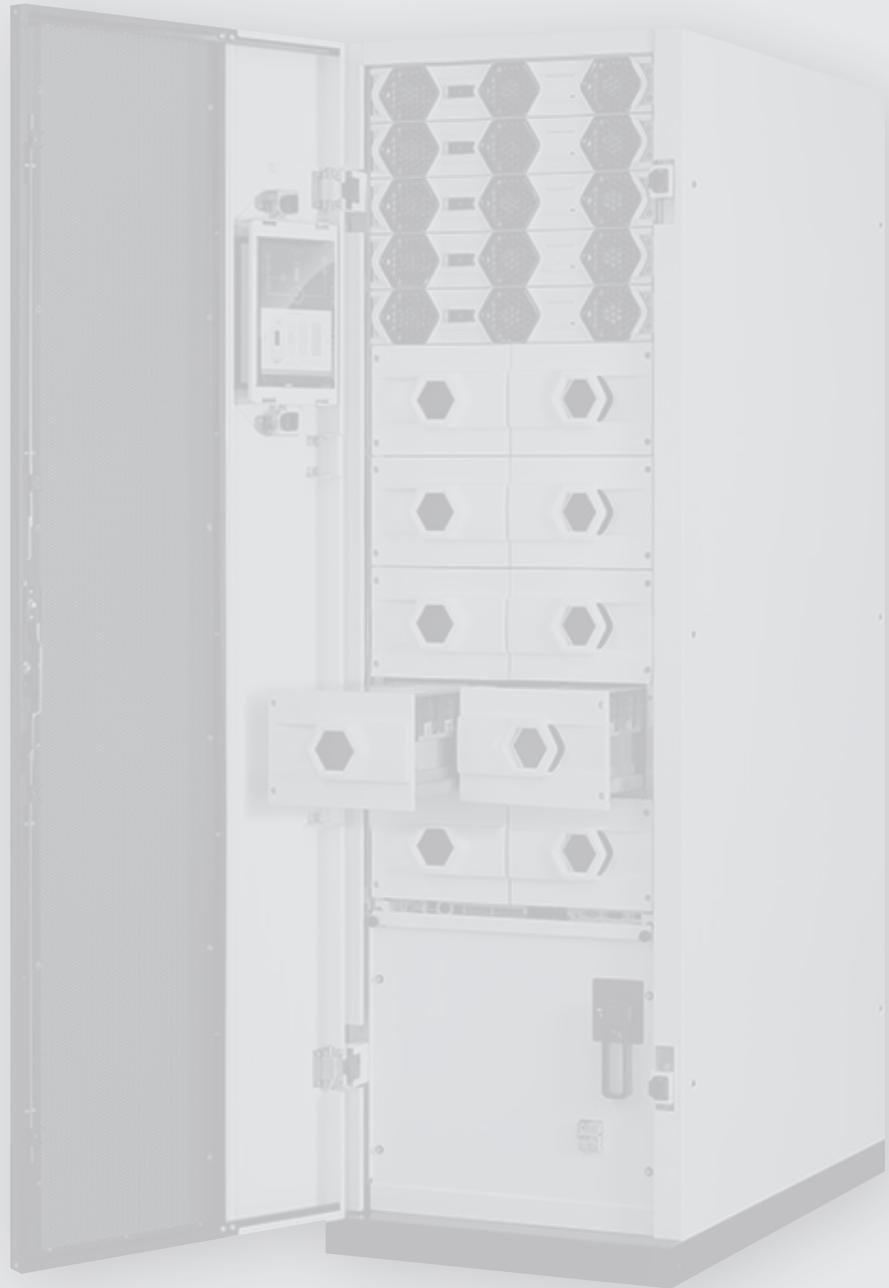


## Keor MOD

EN

ENGLISH

3



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## 1. Introduction



### **INDICATION**

The instructions in this manual are intended for a **SKILLED TECHNICIAN** (paragraph 2.2.1)

### **1.1 Purpose of the manual**

The purpose of this manual is to provide the skilled technician (see paragraph 2.2.1) with instructions for safely installing the Keor MOD UPS, also called "equipment" in the rest of the manual and carry out ordinary maintenance procedures.

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

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

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

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

This manual also refers to laws, directives and standards that the skilled technician is required to be aware of and consult.

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

### **1.2 Symbols in the manual**

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



### **DANGER**

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



### **WARNING**

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



### **CAUTION**

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

### **INDICATION**

This symbol indicates important information which should be read carefully.

### **1.3 Where and how to keep the manual**

This manual must be kept in a safe, dry place and must always be available for consultation exclusively by the skilled technician.

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

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

### **INDICATION**

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

## 1. Introduction

### 1.4 Update of the manual

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

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

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

### 1.5 Manufacturer's liability and guarantee

The skilled technician and the operator shall scrupulously comply with the precautions and installation instructions indicated in the manuals. They must:

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

The Manufacturer declines all indirect or direct responsibility arising from:

- assembly and cabling made by personnel not fully qualified according to national standards to work on equipment presenting electrical hazards;
- assembly and cabling made without using safety equipment and tools required by national safety standards;
- failure to observe the installation and maintenance instructions and use of the equipment which differs from the specifications in the manuals;
- use by personnel who have not read and thoroughly understood the content of the user manual;
- use that does not comply with the specific standards used in the country where the equipment is installed;
- modifications made to the equipment, software, functioning logic unless they have been authorized by the Manufacturer in writing;
- repairs that have not been authorized by the LEGRAND Technical Support Service;
- damage caused intentionally, through negligence, by acts of God, natural phenomena, fire or liquid infiltration;
- damage caused using batteries and protections not specified in the manuals;
- accidents caused by a wrong assembly of the safety protections or due to the lack of application of the safety labels specified in the installation manual.

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

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

#### 1.5.1 Guarantee terms

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

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

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

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

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

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

LEGRAND is not responsible for costs such as:

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

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### **1.5.2 Extension of the guarantee and maintenance contracts**

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

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

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

### **1.6 Copyright**

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

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

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## 2. Safety regulations



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

**Look after this manual carefully and consult it repeatedly during installation and maintenance by a skilled technician.**

### 2.1 General notes

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

The various operations must be carried out according to the criteria and the chronology described in this manual.

### 2.2 Definitions of “Skilled Technician” and “Operator”

#### 2.2.1 Skilled Technician

The figure that will carry out the installation, start up and ordinary maintenance is called “Skilled Technician”.

This definition refers to people who have the specific technical qualification and are aware of the method of installing, assembling, repairing, bringing online and using the equipment safely.

In addition to the requirements listed in the section below for a general operator, the Skilled Technician is qualified according to national safety standards to work under dangerous electrical voltage and uses the personal protective equipment required by national safety standards for all the operations indicated in this manual (see the examples listed in paragraph 2.3).

#### INDICATION

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

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

#### 2.2.2 Operator

The figure assigned to the equipment for normal use is called “Operator”.

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

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

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

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

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

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

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

### 2.3 Personal Protective Equipment



The UPS poses a considerable risk of electric shocks and a high short circuit current. During installation, use and maintenance operations, the equipment mentioned in this section must be used.

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

The following list sum up the minimum Personal Protective Equipment to wear always. Additional requirements may be needed according to national safety standards.

-  Anti-accident and non-sparking shoes with rubber sole and reinforced toe
-  Protective gloves for handling operations
-  Isolated rubber gloves for operations of connection and work under hazardous voltage
-  Protective garments for electrical work
-  Protective face and head shield
-   Isolated tools

#### **INDICATION**

The skilled technician must work on electrical insulated carpet and he must not wear any kind of metal objects like watches, bracelets, etc.

#### **2.4 Hazard signs in the workplace**

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



Electric current  
This sign indicates the electrical live parts.



How to proceed in an emergency  
Do not use water to quench fires but just the extinguishers specially designed for putting out fires in electrical equipment.



No smoking  
This sign indicates that smoking is not allowed.

#### **2.5 Signs on the equipment**

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

Make sure the instructions are adhered to. Removing these plates and working in a way that differs from what written there, is strictly prohibited.

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

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



#### **CAUTION**

The plates must not be removed or covered. Signs in different languages are provided along with the equipment to replace those in English. No other plates may be affixed to the equipment without the Manufacturer's prior written authorisation

## 2. Safety regulations

### **WARNING**

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

### 2.6 General warnings

#### **DANGER**

The UPS works with dangerous voltages. Only Skilled Technicians must perform the installation and ordinary maintenance operations. No part of the UPS can be repaired by the operator. Extraordinary maintenance operations must be carried out by LEGRAND Technical Support Service personnel.

#### **DANGER**

Before beginning any installation and/or maintenance operation, make sure that all the DC and AC power sources are disconnected.

The UPS and the external battery cabinet, if present, must be installed with an earth connection to avoid high leakage currents. First connect the earthing cable.

Check during each installation and/or maintenance operation the continuity of the earthing system.

#### **DANGER**

The UPS is powered by its own DC energy source (batteries). The output terminals may have a dangerous voltage even if the UPS is not connected to the AC power network.

Disconnect all battery drawers and external battery cabinets before performing any installation and/or maintenance operation.

#### **WARNING**

A battery can present a risk of electrical shock and burns by high short-circuit current. Failed batteries can reach temperatures that exceed the burn thresholds for touchable surfaces. The following precautions should be observed when working on batteries:

- a) remove watches, rings or other metal objects.
- b) use tools with insulated handles.
- c) wear rubber gloves and boots.
- d) do not lay tools or metal parts on top of batteries.
- e) disconnect the charging source prior to connecting or disconnecting battery terminals.
- f) determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground.  
Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).
- g) never leave live cable terminals without an insulated protection.
- h) When replacing batteries, replace with the same type and number of batteries or battery packs. There is the risk of explosion if batteries are replaced by an incorrect type.

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

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

#### **INDICATION**

The UPS functions with TT, IT, TN-C and TN-S systems. Input and output neutral are referenced to the same neutral potential: the output neutral status is the same as the input neutral status.

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

#### **CAUTION**

Do not open the battery fuse holders while the UPS is powering the loads in battery mode.

**WARNING**

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

**INDICATION**

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

Keor MOD is a category C3 UPS according to the standard EN62040-2

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

**CAUTION**

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

**INDICATION**

The skilled technician must not leave at the disposal of the operator:

- the keys for opening the UPS door;
- the installation and maintenance manual.

**2.7 How to proceed in an emergency**

The following information are general. For the specific interventions consult the regulations in force in the country where the equipment is installed.

**2.7.1 First-aid procedures**

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

**2.7.2 Fire procedures**

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

## 3. Unpacking and moving

### 3.1 Visual check

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

If there is possible or ascertained damage, immediately inform:

- the transporter;
- the LEGRAND Technical Support Service.

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

If the UPS must be stored, follow the instructions of Chapter 7.

### 3.2 Equipment check

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

Check that:

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

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

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

The following list is general:

- 1 UPS (empty cabinet) with keys to close the doors;
- 1 envelope of accessories;
- user manual;
- installation and maintenance manual.

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

#### **INDICATION**

The installation manual must be used and consulted only by Skilled Technicians.

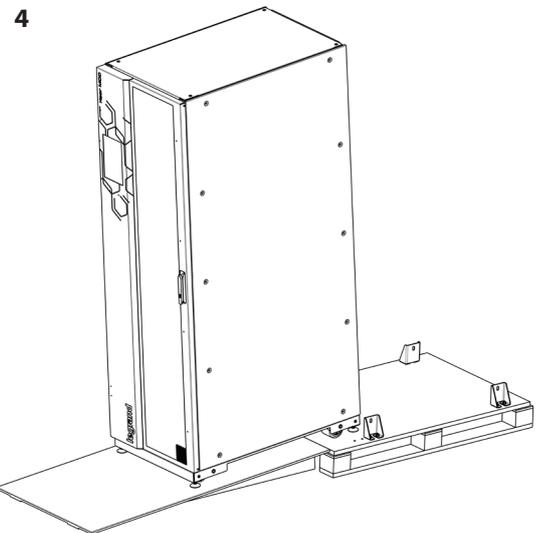
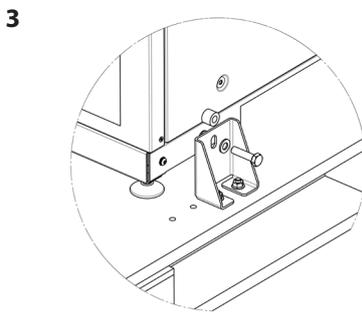
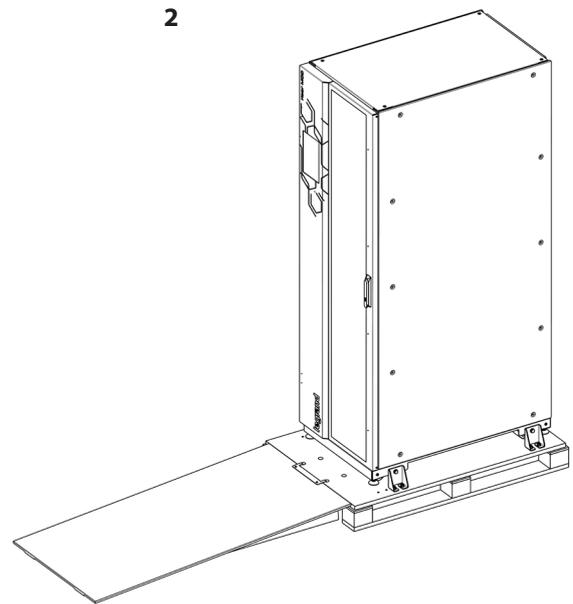
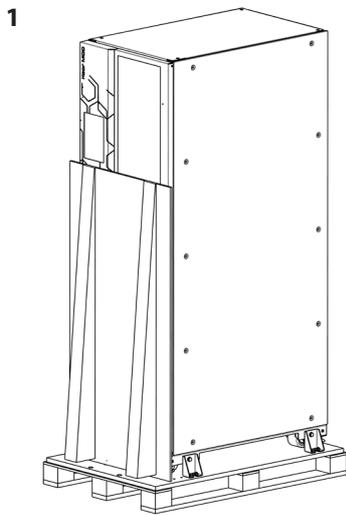
#### **INDICATION**

Power modules and battery drawers to be installed must be bought separately.

### 3.3 Unpacking

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

- bring the UPS to the installation site using a forklift and/or a transpallet with suitable characteristics (see fig. 1);
- remove the plastic film and cardboards protecting the UPS;
- bring down the wooden chute attached to the pallet (see fig. 2);
- loose the screws of the brackets that fix the equipment on the pallet (see fig. 3);
- gently slide by hand the equipment along the chute using the wheels (see fig. 4).



## 3. Unpacking and moving

### 3.4 Movement



#### **WARNING**

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

Follow always the directions indicated in the symbols present on the packaging.

The equipment must always be handled by trained and instructed personnel. Comply with the safety regulations in force in your country relative to the usage of lifting equipment and/or accessories.

The Keor MOD UPS has four wheels at the bottom of the cabinet. Before installations and while it is still empty, it can be moved by hand by at least two people.

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

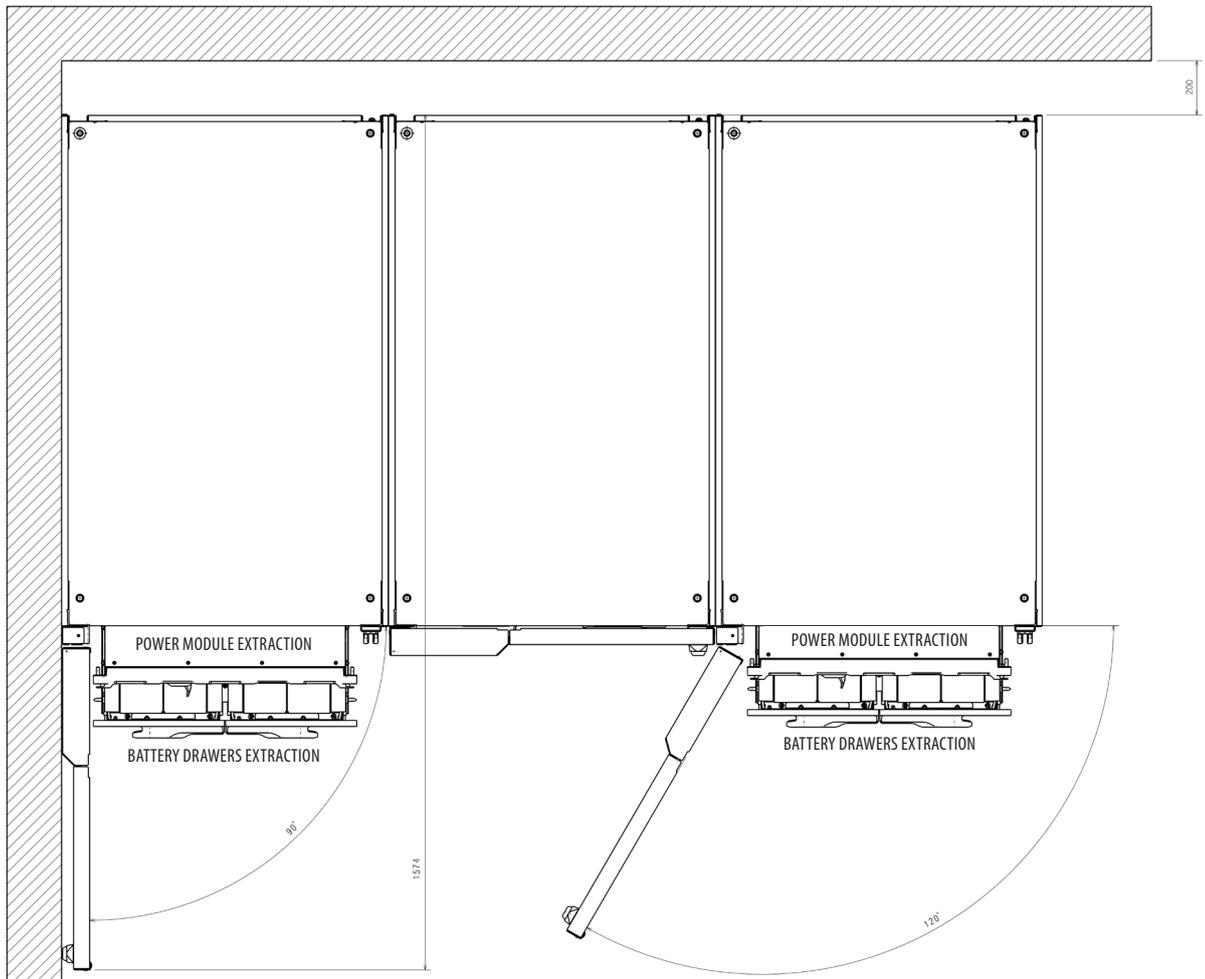


#### **CAUTION**

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

### 3.5 Positioning constraints

(all the dimensions are in mm)



The UPS must be positioned respecting the following conditions:

- do not cover the cooling vents of the power modules and keep a clearance of 20 cm beyond the cabinets real panels;
- keep a clearance of 160 cm on the front to allow the opening of the door;
- temperature and humidity must be within permitted limits;
- fire regulations must be respected;
- the wiring must be simply made;
- front and rear accessibility must be available for assistance or periodic servicing;
- the cooling flow of air must be guaranteed;
- the air conditioning system must be adequately sized;
- dust, corrosive and explosive atmospheres must be absent;
- the installation site must be free of vibration;
- the support surface must be sized for the weight necessary to support the equipment;
- regulate the equipment feet to have perfect perpendicularity and level of the UPS compare with the floor.

To safeguard the batteries as well as possible it is necessary to bear in mind that their average lifetime is strongly influenced by the operating room temperature. Position the UPS in an environment with a temperature range between +20°C (+68°F) and +25°C (+77°F) to guarantee the optimum life of the batteries.

Before proceeding with the installation operations, make sure that there is enough lighting to clearly see every detail. Provide artificial lighting if the natural lighting does not satisfy this requirement.

In case of maintenance operations in places that are not sufficiently well lit, portable lighting systems must be used, avoiding shadows that prevent or reduce visibility on the point where you intend to work or on the surrounding areas.

## 4. Installation



**All UPS installation operations must be carried out exclusively by a SKILLED TECHNICIAN (paragraph 2.2.1).**

### 4.1 Safety regulations



Before carrying out any installation operation you must read and apply the following:

- The UPS has a high leakage current. The earthing connection must be connected before cabling the UPS input. The switchgear must have a safe connection with the earthing and an adequate protection as required by the installation standards.
- The UPS must only be installed in a fixed way with a thermal-magnetic circuit breaker placed upstream of it. Connection to the mains via traditional type plug is not allowed.
- A circuit to protect from voltage backfeed made as in the diagrams shown in paragraph 4.2.5 must be provided outside the UPS.
- The switchgear or the disconnecter switch must be installed near the equipment and must be easily accessible.
- A warning label must be placed on all the mains disconnecter switches installed away from the area of the UPS to remind the assistance personnel of the fact that the circuit is connected to a UPS. The label must contain the following or equivalent text:

**Before working on this circuit**

- Isolate Uninterruptible Power System (UPS)
- Then check for the presence of Hazardous Voltage between all terminals including the protective earth



**Risk of Voltage Backfeed**

- Do not carry out the installation in presence of water or humidity.
- Open only the UPS panels necessary for the electrical connections. After that, close and fix them.
- 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 no voltage is present.
- Check that the fuse breakers on the external battery cabinets (if present) are open.
- Check that all battery drawers (if present) are not fully inserted in the UPS cabinet.
- Check that the mains input voltage and frequency correspond with the values indicated in the technical data on the UPS rating plate.
- Check that the earthing has been carried out in compliance with IEC (International Electrotechnical Commission) standards or local regulations.
- Check that the electrical system has been fitted with the necessary differential and thermal-magnetic protections upstream of the UPS.

### 4.2 Electrical connections

The electrical hook-up of the UPS to the switchgear or to the external battery cabinets is part of the installation that is not normally performed by the UPS manufacturer. For this reason, the indications that follow are to be considered approximate and it is recommended that the electrical connections are based on local installation standards.

After removing the UPS from the packaging and positioning it in its definitive place, the Skilled Technician can begin to make the electrical connections.



The choice of cables type and their cross sections depending on the rated current and their installations must be made as indicated by the local installation standards and it is a responsibility of the Skilled Technician. The input current and the output power of the UPS are indicated in chapter 11 and the battery current in table 4 of chapter 12.

#### **INDICATION**

Chapter 12 includes tables with the recommended cables, fuses, automatic and differential breakers.

#### 4.2.1 Protective devices

To ensure proper protection from overloads, output short-circuits or electrical shocks, it is necessary to install adequate automatic residual-current and thermal-magnetic breakers upstream of the UPS on the input line and on the bypass line (if separate). They must be selected according to the indications in the tables shown in chapter 12.



#### CAUTION

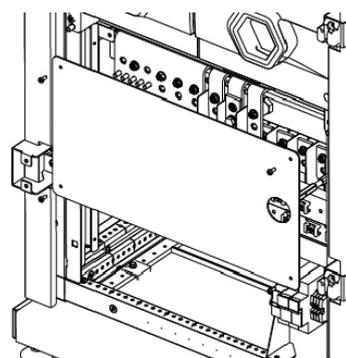
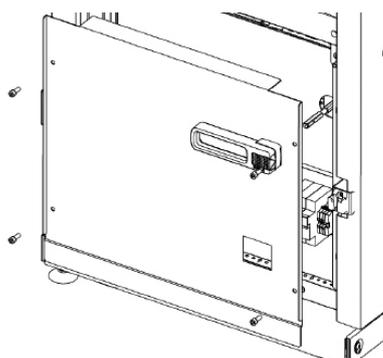
The equipment can cause a d.c. current in the PE conductor. Where a residual current-operated protective device (RCD) is used for protection against electrical shock, only an RCD of Type B is allowed on the supply side of this product.

#### 4.2.2 Disassembly of the distribution panel

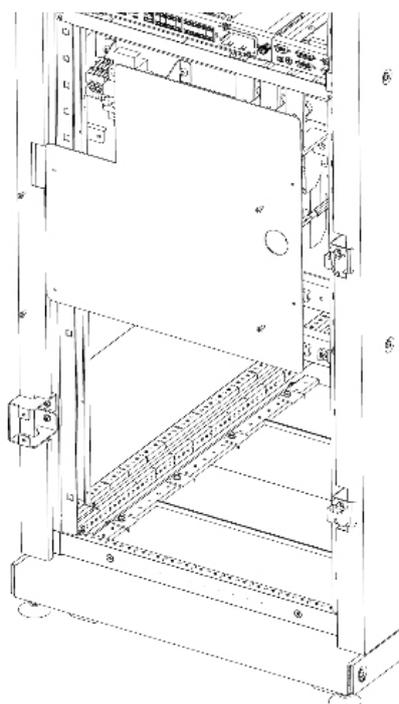
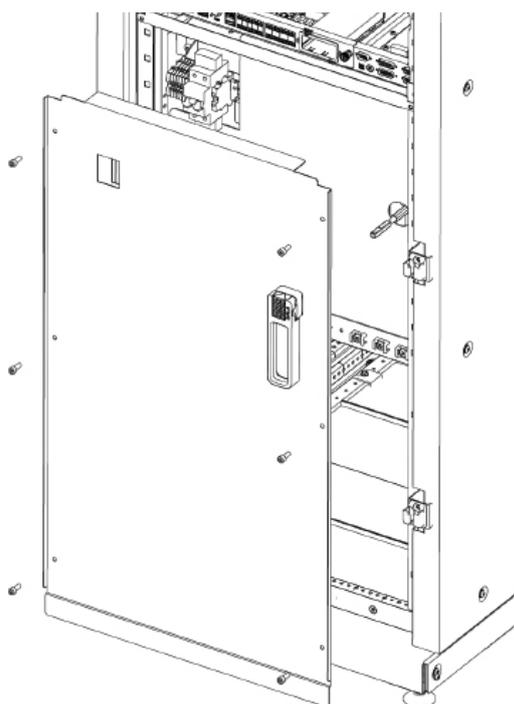
To carry out all the electrical connection operations, it is necessary to unscrew the screws that fix the distribution panel to the cabinet. The screws must be saved to close the distribution panel at the end of the installation (hex socket M6x20 screws along with M6 toothed washers).

Unscrew also the screws that fix the Plexiglas protection panel and save them to close the panel and the end of the installation (Phillips pan head M4x10 screws).

The following pictures show how to disassemble the panels:



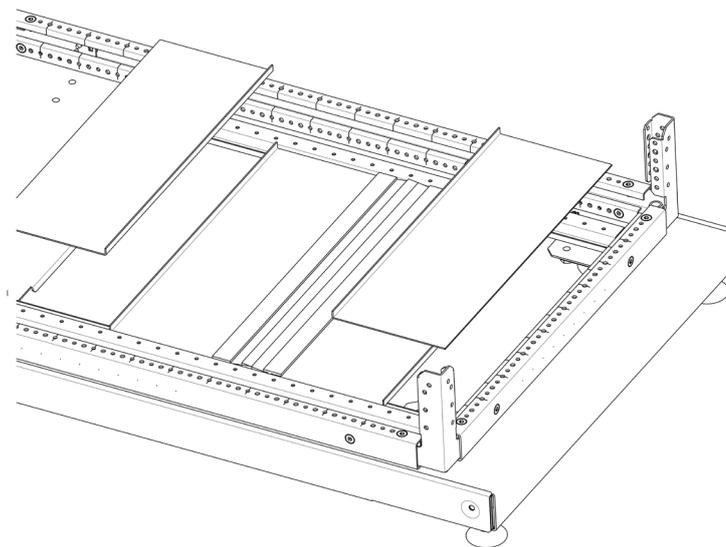
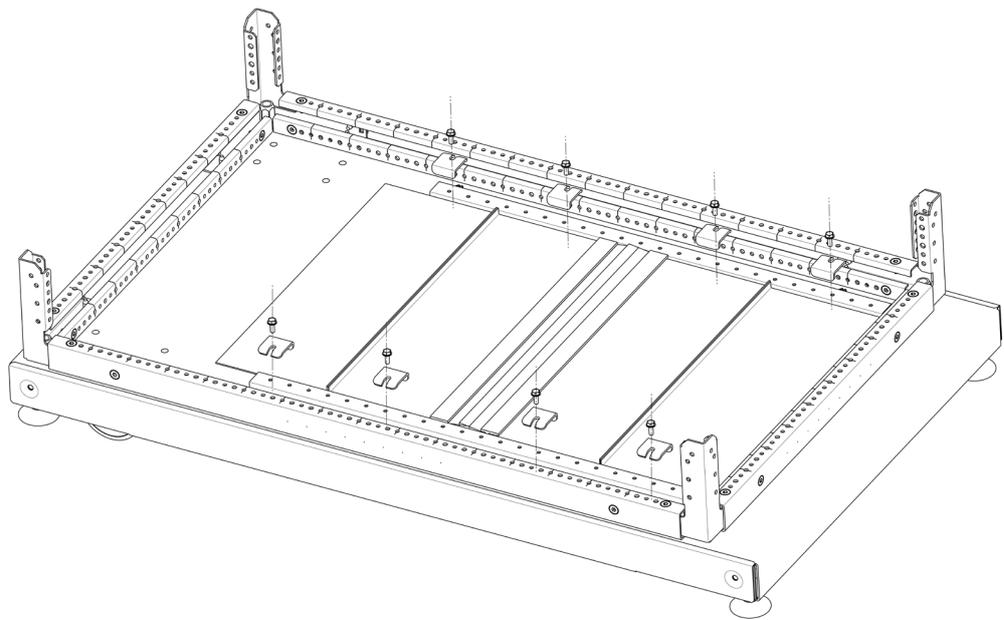
KEOR MOD 125

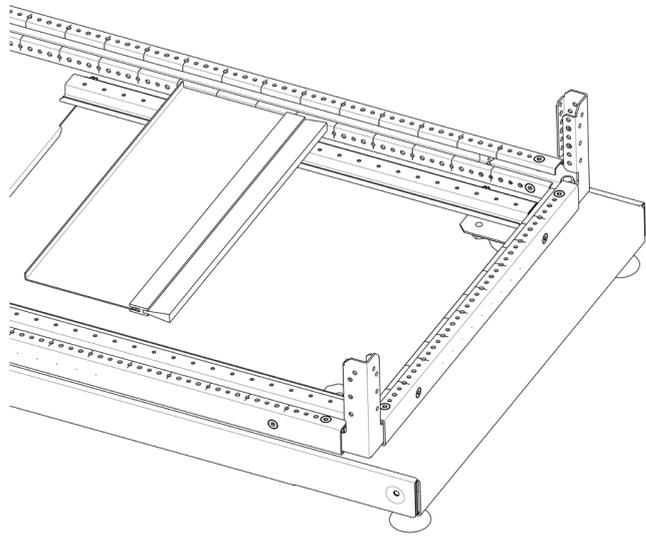
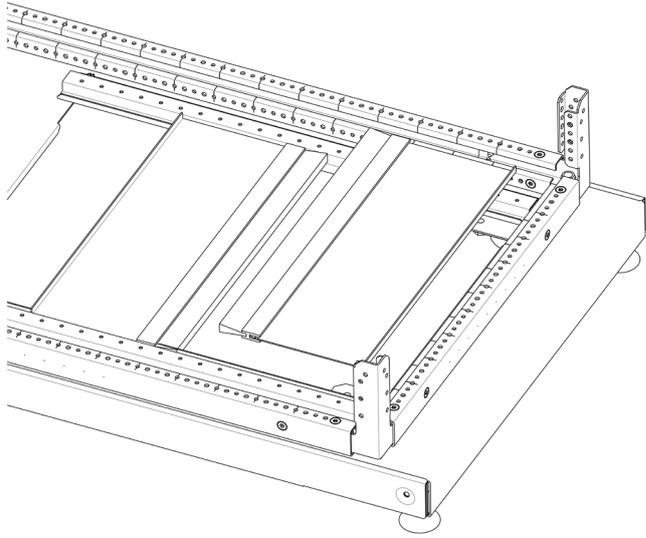
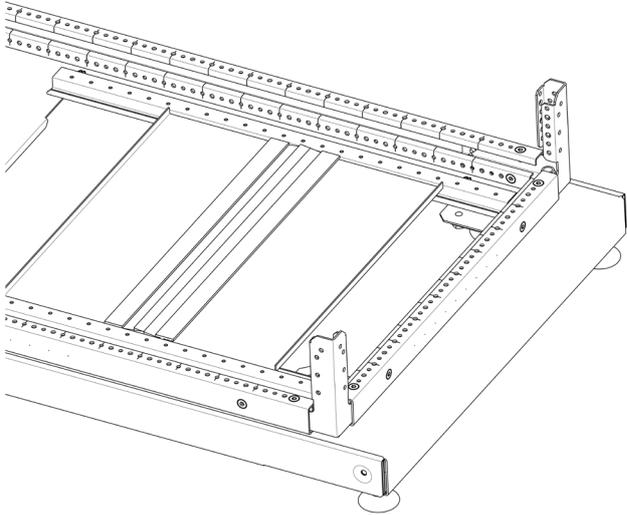


KEOR MOD 250

## 4. Installation

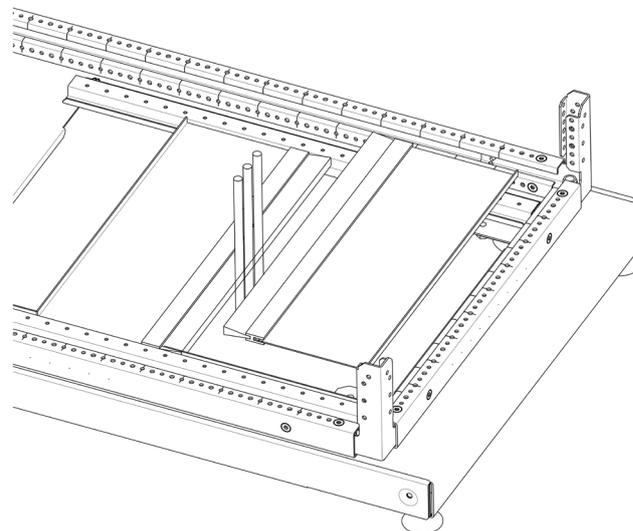
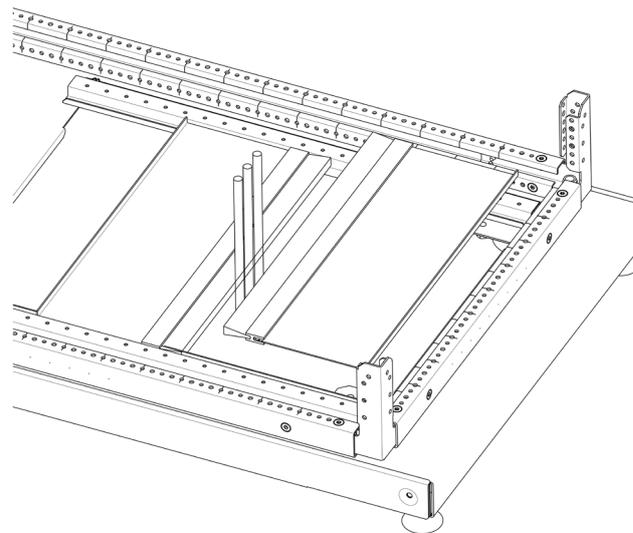
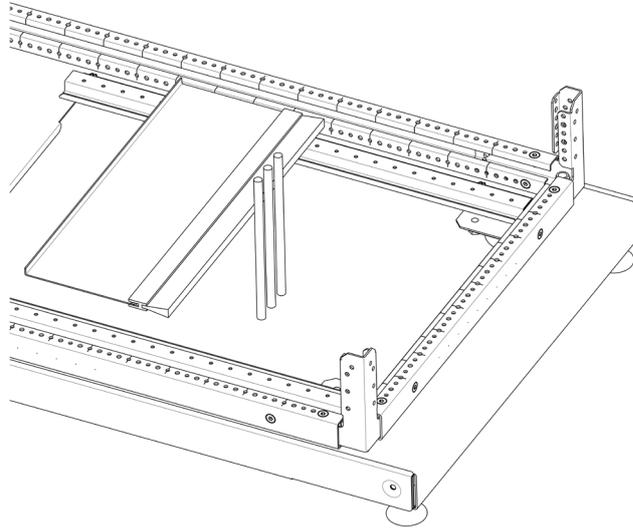
To insert the cables in the cabinet, it is necessary to remove the panels at the bottom of the cabinet according to the following sequence:

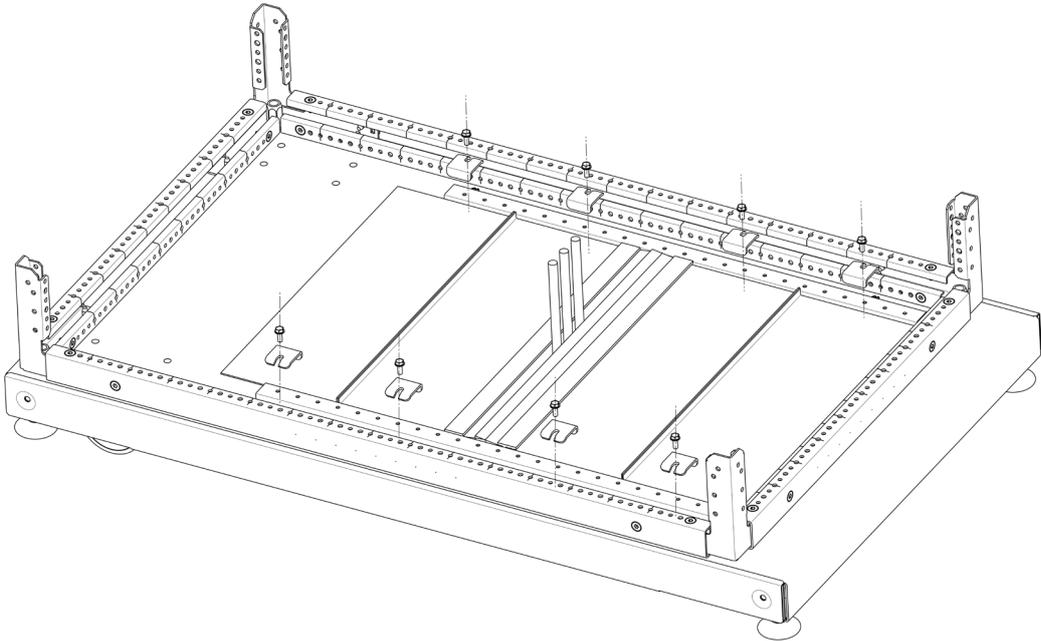
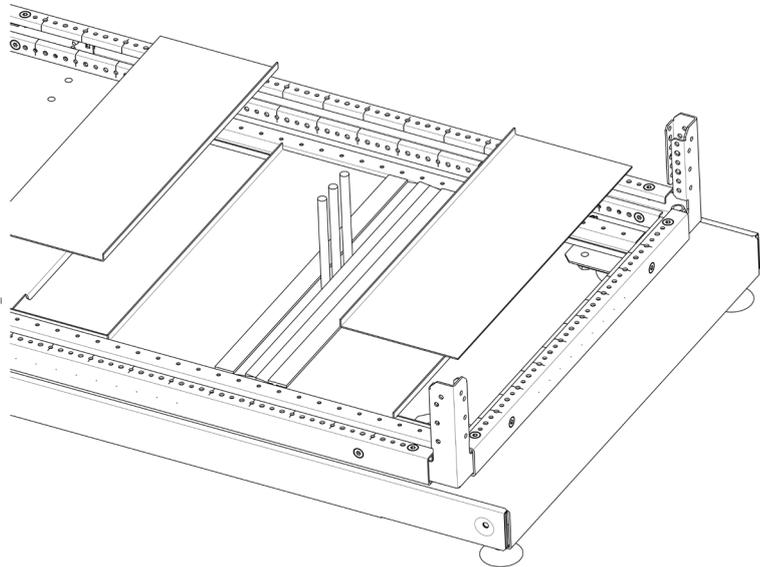




## 4. Installation

Insert the cable and add the panels according to the following sequence:





## 4. Installation

### 4.2.3 Earthing connection

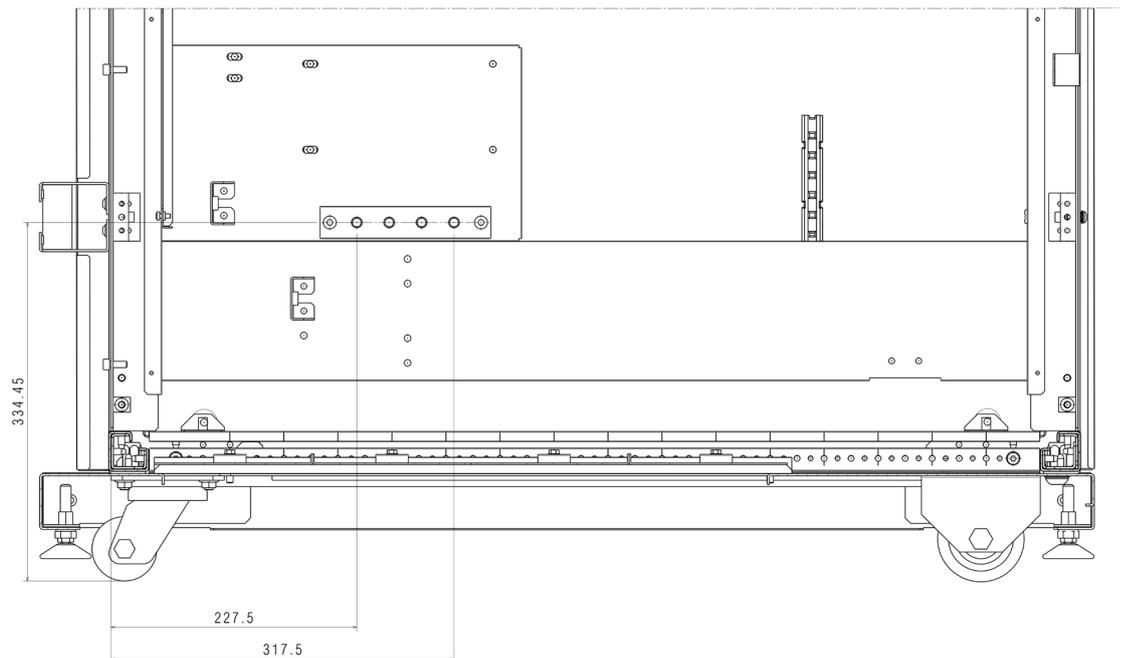
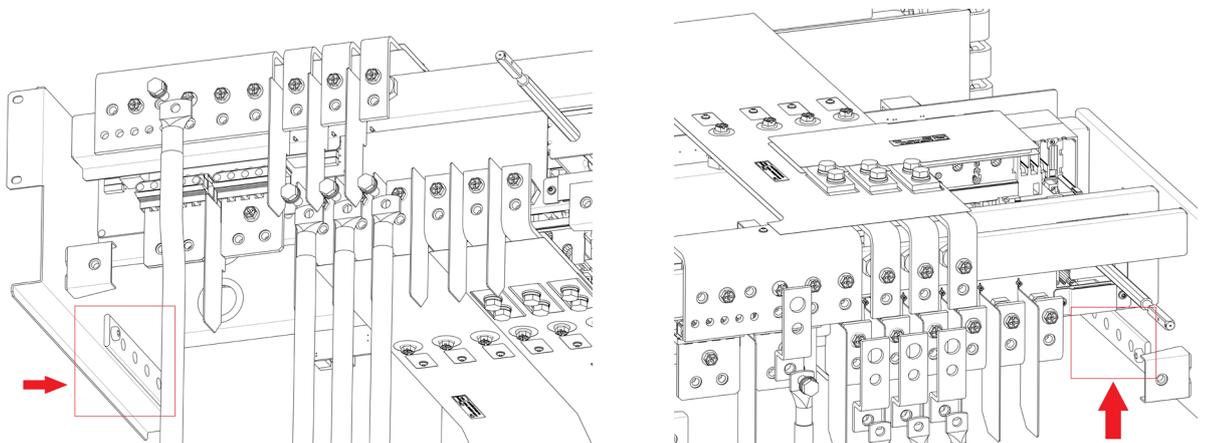
Before carrying out any other installation operation, connect the earthing wiring coming from the low voltage switchgear to one of the earthing bars located on the left and right side of the busbars connection system.

The minimum cross-sectional area of the earthing conductor must be chosen according to the following criteria:

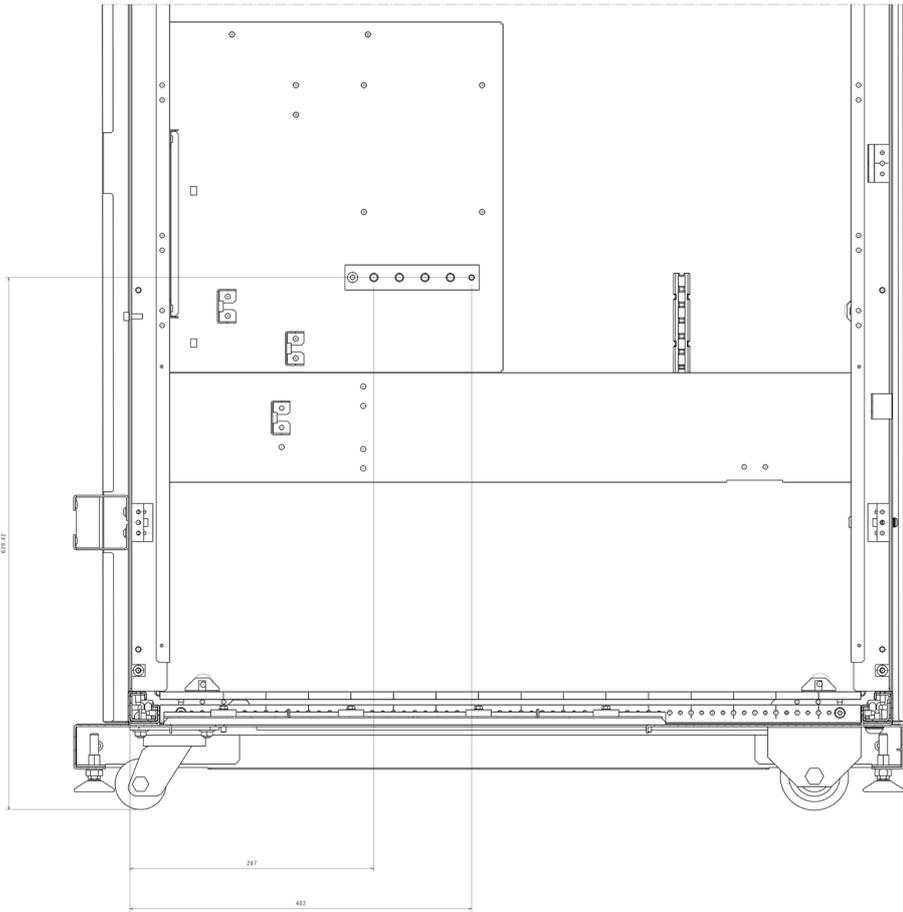
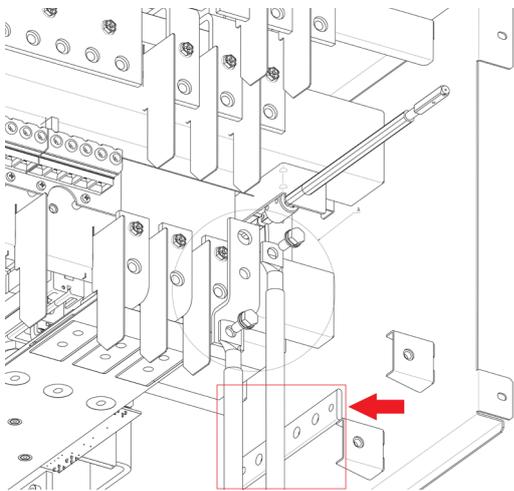
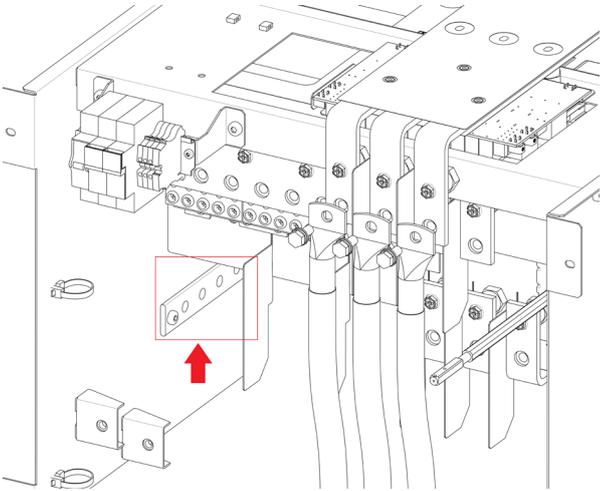
- if the cross-sectional area  $S$  of the phase conductors is  $S \leq 16 \text{ mm}^2$ , the minimum cross-sectional area of the earthing conductor must be the same as the phase conductors;
- if the cross-sectional area  $S$  of the phase conductors is  $16 \text{ mm}^2 < S \leq 35 \text{ mm}^2$ , the minimum cross-sectional area of the earthing conductor must be  $16 \text{ mm}^2$ ;
- if the cross-sectional area  $S$  of the phase conductors is  $S > 35 \text{ mm}^2$ , the minimum cross-sectional area of the earthing conductor must be  $S/2 \text{ mm}^2$ .

Each earthing cable must be crimped with M8 eyelets and fixed to the earthing metal bar using hex M8x20 screws along with M8 flat washers and M8 grower washer.

The grower washer must be put on the top of the flat washer.



KEOR MOD 125 – earthing bar

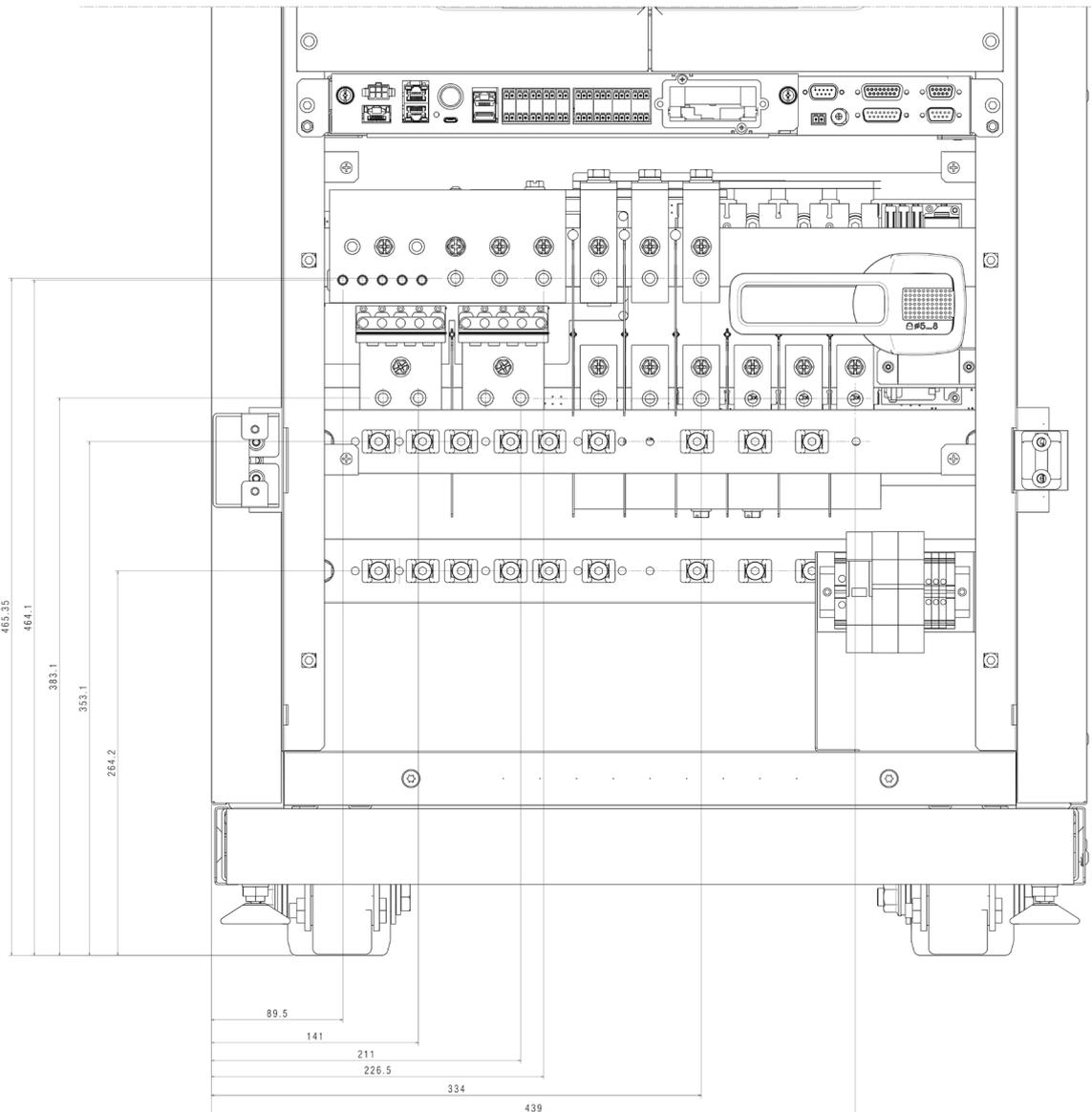


KEOR MOD 250 – earthing bar

## 4. Installation

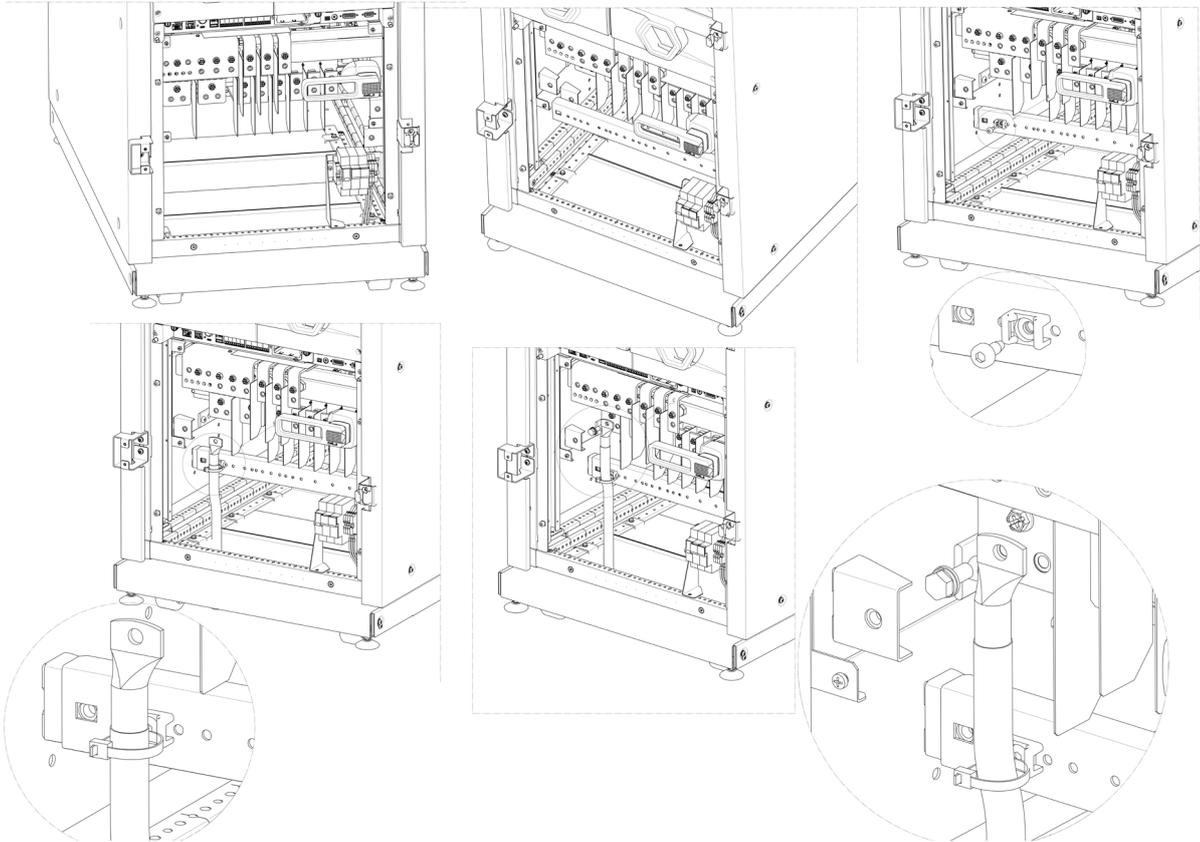
### 4.2.4 Cable fastening

In the accessory envelope there are two metal bars to fasten the cables along with plastic supports for cable ties. Each bar must be fixed to the cabinet using two hex M8x14 screws. The plastic supports for the cable ties must be fixed on the bar using the M6 torx pan head screws.



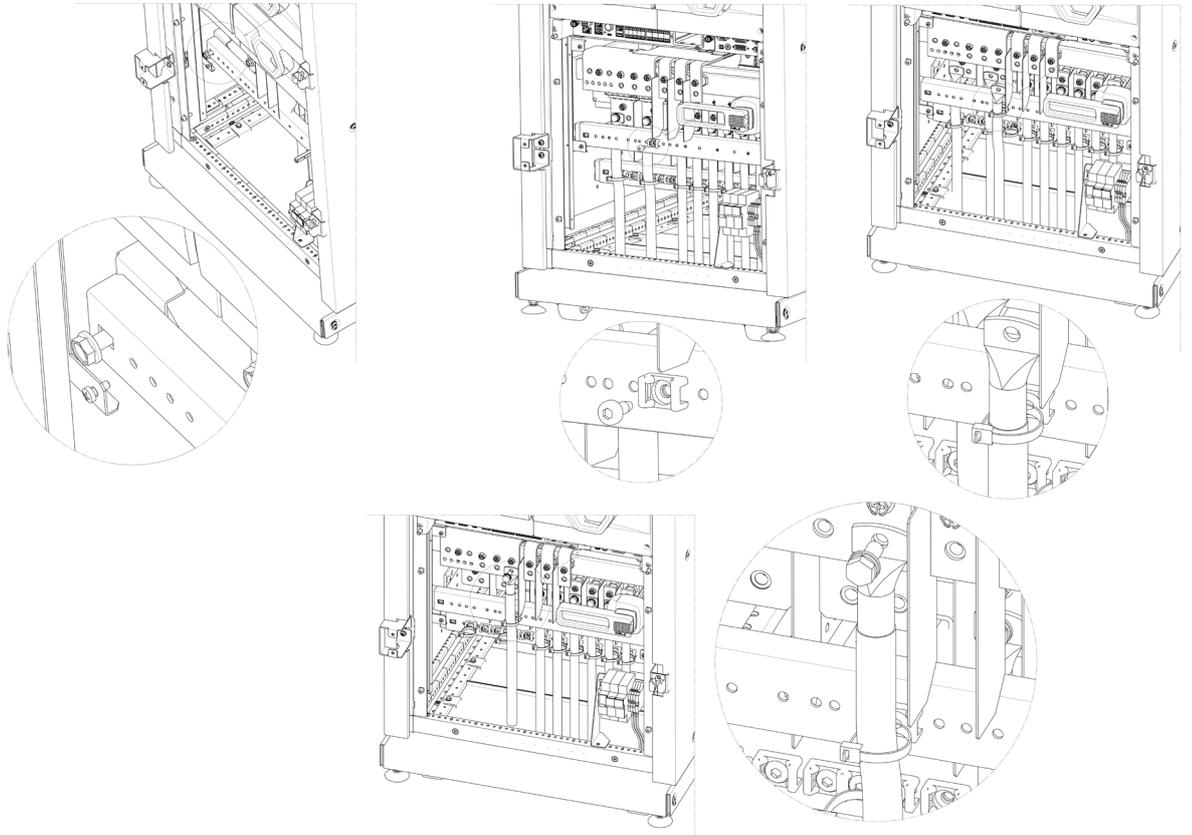
(all the dimensions are in mm)

**KEOR MOD 125 – view of the two metal bars for cable fastening**

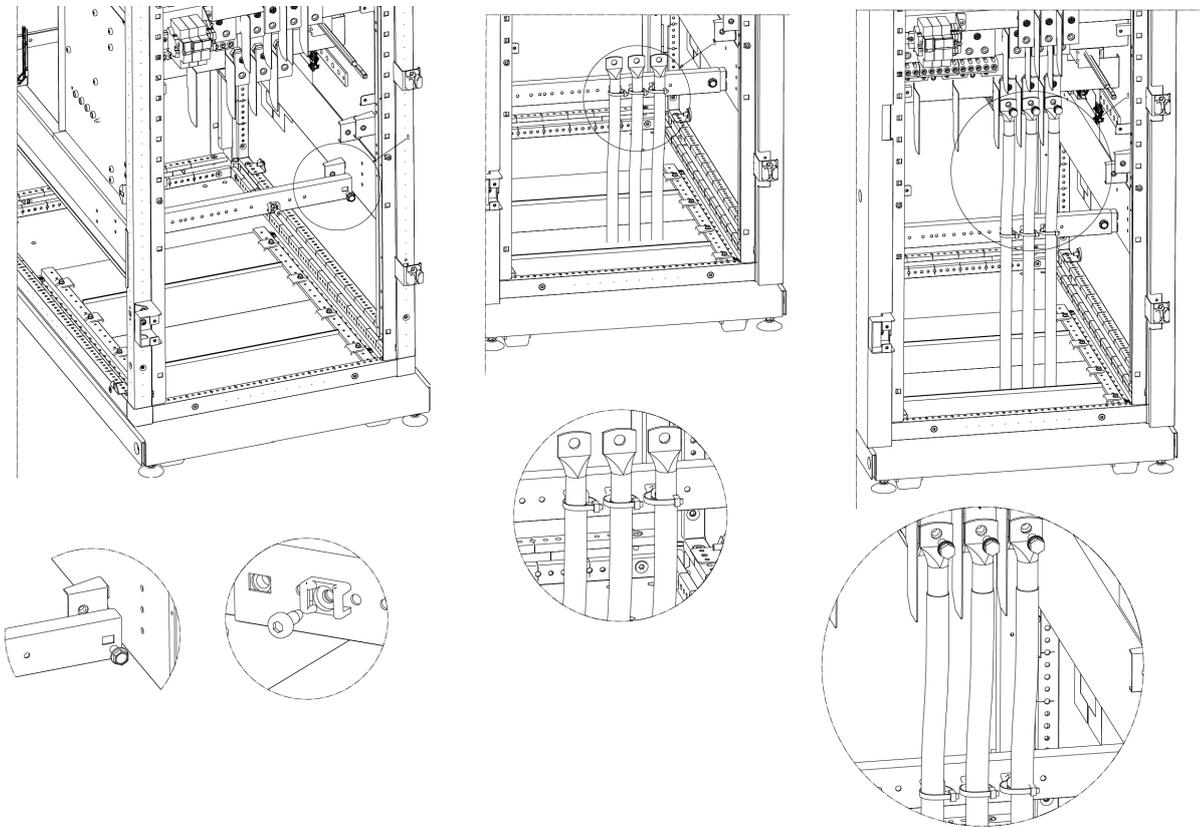


**KEOR MOD 125 – fixing of the bar and fastening of the battery, input and output cables**

## 4. Installation

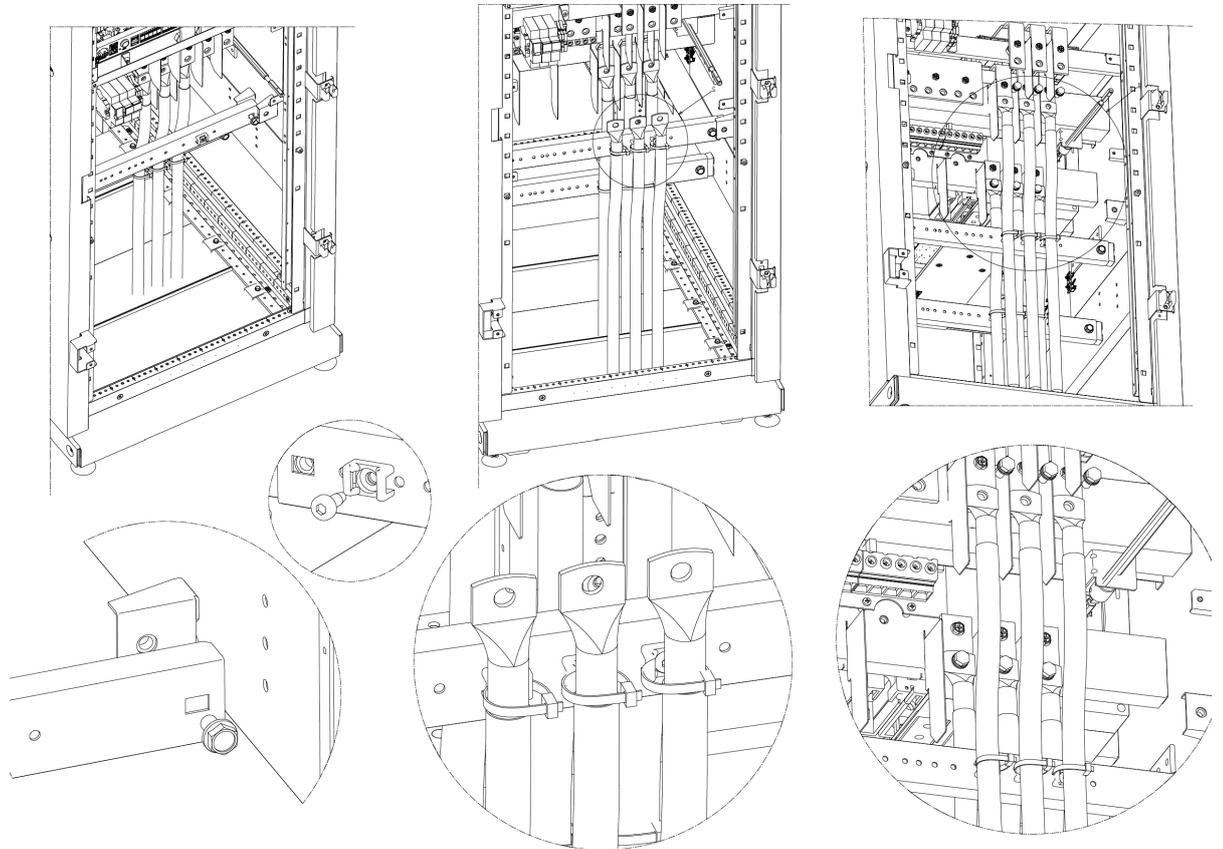


**KEOR MOD 125 – fixing of the bar and fastening of the neutral and bypass cables**

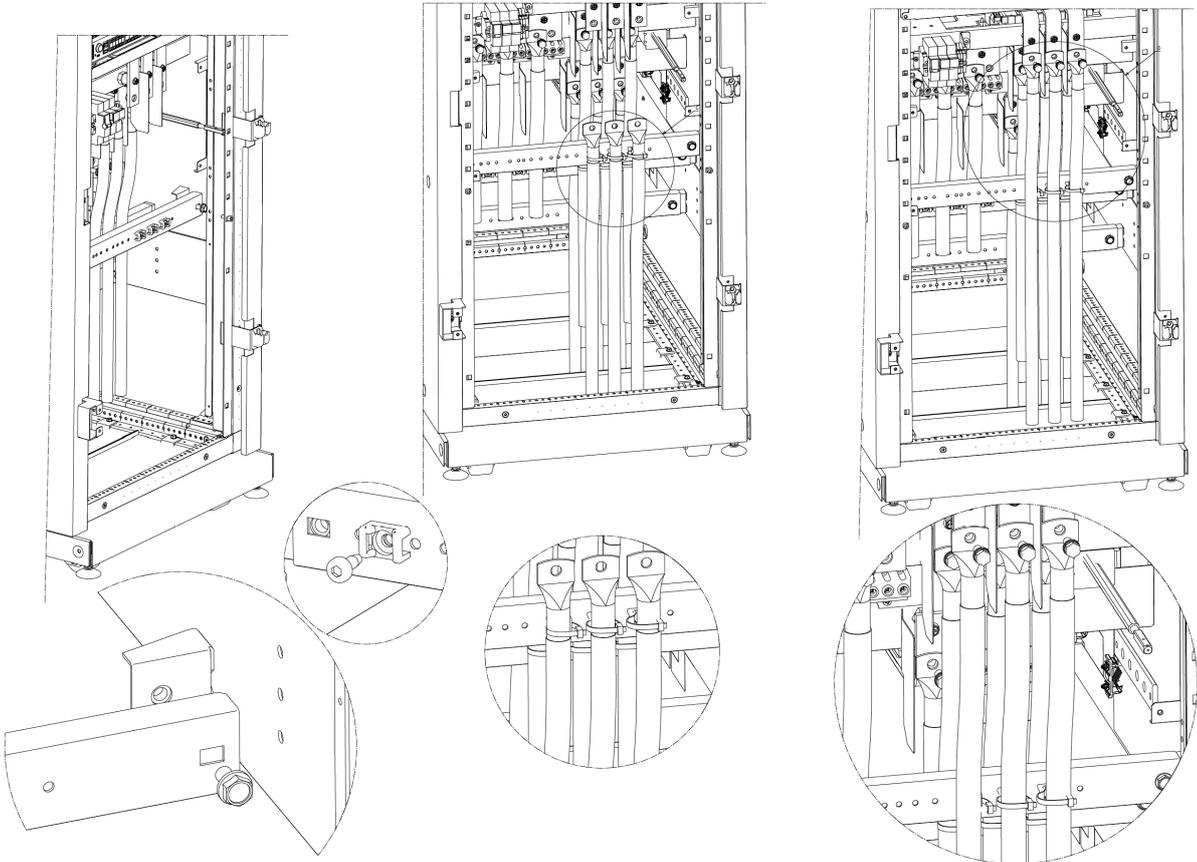


**KEOR MOD 250 – fixing of the bar and fastening of the battery and output cables**

## 4. Installation



**KEOR MOD 250 – fixing of the bar and fastening of the neutral and bypass cables**

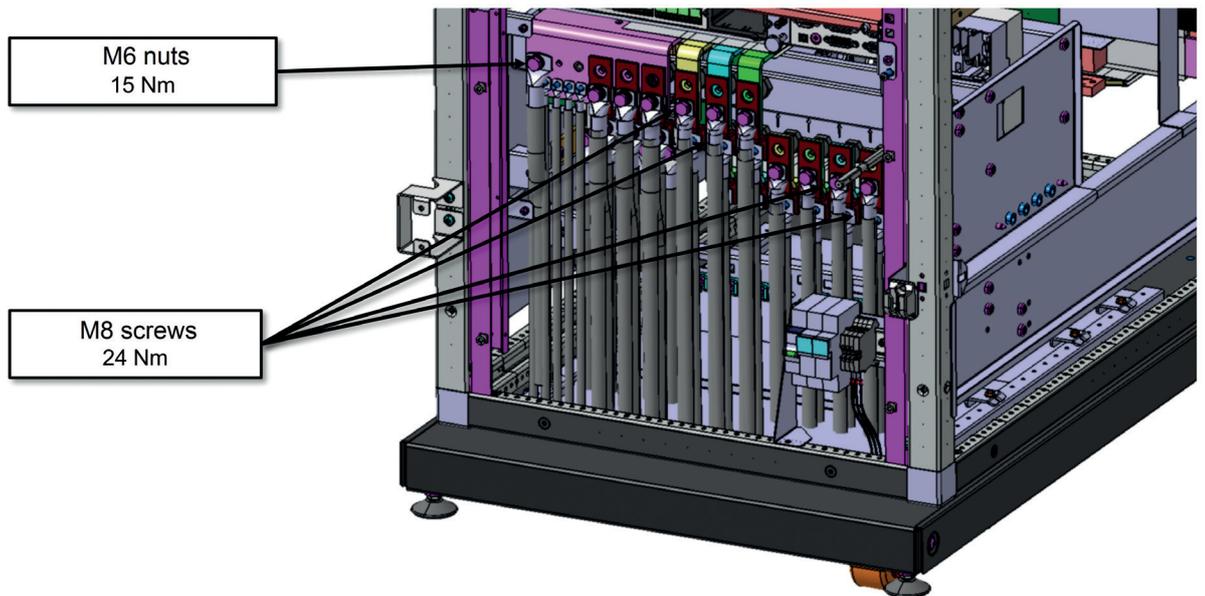


**KEOR MOD 250 – fixing of the bar and fastening of the input cables**

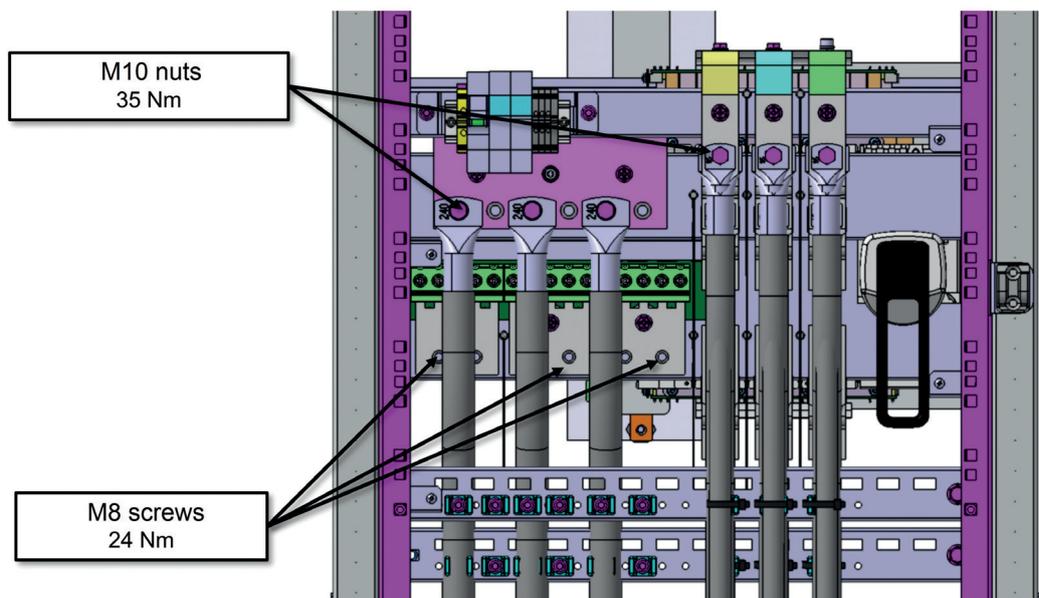
## 4. Installation

The tightening torque values for the cables are the following:

- M8 screws: 24 Nm
- M6 nuts: 15 Nm
- M10 nuts: 35 Nm



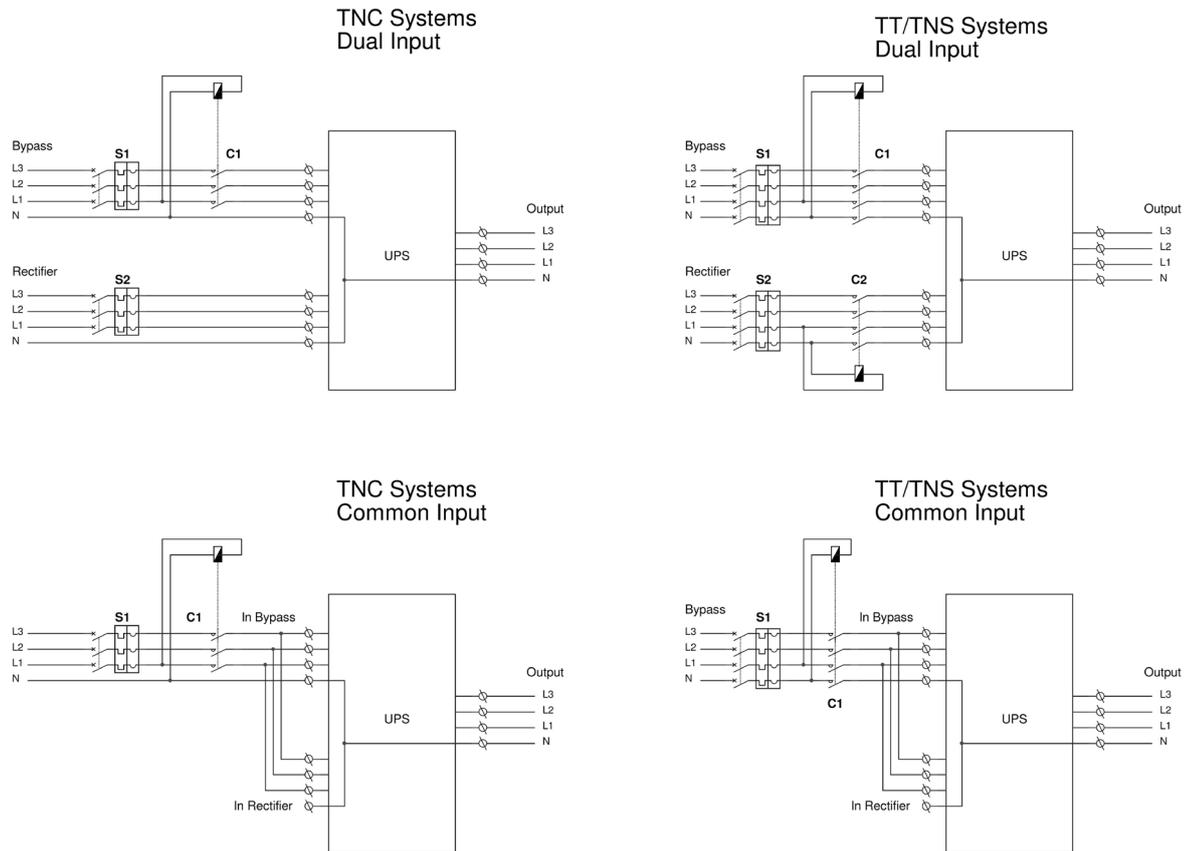
KEOR MOD 125



KEOR MOD 250

#### 4.2.5 Backfeed protection

An external protection against voltage backfeed must be provided according to the following diagrams:



#### 4.2.6 Input cables installation

The installation must be done according to the following steps:

- the maximum voltage allowed is 400 V + 15% - 20%;
- check that the available mains power is at least the same of the UPS nominal power;
- check that the cables to connect to the UPS are isolated upstream and no voltage is present;
- check that the earthing cable from the low voltage switchgear is properly connected (see paragraph 4.2.3);
- connect the input neutral cable to the neutral busbar;
- connect the cables L1,L2, L3 of the input line to the terminals L1IN, L2IN e L3IN of the input busbar, being careful to observe the phase sequence (L1, L2, L3).



#### WARNING

The neutral input cable must always be connected.

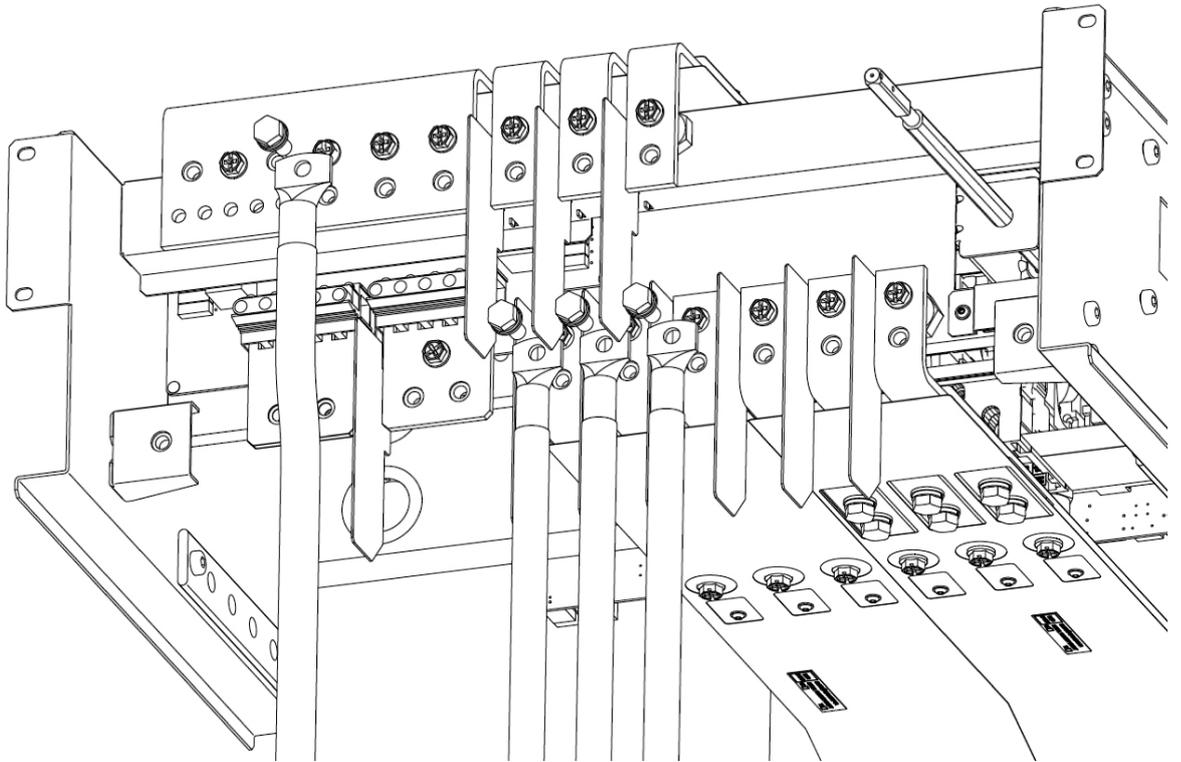
For Keor MOD 125, the cables must be crimped with M8 eyelets and fixed to the busbar using hex M8x20 screws along with M8 flat washers and M8 grower washer.

The grower washer must be put on the top of the flat washer.

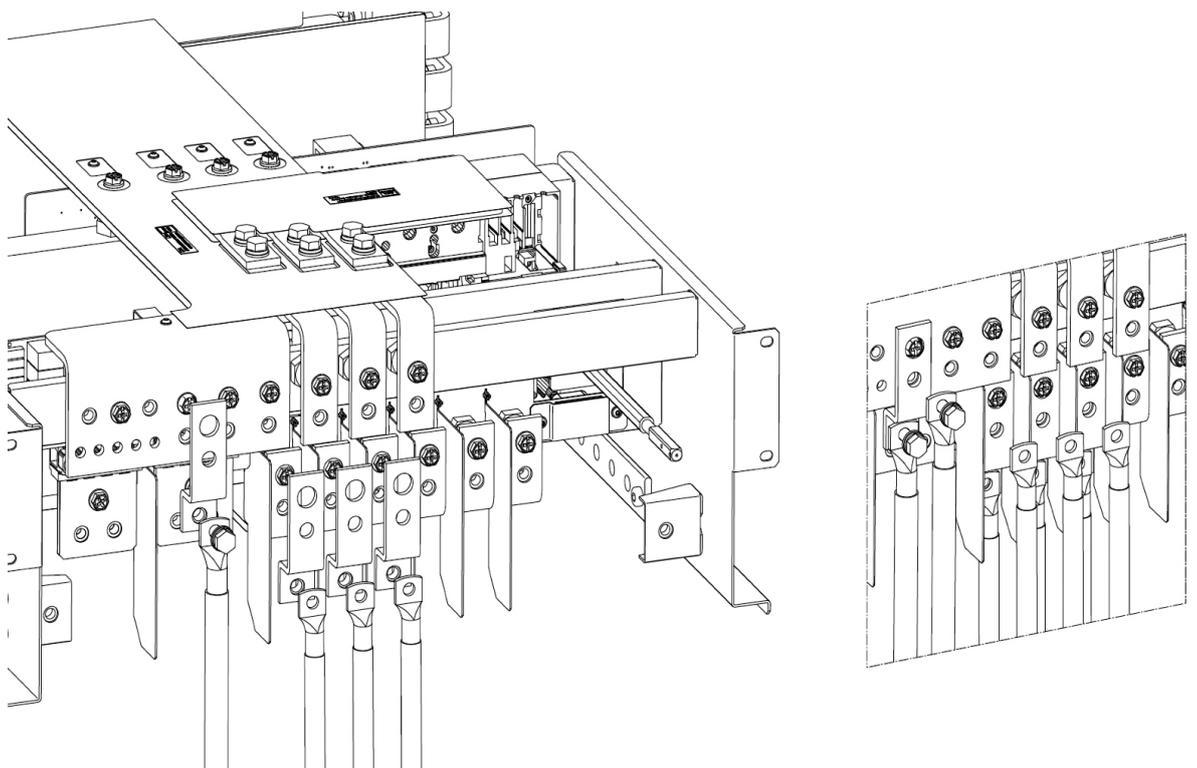
For Keor MOD 250, the cables must be crimped with M10 eyelets and fixed to the busbar using hex M10x30 screws along with M10 flat washers and M10 grower washer.

The grower washer must be put on the top of the flat washer.

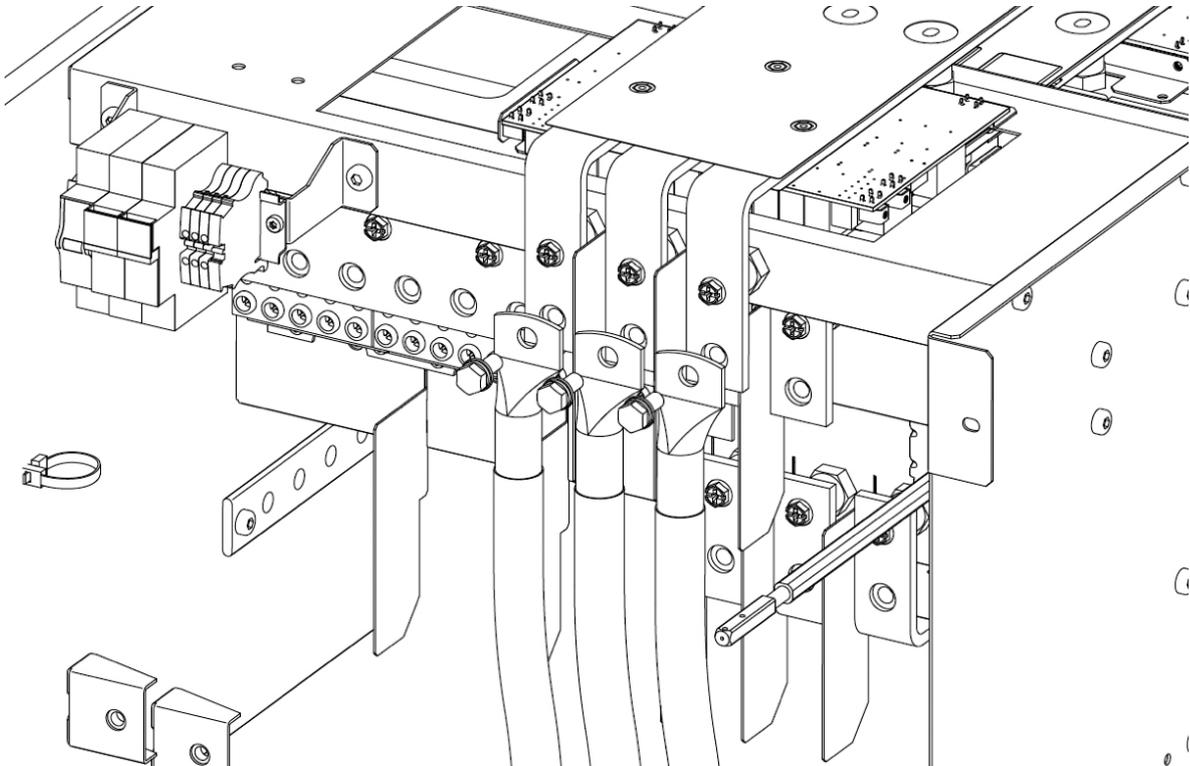
## 4. Installation



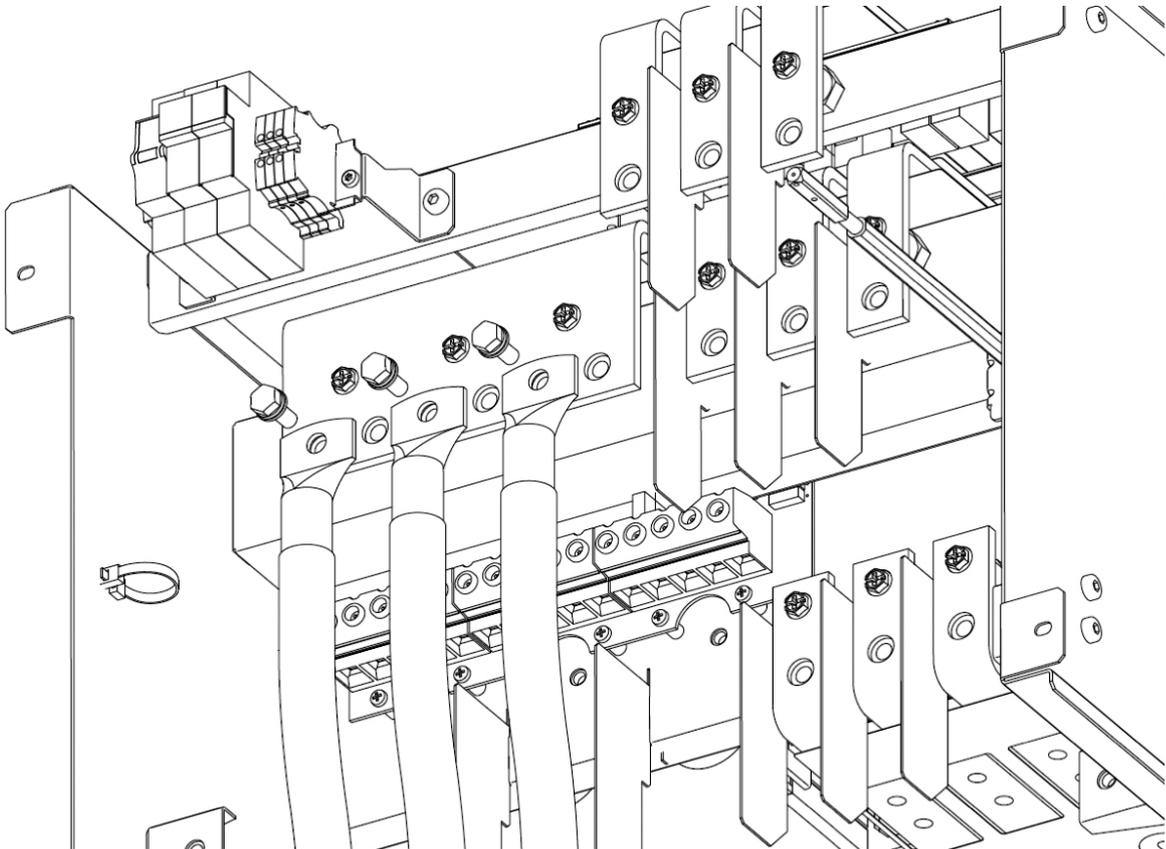
**KEOR MOD 125 – neutral and input cables installation**



**KEOR MOD 125 – neutral and input cables installation with accessory for double cable**



KEOR MOD 250 – input cables installation



KEOR MOD 250 – neutral cables installation

## 4. Installation

### 4.2.7 Bypass cables installation

The default configuration has the bypass line in common with the input line.

A separate bypass line is possible only if the bypass and mains neutral wires are in common (same electrical potential) and each power line must always have their own breakers.

The UPS has the mains, bypass and output passing neutral and they are connected internally to each other.

If there is the need to have a separate bypass line, the installation must be done according to the following steps:

- the maximum voltage allowed is  $400\text{ V} + 15\% - 20\%$ ;
- check that the available mains power is at least the same of the UPS nominal power;
- check that the cables to connect to the UPS are isolated upstream and no voltage is present;
- check that the earthing cable from the low voltage switchgear is properly connected (see paragraph 4.2.3);
- connect the bypass neutral cable to the neutral busbar;
- remove the accessory that connects the bypass busbar to the input busbar;
- connect the cables L1, L2, L3 of the bypass line to the terminals L1BYP, L2BYP e L3BYP of the bypass busbar, being careful to observe the phase sequence (L1, L2, L3).



#### **WARNING**

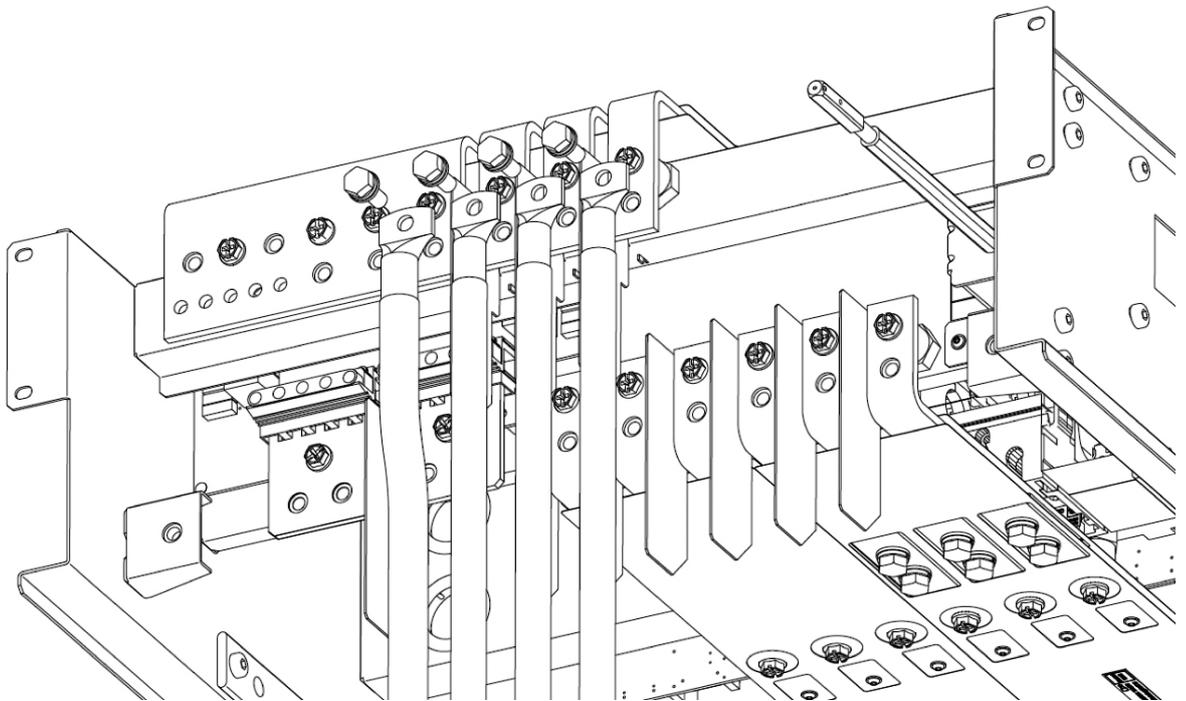
The neutral bypass cable must always be connected.

For Keor MOD 125, the cables must be crimped with M8 eyelets and fixed to the busbar using hex M8x20 screws along with M8 flat washers and M8 grower washer.

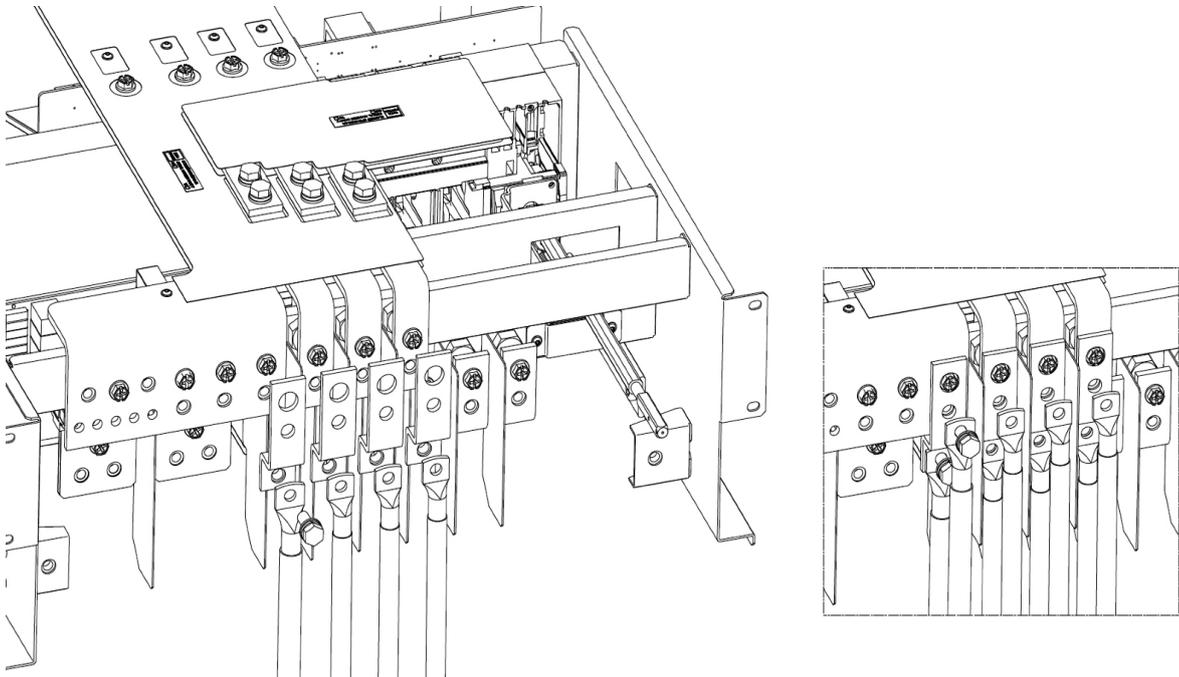
The grower washer must be put on the top of the flat washer.

For Keor MOD 250, the cables must be crimped with M10 eyelets and fixed to the busbar using hex M10x30 screws along with M10 flat washers and M10 grower washer.

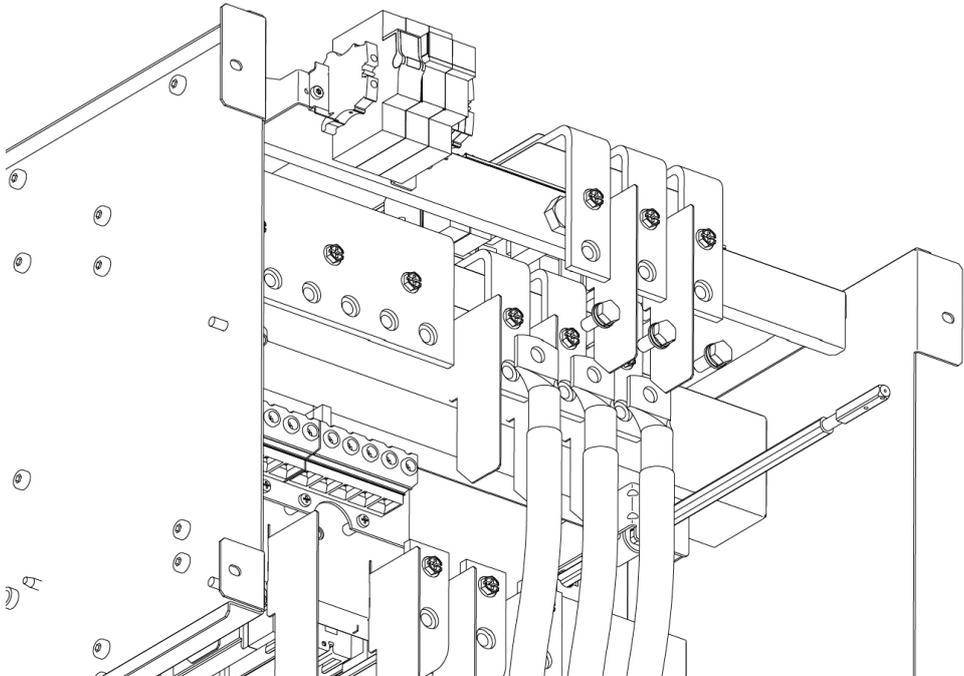
The grower washer must be put on the top of the flat washer.



**KEOR MOD 125 – neutral and bypass cables installation**

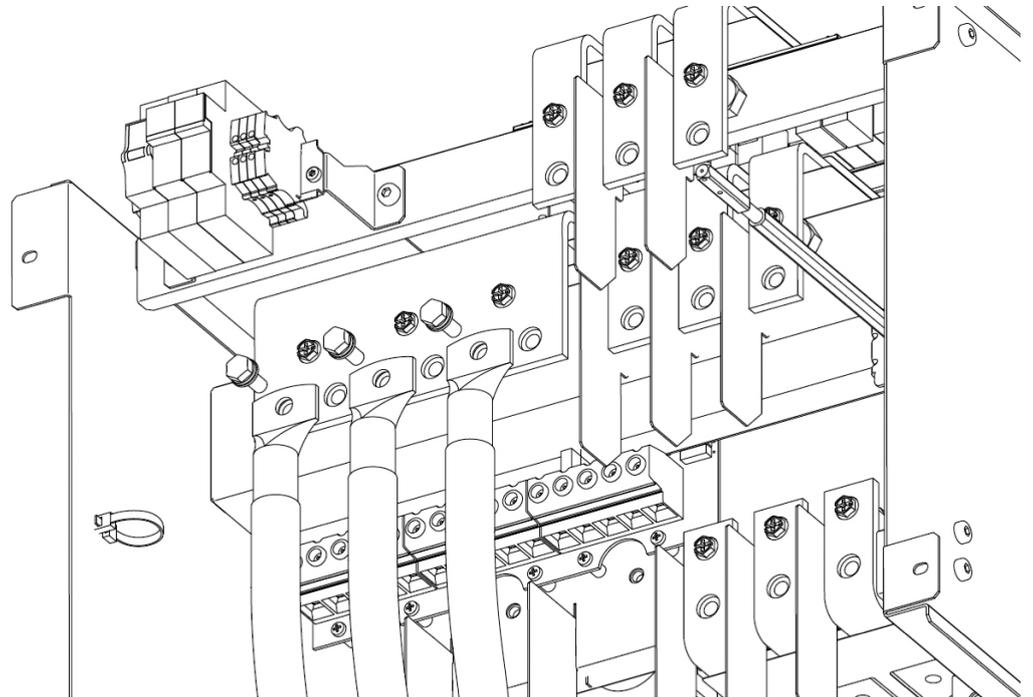


**KEOR MOD 125 – neutral and bypass cables installation with accessory for double cable**



**KEOR MOD 250 – bypass cables installation**

## 4. Installation



**KEOR MOD 250 – neutral cables installation**

### 4.2.8 Output cables installation

The installation must be done according to the following steps:

- check that the nominal power of the UPS is at least the same of the nominal power of the load;
- check that the cables to connect to the UPS are isolated upstream and no voltage is present;
- check that the earthing cable from the low voltage switchgear is properly connected (see paragraph 4.2.3);
- connect the output neutral cable to the neutral busbar;
- connect the cables L1, L2, L3 of the bypass line to the terminals L1OUT, L2 OUT e L3 OUT of the bypass busbar, being careful to observe the phase sequence (L1, L2, L3).

#### **INDICATION**

Provide a separate switchgear for the load. The following information must be indicated on the system switchgear by means of stickers or similar:

- maximum nominal power of the total load;
- maximum nominal power of the load at the load outlets;
- if a common switchgear is used (mains and UPS power outlets), make sure that there is an indication of the power source on every power outlet ("Mains" or "UPS").



#### **WARNING**

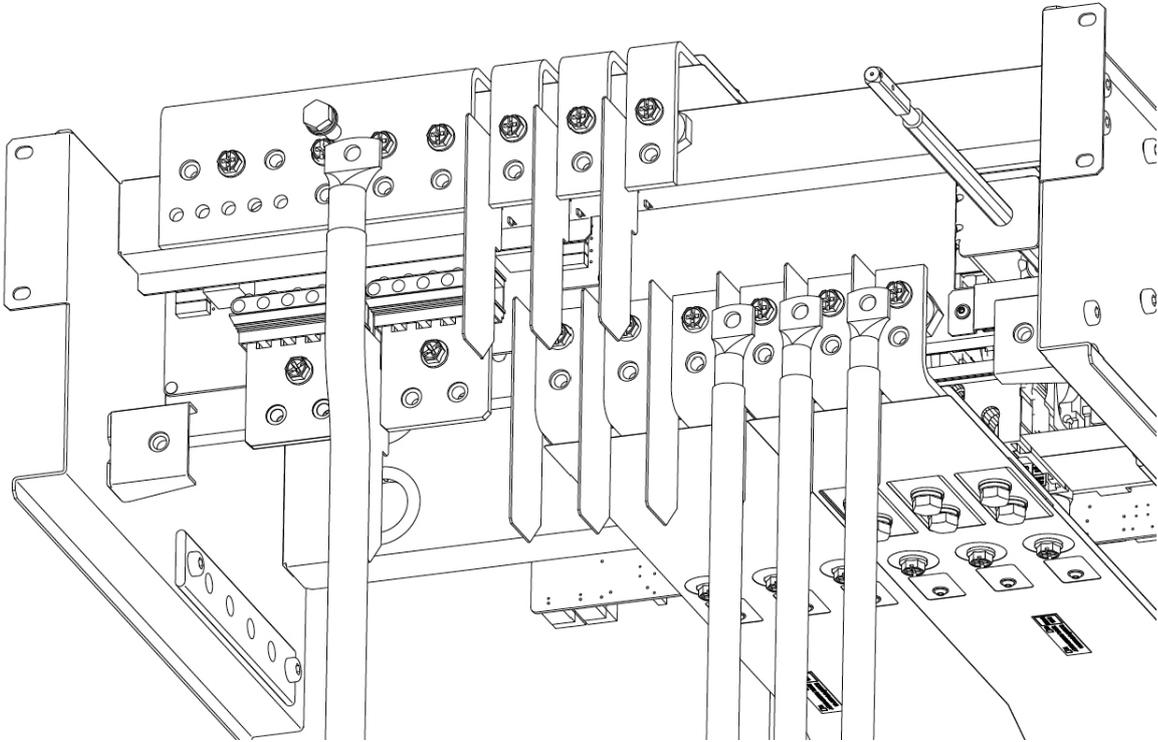
The neutral output cable must always be connected.

For Keor MOD 125, the cables must be crimped with M8 eyelets and fixed to the busbar using hex M8x20 screws along with M8 flat washers and M8 grower washer.

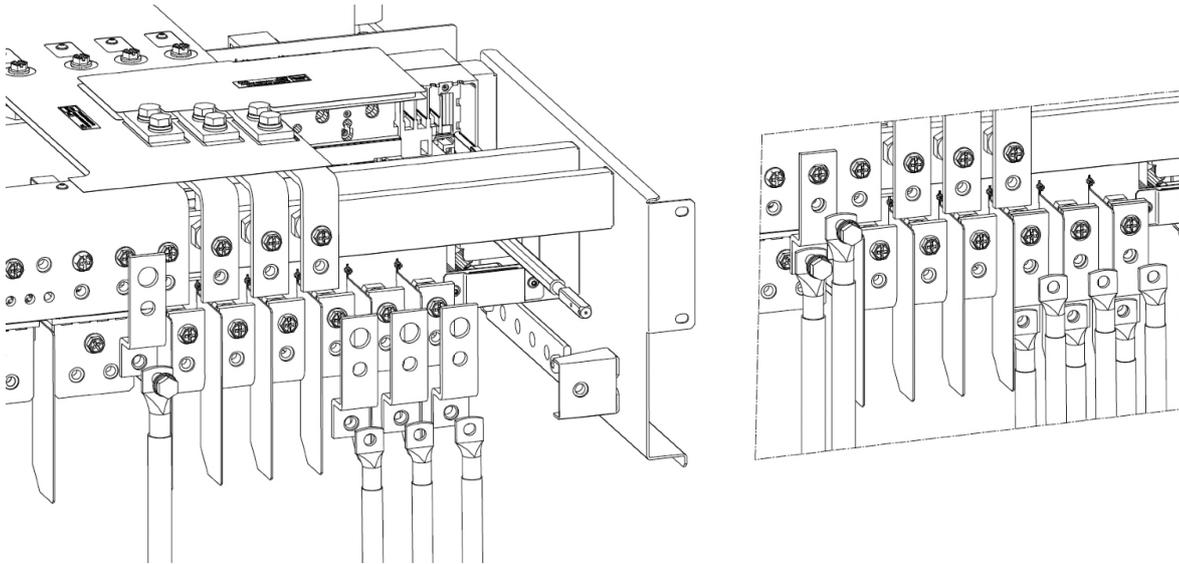
The grower washer must be put on the top of the flat washer.

For Keor MOD 250, the cables must be crimped with M10 eyelets and fixed to the busbar using hex M10x30 screws along with M10 flat washers and M10 grower washer.

The grower washer must be put on the top of the flat washer.

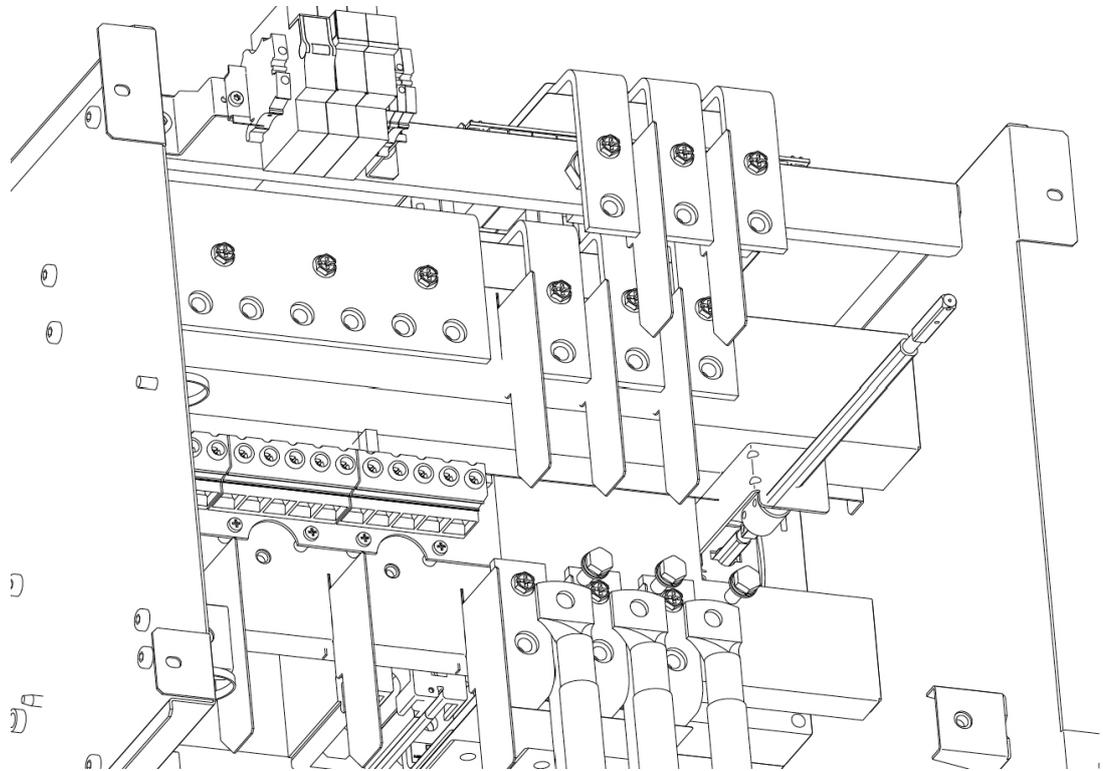


**KEOR MOD 125 – neutral and output cables installation**

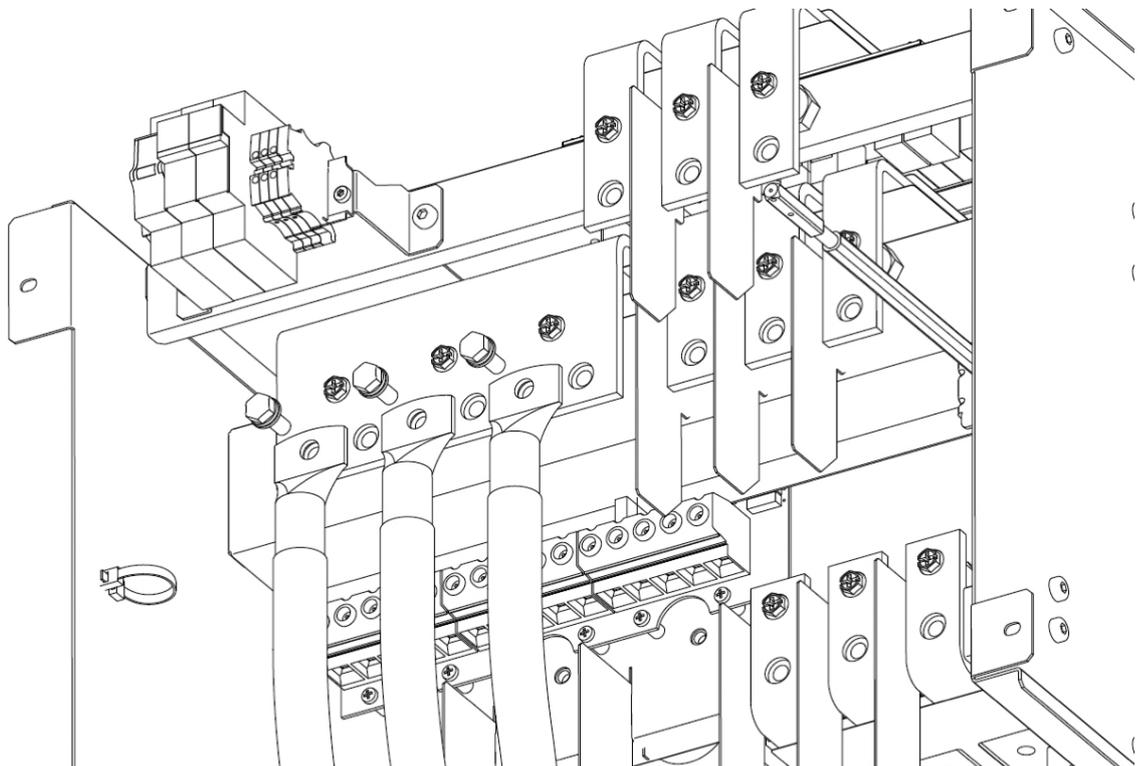


**KEOR MOD 125 – neutral and output cables installation with accessory for double cable**

## 4. Installation



**KEOR MOD 250 – output cables installation**



**KEOR MOD 250 – neutral cables installation**

#### 4.2.9 Battery cables installation

The default configuration has the strings of batteries in common.

The installation with strings of batteries in common must be done according to the following steps:

- check that the fuse breakers of each battery cabinet are open;
- check that the cables to connect the UPS are isolated upstream and no voltage is present;
- check that the earthing cable from the low voltage switchgear is properly connected (see paragraph 4.2.3);
- connect the positive cables of the battery cabinets to the terminals + BATT of the battery busbar;
- connect the negative cables of the battery cabinets to the terminals - BATT of the battery busbar;
- connect the neutral cables of the battery cabinets to the terminals N BATT of the battery busbar.

For Keor MOD 125, the cables must be crimped with M8 eyelets and fixed to the busbar using hex M8x20 screws along with M8 flat washers and M8 grower washer.

The grower washer must be put on the top of the flat washer.

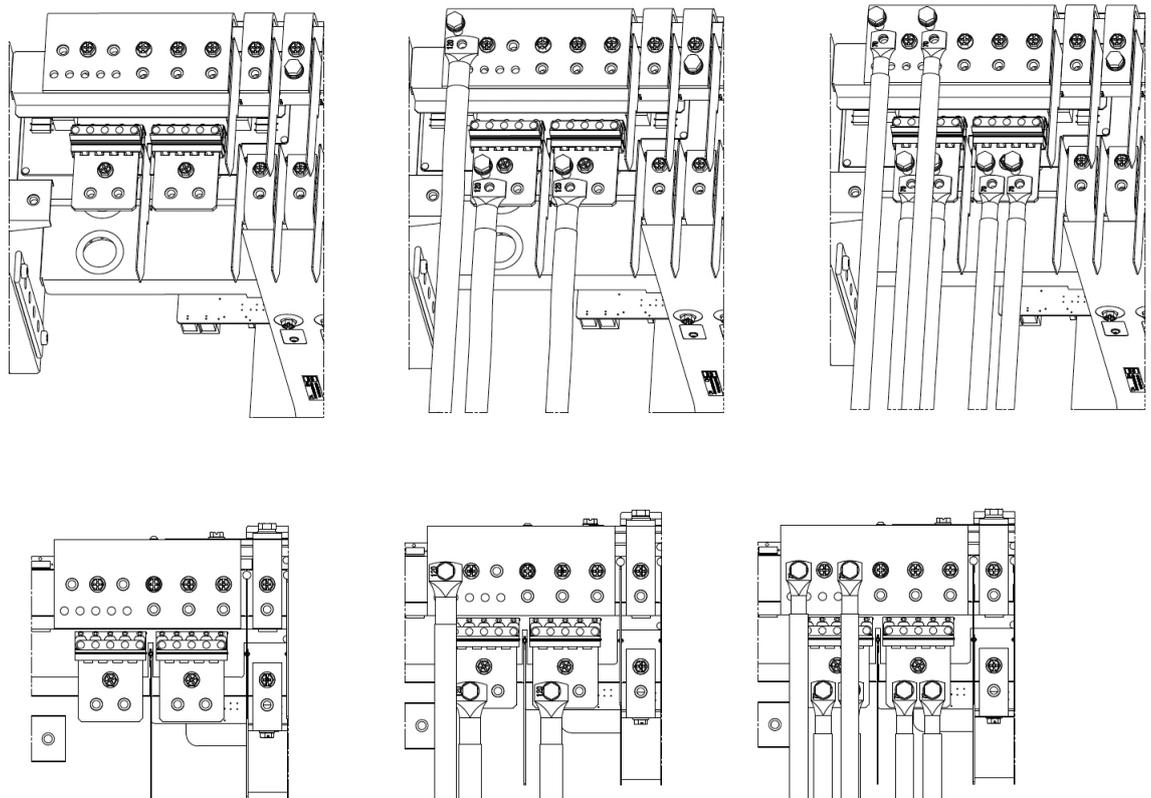
For Keor MOD 250, the cables must be crimped with M10 eyelets and fixed to the busbar using hex M10x30 screws along with M10 flat washers and M10 grower washer.

The grower washer must be put on the top of the flat washer.



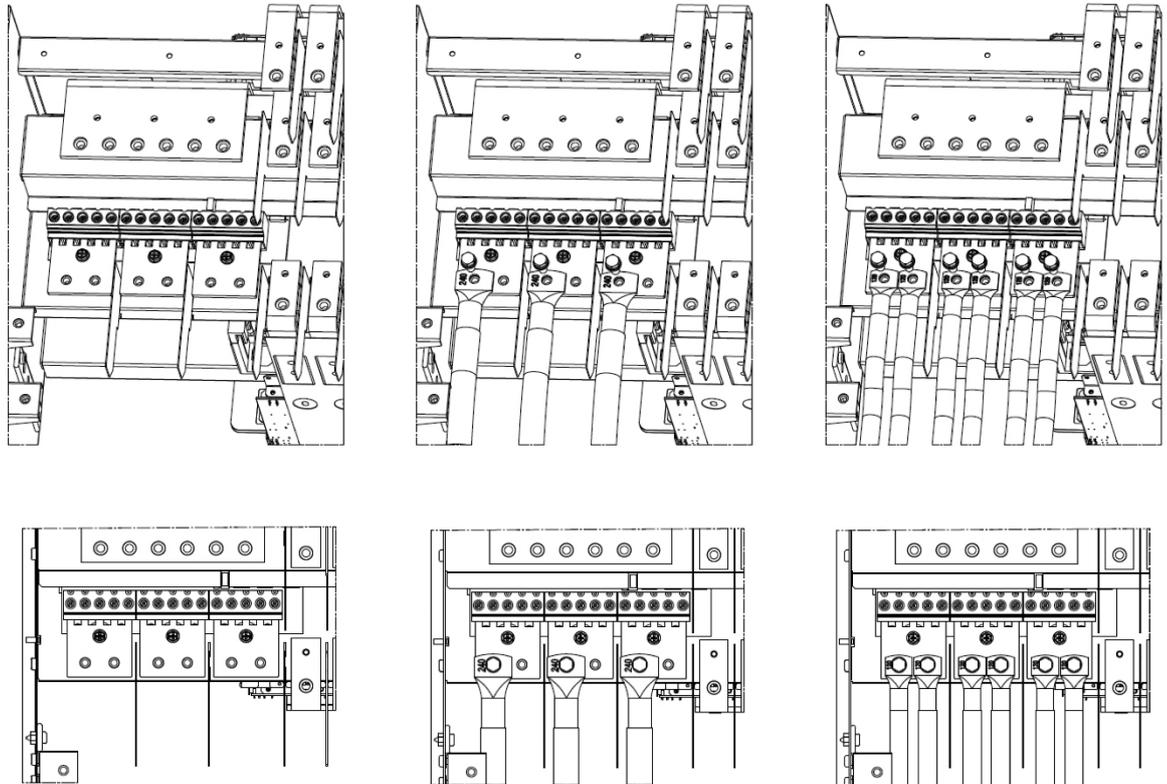
#### WARNING

The neutral battery cables must always be connected.



KEOR MOD 125 – batteries cables installation with strings of batteries in common

## 4. Installation



**KEOR MOD 250 – batteries cables installation with strings of batteries in common**

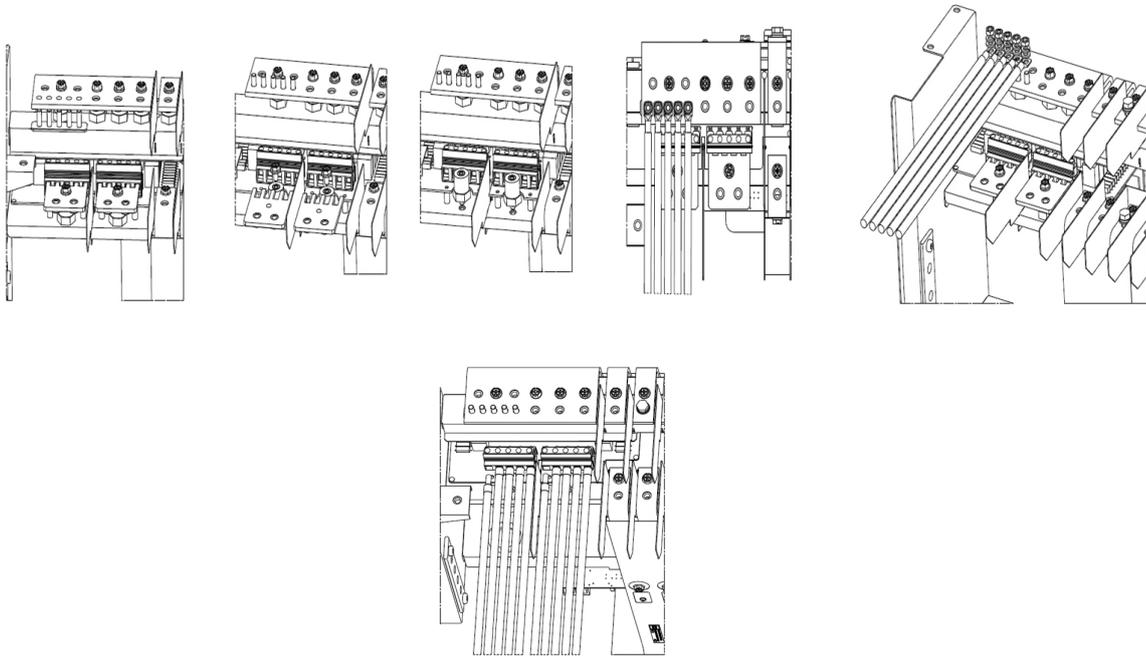
The installation with strings of batteries in common must be done according to the following steps:

- check that the available mains power is at least the same of the UPS nominal power;
- check that the cables to connect to the UPS are isolated upstream and no voltage is present;
- check that the earthing cable from the low voltage switchgear is properly connected (see paragraph 4.2.3);
- remove the plate present in the positive terminals of the battery busbar;
- remove the plate present in the negative terminals of the battery busbar;
- connect the positive cables of the battery cabinets to the terminals + BATT of the battery busbar according to the number of string: +1, +2, +3, +4, +5;
- connect the negative cables of the battery cabinets to the terminals - BATT of the battery busbar according to the number of string: -1, -2, -3, -4, -5;
- connect the neutral cables of the battery cabinets to the terminals N BATT of the battery busbar.

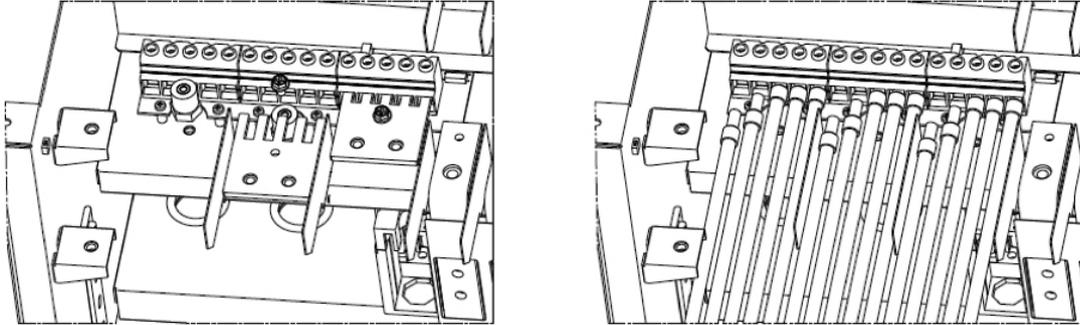


### **WARNING**

The neutral battery cables must always be connected.



**KEOR MOD 125 – batteries cables installation with independent strings of batteries**



**KEOR MOD 250 – batteries cables installation with independent strings of batteries**

## 4. Installation

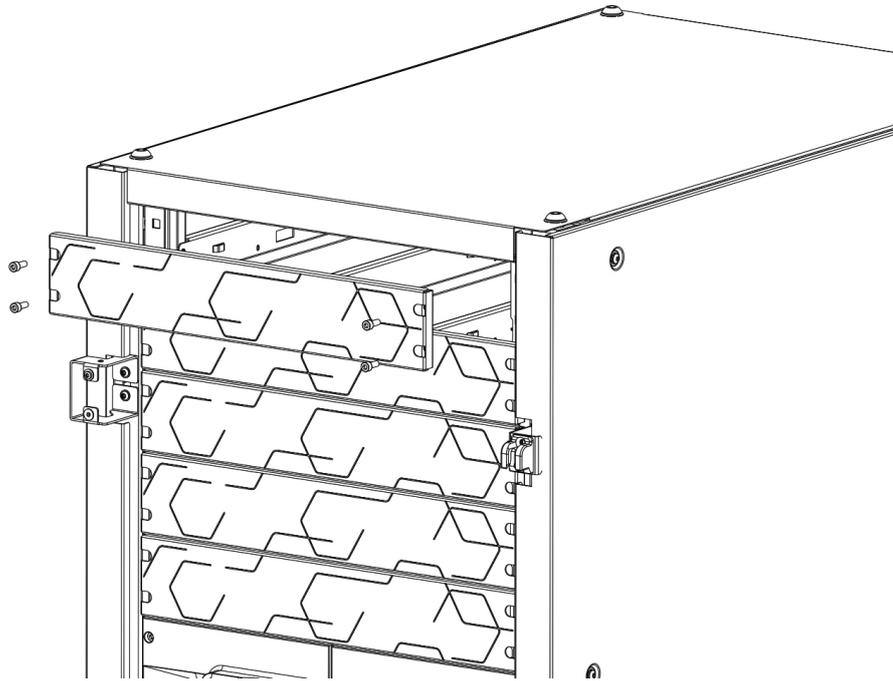
### 4.3 Power modules installation

Once all the electrical connections have been made, close the distribution panels and fix them by screwing all the hex socket M6x16 screws along with M6 toothed washers.

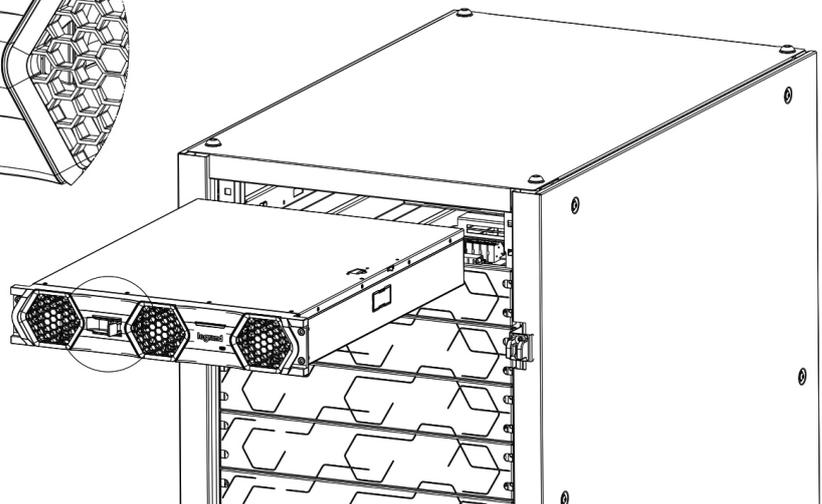
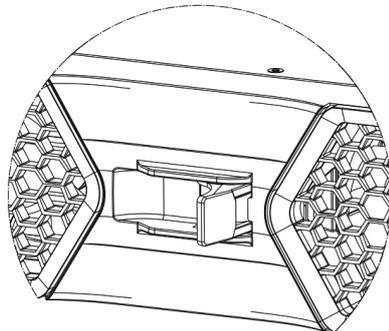
It is then possible to move onto the insertion of the power modules and battery drawers into the UPS (depending on the model).

Insert the power modules one at a time starting from the top of the cabinet.

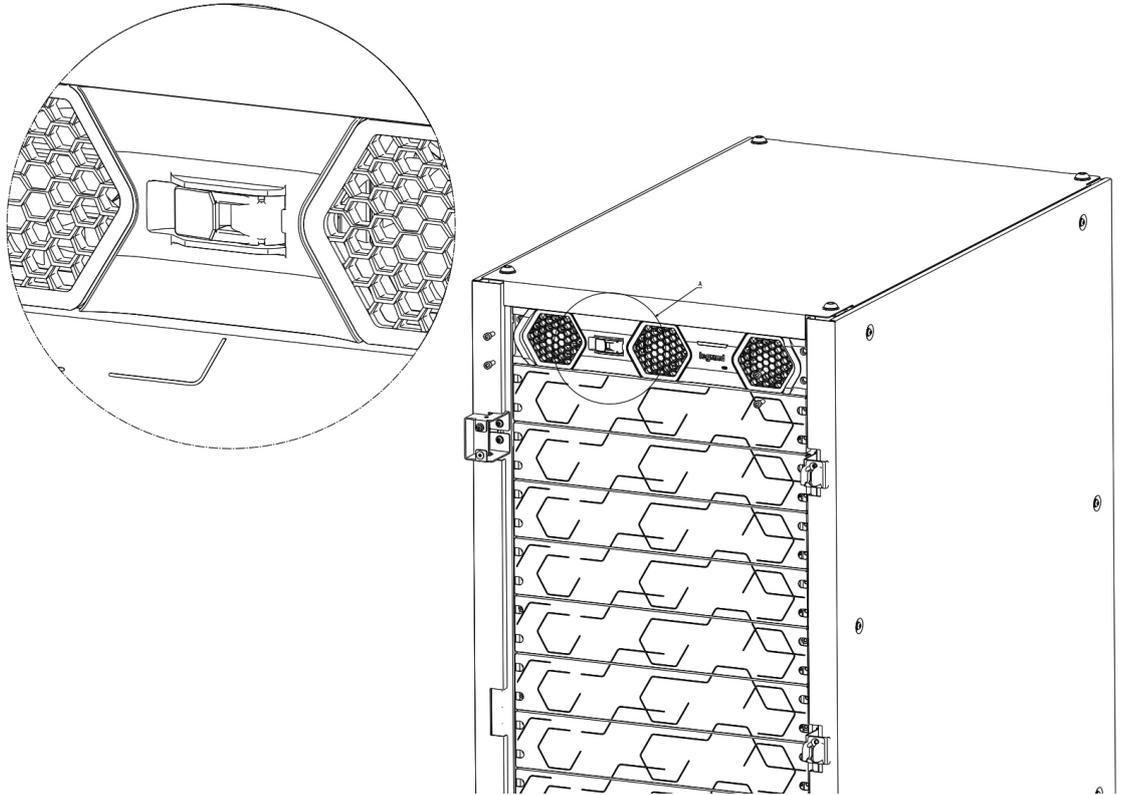
Unscrew the four screws that fix the slot cover where the power module must be installed and save them.



Insert the power module in the free slot, making sure that its switch in the front is open.



Make sure that the power module is abut and then close its front switch. Fix the module to the cabinet with the four screws that were previously saved.

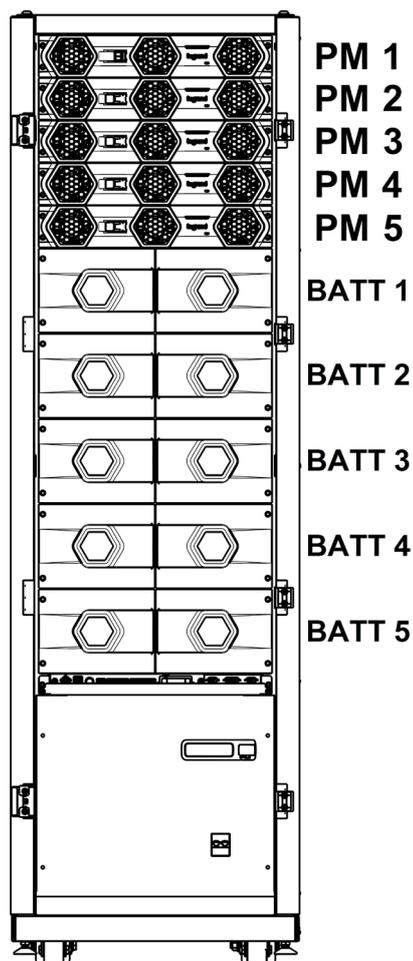


## 4. Installation

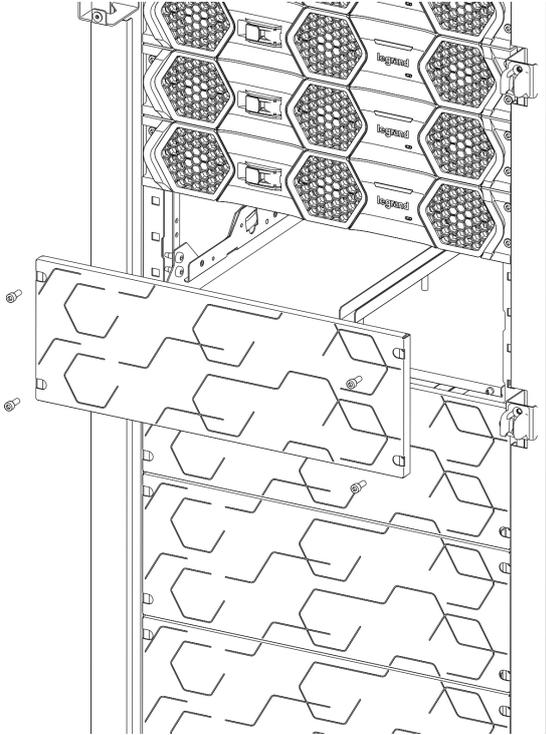
### 4.4 Battery drawers installation

The cabinet for the Keor MOD 125 can have from two to ten internal battery drawers. Each battery string is made up of two drawers, therefore it is necessary to install them two by two.

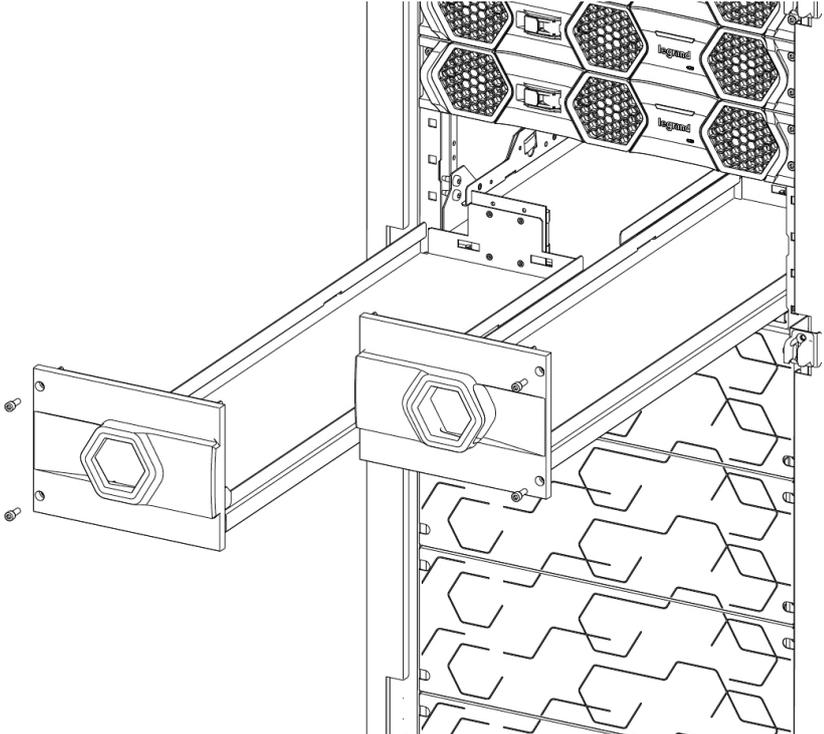
The battery drawers have a specific order in the cabinet that must be kept, especially if the UPS has to work in a configuration with separate batteries (not in common).



Starting from the top of the cabinet, unscrew the four screws that fix the slot cover where the battery drawers must be installed and save them.

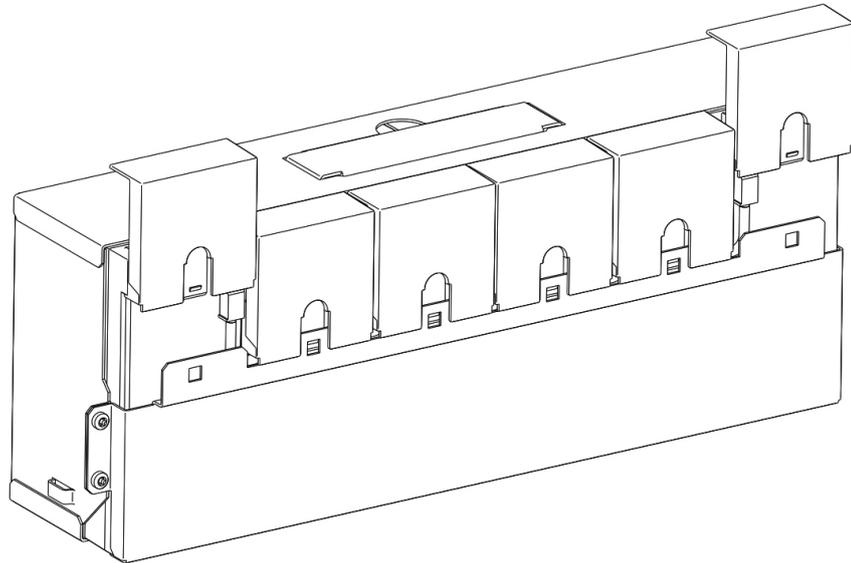


Insert the empty battery drawers in the free slots and push them till you hear a 'click'. The battery blocks must be added to the drawers only when these are inserted in the cabinet.



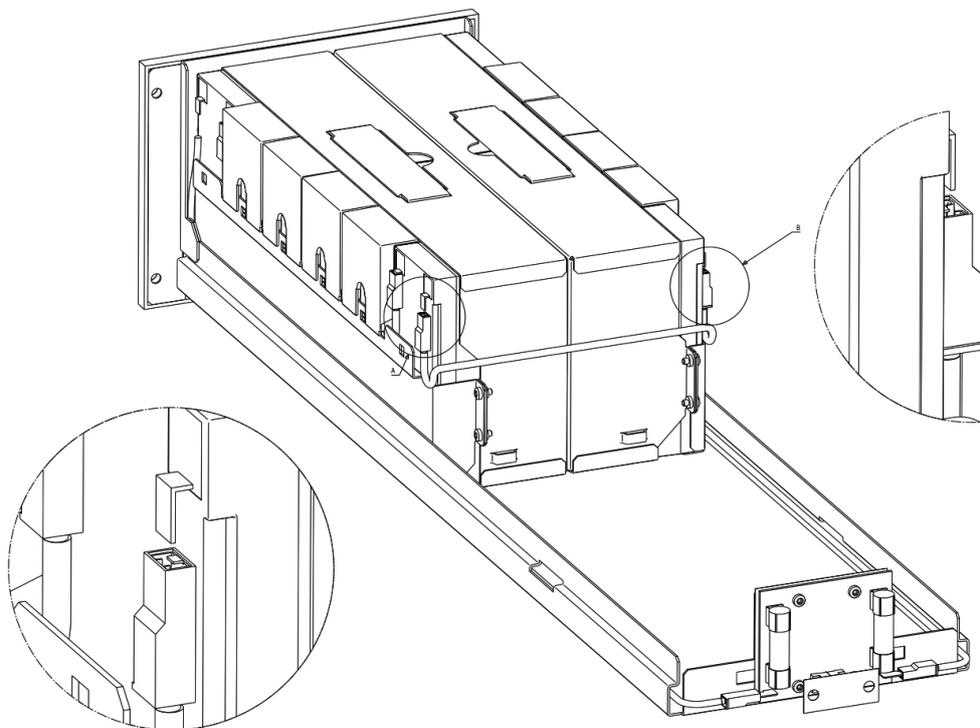
## 4. Installation

Remove the terminal covers of the batteries at the extremes.

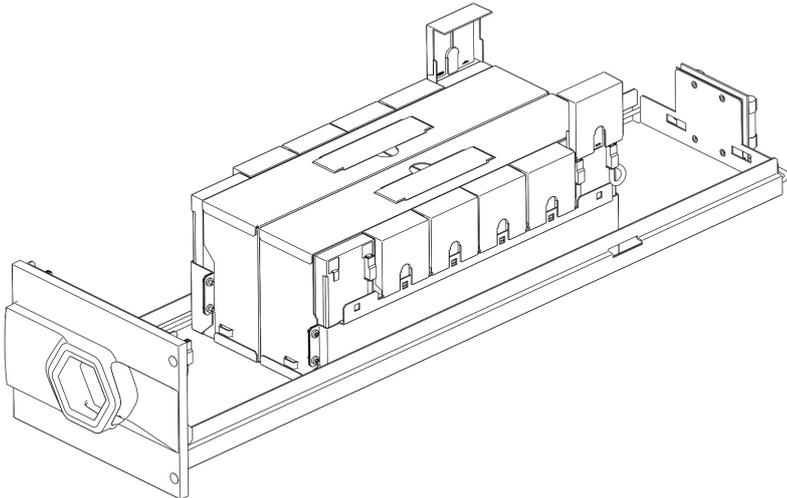


X 4

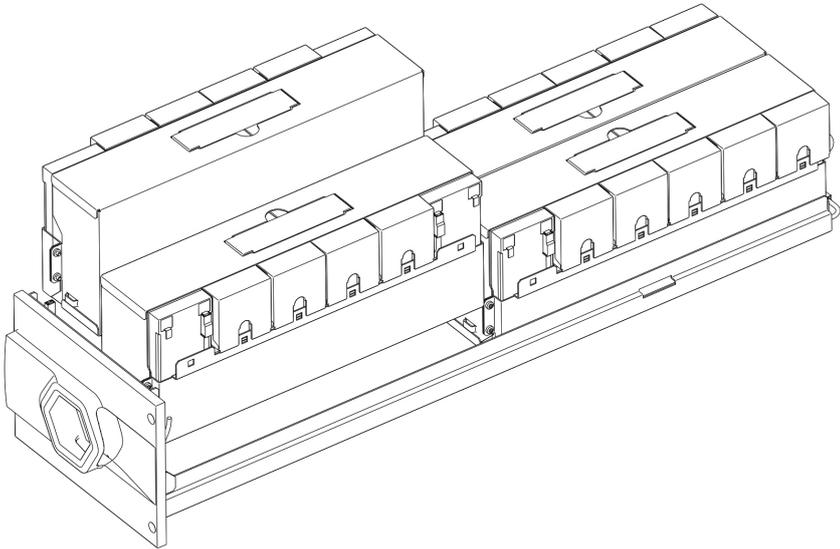
Add two battery blocks on a drawer and connect in series the two blocks using the cable provided and respecting the polarity (connect a positive terminal to a negative terminal).



Once the connection is done, insert the terminal covers on the two batteries and push the blocks at the bottom of the drawer.



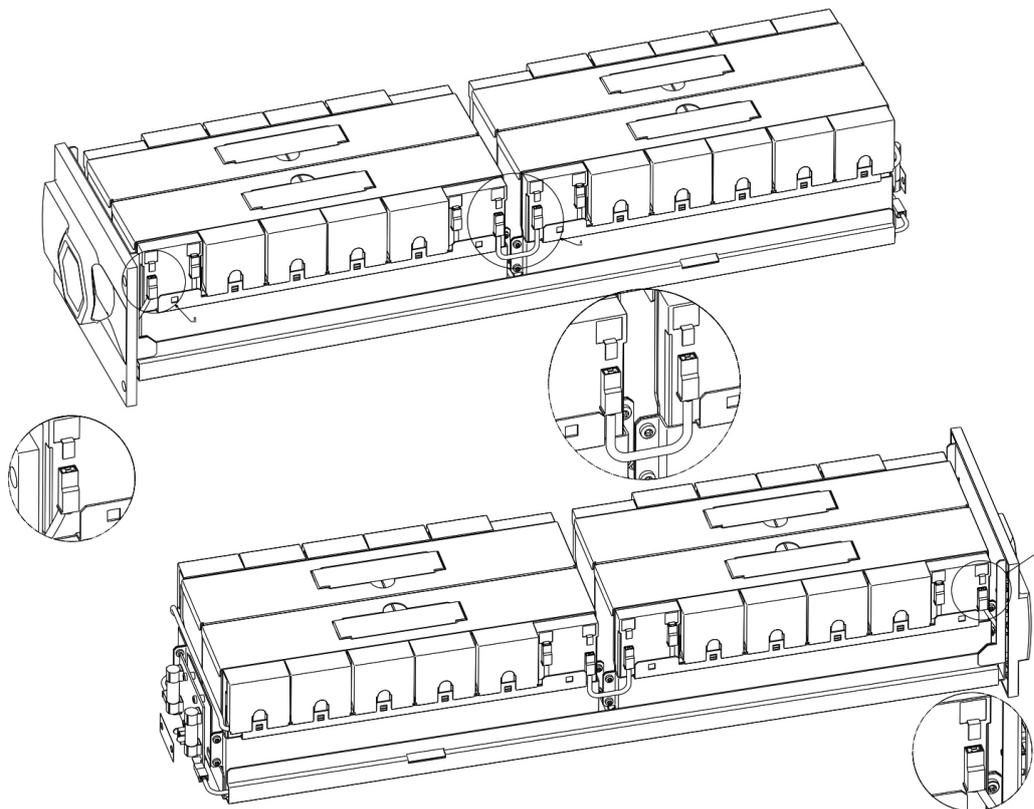
Add other two battery blocks on the drawer



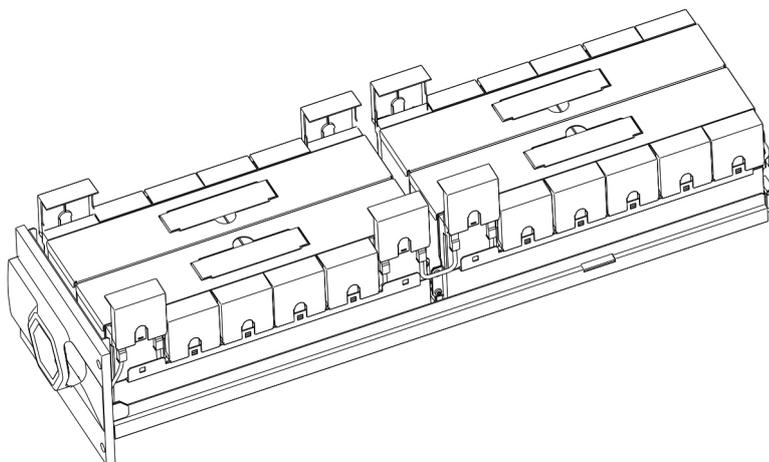
## 4. Installation

Connect in series the two new blocks to the ones already in the drawer using the cable provided and respecting the polarity (connect a positive terminal to a negative terminal).

Connect the free terminals of the two batteries located close to the handle of the drawer to the cables that go to the back of the drawer. Check the correct polarity of the whole cabling.

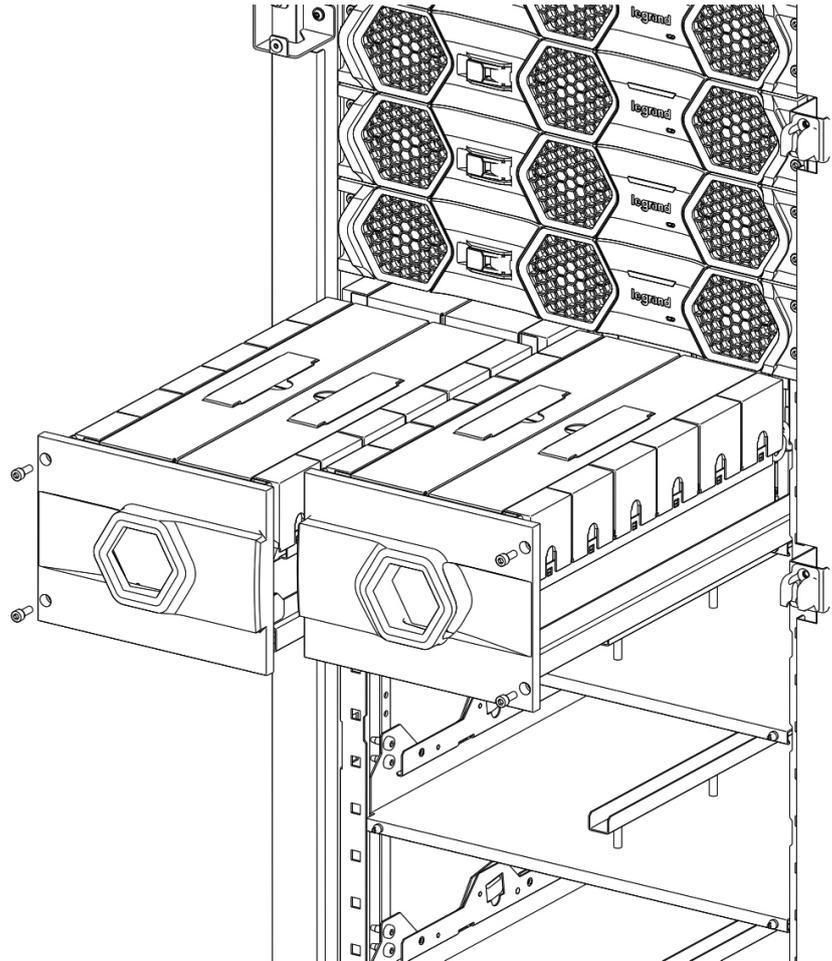


Insert the remaining terminal covers on the batteries.



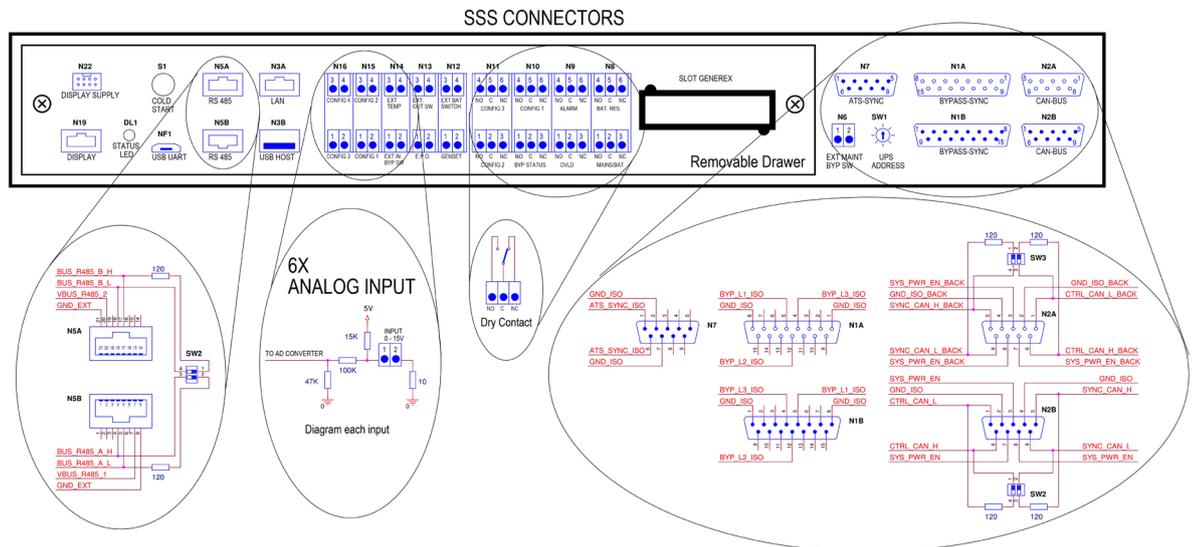
Fill the second drawer in the same way.

After the two drawers are ready, push them inside the UPS cabinet till they are abut and fix them with the four screws that were previously saved.



## 4. Installation

### 4.5 SSS interface



The USB HOST port is needed for firmware updates.

The USB UART port is for maintenance purposes. It must not be used.

The LAN port must not be used at the moment.

The input contact EXT TEMP for the external temperature is not available at the moment.

The input contact GENSET allows the UPS to know if there is an external generator. If the contact is closed, the generator is present. There are ten input floating contacts. The specifications are:

- n° 6 analogic inputs with a pull-up of 15 k $\Omega$ . The maximum measurable voltage is 15 V (except for the EXT TEMP input terminal whose voltage is 5 V);
- n° 4 digital inputs with a pull-up of 1 k $\Omega$  - 5Vdc.

The output contacts can be used as normally closed (NC) or normally open (NO). The specifications are:

- 30 Vdc - 1 A;
- 125 Vac - 0,5 A (resistive load).

#### 4.5.1 Emergency Power Off (EPO)

The UPS has a contact that can be used to activate the immediate stop of the equipment. It can be set as normally closed (NC) or normally open (NO) from the user interface. The default configuration is NC.

The EPO terminal is found on pins 1 and 2 of contact N13 of the SSS interface.

Use a voltage-free contact to connect the epo externally.

#### INDICATION

It is not possible to connect in parallel the EPO circuits of several UPS. If necessary, use contacts on the EPO emergency pushbutton isolated from each other.

The electric characteristics of the EPO interface are:

- voltage between terminals 1 and 2 of contact N13 with open circuit: 5 Vdc
- current between terminals 1 and 2 of contact N13 with closed circuit: 5 mA

## 5. Configuration and start-up



### DANGER

All the configurations and start-up operations must be carried out exclusively by a SKILLED TECHNICIAN (paragraph 2.2.1).

### 5.1 Pre-start-up checks

Before powering the equipment, carry out the following checks:

1. Close all the distribution panels on the UPS cabinet.
2. Check that the external mains input disconnecter is open (OFF position).
3. Check that the external bypass input disconnecter (if present) is open (OFF position).
4. Check that the external output disconnecter is open (OFF position).
5. Check that the battery disconnectors of the external battery cabinets (if present) are open.
6. Check that the maintenance bypass disconnecter and the output disconnectors of the UPS are open (OFF position).
7. Check that the input and output wiring has been done and that all the connections have been tightened up properly.
8. Check the correct phase sequence of the input and bypass line (if separate).
9. Check that the parameters (voltage and frequency) of the mains input are compatible with those shown on the UPS rating plate.
10. Check that all the power modules are inserted properly and that the fixing screws are screwed up to abut the relative slots (use hex socket M6x16 screws along with M6 toothed washers).
11. Check that all the battery drawers (if present) are inserted properly and that the fixing screws are screwed up to abut the relative slots (use hex socket M6x16 screws along with M6 toothed washers).

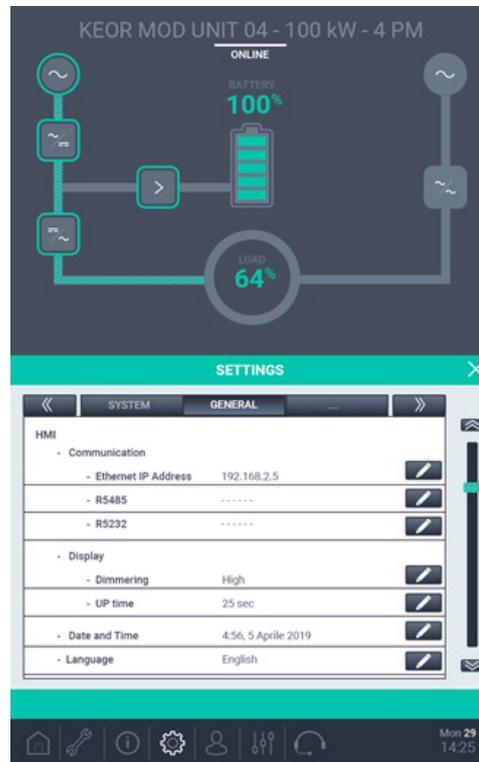
### 5.2 Start-up procedure

1. Insert the battery fuses into the appropriate fuse breakers of the external battery cabinets (if present).
2. Press for at least 5 seconds the COLD START button of the SSS interface. The display turns on and the UPS boot starts.
3. The UPS boot ends when the LEDs on the power modules turn to steady blue. Tap on the Setting icon of the menu bar at the bottom of the display

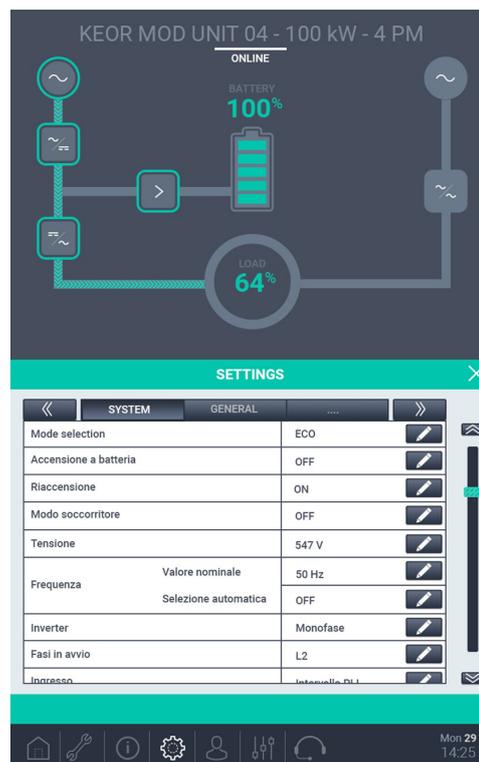


4. Choose the desired language in the tab "General" by tapping on the pencil icon on the item "Language".
5. Set the correct day/time in the tab "General" by tapping on the pencil icon on the item "Date and Time".

## 5. Configuration and start-up



6. Set the desired voltage and frequency output in the tab "System" by tapping on the pencil icon on the items "Voltage" and "Frequency".



7. Set the correct number of KB (Battery Kits) installed in the tab "System"  
**INDICATION**

1 KB (Battery Kit) represents a string of 48 batteries in series.  
In case of models with internal battery drawers, 1 KB is made up of 2 drawers.

8. Set the correct battery capacity in Ah of the single KB in the tab "System"

#### **INDICATION**

The UPS calculates the total battery capacity as produced by the total KB \* Capacity.

9. Provide the mains supply to the UPS by closing the external mains input/bypass input disconnectors (ON position).
10. Tap on the tab "System" and select ON on the item "System Power" to turn ON the UPS. Ensure that the EPO is connected to the SSS interface (the default setting is NC).
11. The LEDs on the power modules turn to steady yellow while they are powered from the batteries. When they are powered from the mains and the UPS is on-line, the LEDs turn to steady green.
12. Check that the output voltage and frequency values set correspond with the requirements of the load. If not, turn off the UPS and set the correct values (see step 6).
13. Provide the power supply to the load by closing the external output disconnector (ON position).
14. Close the UPS door and remove the key.



#### **DANGER**

Do not remove the power modules during the functioning of the UPS without activating the hot-swap procedure (described in paragraph 6.3.1). The removal of one or more power modules without the proper use of the hot-swap procedure could damage the equipment.



#### **CAUTION**

The keys to open the UPS door and the installation manual must not be left at the disposal of the operator.

### **5.3 Switching off the UPS**

Follow this procedure in case there is the need to turn off the UPS:

1. Tap on the Setting icon of the menu bar at the bottom of the display.
2. Tap on the tab "System" and select OFF on the item "System Power" to turn OFF the UPS.
3. The LEDs on the power modules turn to steady blue when they are in stand-by mode and the UPS is no longer supplying the load.



#### **DANGER**

In this stand-by condition there are still hazardous voltages on the UPS.  
After the removal of power from the UPS, the capacitors discharge time inside the power modules is 40 minutes. It is forbidden to operate inside the power modules before this time has elapsed.

To disconnect the UPS from all sources of supply:

- open the external mains input/bypass input disconnectors (ON position);
- open all the fuse breakers of the external battery cabinets (if present);
- remove at least one battery drawer for every shelf present to interrupt the battery string.

## 6. Maintenance



### **DANGER**

**INSTALLATION and ORDINARY MAINTENANCE operations must be carried out only by SKILLED TECHNICIANS (paragraph 2.2.1).**

**EXTRAORDINARY MAINTENANCE operations must be carried out only by LEGRAND TECHNICAL SUPPORT SERVICE.**

LEGRAND declines all liability for any injury or damage caused by activities carried out differently from the instructions written in this manual.

### **6.1 Preventive maintenance**

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

The operator must regularly perform:

- a general external cleaning;
- a check to verify there is no alarm indication on the display;
- a check to verify the correct functioning of the ventilating fans on each power module.

### **6.2 Periodical checks**

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

These inspections should also be made to determine if components, wiring, and connections exhibit evidence of overheating.

During a maintenance inspection, the skilled technician must carry out the following checks:

- no alarm presence;
- list of the memorised events;
- correct function of the static and maintenance bypass;
- integrity of the electrical installation;
- flow of cold air;
- battery status;
- characteristics of the applied load;
- conditions of the installation location.

Contact the LEGRAND Technical Support Service in case of problems.



### **WARNING**

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

6.3 Ordinary maintenance



**DANGER**

After the removal of power from the UPS, the capacitors discharge time inside the power modules is 40 minutes. It is forbidden to operate inside the power modules before this time has elapsed.

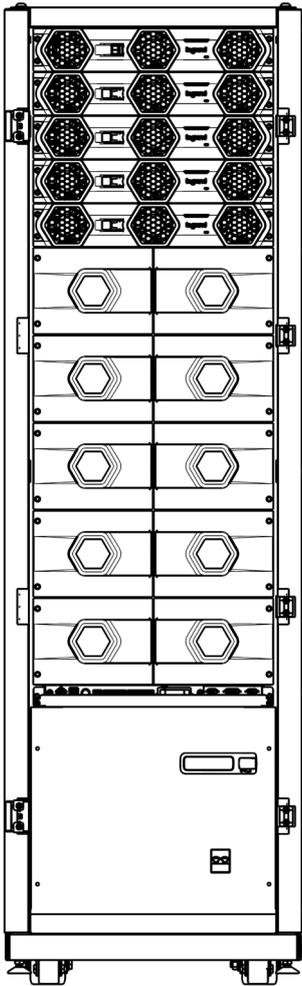
6.3.1 Hot-swap procedure for the replacement of power modules

The hot-swap procedure makes it possible to replace a faulty power module while the load is powered by the UPS in on-line mode. In case of a black-out during the procedure, there is no risk to power off the load since it is supplied by the other power modules.

**INDICATION**

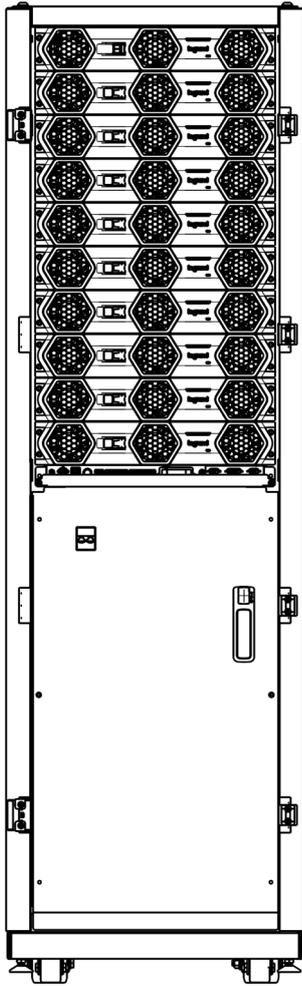
To use this function, the UPS must have at least two power modules and be properly sized. Always replace just one PM at a time. If the load power does not allow the hot-swap without overload, perform the manual bypass mode maintenance procedure.

Each power module (PM) is identified by a unique address inside the system, as shown below:



- PM 1
- PM 2
- PM 3
- PM 4
- PM 5

KEOR MOD 125



- PM 1
- PM 2
- PM 3
- PM 4
- PM 5
- PM 6
- PM 7
- PM 8
- PM 9
- PM 10

KEOR MOD 250

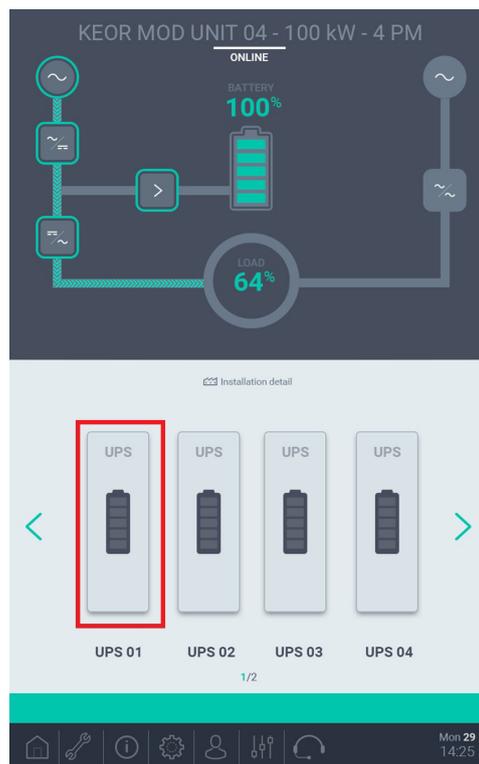
## 6. Maintenance

During the hot-swap procedure the maximum active power available is indicated in the following table:

	MAXIMUM ACTIVE POWER AVAILABLE
KEOR MOD 50	25 kW (50%)
KEOR MOD 75	50 kW (66%)
KEOR MOD 100	75 kW (75%)
KEOR MOD 125	100 kW (80%)
KEOR MOD 150	125 kW (84%)
KEOR MOD 175	150 kW (86%)
KEOR MOD 200	175 kW (88,5%)
KEOR MOD 225	200 kW (89%)
KEOR MOD 250	225 kW (90%)

The following is the how-swap procedure:

1. Check that the load connected to the UPS allows the power module replacement without causing an overload.
2. On the main screen, tap on the UPS which has the PM to replace.



- Choose the PM to replace by tapping on it or scrolling it with the ARROWS UP and DOWN icons. Then, tap on the SWITCH icon and confirm to turn off the module once the pop-up appears.



- Initially, the LED on the PM turns blue. Wait until it turns white: the PM is ready to be replaced.
- Open the frontal switch of the PM.
- Unscrew the fixing screws of the PM and save them. Remove the PM from the slot.
- Insert the new PM on the free slot making sure that the frontal switch is open and that the module is in abutment.
- Fix the PM to the cabinet using the screws previously unscrewed.
- Close the frontal switch of the PM.
- The LED on the PM turns red. After the boot of the PM, the LED turns yellow. Next, the PM starts in battery mode (yellow LED). Finally, the LED turns green and the PM is powered by the mains.

#### INDICATION

If one or more screws are lost, use only hex socket M6x16 screws along with M6 toothed washers to fix the power modules.

#### INDICATION

In case of emergency, e.g. if the display does not work, it is possible to perform a hot-swap replacement by simply opening the frontal switch of the PM. Wait until the LED turns white to replace the PM.

When the frontal switch of the PM is open, it is not possible to restart the PM by simply closing it. It is necessary to extract the module.

### 6.3.2 Installation/replacement of power modules with the UPS in maintenance bypass mode

If the hot-swap procedure explained in the previous paragraph is not applicable, it is possible to replace or even to add PM with the UPS in maintenance bypass mode.

#### INDICATION

During this procedure, the load is not protected by the UPS because it is powered from the bypass input line.

#### 6.3.2.1 Setting the UPS in maintenance bypass mode

- Tap on the Setting icon of the menu bar at the bottom of the display



- Check on the tab "System" that the item "Bypass Enable" is set to YES. If not, tap on the item and enable the bypass.
- Tap on the item "Bypass Forced Mode" and set it to YES. The LEDs of the PM blink fast in orange.
- Close the maintenance manual bypass switch by bringing it to the ON position. The load is powered directly from the bypass line.
- Shutdown the UPS by following the procedure described at paragraph 5.3.

## 6. Maintenance

6. If present, open the battery disconnectors of the external battery cabinets.



If there are battery drawers installed in the cabinet, some internal parts of the UPS are still live with dangerous voltage. Remove at least one battery drawer for every shelf present to interrupt the battery string.

### 6.3.2.2 Installation/replacement of power modules

1. Check that the procedure for setting the maintenance bypass mode described in paragraph 6.3.2.1 has been applied.
2. Open the frontal switch of the PM to replace.
3. Unscrew the fixing screws of the PM and save them. Remove the PM from the slot. To add another PM, unscrew the screws of the protective cover of a free slot starting from the top of the cabinet.
4. Insert the new PM on the free slot making sure that the frontal switch is open and that the module is in abutment.
5. Fix the module using the screws previously unscrewed.
6. Close the frontal switch of the PM.

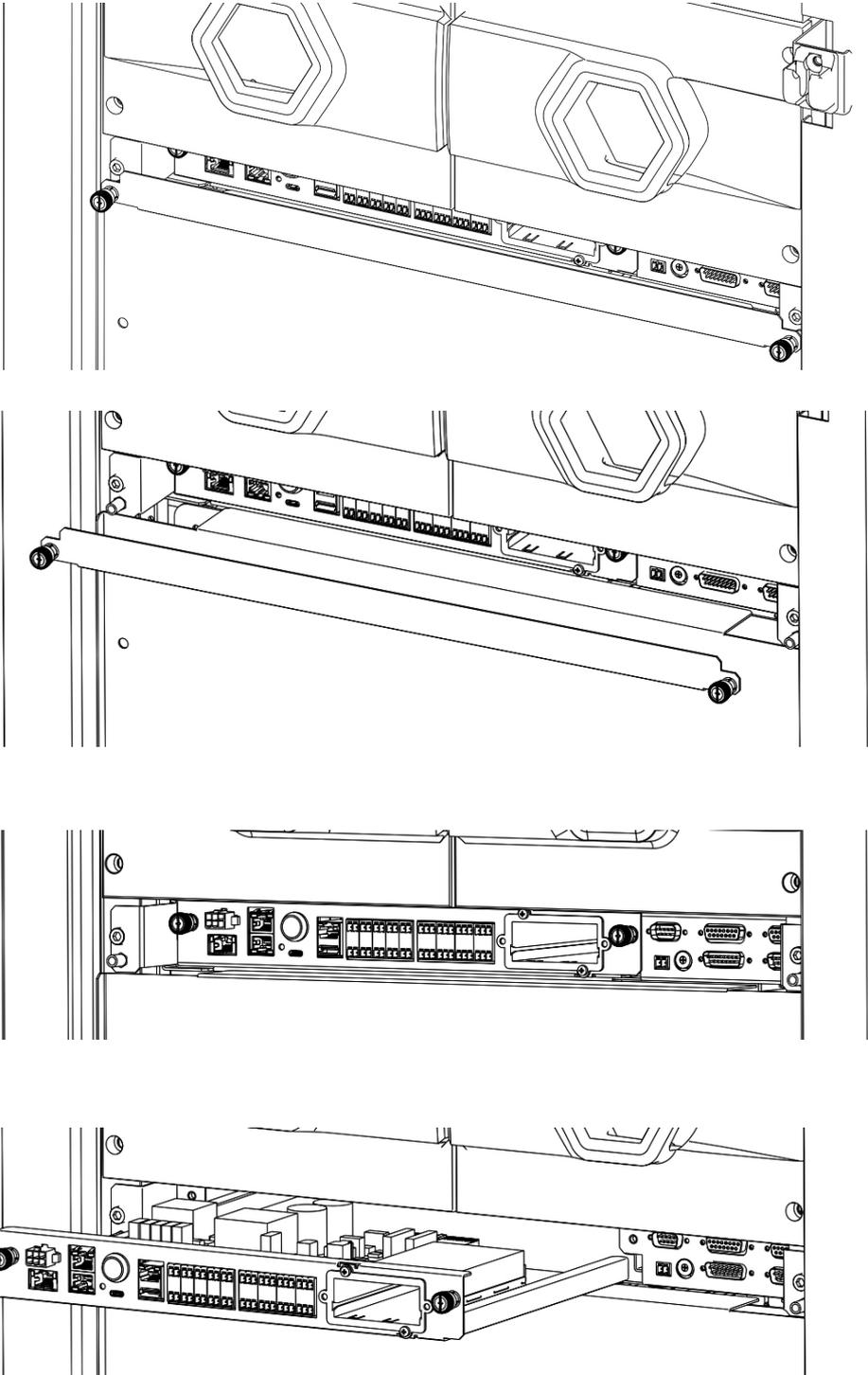
#### **INDICATION**

If one or more screws are lost, use only hex socket M6x16 screws along with M6 toothed washers to fix the power modules.

### 6.3.2.3 Exit the UPS from the maintenance bypass mode

1. If present, close the battery disconnectors of the external battery cabinets and insert all the internal battery drawers.
2. Tap on the "Setting" icon. Then tap on the tab "System" and select ON on the item "System Power" to turn ON the UPS.
3. Wait for the UPS boot until the LEDs of the PM blink fast in orange.
4. Open the maintenance manual bypass switch by bringing it to the OFF position
5. Tap on the item "Bypass Forced Mode" on the "System" tab. Set it to NO. The LEDs of the PM turn to steady green.

6.3.3 Removal of the SSS drawer



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## 6. Maintenance

### 6.4 Battery drawers replacement



#### **WARNING**

A battery can present a risk of electrical shock and high short circuit current. Read and apply the safety instructions in chapter 2 before operating on batteries

#### **INDICATION**

The battery drawers must always be added/removed in multiples of two (1 KB consists of two battery drawers). Always replace just one KB at a time. If one KB is added, start from the free slots at the top which are covered by protective covers. If a KB is completely removed, install the protective covers to block any access to live parts.

If the installation/removal procedure changes the total number of KB installed in the UPS, it is necessary to update this setting from the control panel.

After concluding the installation/replacement operations, perform a battery calibration to get precise information regarding the total autonomy of the UPS.

#### **6.4.1 Installation/replacement of battery drawers with UPS in on-line mode**

1. Check that the UPS has installed more than 1KB every 25kVA of power supplied to the output.
2. Check that the UPS is not working in battery mode and that the battery charger is in the "maintenance" or "standby" state.
3. Follow the procedure shown at paragraph 4.4.

#### **INDICATION**

If the UPS turns to battery mode during these operations, do not continue the installation/replacement. It is possible to resume the operations when the UPS turns to on-line mode.

When there is a black-out during the replacement of battery drawers, the backup time is reduced. It is necessary to carefully assess this event before starting with the installation/replacement procedure.

#### **6.4.2 Installation/replacement of battery drawers with UPS in maintenance manual bypass**

1. Follow the procedure described in paragraph 6.3.2.1 for setting the UPS in maintenance bypass mode.
2. Follow the procedure shown at paragraph 4.4
3. Follow the procedure described in paragraph 6.3.2.3 to exit from the maintenance bypass mode.

#### **INDICATION**

During the installation/replacement operations, the load is not protected by the UPS because it is powered from the bypass input line.

### 6.5 Replacing the fuses and surge arrester (DIN rail)

A surge arrester and two fuse holders can be found in the DIN rail inside the cabinet.

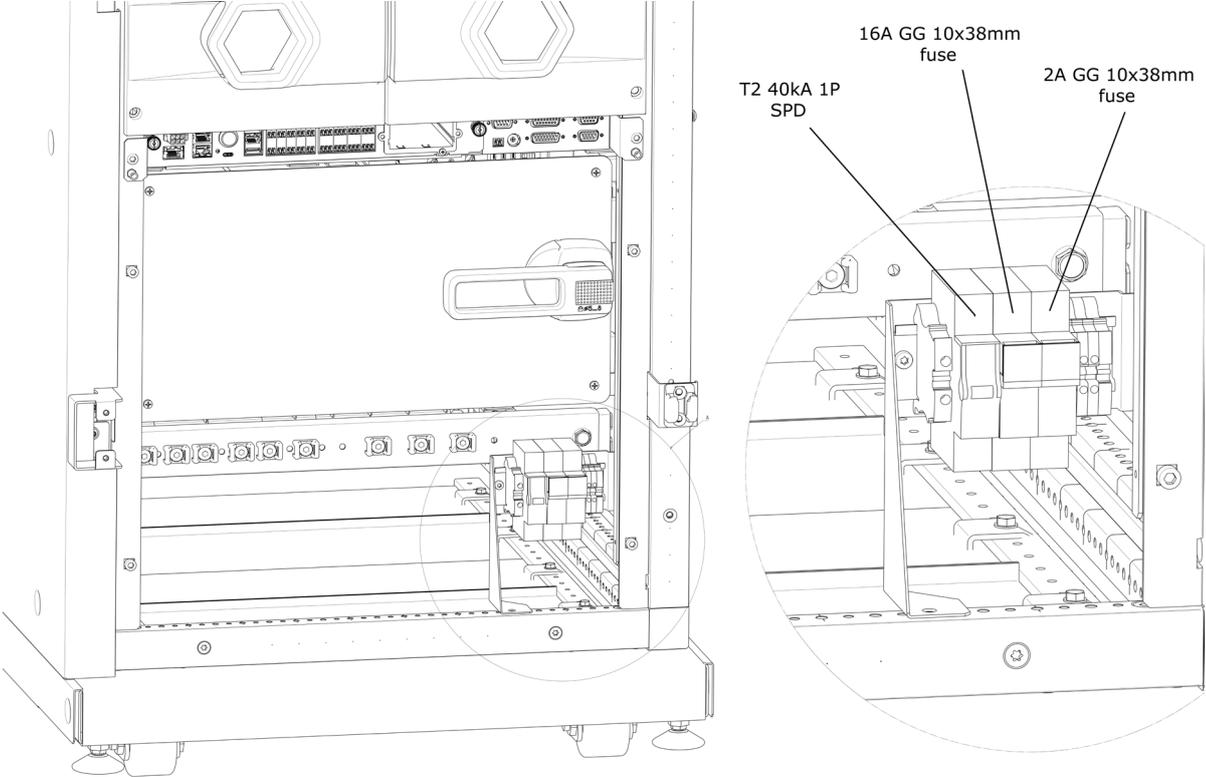
The first fuse holder contains a 16A GG 10x38mm fuse (LG-013316). It is in series to the surge arrester.

The second fuse holder contains a 2A GG 10x38mm fuse (LG-013302). It is in series to the input bypass disconnecter release coil.

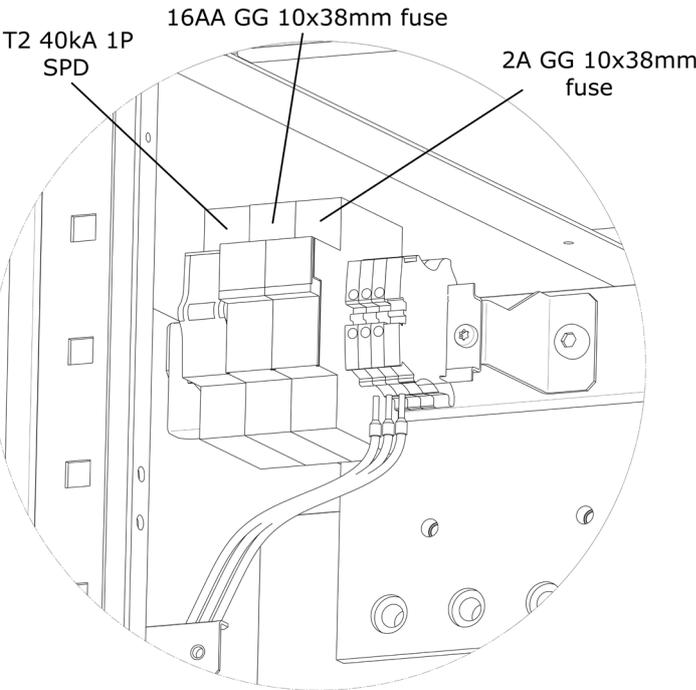
The surge arrester is a T2 40kA 1P SPD (LG-412230).

#### **INDICATION**

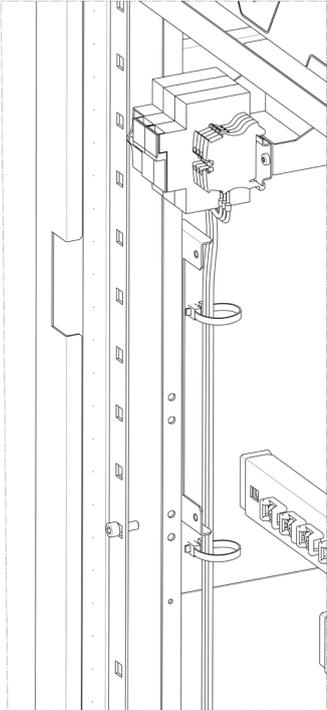
It is mandatory to verify monthly the indication on the surge arrester. The device works correctly if the indicator is green. If the device is damaged, the indicator is red and the surge arrester must be replaced.



KEOR MOD 125



KEOR MOD 250



**6.6 Extraordinary maintenance**

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

## 7. Warehousing



### **DANGER**

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



### **DANGER**

**A SKILLED TECHNICIAN must check that there is no voltage present before disconnecting the cables. All the battery isolator switches on the UPS and on the EBC must be open.**

**All the battery isolator switches on the UPS and on the external battery cabinets must be open. The battery drawers of the UPS and of the external battery cabinet (if present) must be removed.**

### **7.1 UPS**

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

### **7.2 Batteries**

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

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



### **CAUTION**

Batteries must never be stored if partially or totally discharged.

LEGRAND is not liable for any damage or bad functioning caused to the UPS by wrong warehousing of the batteries.

## 8. Dismantling



### DANGER

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

### 8.1 Battery disposal

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

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



Pb



### WARNING

A battery may constitute a risk of electric shock and high short-circuit current. When working on batteries, the prescriptions indicated in chapter 2 must be adhered to.

### 8.2 UPS dismantling

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

For the dismantling operations, it is necessary to wear the Personal Protective Equipment mentioned in paragraph 2.3. Sub-divide the components separating the metal from the plastic, from the copper and so on according to the type of selective waste disposal in the country where the equipment is dismantled.

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

### 8.3 Electronic component dismantling

For the disposal of electronic waste, it is necessary to refer to the relevant standards.



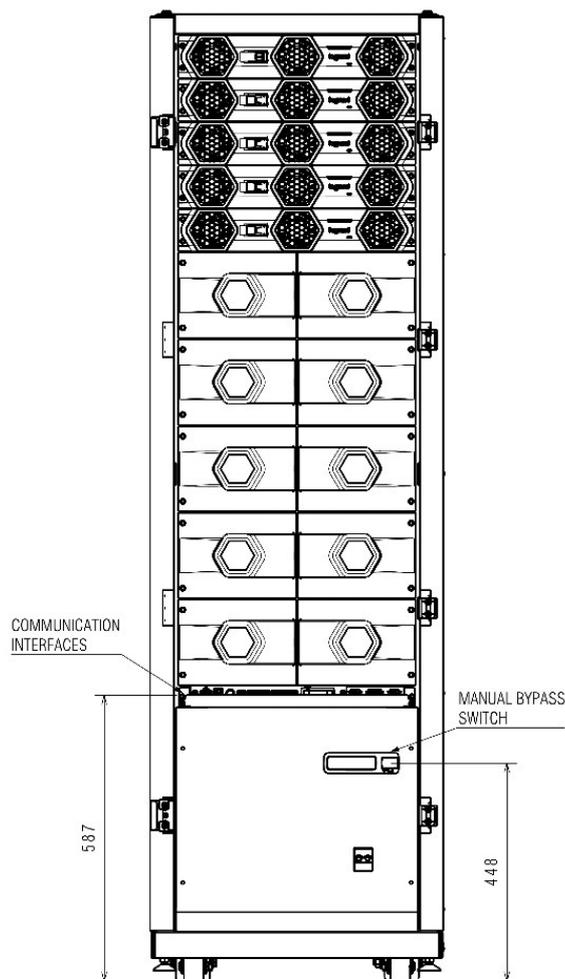
This symbol indicates that in order to prevent any negative effects on the environment and on people, this product should be disposed of separately from other household waste, by taking it to authorised collection centres, in accordance with the EU countries local waste disposal legislations. Disposing of the product without following local regulations may be punished by law. It is recommended to check that this equipment subject to WEEE legislations in the country where it is used.

## 9. Mechanical characteristics

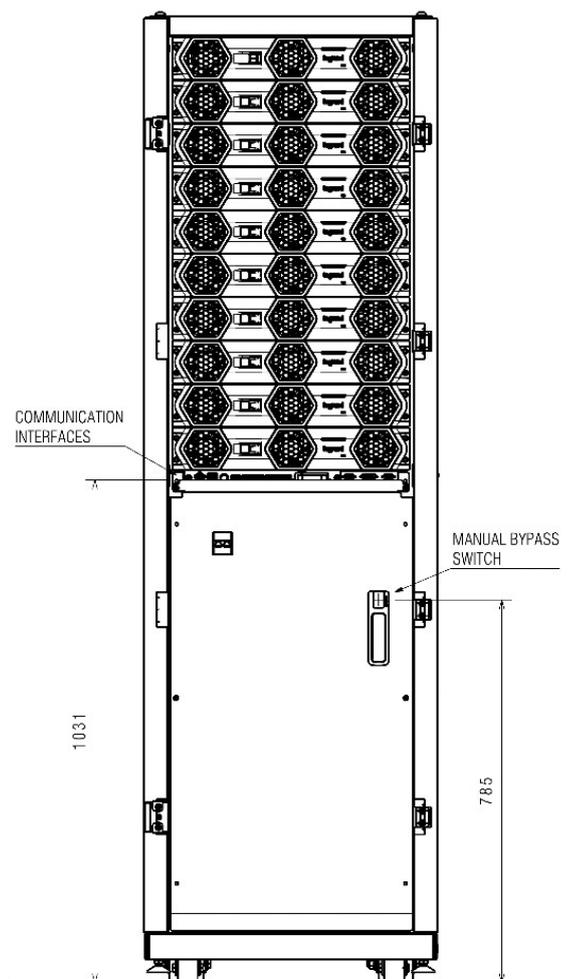
The UPSs Keor MOD are sold as empty power cabinets. It is necessary to purchase the power modules separately.

### 9.1 Cabinets

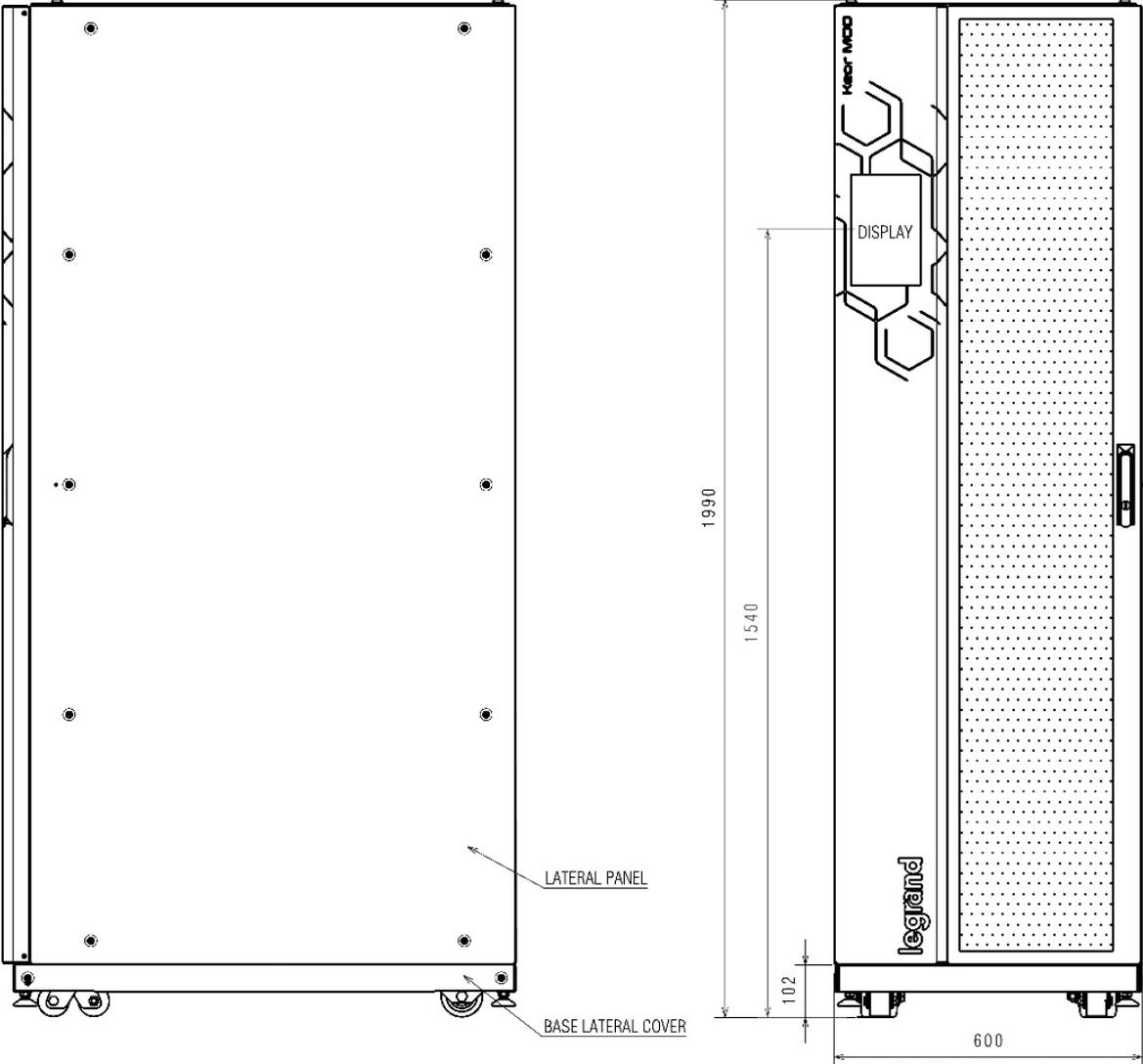
(all the dimensions are in mm)



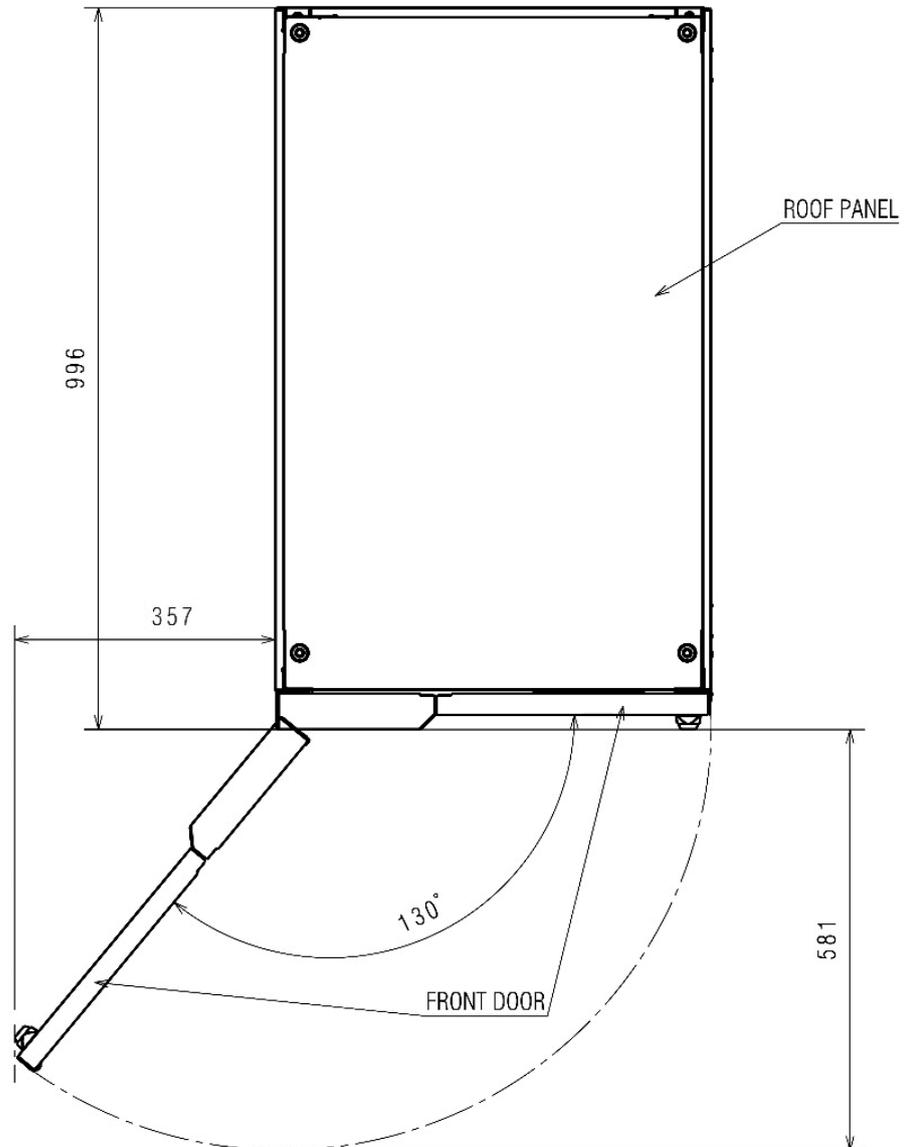
**3 104 80 KEOR MOD 25-125 kVA**

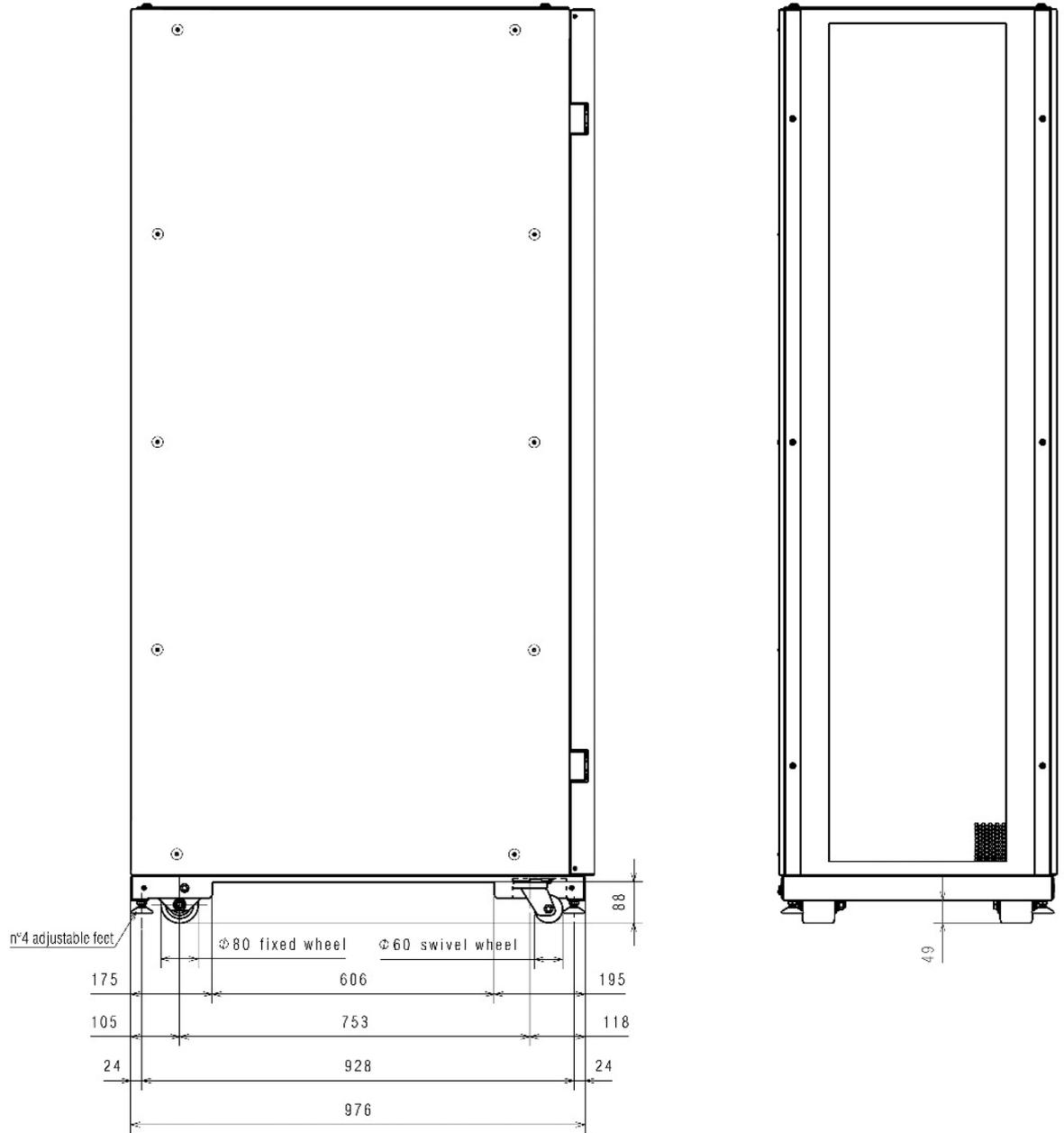


**3 104 81 KEOR MOD 25-250 kVA**

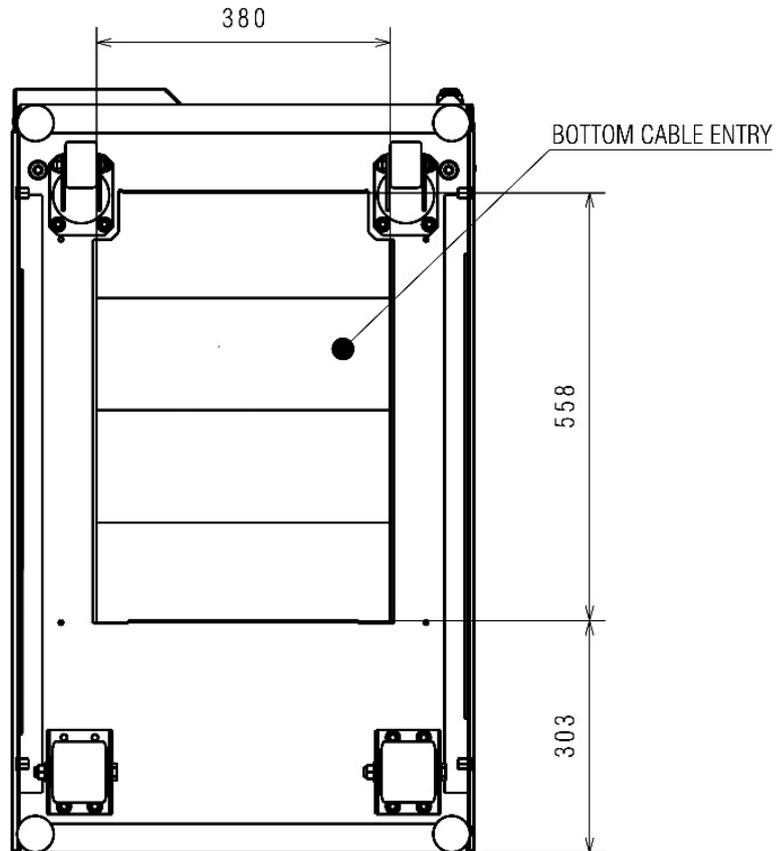


## 9. Mechanical characteristics

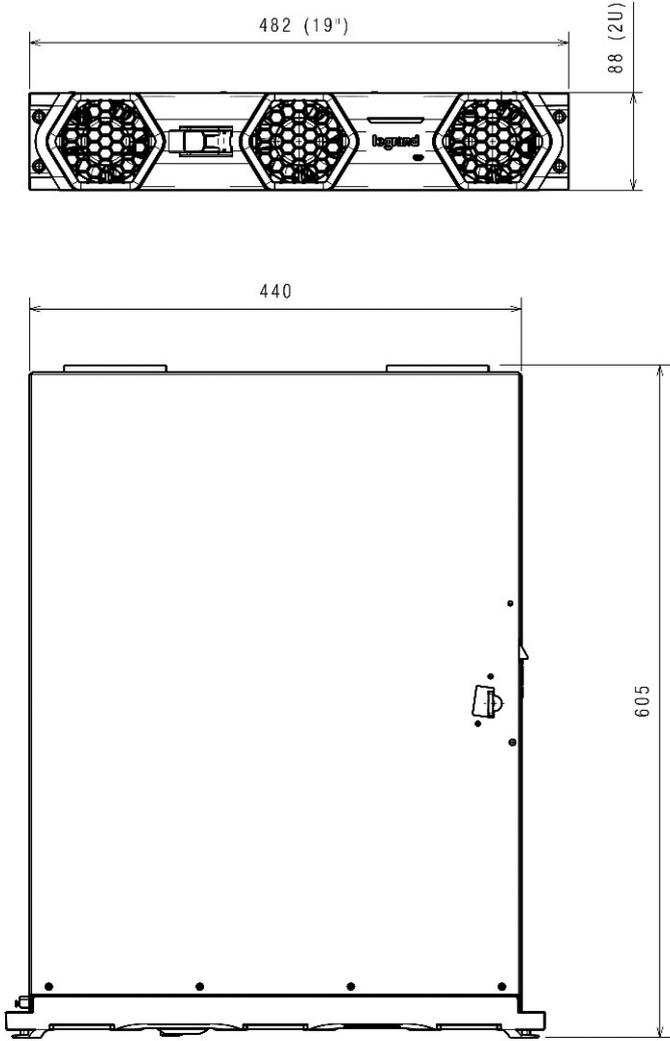




## 9. Mechanical characteristics



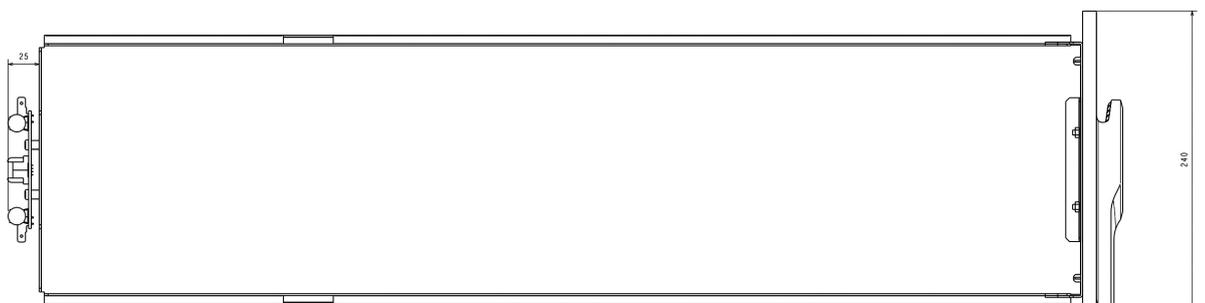
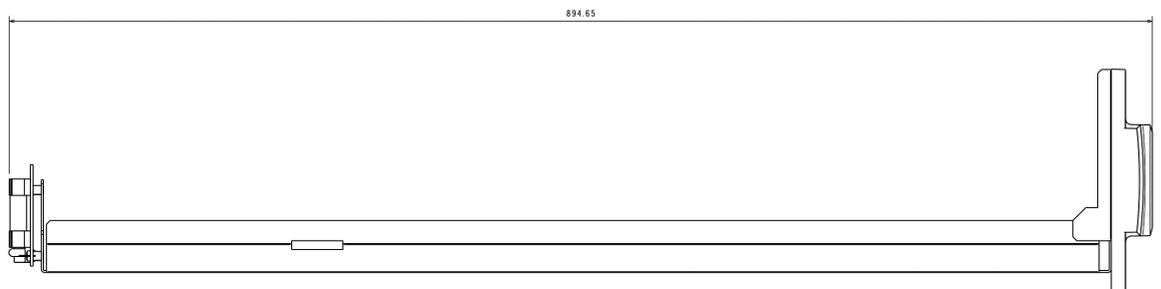
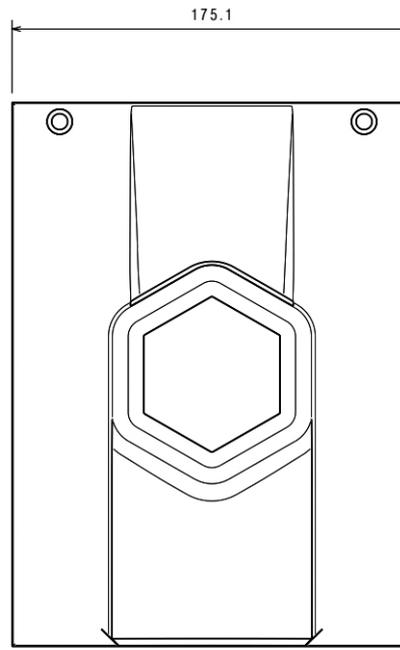
**9.2 Power module PM25**  
*(all the dimensions are in mm)*



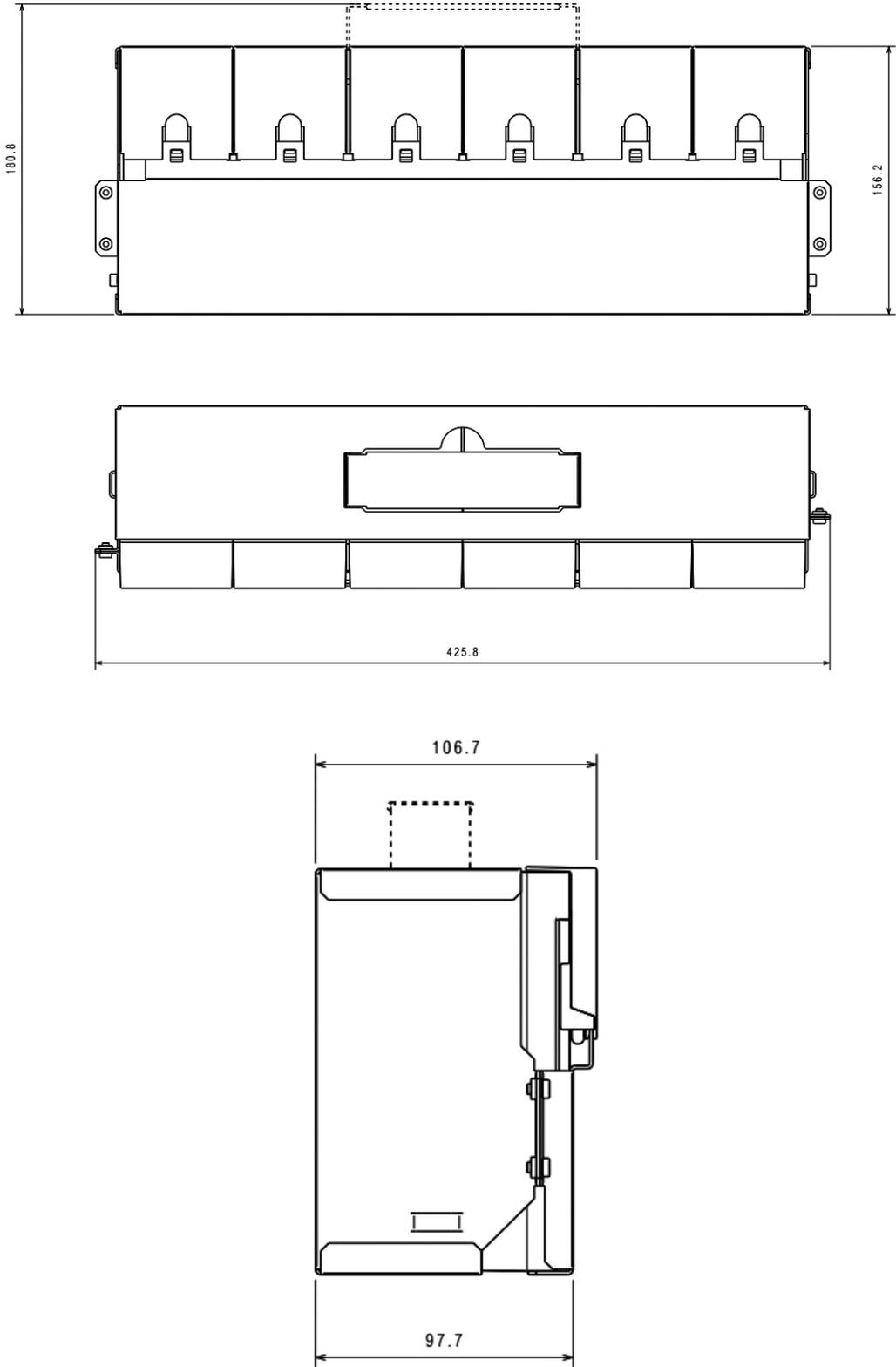
## 9. Mechanical characteristics

### 9.3 Battery drawer

(all the dimensions are in mm)

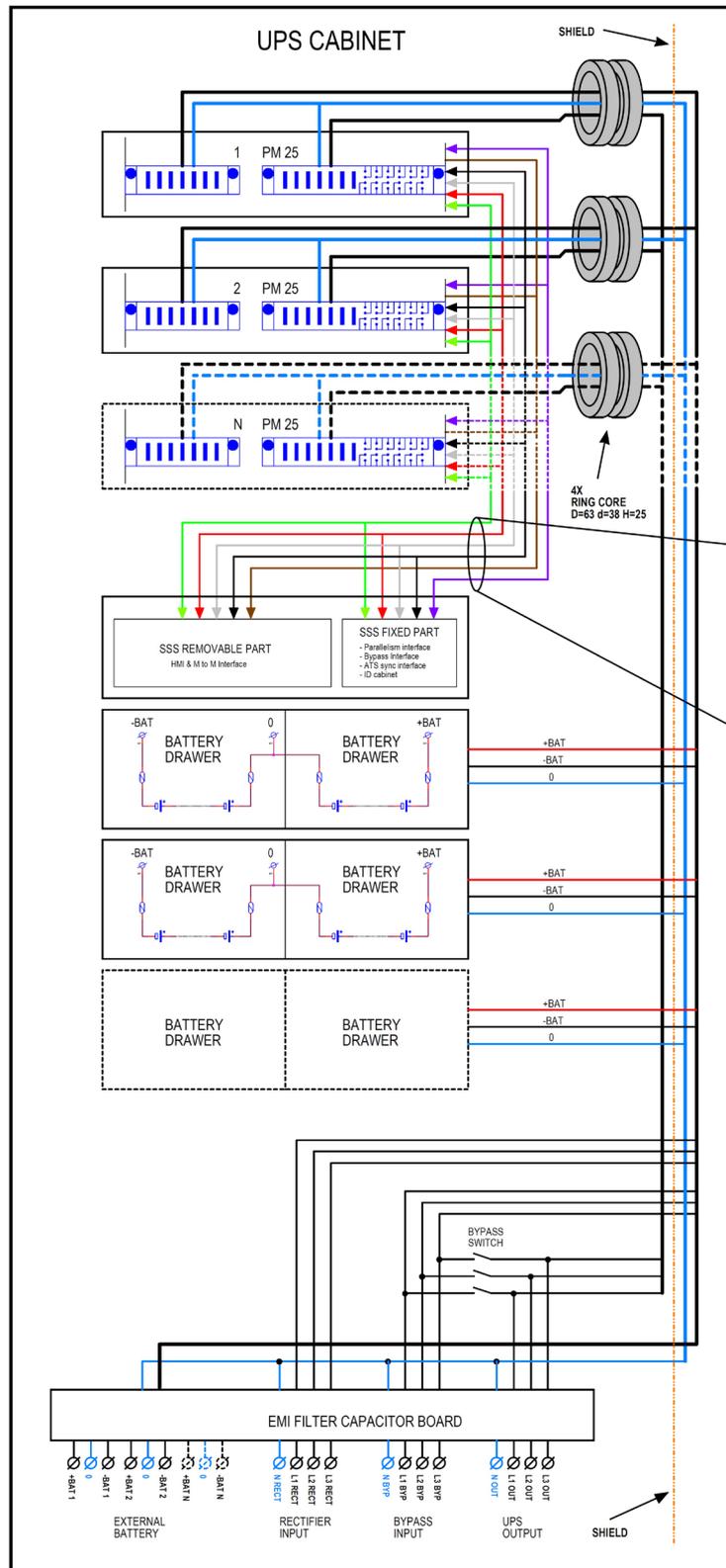


**9.4 Battery block**  
*(all the dimensions are in mm)*

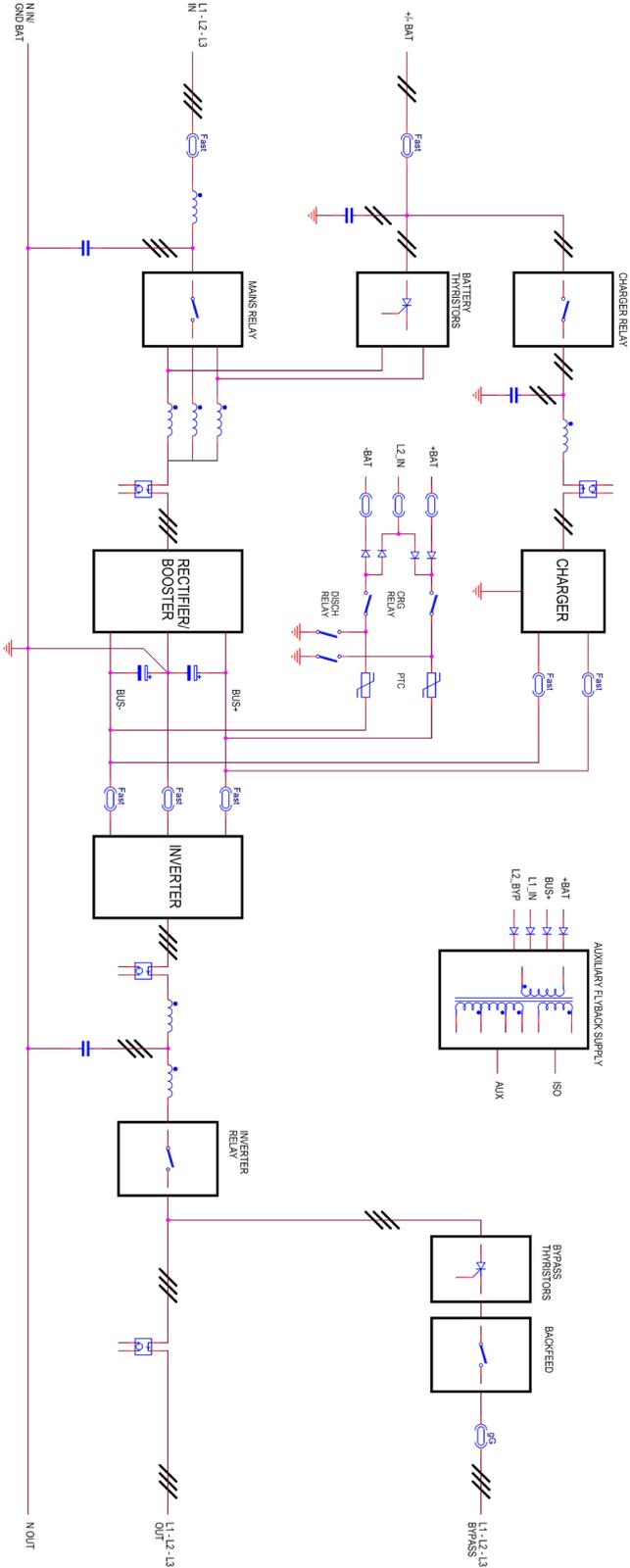


## 10. Electrical diagrams

### 10.1 UPS cabinet block diagram



10.2 PM25 block diagram



## 11. Technical data

### Main features

	Keor MOD 25	Keor MOD 50	Keor MOD 75	Keor MOD 100	Keor MOD 125	Keor MOD 150	Keor MOD 175	Keor MOD 200	Keor MOD 225	Keor MOD 250
Nominal Power (kVA)	25	50	75	100	125	150	175	200	225	250
Active Power (kW)	25	50	75	100	125	150	175	200	225	250
Number of power modules	1	2	3	4	5	6	7	8	9	10
Technology	online, double conversion VFI-SS-111 (EN62040-3)									
IN/OUT configuration	Three-phase / Three-phase									
Dual Input	Available									
UPS system	Modular, expandable and redundant									
Neutral system	Neutral passing straight from input to output (not isolated)									
Bypass	Automatic (static and electromechanical) Manual (for maintenance)									
Overvoltage category	OVC II									

### Input electrical characteristics

	Keor MOD 25	Keor MOD 50	Keor MOD 75	Keor MOD 100	Keor MOD 125	Keor MOD 150	Keor MOD 175	Keor MOD 200	Keor MOD 225	Keor MOD 250
Maximum input current (A)	47	94	141	188	235	282	329	376	423	470
Input voltage (V)	400 + 15% - 20% (3F+N+PE)									
Input frequency (Hz)	50 / 60 ± 2% 50 / 60 ± 14 % (autosensing and/or selectable by the user)									
Input Power Factor	> 0.99									
Total harmonic distortion of the input current	THDi < 3% (at full load)									
I <sub>cp</sub> Prospective short-circuit current (kA)	10									

**Output electrical characteristics (normal mode)**

	Keor MOD 25	Keor MOD 50	Keor MOD 75	Keor MOD 100	Keor MOD 125	Keor MOD 150	Keor MOD 175	Keor MOD 200	Keor MOD 225	Keor MOD 250
Maximum output current (A)	36	72	108	144	180	216	252	288	324	360
Output voltage (V)	380/400/415 ± 1%									
Output frequency (Hz)	50 / 60 (selectable by the user)									
Range of the output frequency	If synchronized with the bypass frequency: adjustable range from ±1% to ±14% If not synchronized (free run): ± 0.1 Hz									
Crest factor admitted on the output current	3:1									
Total harmonic distortion of the output voltage	THDv < 0.5% (at full linear load) THDv < 1% (at full non-linear load)									
Efficiency in Normal Mode	up to 96.5%									
Efficiency in Eco Mode	99%									
Overload capacity	125% for 10 minutes without automatic bypass intervention 150% for 60 seconds without automatic bypass intervention									

**Output electrical characteristics (battery mode)**

	Keor MOD 25	Keor MOD 50	Keor MOD 75	Keor MOD 100	Keor MOD 125	Keor MOD 150	Keor MOD 175	Keor MOD 200	Keor MOD 225	Keor MOD 250
Output voltage (V)	380/400/415 ± 1%									
Output frequency (Hz)	50 / 60 Hz ± 1%									
Total harmonic distortion of the output voltage	THDv < 0.5% (at full linear load) THDv < 2.5% (at full non-linear load)									
Overload capacity	115% for 10 minutes									
Shortcircuit	I <sub>cc</sub> = 3 I <sub>n</sub> for 50 ms I <sub>cc</sub> = 1.45 I <sub>n</sub> for 1 sec									

## 11. Technical data

### Batteries and battery charger characteristics

	Keor MOD 25	Keor MOD 50	Keor MOD 75	Keor MOD 100	Keor MOD 125	Keor MOD 150	Keor MOD 175	Keor MOD 200	Keor MOD 225	Keor MOD 250
Nominal battery voltage (V)	± 288 (48 blocks)									
Battery voltage range (V)	± 264 to ± 312 (44-52 blocks)									
Battery wiring	Internal batteries: string made up of 2 drawers (composed by 4 blocks of 6 batteries) External batteries						Only external batteries			
Battery type	VRLA						-			
Unitary capacity	12 Vdc - 9 Ah 12 Vdc - 11 Ah						-			
Type of battery charger	High performance PWM, one for each power module Smart charge technology (3-stage advanced cycle)									
Maximum recharge current (A)	5 (for each power module installed)									
Independent battery configuration	maximum 5 sets of independent batteries (configurable as common or separate units)									

### Features

	Keor MOD 25	Keor MOD 50	Keor MOD 75	Keor MOD 100	Keor MOD 125	Keor MOD 150	Keor MOD 175	Keor MOD 200	Keor MOD 225	Keor MOD 250
Display	10-inch rotating colour touchscreen									
Communication ports	2 x RS485 ports (one for external accessories) 10 input floating contacts 8 output floating contacts 1 interface slot USB host port									
Protections	Backfeed protections (NC/NO auxiliary contact) Emergency Power Off (EPO) Electronic against overloads, short-circuit and excessive battery discharge Block of functions due to the end of autonomy In-rush limiter on start up Internal battery circuit fuses (for internal battery drawers)									
Remote management	available									

**Mechanical characteristics**

	Keor MOD 25	Keor MOD 50	Keor MOD 75	Keor MOD 100	Keor MOD 125	Keor MOD 150	Keor MOD 175	Keor MOD 200	Keor MOD 225	Keor MOD 250
Empty power cabinet	3 104 80					3 104 81				
Net weight (kg)	205					190				
Dimensions H x W x D (mm)	1990 x 600 x 970									
Installable Power modules PM25 3 106 75	up to 5					up to 10				
PM25 net weight (kg)	22,5									
Installable battery drawers	up to 10					-				
Weight of one battery block (kg)	17 (9Ah batteries) 19,2 (11Ah batteries)					-				
Weight of one battery drawer with 4 battery blocks (kg)	72 (9Ah batteries) 81 (11Ah batteries)					-				

**Environmental conditions**

	Keor MOD 25	Keor MOD 50	Keor MOD 75	Keor MOD 100	Keor MOD 125	Keor MOD 150	Keor MOD 175	Keor MOD 200	Keor MOD 225	Keor MOD 250
Operating temperature (°C)	0 ÷ +40									
Relative humidity during operation	0% ÷ 95% non-condensing									
Storage temperature (°C)	-20 ÷ +50 (excluding batteries)									
Noise level at 1 metre (dBA)	50 ÷ 65									
Ingress Protection Marking	IP 20									
Pollution degree	PD2									
Environmental category (EN 60721-3-3)	class 3K2									
Operating height	up to 1000 metres above sea level without derating									
Heat dissipation with full load (BTU/h)	3560	7120	10680	14240	17800	21360	24920	28480	32040	35600

**Reference directives and standards**

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

## 12. Tables



### CAUTION

The choice of the type and section of the power cables must be done according to the voltage and rated current as well as the local wiring standards and regulations. It is a responsibility of the installation engineer. The input current and the output power of the UPS are indicated in chapter 11 and the battery current in table 4 of this chapter.

The following tables give an indication of the wire cross sections to use if the wires are unipolar with simple PVC installation and installation in tube in the air.

**TABLE 1**  
Minimum wire cross sections recommended for Keor MOD UPS

POWER	INPUT CABLE	BYPASS CABLE (in case of separate bypass line)	OUTPUT CABLE
125 kVA	Phase: 1 x 95 mm <sup>2</sup> or 2 x 50 mm <sup>2</sup> per pole  Neutral: 1 x 120 mm <sup>2</sup> or 2 x 70 mm <sup>2</sup>	Phase: 1 x 95 mm <sup>2</sup> or 2 x 50 mm <sup>2</sup> per pole  Neutral: 1 x 120 mm <sup>2</sup> or 2 x 70 mm <sup>2</sup>	Phase: 1 x 95 mm <sup>2</sup> or 2 x 50 mm <sup>2</sup> per pole  Neutral: 1 x 120 mm <sup>2</sup> or 2 x 70 mm <sup>2</sup>
250 kVA	Phase: 1 x 185 mm <sup>2</sup> or 2 x 95 mm <sup>2</sup> per pole  Neutral: 1 x 240 mm <sup>2</sup> or 2 x 120 mm <sup>2</sup>	Phase: 1 x 185 mm <sup>2</sup> or 2 x 95 mm <sup>2</sup> per pole  Neutral: 1 x 240 mm <sup>2</sup> or 2 x 120 mm <sup>2</sup>	Phase: 1 x 150 mm <sup>2</sup> or 2 x 70 mm <sup>2</sup> per pole  Neutral: 1 x 240 mm <sup>2</sup> or 2 x 120 mm <sup>2</sup>

**TABLE 2**  
Automatic breaker recommended for input and bypass line

POWER	AUTOMATIC CIRCUIT BREAKER
125 kVA	In=250 A curve C Icp=10kA
250 kVA	In=630 A curve C Icp=10kA

**TABLE 3**  
Residual current breaker recommended for input and bypass line

POWER	RESIDUAL CURRENT BREAKER (IΔn)
125 kVA	≥ 300 mA type B
250 kVA	

**TABLE 4**  
Maximum current absorbed by the batteries at full load and minimum wire cross sections recommended for connecting the UPS to the external battery units

POWER	MAXIMUM BATTERY CURRENT	MINIMUM WIRE CROSS SECTION
125 kVA	5 x 65 A	5 x 16 mm <sup>2</sup>
250 kVA	5 x 130 A	5 x 35 mm <sup>2</sup>



