



Archimod HE 240-480®

User manual



Archimod HE 240-480®

EN

ENGLISH

3



Contents

| | | |
|----------|--|-----------|
| 1 | Introduction | 5 |
| 1.1 | Overview | 5 |
| 1.2 | Purpose of the manual | 5 |
| 1.3 | Symbols in the manual | 5 |
| 1.4 | Where and how to keep the manual | 6 |
| 1.5 | Update of the manual | 6 |
| 1.6 | Manufacturer's liability and guarantee | 6 |
| 1.6.1 | Guarantee terms | 7 |
| 1.6.2 | Extension of the guarantee and maintenance contracts | 7 |
| 1.7 | Copyright | 7 |
| 2 | Safety regulations | 8 |
| 2.1 | General notes | 8 |
| 2.2 | Definitions of "Skilled technician" and "Operator" | 8 |
| 2.2.1 | Skilled technician | 8 |
| 2.2.2 | Operator | 8 |
| 2.3 | Personal Protective Equipment | 9 |
| 2.4 | Hazard signs in the workplace | 9 |
| 2.5 | Signs on the equipment | 10 |
| 2.6 | General warnings | 10 |
| 2.7 | How to proceed in an emergency | 12 |
| 2.7.1 | First-aid procedures | 12 |
| 2.7.2 | Fire procedures | 12 |
| 3 | Technological description | 13 |
| 3.1 | Archimod HE technology | 13 |
| 3.2 | Features | 15 |
| 3.3 | Models | 18 |
| 3.3.1 | Archimod HE 240 | 18 |
| 3.3.2 | Archimod HE 480 | 22 |
| 4 | Unpacking and positioning | 26 |
| 4.1 | Visual check | 26 |
| 4.1.1 | Equipment check | 26 |
| 4.2 | Movement | 26 |
| 4.3 | Positioning constraints | 27 |
| 4.4 | Unpacking | 28 |
| 4.5 | Check of the content | 28 |
| 4.6 | Final operations | 28 |

Contents

| | |
|--|-----------|
| 5 Control panel | 29 |
| 5.1 Description | 29 |
| 5.2 Service Mode | 30 |
| 5.3 Main screen | 30 |
| 5.4 Main menu and submenu | 32 |
| 5.4.1 UPS Status | 33 |
| 5.4.2 UPS Setup | 35 |
| 5.4.3 Power Modules | 39 |
| 5.4.4 Events | 41 |
| 5.4.5 Tools | 41 |
| 5.4.6 Log Out | 41 |
| 5.5 POWER ON/OFF menu | 42 |
| 5.6 Switching off the UPS | 42 |
| 5.7 Switching on the UPS | 42 |
| 6 Diagnosis | 43 |
| 6.1 Luminous and audible notifications | 43 |
| 6.2 Messages | 45 |
| 7 Maintenance | 52 |
| 7.1 Introduction | 52 |
| 7.2 Installation | 52 |
| 7.3 Preventive maintenance | 52 |
| 7.4 Periodical checks | 52 |
| 7.5 Ordinary maintenance checks | 52 |
| 7.6 Extraordinary maintenance | 52 |
| 8 Warehousing | 53 |
| 8.1 UPS | 53 |
| 8.2 Batteries | 53 |
| 9 Dismantling | 54 |
| 9.1 Battery disposal | 54 |
| 9.2 UPS dismantling | 54 |
| 9.3 Electronic component dismantling | 54 |
| 10 Technical data | 55 |

1. Introduction



CAUTION

The instructions in this manual are intended for an OPERATOR (paragraph 2.2.2).

1.1 Overview

Congratulations on your LEGRAND Archimod HE 240-480 UPS purchase.

Thanks to this UPS, your critical equipments will always be protected by a constant and reliable electricity supply.

LEGRAND is specialized in designing and producing UPS units. Archimod HE 240-480 is unique in its kind: it is modular, redundant and belongs to the last generation of high power UPS units.

High reliability, low running costs and excellent electrical performance are some of its characteristics. The high quality standard of LEGRAND in design and production allows Archimod HE 240-480 to pass the strictest quality tests.

The UPS has been designed in compliance with the existing European community directives, with the technical standards that include their requirements and with the eco-design guidelines.

The equipment is produced at an ISO14001 certified factory.

This publication, simply defined "user manual" herein, contains all the information for the use of the Archimod HE 240-480 UPS, also referred to as "equipment" in this manual.

The contents of the user manual are intended mainly for an operator (see paragraph 2.2.2) or for people, generically defined as "users", who have the need and/or obligation to provide instructions or work directly on the equipment for their assigned tasks.

These people can be the following:

- managers;
- heads of operating areas;
- department heads;
- direct private users.

1.2 Purpose of the manual

The purpose of this manual is to provide the operator with instructions for safely using the equipment after the installation performed by a skilled technician (see paragraph 2.2.1).

Extraordinary maintenance operations are not dealt with in this manual because they are the sole preserve of the LEGRAND Technical Support Service.

The reading of this manual is essential but does not substitute the skill of technical personnel who must have received adequate preliminary training.

The intended use and configurations envisaged for the equipment as shown in this manual are the only ones allowed by the Manufacturer.

Any other use or configuration must be previously agreed with the Manufacturer in writing and, in this case, the written agreement will be attached to the installation and user manuals.

This manual also makes reference to laws, directives and standards that the operator is required to be aware of and consult.

The original text of this publication, drafted in Italian, is the only reference for the resolution of disputes of interpretation linked to translations into other languages.

1.3 Symbols in the manual

Some operations are shown in graphic symbols that draw the attention of the reader to the danger or the importance they imply:



DANGER

This indication shows a danger entailing a high degree of risk that, if not avoided, will lead to death or serious injury or considerable damage to the equipment and things around it.

1. Introduction



WARNING

This indication shows a danger entailing a medium degree of risk that, if not avoided, could lead to death or serious injury or considerable damage to the equipment and things around it.



CAUTION

This indication shows a danger entailing a low level of risk that, if not avoided, could lead to minor or moderate injury or material damage to the equipment and things around it.

INDICATION

This symbol indicates important information which should be read carefully.

1.4 Where and how to keep the manual

This manual must be kept in a safe, dry place and must always be available for consultation.

It is recommended to make a copy of it and file it away.

If information is exchanged with the Manufacturer or the authorised assistance personnel, it is essential to refer to the equipment's rating plate data and serial number.

INDICATION

The manuals provided with the equipment are an integral part of it and must therefore be kept for its entire lifetime. In case of need (for example in case of damage that even partially compromise its consultation) the operator is required to get a new copy from the Manufacturer, quoting the publication code on the cover.

1.5 Update of the manual

The manual reflects the state of the art when the equipment was put onto the market. The publication conforms with the directives current on that date. The manual cannot be considered inadequate when new standards come into force or modifications are made to the equipment.

Any addition to the manual the Manufacturer considers appropriate to send to the users, must be kept together with the manual of which they will become an integral part.

The version of the manual updated to its latest release is available on the Internet at <http://www.ups.legrand.com>

1.6 Manufacturer's liability and guarantee

The skilled technician and the operator shall scrupulously comply with the precautions indicated in the manuals. In particular they must:

- always work within the operating limits of the equipment;
- always carry out constant and careful maintenance through a skilled technician who complies with all the procedures indicated in the installation and maintenance manual.

The Manufacturer declines all indirect or direct responsibility arising from:

- failure to observe the installation and maintenance instructions and use of the equipment which differs from the specifications in the manuals;
- use by personnel who have not read and thoroughly understood the content of the user manual;
- use that does not comply with the specific standards used in the country where the equipment is installed;
- modifications made to the equipment, software, functioning logic unless they have been authorised by the Manufacturer in writing;
- repairs that have not been authorised by the LEGRAND Technical Support Service;
- damage caused intentionally, through negligence, by acts of God, natural phenomena, fire or liquid infiltration.

The transfer of the equipment to others also requires the handing over of all the manuals. Failure to do it will automatically nullify any right of the buyer, including the terms of the guarantee where applicable.

If the equipment is sold to a third party in a country where a different language is spoken, the original owner shall be responsible for providing a faithful translation of this manual in the language of the country where the equipment will be used.

1.6.1 Guarantee terms

The guarantee terms may vary depending on the country where the UPS is sold. Check the validity and duration with LEGRAND's local sale representative.

If there should be a fault in the product, contact the LEGRAND Technical Support Service which will provide all the instructions on what to do.

Do not send anything back without LEGRAND's prior authorization.

The guarantee becomes void if the UPS has not been brought into service by a properly trained skilled technician (see paragraph 2.2.1).

If during the guarantee period the UPS does not conform with the characteristics and performance laid down in this manual, LEGRAND at its discretion will repair or replace the UPS and relative parts.

All the repaired or replaced parts will remain LEGRAND's property.

LEGRAND is not responsible for costs such as:

- losses of profits or earnings;
- losses of equipment, data or software;
- claims by third parties;
- any damage to persons or things due to improper use, unauthorized technical alterations or modifications;
- any damage to persons or things due to installations where the full compliance with the standard regulating the specific usage applications have not been guaranteed.

1.6.2 Extension of the guarantee and maintenance contracts

The standard guarantee can be consolidated in a single extension contract (maintenance contract).

Once the guarantee period has passed, LEGRAND is available for giving a technical assistance service able to meet all requirements, maintenance agreements, 24/7 availability and monitoring.

Please, contact the LEGRAND Technical Support Service for further information.

1.7 Copyright

The information contained in this manual cannot be disclosed to any third party. Any partial or total duplication of the manual by photocopying or other systems, including electronic scanning, which is not authorised in writing by the Manufacturer, violates copyright conditions and may lead to prosecution.

LEGRAND reserves the copyright of this publication and prohibits its reproduction wholly or in part without previous written authorisation.

2. Safety Regulations



DANGER

Before carrying out any operation on the equipment, it is necessary to read the entire manual carefully, especially this chapter.

Keep the manual in a safe place and consult it repeatedly during the use of the UPS.

2.1 General notes

The equipment has been made for the applications given in the manuals. It must not be used for purposes other than those for which it has been designed or differently from those specified in this manual.

2.2 Definitions of "Skilled Technician" and "Operator"

2.2.1 Skilled Technician

The professional figure who will carry out the installation, start-up and ordinary maintenance is called "Skilled Technician". This definition refers to people who have specific technical qualifications and are aware of the methods of installing, assembling, repairing, commissioning and safe use of the equipment.

In addition to the requirements listed in the paragraph below for a general operator, the Skilled Technician has received instructions on the precautions to take in presence of dangerous electrical voltage and uses the personal protective equipment listed in paragraph 2.3 for all the operations indicated in the installation and maintenance manual.



WARNING

The safety manager is responsible for protection and company risks prevention according to what is indicated in the European directives 2007/30/EC and 89/391/EEC regarding safety in the workplace.

The safety manager must ensure that all the people working on the equipment have received all the instructions concerning them in the manual with particular reference to those contained in this chapter.

2.2.2 Operator

The professional figure assigned to the equipment for normal use is called "Operator".

This definition refers to people who know how to operate the equipment as described in the user manual and have the following requisites:

1. technical education which enables them to operate according to safety standards in relation to the dangers linked to the presence of electric voltage;
2. training on the use of personal protective equipment and basic first aid interventions.

The company safety manager, in choosing the person (operator) who uses the equipment, must consider:

- the person's work fitness according to the laws in force;
- the physical aspect (not disabled in any way);
- the psychological aspect (mental stability, sense of responsibility);
- the educational background, training and experience;
- the knowledge of the standards, regulations and measures for accident prevention.

He shall also impart training in such a way as to provide thorough knowledge of the equipment and its component parts.

The operator shall consult the user manual at any time. He shall also follow the regulations provided to achieve maximum safety for himself and others during all operating phases.

Some typical activities the operator is expected to carry out are:

- the use of the equipment in its normal functioning state and the restore of the functioning after it shuts down;
- the adoption of the necessary provisions for maintaining the quality performance of the UPS;
- the cleaning of the equipment;
- cooperation with personnel responsible for ordinary maintenance activities (skilled technicians).

2.3 Personal Protective Equipment



DANGER
The UPS poses a considerable risk of electric shock and a high short circuit current. During use and maintenance operations, it is forbidden to operate without the equipments listed in this paragraph.

People responsible for operating this equipment and/or passing close to it must not wear garments with flowing sleeves, nor laces, belts, bracelets or other metal pieces that might cause a danger.

The following signs sum up the Personal Protective Equipment to wear at all times:



Anti-accident and non-sparking shoes
with rubber sole and reinforced toe



Waterproof rubber gloves



Protective garments



Protective glasses

2.4 Hazard signs in the workplace

The following signs must be exhibited at all points of access to the room where the equipment is installed:



Electric current
This sign indicates the presence of electrical live parts.



Emergency interventions
Do not use water to quench fires but just the extinguishers specifically designed for putting out fires in electrical equipments.



No smoking
This sign indicates that smoking is not allowed.

2. Safety Regulations

2.5 Signs on the equipment

Displayed on the UPS are explanatory plates that can vary depending on the country the equipment is intended for and constructional standards applied.

Make sure the instructions are adhered to. It is strictly prohibited to remove these plates and to work in a way that differs from what is written there.

The plates must always be clearly read and they must be cleaned periodically.

If a plate deteriorates and/or is no longer legible, even partially, the Manufacturer must be contacted for another one in order to replace it.



The plates must not be removed or covered. No other plates may be affixed to the equipment without the Manufacturer's prior written authorisation.



Potential risks can be drastically reduced by wearing the Personal Protective Equipment listed in this chapter. These protections are indispensable. Always operate with due care around dangerous areas marked by the appropriate warning signs on the equipment.

2.6 General warnings



The UPS works with dangerous voltages. Only SKILLED TECHNICIANS shall perform all installation and ordinary maintenance operations. No part of the UPS can be repaired by the operator.

Extraordinary maintenance operations must be carried out by LEGRAND Technical Support Service personnel.



A battery can present a risk of electrical shock and high short circuit current. The following precautions should be observed when working on batteries:

- a) remove watches, rings or other metal objects.
- b) use tools with insulated handles.
- c) wear rubber gloves and boots.
- d) do not lay tools or metal parts on top of batteries.
- e) disconnect the charging source prior to connecting or disconnecting battery terminals.
- f) determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).

Do not dispose of batteries in a fire. The batteries may explode.

Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic. The batteries installed inside the cabinet must be disposed of correctly. For the disposal requirements refer to local laws and relevant standards.



The UPS functions with TT and TN systems. It has a pass-through neutral architecture: the status of the output neutral is the same as the input neutral.

When a load needs a different neutral status from the input status, it is necessary to place downstream of the UPS a suitably scaled isolation transformer protected in compliance with the standards in force.

 **CAUTION**

Do not open the battery fuse holders of the external battery units while the UPS is powering the loads in stored energy mode.

 **WARNING**

To reduce the risk of fire or electric shock, the UPS must work in clean and indoor environments with controlled temperature and humidity. It must be kept away from inflammable liquids and corrosive substances. The room temperature must not be above +40°C (+104°F) and the relative humidity must be a maximum of 95% not condensing.

 **CAUTION**

The equipment generates, uses and can radiate radio frequency energy. If it is not installed and used in accordance with the instructions, it may cause harmful interference with radio communications.

Archimod HE 240-480 is a category C3 UPS according to the standard EN62040-2.

The UPS can be used in commercial and industrial environments; nevertheless restrictions or adequate countermeasures might be necessary to avoid radio interference.

 **CAUTION**

- The equipment must be maintained and used according to the instructions written in the manuals.
- The departmental manager must instruct the operating and maintenance personnel on the safe use and maintenance of the equipment.
- Only specifically-trained, highly skilled personnel are allowed access to the equipment in order to perform maintenance. While the maintenance operation is being carried out, signs saying "Maintenance work in progress" must be affixed in the department in such a way that they can be easily seen from any access area.
- Any intervention on the equipment must be done only after it has been disconnected from the power supply network by means of a switch disconnector and must be locked with an appropriate padlock.
- The UPS must not be turned on if liquid is leaking from the batteries.
- Depositing flammable material near the equipment is strictly forbidden. The equipment should always be locked, and only specifically trained personnel are allowed access to it.
- Do not disable any safety notification or warning device and do not ignore any alarm or warning message no matter whether they are generated automatically or represented by plates fixed to the equipment.
- Do not run the equipment with fixed protections not installed (panels etc.).
- In case of breaking, buckling or malfunctioning of the equipment or parts of it, repair or replace immediately.
- For no reason can the structure of the equipment, the devices mounted on it, the operation sequence etc, be modified, manipulated or tampered with in any way, without prior consultation with the Manufacturer.
- Keep a register and enter therein the date, time, type, performer's name and any other useful information about each and any routine and extraordinary maintenance operation.
- Do not use oils or chemical products for cleaning because they could scratch, corrode or damage certain parts of the equipment.
- The equipment and workplace must be kept completely clean.
- Upon completion of the maintenance operations, before connecting the power supply, carefully check that no tools and/or material of any kind have been left next to the equipment.

2. Safety Regulations

2.7 How to proceed in an emergency

The following information are general.

For specific interventions consult the regulations in force in the country where the equipment is installed.

2.7.1 First-aid procedures

When administering first aid, adhere to the company rules and the usual procedures.

2.7.2 Fire procedures

Do not use water to quench fires but just the extinguishers specially designed for putting out fires on electrical equipments.

3. Technological description

3.1 Archimod HE technology

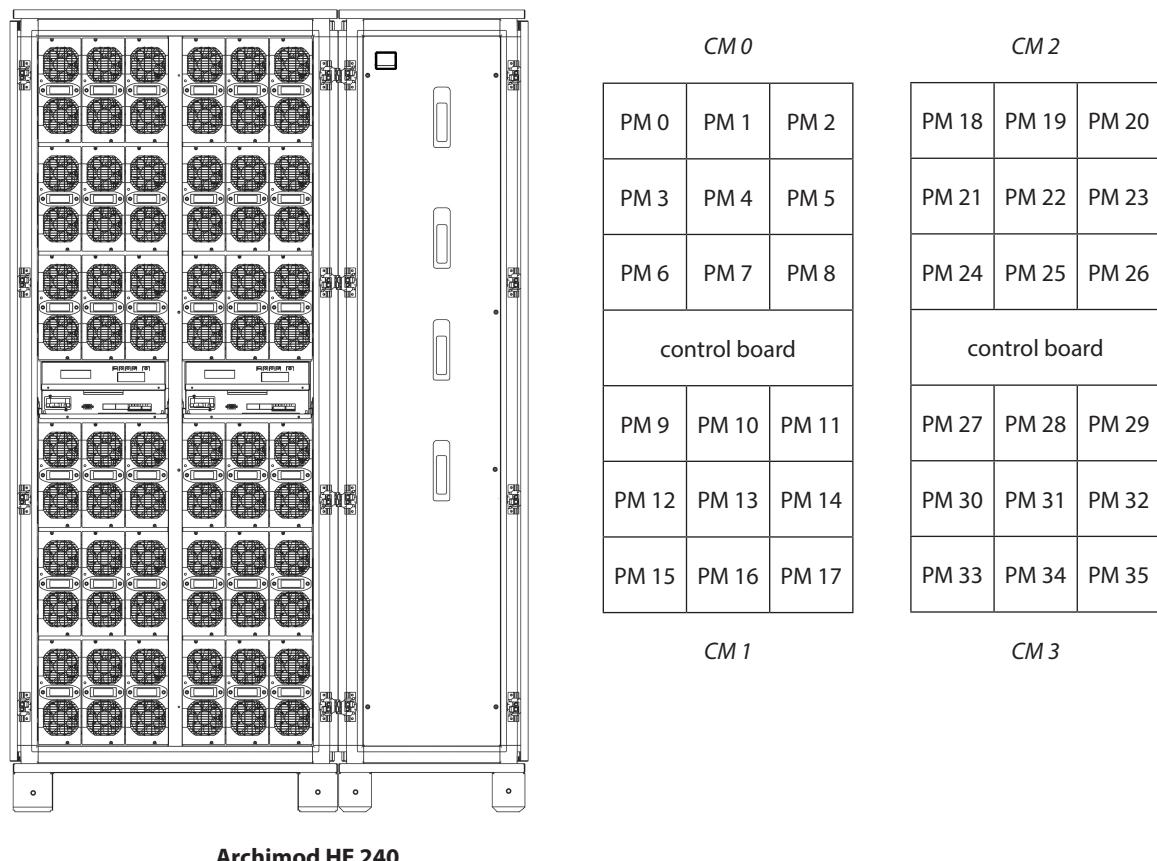
LEGRAND® has developed an innovative and unique project by producing Archimod HE 240-480, the uninterruptible power supply with powers of 240 and 480 kVA able to adapt at any moment to changing demands of the loads. The concepts underlying the project are modularity, expandability and redundancy in order to offer maximum reliability and to guarantee considerable savings.

Thanks to the cabinet already designed to accommodate different numbers of power modules, it is possible to get different configurations. The possible power expansions may be made without the need for interventions of calibration, setting or changes in the factory.

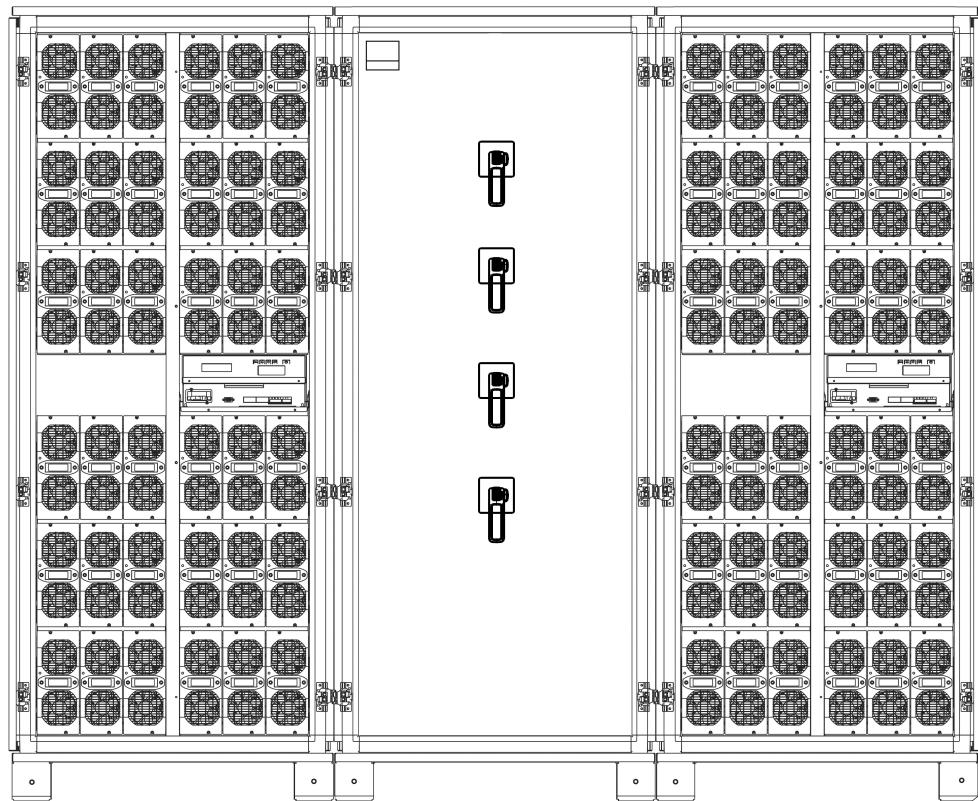
Archimod HE 240-480 is a modular UPS whose basic module is 6.7 kVA single phase power. The power modules are connected in parallel phase by phase and in the event of failure of a single module, it is lost only the power of the module on the affected phase.

The UPS has three phase input and output. However it is possible to manage the three phases independently from each other.

The UPS is controlled by four independent command boards connected in parallel with each other. Both the command boards (CM) and the power modules (PM) are identified by a unique address inside the system, as shown below:



3. Technological description



Archimod HE 480

CM 0

CM 1

CM 2

CM 3

| | | | | | |
|---------------|-------|-------|-------|-------|-------|
| PM 0 | PM 1 | PM 2 | PM 18 | PM 19 | PM 20 |
| PM 3 | PM 4 | PM 5 | PM 21 | PM 22 | PM 23 |
| PM 6 | PM 7 | PM 8 | PM 24 | PM 25 | PM 26 |
| control board | | | | | |
| PM 9 | PM 10 | PM 11 | PM 27 | PM 28 | PM 29 |
| PM 12 | PM 13 | PM 14 | PM 30 | PM 31 | PM 32 |
| PM 15 | PM 16 | PM 17 | PM 33 | PM 34 | PM 35 |

| | | | | | |
|---------------|-------|-------|-------|-------|-------|
| PM 36 | PM 37 | PM 38 | PM 54 | PM 55 | PM 56 |
| PM 39 | PM 40 | PM 41 | PM 57 | PM 58 | PM 59 |
| PM 42 | PM 43 | PM 44 | PM 60 | PM 61 | PM 62 |
| control board | | | | | |
| PM 45 | PM 46 | PM 47 | PM 63 | PM 64 | PM 65 |
| PM 48 | PM 49 | PM 50 | PM 66 | PM 67 | PM 68 |
| PM 51 | PM 52 | PM 53 | PM 69 | PM 70 | PM 71 |

Each command board can manage up to 9 power modules for the Archimod HE 240 and up to 18 power modules for the Archimod HE 480. If a command board becomes faulty, only the modules under its control are put into safe mode and turned off, while the UPS continues to function without any interruption of power supply to the load. It is therefore possible to have redundancy on both the individual phase (power module failure) and in the UPS (command board failure). The hot-swap replacement of the power modules is also possible by switching off the relative command board and group of modules connected to it, without powering the load from the bypass with the consequent temporary loss of protection. The command boards are connected to two control panels with display, from which it is possible to verify the status and settings of the UPS, and to two communication interfaces with RS-232 and SNMP connections, dry contacts and logical contacts. It is possible to access all the UPS functions from the control panel and communicate through any one of the interfaces present thereby guaranteeing the redundancy of the peripherals as well. In installations of the UPS with three separate single phase lines on the output, it is possible to manage each line independently through the software. For example, it is possible to prioritise the autonomy of one of them during battery functioning.

The technology used in the hardware and the firmware of the UPS represents the current state of the art. A sophisticated microprocessor-type control optimises the performance of the UPS both on the Booster/PFC side and on the output inverter. The recharge curve of the batteries has been designed to get the maximum useful lifetime and have the greatest autonomy possible in case of mains failure. The electronic boards are entirely assembled on LEGRAND automated lines and tested to the highest quality standards. Every equipment goes through an extended period of operation at full load before being sent to the customer.

3.2 Features

Modular-redundant architecture

The modular-redundant architecture is the best solution for protecting the nerve centres of a company and has the following advantages:

- there is one control of the devices supplied;
- modular expandability;
- module redundancy;
- easy maintenance;
- low running cost;
- compactness.

Efficiency

The Archimod HE 240-480 UPS concentrate particularly on both the energy absorbed from the mains and the energy provided to the load. They are characterised by high efficiency (up to 96%), PF on input > 0,99, THDi < 3%.

The advantages of a high efficiency are:

- reduction of the power absorbed from the UPS but not supplied to the load and transmitted to the environment as heat;
- less heat loss transmitted to the environment means reducing the need for ventilation or air conditioning systems in the installation site;
- no power factor correction cost and so no increase in charges;
- no need to increase the size of any generator upstream of the UPS.

Expandability

Most UPS systems on the market are of the non-modular and non-expandable type thus requiring an initial upscaling of the system to make future expansions possible.

The advantages of an expandable system are:

- optimisation of investments for UPSs, making them adequate for the current requirements without precluding future expansions and avoiding wastes of energy;
- increase in the efficiency of the system thanks to proper sizing.

Reliability

To obtain a level of redundancy with traditional UPSs it is necessary to put at least two in parallel thereby doubling the power acquired, the space occupied and the electricity consumed. Archimod HE 240-480's modular architecture makes it possible to have redundant configurations within a single cabinet.

The advantages are:

- a UPS with a redundant modular architecture can be configured as an N+X redundant simply by choosing a proper number of 6.7 kVA power modules to be installed in the UPS cabinet. Even in the case of a fault in a module the equipment continues to function avoiding any downtime;
- clear indications and a large display make it possible to find the fault more quickly;
- the modular architecture makes it possible to speed up the solution to problems through the simple replacement of the faulty module without interrupting the service;
- high percentage of faults resolved at the first attempt.

3. Technological description

Dual input

Archimod HE 240-480 has two input disconnectors, one for the mains and the other for powering the load by means of a bypass line completely independent from the mains. The two lines are interconnected by default and they may be rendered independent during the installation or commissioning of the equipment (the neutral cables of the two lines must be in common).

Power module PM7 3 108 73

The high-efficiency single phase module of 6,7 kVA is made up of the following functional blocks:

- command and control logic (managed by a microprocessor);
- PFC rectifier/booster;
- inverter;
- battery charger;
- automatic bypass.

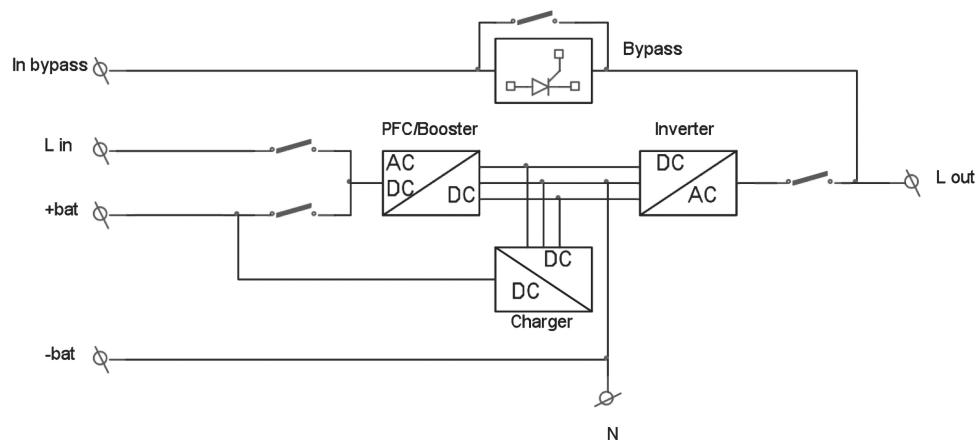
In each power module there is a microcontroller that can oversee the main functions of the individual unit, monitor its correct functioning and flag up any malfunctions.

The power module is Plug & Play to make the power expansion and any maintenance operation easier. Every module is put in parallel with other identical ones until reaching the power of the UPS.

The power modules are independent of each other and can function even if there is a fault in one of them. At the front of the module there is a multicoloured LED with traffic-light code green-yellow-red, making it possible to identify the functioning status of the electronic unit quickly.

The power modules are housed on shelves also called tunnels that can house three modules.

The block diagram of the power module is the following:



Batteries

The nominal battery voltage is 252Vdc, therefore a string of twenty-one 12Vdc batteries form what is called KB (Battery Kit). Archimod HE 240-480 works with either strings of batteries in common or independent, each of them powering one command board and the power modules associated to it. Therefore it is possible to have redundancy in case of a faulty battery string.

Digital display and alarm display

Archimod HE 240-480 is managed by four microprocessor-type command boards and it has two backlit LCD alphanumeric display with twenty characters on four lines.

The display is incorporated in the control panel where there is also a high-brightness functioning status indicator with traffic light type green-yellow-red.

Five simple keys situated near the display enable the user to display the functioning data, set the functioning parameters, analyse the status of the individual power modules, select the language in which the messages are to be displayed, start the hot-swap mode and carry out a guided set of functional tests and procedures.

BCM - Battery Charger Module 3 108 51

The additional battery charger module works in parallel and in sync with the battery chargers in the power modules and it is managed by the same algorithm that governs the recharging cycle. Every additional battery charger module provides up to 15A of charge current that are added to the current of the battery chargers in the power modules. Every power module can provide up to 2.5A of charge current. This guarantees a reduction of the charge time in installations of UPSs requiring long autonomies and increases the availability of the UPS after a black out. During functioning, the battery charger module takes current from the input phase where it is installed. It is possible to install any number of BCMs as long as there is at least one power module and enough empty slots in the UPS cabinet. All the information regarding the functioning status of the BCM is given by the LED on the front of the module and by what is shown on the UPS display. The battery charger module is managed by a microprocessor to optimize performance and reliability. Its use in conjunction with batteries having capacities above 60Ah is recommended.

ECO MODE

One of functioning mode of the Archimod HE 240-480 UPS is called "eco mode". With this mode it is possible to save energy while guaranteeing uninterruptability of the power supply to the load connected. During the functioning in eco mode, the load is powered directly from the electrical mains through the automatic bypass circuit inside the power modules. This means that the output voltage and frequency are the same as the mains. The advantage obtained in the eco mode is a greater electrical efficiency and consequently a reduction in consumption. If the output voltage leaves the window of tolerance (-20% / +15% of the voltage set on the output), the UPS actuates its inverter stage and powers the load with the energy stored in the batteries. The autonomy during the stored energy mode depends on the configuration of the UPS (nominal power, battery capacity) and on the percentage of load applied. When the mains are back within the tolerance values, the UPS switches automatically back to the eco mode. It is possible to change the functioning mode between on-line and eco mode (and viceversa) both with the UPS on and with the UPS off (in this case entering the Service Mode).

EMERGENCY POWER SYSTEM (EPS) MODE

Archimod HE 240-480 has an "emergency power system" functioning mode that is useful for example to power an emergency lighting system.

When the mains is present, the UPS output is disabled. If the mains is missing, the output is powered by the UPS functioning in stored energy mode.

It is possible to enable or disable the emergency power system function only in Service Mode (with the UPS off).

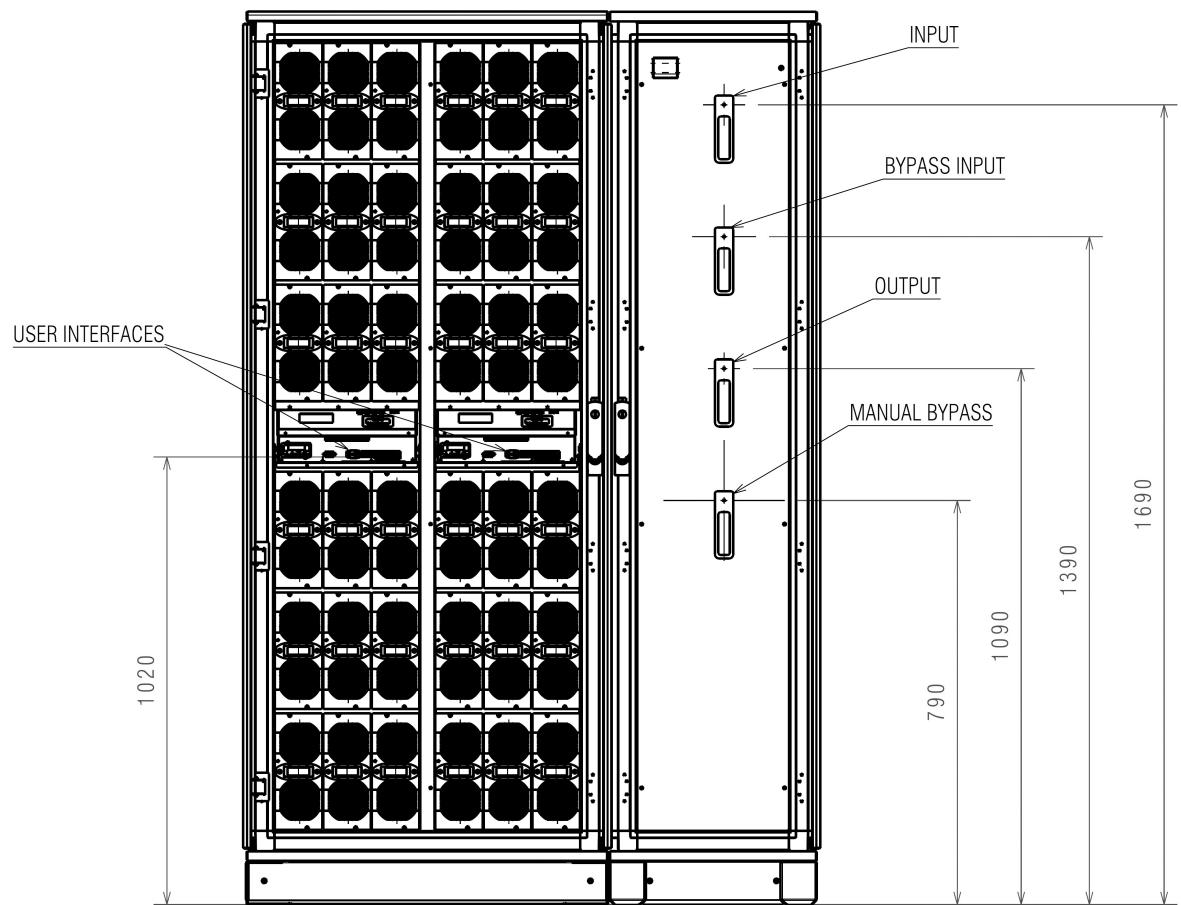
3. Technological description

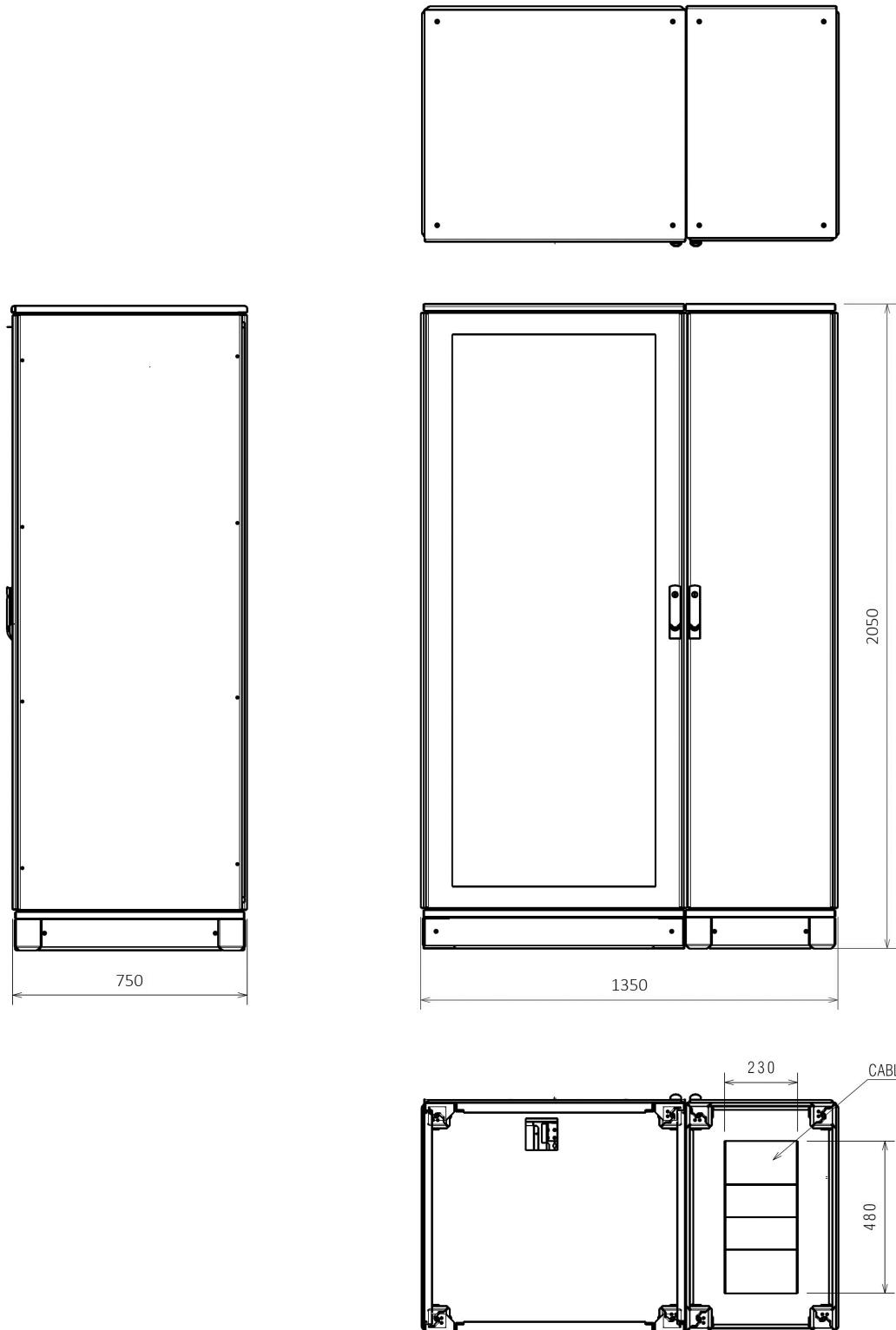
3.3 Models

The UPSs Archimod HE 240-480 are sold without power modules. It is necessary to buy them separately. The model 3 108 74 is the only one admitted for installation.

3.3.1 Archimod HE 240

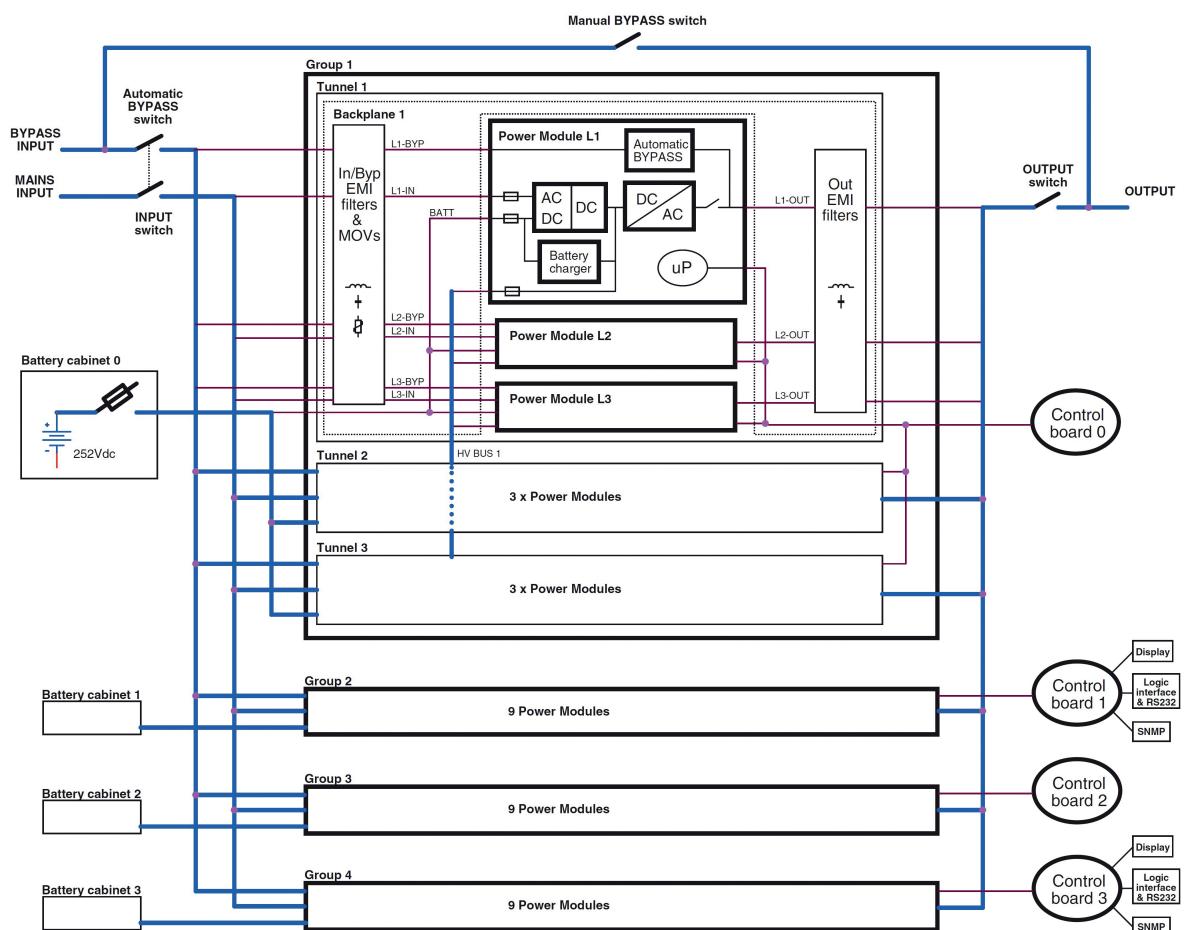
(all dimensions are in mm)





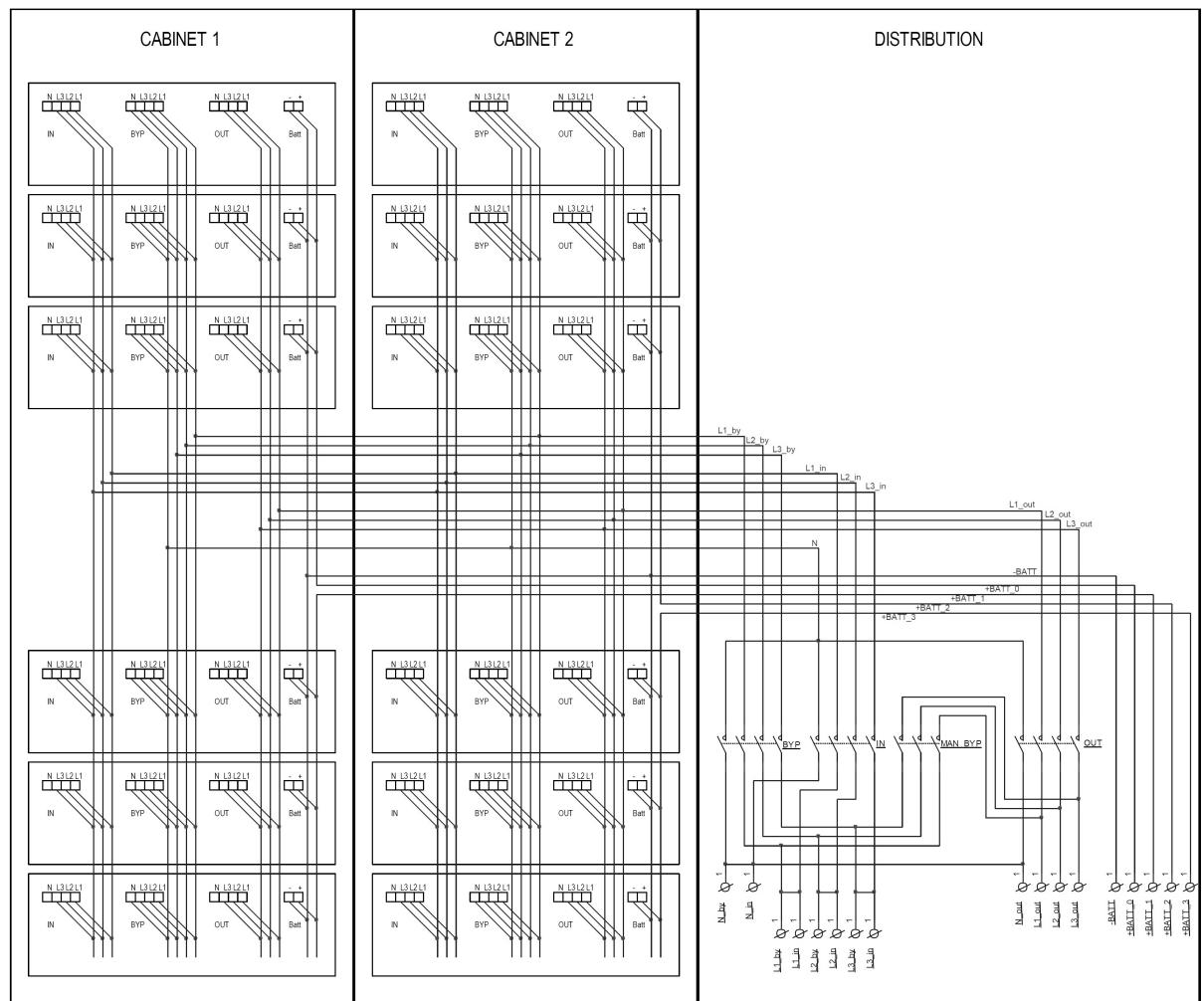
3. Technological description

Block diagram



Block diagram of interconnections and distributions

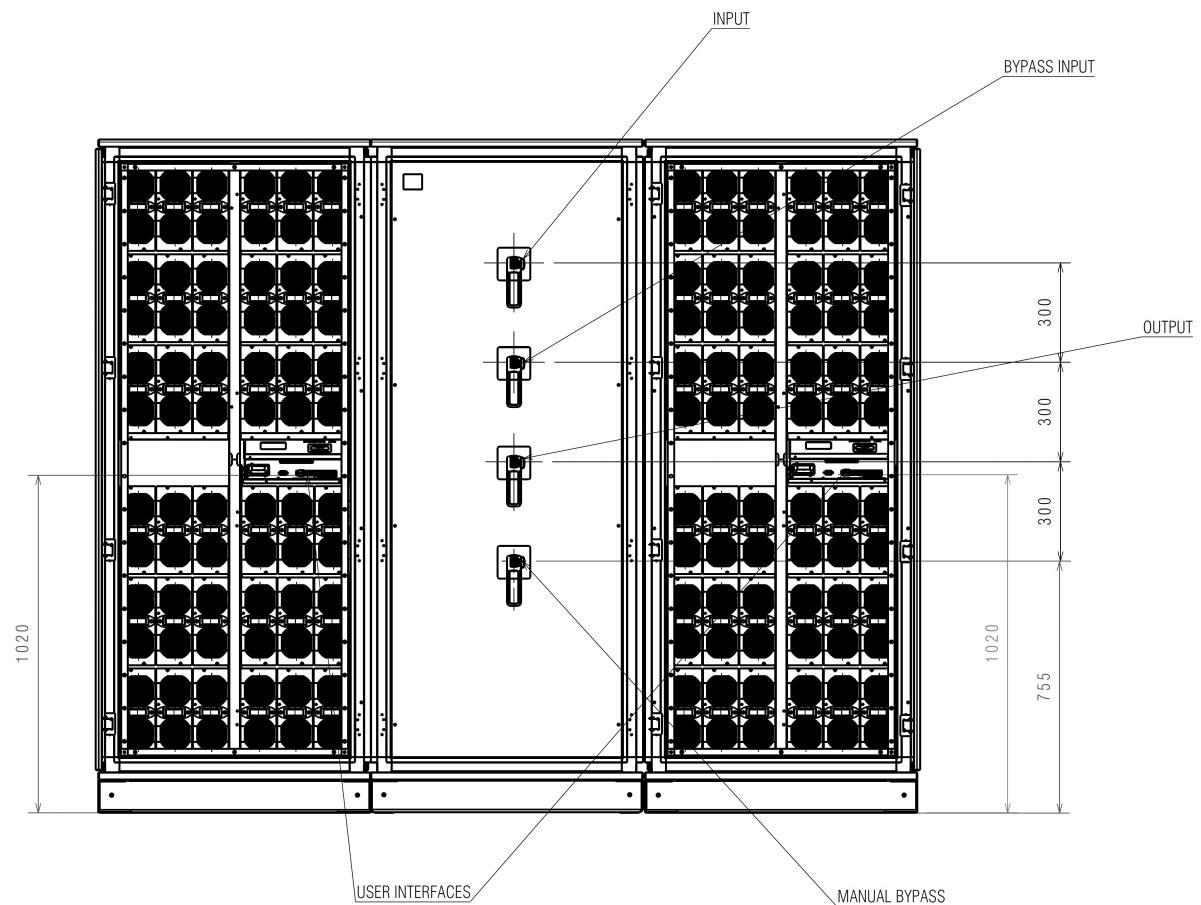
The bypass input terminals are represented according to the factory configuration (bypass input line in common).

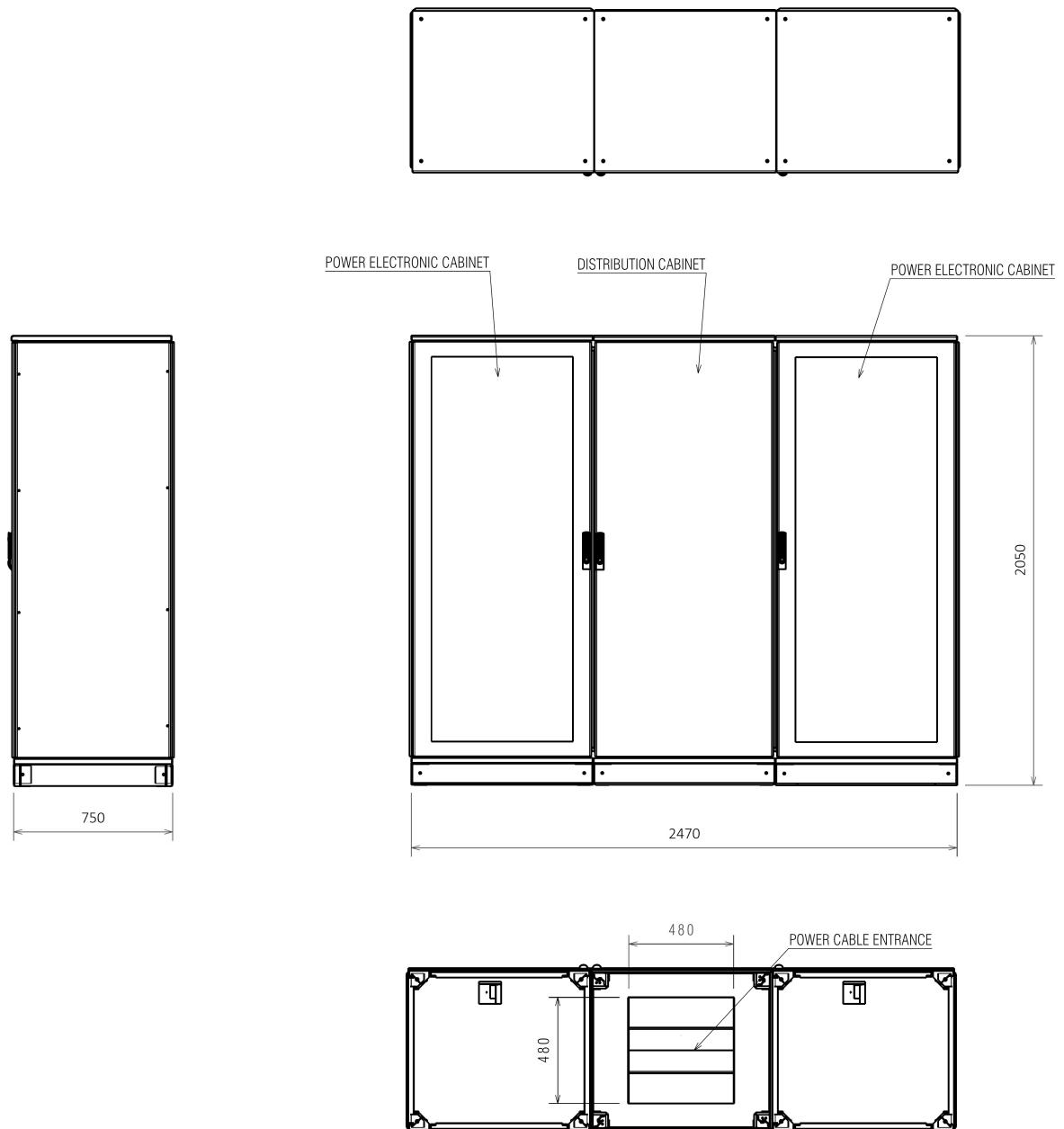


3. Technological description

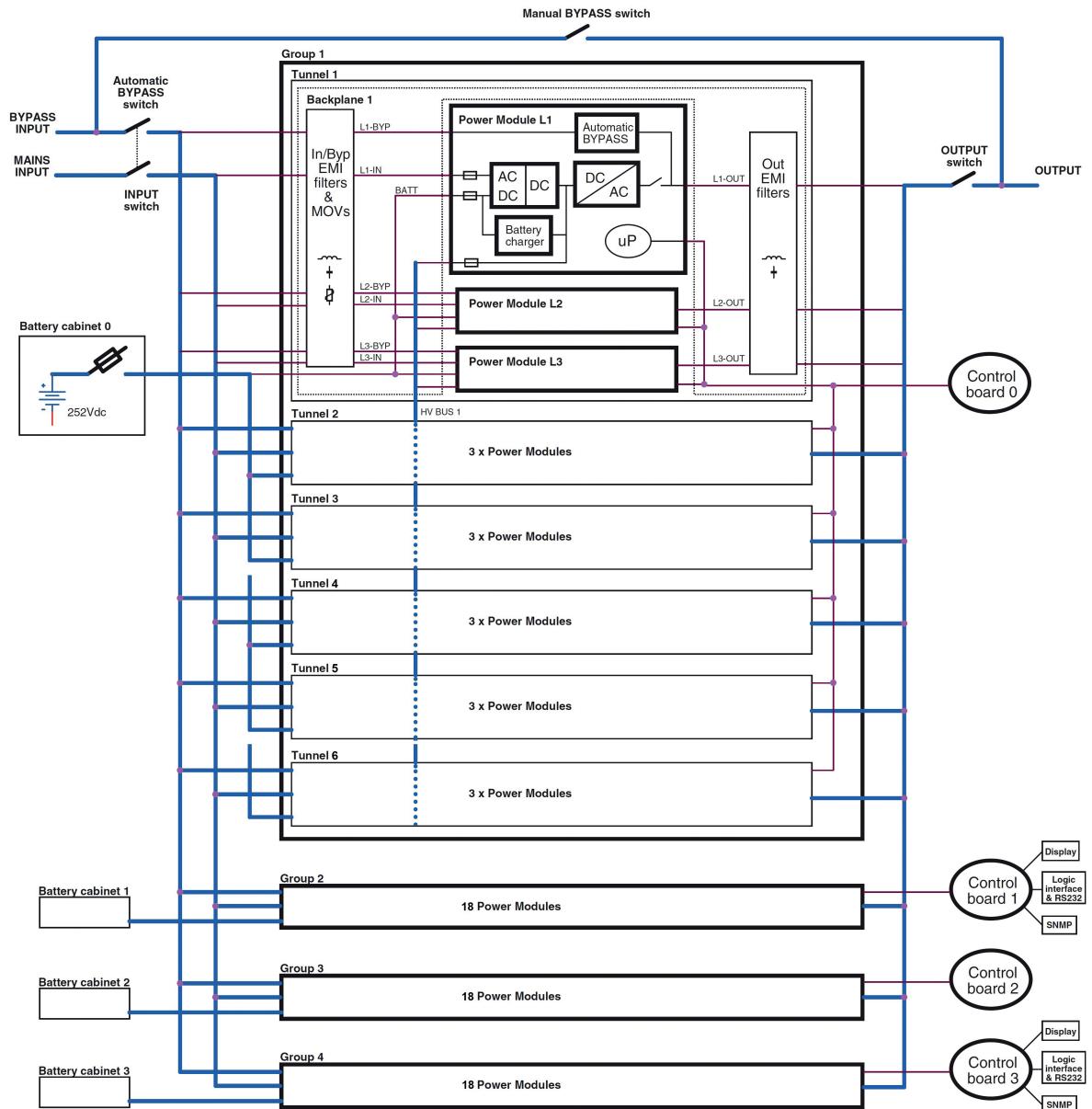
3.3.2 Archimod HE 480

(all dimensions are in mm)



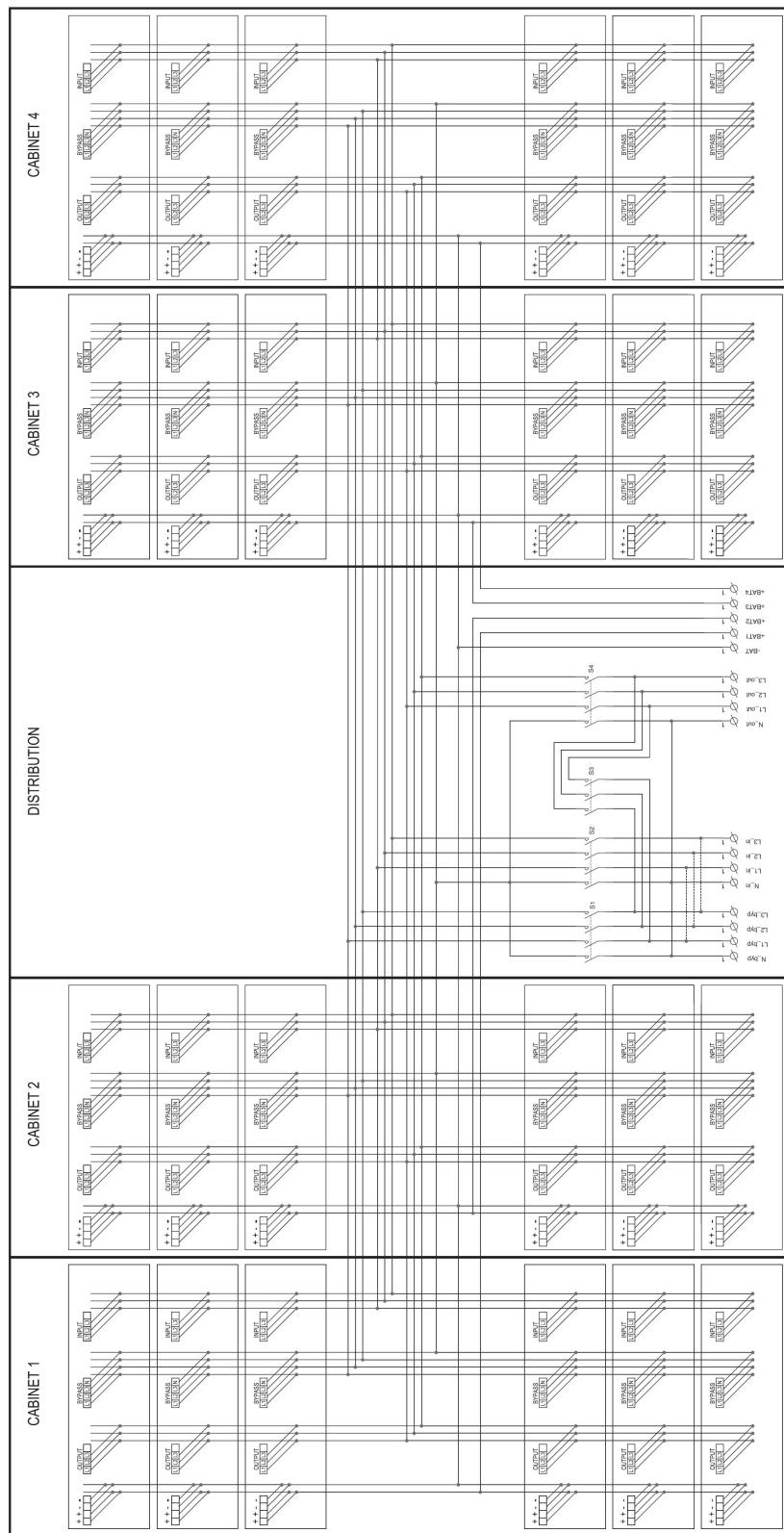


3. Technological description



Block diagram of interconnections and distributions

The bypass input terminals are represented according to the factory configuration (bypass input line in common).



4. Unpacking and positioning

4.1 Visual check

On delivery of the UPS, carefully inspect the packaging and the product for any damage that might have occurred during transport. Check there is no damage to the indicator on the outer label reading "Shock Watch".

If there is possible or ascertained damage, immediately inform:

- the transporter;
- the LEGRAND Technical Support Service.

Check that the equipment corresponds with the items indicated in the delivery documentation.

Follow the instructions in Chapter 8 when storing the UPS.

4.1.1 Equipment check

The equipment and the relative supplied accessories must be in perfect conditions.

Check that:

- the shipping data (address of the recipient, no. of packages, order no, etc.) correspond to what is contained in the delivery documentation;
- the technical rating plate data on the label applied to the UPS correspond with the material described in the delivery documentation;
- the documentation accompanying the equipment includes the installation and user manuals.

In case of discrepancy, immediately inform the LEGRAND Technical Support Service before commissioning the equipment.

4.2 Movement



WARNING

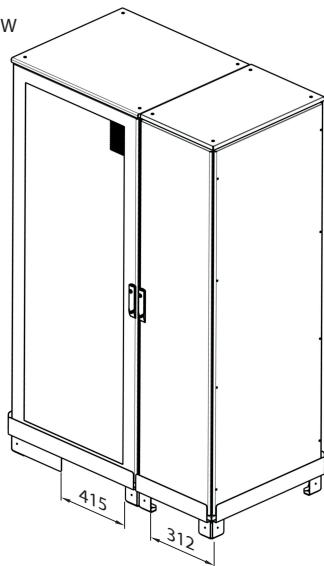
Move the UPS very carefully, lifting it as little as possible and avoiding dangerous swings or falls.

Follow the directions indicated in the symbols present on the packaging regarding the useful sides to move the cabinets. The equipment must always be handled by trained and instructed personnel equipped with the Personal Protective Equipment illustrated in paragraph 2.3.

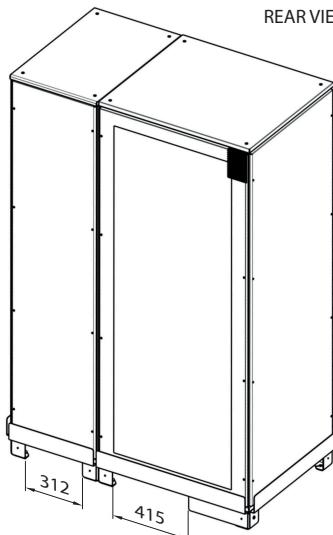
For any lifting, use a forklift or a transpallet with an adequate carrying capacity, placing the forks in the specific spaces of the base and making sure they come out on the other side by at least twenty centimetres.

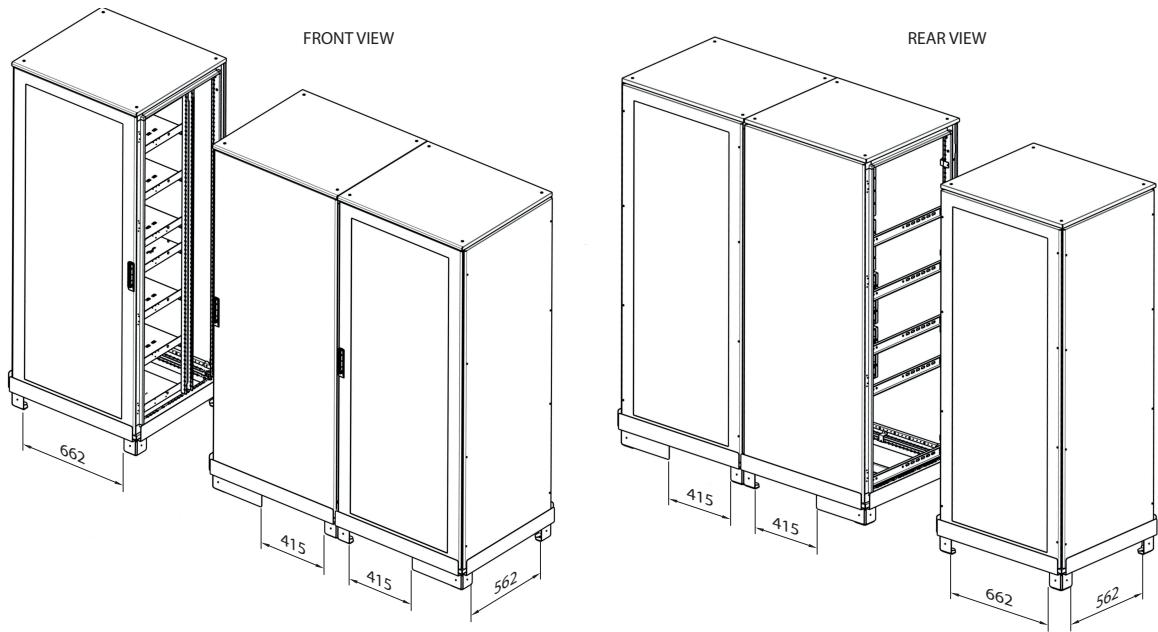
The following images show the measures in mm of the bases in order to facilitate the positioning:

FRONT VIEW



REAR VIEW





WARNING

Do not move the UPS after the installation or following the insertion of the power modules.

INDICATION

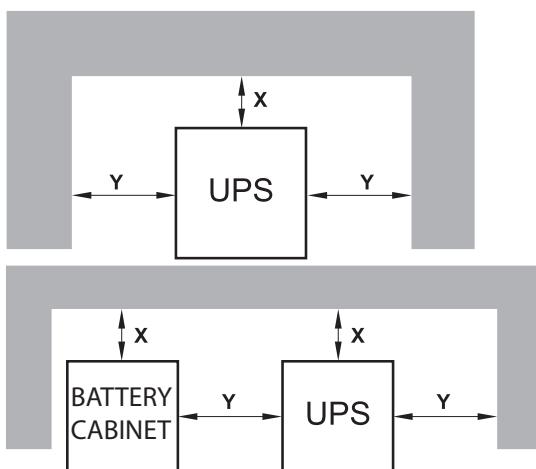
It is also possible the lifting through the set of 4 eyebolts 0 205 82. If they are used, screw them tightly.
Tauten the cables and/or the hooks before starting to lift.

For each new use, lifting eye bolts must be checked for signs of faults such as dents, cracks, sharp burrs, deformation, stripped or missing threading, rust or evident signs of incorrect storage.

Comply with the safety regulations in force in your country relative to the usage of lifting equipment and/or accessories.

4.3 Positioning constraints

Minimum recommended distances for the UPS
 $X=200\text{ mm}/Y=200\text{ mm}$



Recommended minimum distances UPS Archimod HE® + BATTERY CABINET
 $X=200\text{ mm}/Y=200\text{ mm}$

The UPS must be positioned respecting the following conditions:

- temperature and humidity must be within permitted limits;
- fire regulations must be respected;
- the wiring must be simply made;
- front and rear accessibility must be available for assistance or periodic servicing;
- the cooling flow of air must be guaranteed;
- the air conditioning system must be adequately sized;
- dust or corrosive/explosive gasses must be absent;
- the installation site must be free of vibration;
- the rear and side space must be enough to guarantee an adequate circulation of air for cooling;
- the support surface must be sized for the weight necessary to support the equipment.

To safeguard the batteries as well as possible it is necessary to

4. Unpacking and positioning

bear in mind that their average lifetime is strongly influenced by the operating room temperature.
Position the UPS in an environment with a temperature range between +18°C (+64°F) and +23°C (+73°F) to guarantee the optimum life battery expectancy.
Before proceeding with the installation operations, make sure that there is enough lighting to clearly see every detail.
Provide artificial lighting if the natural lighting does not satisfy the requirements cited.
In case of maintenance operations in places that are not sufficiently well lit, portable lighting systems must be used.

4.4 Unpacking

To remove the packaging material, comply with the following procedure:

1. bring the UPS to the installation site using a forklift and/or a transpallet with suitable characteristics;
2. remove the plastic film and cardboards protecting the UPS;
3. remove the metal pointy brackets by loosening the screws that fix them to the UPS base;
4. regulate the equipment feet in order to have perfect perpendicularity and level of the UPS compared with the floor;
5. mount the side, frontal and rear base strips with the screws supplied.

Keep the packaging material for any future shipment of the UPS.

The package can be fully recycled.

4.5 Check of the content

The content of the supply is subject to thorough checking before the shipment. Nonetheless it is always advisable to check that it is complete and in order on receiving the material.

The supply is placed inside the cabinet with the busbars. In the case of the Archimod HE 240 UPS, it is necessary to open the side panel to get the supply. In the case of the Archimod HE 480 UPS, the supply is directly accessible.

The following list is general:

- 1 UPS (empty cabinet) with keys to close the doors;
- 1 envelope of accessories containing washers for grounding, set of screws for fitting the panels, two eight-pole and six-pole terminal strips and a serial cable;
- 4 base strips for front/rear closing;
- 2 base strips for side closing;
- user manual;
- installation and maintenance manual.

In case of defects and/or missing items, immediately inform the LEGRAND Technical Support Service before commissioning the equipment.



CAUTION

The installation manual must be used and consulted only by SKILLED TECHNICIANS.

INDICATION

The power modules 3 108 73 to be installed must be bought separately.

4.6 Final operations

Once the UPS has been properly positioned, fit the two side strips and the frontal one provided in the accessory kit.

5. Control panel

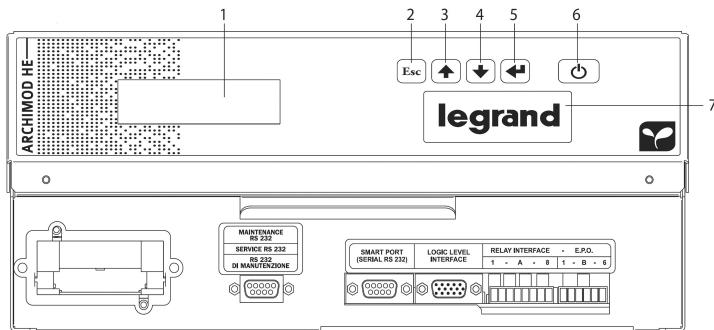
5.1 Description



WARNING

The control panel allows to access some configuration pages of the UPS menu. Only a skilled technician (paragraph 2.2.1) is authorized to modify the configuration set during the installation. Wrong settings could lead to injury or material damage to the equipment and the things around it.

Archimod HE 240-480 UPSs have two control panels in the front part. Each panel consists of a 4 line x 20 character LCD display, a multicolour backlit status indicator and a five keys keyboard.



LEGEND

1 - 4 line x 20 character LCD display

2 - ESCAPE key

Main functions:

- exit a function without changing it;
- passage from a lower to a higher menu level;
- exit the main menu and return to the status display;
- silence of the beeper.

3 - ARROW UP key

Main functions:

- selection of the prior function;
- increase of a value within a function;
- selection of a new item within a function (e.g. from DISABLED to ENABLED);
- scroll a menu with more than 4 lines;
- change of the page of the main screen.

4 - ARROW DOWN key

Main functions:

- selection of the subsequent function;
- decrease of a value within a function;
- selection of a new item within a function (e.g. from ENABLED to DISABLED);
- scroll a menu with more than 4 lines;
- change of the page of the main screen.

5 - ENTER key

Main functions:

- confirmation of a value;
- access a menu item;
- passage from a higher to a lower menu level;
- it allows access to the Service Mode.

6 - ON/OFF key

Main functions:

- it enables to turn the UPS on and off;
- it enables hot-swap replacement of the power modules;
- it enables to shut down the output phases individually (only with UPS set on the output with 3 independent phases).

7 - multicolour backlit status indicator

5. Control panel

5.2 Service Mode

This is the functioning mode necessary to make the setup during the installation and to manage the software updating of command boards and power modules.

To access this mode, press the ENTER key with the UPS off until the display shows the text "Service Mode..." At the end of the start-up procedure, press the ENTER key to access the navigation menu.

It is possible to choose one of the following languages for the text displayed: Italian, English, German, French, Russian, Spanish, Polish and Portuguese. Follow the path: **UPS Setup → Operator panel → Language** and press the ENTER key to confirm the choice.

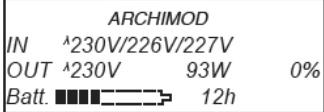
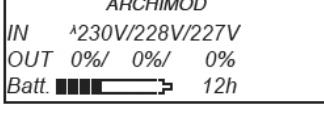
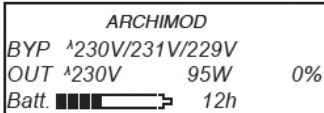
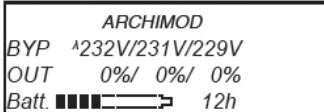
Press the ON/OFF key to exit. Alternatively, the UPS turns off automatically after 20 minutes of not receiving manual or serial commands.

5.3 Main screen

The main screen is shown on the display during UPS operation.

Using the ARROW UP and ARROW DOWN keys it is possible to scroll through the different pages. Every page gives several information about the status of the UPS.

The pictures of the different pages of the main screen are shown below:

| MAIN PAGE | DATA DISPLAYED |
|--|---|
| 1 Input - output - battery  | 1st line: Functioning status of the UPS. If the text is "ARCHIMOD", the UPS is functioning properly 2nd line: Input voltages 3rd line: Voltage set on output, active power absorbed by the load and total percentage of the load applied. 4th line: Bar showing the remaining battery capacity and the actual time of functioning in case of a power failure. |
| 2 Input - percentage output - battery  | 1st line: Functioning status of the UPS. If the text is "ARCHIMOD", the UPS is functioning properly 2nd line: Input voltages 3rd line: Percentage of the loads on the output phases 4th line: Bar showing the remaining battery capacity and the actual time of functioning in case of a power failure. |
| 3 Bypass - output - battery  | 1st line: Functioning status of the UPS. If the text is "ARCHIMOD", the UPS is functioning properly 2nd line: Bypass voltages 3rd line: Voltage set on output, active power absorbed by the load and total percentage of the load applied. 4th line: Bar showing the remaining battery capacity and the actual time of functioning in case of a power failure. |
| 4 Bypass - percentage output - battery  | 1st line: Functioning status of the UPS. If the text is "ARCHIMOD", the UPS is functioning properly 2nd line: Bypass voltages 3rd line: Percentage of the loads on the output phases 4th line: Bar showing the remaining battery capacity and the actual time of functioning in case of a power failure. |

| MAIN PAGE | DATA DISPLAYED |
|---|---|
| 5 Output load availability <div style="border: 1px solid black; padding: 5px; width: fit-content;"> ARCHIMOD L1o 0.4/ 40kVA 1% L2o 0.5/ 40kVA 1% L3o 0.5/ 40kVA 1% </div> | 1st line: Functioning status of the UPS. If the text is "ARCHIMOD", the UPS is functioning properly 2nd line: Phase L1 - power in kVA or in Watt compared with the nominal power or current compared with the nominal or relative percentage 3rd line: Phase L2 - power in kVA or in Watt compared with the nominal power or current compared with the nominal or relative percentage 4th line: Phase L3 - power in kVA or in Watt compared with the nominal power or current compared with the nominal or relative percentage |
| 6 Output measurements <div style="border: 1px solid black; padding: 5px; width: fit-content;"> ARCHIMOD L1o231V 1.7A 27W L2o229V 1.6A 31W L3o231V 1.9A 29W </div> | 1st line: Functioning status of the UPS. If the text is "ARCHIMOD", the UPS is functioning properly 2nd line: Phase 1 on output - Voltage, current and active power 3rd line: Phase 2 on output - Voltage, current and active power 4th line: Phase 3 on output - Voltage, current and active power |
| 7 Output line voltages <div style="border: 1px solid black; padding: 5px; width: fit-content;"> ARCHIMOD L1o-L2o △ 400V L2o-L3o △ 399V L3o-L1o △ 396V </div> | 1st line: Functioning status of the UPS. If the text is "ARCHIMOD", the UPS is functioning properly 2nd line: Line voltage between phase L1 and L2 on output 3rd line: Line voltage between phase L2 and L3 on output 4th line: Line voltage between phase L3 and L1 on output |
| 8 Input measurements <div style="border: 1px solid black; padding: 5px; width: fit-content;"> ARCHIMOD L1i229V 3.4A 408W L2i228V 2.9A 162W L3i230V 2.6A 228W </div> | 1st line: Functioning status of the UPS. If the text is "ARCHIMOD", the UPS is functioning properly 2nd line: Phase 1 on input - Voltage, current and active power 3rd line: Phase 2 on input - Voltage, current and active power 4th line: Phase 3 on input - Voltage, current and active power |
| 9 Bypass line voltages <div style="border: 1px solid black; padding: 5px; width: fit-content;"> ARCHIMOD L1b-L2b △ 401V L2b-L3b △ 402V L3b-L1b △ 400V </div> | 1st line: Functioning status of the UPS. If the text is "ARCHIMOD", the UPS is functioning properly 2nd line: Line voltage between L1 and L2 of bypass line 3rd line: Line voltage between L2 and L3 of bypass line 4th line: Line voltage between L3 and L1 of bypass line |
| 10 Battery status <div style="border: 1px solid black; padding: 5px; width: fit-content;"> ARCHIMOD Batt. 288V -0,3A C 50% R 12h T 24h Charging - maint. </div> | 1st line: Functioning status of the UPS. If the text is "ARCHIMOD", the UPS is functioning properly 2nd line: Voltage, charging current (negative value with charging in progress, positive value when the batteries are powering the equipment) 3rd line: Battery capacity percentage compared with the nominal one, autonomy time remaining, total autonomy time 4th line: Battery status <ul style="list-style-type: none"> - Battery Stand-by - Discharging - Reserve autonomy - End autonomy - Charging - ph1 : battery recharging status (current limitation) - Charging - ph2 : battery recharging status (voltage limitation) - Charging - maint: Battery recharging in maintenance - Testing batteries - Equaliz. batteries: Batteries equalizing in progress - BATTERY FAULT - MaxTime on Battery: end of the maximum time set in stored energy mode |

5. Control panel

5.4 Main menu and submenu

Press the ENTER key on the main screen of the display to access the menu of the UPS.

The main screen has the following items:

- UPS STATUS: it allows to check the UPS status in real time;
- UPS SETUP: it allows to set all the UPS functions;
- POWER MODULES: it allows to analyze the status of the individual power modules in real time;
- EVENTS: it allows to display the events memorized in the UPS history;
- TOOLS: it allows to carry out a series of functional tests on the UPS;
- LOG OUT: it allows to terminate the password-protected session.

Press the ENTER key to access the relative submenus.

The following table sums up all the menu and submenu pages:

| UPS STATUS (paragraph 5.4.1) | UPS SETUP (paragraph 5.4.2) | POWER MODULES (paragraph 5.4.3) | EVENTS (paragraph 5.4.4) | TOOLS (paragraph 5.4.5) | LOG OUT (o) (paragraph 5.4.6) |
|---------------------------------|--------------------------------|------------------------------------|-----------------------------|----------------------------|----------------------------------|
| UPS Info | Options | PM Status | Log View | Battery | - |
| UPS Cfg | Output | Diagnostics (*) | | Signalling test (*) | |
| Measures | Input | PM SW Update (*) | | LCD Display Test (*) | |
| Alarms | Bypass | | | Assistance | |
| History Data | Batteries | | | CM errors recovery | |
| | Operator Panel | | | | |
| | Clock Setup | | | | |
| | Dry contacts | | | | |

(*) Only available in "Service Mode"

(o) Available in password-protected session

The UPS has a menu and relative submenu tree structure, the functions of which are explained in the following paragraphs. On the right of the display, an arrow appears turned downwards or upwards when there are further items to display. Press the ARROW UP and ARROW DOWN keys to display them.

5.4.1 UPS Status

| | | |
|-----------------|---------------|---|
| UPS Info | Model | Equipment model (Archimod) |
| | SYNC. address | Synchronisation address of the command board |
| | Number of CM | Number of command boards recognised |
| | Max VA | Maximum apparent power[kVA] |
| | Max W | Maximum active power [kW] |
| | Max Ichg | Maximum current available to charge the batteries [A] |
| | SW Ver. | Firmware version of the command board |
| | PM SW Ver. | Firmware version of the power modules |
| | Boot Ver. | Bootloader version in the command board |
| | S/N | UPS serial number |

| | | |
|----------------|-----------------|--|
| UPS Cfg | OUT | Single Phase/Three Phases 120° / Three Phases indep. |
| | IN | Single Phase / Three Phases / inv.3 phases / Undefined (_ _ _) |
| | BYP | Single Phase / Three Phases / inv.3 phases / Undefined (_ _ _) |
| | X/Y - X/Y - X/Y | X Power modules spread for phases managed by the command board Y Power modules spread for phases managed by the UPS |
| | Number BCM | Number of battery charger modules recognised |
| | Installed KB | Number of KB installed |
| | Batt. Cap. | Capacity of the batteries installed [Ah] |
| | Batt.N per KB | Number of batteries in series in one KB |

| | | | |
|-----------------|----------|----------------|---|
| Measures | Output X | Power | Output active power on phase X [W] |
| | | Appar. Power | Output apparent power on phase X [VA] |
| | | Vrms | Output effective voltage on phase X [V rms] |
| | | Vrms ph-ph | Output effective line voltage [V rms] |
| | | Irms | Output effective current on phase X [A rms] |
| | | Peak Current | Output peak current of phase X [A] |
| | | Frequency | Pure sine output voltage frequency on phase X [Hz] |
| | | I Crest factor | Crest factor for phase X |
| | | Power fact. | Power factor of the load connected to the UPS on phase X |
| | | Max W | Maximum active power on phase X [W] |
| | | Power | Output active power on phase X, expressed as a percentage in relation to the maximum active power available on phase X [%] |
| | | Max VA | Maximum apparent power on phase X [VA] |
| | | Appar. Power | Output apparent power on phase X, expressed as a percentage in relation to the maximum apparent power available on phase X [%] |

INDICATION

To vary the value of X and therefore vary the phase from which the data is read, press the ENTER key after entering the submenu.

5. Control panel

| | | | |
|---------------------|---------|----------------|--|
| Measurements | Input X | Power | Absorbed input active power on phase X [W] |
| | | Appar. Power | Absorbed input apparent power on phase X [VA] |
| | | Vrms | Effective input voltage of phase X [V rms] |
| | | Vrms bypass | Effective input voltage of phase X of bypass line of the UPS [V rms] |
| | | Vrms ph-ph | Effective input line voltage [V rms] |
| | | Irms | Effective input current absorbed on phase X [A rms] |
| | | Peak Current | Input peak current of phase X [A] |
| | | Frequency | Pure sine input voltage frequency on phase X [Hz] |
| | | I Crest Factor | Crest factor for phase X |
| | | Power Fact. | Power factor of the load connected to the UPS on phase X |

INDICATION

To vary the value of X and therefore vary the phase from which the data is read, press the ENTER key after entering the submenu.

| | | | |
|-----------------|-----------|---------------|--|
| Measures | Batteries | Voltage | Batteries voltage [V] |
| | | Current | Current supplied by the batteries (negative if the batteries are charging) [A] |
| | | Residual Cap. | Battery charge status, expressed as percentage [0-100%] |
| | | (Status) | Battery charge operating status: - Battery Stand-by - Discharging - Reserve autonomy - End autonomy - Charging - ph1 - Charging - ph2 - Charging - maint. - Testing batteries - Equaliz. batteries - BATTERY FAULT - MaxTime on Battery |
| | | Total Auton. | Total autonomy the UPS would have with batteries 100% charged |
| | | Resid.Auton. | Residual autonomy of the UPS |
| | | V Res.Th. | Threshold voltage of the string of batteries for autonomy end [V] |
| | | Disch.Count | Total number of complete battery discharges |
| | | Usage | Total number of hours in which the UPS has functioned in battery mode [h] |
| | | Cal. | Day and time on which the last calibration was carried out. The text "Factory" is displayed if no calibration has yet been made. |
| | | Calibr.count | Total number of calibrations made |

| | | | |
|-----------------|-------|-------------|---------------------------------|
| Measures | Misc. | Int.Temp | Temperature inside the UPS [°C] |
| | | Pos.H.V.Bus | Voltage on positive DC BUS [V] |
| | | Neg.H.V.Bus | Voltage on negative DC BUS [V] |

| | |
|--------|---------------------------|
| Alarms | Alarm Log. See chapter 6. |
|--------|---------------------------|

INDICATION

To scroll through the list of alarms, press the ARROW UP and ARROW DOWN keys.

| | | |
|--------------|-----------------|--|
| History Data | UPS RunTime | Total UPS runtime |
| | OnBatteryTime | Total UPS uptime on battery mode |
| | This Batt. | Total UPS runtime with the batteries currently installed |
| | CHG Runtime | Total battery charger runtime |
| | DrainedOut N. | Total number of complete battery discharges |
| | Booster Int. | Total number of booster interventions |
| | BypassInterv. | Total number of bypass interventions |
| | Batt.calibr. | Total number of battery calibrations |
| | Chg.cycle N. | Total number of battery equalization calibrations |
| | Replace batt.N. | Total number of times the batteries have been replaced |
| | Load>80% N | The total number of times the load has exceeded 80% of the nominal load |
| | Load>80% T | The total time the load has exceeded 80% of the nominal load |
| | Load>100% N | The total number of times the load has exceeded 100% of the nominal load |
| | Load>100% T | The total time the load has exceeded 100% of the nominal load without the overload being signalled |

5.4.2 UPS Setup

| | | |
|---------|---------------------|--|
| Options | Start-up on Battery | If enabled, it allows the UPS to be started up in the absence of mains supply |
| | Auto Restart | If enabled, automatic restarts are permitted |
| | EPS mode (*) | If enabled, the UPS functions in EPS mode When the mains supply is present, the output is not powered. When the mains supply is absent, the output is powered. |

(*) Only available in "Service Mode"

5. Control panel

| | | | |
|--|--------------|---|---|
| | Voltage | This sets the output voltage value [V] | |
| | Frequency | Nominal Value (*) | This makes it possible to set the output frequency value (50 Hz or 60 Hz) independently of the input frequency. |
| | | Auto Selection | If enabled, the UPS detects the frequency of the input voltage and synchronises the output to the same value. If disabled, the UPS uses the "Nominal Value". |
| | Inverter (*) | This sets the output configuration and the applied load: - Single Phase: a unique single phase output (DO NOT SELECT FOR ARCHIMOD HE 240-480 UPS) - Three Phases 120°: three phase output suited to the supply of three phase loads (e.g. a motor) - Three Phases indep.: three single phase output lines that are independent of each other | |
| | | L1 phase | This makes it possible to program the UPS start-up status for each output: - Always ON: phase always on during start-up - Always OFF: phase always off during start-up - Last state: phase restored to the status prior to the shut down |
| | | L2 phase | |
| | | L3 phase | |

(*) Only available in "Service Mode"

(**) Only available with the inverter set up as three phases independent



CAUTION

Only a skilled technician is authorized to modify the settings on the **Output** menu

| | | |
|--|------------------|--|
| | PLL Enable | If enabled, the UPS synchronises the output pure sine with that of the input. If disabled, the output voltage is not synchronised with the input and it is indicated with the status light (green) flashing. |
| | PLL Range * | This makes it possible to select the frequency range in which the UPS synchronises the output voltage with the input: - NORMAL: The UPS synchronises for frequency variations of $\pm 2\%$ of the nominal value - EXTENDED: The UPS synchronises for frequency variations of $\pm 14\%$ of the nominal value - CUSTOM: this can be set by the user (see the next menu item) |
| | Custom PLL Range | This makes it possible to set the customised frequency interval in which the UPS synchronises the output voltage with the input. The value can be selected from a minimum of 0.5 Hz to a maximum of 7.0 Hz with steps of 0.1 Hz. |
| | Input Dip Enable | This allows the input dip function to be enabled/disabled |

° Available with PLL range set in CUSTOMISED mode

INDICATION

The PLL function ensures that the output frequency of the UPS is synchronised with that of the input, guaranteeing that passage through zero (zero-crossing) occurs at the same moment. Even in the case of bypass intervention (e.g. because of overload) the input-output synchronisation remains guaranteed.

INDICATION

By disabling the PLL function, the automatic bypass function is deactivated as well. The UPS turns off in case of an extended overload.



CAUTION

Only a skilled technician is authorized to modify the settings on the **Input** menu

| | | |
|---------------|--------------------|--|
| Bypass | Bypass Enable | If enabled, the UPS manages the bypass intervention automatically. If disabled, the UPS never switches to bypass mode so in the case of an extended overload or in the case of failure and absence of redundancy, the UPS turns off. |
| | Forced Mode | If enabled, the UPS activates the bypass permanently. |
| | DIP Speed. | This makes it possible to vary the sensibility of the switching circuit: - SLOW: indicated for loads not sensitive to voltage variations and that cause peaks of current - STANDARD: normal mode - FAST: for all loads that are extremely sensible to voltage variations |
| | Off-line Mode | If enabled, the UPS functions in eco mode. During the functioning, the load is powered directly by the automatic bypass circuit. If there is a power failure or the voltage input tolerance is exceeded, the UPS activates the inverter thereby powering the load through the batteries. |
| | Start-up on Bypass | If enabled, on mains start-up the initial powering of the load occurs via bypass. If disabled, the inrush current is managed by the inverter as in a battery start-up. |

 **CAUTION**

Only a skilled technician is authorized to modify the settings on the **Bypass** menu

| | | | |
|------------------|------------------|--------------------|---|
| Batteries | Threshold values | Reserve Time | This sets the start time of the battery autonomy warning [min] |
| | | MaxTime on Battery | This sets the maximum functioning time in stored energy mode. Once this time has elapsed, the UPS turns off. Set at OFF to disable the function |
| | Charger | Standby Charge | If enabled, it activates the battery charge with the UPS off |
| | | Restart Enable | This enables or disables the restart of the UPS when the mains returns after the total discharge of the batteries |
| | Auto Restart | Min. Autonomy | This sets the percentage charge value of the batteries to be reached with the function of standby charge in order to restart automatically the UPS after a total discharge. |
| | | Total KB | This sets the total number of KB installed. The parameter is necessary for the UPS to provide correct values for the autonomy based on the load applied and for a correct battery charge. |
| | Capacity (*) | | This sets the capacity value of the batteries in the UPS [Ah]. |

(*) Only available in "Service Mode"

 **CAUTION**

Only a skilled technician is authorized to modify the settings on the **Batteries** menu

5. Control panel

| | | |
|-----------------------|---------------------|---|
| Operator Panel | Language | This sets the language on the display |
| | Buzzer | This enables/disables all the sound signals |
| | Keyboard Beep | This enables/disables the sound made by key presses |
| | Locked turn off (*) | If enabled, the password is required to shutdown the UPS |
| | Display Backlight | This sets the backlighting of the display: - FIXED: always lit - TIMED: the backlighting goes off after one minute of keyboard inactivity - DISABLED: the lighting is always off |
| | Display Contrast | This sets the display contrast |
| | Password Change | This sets a password that blocks access to the UPS settings |
| | Password level | It indicates the level of the password (the default value is "USER") |

(*) Only available with the chosen password.

| | | |
|--------------------|---------------------|--|
| Clock Setup | DD/MM/YY – HH:mm:ss | This sets the date/time of the UPS. By pressing the ENTER key, the value to modify is selected. By pressing the ARROWS UP/DOWN keys, the selected value is increased or decreased. DD: day MM: month YY: year HH: hour mm: minutes SS: seconds |
|--------------------|---------------------|--|

| | | | |
|---------------------|-----------|--|---|
| Dry contacts | Contact 1 | Function | This allows the signal to be associated with the contact: - Mains/Battery - Reserve autonomy - Alarm - Overload - Bypass |
| | | Setup | This makes it possible to select: - NORMALLY CLOSED - NORMALLY OPEN |
| | Contact 2 | Function | (see contact 1) |
| | | Setup | (see contact 1) |
| | Contact 3 | Function | (see contact 1) |
| | | Setup | (see contact 1) |
| | Contact 4 | Function | (see contact 1) |
| | | Setup | (see contact 1) |
| | Contact 5 | Function | (see contact 1) |
| | | Setup | (see contact 1) |
| | All | Makes it possible to set all the contacts: - NORMALLY CLOSED - NORMALLY OPEN | |

5.4.3 Power Modules

| | | | |
|------------------|-------------|----------------|--|
| PM Status | PM Info X | Mod. | Model of power module X |
| | | SW Ver | Version of the firmware inside power module X |
| | | HW Ver | Hardware version of power module X |
| | | S/N | Serial number of power module X |
| | | Max VA | Maximum apparent power available for power module X [VA] |
| | | Max W | Maximum active power available for power module X [W] |
| | | Max Ichg | Maximum current available from the battery charger of power module X [A] |
| | Input X | Power | Active power absorbed by power module X [W] |
| | | Appar. Power | Apparent power absorbed by power module X [VA] |
| | | Vrms | Effective input voltage of power module X [V rms] |
| | | Vrms bypass | Effective input voltage for power module X of the bypass line [V rms] |
| | | Vrms ph-ph | Effective input line voltage of power module X [V rms] |
| | | Irms | Effective current absorbed from the mains by the power module X [A rms] |
| | | Peak Current | Input peak current of power module X [A] |
| | | Frequency | Pure sine input frequency voltage of power module X for the bypass line [Hz] |
| | | I Crest factor | Crest factor applied by power module X to the mains |
| | | Power Fact. | Power factor applied by power module X to the mains |
| | PM Measures | Power | Active power supplied by power module X [W] |
| | | Appar. Power | Apparent power supplied by power module X [V] |
| | | Vrms | Effective output voltage of power module X [V rms] |
| | | Vrms ph-ph | Effective output line voltage of power module X [V rms] |
| | | Irms | Effective output current supplied by power module X [A rms] |
| | | Peak Current | Output peak current of power module X [A] |
| | | Frequency | Pure sine output voltage frequency of power module X [Hz] |
| | | I Crest factor | Crest factor of the output current of power module X |
| | | Power Fact. | Output power factor for power module X |
| | | Max W | Maximum active power available from power module X [W] |
| | | Power | Active power supplied from power module X, expressed as a percentage in relation to the maximum active power available from power module X [%] |
| | | Max VA | Maximum apparent power available from power module X [VA] |
| | | Appar. Power | Apparent power supplied from the power module X, expressed as a percentage in relation to the maximum apparent power available from power module X [%] |

(continues)

5. Control panel

| | | | | |
|-----------|-----------------|---------------|---|--|
| PM Status | PM Measures | Battery X | Voltage | Battery voltage detected by power module X [V] |
| | | | Current | Current required to the batteries by power module X (negative if the batteries are charging) [A] |
| | | | Charger | Status of the battery charger inside power module X |
| | | Misc. X | INV HSink Temp. | Temperature of power module X Invertor heat sink [°C] |
| | | | BST HSink Temp. | Temperature of power module X Booster/PFC heat sink [°C] |
| | | | Fan Speed | Fan speed of power module X expressed as a percentage [%] |
| | | | Pos.H.V.Bus | Voltage on the positive BUS DC of power module X [V] |
| | | | Neg.H.V.Bus | Voltage on the negative BUS DC of power module X [V] |
| | PM History Data | Run Time | Total Runtime | |
| | | Batt.Time | Total runtime on battery mode | |
| | | Chg.Time | Total runtime of the battery charger | |
| | | Bypass int. | Total number of bypass interventions | |
| | | Battery int. | Total number of transfers to battery mode | |
| | | Dumper int. | Total number of dumper interventions | |
| | | Mains High | Total number of times when the tension of the input line has exceeded the maximum value allowed by the power module | |
| | | Overheat N. | Total number of overheating | |
| | | Overload N. | Total number of overloads | |
| | | HVBus Run.N. | Total number of overvoltages on the Bus | |
| | | OutDCLevel N. | Total number of presence of DC output voltages on the power module | |

INDICATION

Press the ENTER key to vary the value of X that represents the power module the data is read from. The value of X starts from 0 that represents the first power module installed in the first tunnel at the top left of the UPS.

| | | |
|------------------|---------------------|--|
| Diagnostics (*) | PM errors recovery | This cancels the memory of errors detected in the power module. It works only with the errors that can be reset. |
| PM SW Update (*) | Update all PM | This allows the sequential and automatic update of the software in all the power modules present in the UPS. The procedure starts by pressing the ENTER key. If the update is not necessary, a message saying "PM SW Versions updated!" appears on the display. By pressing the ESC key, the procedure ends. |
| | Single PM SW update | This allows the update of the software in each individual power module. Using the ARROW UP/DOWN keys, it is possible to choose the module that has to be updated ('PM00' indicates the module installed in the first tunnel at the top left). By pressing the ENTER key a comparison is made between the software currently present in the selected module and the new software. The procedure starts by pressing the ENTER key. When the update is complete, a message saying "PM SW Version updated!" appears on the display. By pressing the ESC key, the procedure ends. |

(*) Only available in "Service Mode"



CAUTION

Only a skilled technician is authorized to carry out an update

5.4.4 Events

| | | | |
|---------------|----------|----------|--|
| Events | Log View | All | This displays all the events |
| | | Critical | This displays the events that have generated critical alarms |
| | | Warning | This displays the events that have generated non-critical alarms |
| | | Info | This displays the events that have generated simple warnings |

5.4.5 Tools

| | | | |
|------------------|-------------------|-----------|---|
| Batteries | Battery Test | Automatic | This performs a test on the batteries to check their status and performance |
| | Batt. Calibration | | This calibrates the batteries, finding the discharge curve. In order for the UPS to provide precise information regarding the charge status, it is necessary to perform the calibration in the following cases: - after installation and before the first start-up; - in case the batteries are replaced; - every six months after the first year of the UPS's life. |
| | Battery cycle | | This carries out a battery test and their equalization to check the status, the performance and to maximise the life of the batteries. |

| | |
|-----------------------------|--|
| Signalling Test (*) | This carries out the signalling test. When the ENTER key is pressed, the tests of the status indicator signal (green, orange and red) and the acoustic signal are performed. |
| LCD Display Test (*) | This performs the test of the alphanumeric display. When the ENTER key is pressed, all the available characters are displayed. |

(*) Only available in "Service Mode"

| | | |
|---------------------------|---|---|
| Assistance | Display Identifier | This displays the code to communicate to the technical support service. |
| | Use code | Insert the code provided by the technical support service. |
| CM errors recovery | This cancels the memory of the errors detected by the control board. It works only with the errors that can be reset. | |

5.4.6 Log Out

It is possible to set a password to prevent non-authorised personnel to modify the configuration of the UPS. By choosing a password, it is necessary to enter a private session to modify the UPS settings. At the end of the operations use the "Log Out" menu to leave the private session.
If the password has been forgotten, it is necessary to contact the LEGRAND Technical Support Service.

5. Control panel

5.5 POWER ON/OFF menu

When the UPS is on, it is possible to access a special menu called POWER ON/OFF by pressing the ON/OFF button for less than 0,5 seconds.

The choices that can be made in this menu are the following:

| | |
|----------------------|--|
| L1 phase (**) | Press the ENTER key to access the submenu in which it is possible to choose whether to turn phase L1 on or off independently of the others. By pressing the ARROW UP/DOWN keys it is possible to choose the ON or the OFF value. By pressing the ENTER key the value is confirmed; pressing the ESC key you leave the submenu. |
| L2 phase (**) | Press the ENTER key to access the submenu in which it is possible to choose whether to turn phase L2 on or off independently of the others. By pressing the ARROW UP/DOWN keys it is possible to choose the ON or the OFF value. By pressing the ENTER key the value is confirmed; pressing the ESC key you leave the submenu. |
| L3 phase (**) | Press the ENTER key to access the submenu in which it is possible to choose whether to turn phase L3 on or off independently of the others. By pressing the ARROW UP/DOWN keys it is possible to choose the ON or the OFF value. By pressing the ENTER key the value is confirmed; pressing the ESC key you leave the submenu. |
| UPS | Press the ENTER key to accesss the submenu for shutting down the UPS. By pressing the ENTER key again, the UPS shuts down; by pressing the ESC key you leave the submenu. |
| Hot swap | Press the ENTER key to access a submenu to make the hot-swap substitution of the power modules.  CAUTION This operation is reserved to a skilled technician |

(**) Available only with the Inverter set up with three phases independent

5.6 Switching off the UPS



The shut down procedure must only be applied if the load is off or does not need powering by the UPS.

There are two possible ways to shut down the UPS.

It is possible to shut down the UPS from the **POWER ON/OFF** menu or it is possible to perform the following procedure:

1. Keep the ON/OFF key pressed for at least 2 seconds.
2. The display shows the text "Turn off the UPS?". Press the ENTER key.
3. Wait for the shut down operation to complete.

If a prolonged shutdown of the UPS is planned, do as instructed in chapter 8.

5.7 Switching on the UPS

The operator can turn on the UPS by doing the following:

1. Press the ON/OFF key.
2. When the display shows the text "<ENTER> to confirm UPS turn ON", press the ENTER key. If no operation is carried out within 30 seconds, the UPS turns off.
If the display shows the message "WARNING: different UPS setup! <ENTER> to confirm UPS turn on", the UPS setup is different from the last power up. A skilled technician must check the UPS setup before confirming the power up.
3. Wait for the power up operations to complete. The load is only supplied when the bar with the text "UPS INITIALIZE" displayed reaches the end and the main screen appears.

6. Diagnosis

6.1 Luminous and audible notifications

The status indicator on the front panel of the UPS and the led on the front of every power module change their colour according to the actual functioning status of the UPS or of the individual power module in accordance with the table shown below.

INDICATION

Some luminous notifications can be accompanied by an audible signal. To turn off the audible notification, press the ESC key. On every subsequent press, the notification is silenced or enabled.

INDICATION

If it is not possible to solve the problem, contact the LEGRAND Technical Support Service.

| STATUS INDICATOR | POWER MODULE LED | AUDIBLE NOTIFICATION | STATUS MESSAGE | UPS STATUS DESCRIPTION AND OPERATING ADVICE |
|---|--|----------------------------|----------------------|--|
| GREEN Steady | GREEN Steady | - | Archimod | Normal functioning with mains present and load within the limits |
| GREEN Steady | GREEN Steady | - | 3V Battery Fail | Contact the LEGRAND Technical Support Service |
| GREEN Steady ORANGE Flashing | ORANGE Flashing | - | Out/phase turned OFF | Phase off in configuration of the 3 independent phases output. Check the output setup. |
| GREEN Steady ORANGE Flashing | OFF | - | Modules turned off | Control board in hot-swap |
| GREEN Steady | 1 module: ORANGE Steady Remaining modules: GREEN Steady | - | Equalizing Battery | Battery Equalization in progress |
| GREEN Quick flashing | GREEN Quick flashing | - | - | Mains supply is absent on at least on one module and/or the frequency of the mains is not correct (>68Hz or <43Hz) and/or the input PLL is not synchronised. A skilled technician must check the mains. |
| GREEN Quick flashing | - | - | - | Bypass Absent, Input PLL not synchronised, bypass voltage outside the limits, bypass sequence not correct or reversed, bypass frequency out of tolerance A skilled technician must check the mains. |
| GREEN Quick flashing | GREEN Quick flashing | - | Bypass line KO | The bypass cannot be used to power the load |
| ORANGE Steady | ORANGE Quick flashing | - | UPS on Bypass | Operation in automatic bypass mode |
| ORANGE Steady | ORANGE Steady | Access 500 ms and off 12 s | UPS on Battery | Stored energy mode |
| ORANGE Steady | ORANGE Steady | - | Battery Cal... | Battery calibration in progress |

continues...

6. Diagnosis

| STATUS INDICATOR | POWER MODULE LED | AUDIBLE NOTIFICATION | STATUS MESSAGE | UPS STATUS DESCRIPTION AND OPERATING ADVICE |
|--|--|--|--------------------|--|
| ORANGE Steady | - | - | Battery Test... | Battery test in progress |
| ORANGE Long intermittent | GREEN Steady | - | Make Maintenance | Contact the LEGRAND Technical Support Service |
| ORANGE Long intermittent | GREEN Steady | - | Check Batteries | A skilled technician must check the batteries status |
| ORANGE Flashing | ORANGE Quick flashing | - | Forced on Bypass | Forced bypass mode |
| ORANGE Flashing | ORANGE Quick flashing | - | Maintenance Bypass | Manual bypass mode |
| ORANGE Short and double intermittent with pause | ORANGE Steady | Short and double intermittent with pause | RUNTIME RESERVE! | Autonomy reserve. Few minutes left before the shutdown. |
| RED Steady | RED Steady only on the module with the fault | Quick intermittent | FAULT CHARGER | Battery charger faulty on at least one power module. A skilled technician must replace the faulty module. |
| RED Steady | RED Steady only on the module with the fault | Quick intermittent | FAULT MODULE | A skilled technician must replace the faulty power module. |
| RED Quick flashing | - | Quick intermittent | BATTERIES KO | Batteries faulty or not connected. A skilled technician must check the batteries. |
| RED Quick flashing | RED Short and double intermittent with pause | Quick intermittent | BATTERY RUNAWAY | Excessive voltage on the batteries. If the alarm persists over time a skilled technician must check the batteries. |
| RED Quick flashing | RED Short and double intermittent with pause | Quick intermittent | HVBUS RUNAWAY FAIL | Contact the LEGRAND Technical Support Service |
| RED Quick flashing | RED Steady | Quick intermittent | OUT DC LEVEL FAIL | Reset the power module error from the control panel in Service Mode (paragraph 5.4.3) and turn on the UPS. If the error persists, one or more power modules are faulty and a skilled technician must replace them. |
| RED Quick flashing | RED Short and double intermittent with pause only on the module in alarm mode | Quick intermittent | OVERHEAT | Overheating of one or more power modules. Check the functioning of the module fans and clean the air intake grilles. |
| RED Quick flashing | RED Short and double intermittent with pause only on the overloaded module | Quick intermittent | OVERLOAD | Overload on one or more power modules. Check the applied load. |
| RED Quick flashing | - | Quick intermittent | CM FAILURE | Contact the LEGRAND Technical Support Service |
| RED Quick flashing | - | Quick intermittent | Reference Error! | Contact the LEGRAND Technical Support Service |
| RED Quick flashing | - | Quick intermittent | BACKFEED | Contact the LEGRAND Technical Support Service |

6.2 Messages

This paragraph shows the messages that appear on the control panel display and the probable cause that could have generated them.

INDICATION

If it is not possible to solve the problem, contact the LEGRAND Technical Support Service.

FIRST ROW OF THE MAIN SCREEN

| MESSAGE | MEANING AND OPERATING ADVICE |
|----------------------|---|
| Archimod | The UPS is functioning properly |
| Service Mode | UPS in Service Mode. The parameters can be modified through the control panel and updates can be made. |
| UPS initialize... | The UPS is starting-up |
| CM initialize... | The command board is starting-up all the power modules after the exit from the hot-swap mode |
| CM turning off... | The command board is turning off all the power modules after entering the hot-swap mode |
| Service Mode... | The UPS is starting up in Service Mode |
| Maintenance Bypass | The load is powered directly from the mains by means of manual bypass. In this configuration, the load is not protected by the UPS. |
| Forced on Bypass | The UPS has entered the forced Bypass mode through a selection from the control panel. In this configuration, the load is not protected by the UPS. |
| UPS on Bypass | UPS in bypass mode. In this operating mode, the load is not protected by the UPS. |
| Bypass line KO | Bypass input KO; problems on the Bypass line have arisen. A skilled technician must check the bypass line. |
| EPS in stand-by | The UPS is working in EPS mode with the mains present and the output not powered |
| Modules turned OFF | Command board in hot-swap The power modules are no longer powered and ready to be replaced. |
| Out/phase turned OFF | Phase or output off. Configuration obtained via display or after a UPS malfunctioning. |
| UPS on Battery | UPS in stored energy mode. This configuration is due to a fault in the UPS power supply system or a loss of mains. |
| UPS in off-line | The load is powered directly from the bypass line. The load is protected because a possible absence of the power line switches the load to battery. |
| Battery Cal... | The UPS is performing the calibration of the batteries through a command from the control board |
| Battery Test... | The UPS is carrying out a test on the batteries in order to check their status and proper operation. |
| Equalizing Battery | The UPS is performing battery equalization |
| Buzzer Muted | The buzzer has been silenced |
| RUNTIME RESERVE! | The battery charge is at the minimum level. The UPS is about to shut down. |

continues...

6. Diagnosis

| MESSAGE | MEANING AND OPERATING ADVICE |
|---------------------|---|
| FAULT MODULE | One or more more modules are faulty. A skilled technician must replace them. |
| BACKFEED | A backfeed error has been detected. Contact the LEGRAND Technical Support Service. |
| FAULT CHARGER | The battery charger circuit of one or more power modules is faulty. A skilled technician must replace them. |
| BATTERIES KO | Batteries faulty. A skilled technician must check their operation and replace them if necessary. |
| STRONG OVERLOAD | The load on output has caused an excessive lowering of the output voltage |
| OVERLOAD | The total load is more than the nominal power of he UPS. The UPS will switch to bypass if there is voltage on the bypass line, otherwise it will shut down. |
| OVERHEAT | The temperature inside the UPS is outside the nominal range. Check the functioning of the module fans and clean the air intake grilles. |
| OUT DC LEVEL FAIL | Reset the power modules error from the control panel in Service Mode (paragraph 5.4.3) and turn on the UPS. If the error persists, one or more modules are faulty and a skilled technician must replace them. |
| HVBUS RUNAWAY FAIL | Contact the LEGRAND Technical Support Service |
| BATTERY RUNAWAY | The voltage of the batteries is out of control. A skilled technician must check battery operation or the battery charger. |
| 3V Battery Fail | The 3V battery of the command board is low. Contact the LEGRAND Technical Support Service. |
| Abnormal batt.drain | Abnormal battery drain. Contact the LEGRAND Technical Support Service |
| Check Batteries | Have a skilled technician check the status of the batteries |
| Make Maintenance | Contact the LEGRAND Technical Support Service |
| Shutdown ongoing... | The UPS is shutting down because it is programmed to do so by the user |
| Charging Battery | The UPS is charging the batteries. The mode is indicated next to the message. |
| UPS EMERGENCY! | Contact the LEGRAND Technical Support Service |
| LOAD TURNED OFF! | An excessive load (e.g. a short circuit) has caused an excessive lowering of the output for an excessive period or the load has been shut down because of an extended overload in stored energy mode. |
| UPS TURNED OFF! | The UPS is turning off due to a command given from the control panel. |
| UPS BLOCKED! | Contact the LEGRAND Technical Support Service |
| PM FW not updated! | One or more power modules have the software not compatible with the command board. Update the modules before turning on the UPS. |
| Reference Error! | Synchronisation error among the control boards. Contact the LEGRAND Technical Support Service. |
| CM FAILURE | Error in communication among command boards. Contact the LEGRAND Technical Support Service. |
| Reference Warning | Synchronisation error among the control boards. Contact the LEGRAND Technical Support Service. |

SCREEN DISPLAYED ON START-UP OR SHUT DOWN

| MESSAGE | MEANING AND OPERATING ADVICE |
|--|--|
| First Turn ON: Supply Mains! | The UPS has never been turned on. No mains supply. Start-up not permitted. Make sure the mains is present before turning on. |
| Mains not Present! Start-up not Allowed | No mains supply. Start-up not permitted. To start the UPS in stored energy mode select this configuration from the control panel (paragraph 5.4.2). |
| Emergency Power Off! | The Emergency Power Off (EPO) has been activated. The EPO command has been sent by a push-button or a switch on the input line has been opened during the operation of the UPS. Check the emergency push-button. |
| Incomplete Setup for start-up! | The UPS requires a complete configuration for start-up. Check that the output configuration, bypass enabling, number of KB, number of batteries per KB and output voltage have been inserted properly. |
| Three Phase Voltage Sequence Invalid! | The three phase sequence is not valid. A skilled technician must check that the input three phase system has been correctly connected. |
| Invalid PM SW Versions: ➡ to execute update | The SW versions of some or of all the power modules are not correct. Press the ENTER key to update. At the end of the update, the UPS continues the start-up procedure. |
| Invalid PM HW Versions! | One or more power modules are not compatible with the command board. Contact the LEGRAND Technical Support Service. |
| START-UP Error! | An error has occurred during the start-up procedure. Contact the LEGRAND Technical Support Service. |
| Start-up aborted | Start-up only possible with confirmation. The start-up has not been confirmed within 30 seconds. |
| UPS turned off by program! | UPS shut down as programmed via software in a remote controlled system |
| Incorrect setup turn-off | An error has occurred during the configuration. UPS is shutting down. One or more of the parameters have not been set properly. Check the configuration from the control panel. |
| Incorrect KB setup turn-off | An error has occurred during the configuration of the number of KB. Set the right number of KB from the control panel (paragraph 5.4.2) |
| Low Battery TurnOff | Shutdown of the UPS because the minimum voltage level of the batteries has been reached |
| Battery Time Expired | Shutdown of the UPS because the maximum battery operating time set from the control panel has been reached (paragraph 5.4.2) |
| Load turned OFF | Load power interrupted |
| Powered from Output | Start-up error. Voltage present on the UPS output. A skilled technician must check the UPS connections. |
| Turned Off with charged H.V.bus | The UPS has not shutdown properly. Make sure the DC buses are discharged before performing any maintenance operation on the UPS. |
| Saving NVData error | Error saving some UPS parameters. If the problem persists, contact the LEGRAND Technical Support Service. |
| Invalid CM SW Versions: Execute update! | The command boards have been programmed with different software versions. The software versions must be aligned by carrying out an update of the command boards through the PC. |

6. Diagnosis

CRITICAL EVENTS

| MESSAGE | MEANING AND OPERATING ADVICE |
|-------------------------------------|--|
| Inverter Fail | Fault detected in the Inverter circuit. One or more power modules are faulty. A skilled technician must replace them. |
| Booster Fail | Fault detected in the Booster/PFC circuit. One or more power modules are faulty. A skilled technician must replace them. |
| Battery Charger Fail | Fault detected in the Battery charger circuit. One or more power modules are faulty. A skilled technician must replace them. |
| Overheat | Overheating. Check the UPS ventilation system. |
| Overload | Overload. Check the load level connected to the UPS. |
| H.V.Bus Runaway Failure | Contact the LEGRAND Technical Support Service |
| Output DC Level | A skilled technician must check that there is not a faulty power module or a voltage backfeed from the load. |
| Battery voltage too high | Battery voltage too high. A skilled technician must check the batteries. |
| Power Module comm. failure | Contact the LEGRAND Technical Support Service |
| Emergency | Contact the LEGRAND Technical Support Service |
| Load turned OFF | The powering of the loads has been interrupted |
| Irregular TurnOff | UPS shutdown in an anomalous way. The skilled technician must make sure that there is no voltage inside the UPS before performing any maintenance operation. |
| Overload TurnOff | UPS shutdown because of extended overload |
| Emergency Power Off turn-OFF | UPS shutdown because of Emergency Power Off |
| Battery KO | Failure in the batteries. A skilled technician must check them. |
| Power Module battery wiring failure | There is a fault in the connection of the batteries to the power module. One or more power modules are faulty. A skilled technician must replace them. |
| Power Module mains wiring failure | There is a fault in the connection of the mains to the power module. One or more power modules are faulty. A skilled technician must replace them. |
| Power Module HVBus wiring failure | There is a fault in the connection of the HVBus to the power module. One or more power modules are faulty. A skilled technician must replace them. |
| Communication failure between CM | Communication error among the control boards. Contact the LEGRAND Technical Support Service. |
| Backfeed | A backfeed error has been detected. Contact the LEGRAND Technical Support Service. |

NOTIFICATION EVENTS

| MESSAGE | MEANING AND OPERATING ADVICE |
|---------------------------------|--|
| Low Battery Turn Off | UPS shutdown due to low battery voltage |
| Invalid sequence turn-OFF | UPS shutdown due to incorrect three phase sequence on input. A skilled technician must check that the input three phase system has been correctly connected. |
| Battery calibration aborted | Battery calibration interrupted by the user |
| Battery Time Expired | Shutdown of the UPS because the maximum battery operating time set from the control panel has been reached |
| StartUP error | Start-up error |
| Start-up granted with alarms | UPS start-up authorised in the presence of alarms |
| Start-up granted with new cfg | UPS start-up authorised with new configuration. The number of power modules installed on the UPS has changed. |
| Incorrect setup turn-off | UPS shutdown because the configuration is wrong. The number of power modules detected by the UPS is not correct for the output configuration set. |
| PM firmware updated | Power module software updated |
| Strong overload | Strong overload |
| Powered from Output | Voltage present on the UPS output. A skilled technician must check the connections. |
| Turned Off with charged H.V.bus | The UPS has not shutdown properly. The UPS has shutdown without completely discharging the buses. |
| Make Maintenance | Contact the LEGRAND Technical Support Service |
| Check Batteries | A skilled technician must check the batteries |
| Replace batteries | A skilled technician must check battery status and change them if necessary |
| Low Battery Emergency | The load is powered directly from the bypass line due to an end of autonomy in stored energy mode |
| Charge finished | Faulty functioning of the battery charger. Contact the LEGRAND Technical Support Service. |

6. Diagnosis

INFORMATIVE EVENTS

| MESSAGE | MEANING |
|-------------------------------|---|
| User Turn ON | User start-up of the UPS |
| User Turn OFF | User shutdown of the UPS |
| Auto Turn ON | Automatic UPS start-up |
| Timed Turn OFF | The UPS has been shut down via the delayed shutdown programming (paragraph 5.4.2) |
| Stand-by battery charge start | The battery charger has started in stand-by mode |
| UPS on battery | The UPS has transferred to stored energy mode |
| UPS on mains | The UPS has transferred to normal mode |
| Line Out turned OFF | The output is not powered |
| Battery test executed | Battery testing successfully completed |
| Battery learning executed | Battery calibration successfully completed |
| Forced Bypass ON | The forced bypass mode has been enabled |
| Forced Bypass OFF | The forced bypass mode has been disabled |
| Maintenance Bypass ON | The load is powered directly from the maintenance bypass disconnector. The load is not protected by the UPS. |
| Maintenance Bypass OFF | The load is not powered directly from the maintenance bypass disconnector. |
| Enter in Hot Swap | The UPS has started-up the hot-swap mode |
| Exit in Hot Swap | The UPS has exited the hot-swap mode |
| Event list erased | The event list has been erased |
| Battery replaced | The batteries have been replaced by the LEGRAND Technical Support Service |

ALARMS

| MESSAGE | MEANING |
|---------------------------------------|---|
| INVERTER FAIL | Fault detected in the Inverter circuit. One or more power modules are faulty. A skilled technician must replace them. |
| BOOSTER FAIL | Fault occurred in the Booster/PFC circuit. One or more power modules are faulty. A skilled technician must replace them. |
| CHARGER FAIL | Fault occurred in the Battery charger circuit. One or more power modules are faulty. A skilled technician must replace them. |
| OVERHEAT | Overheating. Check the UPS ventilation system |
| OVERLOAD | Overload. Check the load level connected to the UPS |
| HVBUS RUNAWAY | Contact the LEGRAND Technical Support Service |
| OUTPUT DC LEVEL ERROR | A skilled technician must check that there is not a faulty power module or a voltage backfeed from the output |
| BATTERY VOLTAGE TOO HIGH | Battery voltage too high. A skilled technician must check the batteries. |
| MODULE COMMUNICATION FAIL PM -> CM | Fault in the communication with the power modules. Contact the LEGRAND Technical Support Service. |
| BATTERY WIRING FAIL | Error in the battery connection with the power modules. One or more modules are faulty. A skilled technician must replace them. |
| MAINS WIRING FAIL | Error in the mains connection with the power modules. One or more modules are faulty. A skilled technician must replace them. |
| H.V.BUS WIRING FAIL | Error in the D.C. bus connection with the power modules. One or more modules are faulty. A skilled technician must replace them. |
| MODULE COMMUNICATION FAIL CM -> PM | Fault in the communication system with the power modules. Contact the LEGRAND Technical Support Service. |
| UNPROTECTED LOAD | Load not protected |
| MAKE MAINTENANCE | A skilled technician must carry out the periodic check of the UPS |
| CHECK BATTERIES | A skilled technician must check the batteries |
| REFERENCE ERROR OVER CAN NETWORK! | Synchronisation failure among the control boards. Contact the LEGRAND Technical Support Service. |
| CM FAILURE ON CAN NET | Synchronisation failure among the control boards. Contact the LEGRAND Technical Support Service. |
| BACKFEED | A backfeed error has been detected. Contact the LEGRAND Technical Support Service. |
| ABNORMAL BATTERY DRAIN | Abnormal battery drain. Contact the LEGRAND Technical Support Service. |

7. Maintenance



DANGER

INSTALLATION and ORDINARY MAINTENANCE operations must be carried out only by SKILLED TECHNICIANS (paragraph 2.2.1). EXTRAORDINARY MAINTENANCE operations must be carried out only by LEGRAND TECHNICAL SUPPORT SERVICE.

7.1 Introduction

This chapter contains all the information necessary for an operator to correctly install and maintain the UPS.



DANGER

The operator is not authorized to carry out the activities listed in the installation and maintenance manual. LEGRAND declines all liability for any injury or damage caused by activities carried out differently from the instructions written in this manual or by a skilled technician who doesn't follow the requirements written in the installation and maintenance manual.

7.2 Installation

The operator is not authorized to install and connect electrically the UPS. These operations are the sole preserve of a skilled technician (paragraph 2.2.1) who must follow the instructions addressed to him in the installation and maintenance manual.

7.3 Preventive maintenance

The UPS does not contain parts for preventive maintenance by the operator.

The operator must periodically perform:

- a general external cleaning;
- a check to verify the absence of alarms on the display;
- a check to verify the correct functioning of the fans on each power module.

After the first year of life of the UPS, check the batteries every six months through the "battery calibration" function to guarantee the optimal operation and continuous protection of the connected load. With this function, the UPS detects the discharge curve of the batteries in order to provide precise information on the charging state.

Enter the main menu to perform this operation and follow the path: **Tools → Batteries → Batt. Calibration**
Press the ENTER key to confirm the choice.

Contact the LEGRAND Technical Support Service in case of problems.

7.4 Periodical checks

The correct functioning of the UPS unit must be guaranteed by periodical maintenance inspections. These are essential to safeguard the reliability of the UPS.



WARNING

The periodical checks involve operations inside the equipment in presence of dangerous voltages. Only maintenance personnel trained by LEGRAND are authorized to intervene.

7.5 Ordinary maintenance checks

Contact a skilled technician if it is necessary to replace or add power modules and external battery cabinets.

7.6 Extraordinary maintenance

Contact the LEGRAND Technical Support Service if there are failures that require the access to internal parts of the UPS.

8. Warehousing



DANGER

All storage operations must be carried out only by a SKILLED TECHNICIAN (paragraph 2.2.1)



DANGER

A SKILLED TECHNICIAN must check that there is no voltage present before disconnecting the cables. All the battery isolator switches on the external battery units must be open.

8.1 UPS

The UPS must be stored in an environment with a room temperature between -20°C (-4°F) and +50°C (+122°F) and humidity less than 90% (not condensing).

8.2 Batteries

It is possible to store VRLA batteries without recharging them in the following conditions:

- up to 6 months at +20°C (+68°F);
- up to 3 months at +30°C (+86°F);
- up to 2 months at +35°C (+95°F)..



CAUTION

The external battery units must never be stored if the batteries are partially or totally discharged.
LEGRAND is not liable for any damage or bad functioning caused to the UPS by wrong warehousing.

9. Dismantling



DANGER

Dismantling and disposal operations must be carried out only by a SKILLED TECHNICIAN (paragraph 2.2.1). The instructions in this chapter are to be considered indicative: in every country there are different regulations with regard to the disposal of electronic or hazardous waste such as batteries. It is necessary to strictly adhere to the standards in force in the country where the equipment is used.
Do not throw any component of the equipment in the ordinary rubbish.

9.1 Battery disposal

Batteries must be disposed of in a site intended for the recovery of toxic waste. Disposal in the traditional rubbish is not allowed.

Apply to the competent agencies in your countries for the proper procedure.



Pb



WARNING

A battery may constitute a risk of electric shock and high short-circuit current.

When working on batteries, the prescriptions indicated in chapter 2 must be adhered to.

9.2 UPS dismantling

The dismantling of the UPS must occur after the dismantling of the various parts it consists of.

For the dismantling operations, it is necessary to wear the Personal Protective Equipment mentioned in paragraph 2.3 and to consult the instructions and diagrams in the installation and maintenance manual.

Sub-divide the components separating the metal from the plastic, from the copper and so on according to the type of selective waste disposal in the country where the equipment is dismantled.

If the dismantled components must be stored before their disposal, be careful to keep them in a safe place protected from atmospheric agents to avoid soil and groundwater contamination.

9.3 Electronic component dismantling

For the disposal of electronic waste like the control panels or the command boards, it is necessary to refer to the relevant standards.



10. Technical data

MAIN FEATURES

| | 3 104 75 | 3 104 76 + 3 104 77 |
|--------------------------------|---|----------------------------|
| Nominal power | 240 kVA | 480 kVA |
| Active Power | 240 kW | 480 kW |
| Technology | online, double conversion Classification according to EN62040-3: VFI-SS-111 | |
| IN/OUT Configuration | Three-phase / Three-phase | |
| Neutral system | Passing system | |
| Dual Input | Available on all the models | |
| Power columns | 2 | 4 |
| Command boards | | 4 |
| UPS architecture | Modular with power modules PM7 3 108 73 of 6,700 VA (PF=1) Expandable, redundant N+X | |
| Waveform in normal mode | Pure sine | |
| Waveform in stored energy mode | Pure sine | |
| Bypass | Automatic (static and electromechanical) Manual (for maintenance) | |
| Transfer time | 0 ms | |

INPUT ELECTRICAL CHARACTERISTICS

| | 3 104 75 | 3 104 76 + 3 104 77 |
|---|---|----------------------------|
| Maximum input current (with minimum input voltage and battery charger active) | 462 A | 924 A |
| Nominal input voltage | 400 V + 15% - 20% (Three-phase) (neutral line indispensable) | |
| Input frequency | 50 / 60 Hz ± 5 Hz autosensing | |
| Power factor on input | PF > 0.99 | |
| Total harmonic distortion of the input current | THDi < 3% | |

10. Technical data

ELECTRICAL OUTPUT CHARACTERISTICS (NORMAL MODE)

| | 3 104 75 | 3 104 76 + 3 104 77 |
|--|--|---------------------|
| Maximum output current | 347 A | 694 A |
| Nominal output voltage | 400 V ± 1% (Three-phase) | |
| Nominal output frequency | 50 / 60 Hz (autosensing and/or selectable by the user) | |
| Tolerance on the output frequency | synchronised to the bypass line with range from ± 0.5 Hz to ± 7 Hz adjustable from the control panel | |
| Crest factor admitted on the output current | 3:1 | |
| Total harmonic distortion of output voltage on linear nominal load | < 0.5% | |
| Total harmonic distortion of output voltage on non-linear nominal load | < 1% | |
| Efficiency in Normal Mode | up to 96% | |
| Efficiency in Eco Mode | 99% max | |
| Overload admitted | 115% for 10 minutes without automatic bypass intervention 135% for 60 seconds without automatic bypass intervention | |

ELECTRICAL OUTPUT CHARACTERISTICS (STORED ENERGY MODE)

| | 3 104 75 | 3 104 76 + 3 104 77 |
|--|---|---------------------|
| Nominal output voltage | 400 V ± 1% (Three-phase) | |
| Output frequency | 50 / 60 Hz ± 1% | |
| Total harmonic distortion of output voltage on linear nominal load | < 0.5% | |
| Total harmonic distortion of output voltage on non-linear nominal load | < 1% | |
| Overload admitted | 115% for 2 minutes 135% for 30 seconds | |

BATTERIES AND BATTERY CHARGER CHARACTERISTICS

| | 3 104 75 | 3 104 76 + 3 104 77 |
|--|--|----------------------------|
| Nominal battery voltage UPS | 252 Vdc (21 x 12 Vdc batteries in series) External battery unit | |
| Type of battery charger | High performance PWM, one for each power module | |
| Recharge curve | Smart Charge, advanced three-stage cycle | |
| Nominal recharge current battery charger | 2.5 A max for every power module installed | |

FEATURES

| | 3 104 75 | 3 104 76 + 3 104 77 |
|----------------------|--|----------------------------|
| Signals and alarms | Large four line alphanumeric screen, multicolour status indicator, acoustic notification | |
| Communications ports | two RS 232 ports, two relay interfaces, two contact ports, two SMNP module slots | |
| Software | Free software for Windows and Linux environments is available to implement the following functions: - displaying all the functioning and diagnostic data in case of problems; - setup of special functions; - automatic shutdown of all the computers supplied by the UPS (if connected to TCP/IP network). Visit us at http://www.ups.legrand.com to download a copy of the software free of charge. | |
| Protections | Electronics against overloads, short-circuit and excessive battery discharge Block of functions due to the end of autonomy In-rush limiter on start-up E.P.O. contact Auxiliary contact for backfeed protection | |

MECHANICAL CHARACTERISTICS

| | 3 104 75 | 3 104 76 + 3 104 77 |
|--|---------------------|---|
| Net weight (empty cabinet) | 440 kg | 256 kg + 610 kg |
| Dimensions (mm) (w x h x d) | 1,350 x 2,050 x 750 | 820 x 2,050 x 750 + 1,650 x 2,050 x 750 |
| Power modules 6,700VA (PM7) 3 108 73 installable | up to 36 | up to 72 |
| Net power module weight | | 8.5 kg |

10. Technical data

ENVIRONMENTAL CONDITIONS

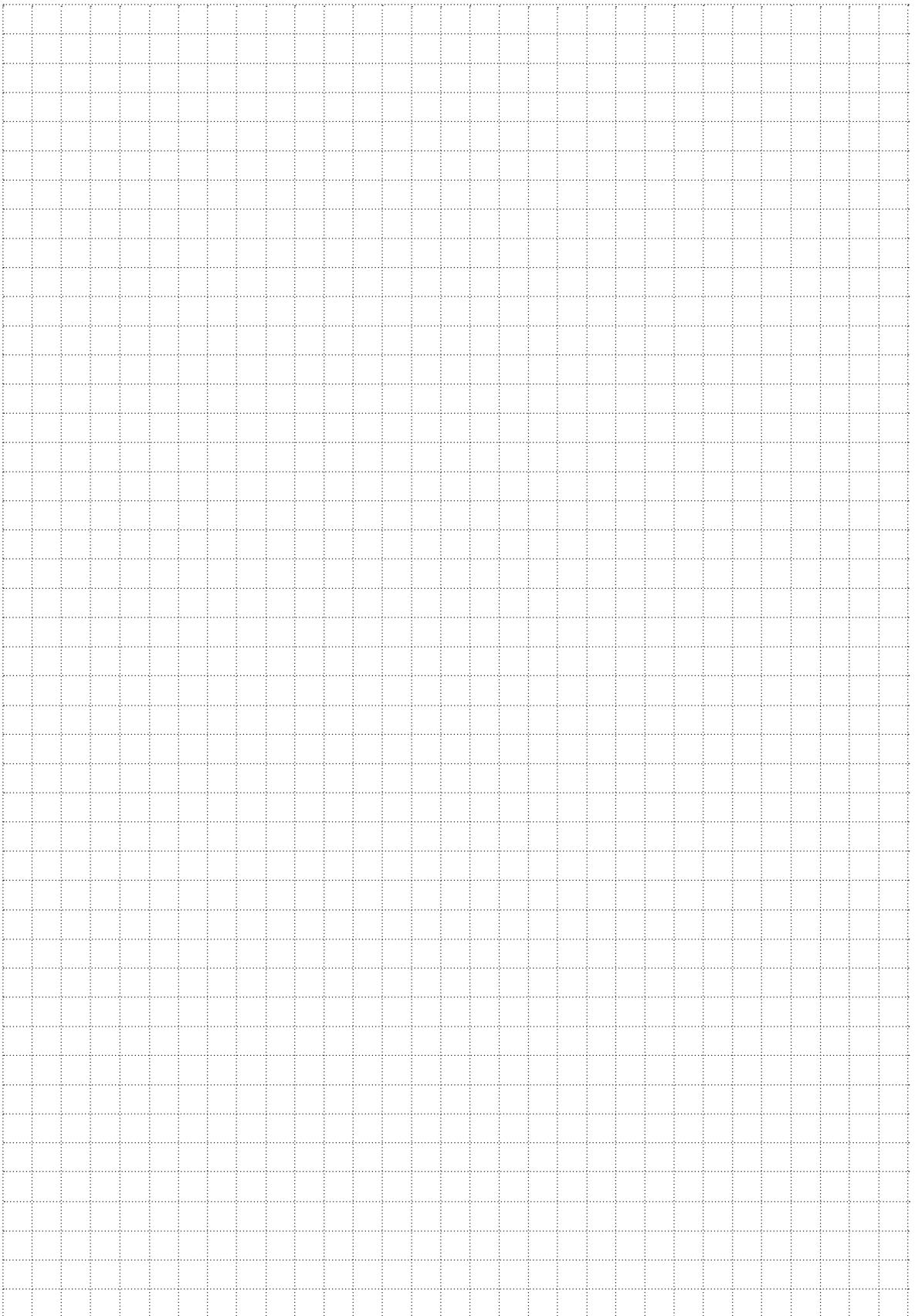
| | 3 104 75 | 3 104 76 + 3 104 77 |
|------------------------------------|--|---------------------|
| Operating temperature | 0 °C ÷ 40 °C | |
| Relative humidity during operation | 0% ÷ 95% non condensing | |
| Storage temperature | -20 °C ÷ 50 °C (excluding batteries) | |
| Noise level at 1 metre | < 80 dBA | |
| IP code | IP 21 | |
| Operating height | up to 1000 metres above sea level without derating | |
| Heat dissipation with full load | 43,092 BTU/h | 86,184 BTU/h |

Archimod HE 3 108 51 BATTERY CHARGER MODULE (BCM) TECHNICAL SPECIFICATIONS

| Nominal input voltage | 230 Vac + 15% - 20% |
|--|---|
| Nominal input current | 19.3 A |
| Input power factor | PF > 0.99 |
| Total harmonic distortion of the input current | THDi < 3% |
| Nominal output voltage | 240/252 Vdc |
| Output voltage in maintenance phase | 13.75 Vdc per battery |
| Nominal output voltage | 15 Adc max |
| AC/DC efficiency | >93% at max rated output current |
| Functioning status indications (signalled by multicoloured LED on the module and indications on the UPS display) | Yellow LED, fast flashing: recharge phase f1 Green LED, slow flashing: recharge phase and maintenance f2 Green LED steady: standby Red LED: fault status |

REFERENCE DIRECTIVES AND STANDARDS

| Safety | 2014/35/EU Directive EN 62040-1 |
|-----------------------------------|------------------------------------|
| EMC | 2014/30/EU Directive EN 62040-2 |
| Performance and test requirements | EN 62040-3 |





LEGRAND
Pro and Consumer Service
BP 30076 - 87002
LIMOGES CEDEX FRANCE
www.legrand.com

Installer stamp