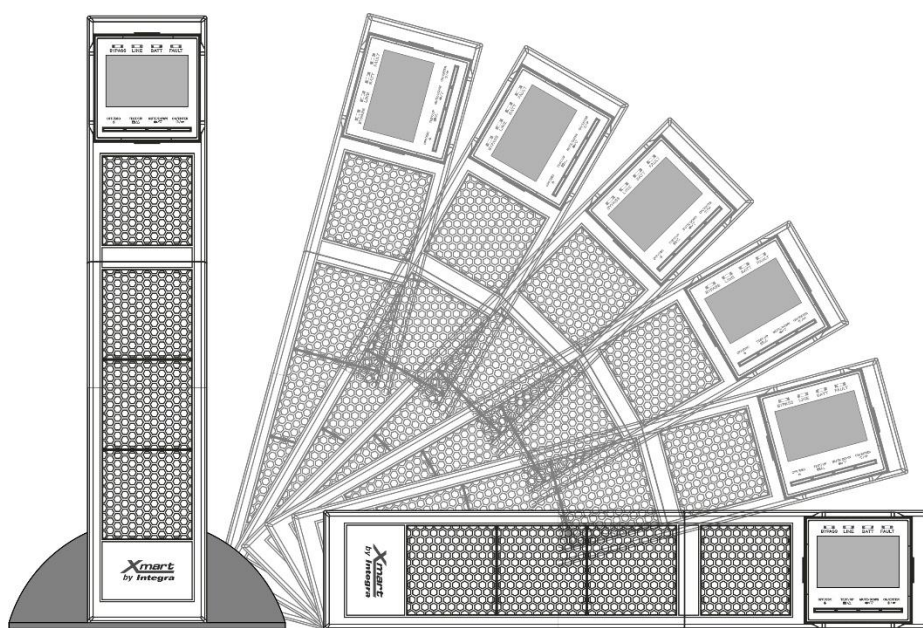


USER MANUAL OPTIMA RT10 6K/10K-UL

UPS ONLINE DOUBLE CONVERSION RACK / TOWER INSTALLATION

OPTIMA-RT10-06K-230-UL
OPTIMA-RT10-10K-230-UL
ISOTX-06K-OPT-RACK-UL
ISOTX-10K-OPT-RACK-UL



R/T : RACK / TOWER

- Technical information on this manual is property of XMART®. This manual Information cannot be copied or distributed totally or partially without written approval of XMART.
- XMART can introduce modifications in their products or manuals without further notice.
- XMART is not responsible of mistakes or missing information in this manual.
- XMART is not responsible for wrong use a third part can do of this information.
- Trademarks and logos in this manual are property of their owners.

TABLE OF CONTENTS**1. GENERAL SAFETY INSTRUCTIONS****2. SAFETY, QUALITY AND PERFORMANCE STANDARDS****3. PRODUCT DESCRIPTION****4. INSTALLATION****INSTALLATION INDIVIDUAL UPS****INSTALLATION PARALLEL UPS****5. OPERATION MODES****6. OPERATION INTERFACE (KEYBOARD & LCD)****7. UPS CONFIGURATION****8. START-UP****INDIVIDUAL UPS****PARALLEL UPS****9. ERROR & ALARMS CODES / TROUBLESHOOTING****10. SOFTWARE****11. BATTERIES: MAINTENANCE****12. BATTERIES & CHARGER: CONFIGURATION & SERVICE****13. SUPPORT & WARRANTY****14. REAR PANEL****15. SPECIFICATIONS****16. BATTERY CHARGER**

1. GENERAL SAFETY INSTRUCTIONS

WARNING: It is required to read and understand this manual. Follow all instructions given in this manual for starting up and operating this product. Only qualified technician must start-up, operate and maintain this product. Keep manuals as a guide for future consults.

UPS manufacturer or distributor will never be responsible for any accident produced by lack of knowledge or negligent practices at the moment of install, starting up or maintain this product. UPS manufacturer or distributor is not liable for any damage that might rise from misusing this unit or defective installation.

SAFETY:

ELECTRIC SHOCK RISK



This product operates with dangerous voltages. It must be installed, operated and maintained **ONLY** by qualified technicians trained for this kind of products. Service personnel **MUST** know and understand very well all electric risks related to this product.

If you are not qualified technician do not try to install, operate or repair this product.

CAUTION: There are dangerous voltages in the UPS power outlets although the equipment is not plugged to power line.

CAUTION: Inside this equipment, due to internal batteries, there are **ALWAYS** dangerous voltages, **EVEN** the UPS is OFF and unplugged.

CAUTION: There are dangerous voltages in internal DC Capacitors. Wait at least 10 minutes after turning off UPS before opening it to access inside.

CAUTION: Power off UPS and unplugged it from AC Line before opening it to Access inside this unit.

CAUTION: Before starting the opening procedure, remove all jewelry and metallic objects such as: Rings, Watches, Bracelets, etc., because they could contact conductive parts and components inside the UPS and this might cause discharges and/or short circuits. Make sure using tools properly isolated to avoid electrical risks.

WARNING: This product has been designed to be used indoors protected from water, direct sun light, dust and extreme temperature.

WARNING: Do not put any object on the UPS; do not apply any force over UPS. Do not cover UPS ventilation.

WARNING: This UPS must be connected to appropriate electrical service according to selected model. Technical specs label in the UPS shows the UPS power ratings. **DO NOT** connect this UPS to any of its own power outlets, this could damage the unit permanently.

WARNING: Do not connect AC motor based equipment without a careful sizing of the UPS based on inrush current instead of average current. Inrush current typical of motor based system could overload this UPS.

WARNING: In case of emergency, power-off UPS and turn it off by <OFF> button in front panel. Then call technical service.

INFORMATION FOR THE PROTECTION OF ENVIROMENT – UPS SERVICING

This UPS and batteries make use of components dangerous for the environment (electronic cards, electronic components). The components removed must be taken to specialized collection and disposal centers.

NOTICE TO EUROPEAN UNION CUSTOMERS: DISPOSAL OF OLD APPLIANCES



This product has been supplied from an environmentally aware manufacturer that complies with Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/CE. The "crossed-out wheeled bin" symbol at left is placed on this product to encourage you to recycle wherever possible. Please be environmentally responsible and recycle this product through your recycling facility at its end of life. Do not dispose of this product as unsorted municipal waste. Follow local municipal waste electrical and electronic equipment (WEEE).

2. SAFETY, QUALITY AND PERFORMANCE STANDARDS

SAFETY - LOW VOLTAGE DIRECTIVE (2006/95/EC) UPS Part 1-1: General & Safety UPS in accessible areas	IEC/EN 62040-1
ELECTROMAGNETIC COMPATIBILITY - EMC DIRECTIVE (2004/108/EC)	
UPS, Part 2, Electromagnetic Compatibility: Radiated & Conducted	IEC/EN 62040-2 (Cat 3)
Low Freq. Conducted Disturbances & Signals:	IEC/EN 61000-2-2
Electrostatic discharge immunity Test:	IEC/EN 61000-4-2 (Level 4)
Radiated radio Frequency immunity:	IEC/EN 61000-4-3 (Level 3)
Electrical Fast Transient / burst immunity:	IEC/EN 61000-4-4 (Level 4)
Surge immunity:	IEC/EN 61000-4-5 (Level 4)
Conducted Immunity:	IEC/EN 61000-4-6 (Level 3)
Power frequency magnetic field immunity:	IEC/EN 61000-4-8 (Level 4)
PERFORMANCE: UPS Part 3: Methods of operation, specifications and test requirement	IEC/EN 62040-3
IT Equipment. SAFETY. Part 1: General Requirements	IEC/EN 60950-1
BATTERY SAFETY	EN 50272
CE	CE compliant
UL1778	UL1778: 2014 R10.17 (by cTUV-US)
CSA	CSA C22.2 No. 107.3-14 (by cTUV-US)
IP PROTECTION	IP21 (static)
QUALITY MANAGEMENT:	Manufactured under: ISO 9001 : 2000
ENVIRONMENTAL MANAGEMENT:	Manufactured under: ISO 14001 : 2004
TRANSPORTATION:	IEC/EN 300019-2-2, Class 2.3

WARNING: Modifications made on the product or the use of this product as a part of a more complex system not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. It also could affect its performance and the compliance of regulations. XSMART is not responsible of modifications made after manufacturing.

WARNING: This is a category C3 UPS product. This category includes UPS with an output current exceeding 16A and intended for use in the second environment. Such UPS are suitable for use in commercial or industrial installations having a minimum boundary of 30m from other buildings classified as first environment. Category C3 UPS shall meet category C3- UPS emission limits and withstand the immunity requirements of above table.

WARNING: This is a product for commercial and industrial applications in the second environment. Installation restrictions or additional measures may be needed to prevent disturbances.

DEFINITIONS:

First Environments: Those sites directly connected without intermediate transformers to the public low-voltage mains supply, like residential buildings and small companies.

Second Environments: Those sites not connected directly to public low-voltage mains that supplies residential buildings like industries and big companies powered by its own intermediate transformer.

3. PRODUCT DESCRIPTION

This is an Uninterruptible Power Supply (UPS) ONLINE DOUBLE CONVERSION with IGBT technology at rectifier and inverter stages with PWM. It generates a pure SINEWAVE output free of noise and imperfections for powering and protecting your valuable system. This UPS is the right choice to protect hardware and data in critical workstations and server applications. This product has been designed to operate under hostile electrical conditions but offering a reliable performance with outstanding features and characteristics. It is equipped with a powerful anti-surge system based on MOV technology and filtering circuits to eliminate electromagnetic interferences (EMI). It is 100% compatible to operate connected to alternative AC sources, such as power generators. This unit includes Auto-Recovery (automatic reset when power is restored after battery discharge) and Cold Start (battery operation in the absence of electrical power) functions to provide reliable and efficient performance.

This unit features a control card based on microprocessors (DSP) that ensures its proper functioning, performance, and reliability. Additionally, its soft-start circuit guarantees a slow connection of the equipment to the electrical grid upon startup, once it has been verified that the AC input is within the appropriate values.

This model allows installation in a vertical format using the supports included with the product, or in a 19" rack format. Rack installation requires mounting guides (rails) not included with the product, which can be purchased separately. This equipment and the system it powers can be monitored via front LCD or remotely using our control and configuration software. Our monitoring software allows configuring and controlling this UPS by any of available communications ports: USB/RS232 or LAN Ethernet optional card (under SNMP protocol).

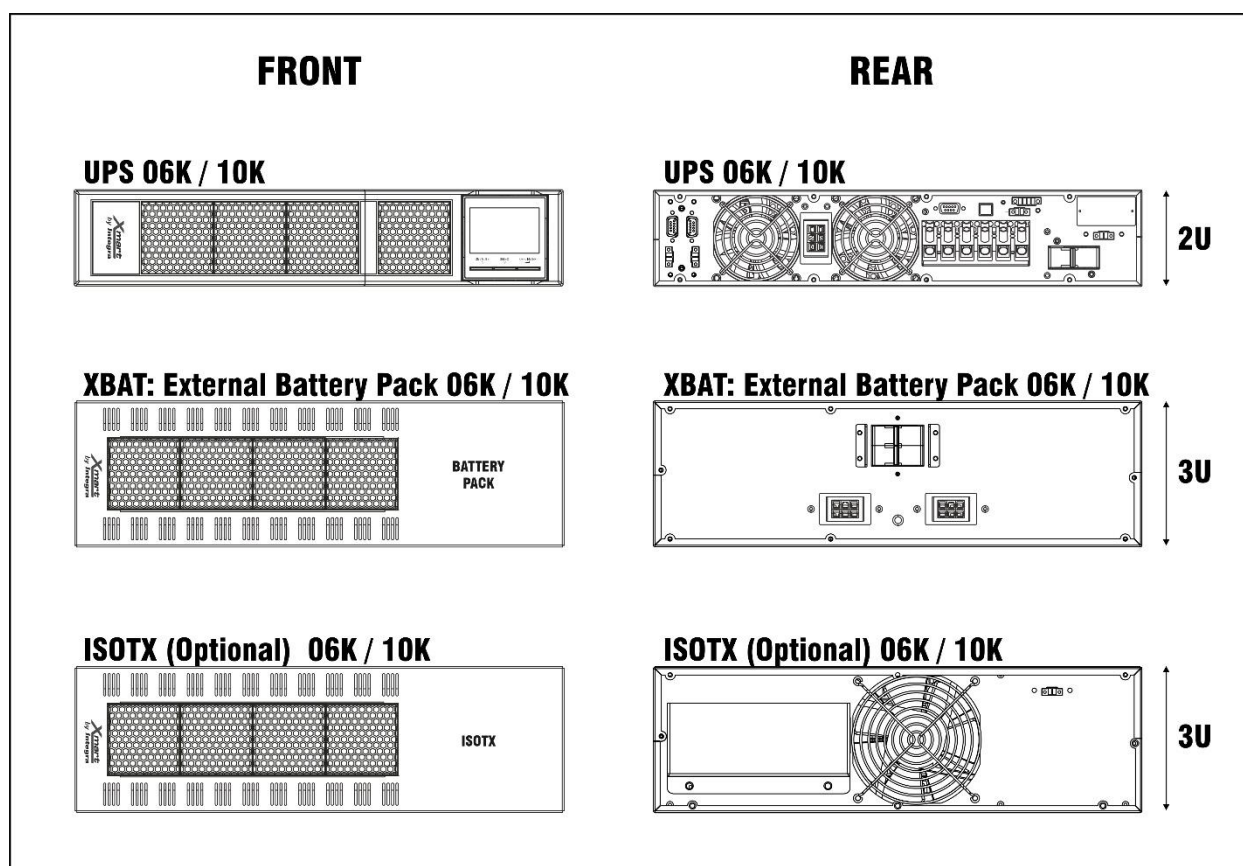
This XSMART equipment features a Conformal Coating treatment on its internal boards and components. Conformal coating is a technique that protects against moisture and corrosive contaminants to ensure stable performance and extend its lifespan in various environments, as long as the requirements of the technical specifications of the equipment are met.

Structure of this UPS is based on 2 basic modules and 1 optional one:

UPS Module: This module contains electronic and power parts. It operates with 220/230V AC input and generates a 220/230V AC output. 6KVA model is 2U height meanwhile 10KVA is 3U height module.

Battery Module (XBAT): This product includes 1 external Battery module named as XBAT. Inside this module are installed all batteries required by the UPS. It is a 3U height module.

ISOTX (optional): There is an additional and optional module named ISOTX. It is an isolated transformer that can be connected to UPS output. ISOTX generates 2 isolated outputs at 120Vac. It is a 3U height module.



4. INSTALLATION

This section of the manual covers installation procedure and instructions for this UPS series. Before doing installation, you must revise and understand sections related to safety and site conditions.

SAFETY INSTRUCTIONS



WARNING: Before revising this section, you must read and understand very well section 1 of this manual: “GENERAL SAFETY INSTRUCTIONS”.

WARNINGS, RECOMMENDATIONS AND LIABILITY LIMITATION

REACH AND LIABILITY LIMITATION: The preparation of the site, wiring and all protection devices must be supplied by end user and it will not be responsibility neither the UPS distributor nor the UPS technician in charge of the start-up.

The place will be conditioned by end user or electrical contractor and must fulfill with local normative and directives and UPS technical requirements.

This manual describes minimal conditions and technical requirements with which the site must accomplish. Directives and requirements described in this manual, do not pretend to substitute in any way local electrical directives or normative. In some cases, local directives or regulations might be more exigent than UPS technical requirements described by this manual. In that case end user electrical contractor must be sure to comply with all related local electrical regulations and directives.

- Installation and start-ups MUST be done by qualified personnel only complying with safety procedures.
- This kind of equipment has been designed to provide electrical output even when it is not powered-on.
- UPS output could be energized even when UPS is turned-off in case external bypass is activated.
- Internal or external battery banks always can generate risk of electrical shock because high DC voltage.
- External battery banks must be revised before connecting them to UPS to confirm their DC voltage is compatible with this UPS.
- DC polarity of the Battery bank must be revised to confirm it is OK before connection. A reverse polarity can generate permanent damage in batteries and UPS.
- This UPS is rated as “Class I” so it is recommendable to connect GROUND terminal to the EARTH before making any other connections.
- Before making AC input connections, technicians must confirm all switches of input lines are in open state (OFF).
- All installation instructions of this manual must be complied.
- All local electrical regulations must be complied.
- Power lines must be protected by protection devices against over current (breakers) or leak currents with capacity and technology appropriate to effectively accomplish its function. Moreover, installation grounding must be correct.
- Install the UPS in well-ventilated locations and leave room enough between UPS and close objects and structures.
- Do not connect to UPS equipment or devices that exceed its capacity, this would overload the UPS.
- This product has been designed to be used indoors protected from water, direct sun light, dust, and extreme temperature.
- Do not put any object on the UPS; do not apply any force over UPS. Do not cover UPS ventilation.
- This UPS must be connected to appropriate electrical service according to selected model. Technical specs sticker in the UPS shows the UPS power ratings. DO NOT connect this UPS to any of its own power outlets, this could damage the unit permanently.
- Do not connect AC motor-based equipment without a careful sizing of the UPS based on inrush current instead of average current. Inrush current typical of motor-based system could overload this UPS.
- We strongly recommend placing a warning sign on main electrical board to avoid external personnel manipulate AC lines during revision and start-up work is performed.
- This unit MUST NOT be installed into closed boxes/cabinets that avoid fresh air access. During normal operation, this unit needs fresh air to flow through ventilation system (Vents) to cool power circuits. Installing this unit in a closed box/cabinet makes inner air to be recycled without refreshing, increasing inside temperature, exceeding operation max. temperature, and causing permanent damage to the UPS.

EN-IEC 62040-1: EXTERNAL BACKFEED PROTECTION

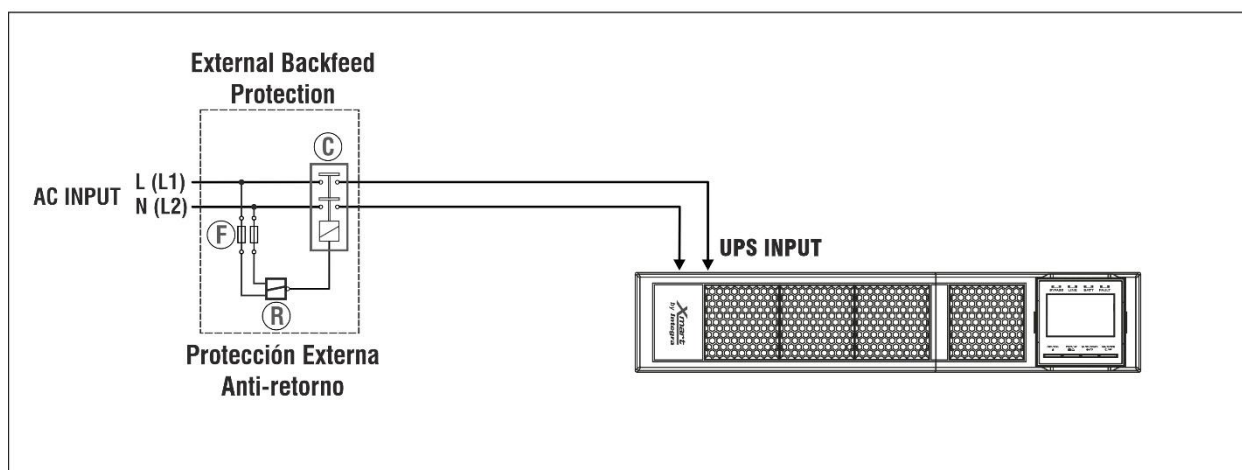
In case back feed protection is required, an automatic external protection circuitry must be installed to provide this kind of protection to comply with EN-IEC 62040-1. This external protection device is not included with this product. External back feed device must be rated to drive maximum UPS current.

back feed protection system must be automatic and must assure to avoid internal voltage of the UPS can feed input AC lines under battery mode. Under normal conditions, UPS internal design avoids this kind of situations happens. However, a failure in the UPS internal Bypass Switch could allow output voltage of the UPS inverter could be driven to the AC input lines through internal bypass lines. In battery mode, an operator working on input AC terminals does not expect to find voltage in input lines of the UPS so that a back feed failure could represent an electrical shock risk for the operator.

An effective back feed design must be able to automatically open all UPS AC input lines when AC main is power-off.

***** External Back feed protection device is not included with this product.**

In below figure a typical automatic back feed protection design is described.



- C:** 2 Poles Contactor. Normally Open. Coil voltage same tan UPS input AC voltage. Max. current similar to max. UPS input current.
- R:** AC Relay. Normally Open.
- F:** General purpose AC fuses. Operating voltage similar to UPS input AC voltage.

WARNING LABEL:

We strongly recommend to place warning labels in all electrical boards related to UPS circuit lines to indicate an UPS is connected to the board. This is because a dangerous voltage could be feed by the UPS on the electrical board even AC main service is out of order.

Label design should include following information:

VOLTAGE BACKFEED RISK

UPS CONNECTED TO THIS CIRCUIT

Before working on this circuit:

- * Isolate UPS
- * Check for dangerous voltage in all circuit terminals.

SITE INSPECTION AND INSTALLATION CONDITIONS

REGULATIONS AND LEGAL DIRECTIVES

It is necessary to check that installation site, wiring and power protection in the installation supplied by end user, fulfill technical parameters required by UPS.

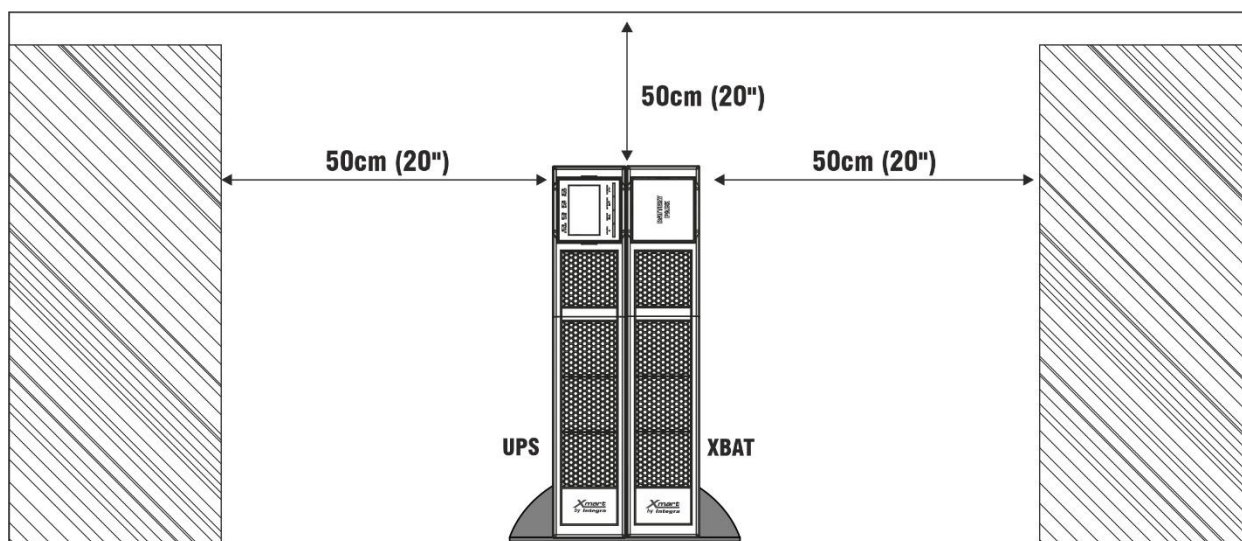
A particular installation might accomplish with UPS requirements but not with local directives and regulations.

The end user and/or electrical contractor will be responsible of watching for complying with electrical regulations and normative during electrical installation managed by end user.

Inspection performed by installation technician is not intended to confirm regulations and directives accomplishing but only with technical needs for optimal UPS operation.

SITE INSPECTION

- During transport of this UPS from a cold place to a warmer and more humid one, some condensation could be generated. Leave the UPS for at least 2 hours to climate to new installation site.
- Do not install the UPS outdoors or near water sources nor in wet environment
- Do not install the UPS in sites exposed to sun light or heat sources. Temperature at operation site should never rise over 35 °C. Batteries' life shortens over 25 °C.
- Installation site must be dry, fresh, free of dust, fibers, and any other objects (conductors or not) suspended in the air that could get into the UPS thru the ventilation system (Fan).
- Do not block UPS ventilations



UPS INPUT AND OUTPUT POWER LINES PROTECTION

AC LINES PROTECTIONS DEVICES:

All UPS Inputs and outputs must be protected by circuit breakers and current leak protections. Protection capacity and type must fulfill local regulations as well as directives from this manual. Grounding must be according to local directives as well. Please check wiring and protections selection table in this section of the manual. A wrong selection of breakers and current leak protections could generate false trips.

LEAK CURRENT PROTECTION:

In many countries, now a day, it is legally required to install protections against current leakage to protect human beings in cases of leaks or discharges to ground. It is responsibility of the end user and/or electrical contractor selecting and including these protection devices in the electrical circuit of the UPS.

DC PROTECTIONS DEVICES:

For Ex models (with external batteries) there must be also DC Circuit Breakers between UPS and battery bank.

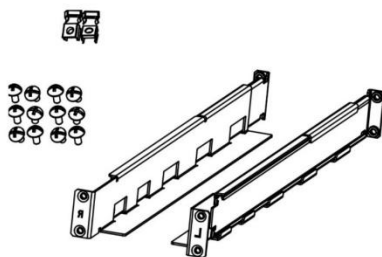
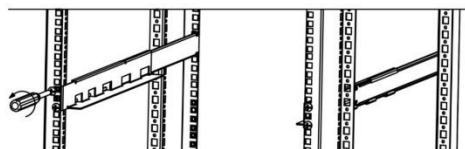
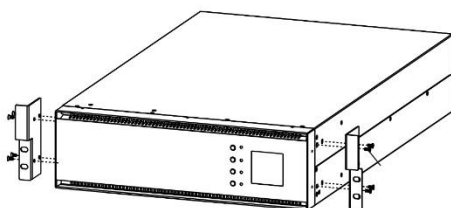
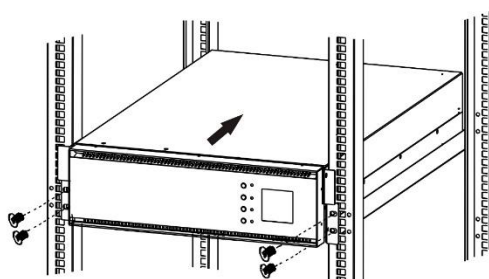
Some Models include a DC breaker on the rear panel for external battery pack protection; otherwise an external DC Circuit breaker must be installed.

SITE INSTALLATION

This UPS can be installed either in vertical format, or inside a 19" rack cabinet.

19" RACK MOUNTING

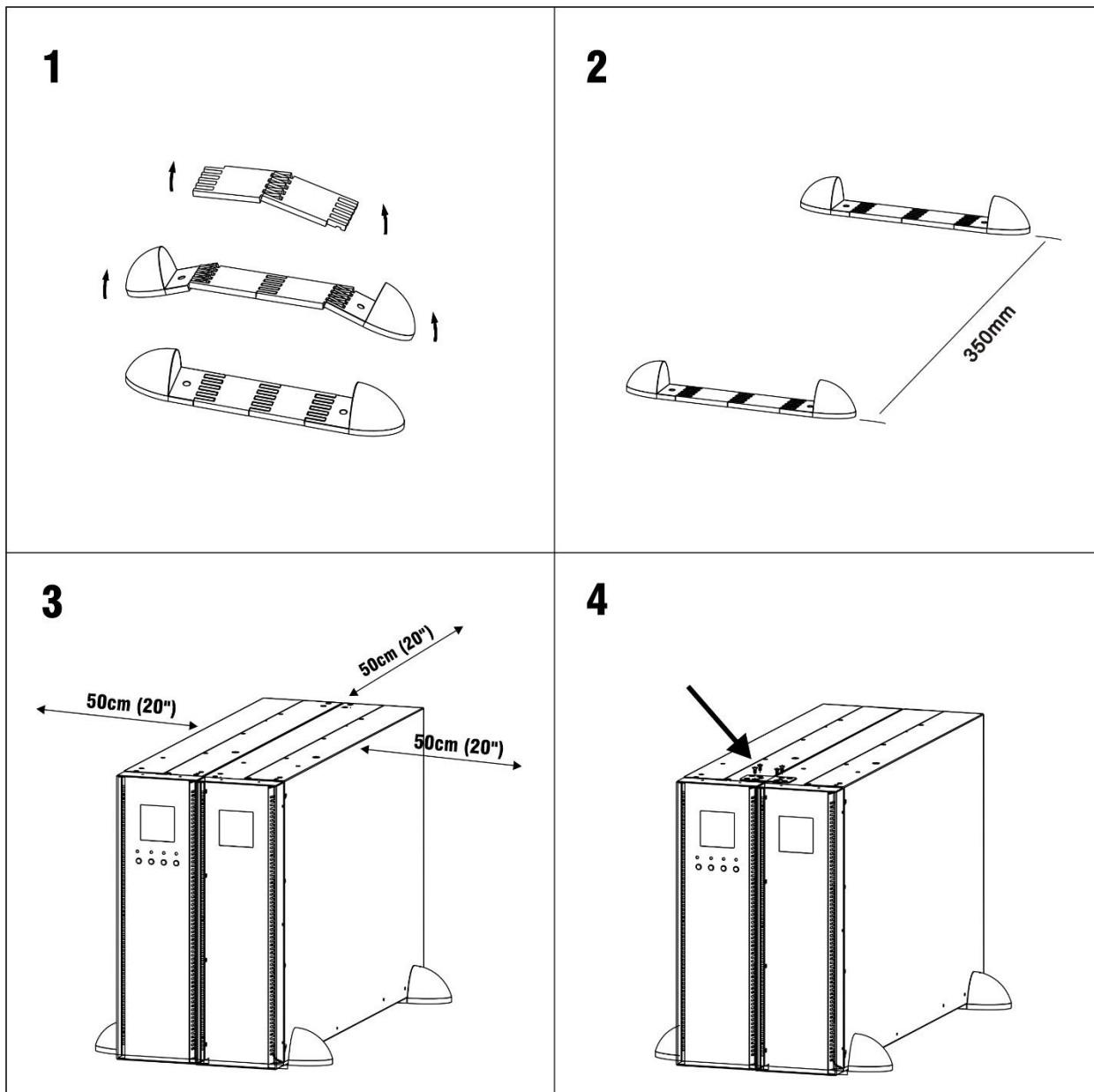
Rack UPS must be installed using L-Shape type guides for supporting UPS weight. Usually, this kind of supports is provided with rack cabinets. If not, UPS distributor can provide original XMART telescopic guides as optional accessory. Small black handles included with the UPS are only for locking purposes. UPS cannot be supported only by these handles.

1**2****3****4**

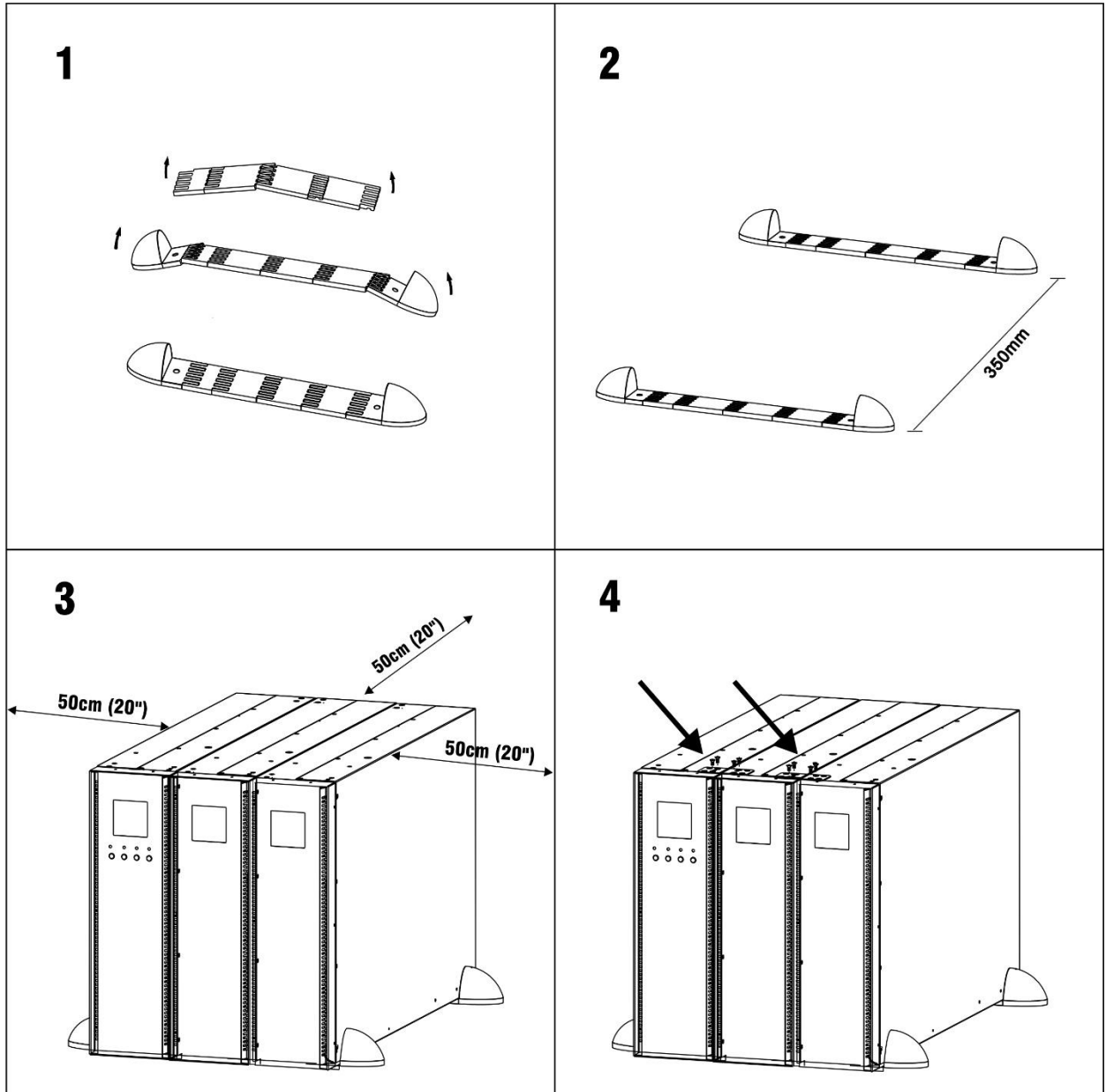
VERTICAL MOUNTING

UPS can be installed in vertical format by using plastic supports (Fig 1 & 2). These supports are included inside the box.

2 MODULES: UPS+XBAT:



3 MODULES: UPS + XBART + OPTIONAL ISOTX

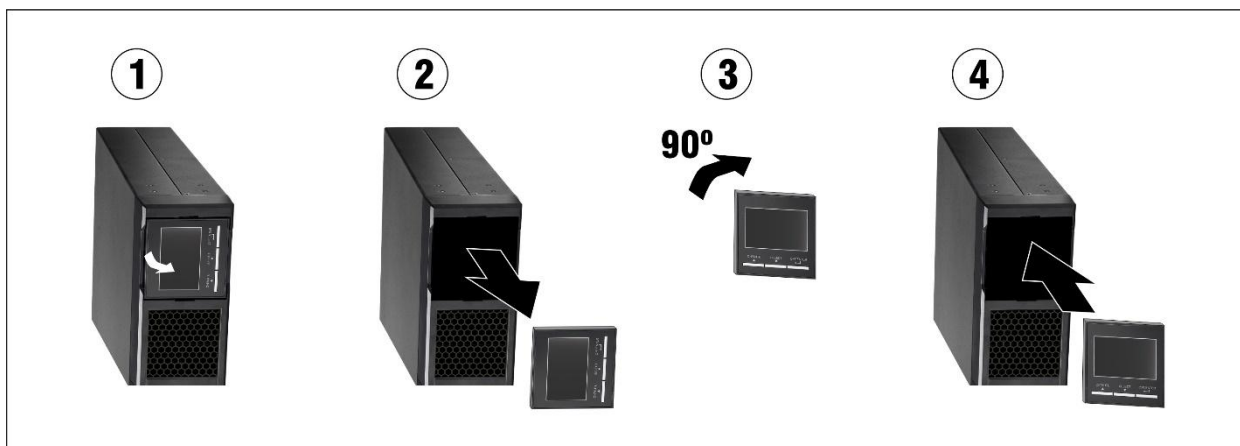


LCD ROTATION

UPS display can be rotated 90° for easy reading in both vertical and horizontal installations.

To rotate LCD, follow next steps:

- 1- Unlatch LCD according to step 1
- 2- Separate LCD from the UPS frame
- 3- Rotate LCD as needed
- 4- Re-install LCD in the UPS. Double check LCD is latched on the UPS frame.



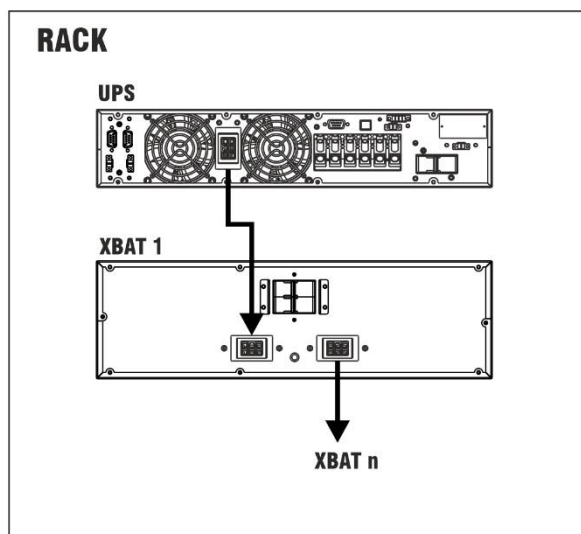
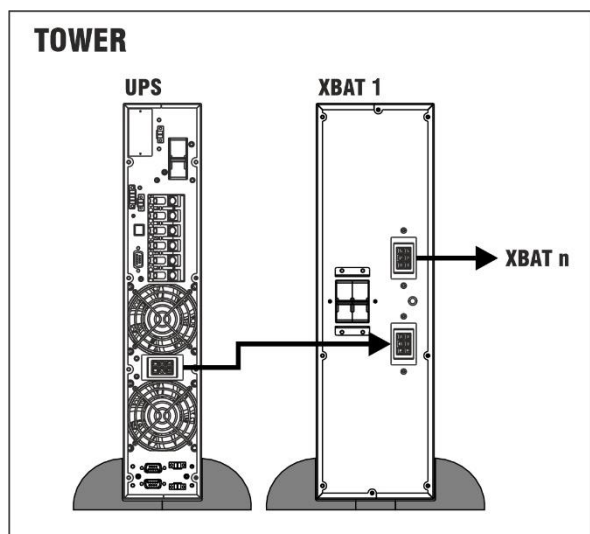
EXTERNAL BATTERY CABINETS (XBAT) – CONNECTION PROCEDURE

External batteries must be connected to UPS by using original XMART DC cable provided inside the box,



IMPORTANT: All OPTIMA RT 6K and 10K work with 240VDC battery voltage. This voltage is provided by battery packs by connecting 20 batteries 12VDC in series. There could be some UPS models working with a different DC voltage. User must check carefully XBAT voltage is compatible with the UPS DC voltage before making DC connections. In case electrical information given by this manual does match with information provided by product labels, user must consider information on labels or printed on the product.

- 1) Place UPS module close to original XMART XBAT modules.
- 2) Check all DC switches on XBAT are in OFF state.
- 3) Connect UPS to first XBAT module by using original DC cable
- 4) In case system has more than 1 XBAT, connect XBAT#1 to XBAT#2. Then XBAT# 2 to XBAT#3 and so on.



CIRCUIT BREAKERS AND WIRING SELECTION

Breakers and gauge of the wires used in input and output lines must be rated to drive current values in Amps as indicated in below tables. NOTE every country has its local electrical requirements and regulations. If local electrical regulations require higher rates than suggested values in this section, please follow local regulations. Below wire gauge values are based on 1999 NEC for individual copper cables at 30°C room temperature.

RT UPS	INPUT 220Vac 1Ph	OUTPUT 220Vac 1Ph	EXT. BATT (240Vdc)
MODEL	BREAKER & WIRING	BREAKER & WIRING	BREAKER & WIRING
6KVA Output 220Vac	AC Breaker: 40A (Curve D) Max. Nominal Current: 36A Wiring (min. size): 10AWG (6 mm ²)	AC Breaker: 40A (Curve D) Max. Nominal Current: 36A Wiring (min. size): 10AWG (6 mm ²)	DC Breaker: 50A DC (Curve C) Max. Nominal Current: 30A DC Wiring (min. size): 10 AWG (6 mm ²)
10KVA Output 220Vac	AC Breaker: 63A (Curve D) Max. Nominal Current: 60A Wiring (min. size): 8AWG (10 mm ²)	AC Breaker: 63A (Curve D) Max. Nominal Current: 60A Wiring (min. size): 8AWG (10 mm ²)	Breaker: 63A DC (Curve C) Max. Nominal Current: 50A DC Wiring (min. size): 8 AWG (10 mm ²)

Original XMART Battery modules have their own DC breaker so no external DC breakers are required between UPS and XBAT.

ISOTX	1 TOTAL OUTPUT: 1 x 120Vac (N1*) (100% Watts)	SEPARATE OUTPUTS: 2 x 120Vac (N2*) (50% Watts C/U)
6KVA with ISOTX Output 110/220V	Unique Output Capacity: 6000VA / 6000W Output Voltage: 120Vac AC Breaker: 80A (Curve D) Max. Nominal Current: 70A Wiring (min. size): 6AWG (16 mm ²)	VA/W per Output: 3000VA / 3000W Output Voltage: 120Vac AC Breaker: 40A (Curve D) Max. Nominal Current: 36A Wiring (min. size): 10AWG (6 mm ²)
10KVA with ISOTX Output 110/220V	Unique Output Capacity: 10000VA / 10000W Output Voltage: 120Vac AC Breaker: 125A (Curve D) Max. Nominal Current: 120A Wiring (min. size): 3AWG (35 mm ²)	VA/W per Output: 5000VA / 5000W Output Voltage: 120Vac AC Breaker: 63A (Curve D) Max. Nominal Current: 60A Wiring (min. size): 8AWG (10 mm ²)

IMPORTANT: Above wire gauge values are only a recommendation.

The wire size is strongly affected by diverse factors such as: Operation temperature, wire length, type of wire and kind of installation. Electrical contractor must assure an appropriate selection for wire and protection devices sizing for complying with local regulations for electrical installations. Wiring colors must be selected according to local directives and regulations.

NOTE: If ISOTX is configured with 1 output 220Vac, table 1 of this section can be consulted to find suggested values.

N1*: If ISOTX configured with 2 outputs 120V connected in parallel allows 100% of power output.

N2*: If ISOTX is configured with 2 separate outputs 120V, each output can only supply 50% of max. output power.

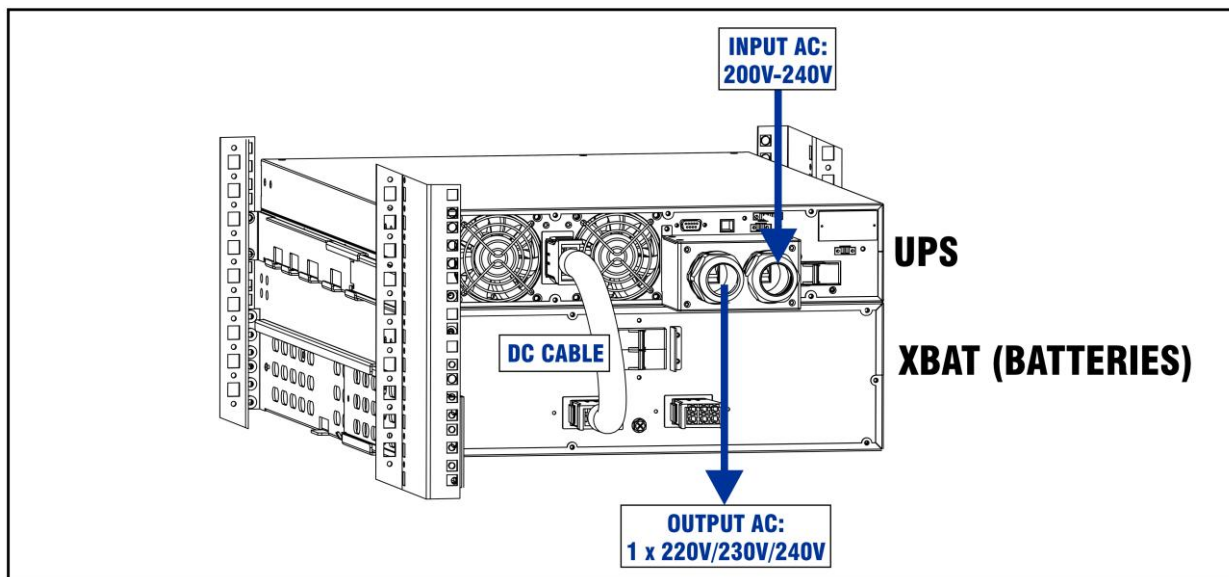
We recommend revising section 2 of this manual to find all ISOTX outputs configurations.

4.1 INSTALLATION: INDIVIDUAL UPS – TERMINAL BLOCK

- Make sure the UPS is Off before starting the installation.
- Remember to check all wires to be connected are not powered (including external batteries).

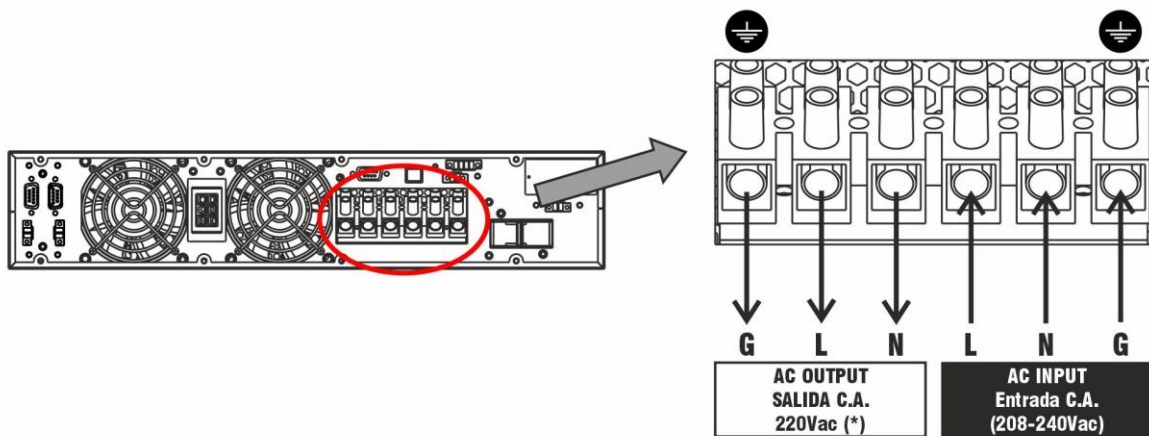
UPS + XBAT

UPS with 220V output generated by UPS inverter. This product has 2 basic modules: UPS & Batteries. This UPS can be feed with 220V-240V line (L-N) to generate one output with a configurable value: 208, 220, 230 or 240Vac. UPS module is connected to XBAT module by using original XSMART DC cable.

**AC TERMINAL BLOCK ON UPS**

Remove TB cover plate located on rear panel to have access to Terminal Block. Next image shows electrical connections, as a reference.

UPS OPTIMA-RT10 6K/10K (UL): TERMINAL BLOCK (REAR PANEL) // REGLETA (PANEL TRASERO)



(*): Configurable Output: 208/220/230/240Vac
(*): Salida Configurable: 208/220/230/240Vac

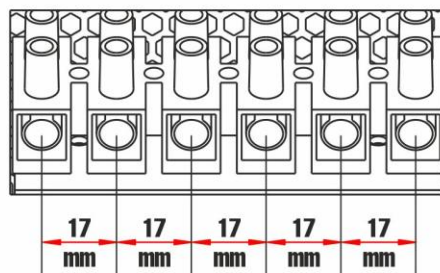
TERMINAL BLOCK / BORNERA DE CONEXION

Notes:

- Recommended terminal: Insulated tip type
- Terminal size: According to wire gauge and terminal block dimensions.

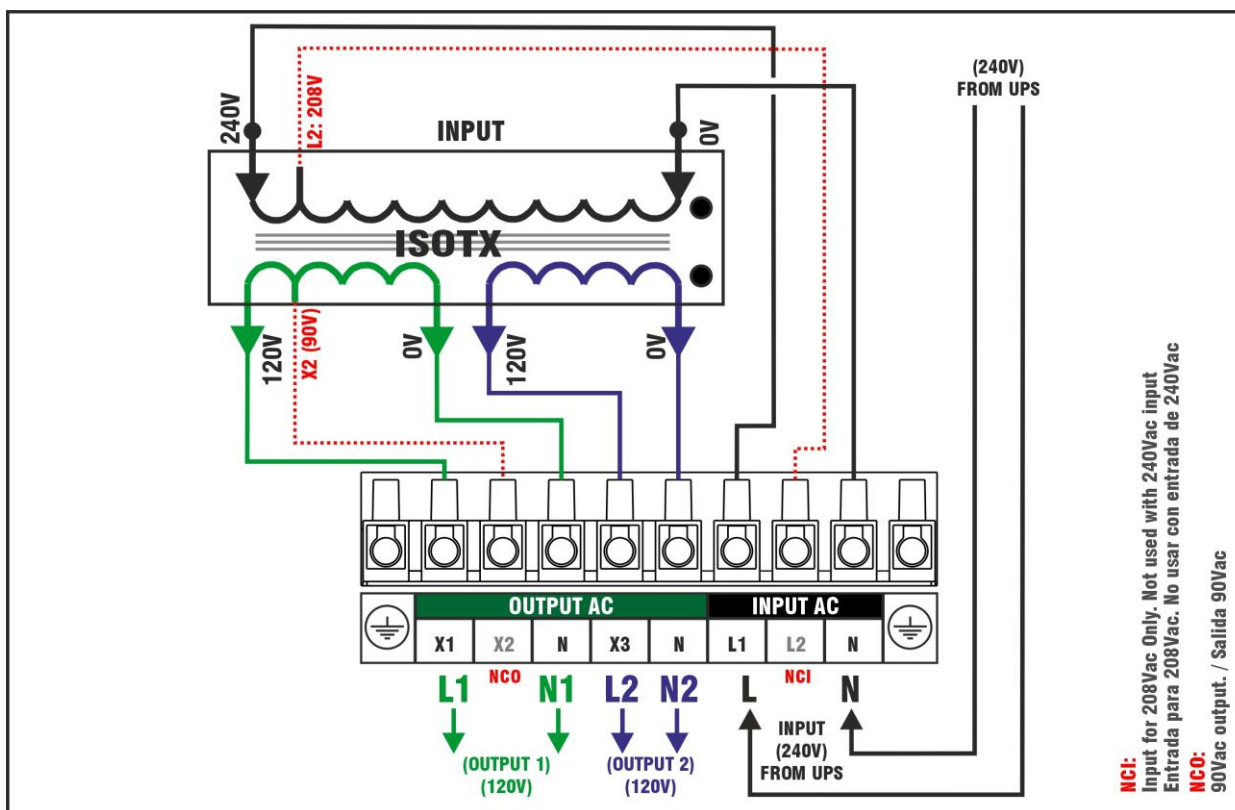
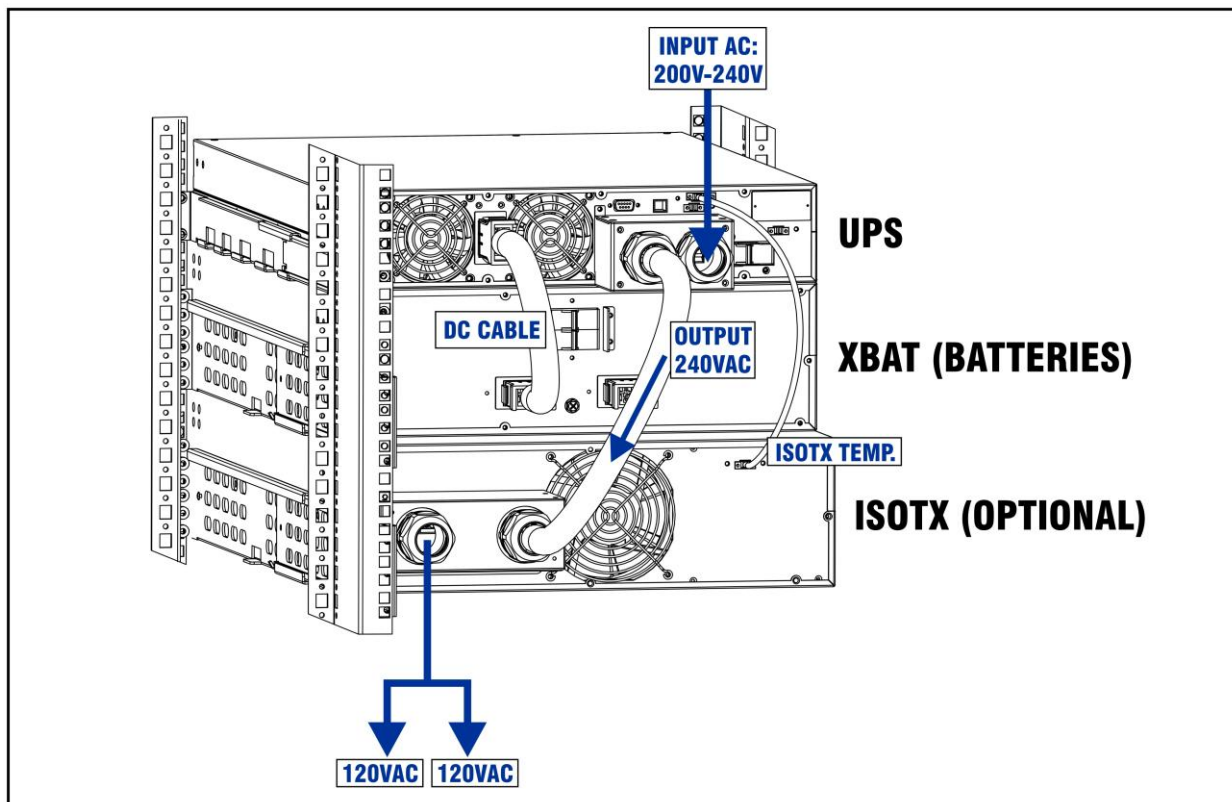
Notas:

- Terminal recomendado: Terminal de punta con aislamiento
- Tamaño del terminal: De acuerdo con el calibre del cable y las medidas de la bornera de conexión.



ISOTX (OPTIONAL MODULE)

ISOTX module is an optional accessory not included with the UPS. It provides 2 galvanic isolated outputs 120V each.



AC TERMINAL BLOCK CONNECTION BETWEEN UPS AND ISOTX

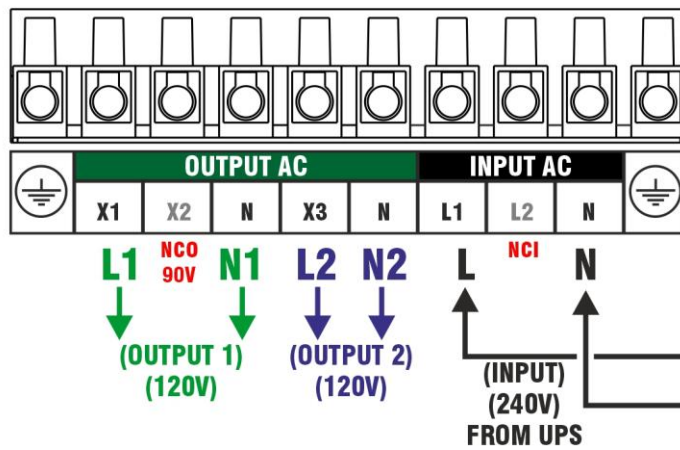
UPS 240Vac output is connected to ISOTX input.

ISOTX input generates 2 outputs of 120V.

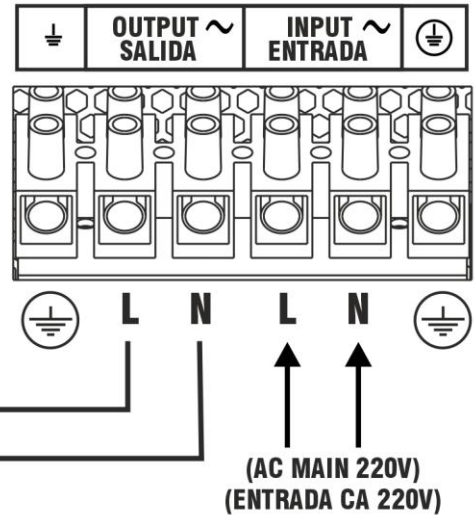
These 2 outputs can be wired as indicated in next section of this manual (ISOTX OUTPUT CONFIGURATION).

ISOTX (TERMINAL BLOCK)

ISOTX



UPS



ISOTX OUTPUTS CONNECTION

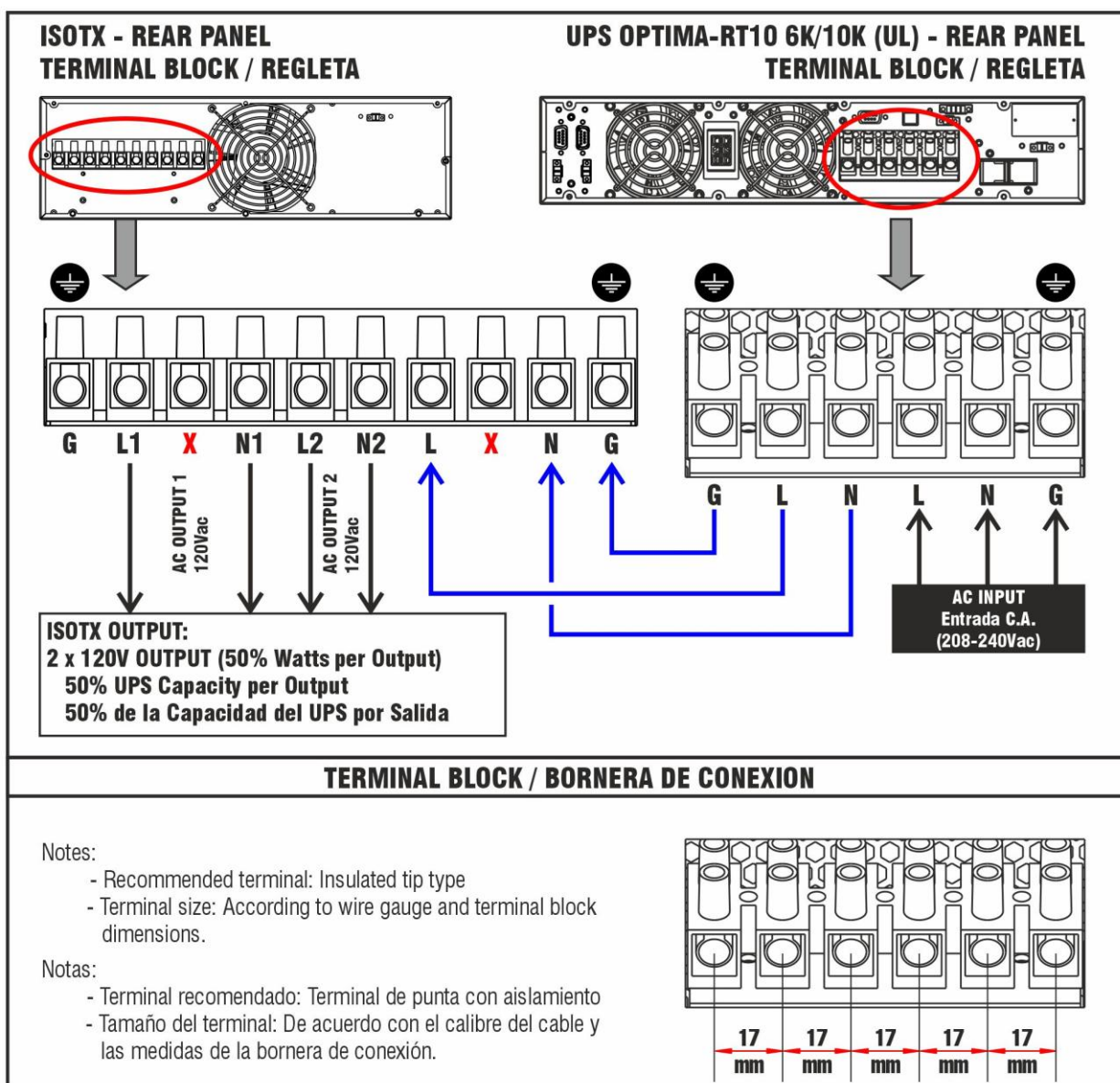
ISOTX outputs can be connected in 3 different configurations according to below wiring diagrams:

- 2 individual outputs 120V (50% of UPS capacity each)
- 1 120V output (100% of UPS capacity)
- 1 240V output (100% of UPS capacity)

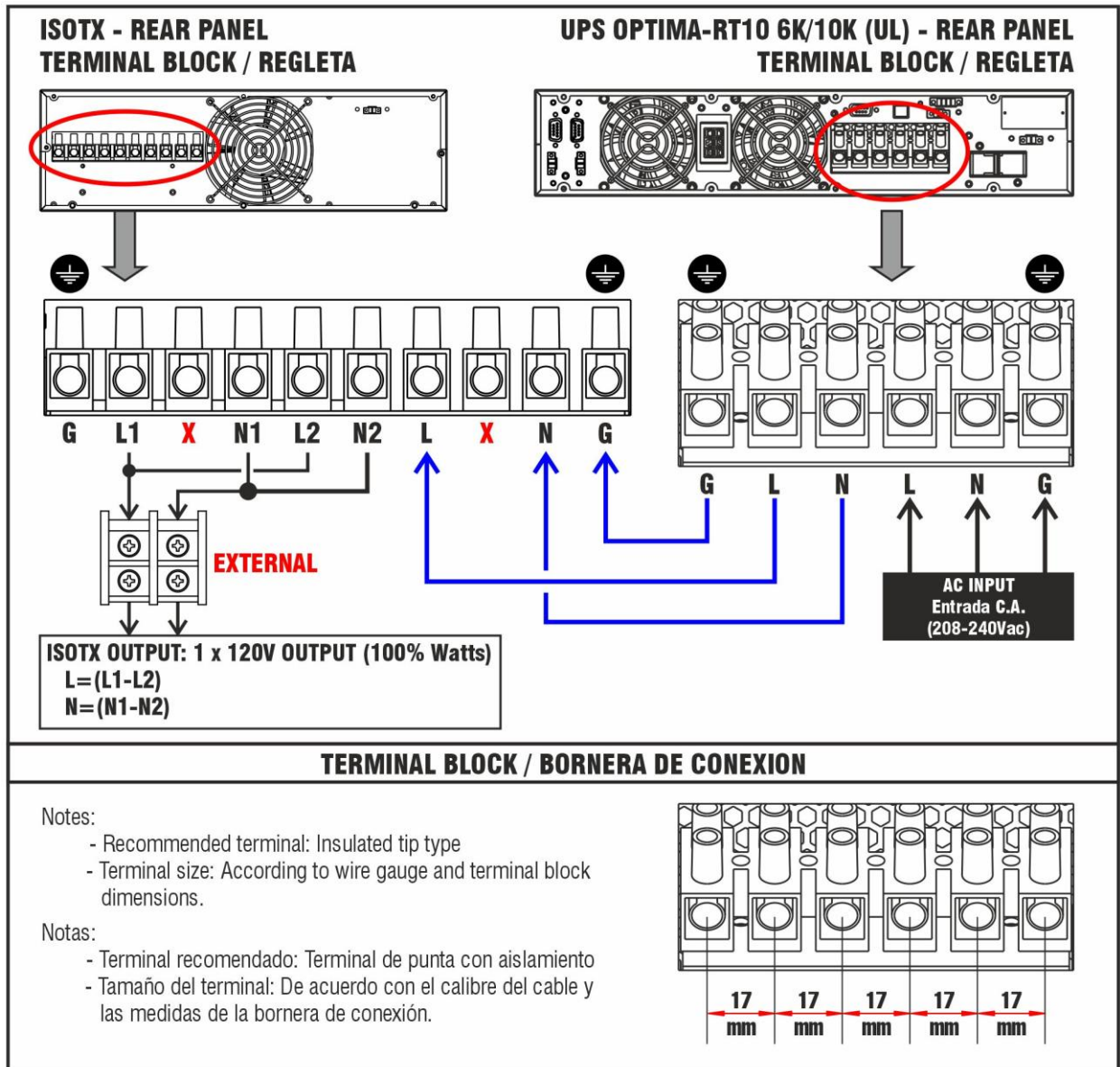
UPS output can be configured in the front panel LCD of the UPS as: 208, 220, 230 or 240V

ISOTX transformation ratio is 2:1 so 120V outputs will be half the voltage of output configured in the UPS.

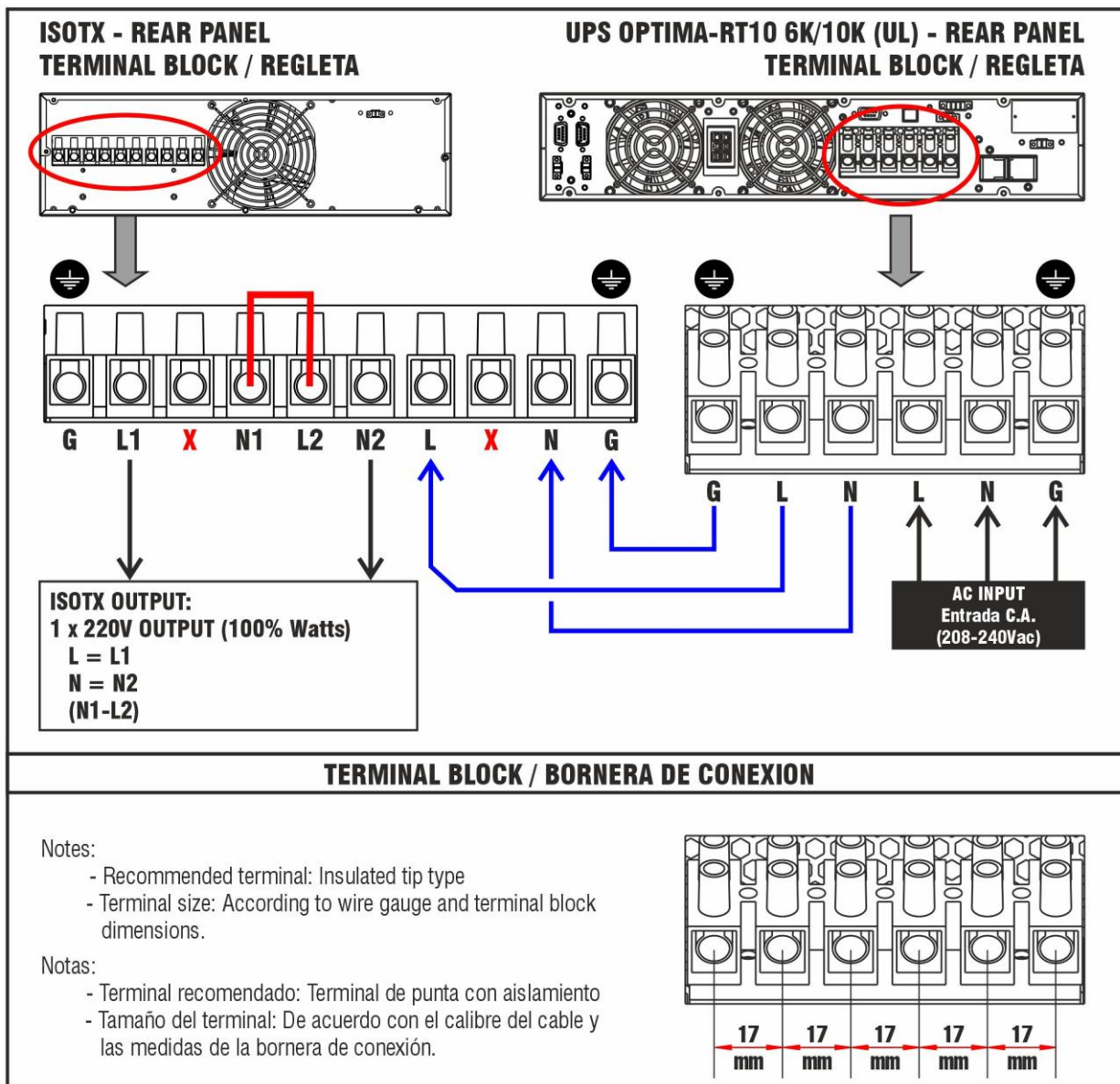
2 INDIVIDUAL OUTPUTS 120V (50% OF UPS CAPACITY EACH)



1 120V OUTPUT (100% OF UPS CAPACITY)



1 220V OUTPUT (100% OF UPS CAPACITY)

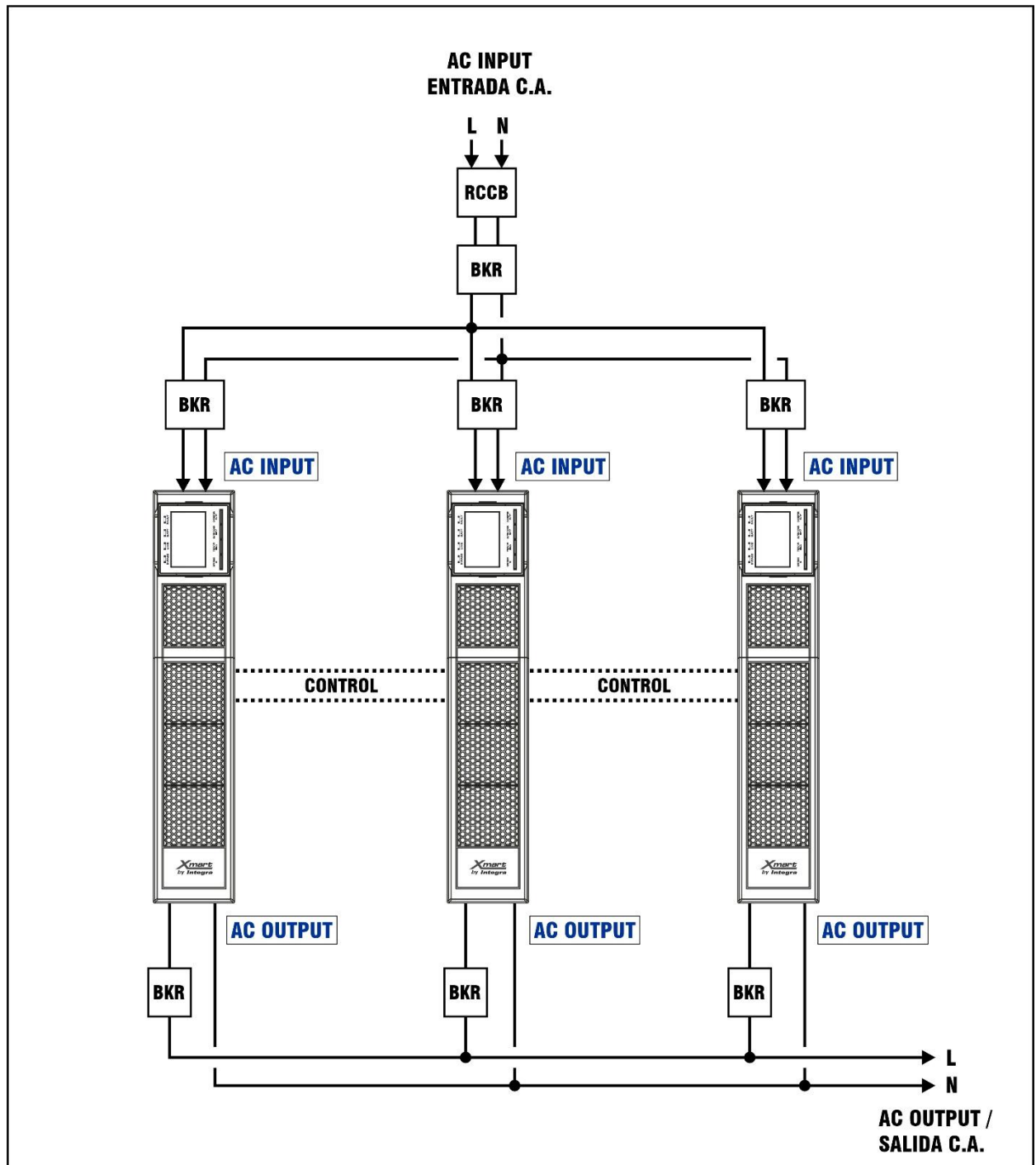


4.2 INSTALLATION: PARALLEL UPS – TERMINAL BLOCK

OPTIMA T10 & RT10 UPS allow connection in parallel up to 3 units. A system based on parallel UPS could offer a more reliable protection for the load in case it is dimensioned to work as redundant system. Parallel connection also allows system can grow in power by adding extra units.

For working parallel as a parallel system, all units must share same AC input and AC output. Some control cables must be also connected between units of the system so that UPS will be able to know important information to share the load efficiently.

All input and output lines must have their own breakers (one per UPS) for safety reasons and for allowing isolation of any UPS when required.



RCCB: Residual Current Circuit Breaker

BKR: Magneto-thermic Breaker

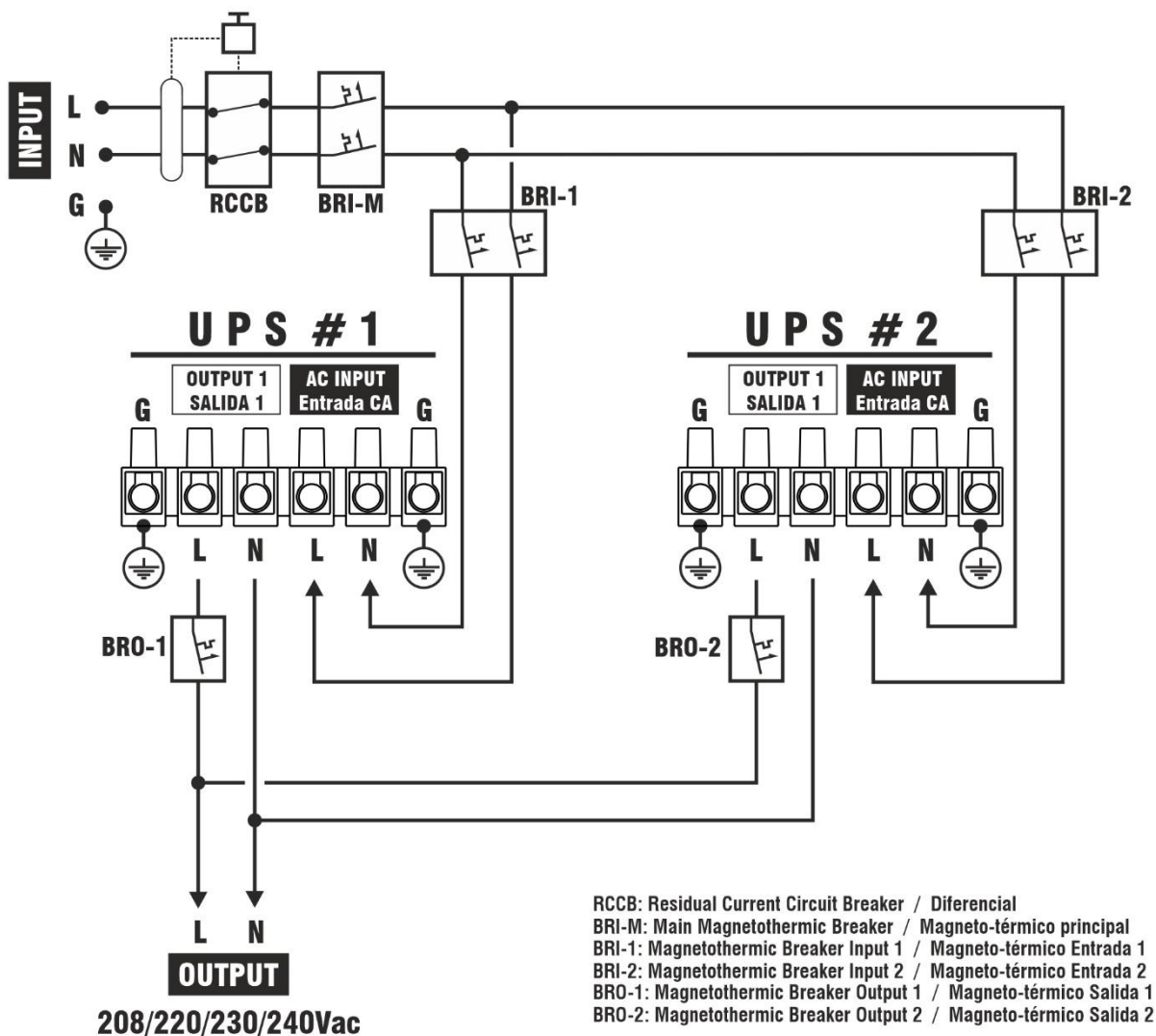
AC LINES: CONNECTION DIAGRAM

OPTIMA T10 & RT10 230 and OPTIMA T10 & RT10 with optional ISOTX.

OPTIMA RT10 6K/10K

UPS with 220V output directly from inverter

PARALLEL SYSTEM : OPTIMA-RT10 (6K / 10K)

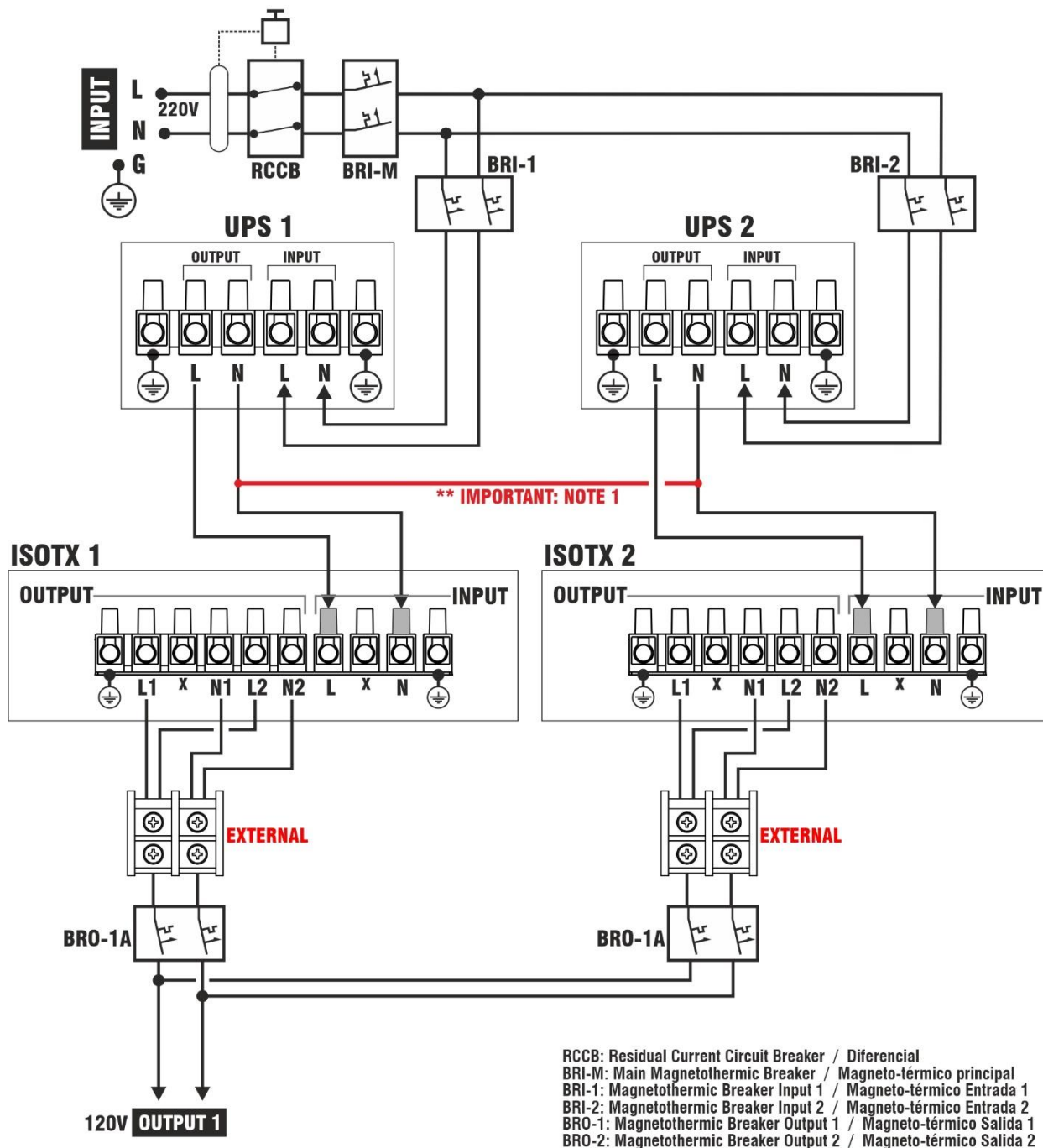


IMPORTANT: It is recommendable all output neutral lines are connected directly without breakers. It is important neutral lines are connected always since neutral is an important electrical reference for all UPS of the parallel system. In battery mode the lack of connection of output neutrals could generate synchronization errors between UPS. In case neutral lines are connected through breakers, there is a possibility of a wrong operation of breakers that forces error states.

(UPS + ISOTX) : 1 OUTPUT x 120VAC

To provide 1 output in 120Vac able to supply 100% of total UPS power, 2 individual 120Vac outputs must be connected by jumpers in terminal blocks (L1-L2 & N1-N2) as indicated in below figure.

PARALLEL SYSTEM : (UPS + ISOTX) : 1 x 120V OUTPUT (100% UPS CAPAITY)



***NOTE 1: Non isolated neutral MUST be connected**

***NOTE 1: Los neutros no aislados DEBEN estar conectados**

In case of 3 UPS, third UPS must be connected following same principle.

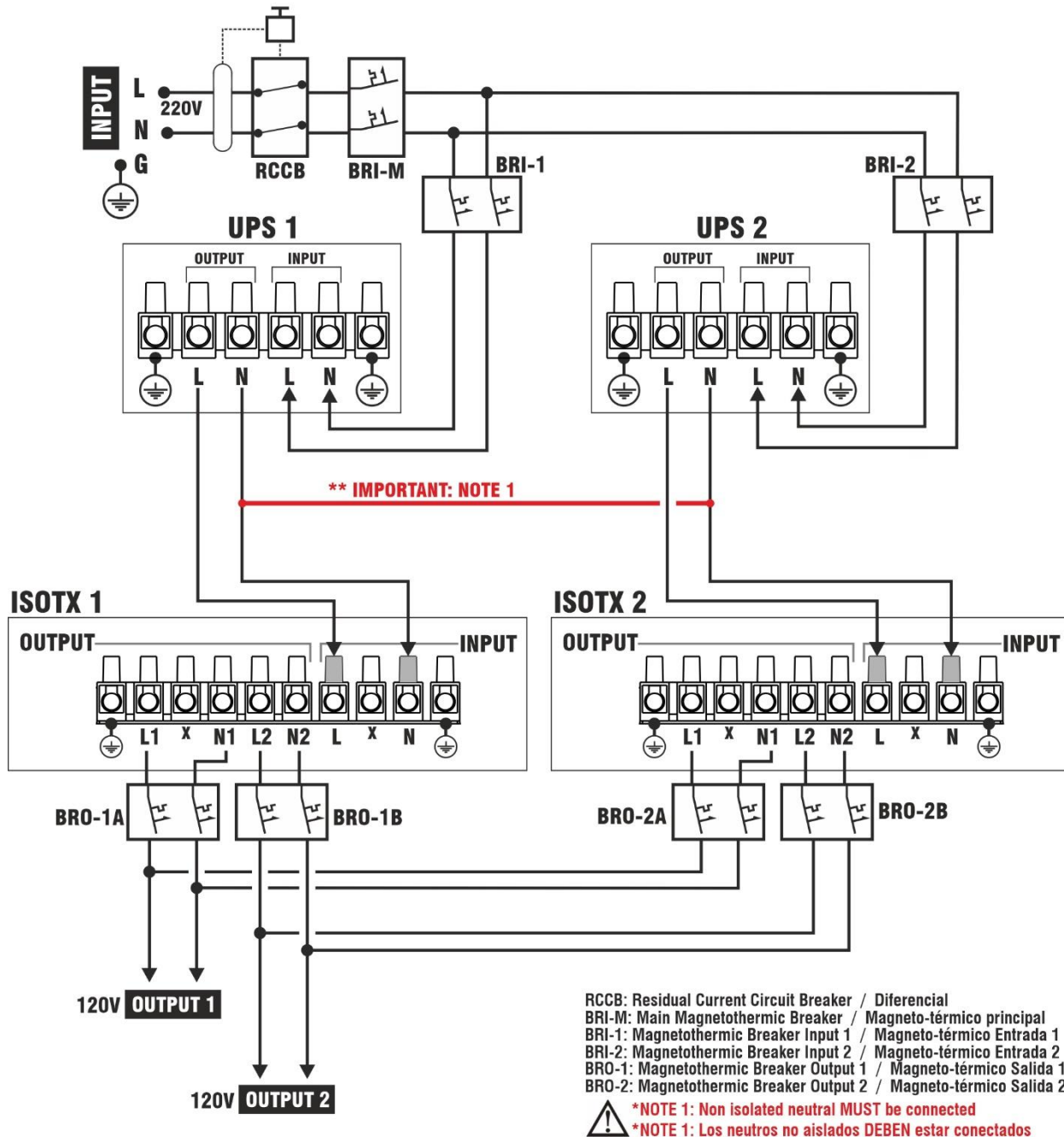


IMPORTANT: It is recommendable all output neutral lines are connected directly without breakers. It is important neutral lines are connected always since neutral is an important electrical reference for all UPS of the parallel system. In battery mode the lack of connection of output neutrals could generate synchronization errors between UPS. In case neutral lines are connected through breakers, there is a possibility of a wrong operation of breakers that forces error states.

(UPS + ISOTX) : 2 x 120VAC

With this configuration, each output will be able to provide 50% of total UPS power.

PARALLEL SYSTEM : (UPS + ISOTX) : 2 x 120V OUTPUTS



In case of 3 UPS, third UPS must be connected following same principle.

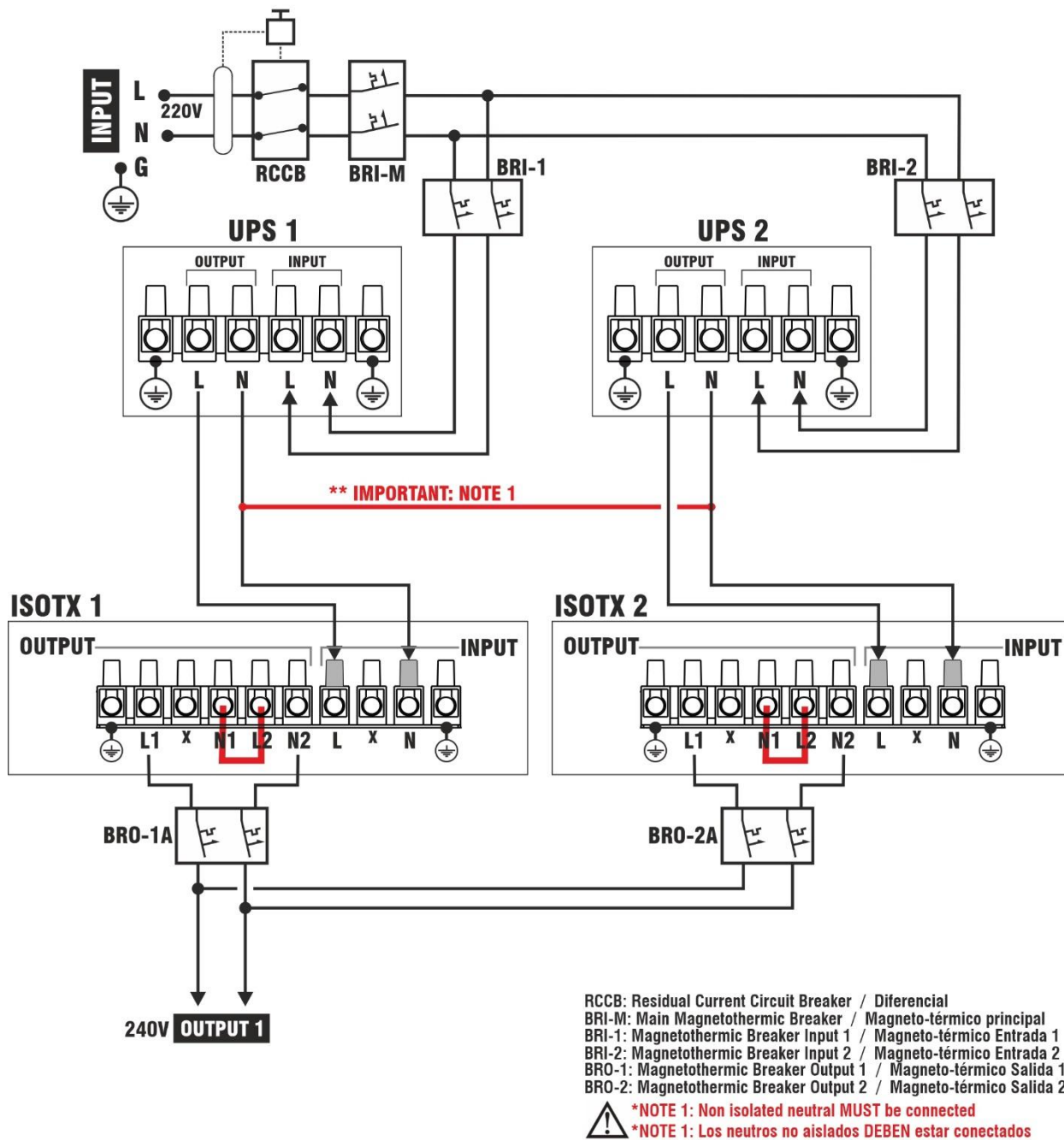


IMPORTANT: It is recommendable all output neutral lines are connected directly without breakers. It is important neutral lines are connected always since neutral is an important electrical reference for all UPS of the parallel system. In battery mode the lack of connection of output neutrals could generate synchronization errors between UPS. In case neutral lines are connected through breakers, there is a possibility of a wrong operation of breakers that forces error states.

(UPS + ISOTX) : 1 x 220VAC

To provide 1 output in 220Vac able to supply 100% of total UPS power, 2 individual 120Vac outputs must be connected in series by jumpers in terminal blocks (N1-L2) as indicated in below figure.

PARALLEL SYSTEM : (UPS + ISOTX) : 1 x 240V OUTPUT



In case of 3 UPS, third UPS must be connected following same principle.

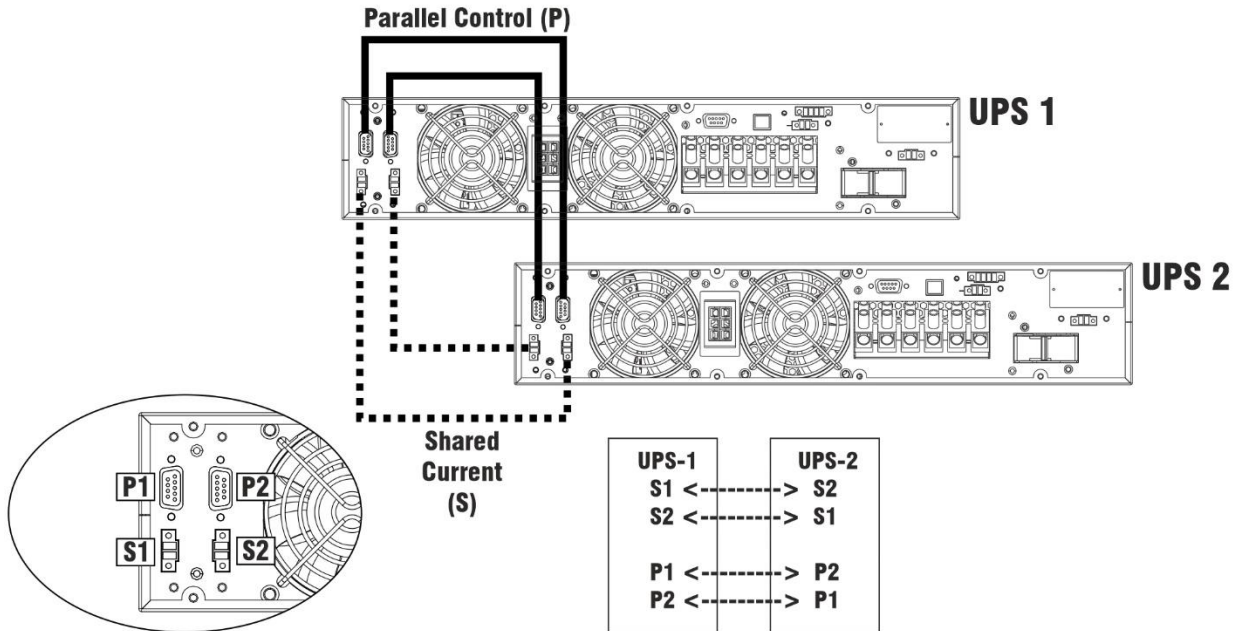


IMPORTANT: It is recommendable all output neutral lines are connected directly without breakers. It is important neutral lines are connected always since neutral is an important electrical reference for all UPS of the parallel system. In battery mode the lack of connection of output neutrals could generate synchronization errors between UPS. In case neutral lines are connected through breakers, there is a possibility of a wrong operation of breakers that forces error states.

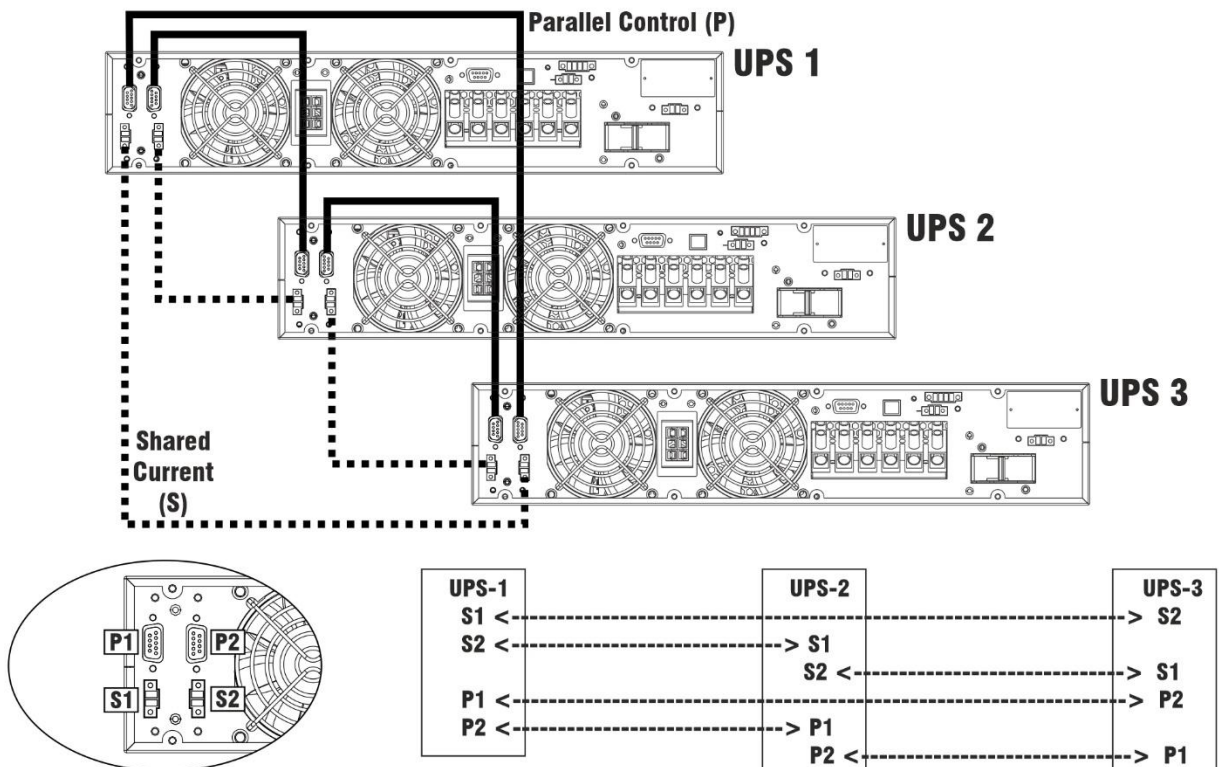
CONTROL CABLES: CONNECTION DIAGRAM

Parallel system requires all UPS share some important control information by parallel control cables. There are 2 kind of control cables: SHARED CURRENT & PARALLEL CONTROL. They must be connected as indicated in below figure:

2 UPS Parallel System - Control Wiring



3 UPS Parallel System - Control Wiring



5. OPERATION MODES

This is a True Online Double Conversion UPS and it is designed to offer clean, bump-less and highest quality power to your computer related equipment protecting also your valuable data. Power delivered by UPS is 100% sine wave as main line.

According to AC main service, and how UPS has been configured, it may operate in following modes:

ONLINE NORMAL Mode

When UPS is off by selecting ON push button in front panel UPS enters into ONLINE NORMAL mode if AC main service is inside acceptable input range. Under this mode UPS Inverter powers outputs and the energy is taken from DC voltage coming from AC/DC converter. Batteries are charged by AC Line if required.

BATTERY Mode (Also known Inverter Mode)

If under ONLINE NORMAL mode UPS detects a problem in AC input Line it enters in battery mode. Under this mode UPS takes energy from batteries to feed inverter that generates power for the output. There are no transfers neither micro-cuts on UPS output as inverter was already working. The only difference is that energy is now coming from batteries instead of rectifier output. Transfer time is actually Zero (0ms). UPS also can enter in battery mode when it is turned on without an acceptable AC input.

STATIC BYPASS (INTERNAL BYPASS):

This mode can be adopted if UPS configuration allows BYPASS mode. This configuration is done by using configuration menus in LCD. Factory preset for 6K and 10K models is BYPASS mode allowed.

Under bypass mode, UPS AC output is feed from UPS AC input. This mode can be adopted by operator by pressing OFF button in front panel (if BYAPSS mode is enable) or automatically in case a problem is detected by UPS. When UPS is in bypass mode, in case AC input is interrupted, output will be interrupted also and UPS will power off. No battery mode can be adopted from bypass mode.

Bypass mode can be caused by any of below conditions:

- 1- Bypass mode is adopted, in case ON button has not been activated as soon as UPS detects a valid AC input on its terminals. (If bypass mode is not enabled, UPS will simply lights its LCD. Outputs will keep powered off)
- 2- Bypass mode is adopted as soon as a problem is detected in its internal circuitries.
- 3- Bypass mode is also activated in case an external overload is detected in UPS output. It happens when equipment connected to UPS output requires a power higher than max. power of the UPS

MAINTENANCE BYPASS:

This is the mode adopted when external bypass switch is activated. On this mode output is feed directly from AC input through external bypass lines. On Maintenance Bypass mode, UPS can be turned-off for maintenance.

In OPTIMA models tower type (T09W and T10) there is a maintenance bypass switch (named MBS) located on rear panel. This switch is covered by a safety plate. In OPTIMA RT (RT9W and RT10) the MBS must be external.

Additionally, this UPS can adopt under operator demand other operation modes as described:

FREQUENCY CONVERSION:

This UPS offers a very sophisticated function named frequency conversion (CF) that allows UPS to generate power output at determined frequency value (50Hz or 60Hz) no matter input frequency value. UPS will be able to generate output at 50Hz even input source is at 60Hz or generate 60Hz even if connected to 50Hz source.

This function can be configured and activated by LCD. Revise configuration section of this manual.

ECO:

Under this mode, UPS powers outputs from the AC input. This is a kind of supervised BYPASS mode. As soon as AC input is out of acceptable input range for ECO mode (as defined on LCD configuration menus), UPS switch UPS from ECO to ONLINE mode or battery mode. Online mode is adopted if input range is acceptable for ONLINE mode. Switching from ECO to other mode takes about 4ms to 10ms. ECO mode must be activated on LCD according to configuration section of this manual.

IMPORTANT NOTES:

- 1.- Under CF mode, UPS will disable BYPASS mode. Since UPS has been configured to generate output with frequency value different to input frequency, BYPASS mode is disabled to avoid a not acceptable frequency value at output.
- 2.- When CF function is activated, maximum power output is de-rated to 60% of maximum nominal capacity. For example, for a 10KVA (8KW) model, when CF is activated maximum output is decreased to 6KVA (4.8KW).

MAINTENANCE BYPASS

Occasionally, all UPS require some kind of maintenance that can only be performed if UPS is powered-off. In that case, an external maintenance bypass switch is actuated to keep system running by feeding it from the AC input service even UPS is powered-off.

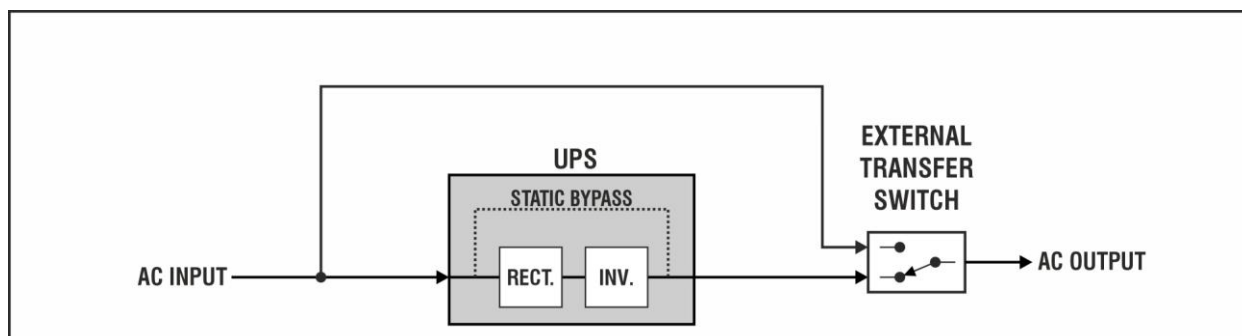
* OPTIMA tower 6K and 10K have their own MBS switch located on rear panel.
* OPTIMA RT 6K and 10K: Due to size limitations, these units do not include an MBS switch within the UPS body. However, XMART offers an optional external BYPASS device, called **ACC-MBS-10K-TB-UL**. This device performs the same function as the MBS in tower units. It has a switch to select the equipment operation mode between UPS (Normal) or BYPASS (Maintenance) to carry out the required tasks. Additionally, a safety cover protects this switch, ensuring it is accessed only when truly necessary and with proper knowledge. XMART **ACC-MBS-10K-TB-UL** can be installed either in a 19" rack or on a flat surface. For more information and operational details, please refer to the manual of this useful accessory.

OPTIMA-RT-6K/10K units feature an external BYPASS status port. This port must be connected to the ACC-MBS-10K-TB-UL. When the operator removes the switch cover from the ACC-MBS-10K-TB-UL, the UPS detects the opening and automatically switches to internal BYPASS mode to prepare the UPS for the imminent activation of the external MBS, preventing a short circuit at the inverter output. In tower UPS units, since the MBS is installed within the UPS body, this signal is internally wired from the MBS cover position detector.

While the UPS is in MAINTENANCE BYPASS mode, the load will be powered from the main electrical service. In this situation, the UPS cannot provide protection to the load. Any failure in the main electrical service will directly affect the load.

GENERIC EXTERNAL BYPASS SWITCH: In case the user installs an external BYPASS device different from the XMART one, without a signal for the BYPASS safety cover status, it will be the operator's responsibility to manually operate the UPS to switch to its internal static BYPASS mode before activating the external BYPASS switch.

Any generic external BYPASS will behave as a Transfer Switch and should be connected according to the following figure. The user will be responsible for its installation and operation.



PROCEDURE FOR ACTIVATING EXTERNAL BYPASS

- 1) Confirm bypass mode is allowed in UPS configuration. Check input voltage is in the acceptable input range for bypass mode.
- 2) Set UPS in static bypass mode by pressing OFF button in front panel. Ups will adopt bypass mode only in bypass is allowed by configuration and input is inside bypass range. Check bypass LED in front panel is ON and online LED is OFF.
- 3) Set External BYPASS switch to the position that connects AC input directly to the load (In case of using a XMART MBS, set it to BYPASS).
- 4) Once the load is powered by AC main input service, UPS can be powered off for maintenance. If there are external batteries, proceed to open DC switches on XBAT to disconnect batteries from the UPS.

COMING BACK FROM MAINTENANCE BYPASS MODE TO NORMAL MODE

With system in maintenance bypass mode (Input lines open and UPS powered-off):

- 1) Power AC input lines and switch-ON input breaker located on rear panel of UPS. If UPS has external batteries, connect them to the UPS switching-on DC switches on XBAT rear panels.
- 2) Verify UPS enters in static bypass mode. Bypass LED must be ON and online LED must be OFF
- 3) Set external bypass switch to the position that connects the UPS Output. In case of using a XMART MBS, set it to UPS position and re-install its safety plate.
- 4) At this moment load is feed by UPS output in static bypass mode.
- 5) Turn UPS on by pressing ON button on front panel. Keep ON button pressed during 2s or longer.

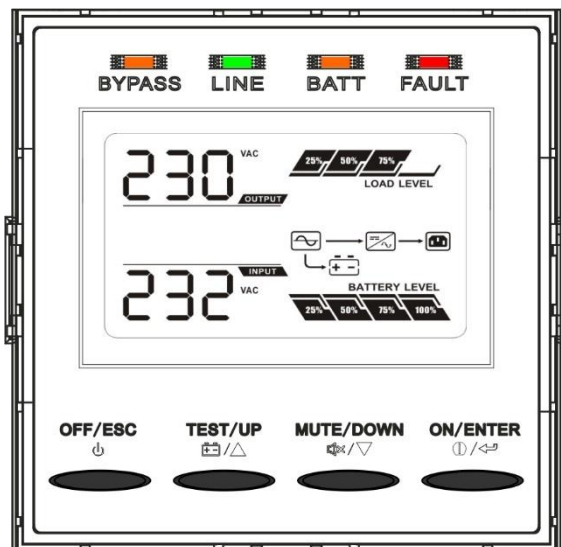
OPERATION MODES LCD SCREENS (230VAC)

LCD screens for 120V UPS models are similar but showing values related to 120V instead of 230V

OPERATION MODE	DESCRIPTION	LCD
STANDBY	<p>A- When bypass is not allowed UPS output is powered-off (0V). It happens when UPS detects a valid input voltage but ON button has not been pressed.</p> <p>B- Flow chart indicates AC input is used to recharge batteries only.</p>	
ONLINE	<p>A – In online mode, Input voltage indicates a valid AC input close to (232VAC).</p> <p>B – Output voltage is displayed in upper left corner (B)</p> <p>C – Flowchart indicates AC input is used to recharge batteries but also feeds rectifier input. UPS output is generated by inverter.</p>	
BATTERY MODE	<p>A- Input indicator at bottom left corner (A) shows Battery voltage since there is no valid AC input detected.</p> <p>B- Output indicator displays AC output generated by UPS inverter.</p> <p>C- AC input symbol must be turned off representing there is no valid AC input detected by UPS.</p> <p>D- Clock symbol lights and backup time is displayed on the screen.</p>	
BYPASS MODE	<p>A- Input and output indicators must show a similar value since output is been feed by input through static internal bypass line.</p> <p>B- Flowchart shows static bypass line is active. Converters icon is turned off representing inverter is OFF.</p>	
ECO MODE	<p>A- ECO symbol is active on LCD</p> <p>B- Flowchart indicates output is powered from input.</p>	
FREQUENCY CONVERTER MODE	<p>A- FC CONVERTER symbol is activated to indicate FC conversion mode is active.</p>	
ERROR/FAILURE MODE	<p>A- When a failure is detected, UPS display error code with alert symbol on screen.</p>	

6. OPERATOR INTERFACE: KEYBOARD & LCD

UPS front panel is equipped with 4 buttons, 4 LEDs and a LCD display.



LEDS DESCRIPTION:

UPS MODE	Bypass	Line	Battery	Fault
UPS turning on	●	●	●	●
BYPASS active	●	○	○	○
NORMAL Online active	○	●	○	○
BATTERY mode active	○	○	●	○
CF Mode active	○	●	○	○
Battery test in progress	●	●	●	○
ECO mode active	●	●	○	○
FAULT mode active	○	○	○	●

● LED ON / ○ LED OFF

KEYBOARD:

<ON / ENTER>

UPS TURN-ON:	Keep it pushed for 2 seconds. If button is release before required time UPS will not turn on.
ENTER:	When UPS is in configuration mode, this key operates as ENTER

<OFF / ESCAPE>

UPS TURN-OFF:	Press for 2 seconds to turn UPS off
SCAPE:	When UPS is in configuration mode, this key operates as SCAPE

<TEST / UP>

BATTERY TEST	Operator can manually initiate a Battery test when UPS is ONLINE if this key is selected
UP	When UPS is in configuration mode, this key operates as UP (↑)

< MUTE / DOWN>

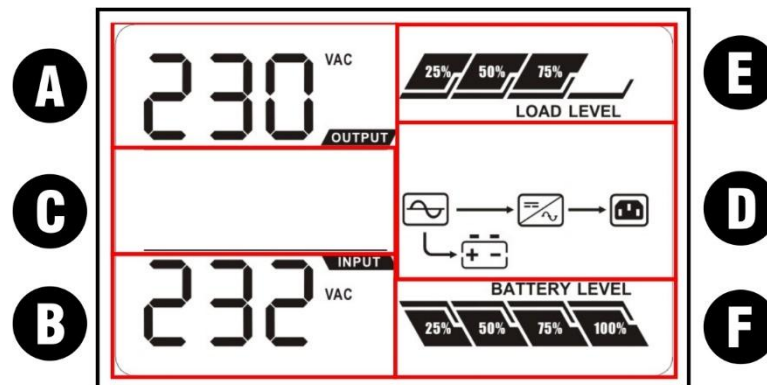
ALARM MUTE	Some no critical alarms can be muted when this key is selected
DOWN	When UPS is in configuration mode, this key operates as DOWN (↓)

< TEST> + < MUTE>

CONFIGURATION MODE	By pressing these 2 keys at same time, UPS enters in configuration mode.
--------------------	--

LCD DESCRIPTION

LCD can be divided in 6 functional areas:



OUTPUT INFORMATION:

It displays: AC Input voltage, DC Battery voltage, Input frequency (in Hz)



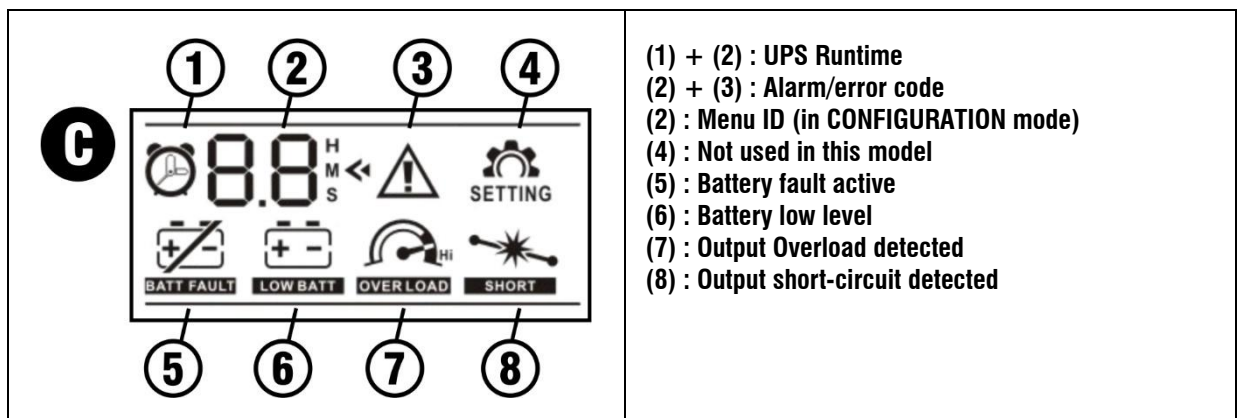
INPUT INFORMATION:

It displays: AC output voltage, Output frequency (in Hz)



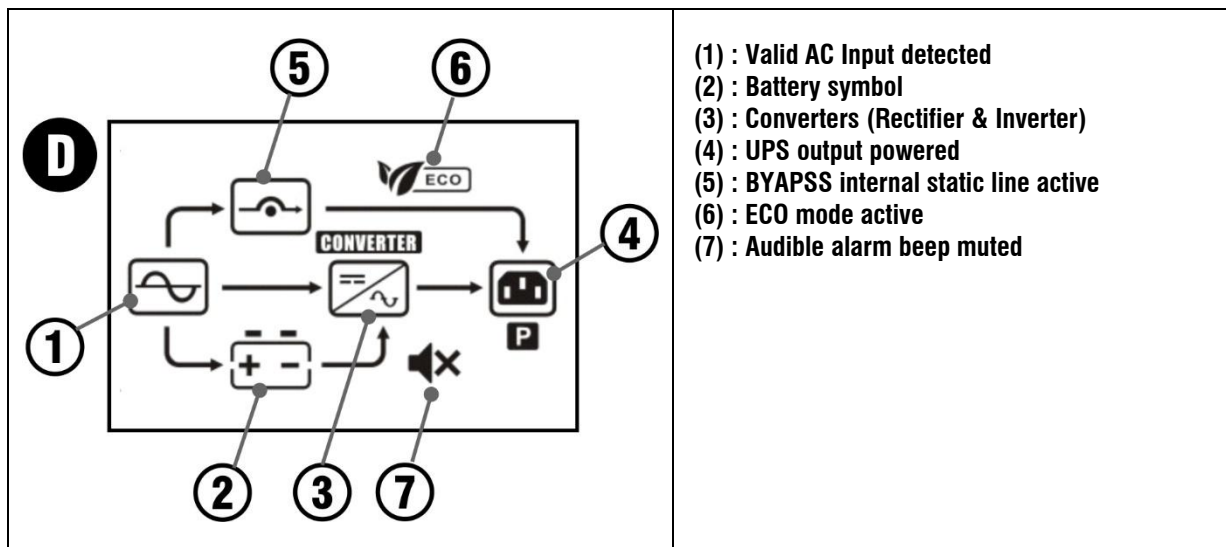
ALARMS & ERRORS

This section of the LCD displays active alarms and errors providing codes and descriptive symbols. This section also shows remaining runtime in battery mode.



FLOWCHART – UPS STATES & MODES

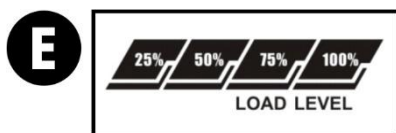
This section displays graphically operation mode and state of the UPS:



OUTPUT POWER METER

This area displays graphically by a 4 segments bar the power supplied by the UPS:

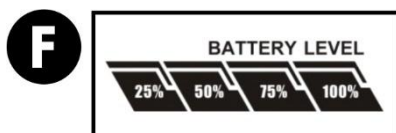
- 25%: Supplied Power is between 0 - 25%
- 50%: Supplied Power is between 26 - 50%
- 75%: Supplied Power is between 51 - 75%
- 100%: Supplied Power is between 76 - 100%



BATTERY LEVEL METER

It shows by a 4 segments bar the charge level of batteries:

- 25%: Between 0 - 25%
- 50%: Between 26 - 50%
- 75%: Between 51 - 75%
- 100%: Between 76 - 100%

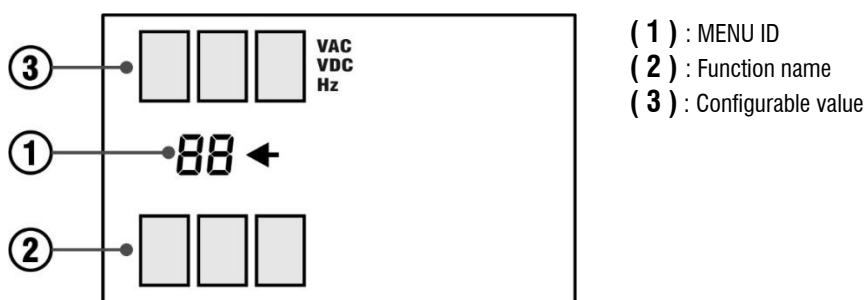


7. UPS CONFIGURATION

Configuration menu allows setting of functions and parameters of the UPS.

Menu is activated by pressing **< TEST >** + **< MUTE >** at same time during 1 second with UPS in STAND-BY or BYPASS mode (powered but without activation of ON button).

In configuration mode, LCD displays ID of the menu and values of 2 adjustable parameters:



KEYBOARD IN CONFIGURATION MODE:

<TEST / UP>

Used as **↑** key to navigate or changing parameters value

<ON / ENTER>

Used as **<ENTER>** key to confirm modifications

<MUTE / DOWN>

Used as **↓** key to navigate or changing parameters value

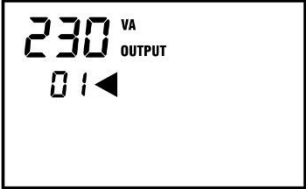
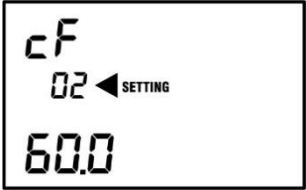
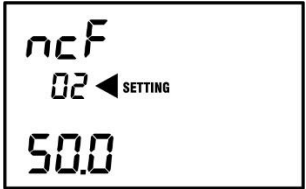
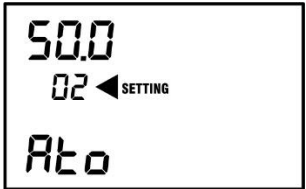
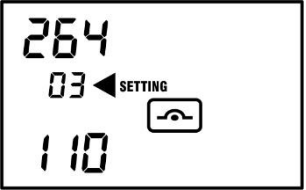
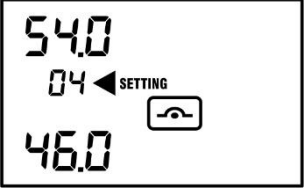

AVAILABLE FUNCTIONS UNDER EACH OPERATION MODE

FUNTION	DESCRIPTION	Bypass	Normal	ECO	CVCF	Battery	Battery Test
1	Output Voltage	●					
2	CF function	●					
3	Input voltage range for BYPASS	●					
4	Input frequency range for BYPASS	●					
5	ECO Enable/Disable	●					
6	Input voltage range for ECO	●					
7	Input frequency range for ECO	●					
8	Bypass Enable/Disable	●	●				
9	Maximum Runtime setting	●	●	●	●	●	●
10	RES (not used)						
11	RES (not used)						
12	No batteries start-up function	●	●	●	●	●	●
13	Battery voltage setting	●	●	●	●	●	●
14	Battery charger setting	●	●	●	●	●	●
15	Inverter setting		●		●	●	
16	UPS output setting		●		●	●	

● Function available.

CONFIGURATION MENU:

This model has configurable functions as listed in below table:

01		OUTPUT VOLTAGE: - For 220V/230V models: Operator can select between: 208Vac / 220Vac / 230Vac / 240Vac. Factory set to: 230V - For 120V models: Operator can select between: 110Vac / 115Vac / 120Vac / 127Vac. Factory set: 120V
02	  	CF: ENABLE / DISABLE FREQUENCY CONVERTER FUNCTION: CF can be enable/disable by setting PAR. 03: CF = Enable NCF = Disable If CF is enabled PAR 02 must be set to preferred frequency value: 50Hz or 60Hz This function allows UPS to generate output at selected frequency no matter value of input frequency If ATO is selected, output frequency will be set by input frequency read when UPS started by first time: from 46 to 54 Hz will set to 50Hz from 56 to 64 Hz will set to 60Hz ** IMPORTANT: 1) If CF is active, output power is decreased by 30%. It means max. UPS power will be 70% of max. rated power. Example: a 10KVA only will be able to supply 7KVA max. 2) BYPASS mode is automatically prohibited if CF is activated.
03		BYPASS: INPUT VOLTAGE RANGE - Sets valid input VOLTAGE range for bypass mode (high and low limits): High limit (Upper row on screen) Adjustable from 231Vac to 276Vac (Factory set to: 264Vac) Low limit (Lower row on screen) Adjustable from 110Vac to 209Vac (Factory set to: 170Vac) Set values with keys: ↑ & ↓
04		BYPASS: INPUT FREQUENCY RANGE - Sets valid input FREQUENCY range for bypass mode (high and low limits): High limit (Upper row on screen) 50Hz Models: Adjustable from 51.0Hz to 54.0Hz (Factory set to: 54.0Hz) 60Hz Models: Adjustable from 61.0Hz to 64.0Hz (Factory set to: 64.0Hz) Low limit (Lower row on screen) 50Hz Models: Adjustable from 46.0Hz to 49.0Hz (Factory set to: 46.0Hz) 60Hz Models: Adjustable from 56.0Hz to 59.0Hz (Factory set to: 56.0Hz) Set values with keys: ↑ & ↓
05		ECO ENABLE / DISABLE: ENA : ENABLE DIS : DISABLE

06
231
06 SETTING
209
Eco

ECO – INPUT VOLTAGE RANGE (Vac)

Function 02: High Limit

Function 03: Low Limit

Set values with keys: ↑ & ↓

07
52.0
07 SETTING
48.0
Eco

ECO – INPUT FREQUENCY RANGE (Hz)

Function 02: High Limit

Function 03: Low Limit

Set values with keys: ↑ & ↓

08
EnA
08 SETTING
oPn
Eco

BYPASS – ENABLE / DISABLE:

PAR 02: OPN: Allowed: according to PAR 03.

FBD: Prohibited: BYPASS not allowed under any condition

PAR 03: ENA: Enable: Bypass allowed in both manual and automatic.

DIS: Disable: Automatic Bypass allowed but manual is prohibited

Set values with keys: ↑ & ↓

09
990
09 SETTING
+ -

MAXIMUM RUNTIME:

This function sets maximum time in Battery mode.

000 a 999: Max. Time in minutes.

DIS: Disable. Runtime will be limited by Battery charge level only.

Set values with keys: ↑ & ↓

10
rES
10 SETTING
rES

NOT USED IN THIS MODEL

11
rES
11 SETTING
rES

NOT USED IN THIS MODEL

12
d15
12
+ -

NO BATTERIES START-UP: Enable/Disable

YES: Allowed

NO: Not allowed

13
0.18 VDC
13 SETTING
Add
+ -

BATTERY VOLTAGE SETTING:

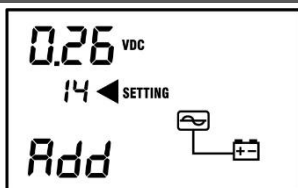
**** ONLY FOR TECHNICAL SERVICE ****

ADD: Increase

SUB: Decrease

Set values with keys: ↑ & ↓

14


CHARGER VOLTAGE ADJUSTMENT:
**** NO MODIFICATIONS RECOMMENDED – ONLY BY TECHNICIANS ****

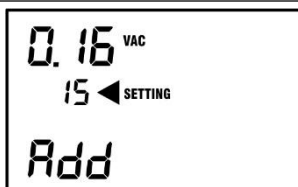
Charger voltage can be adjusted

ADD: for increasing

SUB: for decreasing

Set values with keys: ↑ & ↓

15


INVERTER VOLTAGE ADJUSTMENT:
**** NO MODIFICATIONS RECOMMENDED – ONLY BY TECHNICIANS ****

Inverter voltage can be adjusted

ADD: for increasing

SUB: for decreasing

Set values with keys: ↑ & ↓

16


UPS VOLTAGE ADJUSTMENT:
**** NO MODIFICATIONS RECOMMENDED – ONLY BY TECHNICIANS ****

Inverter voltage can be adjusted

ADD: for increasing

SUB: for decreasing

Set values with keys: ↑ & ↓

17


BATTERY RECHARGING CURRENT:
PAR 2: Allows to configure the current value: 1A, 2A, 3A o 4A

PAR 3: Allows calibration of current in case there is a difference between configured value and real value measured.

Set values with keys: ↑ & ↓

LCD CODES AND TEXTS:

TEXT	DESCRIPTION
BAT	Battery (Batería)
CF	Frequency Converter Function Enabled (Función de Convertidor de Frecuencia Activado)
NCF	Frequency Converter Function Disabled (Función de Convertidor de Frecuencia Desactivado)
ON	ON (Encendido)
OFF	OFF (Apagado)
ENA	Enabled (Habilitado)
DIS	Disabled (Des-habilitado)
ATO	Auto mode (Modo Automático)
SUB	Subtract (Disminuir)
ADD	Add (Aumentar)
PAR	Parallel (Paralelo)
RES	Reserved (Reservado)
FBD	Not Allowed (No permitido)
OPN	Allowed (permitido)
OPV	Output Voltage (Voltaje de salida)

AUDIBLE ALARMS BEEPS

ERROR/FAILURE:	Continuously
BATTERY MODE:	1 "Beep" / 4 seconds
BYPASS MODE:	1 "Beep" / 2 minutes
LOW BATTERY:	1 "Beep" / 1 second.

8. START-UP

INSPECTION BEFORE START UP

1. Make sure all wires are tightly connected to terminal block. Any loose connection will produce overheating, failures and damage to UPS.
2. Make sure all instructions of installation sections have been performed correctly.
3. Put the terminal block cover back in its position to avoid access to wiring
4. Check EPO port:
 - EPO Port closed (Wired): EPO function disabled
 - EPO port connected to an emergency switch: EPO function available by activation of Emergency Switch; which must be "Normally Closed" type in order to guarantee that UPS will shut down when circuit opens.
5. Check Maintenance Bypass Switch (MBS) located in UPS rear panel is in UPS position and its safety cover plate is duly installed.
6. Make sure all external protection devices in input and output lines are in open (OFF) position.

SINGLE UPS - START UP PROCEDURE

1. Make sure all equipment connected to UPS are off
2. Power input lines ON at electrical board by setting Circuit Breaker to ON
3. Put Battery Bank breaker to ON (in case UPS has XBAT connected)
4. Put AC INPUT Breaker to ON in UPS rear panel.
5. LCD of UPS must turns on. UPS should adopt bypass mode.
6. Start up the UPS by pressing <ON> push button during a couple of seconds. ON button must be pressed until LCD shows the text "ON". If ON button is released before that, UPS will not turn-on.
7. UPS will run an auto-test and few seconds later, UPS leaves By-Pass mode to enter in Normal Online Mode, also known as "AC Mode". ONLINE LED must light in green color.
8. Switch external output breakers to ON position.
9. Power on sequentially each protected equipment. The front panel LCD should show the load increase as equipment starts.
10. Once all equipment are on, the total power consumption (load) should not exceed UPS capacity.
11. At this moment UPS working under NORMAL AC-MODE and the system is supplied by UPS.

NOTE 1: If any error or warning message is indicated in LCD, please revise Troubleshooting section of this manual.

NOTE 2: UPS batteries maybe are not fully charged. UPS could require about 4 to 6 hours to recharge batteries up to 100% of their capacity.

PARALLEL UPS - START-UP

MANDATORY REQUIREMENTS FOR PARALLEL UPS



If all these requirements are not complied parallel UPS will not be able to be started-up.

- 1.- Maximum quantity of UPS for working in parallel is 3 units
- 2.- All UPS must be same model and with compatible firmware. If units are manufactured in different production batches, check with your distributor to confirm all units are compatible for parallel connection (similar firmware).
- 3.- All configurable parameters in LCD menus must be similar in all units.
- 4.- All MBS must be in UPS position and safety plate must be covered.
- 5.- In case of using external batteries, each UPS must have its own external battery pack. External batteries cannot be shared by 2 UPS.
- 6.- All UPS must be connected according to this manual.
- 7.- Sum of individual UPS capacities in Watts must be enough to support the total load to be connected to the system. It is highly recommended that UPS system has spare capacity at least of 25% to cover any future load expansion.
If user needs system continues working even if one of the UPS goes to failure, the remaining UPS of the system must be able to assume the load. It means that in a 3 UPS system, the capacity of 2 UPS must be enough to support the load. In case of 2 UPS system, one of the UPS must be able to support 100% of the load. In that way, system will be able to work even if one of the units got failure. This is called as redundancy N + 1.

START-UP – PARALLEL UPS

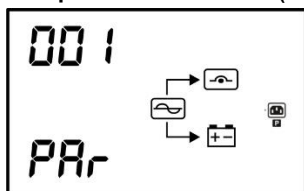


Check all previous requirements are complied. If not, do not try to start-ups parallel UPS.

- 1.- Check parallel UPS are powered OFF and turned OFF.
 - 2.- Check all input breakers are in OFF position.
 - 3.- Power all AC input lines.
 - 4.- Check external batteries are connected to UPS. Switch DC breakers to ON position for all XBAT.
 - 5.- Switch input breaker to ON position in UPS #1. Wait until UPS complete its auto-test process and BYPASS LED turns ON.
 - 6.- Repeat same procedure for UPS #2.
 - 7.- In case of a 3 UPS system, repeat same procedure for UPS #3.
- IMPORTANT:** It is highly recommended to turn UPS ON one by one, not at same time.

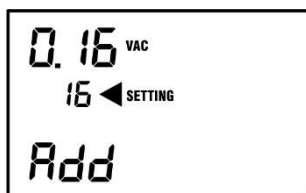
8.- When rear panel AC breaker is set to "ON", UPS recognize all other UPS previously powered ON in the parallel system and will get its own parallel identification as PAR 001 (master UPS), PAR 002 and PAR 003.

Example of LCD for UPS #1 (PAR 001):



- 9.- In case BYPASS mode is allowed in UPS, all UPS will go to BYPASS mode. If bypass mode is not allowed, all units will go to a waiting mode with outputs powered off.
- 10.- Double check configuration menus of each UPS to confirm all parameters are similar in all units of the system.
- 11.- After revision, ON button can be pressed to turn every UPS ON. One by one. Press ON button until message "ON" is displayed on LCD.
- 12.- After few seconds, all UPS in coordinated manner will enter at same time in ONLINE mode.
- 13.- Before closing external AC output breakers to connect AC outputs in parallel, it is mandatory to measure output voltage of each UPS to confirm all of them are similar. Measure with a digital voltmeter. Maximum acceptable difference is about 1.5Vac. If difference is above

1.5Vac technician must adjust output by modifying function 16 of configuration menu (See configuration section in his manual), either increasing (Add) or decreasing (Sub) output voltage on required UPS. See next figure as reference.



14.- After confirming all output voltages in all units are similar, output breakers can be set ONE BY ONE in ON position. First UPS #1, then #2, and then #3. At this moment AC outputs of all UPS are connected.

15.- Verify there is no error messages on LCDs. Now all UPS are working in parallel under ONLINE mode.

16.- Turn load ON equipment by equipment and check load output of UPS is below maximum limit. Output power indicator on LCD provides this information in real time.

ADDING A NEW UPS IN A PARALLEL SYSTEM



For adding a new UPS to an operating system, all loads must be turned off and disconnected from UPS outputs.
Total UPS quantity must be 3 or lower.
Firmware of all UPS must be compatible for allowing parallel functionality.
New UPS must be configured with similar LCD configuration menu than current UPS of the system.
Follow the procedure explained in Installation Section of this manual.

REMOVING AN UPS FROM PARALLEL SYSTEM

There are 2 procedures to isolate and remove one UPS from operative parallel system:

A) Total Power-Off:

Powering off all UPS of the system. This is the less risky procedure.

B) Keeping Parallel system in ONLINE mode:

First check all below requirements are complied, before trying to follow this procedure.

Requirements for removing one UPS in operative UPS:

- 1.- This operation must be performed only by qualified and trained personnel.
- 2.- This operation must be coordinated with the system administrator. System administrator must know about the related risks of this procedure since the system could be shut down during operation because external reasons like:
 - If during this operation occurs a failure in main AC line, battery backup of remaining UPS could not be enough to keep system running before reconnecting removed unit.
 - External breakers could be activated randomly during operation so system could be tripped.
- 3.- There must be a detailed plan to perform this procedure identifying all maintenance activities to be performed on removed unit before reconnecting it.
- 4.- Remaining UPS must be able to support the power system after selected unit is removed.
- 5.- Each UPS must have their own external protections to allow total electrical isolation
- 6.- There must be enough physical room to allow comfortable access to all UPS of the system.

Note: if any of the above requirements cannot be complied, below procedure must not be performed.

In case all requirements can be complied proceed as follow:

- 1.- Power off selected UPS by OFF button in front panel.
Note: OFF button must be selected twice. If OFF is selected only one time, UPS will not respond. Once UPS is turned off it will shut down its outputs but remaining LCD on. This UPS will not go to bypass mode since it is working in UPS system with other UPS generating their output from their inverters. At this moment any failure in AC main line must be supported by operative UPS.
- 2.- Set AC input breaker located in rear panel of the selected UPS to OFF position.
- 3.- Set external output breakers of selected UPS to OFF position.
- 4.- Set external input breakers of selected UPS to OFF position.
- 5.- Once LCD is turned Off, in selected UPS to be isolated, disconnect control parallel cables (parallel cables and current share cables) from its rear panel. Other operative UPS must keep their control parallel cables connected.

NOTE: If you disconnect parallel control cables in any of the operative UPS of the system, a communication problem will occur, and the parallel system will be shut down.








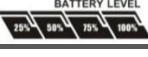









At this moment selected UPS is currently powered off and isolated so that it can be serviced or simply removed.

9. ALARM & ERROR CODES / TROUBLESHOOTING

IMPORTANT:

- All alarm and errors are informed on the LCD by dedicated codes and symbols.
- **ALARMS:** Are usually represented by blinking codes or symbols. Audible alarm beeps are also intermittent for alarms. Alarm states do not avoid UPS working in ONLINE mode.
- **ERRORS:** Are usually represented by steady codes or symbols. Audible alarm for errors always sounds continuously. Error states force UPS to go to Static Internal BYPASS mode.

ALARM SYMBOLS AND CODES




ALARM	ALARM SYMBOLS	AUDIBLE BEEP
OVERLOAD detected at UPS output	 	2 beep / s
LOW BATTERY	 	1 beep / s
BATTERY DISCONNECTED OR FAULTY	 	1 beep / s
BATTERY OVER-VOLTAGE	 	1 beep / s
INPUT FUSES BROKEN	 	1 beep / s
EMERGENCY POWER-OFF ACTIVATED	 	1 beep / s
HIGH TEMPERATURE	 	1 beep / s
CHARGER FAILURE	 	1 beep / s
* UPS BLOCKED: as consequence of detecting 3 overloads in less than 30 minutes OR * MBS cover REMOVED		1 beep / s

ALARMS	ALARM CODES
Battery Disconnected	01
Battery overvoltage	07
Los Battery	08
Overload at UPS output	09
FAN failure	0A
EPO activated	0B
Over temperature	0D
Charger failure	0E
Internal input fuse broken	10
Configuration mismatch in ONLINE for parallel (available only for UPS with parallel functionality)	21
Configuration mismatch in BYPASS for parallel (available only for UPS with parallel functionality)	22
UPS blocked by 3 consecutives overloads (in less than 30 minutes)	33
MBS safety plate removed	3A
Input BYPASS unstable	3D
Boot Loader failure	3E
Overtemperature in transformer	42
Overload in parallel system	45



Some errors and alarms could block UPS until problem is solved and UPS unblocked by operator. Operator must be sure cause of problem has been solved before clear alarm and unblock UPS. Alarm can be deleted by pressing <UP> and <DOWN> keys at same time, when UPS is in BYPASS mode.

ERROR CODES

ERROR CONDITION	ERROR CODE	ERROR SYMBOL
DC BUS start failure	01	
DC BUS High	02	
DC BUS Low	03	
DC BUS unbalanced	04	
INVERTER High voltage	12	
INVERTER Low voltage	13	
SHORT CIRCUIT detected at INVERTER output	14	
SHORT CIRCUIT detected at Battery SCR	21	
SHORT CIRCUIT detected at inverter output	24	
COMMUNICATION "CAN" error	31	
OVER TEMPERATURE	41	
CPU COMMUNICATION ERROR	42	
OVERLOAD: Detected at UPS output	43	
OVERCURRENT IN INVERTER	60	
OVERTEMPERATURE IN TRANSFORMER	77	
NEGATIVE OUTPUT: External device is injecting current to the UPS from its output.	1A	
SHORT CIRCUIT detected at Battery charger	2A	
BATTERY PROBLEM Startup	6A	
RECTIFIER PROBLEM in Battery mode	6B	
DC BUS PROBLEM: Fast voltage variations detected at DC Bus.	6C	
INVERTER CURRENT ERROR	6D	
ABNORMAL VALUE IN SPS 12	6E	

TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE & SOLUCION
Short runtime in Battery mode	Low Batteries Charge: Recharge Batteries during 4-6 h. Old Batteries: Batteries must be replaced by new ones
ALARMS	PROBABLE CAUSE & SOLUCION
Output Overload	High power consumption connected to UPS: Disconnect no critical equipment from UPS. If UPS is blocked by overload alarm, solve overload cause, and unblock UPS as described in ALARMS section of this manual.
Battery failure	Batteries are disconnected or with a very low charging level: Revise batteries connection. Recharge batteries for 4-6 hours. If problem is not solved call technical service.
Batteries disconnected	Revise batteries connection.
EPO active	Revise EPO port on rear panel of UPS. If external switch is connected to EPO port, check external switch.
Over Temperature	Check if fans are working properly. Check if room temperature is in acceptable range. Disconnect noncritical equipment from UPS to reduce internal temperature. If problem is not solved call technical support.
FAN Failure	Check if fans are working properly. If not call technical service.
EEPROM Failure	Turn-off and power-off UPS. Restart UPS. If not solved call technical service.
ERROR CODES	PROBABLE CAUSE & SOLUCION
01 , 02 , 03, 04, 11, 12, 13 24 6A, 6B, 6C 60, 63	Turn-off and power-off UPS. Disconnect all equipment connected to UPS. Restart UPS with no loads connected to its output. If UPS starts-up without problems, find faulty equipment and remove it from UPS. If problem is not solved call technical support.
14	Short-circuit detected in the load connected to UPS. Turns UPS OFF. Identify faulty load and remove it from UPS output. Turns UPS on.
21, 2A	- Turns UPS OFF. Check Battery voltage and related wiring is OK. If problems cannot be solved call service support.
31, 42	UPS is reporting internal communication problem. Turns UPS off and restart it. If problems cannot be solved call service support.
36	In a parallel system, unbalance current has been detected. Check output connections. Check all UPS are working in ONLINE mode. Correct connection problem. If not, call service support.
41	Over-temperature in UPS. Turn UPS off and check if room temperature is below maximum limit. If room temperature is too high solve it before restarting UPS.
43	Overload detected at UPS output. Turn UPS off and remove noncritical loads to reduce power consumption. Restart UPS.
1A	One of the loads is feeding current back to the UPS. This is usually caused by connecting an energy supply to the UPS output by mistake.



IMPORTANT: In case of extreme failure or when burning smell is detected, UPS input lines must be powered off immediately and UPS must be turned-off by <OFF> button. Wait until LCD turns-off. Then call technical service.

10. SOFTWARE

Our monitoring software allows user to manage UPS and monitoring of all its features.

Main software features are: Configuring UPS parameters, Automatic shutdown for protected PCs (OS and files) when long blackouts force UPS to power-off, Scheduled battery tests, shutdown and start-up and Easy interface for monitoring UPS and Main service.

CD software is usually included inside the box. For some models, software can be downloaded from our website. Software manual can be downloaded from our website also.

11. BATTERIES: CARE & MAINTENANCE

To have a longer Battery life, it is recommended to apply a deep discharge to batteries every 3 months. It is also recommendable to operate UPS with a room temperature below 25°C. Operating UPS with higher room temperatures will short dramatically battery life.

IMPORTANT: RECHARGING PLAN FOR LONG STORAGE

If UPS will be stored for long time, it is mandatory to recharge UPS periodically. If UPS is not recharged according to this plan, batteries will get permanent damage. This kind of damage is not covered by warranty.

Recharging plan is conditioned to storage temperature:

STORAGE TEMPERATURE: - 25°C to + 30°C : RECHARGE EVERY 4 MONTHS / RECHARGE DURING 6 HOURS

STORAGE TEMPERATURE: + 30°C to + 45°C : RECHARGE EVERY 2 MONTHS / RECHARGE DURING 6 HOURS

12. BATTERIES & CHARGER: CONFIGURATION & SERVICE

THIS INFORMATION IS ONLY FOR QUALIFIED TECHNICIANS.

Batteries replacement only must be performed by authorized technical service. Batteries are located inside of the UPS or in external battery cabinets. Original batteries must be replaced by new batteries with same technology (VRLA) and specifications: 12VDC and similar capacity in AH.

BATTERIES QUANTITY

This type of UPS is equipped at factory with 20 batteries 12VDC connected in serial for a total of 240VDC. This UPS can be configured to work with different quantity of batteries: 16, 17, 18, 19 or 20 batteries in serial connection. HOWEVER it is not recommendable to modify factory setting of 20 batteries.

In case battery quantity is required to be modified, a different quantity must be configured by configuring jumpers on control board as explained in this section.

IMPORTANT: Some important specifications are downgraded if batteries quantity is reduced below 20 pieces for example: output power factor: 20 pcs → PF=1.0 / 18-19 pcs → PF=0.9 / 16-17 pcs → PF=0.8.

Runtime in battery mode will be shorter in case battery quantity is reduced.

JUMPER JP1 CONTROL BOARD	16 Batteries 218VDC	17 Batteries 232VDC	18 Batteries 245VDC	19 Batteries 259VDC	20 Batteries 273VDC
JP1 pines 5-6	CONNECTED	OPEN	OPEN	OPEN	OPEN
JP1 pines 7-8	OPEN	CONNECTED	CONNECTED	OPEN	OPEN
JP1 pines 9-10	OPEN	CONNECTED	OPEN	CONNECTED	OPEN

BATTERY CHARGER MUST MATCH WITH BATTERY QUANTITY

Charger voltage must be configured according to battery quantity. This is configured on control board by setting Jumpers from JP01 to JP05 according to below table:

JUMPERS CONTROL BOARD	16 Batteries 218VDC	17 Batteries 232VDC	18 Batteries 245VDC	19 Batteries 259VDC	20 Batteries 273VDC
JP01	OPEN	OPEN	OPEN	CONNECTED	OPEN
JP02	OPEN	OPEN	CONNECTED	OPEN	OPEN
JP03	OPEN	CONNECTED	OPEN	OPEN	OPEN
JP04	CONNECTED	OPEN	OPEN	OPEN	OPEN
JP05	OPEN	OPEN	OPEN	OPEN	OPEN

MAXIMUM BATTERY CHARGER CURRENT

It is configured on charger board. Identify jumpers 06, 07 & 08 to set them according to following table:

JUMPERS CHARGER BOARD	1A	2A	3A	4A
JP06 CHARGER	OPEN	OPEN	CONNECTED	OPEN
JP07 CHARGER	OPEN	CONNECTED	OPEN	OPEN
JP08 CHARGER	CONNECTED	OPEN	OPEN	OPEN

13. SUPPORT & WARRANTY

Support: If a failure or problem is detected please check troubleshooting section in user manual. If problem cannot be solved please contact authorized service center or authorized dealer.

Batteries: Rechargeable batteries can be charged and discharged hundreds of times. However, they will eventually wear out. This is not a defect or failure so that batteries wear out is not covered by this warranty.

Battery lifetime will depend on operative conditions like working temperature, type and frequency of discharging cycles. Higher the temperature shorter will be the lifetime. Frequent and deep discharging cycles also will short lifetime. For critical applications batteries should be revised and replaced periodically. Long storage (longer than 6 months) without required recharging will wear out batteries. This situation is not covered by this limited warranty since this is not considered as a defect. Check recharging instructions on user manual.

Conditions - Limited Warranty

1.- Subject to the conditions of this limited warranty, this product is warranted to be free from defects in materials and workmanship at the time of XMART supplies the product.

- In Europe, warranty time is 2 years on electronic parts and 2 years on internal batteries from XMART invoice date.
- In America, standard warranty times could vary depending on country/region or can be extended by purchasing warranty options. Please check warranty plans and extensions with your local distributor.

2.- If during the warranty period, this product fails to operate under normal use and service, due to defects in materials or workmanship, authorized distributor or service center will, at their option, either repair or replace the product in accordance with terms and conditions stipulated herein. Transportation expenses are not covered by this limited warranty.

3.- Warranty is valid only if the original purchasing document, specifying date of purchase, serial number, and name of the dealer, is presented with the product to be revised. XMART and authorized partners reserve the right to refuse warranty service if any of this information has been removed, changed, or missing in original invoice document.

4.- If product is repaired or replaced, repaired, or replaced product will be warranted for the remaining time of the original warranty or for 90 days on repaired part from date of repair, whichever is longer.

5.- XMART or their distribution/service partners reserve the right to charge handling fee if returned product is free of failure or it is out of warranty because any of the reasons described in this warranty.

6.- If product is out of warranty a reparation proposal will be sent to the user for his approval. If proposal is not accepted, service center will keep product available for the user during 60 continuous days. After this period product would be disposed and user will not be able to rise any claim.

7.- Rechargeable batteries, like included in this product, will definitively wear out even under normal operation. This is not a defect or failure, so it is not covered by this warranty.

8.- This warranty does not cover batteries wear out caused by improper or long storage (over 6 months without required recharging as indicated in product manual). Even performing recharging procedure this product cannot be storage longer than 18 months. Problems on batteries caused by this kind of long storage are not covered by this warranty.

9.- This warranty does not cover product failures caused by installations, modifications or repair performed by non-authorized person. If product is open by not authorized technician warranty will be considered void. This warranty does not cover failure caused by inadequate installation or maintenance, misuse, accidents, fire or floods.

10.- This product can include protection devices like input fuse or input breaker. Activation of this kind of devices is not a failure it is caused by an improper product installation. Input fuse or breaker reset, or replacement is not covered by this warranty.

11.- This warranty does not cover damages produced during transportation from user to technical service caused by improper packing of the product by user.

12.- Warranty terms and conditions cannot be modified or extended by third parties without written approval of XMART.

Limited Warranty

- XMART does not warrant that the operation of this product will be uninterrupted or error-free during its lifetime. If product fails to work, the maximum liability of XMART under this limited warranty is expressly limited to the lesser of the price you have paid for the product or the cost of repairing or replacement of any hardware components that malfunction in conditions of normal use.

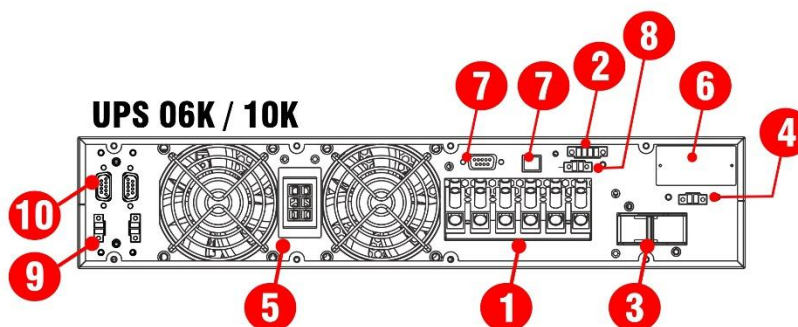
- In no event will XMART be liable for any damages caused by the product or the failure of the product to perform, including any lost profits or savings or special, incidental, or consequential damages. XMART is not liable for any claim made by a third party to XMART or to final user.

- XMART is not responsible for damage that occurs as a result of your failure to follow the instructions intended for this hardware product.

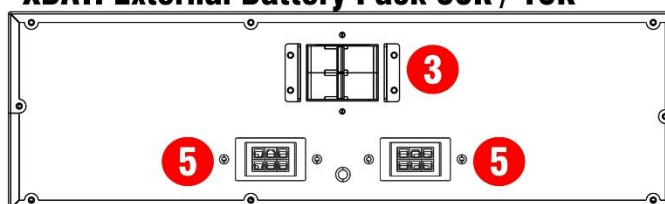
14. REAR PANEL

- | | |
|---|---|
| 1 Terminal Block (AC input & output) | 8 EPO: Emergency Power Off port |
| 2 Temperature input from ISOTX | 9 Parallel Control Ports: Shared Current |
| 3 AC Input Breaker | 10 Parallel Control Ports: Parallel Control |
| 4 Connector for Ext. Bypass status signal | 11 Temperature Port (ISOTX) |
| 5 DC connector for external batteries | 12 Fan (ISOTX) |
| 6 Intelligent port | 13 AC Input (ISOTX) |
| 7 USB & RS232 | 14 AC Output: (ISOTX) |

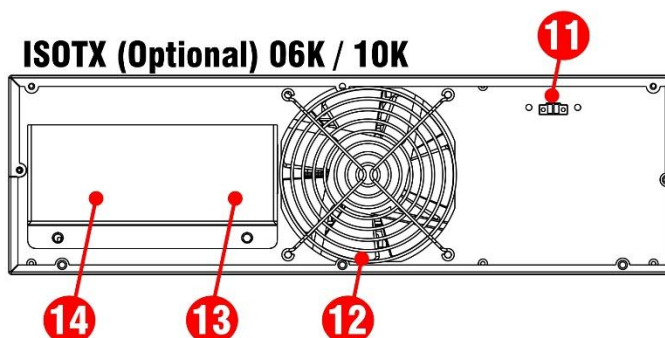
OPTIMA-RT10-06K/10K (UL)



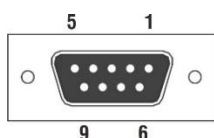
XBAT: External Battery Pack 06K / 10K



ISOTX (Optional) 06K / 10K



RS232 COMMUNICATION PORT



Serial Port – Pinout:

Pin 2: RX
Pin 3: TX
Pin 5: GND

IMPORTANT:

Communication cable for this RS-232 port must be wired 1 to 1, between pins 2, 3, & 5 of both ends.

15. SPECIFICATIONS (1/2)

ONLINE - OPTIMA RT10 (UL)	(RT10 6KVA-230)	(RT10 10KVA-230)
Capacity / Capacidad	6.000VA / 6.000W	10.000VA / 10.000W
INPUT / ENTRADA		
Input Voltage / Voltaje de Entrada	Rated Input / Entrada Nominal: 208/220/230/240 Vac (single phase: L-N-G)	
Input Range / Rango de Entrada	@0-60% load: [110-300Vac] - @61-80% load: [140Vac-300Vac] - @81-100% load: [176-300Vac]	
Frequency Range / Rango Frecuencia	40 - 70 Hz	
Max. Current / Corriente Max.	30A (RMS)	50A (RMS)
Inrush Current / Corriente Pico max.	200A max.	200A max.
Phase / Fases	1 Phase+Neutral+Ground / 1 Fase+Neutro+Tierra	
Power Factor / Factor de Potencia	> 0.99 @ 100%load	
THDi	<4% @ 100%load - < 6% @ 50%load	
Slew Rate / Seguimiento Frecuencia	1 Hz / s	
OUTPUT / SALIDA		
Model 230:	1 phase (L-N): 208/220/230/240Vac	
Model ISOTX:	Dual Isolated Outputs: (L-N): 104/110/115/120Vac	
Voltage Regulation / Regulación Salida	+/- 1%	
Frequency / Frecuencia (Batt. Mode)	50 Hz +/- 0.1 Hz / 60 Hz +/- 0.1 Hz (auto sense)	
Current Crest Ratio / Factor de Cresta	3:1 @ 100% load.	
THDv	< 1% @ Linear Load / Carga Lineal - <4 @ No Linear Load / Carga no Lineal	
Dynamic Accuracy / Regulac. Carga Variable	<5% (load variations 20%-100% & 100%-20% R Load)	
Operating mode transient Response	Comply to IEC 62040-3 (Class 1)	
Dynamic Load Transient Response	Comply to IEC 62040-3 (Class 1)	
Recovery Time after Non-Linear Load Step	100ms (IEC 62040-3, ref Non-linear load)	
Transfer Times / Tiempos Transfer.	0 ms	
Waveform / Forma de Onda	Sine Wave / Sinusoidal Pura	
DC offset / Componente DC en la salida	50 mV	
Power Outlets / Salidas	Terminal Block / Regleta de Conexión	
OVERLOAD / SOBRECARGA		
AC Mode / Modo Normal	[100%-110%: 10m]	[110%-130%: 1m] [>130% : 1s] to Bypass
Battery Mode / Modo Batería	[100%-110%: 30s]	[110%-130%: 10s] [>130% : 1s] to Cut-Off
Bypass Mode / Modo Bypass	[100%-130%: Warning]	[>130% : 1min] to Cut-Off
Overload Memory Protection / Protección por Memoria de Sobrecarga	3 Overload in 30min and UPS locks on bypass and alarm status / 3 Sobrecargas en 30min y el UPS se bloquea en Bypass y estado de alarma	
EFFICIENCY / EFICIENCIA @ (100%/75%/50%/25%) R LOAD		
Eco Mode / Modo ECO	MODEL 230V: 99% / 99% / 98% / 97% - MODEL ISOTX: 95% / 95% / 94% / 93%	
AC Mode / Modo AC	MODEL 230V: 94% / 93% / 87% / 83% - MODEL ISOTX: 90% / 89% / 83% / 80%	
Battery Mode / Modo Batería	MODEL 230V: 92% / 91% / 85% / 81% - MODEL ISOTX: 88% / 87% / 82% / 81%	
Inverter Efficiency / Eficiencia Inversor	97% Inverter (@ 100 LOAD)	
BTU @ 100% LOAD	1228	2046
PROTECTIONS / PROTECCIONES		
Surge / Contra Picos	All lines protection / Protección en todas las líneas (L-N, L-G, N-G): > 650J (10/1000us)	
Short Circuit / Cortos en la salida	Electronic inverter shortcircuit protection / Protección del inversor contra cortocircuitos: <100ms: Current limited to max. capacity / Corriente limitada al 100% de Capacidad >=100ms: Output shutdown. UPS goes to Fault Mode / UPS apaga salida y pasa a Modo Falla	
Enhanced Protection / Protección Ampliada	Batt. Overcharge & deep discharge, high/low AC Input Volt., overtemp., internal comm. failure / Sobrecarga y descarga profunda de bat., alto/bajo voltaje en línea AC, sobretemp., fallas de com. interna	
Input Current / Corriente de Entrada	Fuse protected / protegido por fusibles	
Starting Time / Tiempo de Arranque	7s - 10s (@ 100% load)	

15. SPECIFICATIONS (2/2)

ONLINE - OPTIMA RT10 (UL)		(RT10 6KVA-230)	(RT10 10KVA-230)
BATTERIES / BATERIAS			
Technology / Tecnología		YUASA or CSB: Sealed Lead Acid VRLA-AGM / Sellada Sin Mantenimiento VRLA-AGM	
Each XBAT / Cada XBAT		12V/7AH x 20 pcs (20pcs x 1: 240VDC)	12V/9AH x 20 pcs (20pcs x 1: 240VDC)
Recharge Time / Tiempo Recarga 1 XBAT		3.5 H (90%, Typical)	4 H (90%, Typical)
Extra XBAT / XBAT adicionales		Depending on external battery configuration / Según cantidad de baterías adicionales	
Hot-Swap / Intercambiables en Caliente		Yes / Si	
Batteries charger / Cargador de baterías		3 steps technology according to DIN41773 / Tecnología de 3 etapas según DIN41773 (Constant Current / Equalizing / Floating)	
Charging Amps / Corriente de Carga		1A, 2A, 3A & 4A Configurable // (0.1C min / 0.2C recommended)	
Recharging Time / Tiempo Recarga (90%)		1h - 2h (*N5)	
Charging VDC / Voltaje Cargador (Floating)		273.0 VDC	
Temp. Compensation / Compensación Temp.		120mV/°C per battery (Temp: 25°C-50°C)	
Batt. Management / Manejo de Baterías		Optimiced Battery Management (OBM) / Manejo Optimizado de Baterías (OBM)	
Shutdown battery Voltage / Voltaje DC Apag.		214VDC (0-30% load) / 204VDC (30-70% load) / 192VDC (load >70%)	
INDICATORS / INDICADORES			
LCD / Pantalla LCD		UPS status, Load level, Battery, Input/Output voltage, Discharge timer, and Fault conditions Estado del UPS, Consumo, Baterías, Voltaje Entrada-Salida, Tiempo Descarga, Diagnóstico	
ALARM / ALARMAS			
Beep Alarm / Alarma sonora:		Battery Mode, Low battery, Overload, UPS Failure / Modo Batería, Baja batería, Sobrecargas, Falla	
PRODUCT SIZE & WEIGHT / DIMENSIONES Y PESOS DEL EQUIPO			
UPS (DxWxH)		610x438x88 mm	610x438x88 mm
XBAT (DxWxH)		715x438x133 mm	715x438x133 mm
ISOTX (DxWxH)		607x438x133 mm	607x438x133 mm
UPS (Net weight / Kg)		17	20
XBAT (Net weight / Kg)		47	53
ISOTX (Net weight / Kg)		62	92
PACKING / EMPAQUE			
UPS (DxWxH)		835x575x250 mm	835x575x250 mm
XBAT (DxWxH)		880x585x250 mm	880x585x250 mm
ISOTX (DxWxH)		880x585x250 mm	880x585x250 mm
UPS (Gross weight / Kg)		19	22
XBAT (Gross weight / Kg)		52	58
ISOTX (Gross weight / Kg)		67	97
OPERATING / AMBIENTALES			
Humidity / Humedad		<95 % (non-condensing / no condensante)	
Temperature / Temperatura		0 to 40 °C	
Storage Temp / Temp. Almacenaje		-40°C to +60°C (without batteries) // -15°C to +40°C (with batteries)	
Noise Level / Ruido Producido		< 55dB @ 1m	
Protecting Coating / Tropicalizado de Tarjetas		Yes / Si	
Max. Altitude / Altura de Operación Max.		4.500 meters over sea level / sobre nivel del mar. * Power output de-rate of 1% every 100m (over 1.000m)	
COMMUNICATION / COMUNICACION			
Smart RS-232 & USB ports		Windows family, Linux, and MAC	
Intelligent Port (SNMP)		Optional LAN card / Comunicación LAN Ethernet opcional AS400 optional interface board / Interfaz AS400 - opcional	
SAFETY / ESTÁNDARES			
Safety / Seguridad		CE / 62040-1 // UL1778 & CSA C22.2	
EMC		62040-2 & FCC Part 15, Class A	
Others / Otros		Check in user manual (section 2) / En manual de usuario, sección 2	
Quality and Enviroment		RoHS / ISO9001 & ISO14001	
Degree of protection / Grado de Protección		IP 21	
Note 1: Max. output power is derated to 90% when output voltage is set to 208V. La potencia máx. de salida se reduce al 90% si se fija voltaje en 208V			
Note 2: Max. output power is derated to 70% when CF function is activated. La potencia máxima de salida se reduce al 70% si se activa la función CF.			
Note 3: If installed over 1.000m altitude, output power is derated 1%/100m over 1.000m. La salida se reduce en 1% cada 100m, sobre los 1.000msnm.			
Note 4: Bypass mode is automatically prohibited when CF function is activated. El modo bypass se anula automaticamente cuando se activa la función CF.			
(*N5): Recharging time based on previous 10min to 20min full discharging cycles. Tiempo de recarga basado en ciclos previos de descarga profunda de 10 a 20min.			

16. BATTERY CHARGER

This UPS includes a powerful and modern battery charger which is connected to the AC input

CHARGER CONFIGURATION:

Maximum recharging current can be configured in the LCD frontal panel. Maximum current must be configured according to the capacity of the battery bank.

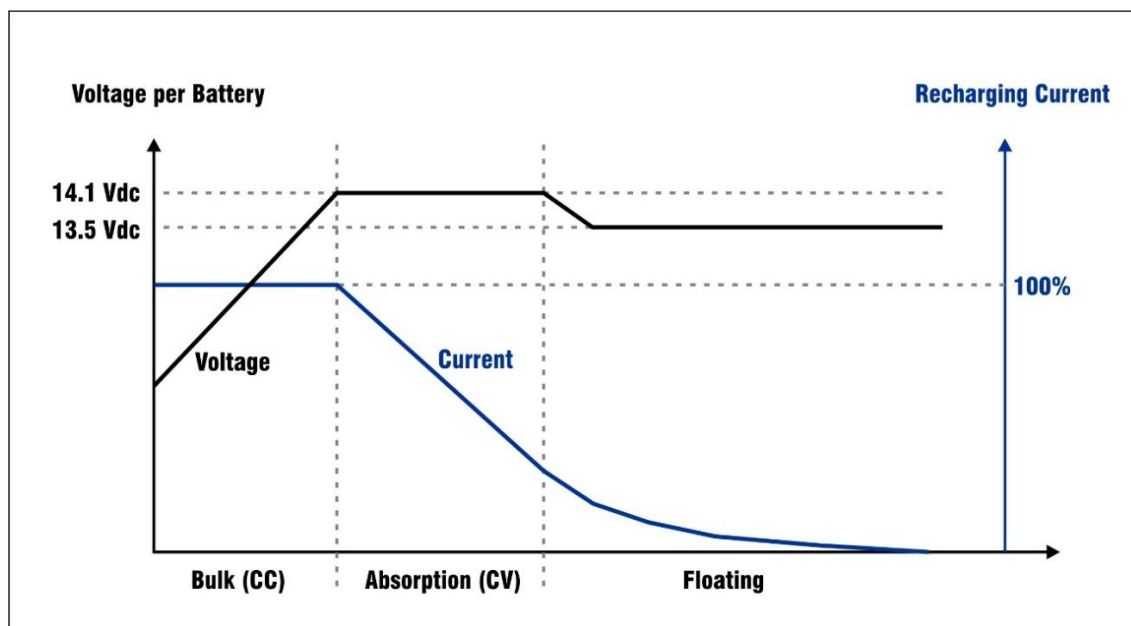
IMPORTANT: Maximum current must be between 10% and 20% of the total AH battery capacity. Charging currents over 20% of AH, might cause battery overheating and internal pressure increase and shorten battery lifespan. For example, for a small 9AH battery bank, the minimum current should be 0.1C (about 0.9A). In this case, charger should be configured as 1A.

To get shorter recharging time current could be configured close to its maximum value 0.2C (1.8A). In this case, charger should be configured as 2A.

RECHARGING ALGORITHM

This UPS battery charger uses a 3 steps algorithm to care batteries.

- **Constant Current**
During this stage charger injects a constant current meanwhile batteries increase their voltage. During this stage batteries recover up to 90% of total capacity. This stage takes 60% of total recharging time.
- **Constant Voltage**
When first step is finished charger provides stable voltage meanwhile current decreases slowly. Charging voltage for VRLA/AGM batterie is close to 2.35Vdc per cell (14.1 VDC per battery). In this stage batteries recover 100% of their capacity.
- **Floating**
In this stage, batteries are considered fully charged and voltage is allowed to remain close to 2.25VDC per cell (13.5VDC per battery)



TEMPERATURE COMPENSATION

Batteries should be recharged with a room temperature under 25°C. In case temperature rises above 25°C, charger decreases charging voltage to protect batteries as follows:

For temperatures over 25°C:

Compensation: -20mV/°C per cell (-120mV/°C per battery). Over 50°C batteries are not recharged.

Both, the smart battery recharge algorithm, and the temperature compensation are part of our Optimized Battery Management or Advance Battery Management (ABM) which improves the battery operations efficiency, as well as enlarges its lifespan.

NOTES

[illegible]

USA Main Offices:
Doral, FL 33172. USA

EUROPE Main Offices:
Sabadell 08202. Spain

Latin America Main Offices:
Santiago de Chile, Chile