid any type of mains interferences and to allow a stabilized output voltage.
  Simultaneously the systems assure the correct batteries stand-by charging to be always efficient. Blue LED "mains on" ON.

- BATTERY MODE
  when mains failure occur, the load will be supplied through the batteries granting constant/steady load supply, without interruption. Yellow LED "battery in use" ON with short intermittent sound.
  Back-up time may change according to connected load and battery status.
  When the battery are low a red LED "battery low" switches ON with a long intermittent sound. Take care that back-up time is finishing!
  When the back-up time is finished, the unit will stop to supply the load and the RED led "battery low" remain ON but with a fixed sound.
  When mains recover, the unit will restart automatically to supply the load and to recharge the batteries.
  The battery charger works with mains present (taking care that the battery switch is ON). The charging is also with the frontal button in OFF position.

SWITCHING OFF PROCEDURE AND DISCONNECTION

WARNING
THIS PROCEDURE IS ALLOWED ONLY TO TECHNICAL PERSONNEL PROVIDED WITH SPECIALIZED ELECTRIC EQUIPMENT INSTALLATION KNOWLEDGE.

Unit switching OFF

- Switch OFF all devices connected to the unit
- Push the ON/OFF button on the unit frontal panel to switch OFF the unit.

WARNING
The unit is still supplied from mains and from batteries! Dangerous voltages are present! Electric shock risk!

Unit disconnection

- Switch OFF all devices connected to the unit
- Switch OFF earth leakage switch or the output breaker
- Switch OFF the input circuit breaker; the unit is working in battery mode with a short intermittent sound
- Disconnect the battery fuse and wait 30 seconds before the complete discharge.
- Switch OFF the unit pushing the ON/OFF button on the frontal panel
- Switch OFF the implant circuit breaker (previously installed)
- Disconnect the cables

WARNING:
VERIFY THAT THERE IS NO VOLTAGE ON THE UNIT IMPLANT POWER SUPPLY

INPUT/OUTPUT PROTECTIONS

Input protection
Input circuit breaker

Output protection
Output circuit breaker + insulation controller

Temporary overload
The load is supplied for 5 seconds through the inverter.

Fixed overload
The load is supplied for 5 seconds through the inverter.
After that time if the overload is still present, the unit switches in by-pass mode.
RED led "by-pass mode" ON with fix sound and RED led "Overload" ON.
To reset this condition switch off the unit through the frontal on/off button, remove the overload and switch on again.

Short circuit
The unit have an electronic self-protection.
After 5 seconds if the short circuit is still present, the unit switches in by-pass mode and the input and output breakers trip.
RED led "by-pass mode" ON with fix sound and RED led "Overload" ON.
To reset this condition switch off the unit through the frontal on/off button, remove the short circuit condition. Enable the input and output breakers and push the ON/OFF button to restart the unit. If this procedure is successful the blue led "mains on" will activate and the unit will supply again the load.

Over temperature internal protection
If there is an over temperature situation, at 62°C the unit is in pre-alarm through a yellow led "over temperature" and an intermittent sound.
To verify the correct ventilation is suggested.
If the alarm persists please take care because at 67°C the unit switches in by-pass mode.
RED led "by-pass mode" ON with fix sound and RED led "stop temperature" ON.
To reset this condition switch off the unit through the frontal on/off button, check the correct ventilation and switch on again.

Battery low
An acoustic and visual pre-alarm is enabled when the battery charge is low.
If the battery is discharged the unit stops to supply the load. A red led "battery low" and a continuous sound switch on. The unit start again working immediately only when the mains comes back

PECULIAR FEATURES INSULATION CONTROLLER (option)

DEVICE USED TO PERMANENTLY KEEP INSULATION UNDER CONTROL

General description

The insulation controller is a device used to permanently keep under control the insulation of single-phase or three-phase networks with neutral, which are earth insulated or without neutral.
The instrument operates on the principle of the measurement direct voltage injection between the network under control and earth.
The device will measure the current that the plant absorbs by the voltage injection.
The voltage/current ration gives the effective value of the plant insulation resistance.
On the frontal panel are located the operating and fault signals, the test pushbutton and the setting level regulation.

Referring norms:
CEI EN 50081-2
CEI EN 50082-2
CEI EN 60529
CEI EN 61010-1

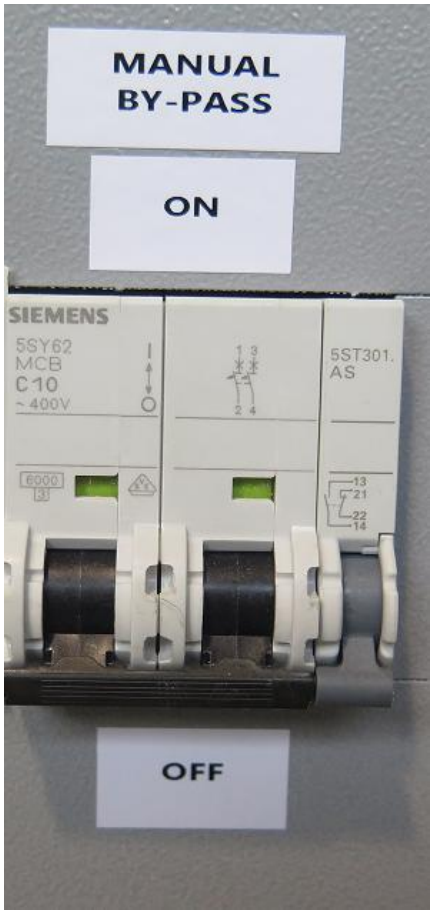
Technical characteristic

SUPPLY VOLTAGE	115-230-440Vac +15%, -20%	SCREW TERMINALS	IP 20
MAX CONSUMPTION	2,5VA	INSULATION TEST	2,5KV for 60 sec.
OPERATING FREQUENCY	50/60Hz	MAX MEASUREMENT CURRENT	< 25µA
MAX VOLTAGE NETWORK UNDER CONTROL	< 400V	INTERNAL RESISTANCE	>1 Mohm
NETWORK FREQUENCY UNDER CONTROL	50/60Hz	WORKING TEMPERATURE	-10° / +55° C
MEASUREMENT VOLTAGE	< 24Vcc/dc	WEIGHT	gr. 180
TRIPPING ACCURACY	+/-10% on the setting value	ADJUSTABLE TRIPPING VALVE	50 / 300 Kohm

WARNING
the insulation controller sensibility is settled from the manufacturer at 50Kohm.
It is up to the customer or final user to change this sensibility depending on the load connected, if necessary.

MANUAL BY-PASS (option)

The manual by-pass operation should be done only by qualified personnel and only in emergency situation.



The manual by-pass is an automatic breaker arranged on the unit rear side used to "by-pass" the system in case of unit problems.
It is directly connected to the 230V input transformer secondary winding to avoid the galvanic insulation lack during manual by-pass functioning.
With this solution the load is connected to the mains always through the toroidal transformer with 6000V isolation.

WARNING:
Take care DANGEROUS VOLTAGES present inside the unit and on input/output terminals.

Electric shock risk!

The MANUAL BY-PASS it is mainly used to RESET the unit functions in case of OVERLOAD or OVERTEMPERATURE conditions and in case of a general fault.

UNIT NORMAL FUNCTIONING – BREAKERS POSITION

Input breaker ON

Manual by-pass breaker OFF

Earth leakage switch / Output breaker ON

Frontal panel on/off button: ON

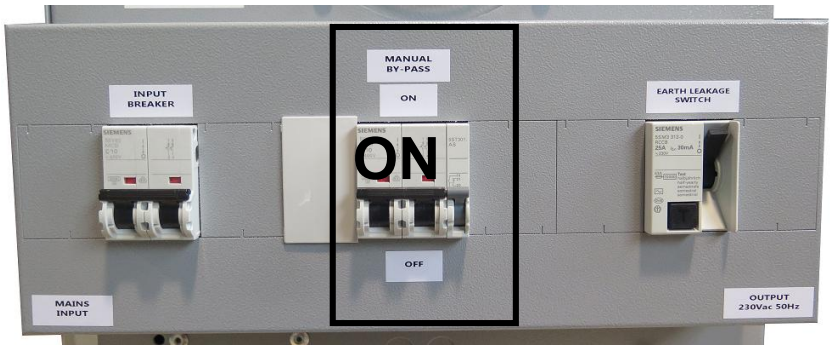
MANUAL BY-PASS PROCEDURE WITH OVERLOAD AND OVERTEMPERATURE CONDITIONS

When overload or over temperature condition are present, the unit remain in by-pass mode, with the load connected to the mains through the input toroidal transformer.
To reset this condition without disconnecting the load, it is necessary to follow the manual by-pass procedure:

1. Switch ON the manual by-pass breaker **(OFF → ON)**
2. if overload condition, remove the excessive load; if over temperature condition check the ventilation holes and fan.
3. Switch OFF the unit pushing the button on the unit frontal panel and subsequently switch ON again.
4. Verify that the RED led by-pass is ON and a fix sound present
5. Verify the BLU led mains present is ON
6. Switch OFF the manual by-pass breaker **(ON → OFF)**
7. Verify that the RED led by-pass mode and the fixed sound switches off.
8. The unit will start its normal functioning.

MANUAL BY-PASS PROCEDURE WITH GENERAL FAULT

NORMAL FUNCTIONING → MANUAL BY-PASS FUNCTIONING



1. MANUAL BY-PASS BREAKER → ON
   Red led by-pass mode ON and fix sound
2. ATTENTION: EARTH LEAKAGE SWITCH / OUTPUT BREAKER REMAIN → ON
3. ATTENTION: INPUT BREAKER REMAIN → ON
4. ON/OFF BUTTON ON FRONTAL PANEL → OFF
5. REMOVE THE BATTERY FUSE OR SWITCH OFF THE BATTERY BREAKER

WARNING:
Take care DANGEROUS VOLTAGES present inside the unit and on input/output terminals.
Electric shock risk!

MANUAL BY-PASS FUNCTIONING → NORMAL FUNCTIONING

1. ATTENTION: INPUT BREAKER REMAIN → ON
   Blu led "mains present" ON
2. ATTENTION: EARTH LEAKAGE SWTICH / OUTPUT BREAKER REMAIN → ON
3. ON/OFF BUTTON ON FRONTAL PANEL → ON
4. WAIT 20 seconds TILL THE STATIC SWITCH BY-PASS IS PHASED WITH THE MAINS
   Red led "by-pass mode" ON with fixed sound
5. INSERT THE BATTERY FUSE OR SWITCH ON THE BATTERY BREAKER
6. MANUAL BY-PASS BREAKER → OFF
   Red led "by-pass mode" OFF and no sound
7. UNIT IN NORMAL FUNCTIONING

MAINTENANCE

WARNING
MAINTENANCE OPERATIONS SHOULD BE DONE ONLY BY MANUFACTURER AUTHORIZED PERSONNEL.

MAINTENANCE AND/OR BATTERY SUBSTITUTION SHOULD BE DONE BY QUALIFIED PERSONELL AFTER DEDICATED TRAINING AT MANUFACURER PREMISES AND BY SERVICE CENTRES AUTHORIZED BY THE MANUFACTURER.

THE LACK OF THESE PROCEDURES AUTOMATICALLY INVALIDATE THE WARRANTY AND DISPENSE THE MANUFACTURER WITH ANY RESPONSIBILITY.

WARNING
UNIT FUNCTIONING INDICATE DANGEROUS VOLTAGES PRESENCE ON THE LOAD.
To avoid electrical shocks, any operation or maintenance should be done only by qualified personnel authorized by the manufacturer.

PLEASE CONTACT OUR CUSTOMER SERVICE:
service @enersine.com – phone 0332 1888121

- When problems may occur or help is needed during unit installation or use, give the following details:
  - Model or unit type
  - Serial number
  - Full description of the problems with all alarms shown by the unit.
- For ordinary maintenance operations (suggested every 3 years) and/or eventual information on assistance contracts
- For possible recommendations on the maintenance timing, that it will depend on the unit application.

PERMETTED CONTROLS BY EXTERNAL QUALIFIED TECHNICAL PERSONNEL:

- Check batteries efficiency:
  the unit is equipped with an AUTOMATIC BATTERY TEST settled every 4 months.
  To verify the "battery ok/fault" LED on the unit frontal panel is suggested:
  GREEN LED : batteries OK
  RED LED: batteries fault (please contact the manufacturer for assistance)
  If a manual battery test is necessary, push the black button "BATTERY TEST" on the unit frontal panel to enable the battery test procedure.
  Please wait till the end and proceed as previously indicated with the "battery ok/fault" LED check.
- Every year: verify the earth leakage switch or insulation controller pushing the dedicated test button, before doing this operation is suggested to disconnect the load.
- Every 6 months: verify the ventilation holes checking if objects or excessive dust are reducing the air flow through the openings.

BATTERY FUSES

The battery protection is assured by a dedicated fuse.
In case of substitution it is necessary always to install a new one with the same capacity and typology.
Please take care of the following schemes:

ERGON-MED 2 / ERGON-MED 4 / ERGON-MED 6	
DIMENSIONS	10x38
CURRENT	32A
VOLTAGE	400V
TYPE	aM

ERGON-MED 9 / ERGON-MED 12	
DIMENSIONS	22X58
CURRENT	80A
VOLTAGE	500V
TYPE	aM

ERGON-MED 15 / ERGON-MED 18	
DIMENSIONS	22X58
CURRENT	100A
VOLTAGE	500V
TYPE	aM

BATTERY FUSE SUBSTITUTION

Open the fuse box on the unit rear side;

Pull out the damaged battery fuse;

Verify the data present on the original fuse before changing it. Replace it with a new one of the same type, dimensions and characteristics;

Close the fuse box and verify the presence of the mains (blue LED "mains on" ON)

To verify the operation success is suggested to check the unit battery mode switching off the input breaker (blue led "mains on" OFF; yellow led "battery mode" ON with short intermittent sound)

WARNING: **these maintenance operations are suggested after the load disconnection.**
only when the input breaker is enabled the unit will supply the load.

WARRANTY CONDITIONS

Each unit is subjected to accurate tests, both electronic boards and general functioning.
A dedicated TEST REPORT will be provided together with each unit.

The warranty is of **36 months**, battery excluded, from the delivery date and it is EX WORKS.
Battery warranty is 12 months.

All products are guaranteed from material or defects due to manufacturer fault.

The warranty is not valid in these cases:

- Lack of the safety seal
- Any maintenance or assistance operation without authorization
- Breakdowns due to wrong installation and/or careless use
- Removal or missing of manufacturing parts

Units under warranty:
For warranty reparation, the unit should be deliver to the company with a document shipping with all the dates of the unit (model, serial number, short description of the problem). The unit repaired under warranty will be returned with transport costs and risks at the expense of the customer.

THE PRESENT MANUAL IS EDITED IN AN EASY AND COMPLETE WAY.
THIS MANUAL CAN BE MODIFIED OR UPDATED ALL TIME IS NEEDED WITHOUT ANY NOTICE FROM THE MANUFACTURER AND WITHOUT ANY OBLIGATION TO UPDATE THE MANUALS IN CIRCULATION

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