legrand®

Archimod®

Operating and Maintenance Manual

Part. LE07015AA-01/14-01 GF

Archimod®

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1. Foreword

1.1 Overview

Congratulations for having bought a LEGRAND® UPS Archimod® product.

Thanks to UPS Archimod® unit your critical equipment will always be protected by a constant and reliable supply of power.

LEGRAND® is based in Italy and specializes in designing and producing UPS units. The UPS Archimod® system is unique in its kind, modular, redundant and the last generation of medium power UPS units.
Highly reliable, low running costs and excellent electrical performance are but a few of the great features of this innovative UPS. Moreover, the criteria and methods that LEGRAND® uses for its design and production comply with the strictest quality standards.
The product is, in fact, produced at an ISO14001 certified factory in full compliance with the eco-design laws.

The UPS Archimod® system is made in compliance with the existing European Community directives and with the technical standards that include their requirements as certified by the Declaration of Conformity issued by the Manufacturer and enclosed with this manual.

This publication, simply defined 'manual' herein, contains all the information for the installation, use and maintenance of the equipment specified in the Declaration of Conformity.

Every of this equipment will be referred to simply as 'equipment' or even 'machine' in this manual and is manufactured by LEGRAND® whose address can be found further on in this chapter.

The contents of this manual are intended for an operator who has already been instructed on the precautions to be taken in relation to the presence of dangerous electricity.

The persons to whom this publication is addressed, normally defined 'users', are all those people who, for their field of expertise, have the need and/or obligation to provide instructions or work directly on the equipment.

These people can be the following:
- managers;
- heads of operating areas;
- department heads;
- operators directly concerned with transporting, storing, installing, using and servicing machines from the moment they are put on the market up to the day they are scrapped;
- direct private users.

The original text of this publication is in Italian and is the only reference for solving any interpretation disputes related to the translation into other languages.

This publication is to be considered an integral part of the equipment supplied and, as such, must be kept for future reference up until the equipment is definitively dismantled and scrapped.

1.2 Purpose of the manual

The purpose of this manual is to provide indications for using the equipment safely and to carry out routine maintenance procedures.

Adjustments and extraordinary maintenance jobs are not dealt with in this manual as they are reserved exclusively to the assistance technician who must observe to the technical and design characteristics for which the equipment was made when working on it.

It is essential that this manual is read through but it is not a substitute for the expertise of the technical personnel who must have had adequate preliminary training.

The intended use and configurations envisaged for the equipment are the only ones allowed by the Manufacturer; do not attempt to use the equipment in disagreement with the indications given.

Any other use or configuration must be agreed on beforehand with the Manufacturer in writing and, in such a case, will be an enclosure to the manual.

For its use the user must also comply with the specific laws on work that exist in the country where the equipment is installed.

Reference is also made in this manual to laws, directives, etc., that the user must know and consult in order to fulfil the purposes established by the manual.

1.3 Where and how to keep the manual

This manual (and its enclosures) must be kept in a safe, dry place and always be available for consultation.
We suggest making a copy and filing it.
If information is exchanged with the Manufacturer or assistance personnel authorised by the former, please refer to the equipment's rating plate data and serial number.

The manual must be kept for the equipment's useful life cycle and, if necessary (e.g. damage which prevents it being consulted even partially) the user must ask the Manufacture for a new copy, quoting the publishing code on the cover.

1.4 Manual update

The manual reflects the state of the art at the moment the equipment was put on the market, of which it is an integral part. The publication complies with the directives in force at such a date. The manual cannot be considered inadequate if updates of standards or changes are made to the equipment.

Any integration to the manual which the Manufacturer deems fitting to send to the users, must be kept with the manual, becoming an integral part of it.

1.5 Collaboration with the user

The Manufacturer is available to its clientele to provide additional information and will take into consideration any suggestions made to improve this manual to bring it even closer to the requirements for which it was drawn up.

If the equipment is sold, which always includes handing over this operating manual, the primary user must notify the Manufacturer, giving him the address of the new user so the latter can be reached if there are any communications and/or updates deemed indispensable.

1.6 Manufacturer

The equipment's identification data are given on the ID plate.

1.7 Responsibilities of the manufacturer and guarantee

In order to use the guarantee supplied by the Manufacturer the user must scrupulously comply with the precautions indicated in the manual and in particular:
- to always work within the equipment's limits of use;
- to always carry out constant and accurate maintenance;
- to have persons use the equipment with proven capabilities and skill and adequately trained for the purpose;

The Manufacturer declines all liabilities, direct and indirect, resulting from:
- disregard for the instructions and if the equipment is used differently to what is foreseen in the operating manual.
- use by personnel who have not read and understood properly the contents of the manual;
- a use failing to conform to the specific laws existing in the country of installation;
- changes made to the equipment, software, operating logic that were not authorised by the Manufacturer in writing;
- unauthorised repairs;
- exceptional events.

1. Foreword

When the equipment is sold to a third party this manual has to go with it; if the manual is not given to the new user then all purchaser rights are automatically invalidated, including guarantee terms where applicable.

If the equipment is sold to a thirty party in a country of a different language it is the responsibility of the original user to provide a true translation of this manual in the language of the country where the equipment is going to be used.

1.7.1 Guarantee terms

UPS Archimod® is supplied with a 24-month guarantee, also limited to material defects of the UPS and its components.
The instant an anomaly occurs on the product, contact the LEGRAND® Technical Assistance Centre who will provide all the instructions on how to proceed.

Do not return anything without prior authorisation from LEGRAND®
LEGRAND® will provide further instructions on how to proceed.
This guarantee is not valid if the UPS is not started by a correctly trained specialized technician.
This guarantee does not cover damages or losses caused by:
an incorrect use, abuse, negligence, carelessness, unauthorised repairs or changes, incorrect installation, inadequate environment, accident, force majeure or inappropriate application, atmospheric events, etc.
If, during the guarantee period the UPS is found not to conform to the characteristics and performances described in this manual, LEGRAND® , at its discretion, will repair or replace the unit (or its components).
All pieces repaired or replaced remain the property of LEGRAND®.

LEGRAND® is not liable for costs such as: loss of profits or failed turnover, loss of equipment, loss of data or software, complaints from third parties and so on.

Use of its products for life supporting applications is not one recommended by LEGRAND® because it is possible, and reasonable to foresee that an anomaly or malfunction of the product can cause an anomaly in the life support device or significantly compromise its reliability and effectiveness.
LEGRAND® does not recommend using its products for the direct care of a sick person and does not supply its equipment for use in any such application unless it receives written confirmation that the risks of possible injury or harm have been minimised and that the customer has assessed all the risks and takes full responsibility for all related consequences.

The UPS can contain batteries that must be recharged for a minimum of 24 hours every 6 months if they are stored, in order to prevent being completely flat. Batteries that are completely flat for any reason are not covered by the guarantee.

1.7.2 Extension of the guarantee and maintenance contracts

La garanzia standard può essere consolidata al fine di proteggere il gruppo di continuità con un contratto di estensione garanzia (contratto di manutenzione). Per maggiori informazioni si prega di contattare il Centro Assistenza LEGRAND®.
Terminato il periodo di garanzia, è possibile aderire a un servizio di assistenza tecnica tramite la sottoscrizione di un canone di abbonamento in grado di offrire una manutenzione ottimale dell'UPS.

1.8 Copyright

2. Configuration and Start-up

WARNING
The instructions given in this chapter are not for an ordinary operator but for a specialized, authorised technician only if he is using the Individual Protective Gear specified in chapter 4.

As illustrated in the previous chapter the default configuration for the Archimod® UPS units entails a THREE-PHASE INPUT and a THREE-PHASE OUTPUT.
If this type of connection is used, the equipment requires no additional configuration as it has already been set in the factory.
If, on the other hand, the output terminal block configuration is altered during installation (only Archimod® 20 and 40kVA, see chapter 6) the inverter's configuration must also be changed via the display before starting the UPS, referring to the following instructions.

2.1 Input configuration

UPS Archimod® automatically recognises the voltage, frequency and number of phases in input even if the electrical connection on the terminal block is changed. So once the input wiring to the terminal block has been modified and accordingly, no further configuration via the display is necessary.

ATTENTION
Ensure that the neutral is always connected.

2.2 Output configuration

The UPS Archimod® does not automatically recognise the electrical configuration on the output terminal block. It is therefore ALWAYS necessary to select the electrical configuration on the output terminal block via the display when installing, depending on the load type applied.

The output default configuration for the UPS Archimod® units is THREE 120° phases, 400 VAC.

For power 20 kVA and 40 kVA the unit can be configured to obtain just one single-phase output (230 VAC).
Follow the instructions in paragraph 2.4 to ensure you select, via the display, the correct output configuration for the system.

If the unit is configured with a three-phase output, it is possible to select management of the three phases as follows:

- **THREE 120° phases**: this is the default setting and it is normally used if three-phase loads have been applied in output from the UPS (e.g. three-phase electrical motors) or if three-phase and single-phase loads are being powered by the UPS. In this case the UPS manages the three output phases, protecting the three-phase load. For example, if an excessive load is applied to one of the three output lines, the automatic bypass switches all three output lines.

- **THREE single-phase outputs**: this setting is necessary if three separate single-phase lines were created at the UPS output. In this case, the UPS manages the three outputs separately one from the other. For example, if an excessive load is applied to one of the three output lines, the bypass will intervene only on the overloaded line while power is guaranteed on the other two by the UPS.

2.3 Checks prior to switching on

Check the following before powering the equipment:
1. Make sure the carrier isolating switches for powering the UPS in the distribution box are open;
2. Ensure that the fuse carrier isolating switches of the UPS batteries (F B+ and F B-) and those of the Archimod® BATTERY (if used) are open;
3. Check that the maintenance bypass switch and the UPS output switch are both open, in the 0 position.
4. Ensure that the input and output wiring is correct;
5. Check correct cycling of the phases in input;
6. Check correct cyclicity of the phases in mains input and in bypass input (if used).
7. Check that all power modules are properly plugged and that all the securing screws for the power modules are screwed right down into their slots; use only and exclusively M4x20mm Allen screws and do not tighten them with too much force.

2. Configuration and Start-up

WARNING
This is because these screws act on a safety micro switch that controls shutting down of the power modules if an attempt is made to extract them without using the Hot Swap function. Even if just one screw has not been tightened right down it can stop 3 or 6 power modules from working
The empty slots not used by power modules must be covered with a plastic mask (supplied) that must be secured only and exclusively with two M4x20mm Allen screws with a 4 mm diameter Grower washer in between, without tightening too much.

2.4 Starting procedure

1. Insert the battery fuses in their disconnectors (F B+ and F B-) and, if applicable, those in the Archimod® BATTERY cabinets (where used)
2. Close the battery disconnectors of the UPS and of the Archimod® BATTERY (if used)

WARNING
Before turning the unit on, the correct output configuration must be selected
(Three-phase 120° / Three independ. phases / Single-phase). To do this, proceed as follows.

3. With the unit off, press the ENTER key on any operator panel to gain access to the Service Mode.
   See chapter 7 for more information about the SERVICE MODE and how the operator panel works.
4. Follow this path: UPS Config. → Output → Inverter.
   Select Three-phase 120° / Three independ. phases / Single-phase, depending on the type of load/distribution downstream from the UPS. Use the arrow keys to move selection on the display, the Enter key to confirm, the ESC key to cancel.

Note: the inverter output configuration to select on the display (three or single phase) must match the configuration set on the output terminal block during installation.

WARNING
Wrong connections or output configuration settings can cause injury to people and/or damage to things!

5. Follow this path: UPS settings → Batteries → total KB
   Check/select the right number of KBs (Battery Kits) installed.
6. Follow this path: UPS settings → Batteries→ Capacity
   Check/select the right battery capacity value for each single KB in Ah.
   The total KB value represents the number of strings of 21 batteries installed in series which are parallel with each other. The Capacity in Ah to enter is that of a single string (1KB). The UPS calculates total battery capacity as a product of total KB * Capacity.
   Example 1: a 60kVA Archimod® UPS is connected to a modular Archimod® BATTERY containing 10KB made up by 21 x 9Ah batteries. The KB=10 and Capacity=9Ah values must be set on the UPS.
   Example 2: a 120kVA Archimod® UPS is connected to 2 non-modular Archimod® BATTERY units each containing 1KB made up by 21 x 94Ah batteries. The KB=2 and Capacity=94Ah values must be set on the UPS.
7. Exit the Service Mode by pressing the ON/OFF button.
8. Power the UPS and close its mains input disconnector switch;

ATTENTION
If the charging in standby function has been enabled, when the unit detects the input voltage it automatically prompts starting a battery charging cycle. Press the ESC key to refuse the charging in standby and proceed with turning the Archimod® UPS on.

9. Press the ON/OFF button to switch the UPS on;
10. Wait until the status indicator on the display turns a fixed green;
11. Check that the output voltage and frequency values set correspond to the applied load requirements. If they do not, enter the necessary values (see next chapter)
12. Close the output switch on the UPS.
    At this stage the load is powered and protected by the Archimod® UPS.

WARNING
If during installation it is necessary to verify the proper functioning of the UPS on battery mode, remove mains opening the switch located upstream of the UPS and not through the input switch in the front panel of the UPS.

3. Technical description

3.1 Archimod® Technology

Congratulations on your purchase of a UPS Archimod® product froLEGRAND®.
Thanks to the UPS Archimod® your critical equipment will be always protected by a constant and reliable supply of power.

LEGRAND® has developed a project that is both innovative and unique, creating Archimod®, the UPS with a power range of 20, 40, 60, 80, 100 e 120 kVA capable of adapting itself at any time to the changing requirements of protected loads: greater power, longer autonomy, reliability. The basic concepts of the Archimod® project are, in fact, modularity, expandability and redundancy which, besides offering maximum safety, are also the guarantee of a considerable economic saving.
Even the Archimod® BATTERY rack cabinet is modular with boxes for extremely simple maintenance and battery Hot-Swap.
The Archimod® UPS guarantees the best load protection levels. This is possible thanks to a modular architecture that has a 6.7 kVA single-phase power module as its basic element. The power modules are connected in parallel, phase by phase, and should just one module fail only the power of that module on the phase involved is lost. The UPS is controlled by 1, 2 or 3 boards, depending on the configuration. Each board can control up to 6 power modules. If one of the control boards fails, only the modules it controls are turned off and made safe while the UPS carries on working on-line with no interruption to the load.

Redundancy is therefore possible on a single phase (power module failure) and inside the UPS (control failure). Hot-Swap replacement of the power modules is also possible, turning the control off as well as the set of modules connected to it without having to power the load from the bypass line thus temporarily losing protection.
Even the modular Archimod® BATTERY boxes can be Hot-Swap replaced without having to put the UPS in maintenance bypass.
Each control board is connected to a control panel with display - by means of which both UPS status and settings can be checked - and to a communication interface with an RS-232 connection, SNMP, free contacts and accessories slot.
All UPS functions can be accessed from any control panel and it is also possible to communicate through any interface installed: thus even these peripheral devices are redundant. In UPS installations where there are three separate single-phase lines in output, each line can be separately software
controlled to privilege, for example, the autonomy of one of them when running on battery and install only the necessary number of modules on each phase to have the power required. An input bypass
line separate from the mains input line will allow the bypass to be powered by a second power source (the neutral conductors of both lines must be in common). In addition, the 20kVA and 40kVA models
can be configured freely - single or three phase - in output or input by appropriately configuring the terminal block and by means of the software settings.
Cutting edge technology is used for the UPS hardware.

A sophisticated microprocessor control optimises UPS performance both on the Booster/PFC side and
on the output inverter. The battery charge curve has been studied to obtain maximum useful accumulator life and greater autonomy when there is no mains power.
The electronic boards are entirely assembled on automated LEGRAND® lines and tested to ensure the highest possible quality standards.
Each piece of equipment is tested by letting it work for a long time at full load before being packed and shipped to the customer. All these measures contribute to the value of the Archimod® UPS over time.

3.2 Features

Power module
The basic module, supplying 6700 VA with an 0.8 power factor, is basically made up of the following functional blocks: command and control logic (microprocessor controlled), rectifier/PFCr, inverter, booster, battery charger, automatic bypass.
The power unit is the Plug & Play type to facilitate power expansion and all maintenance works.
Each module is paralleled with other identical ones until the UPS power wanted on each phase is reached.
The power modules are separate from each other and can work even if one malfunctions.
A multicolour LED with a traffic light code green-amber-red on the front of the module quickly shows the operating state of the electronic unit.
The power modules are housed on shelves that can hold 3 modules, referred to as "tunnels" in the rest of this document.

3. Technical description

Battery box
The battery modules are designed for easy insertion in the cabinet with no work needed to connect them; they are easy to handle thanks to their light weight, likewise any maintenance or replacing.
A box holds 7 12V, 7.2 Ah or 9 Ah batteries connected in series and, thanks to the Plug & Play connection can be easily pulled out or put inside the cabinet. In order to guarantee maximum safety, especially during maintenance, the voltage of each box is adequately disconnected into two 36 and 48V that are connected in series only when the box is placed right inside its housing.
This conforms to the CEI-EN 60950 standard on electrical safety which establishes that adequate safeguards must be used and particular attention where there are dangerous voltages higher than 60 Vdc with the possibility of direct contact.
Autonomy can be increased further still by adding other battery 'boxes' in multiples of three, exploiting the space inside the UPS and the space in the additional Archimod® BATTERY cabinet.

Digital display and displaying alarms
The UPS Archimod® is controlled by 1, 2 or 3 microprocessor boards (depending on the versions) and has the same number of backlit alphanumerical LC-displays with 20 characters on 4 lines.
They are built into the front of the UPS together with their high luminosity operating status indicators which, by means of a traffic-light code (green-yellow-red), indicates the operating status and any alarm conditions.
Four simple push buttons near the display allow the user to: see operating data, set operating parameters, analyse the state of each single power module, select the language in which to see the messages, start the Hot-Swap mode and execute a set of functional tests.

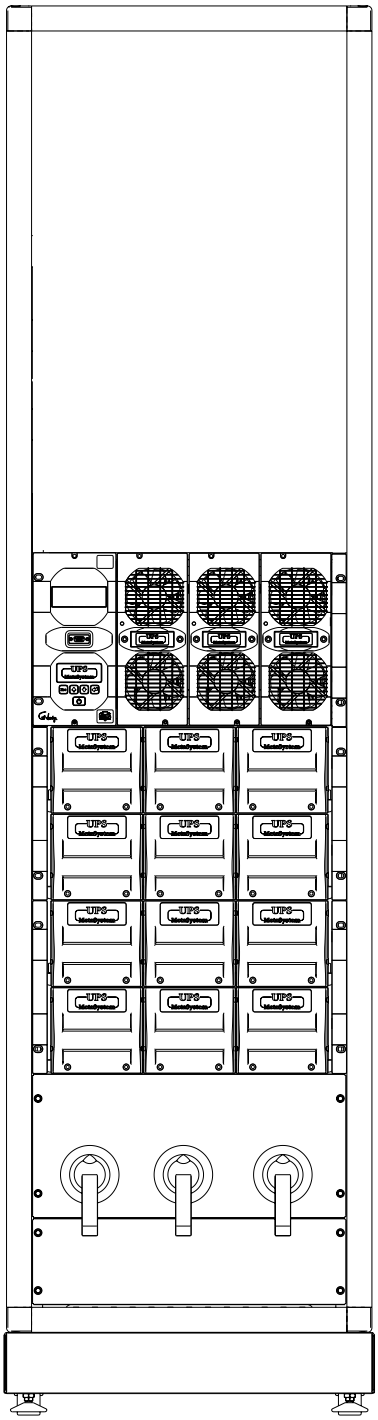
BCM (Battery Charger Module)
It works together with internal PM chargers, with the same intelligent management of the charging cycle. For each BCM installed the maximum batteries recharging current is increased of 15Adc: 1 BCM has a charging current equivalent to that of 6 (internal to the charger) PMs. This guarantees to reduce charging time in installations that require long backup time UPS and increases the availability of the UPS system after a power failure (blackout).
During operation, the module draws current from the phase input (slot) in which it is installed. If at least n°1 PM is present, it is possible to install any number of BCM.
All informations about BCM are indicated by LED on the front of the module and described on the display menu.
The module is controlled by a microprocessor to optimize performance and reliability, we recommend the use in combination with higher than 60Ah capacity batteries.
Input voltage 230V +15% -20%, rated output power 4kW, maximum rated current 15Adc, maintenance voltage 13.75Vdc/battery. Operating status through the UPS front panel LEDs and multi-colored, adjustable fan speed versus power output, overtemperature protection.
Intelligent charging cycle with four stages to maximize battery life (constant current, final charge, maintenance and stand-by).

Off-Line mode
The Archimod® UPS features an Off-Line mode for saving energy while still guaranteeing power continuity protection to the connected load. When working in the Off-Line mode the load is powered directly by the mains via the automatic bypass circuit inside the power modules.
This means that both the output frequency and voltage are the same as the input mains and the UPS Archimod cannot control such quantities.
The advantage of the Off-Line mode is a greater electrical yield in that the UPS does not convert energy.
If the output voltage goes outside the tolerance range (±15% of the voltage set in output) or there is a power cut, the UPS activates its inverter stage, feeding the load with the energy stored in the battery.
When running on battery power, autonomy depends on UPS configuration (nominal power, battery capacity) and on the load percentage applied. When the input mains returns to within the tolerance parameters the UPS goes automatically to the Off-Line mode. The On-Line and Off-Line modes can be switched (and vice versa) whether the UPS is on or off (accessing the Service Mode).

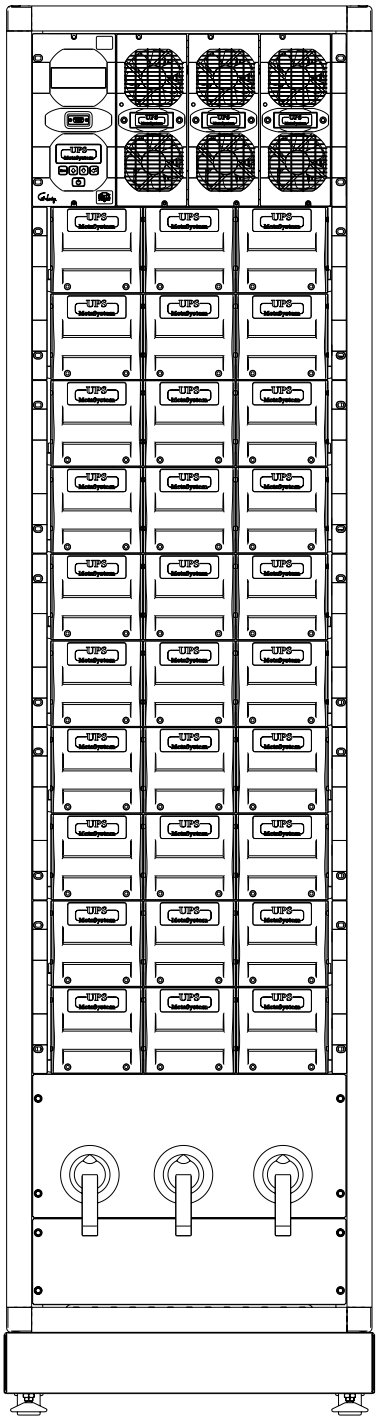
- To activate the Off-Line mode access the Main menu → UPS settings → Bypass → Off-Line mode and select Enabled, confirming your choice with the Enter button.
- To activate the On-Line mode access the Main menu → UPS settings → Bypass → Off-Line mode and select Disabled, confirming your choice with the Enter button.

ATTENTION!
If the load requires powering without any interruption or with a voltage regulated in amplitude and/or frequency, the Archimod® UPS must be used in the dual conversion On-Line mode.

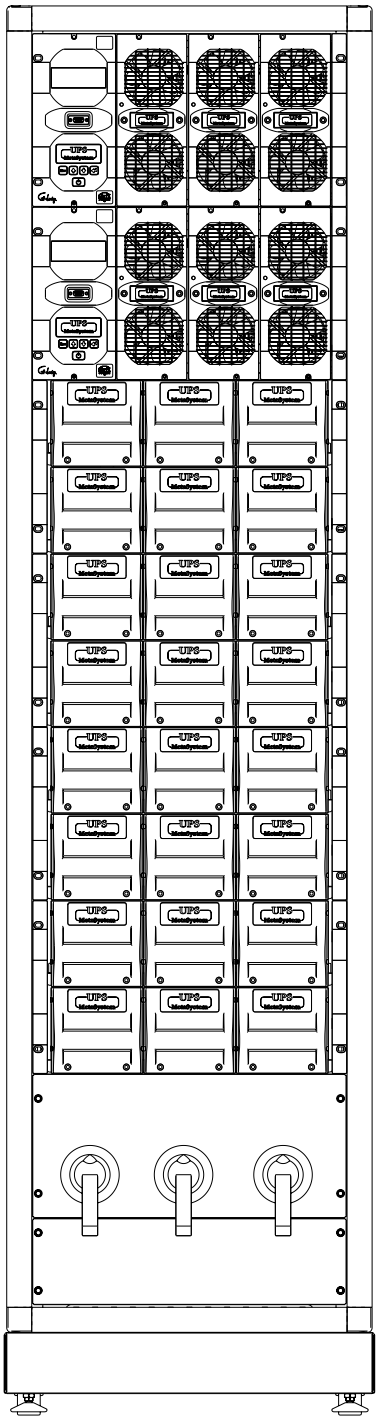
3.3 Models



UPS Archimod® 20+18U

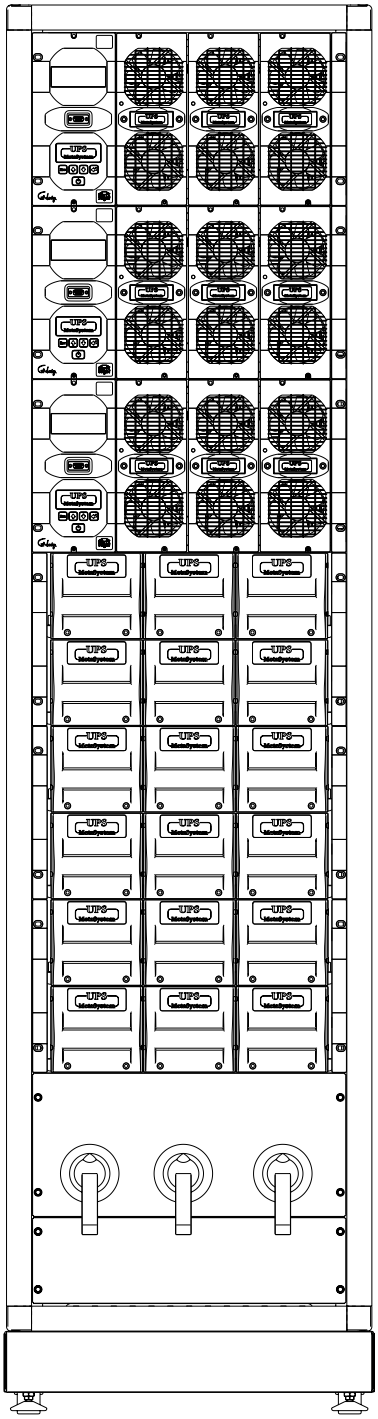


UPS Archimod® 20

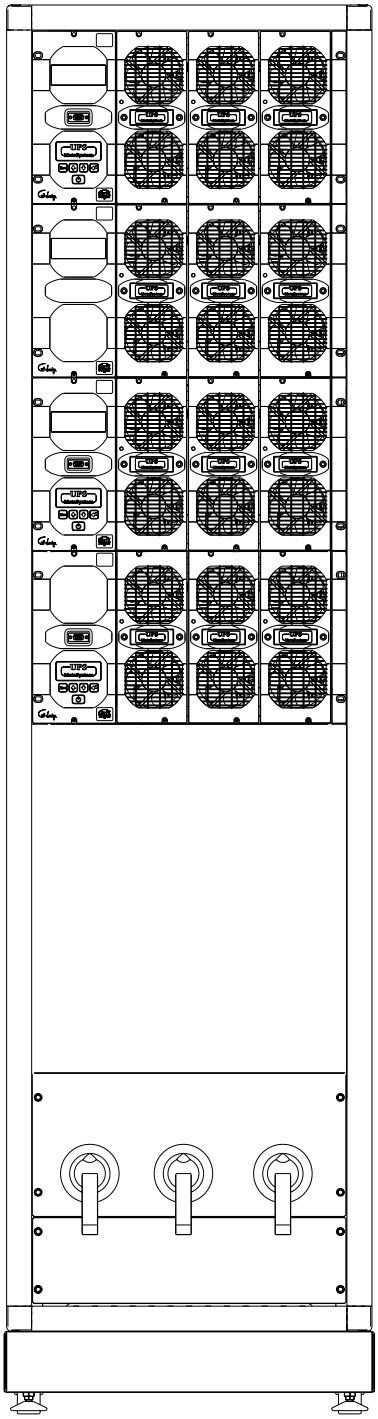


UPS Archimod® 40

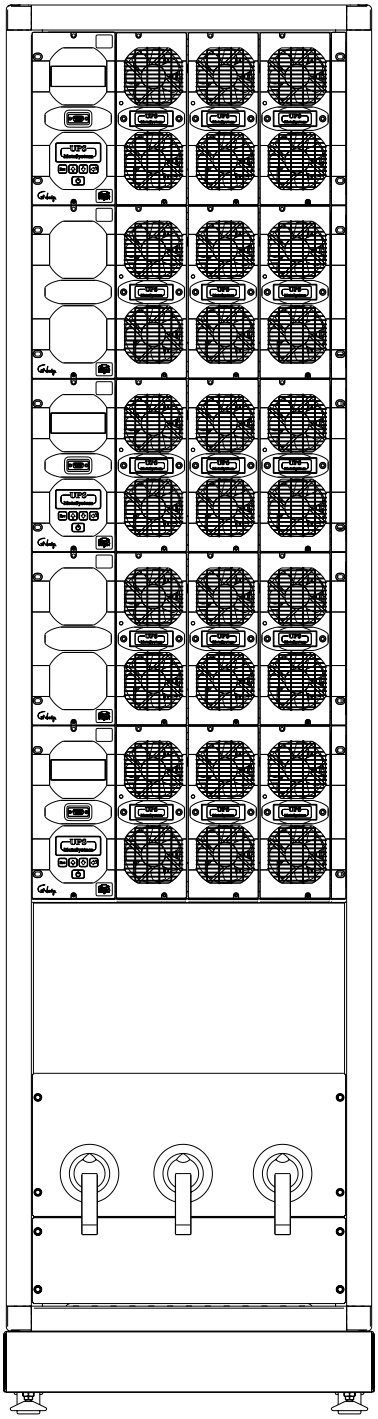
3. Technical description



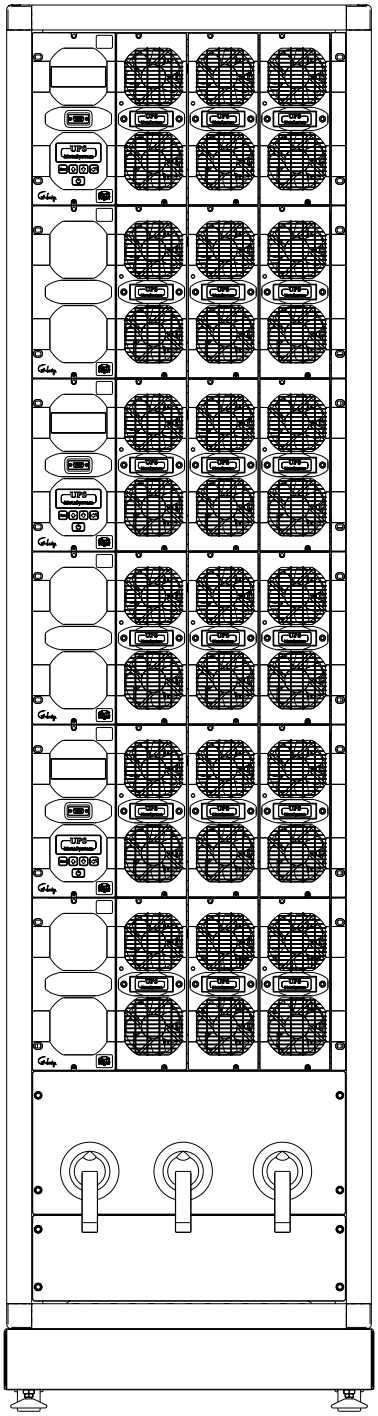
UPS Archimod® 60



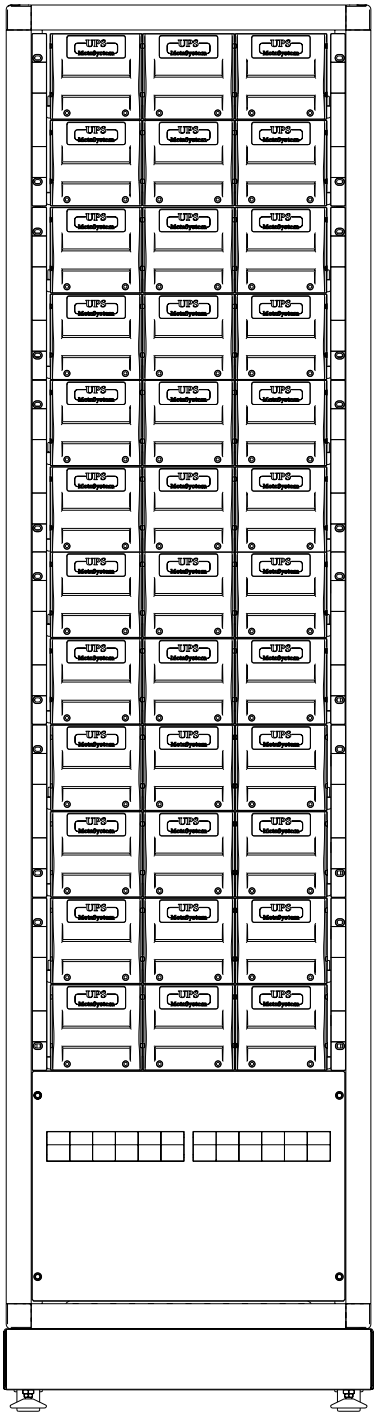
UPS Archimod® 80



UPS Archimod® 100



UPS Archimod® 120



UPS Archimod® Battery

3. Technical description

3.4 Technical specifications

General charateristics

	3 104 58 3 104 59	3 104 60	3 104 61	3 104 62	3 104 63	3 104 64
Rated Power	20 kVA	40 kVA	60 kVA	80 kVA	100 kVA	120 kVA
Active Power	20 kW	40 kW	60 kW	80 kW	100 kW	120 kW
Technology	On Line, double conversion VFI – SS - 111					
Configuration I/O	Triphase / Triphase (Only Archimod 20/40kVA can be configured single/single, single/tri, tri/single, tri/tri by user)					
UPS architecture	Modular with 6,7 kVA power modules (PF = 1). Housed in a single cabinet. Expendable, redundant N+X					

Input characteristics

	3 104 58 3 104 59	3 104 60	3 104 61	3 104 62	3 104 63	3 104 64
Maximum current (tri/tri)	38.4 A	76.8 A	115.2 A	153.6 A	192 A	230.4 A
Maximum current (tri/single)	38.4 A	76.8 A	-	-	-	-
Maximum current (single/tri)	115.2 A	230.4 A	-	-	-	-
Maximum current (single/single)	115.2 A	230.4 A	-	-	-	-
Input voltage	230 V + 15% - 20% (Single-phase) 400 V + 15% - 20% (Three-phase) (Neutral line is essential)		400 V + 15% - 20% (Three-phase) (Neutral line is essential)			
Input frequency	50 Hz / 60 Hz ± 2%					
Input connections	Tri + Neutral (Neutral line is essential)					
THD input current	< 3%					
Input power factor	> 0.99					

Output characteristics

	3 104 58 3 104 59	3 104 60	3 104 61	3 104 62	3 104 63	3 104 64
Maximum current (tri/tri)	29 A	58 A	87 A	116 A	145 A	174 A
Maximum current (tri/single)	87 A	174 A	-	-	-	-
Maximum current (single/tri)	29 A	58 A	-	-	-	-
Maximum current (single/single)	87 A	174	-	-	-	-
Output voltage	230 V ± 1% (Single-phase) 400 V ± 1% (Three-phase)		400 V ± 1% (Three-phase)			
Output nominal frequency	Hz = 50/60 sincronized					
Output connections	Trifase + Neutro					
Efficiency - Mains (On Line) - Mains (Eco mode)	up to 96% 99%					
Over load	115% for 10 min - 135% for 60 sec					

Functional electrical characteristics

<table>
<tr><th></th><th>3 104 58
3 104 59</th><th>3 104 60</th><th>3 104 61</th><th>3 104 62</th><th>3 104 63</th><th>3 104 64</th></tr>
<tr><td>Command board</td><td>1</td><td>2</td><td colspan="4">3</td></tr>
<tr><td>Redundancy of command board</td><td>No</td><td colspan="5">Yes</td></tr>
<tr><td>Percentage of load admitted after rupture of a control board</td><td>-</td><td>50%</td><td>66%</td><td>(50÷75)%</td><td>(60÷80)%</td><td>66%</td></tr>
<tr><td>Model</td><td>20 kVA</td><td>40 kVA</td><td>60 kVA</td><td>80 kVA</td><td>100 kVA</td><td>120 kVA</td></tr>
<tr><td rowspan="3">Power Module PM7</td><td rowspan="3">3 PM7 driven by control board N.1</td><td rowspan="2">3 PM7 driven by control board N.1</td><td>3 PM7 driven by control board N.1</td><td>6 PM7 driven by control board N.1</td><td>6 PM7 driven by control board N.1</td><td>6 PM7 driven by control board N.1</td></tr>
<tr><td>3 PM7 driven by control board N.2</td><td>3 PM7 driven by control board N.2</td><td>6 PM7 driven by control board N.2</td><td>6 PM7 driven by control board N.2</td></tr>
<tr><td>3 PM7 driven by control board N.2</td><td>3 PM7 driven by control board N.3</td><td>3 PM7 driven by control board N.3</td><td>3 PM7 driven by control board N.3</td><td>6 PM7 driven by control board N.3</td></tr>
<tr><td>Maximum output power during replacement mode Hot swappable modules</td><td>-</td><td>50%</td><td>66%</td><td>(50÷75)%</td><td>(60÷80)%</td><td>66%</td></tr>
<tr><td>Maximum output power in case of failure of a module (Redundancy)</td><td>0% (with 3 fhase load)
66% (with single fhase load)</td><td colspan="2">50%</td><td>66%</td><td>75%</td><td>80%</td><td>84%</td></tr>
<tr><td>Power Module PM7</td><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td><td>18</td></tr>
<tr><td rowspan="3">Characteristics of Power Module PM7</td><td colspan="6">Nominale Power 6.7kVA</td></tr>
<tr><td colspan="6">Active Power 6.7kW</td></tr>
<tr><td colspan="6">Hot swappable electronics is permitted by dedicated procedure, replacing a power module with the machine on after turning off, via the relative control board, its corresponding 3-phase block (3 or 6 power modules).</td></tr>
<tr><td>Number of Display</td><td>1</td><td>2</td><td colspan="4">3</td></tr>
<tr><td>Characteristics of Display</td><td>NON Hot Swappable</td><td colspan="5">Redundant.
Independent displays each connected with a separate command.
Display back light green background
Multicolor Status Indicator operation (green / yellow / red)</td></tr>
<tr><td>RS232 user port</td><td>N.1
Rear side</td><td>N.2
Rear side</td><td colspan="4">N.3
Rear side</td></tr>
<tr><td>RS232 maintenance port</td><td>N.1
Front side</td><td>N.2
Front side</td><td colspan="4">N.3
Front side</td></tr>
<tr><td>Contact port</td><td>N.1 DB15
rear side</td><td>N.2 DB15
rear side</td><td colspan="4">N.3 DB15
rear side</td></tr>
</table>

(continue)

3. Technical description

Functional electrical characteristics

	3 104 58 3 104 59	3 104 60	3 104 61	3 104 62	3 104 63	3 104 64
Relay interface	N.1 Rear side	N.2 Rear side	N.3 Rear side			
SNMP slot Adapter (Imax 700mA)	N.1 Rear side	N.2 Rear side	N.3 Rear side			
MULTI SLOT	N.1 Rear side	N.2 Rear side	N.3 Rear side			
Battery drawer	Available also in dedicated Battery Cabinet. Hot swappable operation is permitted by dedicated procedure, replacing a battery drawer with the UPS on, only if the KB available are higher than the minimum necessary for the operation of the UPS battery.					
Through neutral	Yes					
Operating mode	On-line - Eco Mode					
Maintenance By-pass	Yes					
Automatic by-pass	Yes					
Expendable	Yes (power modules and battery drawers)					
Redundancy	Yes					
Restart	Yes (after complete battery run down)					
Other	Max battery charging current for each module 2,5A installed					

Protections and Safety devices

	3 104 58 3 104 59	3 104 60	3 104 61	3 104 62	3 104 63	3 104 64
Output short-circuits	Yes					
Input Overvoltage	Yes					
Overtemperature	Yes					
Overload	Yes					
Powering surge limiter	Yes					
Excessive battery discharging	Yes					
Differential	No					
Epo	Yes					
Input fuse	Input breaker - no fuse (front panel)					
Output fuse	Output breaker - no fuse (front panel)					
Battery fuse	Battery breaker fuse (20/40/60 kVA)					
Back Feed protection:	No					

Batteries

	3 104 58 3 104 59	3 104 60	3 104 61	3 104 62	3 104 63	3 104 64
Type of batteries	12V 7.2Ah or 12V 9Ah maintenance-free sealed lead batteries					
KB	Series of N.3 battery drawers (N.7 batteries in each drawer)					
Over load	115% for 2 min - 135% for 30 sec					

Standards

	3 104 58 3 104 59	3 104 60	3 104 61	3 104 62	3 104 63	3 104 64
EN62040-1	Yes					
EN62040-2	Yes					
EN62040-3	Yes					

Environmental conditions

	3 104 58 3 104 59	3 104 60	3 104 61	3 104 62	3 104 63	3 104 64
Operating temperature	0° - 40° C					
Relative Humidity	20% - 80% non condensing					
Noise level at 1 m	50/65 dBA					
Thermal dissipation	3591 BTU/h	7182 BTU/h	10773 BTU/h	14364 BTU/h	17955 BTU/h	21546 BTU/h
Max altitude	up to 1000m without derating					

Construction features

	3 104 58 3 104 59	3 104 60	3 104 61	3 104 62	3 104 63	3 104 64
Weight (Kg) (modules and battery drawers not included)	140	184,5	204	213	197	216
Dimensions L x W x H (mm)	570 x 912 x 2080 (42U)					
Protection degree (IP)	IP20					
Other notes						

3. Technical description

3.5 Communication devices

The uninterrupted power supply units of the UPS Archimod® type have, for each control board:
2 RS232 serial ports, 1 relay interface, 1 logic level output on a female DB15 connector and an SNMP slot.
If there are several control boards they provide the same redundant information.

ATTENTION
To ensure operator safety it is mandatory for the interfaces to be connected so that:
- the maximum voltage between any two conductors connected to the interface and between either of these two conductors and earth is less than a peak 42V or less than 60Vdc;
- the insulation voltage between any conductor connected to the interface and earth is at least 1500Vac

3.5.1 RS232 serial ports

The first of the 2 RS232 serial ports that are on each of the UPS control boards is called "maintenance Interface"; it is located in the middle of the front control panel between the display and keypad.
It is dedicated exclusively to diagnostic functions and machine firmware upgrades.
The second, called "user interface" is at the back of the UPS. Thanks to this port a whole set of data on UPS operation can be accessed by means of a computer or network board besides being able to control the unmanned switching off of the operating system.

3.5.2 Relay interface/E.P.O.

The relay interface contacts are programmed by default as Normally Open (NO) but can be configured as Normally Closed (NC) via the UPS control panel and display. There is also an input for the E.P.O. function.
The indications available with this interface are:
- running on battery
- autonomy reserve
- generic alarm
- overload
- UPS running on bypass

Electrical specifications/contact interface
The indications available with relay interface are
- V_{MAX} = 250VAC - 30VDC, I_{MAX} = 5A

E.P.O. input
Voltage with open contacts 12VDC, current with closed contacts 5mA.

Description of the contacts' interface PINs:

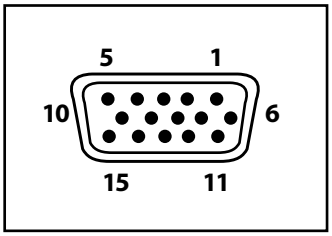
G

PIN	FUNCTION
1 -2	Running on battery
3 - 4	Autonomy Reserve
5 - 6	Generic alarm
7 - 8	Overload

H

PIN	FUNCTION
1 -2	Running on Bypass
3 - 4	E.P.O.
5 - 6	-

3.5.3 Logic level interface



Logic level interface is available on connector DB15 (F) and it allows the UPS to be connected to a remote system for monitoring its operating status, making available the following indications and controls:

- Mains/battery operated;
- Autonomy reserve
- UPS fault
- Overload
- UPS on bypass
- ON/OFF input

The functions of the interface pins are:

- Pin 1: GND;
- Pin 2: Mains/Battery (output, active high);
- Pin 3: Autonomy Reserve (output, active high);
- Pin 4: RS232 power supply;
- Pin 6: do not connect
- Pin 7: Overload (open collector, active low);
- Pin 12: UPS on Battery (open collector, active low);
- Pin 13: UPS on Bypass (open collector, active low);
- Pin 14: Autonomy Reserve (open collector, active low);
- Pin 15: Alarm (open collector, active low).

Electrical specifications

Logic output: $12V_{DC}$ max., output impedance 2.2kΩ in series.
RS232 power supply: $12V_{DC}$ 700mA max., not adjusted.
Open collector outputs (all): $30V_{DC}$, 100mA max.

3.5.4 Communication slot

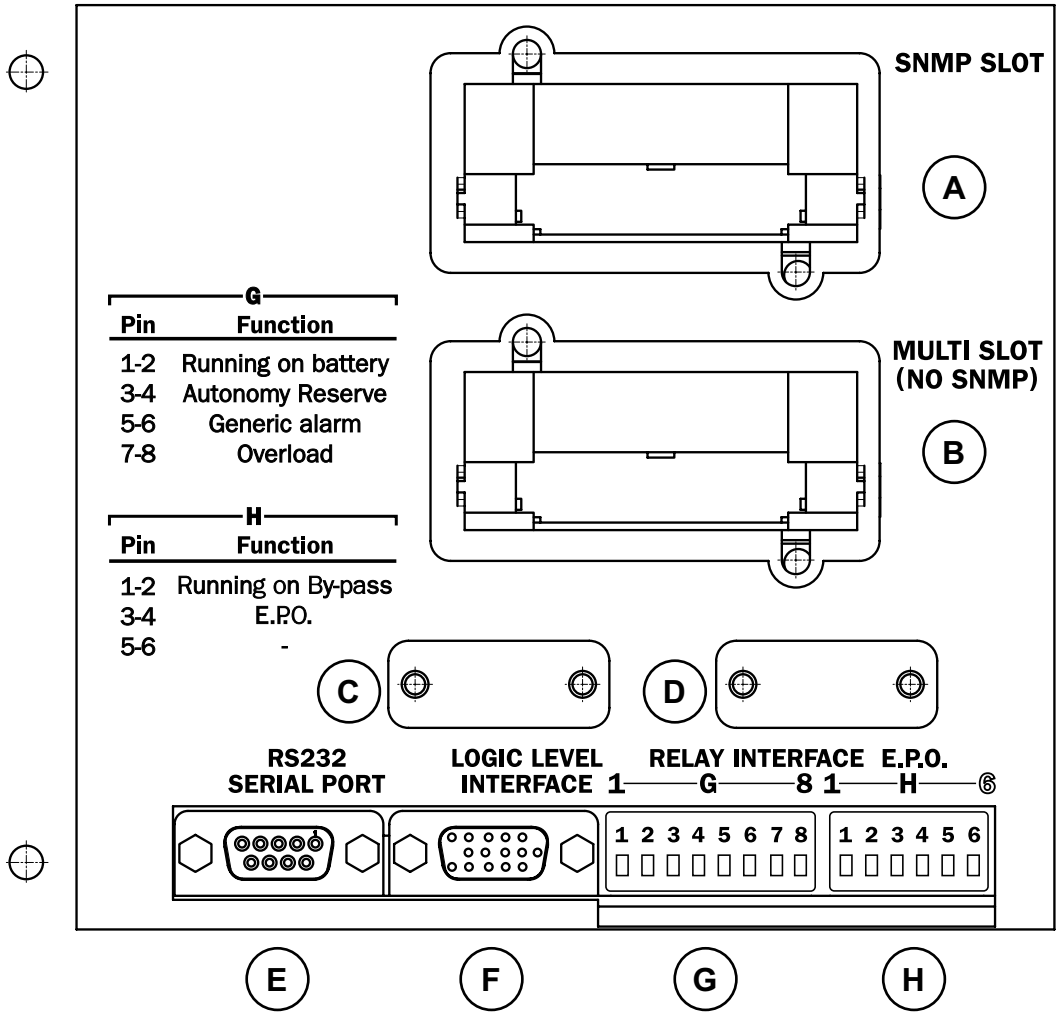
A slot at the back of the UPS Archimod® is for the SNMP (A) board (optional).

ATTENTION
The maximum current taken from pin4 of connector DB15 "RS232 power supply" and from the SNMP slot for the network board to work must be, in total, less than 700mA.

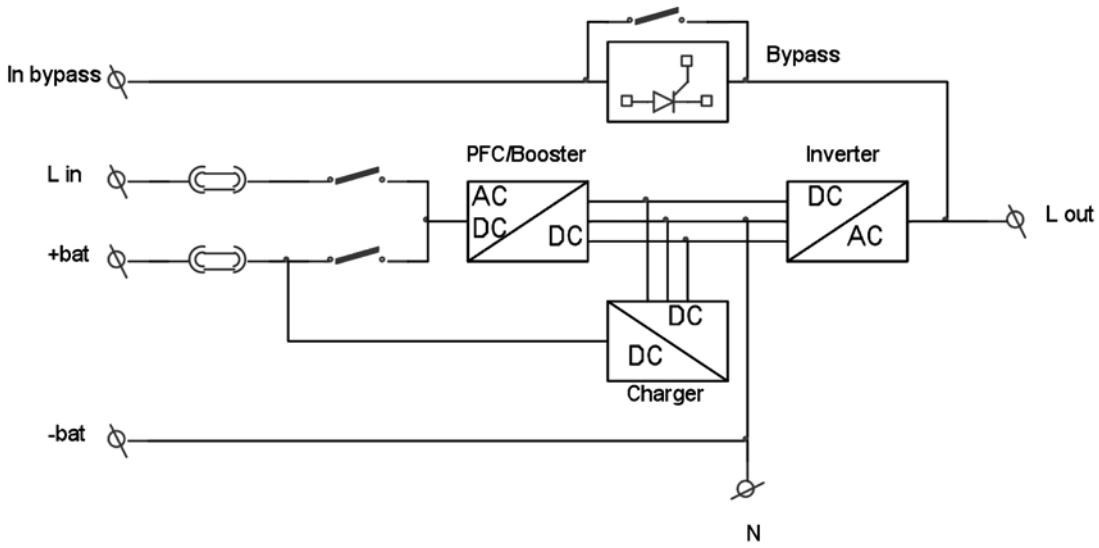
3.5.5 Multi-Slot

Slot for future interface devices (B).

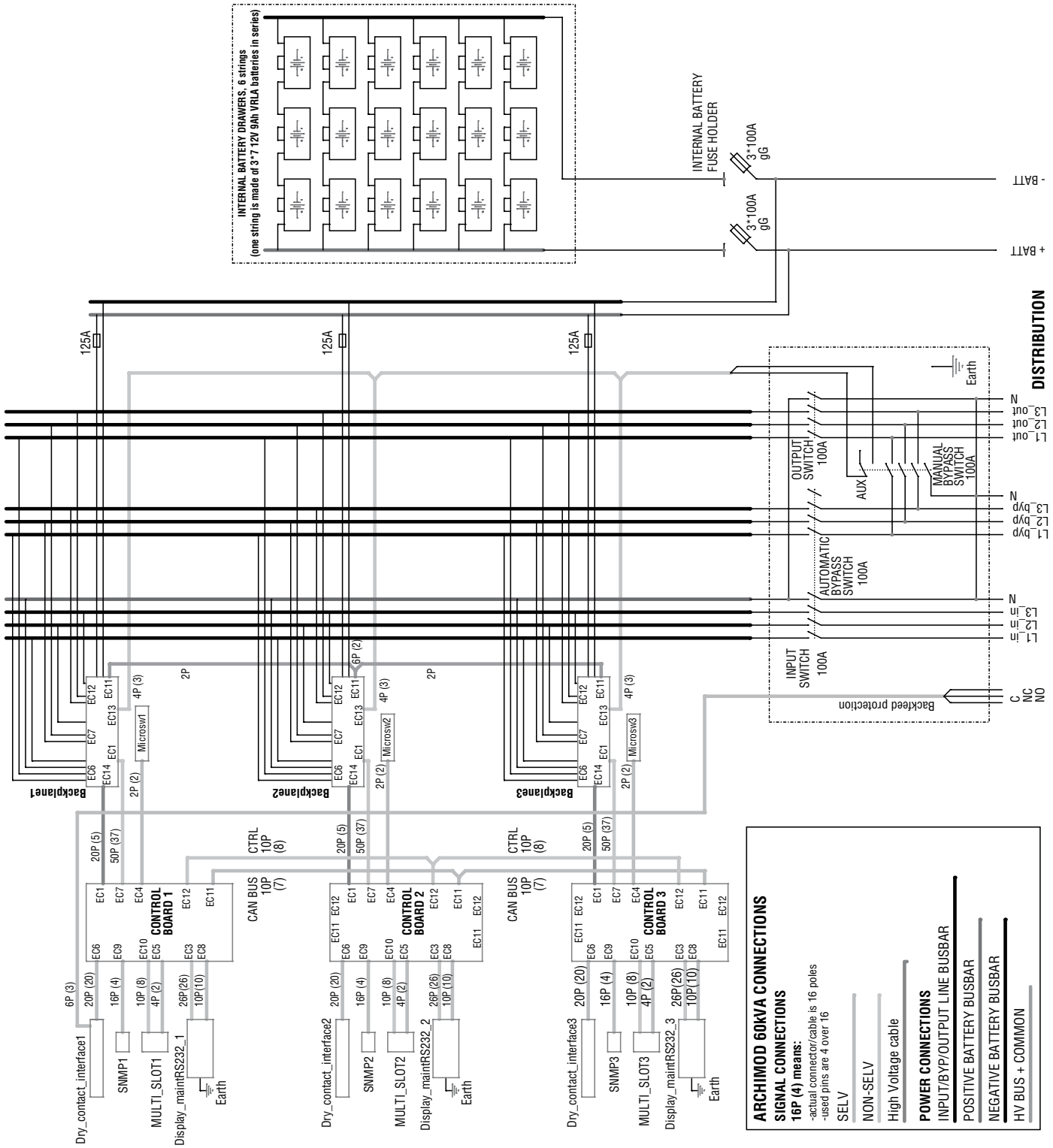
3. Technical description



3.5.6 Power module block diagram



3.5.7 Archimod® 60KVA Interconnection block diagram



4. Safety Provisions

4.1 General notes

WARNING
Before doing any operation on the equipment, it is necessary to read through the whole manual carefully, paying attention to this chapter in particular.

The equipment has been built for the application specified in the declaration of conformity enclosed with this manual.
For no reason whatsoever it is allowed to use it for purposes other than those for which it has been designed, nor in ways different to those explained in the manual.
The various interventions must be carried out following the criteria and chronology described in this manual.

4.2 Symbols

In this manual, some operations are highlighted by graphic symbols that advise the user that they can be dangerous. The graphics are the following:

WARNING
This means the possibility of an event happening that could lead to serious injury or great damage to the equipment if adequate precautions are not taken.

ATTENTION
This means the possibility of an event happening that could lead to are slight injury or material damage if adequate precautions are not taken.

INDICATION
This means important information that must be read paying maximum attention.

4.3 Reference standards

EN 62040-1: general provisions and safety recommendations for the UPS
EN 62040-2 : EMC provisions

4.4 Definitions of 'Operator' and 'Specialized Technician'

The professional figure that is going to access the equipment for normal use and maintenance is defined by the term "operator".
With this definition we mean personnel who know how to use and service the equipment and have the following requirements:

1. specific training that authorises them to work according to the safety standards in relation to the dangers that the presence of electricity can bring about.

2. training on how to use the Individual Protective Devices and on the basic first aid interventions.

When the company person in charge of safety chooses the operator who is to use the equipment (which must be suitable for work in accordance with the existing laws) he must consider the physical aspect (no impairment), the psychological aspect (mental equilibrium, sense of responsibility) and personal education, training, experience and knowledge of the standards, prescriptions and provisions for the prevention of accidents.

Based on the skill and capacity found, he shall also see to the operator's training in order to give him full knowledge of the equipment and of the parts it is made of.

To conclude, the operator must be made aware of the contents of this manual.

4.4.1 Qualification required to the operator

The operator must follow the instructions given to ensure maximum safety for himself and for the others. **In particular he must comply with all the requirements contained in this manual throughout all the operating phases.**

Typical activities envisaged:
- using the equipment when it is working normally and resetting subsequent to a stop;
- taking the necessary measures to maintain performance quality;
- cleaning the equipment
- collaborating with personnel who are to see to extraordinary maintenance work ("specialized technician").

4.4.2 Qualification required to the specialized technician

The professional person who has to look after installation, starting and extraordinary maintenance is defined by the term "specialized technician".

With such a definition we mean people with knowledge of the procedures for installing, assembling, repairing and servicing the equipment and who have specific technical qualification.
Besides the requirements listed for a generic operator, the specialized technician must have had technical training or specific training for the procedures needed to use and service the equipment in complete safety.

Broadly speaking, the specialized technician will be a person selected among the professional people in the department and who has proven experience and capacities and specific technical expertise in relation to the type of work to be done.

WARNING
The person in charge of safety is responsible for the protection against and prevention of company risks in accordance with the European Directive 89/391 EEC (safety at the work place), in ITALY it is part of the Law Decree dated 12/11/1994. The person in charge of safety must ensure that all people working on the machine have received all the relevant instructions of this manual, included start-up and commissioning, and with particular reference to the contents of this chapter.

4.5 Individual protective gear

WARNING
There is a high risk of electrical shock with the equipment as well as a considerable short circuit current. When using and servicing the equipment it is absolutely forbidden to work without the protective gear mentioned in this paragraph.

The personnel who are going to work with the equipment for installation or maintenance jobs must not wear clothes with baggy sleeves or laces, belts, bracelets or other metal items that could be a hazard source.

4.5.1 Gear to wear

The following indications summarise the protective gear to wear.

Accident and spark proof footwear with rubber sole and reinforced toe
Use: always

Waterproof rubber gloves
Use: always

Protective gear
Use: always

Protective glasses
Use: always

4. Safety Provisions

4.6 Indications of danger in the work place

The following signs must be placed in all points of access to the premises where the equipment is installed.

Electric current
It indicates the presence of live parts.

Emergency interventions
Do not use water to extinguish a fire but only the extinguishers designed specifically for putting fires out on electronic equipment.

No smoking
This indication explains that it is forbidden to smoke in the area where the sign is affixed.

4.6.1 Indications on board the equipment

The explanatory plates on the equipment can vary according to the country of destination and to the relative applicable construction laws.
Strictly comply with what is required. It is strictly forbidden to remove these plates or to work in a way different from what is indicated on them.
All the data on the plates must always be readable and cleaned periodically.
If a plate is ruined and/or is no longer legible, even only in part, ask for a new one from the Manufacturer who is bound to supply a substitute.

WARNING
The plates must be neither removed nor covered; it is forbidden to affix others on the equipment without the prior written authorisation from the Manufacturer.

4.7 Residual risks

"Residual" risks are risks that were impossible to eliminate at the design phase and, as such, are potentially present on the equipment.
These risks are found with a specific analysis as prescribed by the standards of the sector.
The documentation relative to the analysis is included in the Technical File of the machine filed by the Manufacturer.
In the case of the UPS Archimod® there are no residual risks provided that all the indications and provisions in this manual are scrupulously complied with.

WARNING
The risk can be drastically reduced by wearing the Individual Protective Gear listed in this chapter, considered indispensable. Always work with due caution when near the dangerous areas indicated by the signs on board the equipment.

4.8 General warnings

ATTENTION
The equipment generates, uses and can radiate energy and radio frequencies.
If not installed and used in agreement with the indications given in this manual, it can interfere with radio communications.

- The equipment must be kept and used in accordance with the instructions given herein and as suggested from time to time.
- The department manager must instruct the operating and maintenance personnel on how to use and service the equipment in complete safety.
- Only specialized and specifically instructed personnel must be allowed to access the equipment for maintenance work.
- All the time such maintenance work is being done, 'Work underway' signs must be affixed in the department that can be seen from all access points.
- Connection of the equipment (and of any accessory devices) must include standard earthing to discharge short circuit current and electrostatic voltages. Mains voltage must correspond to the value on the ID plate. Use of current adapters is not allowed. When connecting pay attention to polarities.
- Work on equipment that is not contemplated in this manual must be done only after it has been disconnected from the supply mains via the switch which must be padlocked.
- When the equipment is received, or prior to switching on each time, DO NOT switch the UPS on if the batteries are leaking.
- Tools used for maintenance (pliers, screwdrivers, etc.) must be the electrically insulated type.
- It is strictly forbidden to deposit combustible materials near the equipment. It must always be kept locked and access allowed only to specifically trained personnel.
- Do not deactivate the safety devices or delude the indications, alarms and warnings, whether they are communicated automatically or by means of plates on the installation.
- Do not turn the machine on without the fixed protections in place (panels, etc.).
- In the case of breakages, deformation or malfunctions of the equipment or parts of it, repair or replace immediately, avoiding "emergency" repairs.
- It is not allowed, for any reason, to modify, manipulate or in any way alter the structure of the equipment, the devices mounted on it, operating sequence, etc., without having first consulted the Manufacturer.
- If the fuses have to be changed, always and only use ones of the same type.
- Changing the batteries is a job for a specialized technician. Bear in mind that the electrolyte can cause irreparable injury to skin, mucous membranes, and eyes and is toxic if inhaled or swallowed. Always work with the most suitable Individual Protective Gear. Do not forget that the batteries must be disposed of according to the laws existing in the country where the equipment is installed as they are toxic waste. Under no circumstances can a battery be burnt as it would cause an explosion!
- All maintenance work, routine and extraordinary, must be recorded in a register, noting the date, time, type of job, name of the operator and all useful information. If necessary use the pages added at the end of the "Maintenance" chapter.
- Do not use oils or chemicals to clean with as they can corrode or damage parts of the equipment.
- Both the equipment and the work place must be kept perfectly clean.
- When maintenance is finished check carefully that no tools and/or materials have been left near the equipment before turning the electricity back on.

4. Safety Provisions

4.9 Emergency interventions

The following information is of a general nature. For specific interventions please consult the laws existing in the country where the equipment is installed.

4.9.1 First aid interventions

If any first aid intervention is required, comply with company rules and traditional procedures.

4.9.2 Fire-prevention measures

- Do not use water to extinguish fire but only the extinguishers designed specifically for putting fires out on electronic equipment.

5. Unpacking

5.1 Visual Inspection

When the UPS is delivered, examine the packaging and product carefully to see if any damage was done during transport.
In particular check the integrity of the indicators on the external "Shock Watch" labels.
If either possible or ascertained damage is found report it immediately to:
- the carrier;
- the LEGRAND® Technical Assistance Centre.

Make sure that the unit received corresponds to the material specified on the delivery document.
The UPS Archimod® packaging protects the equipment against mechanical and environmental damages.
For greater protection it is also wrapped in a transparent film.

5.1.1 Controllo apparecchiatura e corredo di fornitura

The equipment and relative accessories supplied (as agreed with the manufacturer) must be in perfect condition.
Before it is shipped the equipment is checked carefully; however, it is always advisable to check it is complete and in order when receiving it.
Make sure that:

- The shipping data (consignee's address, number of packs, order number, etc.) are the same as those written on the delivery documents;
- Check that the Archimod® UPS technical data on the label affixed to the UPS correspond to the material purchased, described in the delivery documentation.
- The technical-legal documentation that comes with the equipment includes the user manual for the specific type of UPS to install together with the CE Declaration of Conformity.

In the case of defects and/or material missing, send a report immediately to the Manufacturer and wait for his instructions before commissioning the equipment.

5.2 Positioning limits

The UPS must be placed observing the following conditions:

- humidity and temperature must be within the prescribed limits;
- the fire protection regulations must be observed;
- wiring must be of easy execution;
- the front and rear must be accessible for assistance or routine maintenance;
- the flow of cooling air must be guaranteed;
- the air conditioned system must be adequately sized
- there must be no corrosive/explosive gases;
- the premises must be free from vibrations;
- the clearance at the back and sides must guarantee adequate circulation of the cooling air.
- It must be possible to size the support used for the equipment to ensure it will withstand its weight.

ATTENTION
The minimum rear clearance of the UPS must be at least 200 mm to guarantee correct ventilation. Bear in mind that you need to be able to reach the back of the UPS for manoeuvring the battery fuse holder disconnector switches and for maintenance.

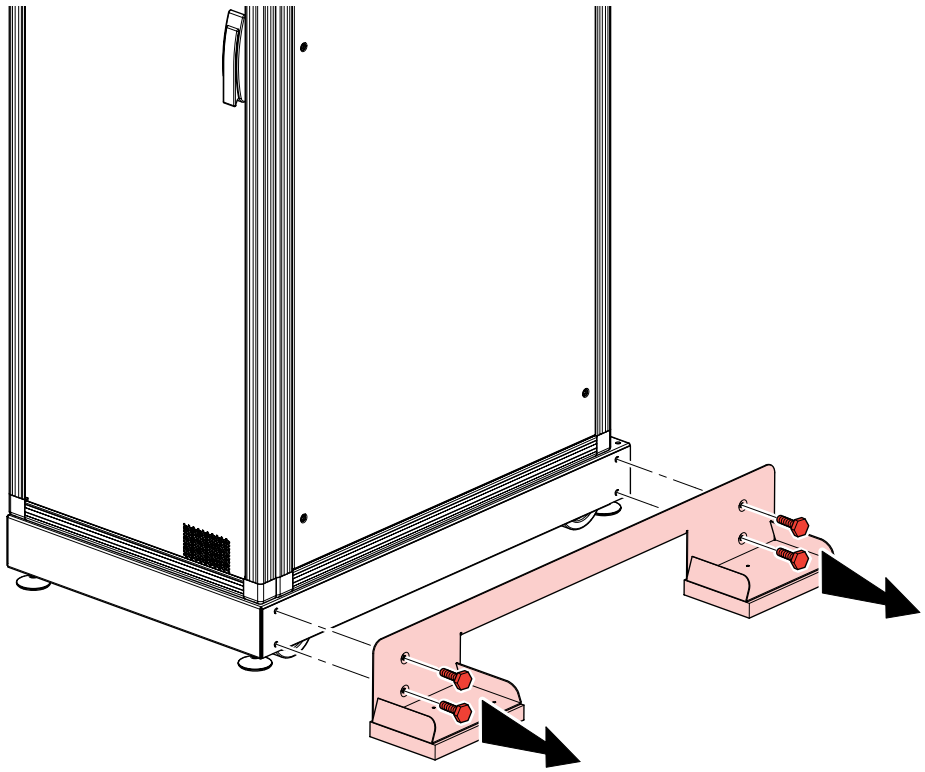
To better protect the batteries bear in mind that the average life of the batteries is strongly influenced by the environmental operating temperature.
Place the unit on premises where the temperature ranges between +18°C (64.4°F) and +23°C (73.4°F) which will guarantee a very long battery life.
Before commencing installation, make sure there is enough lighting on the equipment so that each single detail can be seen easily.
Use artificial lighting if natural lighting is not enough for the aforementioned requirements.
If maintenance work has to be done on parts that are insufficiently illuminated, it is compulsory to use portable lighting, being careful not to create shadows that will prevent or reduce visibility on the point you are working on or on the surrounding areas.

5. Unpacking

5.3 Positioning and unpacking

To position and unpack the UPS please follow this procedure:

1. Take the UPS to the place of installation with a forklift truck and/or a transpallet of a suitable capacity and type;
2. Remove the film and cardboard protecting the UPS;
3. Lower the 4 adjustable feet under the UPS base until the 2 side L-shaped supports are slightly raised, including the wood fixed to them;
4. Remove the 2 side L-shaped supports by undoing the 4 screws on each side securing it to the UPS base;



5. If it is necessary moving the UPS to position it better, lift the 4 feet until the UPS is resting on the wheels;
6. Check perpendicularity and level of the UPS with the floor with a suitable instrument (by adjusting the feet):
   Please note: lock the 4 feet with the check nut;
7. Mount the 2 side base strips with the screws supplied.

5.4 Checking the contents of the pack

Below is a list of the materials supplied. The list is general. Please refer to the packing list for shipment details.
Archimod® INVERTER
- No. 1 UPS Archimod® unit;
- No. 1 bag of accessories with a set of screws for installing the unit correctly;
- No. 2 base strips for side closing;
- Operating and maintenance manual;
- International guarantee.

Archimod® BATTERY
- No. 1 Archimod® BATTERY cabinet;
- Operating and maintenance manual;
- No. 1 bag containing fuses and keys for the front door.

Note: the power modules and battery boxes are shipped separately and must be installed after the equipment has been definitively positioned in the place of installation.

5.5 Handling

Handle with great care, lift it only to the extent necessary, keep it well balanced and avoid swinging which could be dangerous.
Do not forget that the equipment must always be handled by trained personnel, equipped with the Individual Protective Gear as specified in Chapter 4.
If the equipment needs to be lifted, use a forklift truck or transpallet of a suitable capacity, inserting the forks in the base, making sure they come through on the opposite side by at least twenty centimetres. The means used for lifting must be driven at slow speed with minimum acceleration while moving the equipment.

ATTENTION
The equipment is to be handled and/or shipped without the power modules and internal battery boxes, if any. If either the UPS Archimod® or the BATTERY Archimod® needs moving by lorry, or the equivalent, use only the two side supports removed at point 4) of paragraph 5.3 without putting a wooden pallet in between.

5.6 Storing

5.6.1 UPS

If the UPS is going to be stored prior to installation, regardless of whether or not it is still packed, it must be on dry, clean and fresh premises where the ambient temperature is between 0°C and +50°C (32-122°F) and with humidity below 90% (not condensing).

5.6.2 Batteries

The standard batteries of the UPS Archimod® are sealed lead-acid, they are maintenance free and can be installed internally in the models 20, 40 and 60 kVA.
Lead is a dangerous substance for the environment if it is not recycled by specialized companies.
If the batteries are not charged they cannot be kept for more than 6 months at 20°C (68°F) or more than 3 months at 30°C (86°F) or more than 2 months at 35°C (95°F).

ATTENTION
sealed batteries must never be stored if they are partly or totally flat.

To charge the batteries before and after storing, simply connect the input power supply to the UPS, plug in fuses of the battery (F B+ and F B-) and then close battery and mains disconnector switches.
When the unit detects the input voltage it automatically proposes starting a battery charging cycle.
After about 1 minute charging starts automatically and the time left to finish charging is shown on the display. The charging cycle can be stopped at any time by pressing the "ESC" key.
If the UPS is delivered without batteries, LEGRAND® is not liable for any damage or bad operation caused to it by an incorrect wiring and/or by using a different type of battery.

6. Installation

WARNING
The instructions in this chapter are not addressed to a normal operator but to a specialized technician, authorised to work only if he uses the Individual Protective Gear mentioned in Chapter 4.

6.1 Safety rules and regulations

Before starting installation please read and apply the following:

1. Attention: equipment with a high sneak current, it is indispensable to earth it before connecting the power supply. It is necessary to ensure that the distribution panel, to which the UPS is to be connected, has a secure connection to the earth circuit and adequate protection as required by law.
2. Only the fixed type of the UPS Archimod® units must be installed with a thermal circuit breaker upstream. Connection of the unit to the mains using a traditional plug is not allowed.
3. The mains supply panel or disconnecting device, must be installed near the equipment and easy to access.
4. A warning label must be affixed on all mains supply isolating switches installed far away from the UPS area to remind assistance personnel that the circuit is connected to a UPS. The label must give the following message (or the equivalent):

Before working on this circuit
- Isolate Uninterruptible Power System (UPS)
- Then check for Hazardous Voltage between all terminals including the protective earth

Risk of Voltage Backfeed

6.2 Electrical connections

The electrical connection of the UPS to the switchboard is part of the installation and usually is not done by the UPS manufacturer; therefore the following indications are purely an example and the actual electrical connections must be done in accordance with local standards.

Once the UPS has been removed from the packaging and positioned in its final place of installation, the authorised technician can start its installation.

ATTENTION
The type and cross section of the connecting cables must be chosen according to their operating current and laying must be as established by existing laws; this is the responsibility of the installer. The UPS input current and output power are given in paragraph 3.4 and the battery current in Table 7.

INDICATION
In the TABLES chapter, tables 1 to 6 give indications about sizing of cables, fuses, circuit breakers and RCDs as well as an example of cable sizing if unipolar cables are used without a sheath, in PVC and laid in a pipe above ground.

6.2.1 Safety recommendations

WARNING
Before starting please read and apply the following with attention. It is strictly forbidden to proceed with installation if one or more of the following conditions have not been checked.

- Do not proceed with installation if there is water or moisture.
- Remember that opening or removing the panels from the UPS you risk exposure to high and dangerous voltages.
- Check there is no mains voltage on the equipment.
- Check that the loads are off and disconnected from the UPS;
- Check that the UPS is off and not live.
- Check that the battery disconnector switches on the UPS and on all the external Archimod® BATTERY cabinets are open and remove at least 1 battery box from each battery shelf in the UPS.
- Each slot not used by power modules must be covered with a plastic mask (supplied) and secured only and exclusively with two M4x20mm Allen screws with a 4 mm diameter Grower washer in between, without tightening too much.

- Electrical connection has to be carried out by means of the terminals of the front disconnectors and of the battery disconnector fuse holder/bars of the UPS.

6.2.2 Preliminary operations

Before connecting the UPS make sure that:
- input mains voltage and frequency correspond to the values on the UPS rating plate;
- earthing complies with the IEC standards (International Electronic Commission) or local regulations;
- the electrical system is equipped with all the necessary differential protections and thermal circuit breakers upstream from the UPS input.

6.2.3 Earthing

It is mandatory to connect first the earth cable leading from the low voltage distribution panel to the EARTH terminal before doing any other connections.

6.2.4 Connecting the loads, general notes

Before actually starting to connect the loads make sure the rated power of the UPS (OUTPUT POWER) indicated on its rating plate is equivalent to or greater than the total sum of the load powers.
The type and cross section of the connecting cables must be chosen according to their operating current and laying must be as established by existing laws.
A separate switchboard must be supplied for the load. It is a good idea to use disconnectors or circuit breakers conforming to the IEC standards to protect the lines leading from the electrical panel.
Use adhesive labels or some similar way to indicate the following values on the system's general panel:
- maximum rated power of the total load;
- maximum rated power of the load at power intakes.
- if an ordinary switchboard is used (outlets for mains voltage and for the UPS), make certain that there is an indication of the voltage applied on each outlet ("Mains" or "UPS") of the related power source.

6.2.5 Installing the Archimod® BATTERY

It is possible to connect external batteries to increase UPS autonomy of the 20, 40 and 60kVA models. The Archimod® models 80, 100 and 120kVA always need external battery cabinets for working. For configurations with more than one battery cabinet, all the Archimod® BATTERY units must be positioned on the same side as the Archimod® UPS and connected in parallel with each other with minimum capacity cables as indicated in Table 7.
The type and cross section of the connecting cables must be chosen according to their operating current and laying must be as established by existing laws.
In the TABLES chapter, Table 7 gives an example of the battery cable cross section to use as far as concerns using unipolar cables, without sheath, in PVC and laid in a pipe above ground.

There are two different external battery cabinets for the Archimod® BATTERY units:
- a modular model consisting of a cabinet with an internal structure that uses battery boxes for up to a maximum of 12 series of N°3 12V 9Ah battery boxes, parallel to each other, (see chapter 3)
- a compact, non modular, economical model that uses a shelf architecture instead and on which the batteries are placed. It can house 21 high capacity 12V batteries.

Note: Only battery cabinets of the same type can be connected together in parallel.

WARNING
The following instructions are of a prescriptive nature and it is imperative they be complied with.
Opening or removing the panels from the UPS Archimod® or Archimod® BATTERY you risk exposure to high and dangerous voltages!
There are dangerous live parts inside the equipment due to the internal batteries even if all the fuse holder disconnectors are opened. To remove the battery induced voltage, remove at least 1 battery box from each battery shelf (to interrupt the battery string series).

6. Installation

To guarantee protection of personnel during installation of the Archimod® BATTERY make sure that the connections are done under the following conditions:

1. there must be no mains voltage
2. the loads are off and disconnected;
3. the UPS Archimod® is off with no voltage;
4. all the battery disconnector switches in the Archimod® UPS and in each Archimod® BATTERY must be open and remove at least one battery box from each battery shelf of the 'UPS.

To ensure that the UPS Archimod® has stopped completely if you want to add a ARCHIMOD ® BATTERY in an existing installation, follow the steps illustrated in the MAINTENANCE chapter.

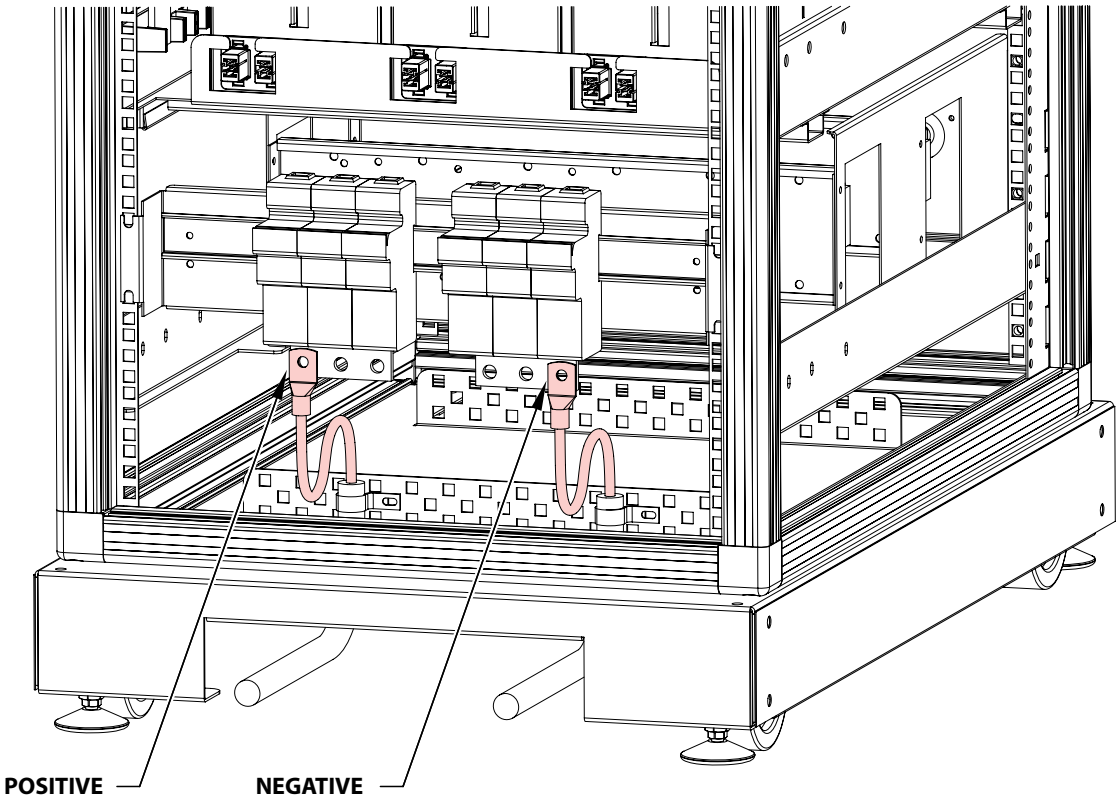
The connection of an Archimod® BATTERY to the Archimod® UPS or to another Archimod® BATTERY must comply with the instructions given above, with the following diagram and the steps described below:

1. make sure that all the fuse holder disconnectors of all battery cabinets are open;
2. remove the front bottom panel of each Archimod® BATTERY;
3. remove the rear bottom panel of the Archimod® UPS to reach the battery terminals;
4. connect the UPS and the Archimod® BATTERY battery cabinet(s) with the earth cable (yellow green)
5. connect the positive and negative terminals of the Archimod® UPS to those of the adjacent Archimod® BATTERY.
6. connect any other Archimod® BATTERY units that are parallel to the previous one (point 5)
7. screw down the front bottom panel of each Archimod® BATTERY;
8. screw down the rear bottom panel of the Archimod® UPS.

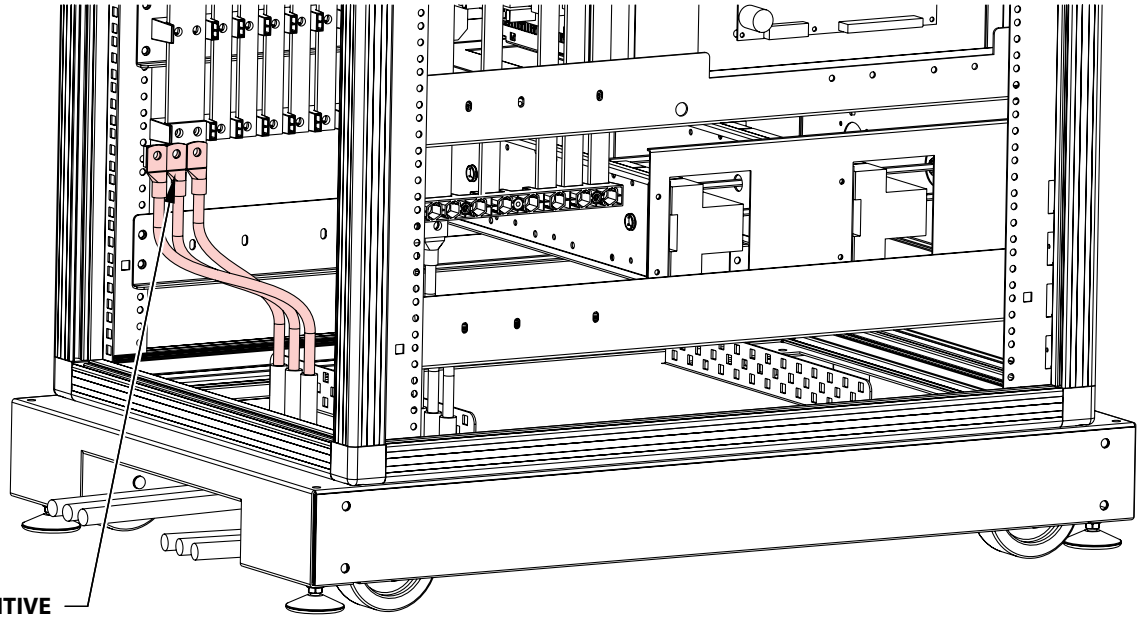
Please note:

- The terminals of the Archimod® models 20, 40 and 60kVA for connecting to the external battery cabinets are on the bottom plates of the internal battery disconnectors marked with + and -.
- The terminals of the Archimod® models 80, 100 and 120kVA for connecting to the external battery cabinets are on the bottom end of the copper bars at the bottom rear of the UPS, marked with + and -.

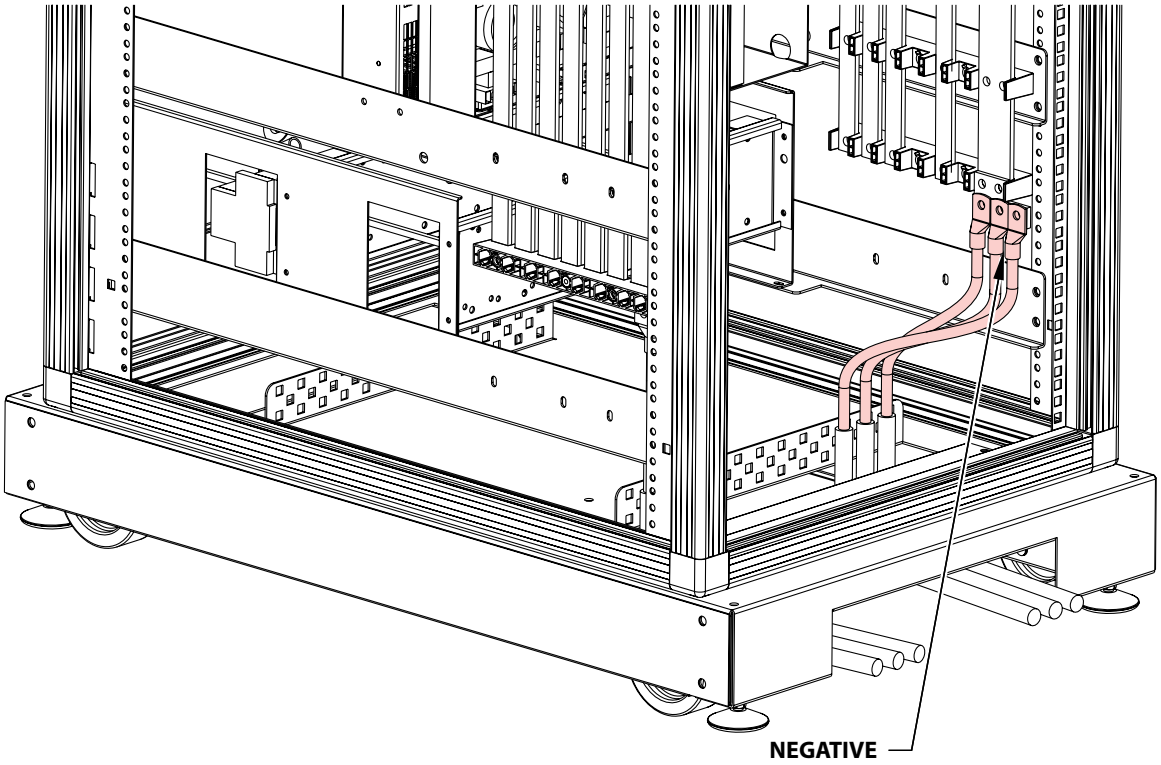
External Archimod® 20-40-60kVA battery connection - Rear side



External Archimod® 80-100-120kVA battery connection - Rear side, positive pole



External Archimod® 80-100-120kVA battery connection - Rear side, negative pole



6. Installation

6.2.6 Protections

To ensure correct operation of the UPS and its accessories the electrical system must be adequately protected.
It is mandatory to protect the UPS upstream with thermal circuit breakers on the mains input line and on the bypass input line (if different from the first), sized as explained in Table 5. This is to provide suitable protection from overloads or shorts in output.

6.2.7 Configuration: three-phase input/three-phase output

The default configuration for the Archimod® UPS units distributed by LEGRAND® is a THREE-PHASE INPUT and a THREE-PHASE OUTPUT.
Before starting to connect, make sure that the mains input, maintenance bypass and output disconnector switches on the front panel of the UPS are open in the OFF position.

ATTENTION
When connecting the input, bypass (if used) and output cables take care not to reverse the UPS cables that are already on the terminals of the relative disconnector switch.

Mains input connection:
Before connecting the mains input, check that the available mains power is higher or the same as the UPS's rated input power. Also check that the cables to connect to the UPS are disconnected upstream and there is no voltage.
- Check that the earth cable leading from the low voltage distribution panel is connected to the terminal on the base of the equipment.
- Connect the neutral mains input cable to its terminal on the mains input disconnector using a suitable cable terminal.
- Connect cables L1, L2, L3 of the mains input line to their terminals L1n, L2n and L3n on the mains input disconnector using suitable cable terminals and taking care to observe correct cyclicity of the phases L1, L2 and L3.

ATTENTION
The equipment's neutral passes through.
The neutral conductor cable of the mains input must ALWAYS be connected! If the neutral is not connected the UPS could be seriously damaged when powered off the mains.
In the three-phase output configuration the UPS could be seriously damaged if there is one or more EC15 connectors on the UPS' backplane boards.
If this is the case, remove all the EC15 connectors.

Separate bypass mains connection (if any):
The connection of a separate bypass line is only possible if the neutral conductor of the bypass line and that of the mains input are in common (the same potential). The neutral of the UPS's mains input, bypass input and through output are connected together internally.

Note: the factory supplies the UPS with the bypass input in common with the mains input.

Before connecting the bypass line, check that the available mains power is higher or the same as the UPS's rated input power.
Also check that the cables to connect to the UPS are disconnected upstream and there is no voltage.
- If there is a bypass line earth cable connect it to the terminal on the base of the equipment.
- Connect the neutral bypass line cable to its terminal on the bypass input disconnector using a suitable cable terminal.
- Remove the three cables jumpering terminals L1in, L2in, L3in and L1byp, L2byp, L3byp on the relative disconnectors.
- Connect cables L1,L2 and L3 of the bypass input line to their terminals L1in, L2in, L3in and L1byp, L2byp, L3byp on the bypass input disconnector using suitable cable terminals and taking care to observe correct cyclicity of the phases L1, L2 and L3.

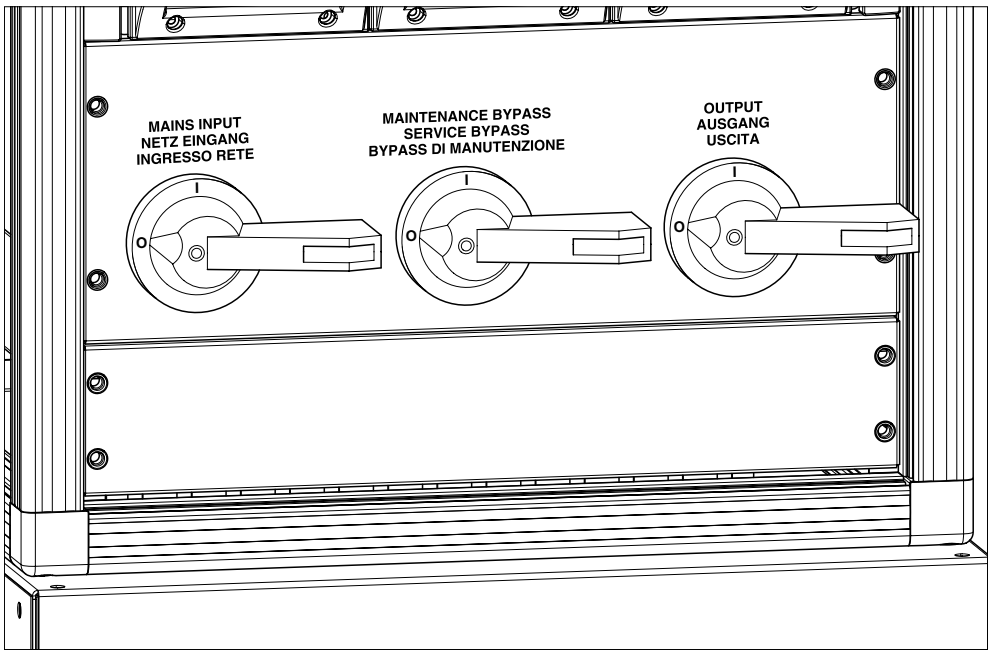
WARNING
The neutral conductor cable of the separate bypass mains must ALWAYS be connected! If the neutral is not connected the UPS could be seriously damaged when powered off the mains.

Mains output connection

Before connecting the output make certain the UPS is off and there is no voltage on the output disconnector terminals.

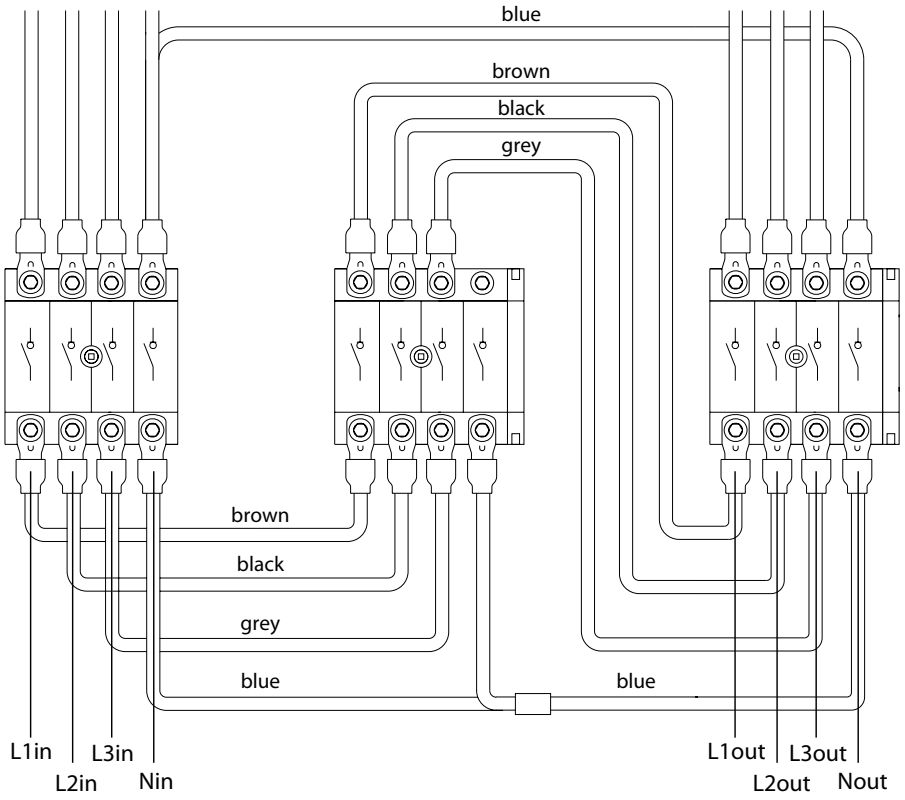
- Connect the output line earth cable to the terminal on the base of the equipment.
- Connect the output line Neutral cable to its terminal on the output disconnector using a suitable cable terminal.
- Connect cables L1,L2, L3 one by one of the output line to their terminals L1out, L2out and L3out on the output disconnector using suitable cable terminals and taking care to observe correct cyclicity of the phases L1, L2 and L3.

UPS Archimod® - Front panel

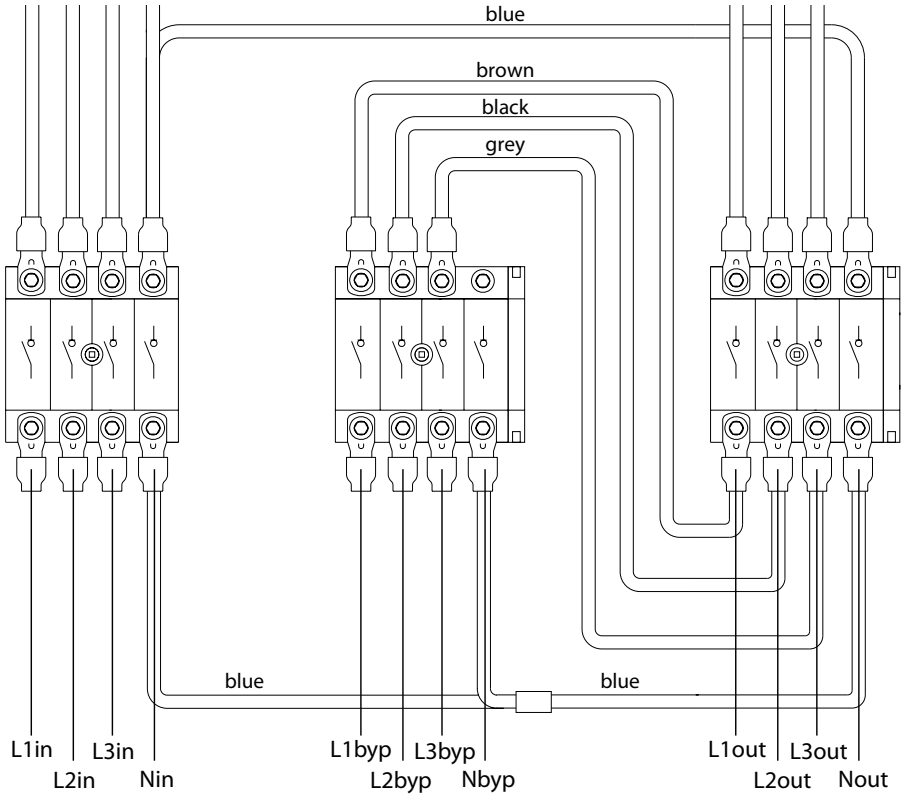


6. Installation

Archimod® Three-phase/Three-phase UPS (without separate bypass line)



Archimod® Three-phase/Three-phase UPS with separate bypass line



6.2.8 Configuration: Three-phase input/Single-phase output (only Archimod® 20kVA and 40kVA UPS)

To configure the UPS as a three-phase input/single-phase output follow the instructions given below.
Before starting to connect, make sure that the mains input, maintenance bypass and output disconnector switches on the front panel of the UPS are open in the OFF position.

ATTENTION
Only the Archimod® 20kVA and 40kVA models can be configured as three-phase/single-phase.
Follow the instructions in paragraph 2.4 to select the right output configuration on the operator panel before starting the UPS.
If the automatic bypass is enabled in this configuration it transfers the output load only to the input phase L1 which has to be sized to supply all the UPS power.
When connecting the input, bypass (if used) and output cables take care not to reverse the UPS cables that are already on the terminals of the relative disconnector switch.

Mains input connection:
Before starting to connect the mains input, check that the available mains power is higher or the same as the UPS's rated input power. Also check that the cables to connect to the UPS are disconnected upstream and there is no voltage.
- Check that the earth cable leading from the low voltage distribution panel is connected to the terminal on the base of the equipment.
- Connect the Neutral mains input cable to its terminal on the mains input disconnector using a suitable cable terminal.
- Remove the two cables jumpering terminals L2in-L2byp and L3in-L3byp on the relative disconnectors.
- Insert 1 copper plate on terminals L1byp, L2byp and L3byp making sure the cable, jumpering terminals L1in and L1byp on the relative disconnectors, is in place and tightened correctly (if a separate bypass line is not used leave this cable where it is).
- Connect cables L1, L2, L3 of the mains input line to their terminals L1in, L2in and L3in on the mains input disconnector using suitable cable terminals and taking care to observe correct cyclicity of the phases L1, L2 and L3.

ATTENTION
The plate must be mounted in contact on the disconnector switch terminals with the cable terminals on top – and not vice versa.
The equipment's neutral passes through.
The neutral conductor cable of the mains input must ALWAYS be connected!
If the neutral is not connected the UPS could be seriously damaged when powered off the mains.

Separate bypass mains connection (if any):
The connection of a separate bypass line is only possible if the neutral conductor of the bypass line and that of the mains input are in common (the same potential). The neutral of the UPS's mains input, bypass input and through output are connected together internally.
Before connecting the bypass line, check that the available mains power is higher or the same as the UPS's rated input power. Also check that the cables to connect to the UPS are disconnected upstream and there is no voltage.
- If there is a bypass line earth cable connect it to the terminal on the base of the equipment.
- Connect the Neutral bypass line cable to its terminal on the bypass input disconnector using a suitable cable terminal.
- Remove the cable jumpering terminals L1in and L1byp on the relative disconnectors.
- Connect cable L1 of the bypass input line to its terminal L1byp of the bypass input disconnector using suitable cable terminals and checking that the copper plate is in place between terminals L1byp, L2byp and L3byp.

ATTENTION
The plate must be mounted in contact on the disconnector switch terminals with the cable terminals on top – and not vice versa.
The neutral conductor cable of the separate bypass line must ALWAYS be connected!
If the neutral is not connected the UPS could be seriously damaged when powered off the mains.

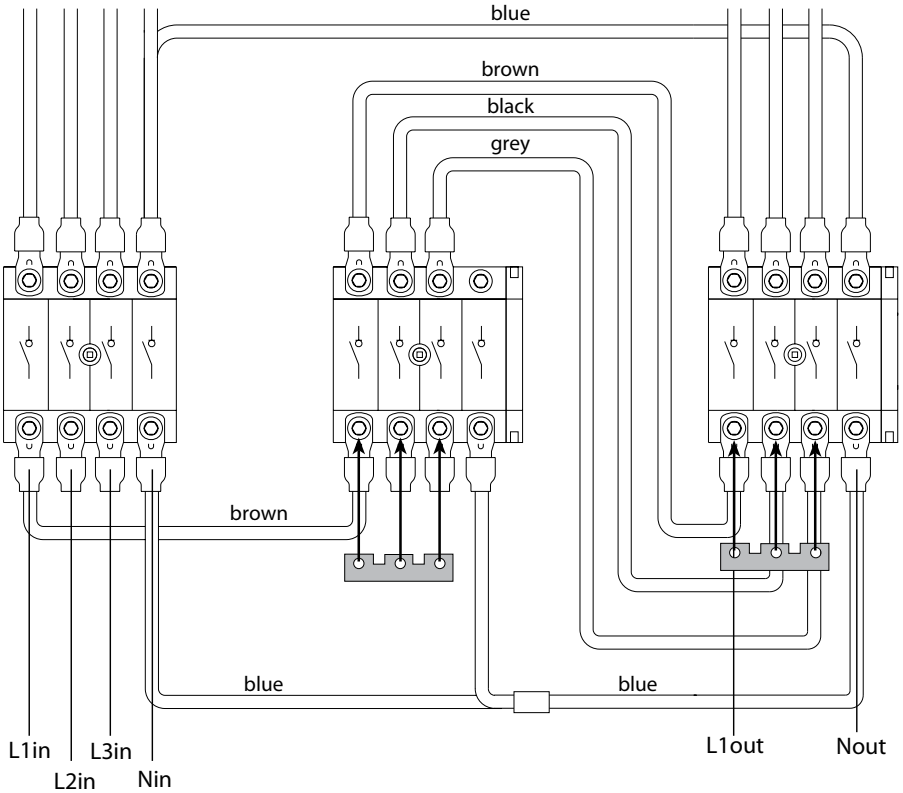
6. Installation

Output connection
Before connecting the output make certain the UPS is off and there is no voltage on the output disconnector terminals.

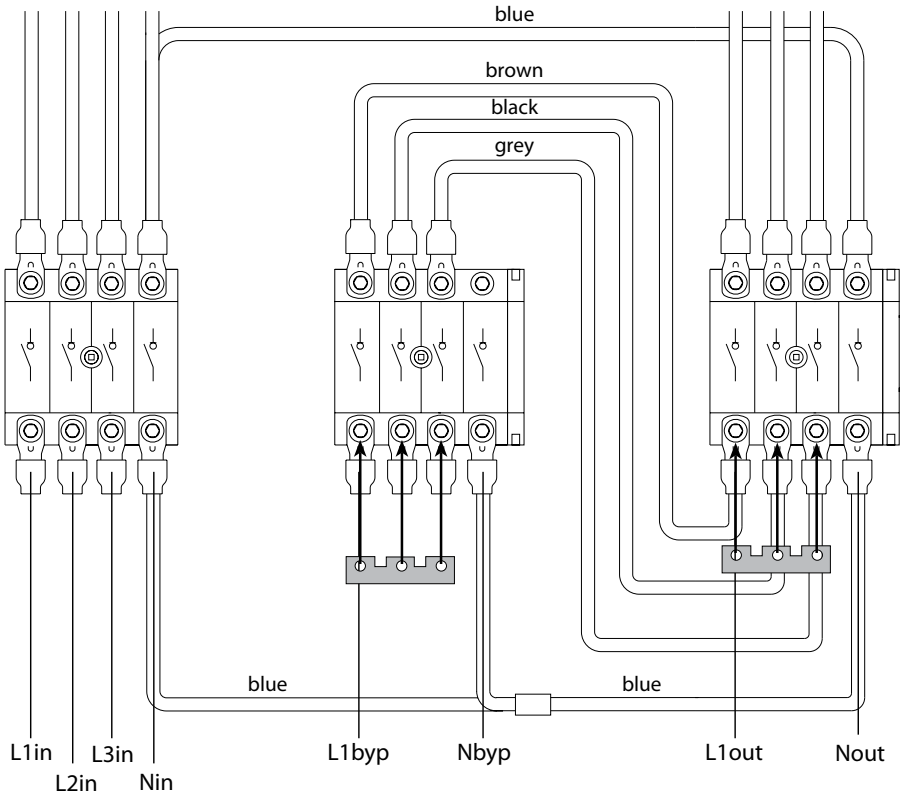
- Connect the output line earth cable to the terminal on the base of the equipment.
- Connect the output line Neutral cable to its terminal on the output disconnector using a suitable cable terminal.
- Insert a copper plate between terminals L1out, L2out and L3out of the output disconnector.
- Connect the output line cable L1 to its terminal L1out on the output disconnector using a suitable cable terminal.
- Plug the EC15 connector into the backplane of each UPS tunnel as shown in the figure.

ATTENTION
The plate must be mounted in contact on the disconnector switch terminals with the cable terminals on top – and not vice versa.
In the single-phase output configuration the UPS could be seriously damaged if the EC15 connector is not plugged in to each UPS backplane.
When connecting the output line take great care not to reverse the UPS cables that are already on the terminals of the disconnector switch.

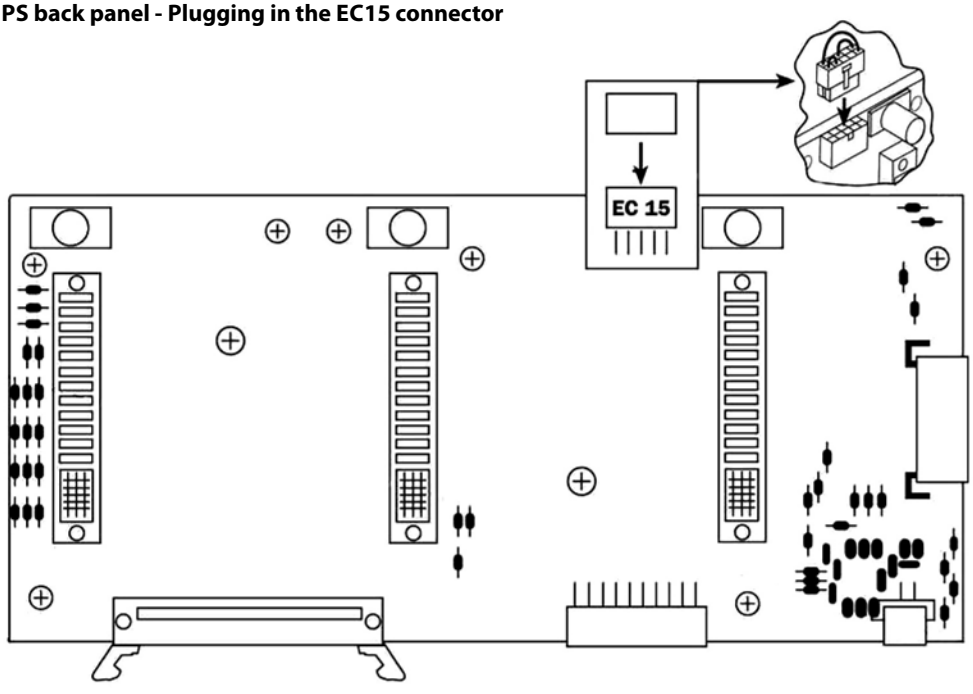
Archimod® 20kVA-40kVA Three-phase/Single-phase UPS (without separate bypass line)



Archimod® 20kVA-40kVA Three-phase/Single-phase UPS (with separate bypass line)



Archimod® UPS back panel - Plugging in the EC15 connector



6. Installation

6.2.9 Single-phase input/single-phase output connection (only Archimod® 20kVA and 40kVA)

To configure the UPS as a single-phase input/single-phase output follow the instructions given below.
Before starting to connect, make sure that the mains input, maintenance bypass and output disconnector switches on the front panel of the UPS are open in the OFF position.

ATTENTION
Only the Archimod® 20 and 40kVA models can be configured as single-phase/single-phase.
Follow the instructions in paragraph 2.4 to select the right output configuration on the operator panel before starting the UPS.
When connecting the input, bypass (if used) and output cables take care not to reverse the UPS cables that are already on the terminals of the relative disconnector switch.

Mains input connection:
Before starting to connect the mains input, check that the available mains power is higher or the same as the UPS's rated input power. Also check that the cables to connect to the UPS are disconnected upstream and there is no voltage.
- Check that the earth cable leading from the low voltage distribution panel is connected to the terminal on the base of the equipment.
- Connect the Neutral mains input cable to its terminal on the mains input disconnector using a suitable cable terminal.
- Remove the cables jumpering terminals L2in-L2byp and L3in-L3byp on the relative disconnectors.
- Insert 1 copper plate between terminals L1in, L2in and L3in of the output disconnector.
- Insert 1 copper plate on terminals L1byp, L2byp and L3byp making sure the cable, jumpering terminals L1in and L1byp on the relative disconnectors, is in place and tightened correctly (if a separate bypass line is not used leave this cable where it is).
- Connect cable L1 of the mains input line to its terminal L1in on the mains input disconnector using a suitable cable terminal.

ATTENTION
The plate must be mounted in contact on the disconnector switch terminals with the cable terminals on top – and not vice versa.
The equipment's neutral passes through.
The neutral conductor cable of the mains input must ALWAYS be connected!
If the neutral is not connected the UPS could be seriously damaged when powered off the mains.

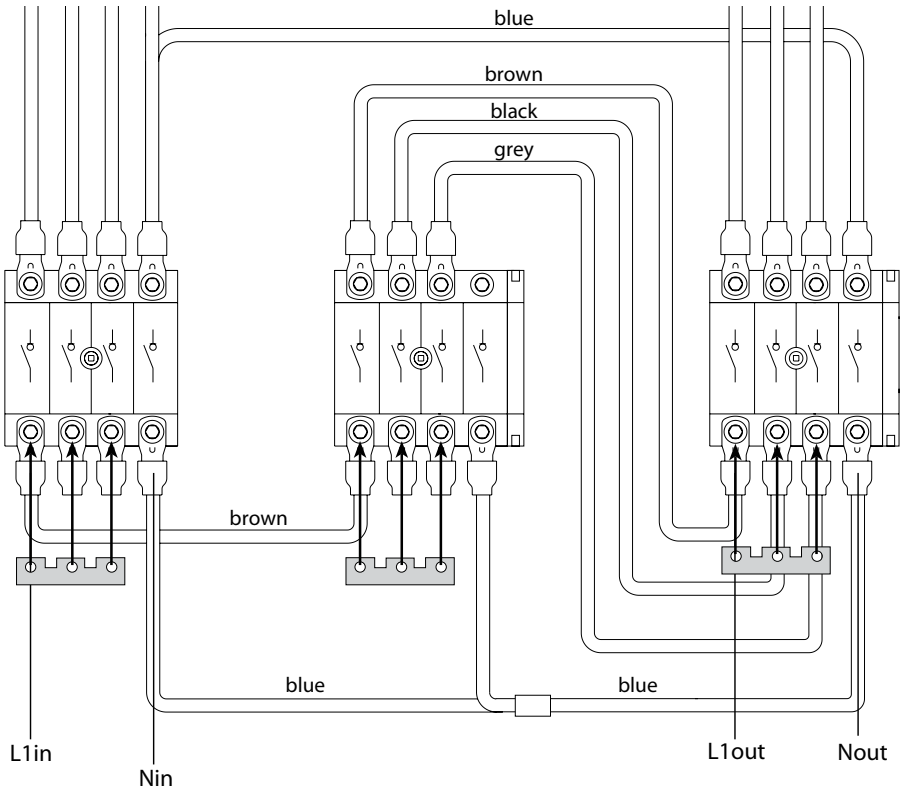
Separate bypass mains connection (if any):
The connection of a separate bypass line is only possible if the neutral conductor of the bypass line and that of the mains input are in common (the same potential). The neutral of the UPS's mains input, bypass input and through output are connected together internally.
Before connecting the bypass line, check that the available mains power is higher or the same as the UPS's rated input power. Also check that the cables to connect to the UPS are disconnected upstream and there is no voltage.
- If there is a separate bypass line earth cable connect it to the terminal on the base of the equipment.
- Remove the cable jumpering terminals L1in and L1byp on the relative disconnectors.
- Connect the Neutral bypass line cable to its terminal on the bypass input disconnector using a suitable cable terminal.
- Connect cable L1 of the bypass input line to its terminal L1byp of the bypass input disconnector using suitable cable terminals and checking that the copper plate is in place between terminals L1byp, L2byp and L3byp.

ATTENTION
The plate must be mounted in contact on the disconnector switch terminals with the cable terminals on top – and not vice versa.
The neutral conductor cable of the separate bypass line must ALWAYS be connected!
If the neutral is not connected the UPS could be seriously damaged when powered off the mains.

Output connection:
Before connecting the output make certain the UPS is off and there is no voltage on the output disconnector terminals.
- Connect the output line earth cable to the terminal on the base of the equipment.
- Connect the output line Neutral cable to its terminal on the output disconnector using a suitable cable terminal.
- Insert a copper plate between terminals L1out, L2out and L3out of the output disconnector.
- Connect the output line cable L1 to its terminal L1out of the output disconnector using a suitable cable terminal.
- Plug the EC15 connector into the backplane of each UPS tunnel as shown in the figure.

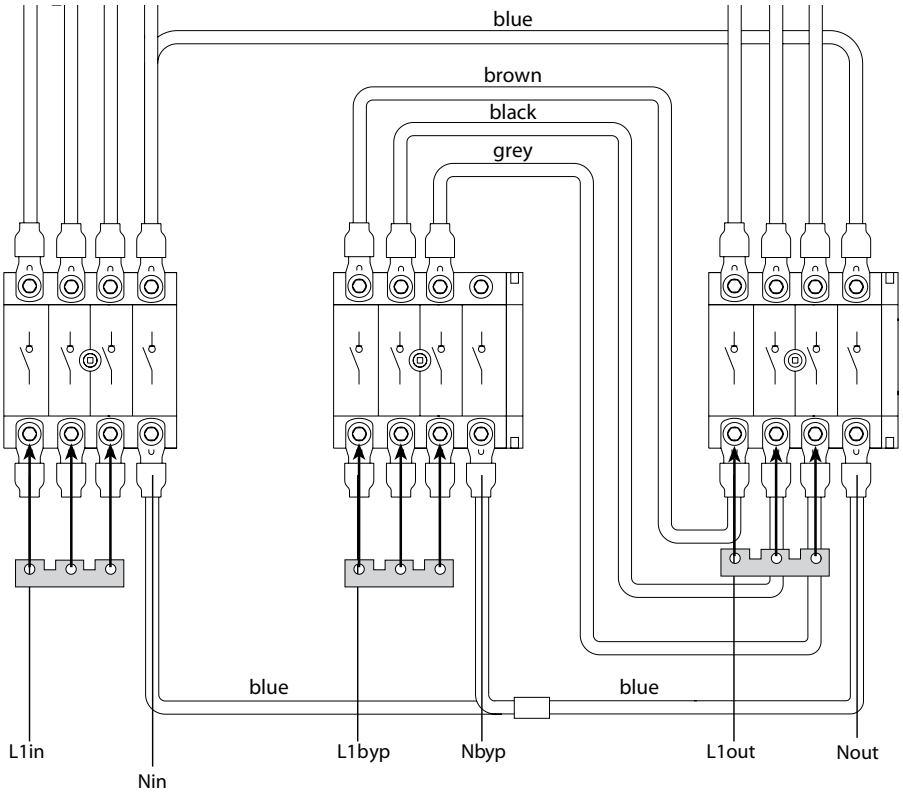
ATTENTION
The plate must be mounted in contact on the disconnector switch terminals with the cable terminals on top – and not vice versa. In the single-phase output configuration the UPS could be seriously damaged if the EC15 connector is not plugged in to each UPS backplane.
When connecting the output line take great care not to reverse the UPS cables that are already on the terminals of the disconnector switch.

Archimod® 20kVA-40kVA Single-phase/Single-phase UPS - (without separate bypass line)

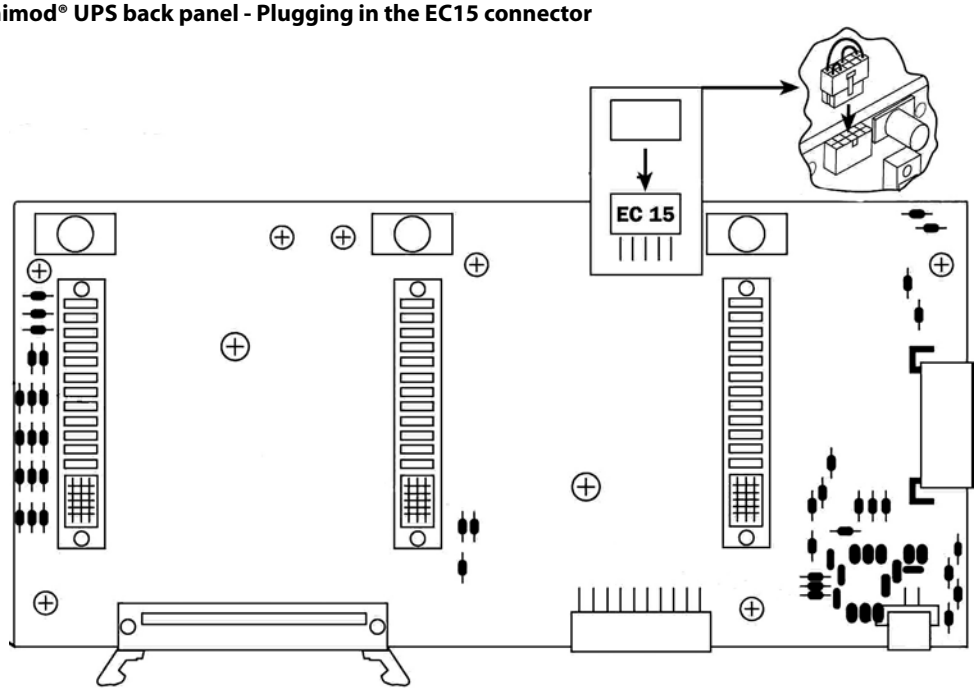


6. Installation

Archimod® 20kVA-40kVA Single-phase/Single-phase UPS - With separate bypass line



Archimod® UPS back panel - Plugging in the EC15 connector



6.2.10 Single-phase input/three-phase output connection (only Archimod® 20kVA and 40kVA) Inverter in the 120° THREE-PHASE mode

To configure the UPS as a single-phase input/three-phase output with inverter in the 120° THREE-PHASE mode, follow the instructions given below.

Before starting to connect, make sure that the mains input, maintenance bypass and output disconnector switches on the front panel of the UPS are open in the OFF position.

Note: only the Archimod®20 and 40kVA models can be configured as 120° single-phase/three-phase.

ATTENTION
In this configuration with 120° THREE-PHASE inverter mode, the bypass cannot be used and terminals L1byp, L2byp and L3byp of the bypass input disconnector must not be connected.
Follow the instructions in paragraph 2.4 to select the right output configuration on the operator panel before starting the UPS.
When connecting the input, bypass (if used) and output cables take care not to reverse the UPS cables that are already on the terminals of the relative disconnector switch.

Mains input connection:
Before starting to connect the mains input, check that the available mains power is higher or the same as the UPS's rated input power. Also check that the cables to connect to the UPS are disconnected upstream and there is no voltage.
- Check that the earth cable leading from the low voltage distribution panel is connected to the terminal on the base of the equipment.
- Connect the Neutral mains input cable to its terminal on the mains input disconnector using a suitable cable terminal.
- Remove the cables jumpering terminals L1in-L1byp, L2in-L2byp and L3in-L3byp on the relative disconnectors; the bypass line must not be used.
- Connect cable L1 of the mains input line to its terminal L1in on the mains input disconnector using a suitable cable terminal.

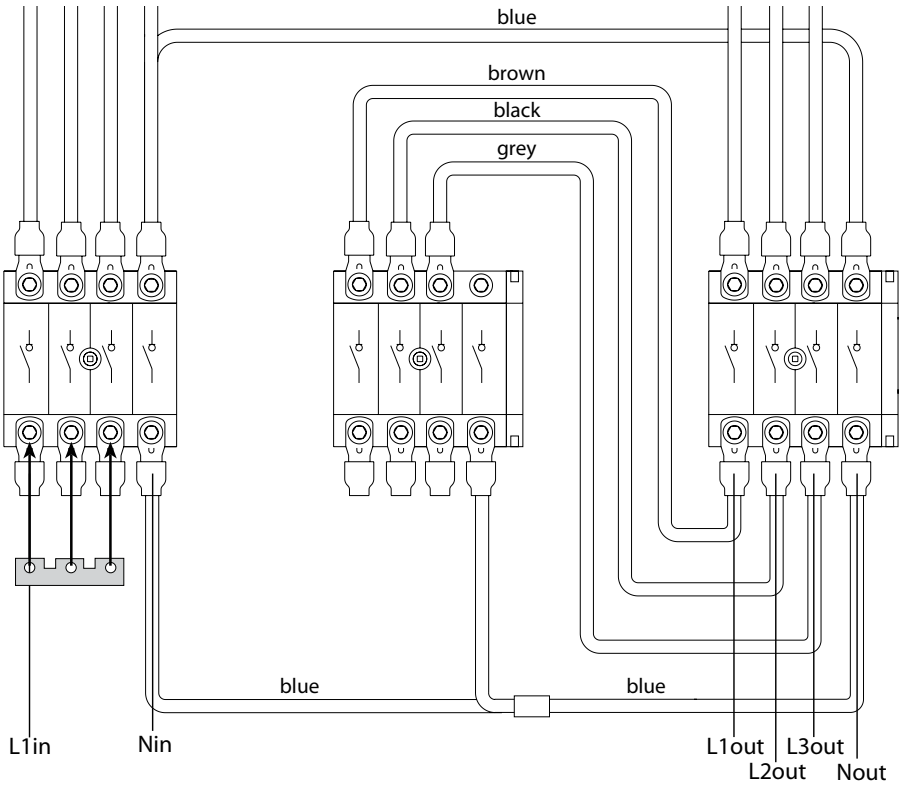
ATTENTION
The equipment's neutral passes through.
The neutral conductor cable of the mains input must ALWAYS be connected!
If the neutral is not connected the UPS could be seriously damaged when powered off the mains.
In the three-phase output configuration the UPS can be seriously damaged if there is one or more EC15 connectors on the UPS' backplane boards.
If this is the case, remove all the EC15 connectors.

Output connection
Before connecting the output make certain the UPS is off and there is no voltage on the output disconnector terminals.
- Connect the output line earth cable to the terminal on the base of the equipment.
- Connect the output line Neutral cable to its terminal on the output disconnector using a suitable cable terminal.
- Connect cables L1,L2, L3 one by one of the output line to their terminals L1out, L2out and L3out on the output disconnector using suitable cable terminals and taking care to observe correct cyclicity of the phases L1, L2 and L3.

ATTENTION
When connecting the output line take great care not to reverse the UPS cables that are already on the terminals of the disconnector switch.

6. Installation

Archimod® 20kVA-40kVA 120° Single-Phase/Three-Phase UPS



6.2.11 Single-phase input/three-phase output connection (only Archimod® 20kVA and 40kVA) Inverter in the THREE INDEPENDENT PHASES mode

To configure the UPS as a single-phase input - three-phase output with inverter in the THREE INDEPENDENT PHASES mode, follow the instructions given below.
Before starting to connect, make sure that the mains input, maintenance bypass and output disconnector switches on the front panel of the UPS are open in the OFF position.

Note: only the Archimod® 20kVA and 40kVA models can be configured as single-phase/three independent phases.

ATTENTION
The configuration with inverter in the THREE INDEPENDENT PHASES mode is only to be used when you are absolutely certain that loads are never connected to the UPS output line that require a three-phase 120° supply such as motors, transformers, etc.
Follow the instructions in paragraph 2.4 to select the right output configuration on the operator panel before starting the UPS.
When connecting the input, bypass (if used) and output cables take care not to reverse the UPS cables that are already on the terminals of the relative disconnector switch.

Mains input connection:
Before starting to connect the mains input, check that the available mains power is higher or the same as the UPS's rated input power. Also check that the cables to connect to the UPS are disconnected upstream and there is no voltage.
- Check that the earth cable leading from the low voltage distribution panel is connected to the terminal on the base of the equipment.
- Connect the Neutral mains input cable to its terminal on the mains input disconnector using a suitable cable terminal.
- Remove the cables jumpering terminals L2in-L2byp and L3in-L3byp on the relative disconnectors - insert 1 copper plate on terminals L1byp, L2byp and L3byp making sure the cable, jumpering terminals L1in and L1byp on the relative disconnectors, is in place and tightened correctly (if a separate bypass line is not used leave this cable where it is).
- Connect cable L1 of the mains input line to its terminal L1in on the mains input disconnector using a suitable cable terminal.

ATTENTION
The plate must be mounted in contact on the disconnector switch terminals with the cable terminals on top – and not vice versa.
The equipment's neutral passes through.
The neutral conductor cable of the mains input must ALWAYS be connected!
If the neutral is not connected the UPS could be seriously damaged when powered off the mains.

In the three-phase output configuration the UPS can be seriously damaged if there is one or more EC15 connectors on the UPS' backplane boards.
If this is the case, remove all the EC15 connectors.

Separate bypass line connection (if any):
The connection of a separate bypass line is only possible if the neutral conductor of the bypass line and that of the mains input are in common (the same potential). The neutral of the UPS's mains input, bypass input and through output are connected together internally.
Before connecting the bypass line, check that the available mains power is higher or the same as the UPS's rated input power. Also check that the cables to connect to the UPS are disconnected upstream and there is no voltage.
- Connect the earth cable to its terminal on the base of the equipment.
- Remove the cable jumpering terminals L1in and L1byp on the relative disconnectors.
- Connect the Neutral bypass line cable to its terminal on the bypass input disconnector using a suitable cable terminal.
- Connect cable L1 of the bypass input line to its terminal L1byp of the bypass input disconnector using suitable cable terminals and checking that the copper plate is in place between terminals L1byp, L2byp and L3byp.

ATTENTION
The plate must be mounted in contact on the disconnector switch terminals with the cable terminals on top – and not vice versa.
The neutral conductor cable of the separate bypass line must ALWAYS be connected!
If the neutral is not connected the UPS could be seriously damaged when powered off the mains.

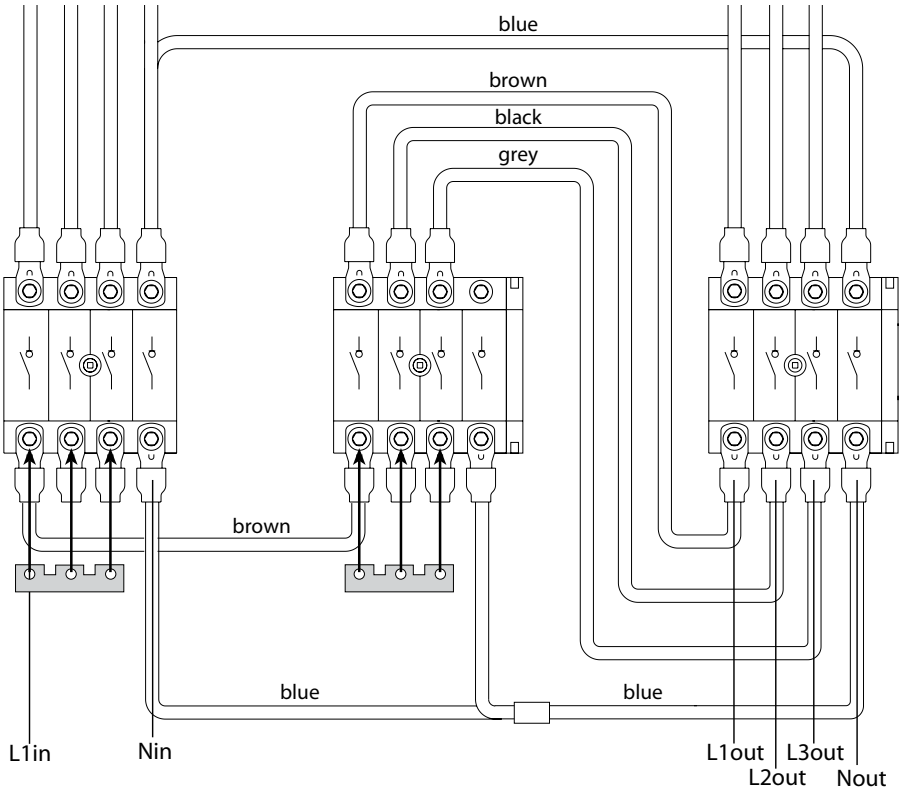
Output connection:
Before connecting the output make certain the UPS is off and there is no voltage on the output disconnector terminals.

- Connect the output line earth cable to the terminal on the base of the equipment.
- Connect the output line Neutral cable to its terminal on the output disconnector using a suitable cable terminal.
- Connect cables L1,L2, L3 one by one of the output line to their terminals L1out, L2out and L3out of the output disconnector using suitable cable terminals and taking care to observe correct cyclicity of the phases L1, L2 and L3.

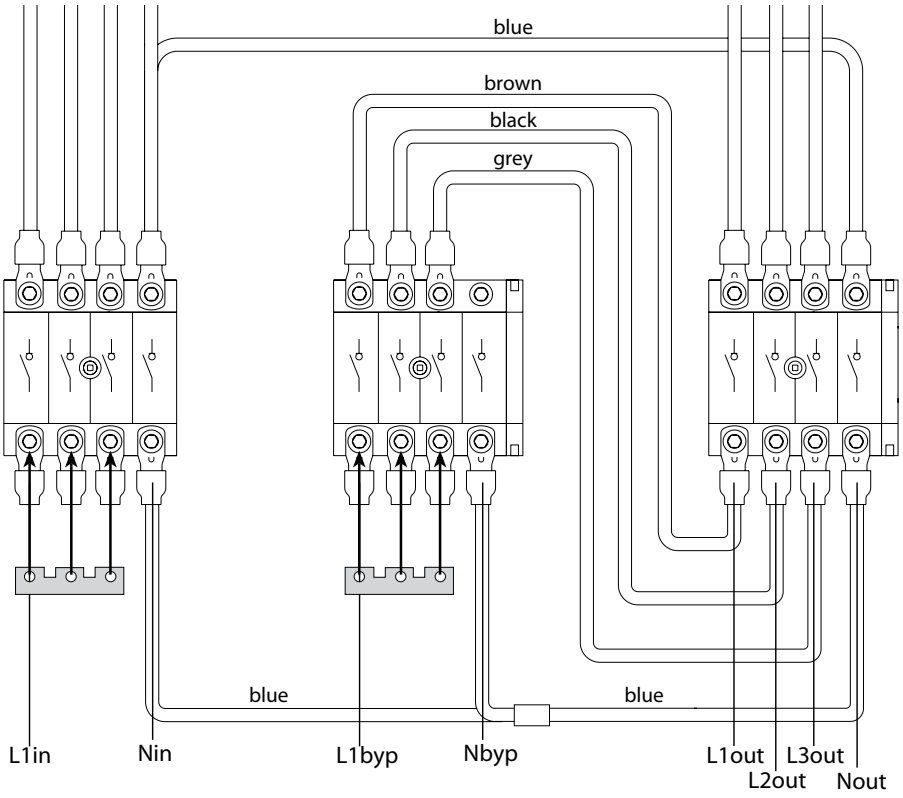
ATTENTION
When connecting the output line take great care not to reverse the UPS cables that are already on the terminals of the disconnector switch.

6. Installation

Archimod® 20kVA-40kVA Single-Phase/Three independent / Phases UPS without bypass line



Archimod® 20kVA-40kVA Single-Phase/Three Independent / Phases UPS with bypass lin



6.2.12 Wiring

An opening in the base of the UPS is for passing the cables through and there are also some fixing points for the cables. It is essential to secure the cables firmly after they have been connected to the equipment.

6.2.13 Emergency Power Off (Remote E.P.O.)

In accordance with the standards, the UPS is fitted with an emergency device arranged to use a normally closed external contact that can be opened to activate the emergency machine power off.
The E.P.O. terminals are in the UPS's rear panel on pins 3 and 4 of the 6-pole Combicon connector installed on all contact interfaces (see 3.5.2).
If there is more than one contact interface, connect the E.P.O terminals on each contact interface as follows:

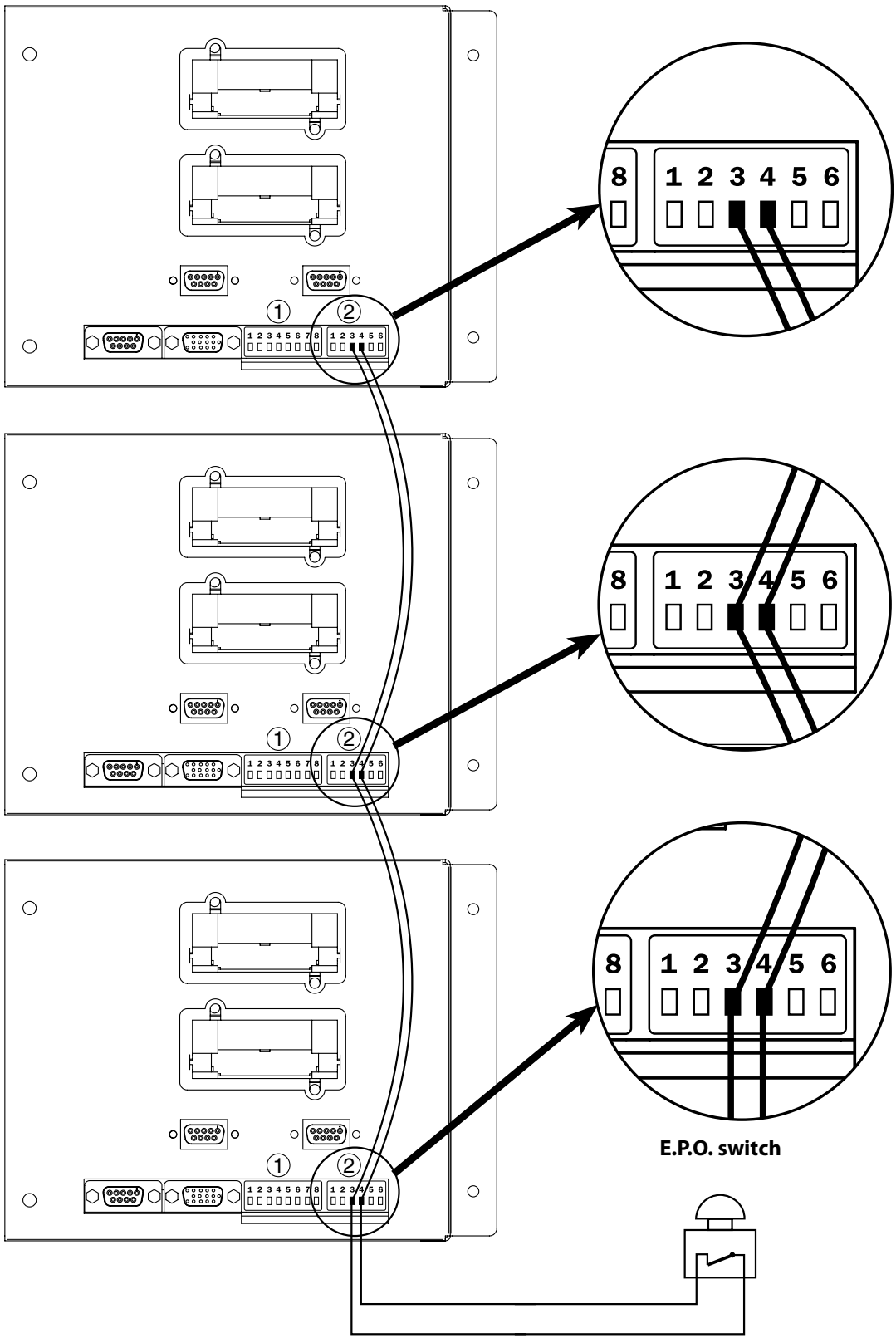
1. connect the E.P.O. terminals of all the contact interfaces in parallel (pin 3 with pin 3, pin 4 with pin 4).
2. close the parallel created on the n.c. contact of the emergency power off device.

To connect the emergency-power-off device correctly please follow these instructions:
- use a cable with double insulation, no more than 10 metres in length.
- check that the switch used is galvanically insulated.

Electrical specifications of the E.P.O. interface:
- Voltage between terminals 3 and 4 (6P Combicon) with open circuit = 12Vdc.
- Current between terminals 3 and 4 (6P Combicon) with closed circuit = 5mA.

6. Installation

The following figure shows how the emergency power off device has to be connected if there are 3 contact interfaces.

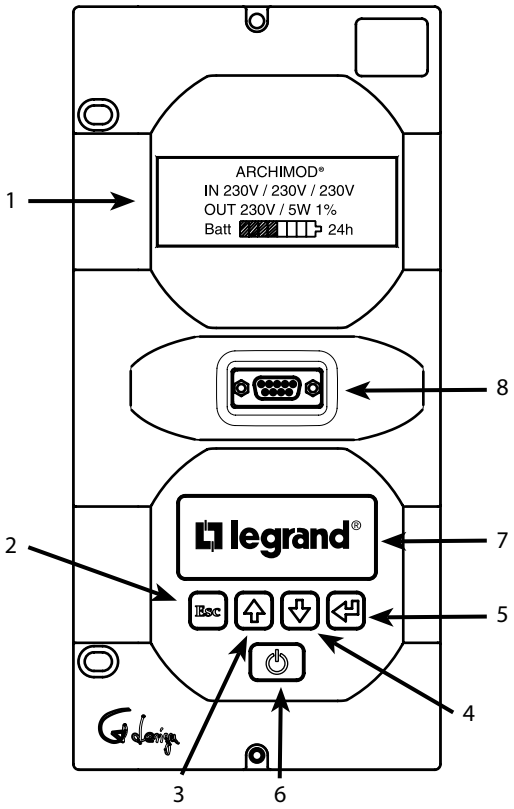


7. Control panel

The control panel, at the front of the unit, has a 4-line, 20-character LCD display, a backlit multicolour status indicator and a 5-key keypad.
The RS232 serial maintenance communication interface is under the display

The keys on the front panel are used to gain access to the UPS menus.

Legend



1 - 4 line x 20 character LCD display

2 - ESCAPE key
Main functions:
- Exit a function without modifying
- Goes from a lower to a higher menu level
- Exit the main menu and return to displaying status
- Silencing the acoustic indicator;

3 - UP ARROW key
Main functions:
- Exit a function without modifying
- Goes from a lower to a higher menu level
- Exit the main menu and return to displaying status
- Silencing the acoustic indicator;

4 - DOWN ARROW key
Main functions:
- Selects the next function
- Reduces a value inside a function
- Selects a new item inside a function (e.g. from ENABLED to DISABLED)
- Scrolls the menus that contain more than 4 lines
- Changes the main frame page

5 - ENTER key
Main functions:
- Confirms a value
- Accesses a menu item
- Goes from a higher to a lower menu level
- It starts the service mode on;

6 - ON/OFF key
Main functions:
- it allows starting and stopping the UPS. Keep pressed for at least 2 seconds to shut down;
- it allows hot-swapping of the power module; press for at least 0.5 sec;
- it allows the output phases to be turned off individually, only with the UPS set as 3 independent phases in output. Press for at least 0.5 sec;

7 - Multicolour backlit status indicator.

8 - RS232 maintenance serial communication interface.

7. Control panel

7.1 "Service Mode" function

This is the mode in which the Archimod® UPS is to be used when setting up during installation and for managing software upgrades of commands and Power Modules.
To access this mode press "ENTER" with the UPS off; the display turns on and the navigation MENU can be surfed. One of the seven languages available can be chosen for the strings displayed: Italian, English, German, French, Russian, Spanish and Polish.
To exit this mode press the "ON/OFF" key otherwise, after 20 minutes without receiving any manual or serial commands, the UPS exits the function automatically and shuts down.

7.2 Main menu and Submenus

Press the ON/OFF button to start the UPS and confirm with the ENTER key when prompted.
At the end of the start-up procedure the main frame appears on the display. Remember that when starting the voltage in output from the machine is present only when the UPS STARTUP bar reaches the end and the main frame appears.
The UP ARROW and DOWN ARROW buttons can be used to scroll the main frame pages, each one giving different information on UPS status.

Below is a list of the main pages:
1. input – output – battery;
2. input – percentage output – battery;
3. bypass – output – battery;
4. bypass – percentage output – battery;
5. load available in output;
6. measurements on the output;
7. output line voltages;
8. measurements on the input;
9. bypass line voltages;
10. battery status.

The images of the different main frame pages are given below.

MAIN PAGE	DATA DISPLAYED
1 input – output – battery; ARCHIMOD IN ^230V/226V/227V OUT 230V 93W 0% Batt. ▮▮▮▮⊏⊏⊏⊐ 12h	1st line: UPS operating status; 2nd line: Input voltages; 3rd line: Voltage set in output, active power absorbed by the load and total load applied percentage 4th line: Bar showing residual battery capacity and actual time of operation in the case of a power failure.
2 input – percentage output - battery; ARCHIMOD IN ^230V/228V/227V OUT 0%/ 0%/ 0% Batt. ▮▮▮▮⊏⊏⊏⊐ 12h	1st line: UPS operating status; 2nd line: Input voltages; 3rd line: Load percentage on the phases in output; 4th line: Bar showing residual battery capacity and actual time of operation in the case of a power failure.
3 bypass – output – battery; ARCHIMOD BYP ^230V/231V/229V OUT ^230V 95W 0% Batt. ▮▮▮▮⊏⊏⊏⊐ 12h	1st line: UPS operating status; 2nd line: Bypass voltages; 3rd line: Voltage set in output, active power absorbed by the load and total load applied percentage 4th line: Bar showing residual battery capacity and actual time of operation in the case of a power failure.
4 bypass – percentage output – battery; ARCHIMOD BYP ^232V/231V/229V OUT 0%/ 0%/ 0% Batt. ▮▮▮▮⊏⊏⊏⊐ 12h	1st line: UPS operating status; 2nd line: Bypass voltages; 3rd line: Load percentage on the phases in output; 4th line: Bar showing residual battery capacity and actual time of operation in the case of a power failure.
5 load availability in output; ARCHIMOD L1o 0.4/ 40kVA 1% L2o 0.5/ 40kVA 1% L3o 0.5/ 40kVA 1%	1st line: UPS operating status; 2nd line: Phase L1: power in kVA or Watt with respect to nominal power or current with respect to the nominal and relative percentage; 3rd line: Phase L2: power in kVA or Watt with respect to nominal power or current with respect to the nominal and relative percentage; 4th line: Phase L3: power in kVA or Watt with respect to nominal power or current with respect to the nominal and relative percentage;
6 measurements on the output; ARCHIMOD L1o231V 1.7A 27W L2o229V 1.6A 31W L3o231V 1.9A 29W	1st line: UPS operating status; 2nd line: Phase L1 in output: Voltage, current and active power; 3rd line: Phase L2 in output: Voltage, current and active power; 4th line: Phase L3 in output: Voltage, current and active power.
7 Output line voltages; ARCHIMOD L1o-L2o Δ 400V L2o-L3o Δ 399V L3o-L1o Δ 396V	1st line: UPS operating status; 2nd line: output: line voltage between phases L1 and L2; 3rd line: output: line voltage between phases L2 and L3; 4th line: output: line voltage between phases L3 and L1

7. Control panel

MAIN PAGE	DATA DISPLAYED
8 measurements on the input; ARCHIMOD L1i229V 3.4A 408W L2i228V 2.9A 162W L3i230V 2.6A 228W	1st line: UPS operating status; 2nd line: Phase L1 in input: Voltage, current and active power; 3rd line: Phase L2 in input: Voltage, current and active power; 4th line: Phase L3 in input: Voltage, current and active power.
9 bypass line voltages; ARCHIMOD L1b-L2b Δ 401V L2b-L3b Δ 402V L3b-L1b Δ 400V	1st line: UPS operating status; 2nd bypass line: line voltage between phases L1 and L2; 3rd bypass line: line voltage between phases L2 and L3; 4th bypass line: line voltage between phases L3 and L1.
10 Battery status; ARCHIMOD Batt. ^288V -0,3A C 50% R 12h T 24h In carica - mant.	1st line: UPS operating status; 2nd line: voltage, load current (negative value with ongoing load, positive value when the batteries are powering the machine); 3rd line: capacity percentage of the batteries with respect to the nominal, autonomy time left, total autonomy time; 4th line: battery status: - Batt. on Standby: Batteries on stand-by - Running down: Batteries running down - Autonomy reserve: Autonomy reserve: - End of autonomy: End of autonomy, UPS shutting down; - Charging - f1: battery charging status (current limitation); - Charging - f2: battery charging status (voltage limitation); - Charging – maint.: Battery charge in maintenance; - Batt. being tested Batteries being tested; - Battery Equal.batteries being equalised; - BATTERIES FAILED: batteries failed; - Max. Battery time Maximum time when the battery is flat, UPS shutting down;

The keys on the front panel are used to gain access to the UPS menus

INDICATION
Press the ENTER key on the main frame to gain access to the main menu which contains the following options:

- UPS STATUS: it allows checking of the UPS's functional status in real time;
- UPS SETTINGS: it allows configuration of all the UPS functions;
- POWER MODULES: it allows analysing of the status of each single power module in real time;
- EVENTS: it allows the visual display and/or deletion of stored events in the UPS log;
- TOOLS: it allows a series of functional tests to be run on the UPS.
- LOG OUT: it allows the session to be terminated by entering a password:

By selecting one of the above listed items again with "ENTER", you gain access to the relative submenu. The following table summarises them all.

UPS STATUS	UPS SETTINGS	POWER MODULES	EVENTS	TOOLS	LOG OUT (o)
UPS Info	Options	PM status	Visual display	Batteries	-
UPS Config.	Output	Diagnostics (*)	Delete	Signalling Test (*)	
Measurements	Input	PM SW Update (*)		LCD Display Test (*)	
Alarms	Bypass			Assistance	
Historical Data	Batteries			Reset CM Errors	
	Operator Panel				
	Clock setting				
	Contact interf.				

(*) Available in the 'Service Mode' only
(o) Available with password protected session

The UPS has a menu structure with relative tree submenus, the functions of which are explained in the following paragraphs. An arrow facing down or up appears on the right of the display when there are other items to see. Use the arrow keys to see these items.

7. Control panel

7.2.1 UPS Status

UPS Info	Archimod® Model	Equipment model
	Synchr. address	Synchronisation address for this command
	CM number	Number of commands recognised
	Max VA	Maximum suppliable apparent power [kVA]
	Max W	Maximum suppliable active power [kW]
	Max Icgh	Maximum current that can be supplied for charging the batteries [A]
	SW vers.	Firmware version of the control
	PM SW vers.	Firmware version of the power modules
	Boot Ver.	Bootloader version in the command
	S/N	UPS serial number

UPS config.	OUT	Single-phase/Three-phase 120°/3 indep. phases
	BYP	Single-phase/Three-phase/inverse three-phase/Undefined
	PM X/Y - X/Y - X/Y	X Power modules divided by phase controlled by this command Y Power modules divided by phase controlled by the UPS
	BCM number	Number of battery charger modules recognised
	KBs installed	Number of KBs installed (1 KB = 3 battery boxes)
	Batt. Cap.	Capacity of the batteries installed in Ah
	No. Batt. per KB	Number of batteries in series in one KB

Measurements	Output X	Power	Active power supplied in output by the UPS on phase X [W]
		App.Pow.	Apparent power supplied in output from the UPS on phase X [VA]
		V rms	Effective voltage supplied in output from the UPS on phase X [V RMS]
		Line Vrms	Effective line voltage between the phases in output from the UPS V RMS]
		I rms	Effective current supplied in output from the UPS on phase X [A RMS]
		Peak I Val.	Peak current supplied in output from the UPS on phase X [A]
		Frequency	Frequency of the sinusoid voltage in output from phase X [Hz]
		Crest I Factor	Crest factor on phase X
		Power Factor	Power factor of the load connected to the UPS on phase X
		Max W	Maximum active power suppliable by the UPS on phase X [W]
		Power	Active power supplied by the UPS on the X phase, expressed as a percentage in relation to the maximum active power the UPS can supply on the X phase [%]
		Max VA	Maximum apparent power suppliable by the UPS on phase X [W]
		Appar. Power	Apparent power supplied by the UPS on the X phase, expressed as a percentage in relation to the maximum apparent power the UPS can supply on the X phase [%]

Note: press "ENTER" to change the X value and consequently vary the phase of which you are reading the data.

Measurements	Input X	Power	Active power absorbed by the UPS by the mains on phase X [W]
		Appar. Power	Apparent power absorbed by the UPS by the mains on phase X VA]
		Vrms	Effective voltage in input to the UPS on phase X [V RMS]
		Bypass Vrms	Effective voltage in input to the UPS on phase X, for the bypass line [V RMS]
		Linked Vrms	Effective line voltage between the phases in input to the UPS for the bypass line [V RMS]
		Irms	Effective current absorbed by the UPS by the mains on phase X [A RMS]
		Peak I Value	Peak current absorbed by the UPS by the mains on phase X [A]
		Frequency	Frequency of the voltage sinusoid in input to the UPS on phase X for the bypass line [Hz]
		Crest I Factor	Crest factor applied by the UPS to the mains on phase X
		Power Factor	Power factor applied by the UPS to the mains on phase X

Note: press "ENTER" to change the X value and consequently vary the phase of which you are reading the data.

Measurements	Batteries	Voltage	Voltage measured at the ends of the batteries [V]
		Current	Current supplied by the batteries (negative if the batteries are being charged) [A]
		Residual Capac.	Battery charged status, expressed as a percentage [0-100%]
		Chg Status	Working status of the battery charger: - Batt. in Standby; - Running down; - Autonomy reserve; - End of autonomy; - Charging – f1; - Charging – f2; - Charging – maint.; - Batt. being tested; - Battery equalisation; - BATTERIES FAILED; - Max. Battery time;
		Tot autonomy	Total autonomy the UPS would have with batteries charged 100%
		Res. autonomy	Residual autonomy of the UPS
		End of aut V	Battery threshold voltage for end of autonomy [V]
		No. run downs	Total number of times the batteries have been completely run down
		Use	Total number of hours the UPS has been running on battery [h]
		Cal.	Day and time the last calibration was made; Factory setting if no calibration has been done yet
		No. Calibrations	Total Number of calibrations made

Measurements	Misc.	Internal Temp.	Temperature inside the UPS [°C]
		H.V. Bus Pos.	Voltage on the DC BUS positive [V]
		H.V. Bus neg.	Voltage on the DC BUS negative [V]

Alarms	Alarm Register. See chapter 8.

Note: press the "ARROW UP" and "ARROW DOWN" keys to scroll the list of alarms.

7. Control panel

Historical Data	UPS operation	Total time the UPS has been working
	With battery	Total time the UPS has been running on battery
	This batt.	Total time the UPS has been running with this specific battery
	Battery charger Op.	Total time the battery charger has been working
	Tot. run downs	Total number of times the batteries have been completely run down
	Booster Int.	Total number of Booster interventions
	Bypass Int.	Total number of Bypass interventions
	Batt. Calibr.	Total number of battery Calibrations
	Battery ch.Cycles	Total number of battery charger cycles
	Batt.eq.cycles	Total number of battery equalisation cycles
	Replace batt.N.	Total number of battery replacements
	>80% load N	Total number of times the load has exceeded 80% of nominal load
	>80% load T	Total time the load has exceeded 80% of the nominal load
	>100% load N	Total number of times charging has exceeded 100% of nominal load
	>100% load T	Total time the load has exceeded 100% of the nominal load without the overload being signalled

7.2.2 UPS settings

Options	Startup with Battery	If enabled, it allows the UPS to be started when there is a power failure
	Restart	If enabled, it allows automatic restarts
	EPS mode (*)	Emergency Power System mode. If enabled the UPS can be used to on emergency light when there is a power outage.

Output	Voltage		It sets the output voltage value [V]
	Nominal Value		It sets the output frequency value [Hz]. It allows the output frequency value to be set (50 or 60 [Hz]) regardless of the supply voltage frequency.
	Auto Selection		If enabled the UPS measures the input voltage frequency and synchronizes the output to the same value. If disabled the UPS uses the Nominal Value as the setting.
	Inverter (*)		It sets the output configuration and the load applied - Single-phase: just one single-phase output - Three-phase 120°: three-phase output suitable for supplying three-phase loads (e.g. a motor) - Three separate phases: three single-phase output lines separate from each other
	Phases in start-up (**)	Phase L1	It allows the UPS start-up status to be programmed for each output: - Always on: phase always on in start-up; - Always off: phase always off in start-up; - Last status: phase restored to the status prior to shutting down
		Phase L2	
		Phase L3	

(*) Available in the "Service Mode" only (**) only available with the inverter configured with 3 independent phases

ATTENTION:
Please refer to paragraph 2.4 to set the CONFIG INVERTER parameter correctly.

Input	PLL enabling	If enabled, the UPS synchronises the output sinusoid with that of the input. If disabled, the output voltage is not synchronised with the input and is signalled by the flashing of the status indicator (green)
	PLL interval	It allows the frequency interval to be selected during which the UPS synchronises the output voltage with the input: - NORMAL: the UPS synchronises for variations of frequency of ±2% of the nominal value; - EXTENDED: the UPS synchronises for variations of frequency of ±14% of the nominal value; - CUATOMISED: settable by the user (see the next menu item);
	Custom. PLL interval°	It allows the customised frequency interval to be set during which the UPS synchronises the output voltage with the input: Value selectable from a minimum of 0.5 Hz to a maximum of 7.0 Hz with 0.1 Hz steps.
	Input Dip Enab.	It allows the Input Dip function to be enabled/disabled.

° available with the PLL interval set in the CUSTOMISED mode

Note: the PLL function sees to it that the unit's output frequency is synchronised with the input frequency, guaranteeing that the passage for zero occurs at exactly the same time. Hence, if activated, even if the bypass triggers (e.g. due to an overload), the input-output synchronisation is always guaranteed.

ATTENTION
If the PLL function is disabled the automatic bypass function is disabled automatically as well. If the overload is prolonged the UPS switches off (see "Overload permitted" in the Technical Description chapter).

Bypass	Bypass Enabling	If enabled, the UPS controls triggering of the bypass automatically. If disabled, the UPS will never switch over to bypass and, therefore, in the case of a prolonged overload (see "Overloaded permitted" in Chap. Technical Description), or In the case of a failure and redundancy absence, the UPS switches off
	Forced Mode	If enabled, the UPS activates the bypass permanently. In this case the load is not protected.
	DIP speed	It allows variation of the automatic bypass activation sensitivity (forced mode disabled) - SLOW: loads that are not sensitive to drops in voltage or microinterruptions but which provoke frequent current peaks. - STANDARD: normal uses. - FAST: loads sensitive to the microinterruptions
	Off-line Mode	If enabled, the UPS works in ECOmode
	Start with Bypass	If enabled, when the mains are switched on, the first load feeding by the UPS is via the bypass. If disabled, the load peak will be handled by the inverter, as happens when switching on with the battery.
	End aut. on Bypass	If enabled, in presence of end autonomy the UPS switches the load on bypass instead of turning off."

7. Control panel

Batteries	Threshold Values	Aut end warning	Setting the start time of the end of battery autonomy warning
		Max. Battery time	Setting the maximum time of the UPS running on battery [sec]. When this battery time is up the UPS shuts down. Set OFF to disable to function.
	Battery Charger	Charge in Standby	If enabled, it enables battery charging with the UPS off.
	Restart	Restart Enabling	Enables or disables restarting of the unit when mains power returns after the batteries have run down completely
		Minimum autonomy	Minimum percentage of autonomy for restarting
	Total KBs	Sets the total number of KBs installed (1 KB = 3 battery boxes) Necessary for the UPS to supply correct autonomy values on the basis of the load applied and for correct battery charging.	
	Capacity (*)	Sets the capacity value of the batteries in the UPS [Ah]	

(*) Disponibile solo in "Service Mode"

ATTENTION
Set the total KB value and Capacity correctly for the batteries being used. If set incorrectly there is the danger of damaging the batteries.

Operator Panel	Language	Sets the display language
	Buzzer	Enables/disables all acoustic signals
	Keyboard Beep	Enables/disables the acoustic signalling when the keys are pressed
	Shutting down block (*)	If enabled a password is required to shut the UPS down
	Display Backlighting	Sets display backlighting - Fixed: always lit - Timed: lighting turns off if the keyboard is not used for 1 minute - Disables: lighting always off
	Display Contrast	Sets display contrast
	Password change	Sets a password that prevents access to UPS settings
	Password level	The default setting is in the USER item

(*) Only available with the password chosen

Clock Setting	DD/MM/YY – HH:mm:SS	Set the date/time of the UPS. ENTER": selects the value to change; ARROWS": increases/reduces the value selected DD: day; MM: month; YY: year; HH: hour; mm: minutes; SS: seconds.

Contact Interface	Item 1	Function	It allows to set item function: - Mains/Battery; - Autonomy reserve; - Alarm; - Overload; - Bypass;
		Setting	It allows the setting of item - normally closed - normally open
	Item 2	Function	See item 1
		Setting	
	Item 3	Function	See item 1
		Setting	
	Item 4	Function	See item 1
		Setting	
	Item 5	Function	See item 1
		Setting	
	All items	It allows the setting of all items - normally closed - normally open	

7.2.3 Power Modules

PM status	PM X Info	Mod	Model of power module X	
		SW Vers.	Firmware version inside the power module X	
		HW Vers.	Hardware version of the power module X	
		S/N	Serial number of the power module X	
		Max VA	Maximum apparent power suppliable by the power module X [VA]	
		Max W	Maximum active power suppliable by the power module X [W]	
		Max Icgh	Maximum current suppliable by the battery charger of the power module X [A]	
	PM Measure-ments	Input X	Power	Active power absorbed by the mains by the power module X [W]
			Appar. Power	Apparent power absorbed by the mains by the power module X [VA]
			Vrms.	Effective voltage in input to power module X [V RMS]
			Bypass Vrms	Effective voltage in input to the power module X for the bypass line [V RMS]
			Linked Vrms	Input line voltage to the power module X [V RMS]
			I rms	Effective current absorbed by the power module X by the mains [A RMS]
			Peak I Value	Peak current absorbed by the power module X by the mains [A]
			Frequency	Frequency of the sinusoid voltage in input to the power module X [Hz] for the bypass line
			Crest I Factor	Crest factor applied by the power module X to the mains
			Power factor	Power factor applied by the power module X to the mains

(continue)

7. Control panel

PM status	PM Measure-ments	Output X	Power	Active power supplied by the power module X [W]
			Appar. Power	Apparent power supplied in output by the power module X [VA]
			V rms	Effective voltage supplied in output by the power module X [V RMS]
			Linked Vrms	Line voltage in output by the power module X [V RMS]
			I rms	Effective current supplied in output by the power module X [A RMS]
			Peak I Value	Peak current supplied in output by the power module X [A]
			Frequency	Frequency of the sinusoid voltage in output from the power module X [Hz]
			Crest Factor	Crest factor of the current in output from the power module X
			Power factor	Power factor in output from the power module X
			Max W	Maximum active power suppliable by the power module X [W]
			Power	Active power supplied by the power module X, expressed as a percentage in relation to the maximum active power the power module X can supply [%]
			Max VA	Maximum apparent power suppliable by the power module X [W]
			App. Power	Apparent power supplied by the power module X, expressed as a percentage in relation to the maximum apparent power the power module X can supply [%]
		Battery X	Voltage	Voltage measured at the ends of the batteries by the power module X [V]
			Current	Current required to the batteries from the power module X (negative if the batteries are being charged) [A]
			Batt. Charger	Status of the battery charger inside module X
		Misc. X	INV. dissip. Temp.	Temperature of the INV dissipater (Inverter) of the power module X [°C]
			BST dissip. Temp.	Temperature of the Booster /PFC dissipater of the power module X [°C]
			Fan speed	Fan speed expressed as a percentage of the power module X
			HV Bus pos.	Voltage on the DC BUS positive of the power module X [V]
			HV Bus neg.	Voltage on the DC BUS negative of the power module Xm [V]
	PM Historical Data X	Run Time	Total time working	
		Battery time	Total time running on battery	
		BattCharg Time	Total time the battery charger has been working	
		Bypass int.	Total number of Bypass interventions	
		Battery int.	Total number of battery interventions	
		Dumper int.	Total number of Dumper interventions	
		T mains high	Total number of times the input mains voltage has exceeded the maximum value allowed by the power module	
		No.Overheat.	Total number of overheatings	
		No. Overloads	Total number of overloads	
		No. HV Bus run	Total number of overvoltages on the Bus	
		No. Out DC Level	Total number of continuous voltage presences in output from the PMs	

INDICATION

Press ENTER to change the X value and consequently vary the power module from where you read data.

Diagnostics (*)	Reset PM Errors	Deletes the memory of errors found in the power module. Resets only resettable errors.

PM SW update (*)	Update all the PMs	It allows the sequential and automatic updating of the internal software of all the UPS power modules. Press "ENTER" to start the procedure. If the update is unnecessary the following message appears on the display: "PM SW versions updated!" Press "ESC" to exit the frame.
	Update a single PM	It allows the updating of the internal software of a single power module. Using the "ARROW" keys you select the module you wish to update ('PM00' indicates the module at the top on the left, going on to the last one at the bottom on the right). By pressing "ENTER" key a frame appears that gives a comparison between the software that is actually in the module selected and the software you are about to load. Press "ENTER" to start the update procedure. Once updated, the message "PM SW version updated!" appears on the display. Press "ESC" to exit the frame.

(*) Available in the "Service Mode" only

7.2.4 Events

Events	Visual display	All	Displays all the events
		Critical	Displays events that have generated critical alarms
		Malfunctions	Displays events that have generated non critical alarms
		Info	Displays events that have generated simple information
	Deletion	All	Deletes all the events

7.2.5 Tools

Batteries	Battery test	Automatic	Tests the batteries to check their condition and performance.
	Batt. Calibration	Calibrates the batteries, measuring the run down curve. If the battery is changed, we recommend carrying out this cycle so that the UPS provides precise information about the charge status.	
	Battery cycle	Executes a Battery Test and battery equalisation to verify their status and performance and to maximise battery life.	

Signalling Test (*)	Tests the luminous signals. Press "ENTER" to carry out the test on the signals of the status indicator (green, orange and red) and the acoustic signals

LCD Display Test(*)	Tests the alphanumerical display. By pressing "ENTER" all the characters available on the alphanumerical display are shown.

(*) Available in the "Service Mode" only

Assistance	Displaying the ID	Displays the code to communicate to assistance if a request is made.
	Using code	Enter the code given by technical assistance.

Reset CM Errors	Deleting the memory of errors detected by the command. It resets only resettable errors.

7. Control panel

7.2.6 Log Out

A password can be set to protect the UPS from changes to settings by unauthorised personnel. Choosing a password each time the UPS settings need changing is necessary to access a private session.
Use the "Log Out" menu to exit the private session when finished.
If you forget the password contact the assistance centre.

7.2.7 Turning the single output phases ON and OFF

When the inverter output is configured as three separate single-phase lines, by very lightly pressing the On/Off key for less than 500 ms it is possible to gain access to a particular menu where you can choose which of the three phases R,S,T to turn on or off independently from the others.

7.2.8 Shutting down the UPS Archimod®

ATTENTION
The shutting down procedure described below is to be used only and exclusively if the load applied to the UPS is off or does not need powering by it.

1. Check there is no need to power the connected loads.
2. Hold down the ON/OFF button on the UPS control panel for at least 2 seconds.
3. When asked "Turn the UPS off?" confirm with the ENTER key.
4. Wait for the shutdown operation to finish. If the UPS needs repairing or maintenance appertaining to the power modules, battery boxes or "backplanes"
5. Open the output switch.
6. Open the mains disconnecting switches
7. Open the battery disconnecting switches (F B+ and F B-) of the unit and of the Archimod® BATTERY system (if present).

If you expect to leave the UPS off for a long time, please read carefully and put into practice what is prescribed in paragraph 5.6 concerning storage.
If these operations are done correctly, there will be no voltage in the UPS ARCHIMOD.

8. Diagnostics

8.1 Luminous and acoustic signals

The operating status indicator, on the front panel of the UPS, and the LED on the front of each power module, change colour depending on the actual operating status of the UPS or of the single power module, according to the following table:

INDICATION

Some luminous signals can be accompanied by an acoustic signal. Press the "ESC" key to turn the acoustic signal off; each time it is pressed after this you will either enable or disable the acoustic signal.

STATUS INDICATOR	POWER MODULE LEDs	ACOUSTIC SIGNAL	MESSAGE ON THE DISPLAY	DESCRIPTION OF THE UPS STATUS AND OPERATING ADVICES
GREEN Fixed	**GREEN Fixed**	-	Archimod®	Normal operation with mains present and load within the limits
GREEN Fixed	**GREEN Fixed**	-	3V battery flat	Change the 3V command battery
GREEN Fixed ORANGE Intermittent	**ORANGE Intermittent**	-	Output/phase off	Phase turned off when configuring the 3 independent phases output
GREEN Fixed ORANGE Intermittent	**Off**	-	Modules off	Hot-swap control
GREEN Fixed	**1 module: ORANGE Fixed The remaining modules: GREEN Fixed**	-	Battery equalisation	Batteries being equalised
GREEN Fast intermittent	**GREEN Fast intermittent**	-	-	There is no mains voltage and/or incorrect mains frequency on at least one module (>68Hz or <43Hz) and/ or the input PLL is not synchronised.
GREEN Fast intermittent	**-**	-	-	No bypass, input PLL is not synchronised, bypass voltage outside the limits, incorrect or inverse bypass sequence, bypass frequency outside the tolerance
GREEN Fast intermittent	**GREEN Fast intermittent**	-	Bypass input KO	The bypass is unusable for supplying the load
ORANGE Fixed	**ORANGE Fast intermittent**	-	UPS on Bypass	Operating in bypass automatic
ORANGE Fixed	**ORANGE Fixed**	On for 500 ms and off 12 s	UPS on Battery	Running on battery
ORANGE Fixed	**ORANGE Fixed**	-	Battery calibr.	Batteries being calibrated
ORANGE Fixed	**-**	-	Battery test	Batteries being tested
ORANGE Fast intermittent	**GREEN Fixed**	-	Maintenance required	Check the UPS periodically
ORANGE Fast intermittent	**GREEN Fixed**	-	Check the batteries	Check battery status
ORANGE Intermittent	**ORANGE Fast intermittent**	-	Forced bypass	Forced bypass mode

8. Diagnostics

STATUS INDICATOR	POWER MODULE LEDs	ACOUSTIC SIGNAL	MESSAGE ON THE DISPLAY	DESCRIPTION OF THE UPS STATUS AND OPERATING ADVICES
ORANGE Intermittent	**ORANGE Fast intermittent**	-	Manual bypass	Manual bypass mode
ORANGE Short double blink with pause	**ORANGE Fixed**	Short double blink with pause	AUTONOMY RESERVE!	Autonomy reserve
RED Fixed	**RED Fixed only on the failed module**	Fast intermittent	BATTERY CHARGER FAILED	Battery charger failed on at least one module
RED Fixed	**RED Fixed only on the failed module**	Fast intermittent	MODULE FAILED	At least one module failed. Possible failures: inverter, Booster/pfc, communication between CM and PM, battery connection, network connection, HVBUS connection.
RED Fast intermittent	-	Fast intermittent	BATTERIES K.O.	Batteries failed or not connected
RED Fast intermittent	**RED Short double blink with pause**	Fast intermittent	RUNAWAY BATTERIES	Excessive voltage on the batteries
RED Fast intermittent	**RED Short double blink with pause**	Fast intermittent	HVBUS RUNAWAY FAILURE	Excessive voltage on the high voltage DC buses
RED Fast intermittent	**RED Fixed**	Fast intermittent	DC OUT LEVEL FAILURE	Excessive DC level in output
RED Fast intermittent	**RED Short double blink with pause only on the PM in alarm**	Fast intermittent	OVERHEATING	One or more power modules are overheating
RED Fast intermittent	**RED Short double blink with pause only on the PM in overload**	Fast intermittent	OVERLOAD	Overload on one or more power modules
RED Fast intermittent	-	Fast intermittent	CM MALFUNCTIONING	Communication error between commands
RED Fast intermittent	-	Fast intermittent	Reference error!	Communication error between commands
RED Fast intermittent	-	Fast intermittent	BACKFEED	Backfeed error detected

8.2 Messages

In this paragraph the messages that appear on the unit's display are listed, also giving the most likely cause that could have generated them.
If you are unable to solve the problem then please contact the Technical Service.

FIRST LINE OF THE MAIN FRAME

MESSAGE	MEANING
BUZZER OFF	The buzzer is turned off.
SERVICE MODE	UPS in the Service Mode. All settings via the display, maintenance functions and updates are possible.
BATTERIES BEING CHARGED	The UPS is charging the batteries. The load is not fed.
MAINTENANCE REQUIRED	Have specialized personnel carry out the routine check on the UPS.
CHECK THE BATTERIES	Have specialized personnel check battery status.
3V BATTERY FLAT	The control board's 3V battery is flat.
OUTPUT/PHASE OFF	Phase or output off Configuration achieved via the display or subsequent to a UPS malfunction.
BYPASS INPUT KO	Bypass input KO; some problems have arisen on the Bypass line. It is not possible to feed the loads directly off the mains.
UPS IN BYPASS	UPS in Bypass. The load is not protected by the UPS in this configuration.
FORCED BYPASS	The UPS has entered the forced Bypass mode via configuration on the display. Load not protected by the UPS.
MANUAL BYPASS	The load is powered directly by the mains via a manual bypass. In this configuration the load is not protected by the UPS.
UPS OFF-LINE	The load is powered directly by the bypass line. The load is protected because if there is a power failure with the line it switches the load over to battery.
UPS ON BATTERY	UPS on battery. The cause for this configuration is a failure in the UPS feeding system or a mains power failure.
BATTERY CALIBRATION	The UPS is calibrating the batteries by means of a command on the display.
BATTERY EQUALIS.	The UPS is equalising the batteries.
BATTERY TEST.	The UPS is testing the batteries to check their status and verify they are working properly.
REFERENCE MALFUNCTION	Synchronisation error between the commands.
AUTONOMY RESERVE!	Battery charge level is at minimum. The unit is about to shutdown.
BATTERIES KO	Batteries failed. Check their operation and replace them if necessary.
RUNAWAY BATTERIES	Battery voltage out of control. Either the batteries or battery charger are/is malfunctioning.
HVBUS RUNAWAY FAILURE	A failure with the UPS has caused a voltage level on the High Voltage Bus that is out of control.
OUT DC LEVEL FAILURE	A failure with the UPS has caused a DC voltage in output.
OVERHEATING	The temperature inside the UPS is out of the nominal range.
OVERLOAD	The total load is higher than the UPS's nominal power. The UPS switches to Bypass if there is voltage on the bypass line otherwise it shuts down.

8. Diagnostics

MESSAGE	MEANING
BIG OVERLOAD	The load in output has caused an excessive drop in the output voltage.
BACKFEED	Backfeed error detected.
CM MALFUNCTIONING	Communication error between commands.
BATTERY CHARGER FAILED	The battery charger circuit of one or more Power Modules has failed. It must be either repaired or changed.
MODULE FAILED	One or more Power Modules have failed. They must be either repaired or changed.
LOAD OFF!	An excessive load (e.g. short circuit) has caused an excessive drop in the output voltage for too long a time or the load has been switched off due to a prolonged battery overload.
UPS IN EMERGENCY!	UPS in Emergency.
UPS STOPPED!	UPS has stopped.
Shutdown in progress…	The unit is shutting down because it was programmed by the user.
Modules off	Command in hot-swap. The power modules are not being fed and are ready to be taken out.
PM not updated!	The software of one or more Power Modules is not compatible with the command. Update the modules before starting the unit.

FRAMES DISPLAYED WHEN SHUTTING DOWN

MESSAGE	MEANING
First start-up: connect the mains!	The UPS has never been switched on. No mains supply. Start-up not allowed. Make sure the mains are present before starting up.
No mains! start-up not allowed	No mains supply. Start-up not allowed. To start the UPS on battery, select this configuration via the display.
Emergency Power Off!	The Emergency Power Off (EPO) is working, the EPO command has been given by a push button or a disconnecting switch on the input line was opened while the UPS was working.
Config. incomplete for start-up!	The UPS requires a complete start-up configuration. Ensure that the output configuration, bypass enable, KB number, number of batteries for KB and the output voltage have been entered correctly.
Three-phase circuit sequence incorrect!	Invalid three-phase input sequence. Check that the three-phase circuit has been connected correctly.
The pms' hw versions are incorrect	One or more Power Modules are not compatible with the UPS. Call assistance.
Start-up error!	An error occurred during start-up of the UPS.
Start-up interrupted	Start-up possible only by confirming. Start-up was not confirmed within 30 seconds.
UPS shut down by programming!	UPS shut down by programming.
Shutting down due to an incorrect configuration	An error occurred in configuration. UPS in shutting down. The number of Power Modules detected by the UPS is incorrect for the output configuration set.
Shutting down due to a wrong KBnumber "	An error occurred when configuring the KBs. Set the right KB number
Shutting down due to end of autonomy	Battery charge level is too low, UPS in shutting down.
Maximum time on battery	The UPS has been running on battery for the maximum time set, UPS shutting down.
Load not fed.	Load feeding interrupted.
Feeding from the output	Error in starting up. Voltage present on the UPS output. Check connections.
Shutting down with H.V. buses loaded	The UPS did not shutdown correctly. Make sure the DC buses are discharged prior to carrying out any maintenance on the unit.
Current data saving error	Error in saving some of the UPS parameters.
The CMs SW releases are not correct: Update them!	The commands are programmed with different SW releases. The software releases need aligning. Start the UPS in the Service mode and align the commands' Software.

8. Diagnostics

IMPORTANT EVENTS

MESSAGE	MEANING
Inverter failure	Failure occurred in the Inverter circuit.
Booster failure	Failure occurred in the Booster / PFC circuit.
Battery charger failure	Failure occurred in the Battery Charger circuit.
Overheating	Overheating. Check the UPS ventilation system.
Overload	Overload. Check the load level connected to the UPS.
Excessive voltage on the H.V. BUS	Anomalous high voltage on the DC BUS.
Excessive DC level in output	The DC (Direct Current) level in output is excessive.
Excessive battery voltage	Battery voltage too high.
Power module communication failure	Failure of the communication system with the Power Modules.
Emergency	Emergency.
Load not powered.	Power to the loads has been interrupted.
Abnormal shutting down	UPS shut down abnormally
Shutting down due to an overload	UPS shut down due to an prolonged overload.
Shutting down due to an Emergency Power Off	UPS shut down due to an Emergency Power Off.
Batteries KO	Battery failure.
PM battery connection failure	Failure in the connection of the batteries to the Power Module. Check battery fuses and wiring.
PM mains connection failure	Failure in the connection of power to the Power Module. Check mains fuses and wiring.
PM HVBus connection failure	Failure in the HVBus connection with the Power Modules. Check the HVBus fuses inside the Power Modules.
Communication failure between CM	Communication error between commands.

SIGNALLING EVENTS

MESSAGE	MEANING
Shutting down due to end of autonomy	UPS shut down due to the end of autonomy.
Shutting down due to incorrect three-phase sequence	UPS shut down due to an incorrect three-phase sequence in input.
Batt.cal.interrupted	Battery calibration interrupted by user
Maximum time on battery	Maximum time on battery.
Start-up error	Error in starting up.
Start-up authorised when there are ongoing alarms	UPS start-up authorised in the presence of alarms.
Startup authorised with a new config.	UPS start-up authorised with a new configuration. The number of Power Modules installed on the UPS has changed.
Shutting down due to incorrect configuration	UPS shutting down due to an incorrect configuration. The number of Power Modules detected by the UPS is incorrect for the output configuration set.
Power Module FW update	The Power Module Firmware updated.
Big overload	Big overload
Feeding from the output	Voltage present on the UPS output. Check connections.
Shutting down with H.V. buses loaded	The UPS did not shutdown correctly. The UPS shutdown without discharging all the buses completely.
Maintenance required	Have specialized personnel carry out the routine check on the UPS.
Check the batteries	Have specialized personnel check the batteries.
Replace the batteries	Check battery status and replace them if necessary.

8. Diagnostics

INFORMATION EVENTS

MESSAGE	MEANING
Startup by user	UPS start-up by user.
Shutting down by user	UPS shut down by user.
Automatic startup:	Automatic UPS start-up.
Delayed shutting down	The UPS was shut down by programming a delayed shutdown.
Battery charger start in stand-by	The battery charger started in standby.
UPS on battery	UPS on battery.
UPS on mains	UPS on mains.
Output off	The output is off
Battery test executed	Battery test completed successfully
Batteries calibrated	Batteries calibrated successfully
Forced bypass ON	The forced bypass mode has been enabled. The load is powered by force directly by the bypass. Load not protected.
Forced bypass OFF	The forced bypass mode has been disabled.
Maintenance bypass ON	The load is powered directly by the manual bypass disconnector. Load not protected.
Maintenance bypass OFF	The load is not powered directly by the manual bypass disconnector.
List of events deleted	The user has deleted the events log

ALARMS

MESSAGE	MEANING
INVERTER FAILURE	Failure occurred in the Inverter circuit.
BOOSTER FAILURE	Failure occurred in the Booster /PFC circuit.
BATTERY CHARGER FAILURE	Failure occurred in the Battery Charger circuit.
OVERHEATING	Overheating. Check the UPS ventilation system.
OVERLOAD	Overload. Check the load level connected to the UPS.
HVBUS RUNAWAY	Anomalous high voltage on the DC BUS.
EXC. IN OUTPUT DC LEVEL	Excessive DC voltage in output.
EXCESS.BATTERY VOLTAGE	Battery voltage too high.
PM → CM COMMUNICATION FAILED	Failure of the communication system with the Power Modules.
BATTERY CONNECTION FAILURE	Error in connecting the battery to the Power Module. Check the connection and the battery fuse inside the Power Module.
MAINS CONNECTION FAILURE	Error in connecting the mains to the Power Module. Check the connection and the mains fuse inside the Power Module.
H.V.BUS CONNECTION FAILURE	Error in connecting the D.C. Bus to the Power Module. Check the connection and the D.C. bus fuse inside the Power Module.
CM → PM COMMUNICATION FAILURE	Failure of the communication system with the Power Modules.
OVERLOAD	Overload
LOAD NOT PROTECTED	Load not protected by the UPS
MAINTENANCE REQUIRED	Have specialized personnel carry out the routine check on the UPS.
CHECK THE BATTERIES	Have specialized personnel check the batteries.
CAN NETWORK REFERENCE ERROR	Synchronisation error between the commands.
CM MALFUNCTIONING ON CAN NETWORK	Communication error between commands
BACKFEED	Backfeed error detected

9. Maintenance

WARNING
The instructions given in this chapter are not addressed to a normal operator but to a specialised technician, authorised to work only if he uses the Individual Protective Gear mentioned in Chapter 4.

9.1 Introduction

This chapter contains all the information necessary for a correct maintenance of the UPS Archimod® unit.

All the operations described in this section must be carried out by authorised technicians or qualified personnel. LEGRAND® is not liable for any injury to persons or damage to things caused by incorrect operations or activities if not carried out according to the instructions given in this manual, with particular reference to the safety rules and regulations that can be found in chapter 4.
To ensure optimum operation of the UPS Archimod® and continuous and effective protection of the load connected to it, the batteries must be checked every six months after the first year of the machine's life, via the battery calibration function (see par 8.2.4).

9.2 Preventive maintenance

The UPS does not contain parts subject to preventive maintenance by the end user.
Therefore, with the exception of normal cleaning, all the user has to do is periodically check there are no alarms on the display and that both fans on each power module are working correctly.

If there are any problems contact the LEGRAND® assistance centre immediately.

9.3 Periodical checks

Correct operation of the UPS must be guaranteed by periodical maintenance inspections, essential for safeguarding the unit's operating life and reliability.

WARNING
The periodical checks entail operations inside the UPS where dangerous voltages are present. Only maintenance personnel, trained and authorised by LEGRAND®, know all the parts of the UPS that are live with dangerous voltages and, therefore, authorised to work on them.

During a preventive maintenance inspection, the maintenance technician must check the following:
- there are no alarms;
- the list of any events stored;
- correct operation of the static and maintenance bypass;
- integrity of the electrical installation;
- flow of cooling air;
- condition of the batteries;
- characteristics of the load applied;
- conditions of the installation premises.

9.4 Hot-swap replacing of power modules or adding new modules

The Archimod® UPS allows any faulty power modules (Hot-Swap) to be replaced when they are hot.
This means that the load is powered by the UPS which still protects the user points without them being powered by the bypass line. To do this the modules managed by the same control unit have to be turned off but the load will be powered by the remaining power modules.
To use this function it is necessary for the UPS to be sized correctly. If the load percentage is such that the Hot-Swap cannot be done without overloading, it is advisable to follow the maintenance procedure bypassing the UPS.

Example: in a 60kVA Archimod® where there are 3 controls and 9 power modules, to replace the module in the PM1 position, modules PM0, PM1 and PM2 will be turned off by means of control number 1 (the first from the top).
During the Hot-Swap we will not have 20kVA of power which means that the maximum applicable load, so as not to overload the UPS, is 40kVA.

ATTENTION
Hot-Swap replacing of power modules or adding new modules is not available for Archimod® 20kVA. Please follow the indications given in paragraph 9.5.

1. Make sure that the load percentage applied to the UPS allows the Hot-Swap procedure without overloading the UPS;
2. See which is the control for the power module you wish to service;
3. Briefly press (less than 0.5 seconds) the ON/OFF button of this control ;
4. Access the CM - Hot-swap menu, set OFF and press Enter: This control will turn all the modules off of the tunnels it controls and remains in standby;
5. Wait for all modules to turn off completely (front LED off);
6. Undo the securing screws of the modules you are going to replace and put them aside without losing them;
7. Take the modules out to replace one at a time;
8. Check that on all the new power modules the two LEDs that can be seen through the two holes on the cover are off. If they are on wait until they have turned off;
9. Put the new modules in, one at a time, and screw them in with the screws removed making certain they are tightened right down; The two screws also serve as grounding of the module, and therefore for safety purposes must be both fixed;
10. Briefly press (less than 0.5 seconds) the ON/OFF button on the control of the tunnel where the power modules are being replaced;
11. Select the CM - Hot-swap menu, set ON and press Enter: the control will start all modules automatically in the tunnels it controls;
12. Completion of the operation can be monitored by means of the progress bar.

ATTENTION
By pressing the ON/OFF button continuously for more than 2 seconds the whole UPS will turn off cutting power to the load.
If one or more screws have been lost use only M4x20mm Allen screws to fix the power modules. If the bottom screw of a module is not put back in place the control prevents the tunnel from restarting.
Attention: if the bottom screw of a module is undone while the UPS is on, the control switches that module off and all the modules it controls in order to make the UPS safe in the event an attempt is made to take the power module out before having carried out the Hot-Swap procedure explained in this paragraph 9.4.

WARNING
Never touch the backplane of the tunnel left uncovered after the modules have been removed – there are some dangerous live parts.
There are two holes on the cover of the power module through which it is possible to see two LEDs; if they are on it means there is dangerous voltage on the rear connector.
MAKE ABSOLUTELY CERTAIN THAT THESE LEDs ARE OFF before handling the module.
If they are on, wait until they have turned off.
If one or more power modules are not used, all slots left empty must be covered with a plastic mask (supplied) and secured with two M4x20mm Allen screws with a 4 mm diameter Grower washer in between, without tightening too much.

9. Maintenance

9.5 Maintenance procedure of the ups in the manual bypass mode.

If the Hot-Swap replacement procedure of the power modules is not applicable (paragraph 9.4), the modules can still be replaced by putting the UPS in maintenance bypass. This mode is also necessary if ever it is requested to service or replace parts such as the control boards, backplane, upgrading the UPS firmware, etc.

ATTENTION
When working in the forced bypass and maintenance mode the load is not protected.

9.5.1 Accessing the manual maintenance bypass mode.

WARNING
It is strictly forbidden to change the power modules if first the following instructions have not been scrupulously complied with!

1. Open the door of the Archimod® UPS;
2. Enable the UPS forced bypass function by acting directly on the front display.
   Access the following menus to do this:
   UPS settings → Bypass → Forced Mode;
   Set the parameter value on "enabled".
   In these conditions the power modules are excluded and the load is fed directly by the mains; "Bypass forced" appears on the panel. When the unit is in the forced bypass mode, the wording "UPS LEGRAND®" blinks quickly on the front of the panel. Likewise, the LEDs on the various power modules also blink quickly.
3. Put the manual maintenance bypass disconnector in the ON position. The load is now being powered directly by the mains; the wording "Manual Bypass" appears on the panel.
4. Open the output disconnector by putting it in the OFF position;
5. Turn the UPS off, holding the "ON/OFF" push button down on the control panel for a few seconds;
6. Open the mains input disconnector by putting it in the OFF position;
   Open all the battery disconnectors (FB+ and FB-) of the UPS and of the Archimod® BATTERY units (if installed);
8. Press the ON/OFF push button to discharge any internal capacities.

Now proceed with maintenance.

WARNING
There are dangerous live parts inside the equipment due to the internal batteries even if all the battery fuse holder disconnectors are opened. To remove the battery induced voltage, remove at least 1 battery box from each battery shelf (which will interrupt the battery string series).

9.5.2 Replacing a power module or adding new modules

1. Make sure that the maintenance bypass procedure described in the previous paragraphs has been scrupulously applied.
2. Extract the module after having loosened the two securing screws.

WARNING
There are two holes on the cover of the power module through which it is possible to see two LEDs; if they are on it means there is dangerous voltage on the rear connector.
MAKE ABSOLUTELY CERTAIN THAT THESE LEDs ARE OFF before handling the module. If they are on wait until they have turned off.

3. Check that on the new power module the two LEDs that can be seen through the two holes on the cover are off. If they are on wait until they have turned off.
4. Put the new power module in place of the old one or in one of the available compartments if you wish to increase UPS power.
5. Secure the power module to the unit's frame with the 2 screws supplied, making certain they are down as far as they can go and use only M4x20mm Allen screws; The two screws also serve as grounding of the module, and therefore for safety purposes must be both fixed.

Note: if the power module is not fixed with the screws prescribed, the switching-on of all the tunnel modules, controlled by the control board, is inhibited.

The procedure described needs no further manual settings via the operator panel; the UPS automatically recognises the new power module and reconfigures automatically.
As far as identification of the modules is concerned, bear in mind that the first module at the top left is always identified with zero. The adjacent module is, therefore, number 1 and the others follow in sequence.

9.5.3 Manual exiting from maintenance bypass

To restart the UPS from the maintenance bypass to the On-line status, follow these steps.

1. Ensure that the output disconnector is open and start the UPS, pressing the ON/OFF push button.
2. Wait until the UPS is on completely and the main screen page displayed. In this case the UPS is on but the load is powered directly by the bypass mains; the message "Manual bypass" appears on the panel. In this condition the backlit status indicator on the front panel turns orange.
3. Close the output disconnector by putting it in the ON position.
4. Open the manual maintenance bypass disconnector by putting it in the OFF position; the UPS goes automatically to working on-line.
5. At the end of the procedure the load is powered by the UPS. In this condition the backlit status indicator on the front panel turns green.
6. Close the Archimod® door.

9.6 Installing/replacing battery boxes

There are two different ways to install/replace Archimod® UPS 20, 40 and 60kVA and Archimod® BATTERY battery boxes. Please read carefully all the following instructions prior to working on the equipment.

The battery boxes must always be added/replaced in multiples of 3 (1 KB).

Note: if the installation/replacement procedure has altered the total number of KBs installed in the UPS their setting will need to be updated by means of the front panel.
Once the above steps have been done we recommend a battery calibration in order to know exactly what the UPS's total autonomy is.

WARNING
A battery can be a potential electric shock risk and a high short circuit current. The following precautions must be taken when working on the batteries:
a) take off wristwatches, rings and any other metal objects;
b) use tools that have a insulated handle/grip;
c) wear rubber shoes and gloves;
d) do not put tools or metal objects on top of the batteries;
e) disconnect the charging source before connecting or disconnecting the battery terminals
f) make sure the battery has not been accidentally connected to ground. If it has, disconnect the ground source. If any part of a grounded battery is touched it can give an electric shock. Chances can be reduced if the ground connections are interrupted during installation and maintenance (applicable to battery power supplies and equipment placed far away and with no grounded power supply circuitry).

9.6.1 Replacing battery boxes with the UPS On-line (Hot Swap)

If, in total, the UPS has more than 1 KB for each 10kVA of rated power supplied in output (example: at least 5 KBs for one Archimod® supplying 40kVA), it is possible to replace the battery boxes 1 KB at a time with the UPS On-line.
This can be done on the Archimod® UPS and on the Archimod® BATTERY.
Remember that 1 KB consists of 3 battery boxes.
The procedure for replacing is the following:

1. Ensure that the UPS has at least 1KB installed for each 10kVA of rated power supplied in output plus one;
2. Ensure that the UPS is not running on battery and that the battery charger is either in the maintenance or standby status. To check battery charger status, access the UPS Status → Measurements → Batteries menu and check the fourth item displayed.
3. Extract the 3 battery boxes of just one KB. To add another KB do not remove any battery boxes;

9. Maintenance

4. Insert the 3 new battery boxes and screw them into place with the screws supplied;
5. Repeat steps 2, 3 and 4 for each KB to install/replace.
   If just KB is added simply follow the steps described in points 2, 4 and 5.

ATTENTION
Always replace just 1 KB at a time

Note: if the UPS goes over to running on battery while you are doing this, stop and neither extract or insert any battery boxes! You can continue when the UPS returns working On-line.
Note: if mains input should fail during the operation, autonomy will be reduced: you will need to carefully evaluate such an eventuality occurring before you start.

9.6.2 Installing/replacing battery boxes with the UPS in the maintenance bypass mode

This procedure is valid for all Archimod® UPS and Archimod® BATTERY models.

ATTENTION
the load is powered directly by the mains input when in the maintenance bypass mode.

1. To put the UPS in the maintenance bypass mode, proceed with steps 1 to 8 described in paragraph 9.5.1.
2. Ensure that the UPS is not running on battery and that the battery charger is either in the maintenance or standby status;
3. Extract the 3 battery boxes of just one KB. To add another KB do not remove any battery boxes;
4. Insert the 3 new battery boxes and screw them into place with the screws supplied;
5. Repeat steps 2, 3 and 4 for each KB to install/replace.
6. Do steps 1 to 7 described in paragraph 9.5.3 to take the UPS from the maintenance bypass to the On-line status.

If just KB is added simply follow the steps described in points 1, 2, 4, 5, 6 and 7.

10. Dismantling

ATTENTION
The instructions in this chapter are to be considered indicative. Please refer to the laws in the country where the unit is used.

10.1 Disposing of the batteries

At the end of their life, the batteries must be disposed of in a place set aside for the collection of such waste. Since batteries are toxic waste it is not allowed to dispose of them like traditional waste.
For the correct procedure please contact the relevant Authorities in your area.

10.2 Dismantling the UPS

Once the batteries have been removed all the parts of the UPS Archimod® must be removed.

To remove and dismantle the unit wear the Individual Protective Gear described in chapter 3 and refer to the instructions and charts that you will find in this manual.

Once the various parts have been removed, divide the components into groups, separating metal from plastic, from copper, etc., according to the selected disposal scheme used in the country where the unit is being dismantled.

If the parts have to be stored while waiting to go to the dump, keep them in a safe place, protected from atmospheric agents to prevent any chance of contamination of the ground and under water tables (especially with lead and the electrolyte of the batteries).

10.3 Disposing of the electronic components

To dispose of these components, like, for example, the unit's control panel, refer to the laws relevant to this sector.

11. Tables

ATTENTION
the type and cross section of the connecting cables must be chosen according to their operating current and laying must be as established by existing laws; this is the responsibility of the installer. The UPS input current and output power are given in paragraph 2.4 and the battery current in Table 7.

WARNING
The following tables give only an indication of the cable cross sections to use as far as concerns using unipolar cables, with single insulation, in PVC and laid in a pipe above ground.

TABLE 1
Minimal Recommended Cable Sections for UPS Archimod®

POWER	INPUT PHASES	OUTPUT PHASES	INPUT CABLE	OUTPUT CABLE	INPUT I_{max}
20 kVA	3	3	5 x (10 mm²)	5 x (10 mm²)	38.4 A
	1	1	3 x (25 mm²)	3 x (25 mm²)	115.2 A
	1	3	3 x (25 mm²)	5 x (10 mm²)	115.2 A
	3	1	5 x (25 mm²)	3 x (25 mm²)	115.2 A
40 kVA	3	3	5 x (25 mm²)	5 x (25 mm²)	76.8 A
	1	1	3 x (95 mm²)	3 x (95 mm²)	230.4 A
	1	3	3 x (95 mm²)	5 x (25 mm²)	230.4 A
	3	1	5 x (95 mm²)	3 x (95 mm²)	230.4 A
60 kVA	3	3	5 x (35 mm²)	5 x (35 mm²)	115.2 A
80 kVA	3	3	5 x (50 mm²)	5 x (50 mm²)	153.6 A
100 kVA	3	3	5 x (70 mm²)	5 x (70 mm²)	192 A
120 kVA	3	3	5 x (95 mm²)	5 x (95 mm²)	230.4 A

TABLE 2
UPS Archimod® Recommended battery fuse ratings

POWER	BATTERY FUSE	
	UPS Archimod®	
	FB+	FB-
20 kVA	1 x 100A 500V gG (22 x 58)	1 x 100A 500V gG (22 x 58)
40 kVA	2 x 100A 500V gG (22 x 58)	2 x 100A 500V gG (22 x 58)
60 kVA	3 x 100A 500V gG (22 x 58)	3 x 100A 500V gG (22 x 58)

TABLE 3
UPS Archimod® BATTERY Recommended Battery Fuse Ratings

POWER	BATTERY FUSE	
	UPS Archimod® battery	
	FB+	FB-
20 kVA	N.1 - 100A 500V gG (22 x 58)	N.1 - 100A 500V gG (22 x 58)
40 kVA	N.2 - 100A 500V gG (22 x 58)	N.2 - 100A 500V gG (22 x 58)
60 kVA	N.3 - 100A 500V gG (22 x 58)	N.3 - 100A 500V gG (22 x 58)
80 kVA	N.4 - 100A 500V gG (22 x 58)	N.4 - 100A 500V gG (22 x 58)
100 kVA	N.5 - 100A 500V gG (22 x 58)	N.5 - 100A 500V gG (22 x 58)
120 kVA	N.6 - 100A 500V gG (22 x 58)	N.6 - 100A 500V gG (22 x 58)

TABLE 4
UPS Archimod® BATTERY (21 high capacity batteries) Recommended Battery Fuse Ratings

POWER	BATTERY FUSE	
	UPS Archimod® battery	
	FB+	FB-
20 kVA	N.1 - 125A 500V gG (22 x 58)	N.1 - 125A 500V gG (22 x 58)
40-60 kVA	N.2 - 125A 500V gG (22 x 58)	N.2 - 125A 500V gG (22 x 58)
80 kVA	N.3 - 125A 500V gG (22 x 58)	N.3 - 125A 500V gG (22 x 58)
100-120 kVA	N.4 - 125A 500V gG (22 x 58)	N.4 - 125A 500V gG (22 x 58)

TABLE 5
Recommended Input Automatic Breaker

POWER	RECOMMENDED INPUT AUTOMATIC BREAKER	RECOMMENDED INPUT FUSE	PHASE IN / PHASE OUT
20 kVA	40A (3P+N) curve C	32A gG	3φ / 3φ
	100A (3P+N) curve C	100A gG	3φ / 1φ
	100A (1P+N) curve C	100A gG	1φ / 1 - 3φ
40 kVA	80A (3P+N) curve C	63A gG	3φ / 3φ
	200A (3P+N) curve C	200A gG	3φ / 1φ
	200A (1P+N) curve C	200A gG	1φ / 1 - 3φ
60 kVA	100A (3P+N) curve C	100A gG	3φ / 3φ
80 kVA	150A (3P+N) curve C	125A gG	3φ / 3φ
100 kVA	180A (3P+N) curve C	160A gG	3φ / 3φ
120 kVA	200A (3P+N) curve C	200A gG	3φ / 3φ

11. Tables

TABLE 6
Differential Breaker - Differential Current

POWER	DIFFERENTIAL BREAKER - DIFFERENTIAL CURRENT
20 kVA	>= 300 mA
40 kVA	>= 300 mA
60 kVA	>= 300 mA
80 kVA	>= 300 mA
100 kVA	>= 300 mA
120 kVA	>= 300 mA

TABLE 7
Battery current (100% load at the end of discharge) and minimal recommended cable sections

POWER	BATTERY CURRENT	MINIMUM WIRES SECTION
20 kVA	91 A	1 x 25 mm^2 per pole
40 kVA	182 A	1 x 70 mm^2 per pole
60 kVA	273 A	2 x 50 mm^2 per pole
80 kVA	364 A	2 x 70 mm^2 per pole
100 kVA	455 A	2 x 95 mm^2 per pole
120 kVA	546 A	3 x 70 mm^2 per pole

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