UPS KEOR DK RACK

Installation and Maintenance Manual

LE15418AA (Rev. 06– 08/25)

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1. Introduction

The instructions in this manual are intended for a SKILLED TECHNICIAN (paragraph 2.2.1) to provide information on how to install and maintain the UPS.

You can download the full manual from the UPservice App.

1.1 General remarks

The purpose of this manual is to provide to the skilled technician:
- instructions to safely install the Keor DK UPS (also called only “UPS” or “equipment” in the rest of the manual).
- information to 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 manual refers to laws, directives, and standards that the skilled technician is required to be aware of and consult. It 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 LEGRAND (also called "Manufacturer" in the rest of the manual).
Any other use or configuration must be previously agreed with the Manufacturer in writing and the written agreement will become part of the installation and user manuals.

This manual is not a specification; therefore, LEGRAND reserves the right to make any changes to data without prior notice. It also complies with the directives and standards in force at the time of its release.
The version of the manual updated to its latest release is available at ups.legrand.com.
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.

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

This symbol indicates 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, people and things around it.

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

This symbol indicates important information which should be read carefully.

The manual must be kept in a safe, dry place and must always be available for its entire lifetime. It is recommended to make a copy of it and file it away. 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.
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.

1.2 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 manual.
- accidents caused by a wrong assembly of the safety protections or due to the lack of application of the safety labels.

The transfer of the equipment to others also requires handing 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.

1.2.1 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.

1.2.2 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.

1.3 Copyright

2. Regulatory and safety requirements

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.

Keor DK is a category C3 UPS according to the standard EN IEC 62040-2.
The UPS is a product for commercial and industrial application in the second environment – installation restrictions or additional measures may be needed to prevent disturbances.

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.

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 signs fixed to the equipment.

In case of emergency, follow the regulations in force in the country where the equipment is installed.

2.1 Definitions of “Skilled Technician” and “Operator”

2.1.1 Skilled Technician

The professional that will carry out the installation, start up and ordinary maintenance is called “Skilled Technician”.
This definition refers to people qualified by LEGRAND 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 paragraph 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).

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.

2.1.2 Operator

The professional 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.

When choosing an operator, the company safety manager 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 the equipment.
- cooperation with personnel responsible for ordinary maintenance activities (Skilled Technicians).

2.2 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


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

2.3 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 electrical live parts.


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


No smoking
This sign indicates that smoking is not allowed.

2.4 Signs on the equipment

Safety signs are displayed on the UPS to communicate warning message about potential dangers. Strictly comply with those instructions. Removing these signs and/or working by ignoring those warnings is prohibited.
Contact the Manufacturer if a sign deteriorates and/or it is no longer legible, even if only partially.


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.

2.5 Batteries

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

 A battery can present a risk of electrical shock and burns by high short-circuit 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.

 The UPS must not be turned on if liquid is leaking from the batteries.

 Do not open any battery breaker while the UPS is powering the loads in stored energy mode.

2.6 Installation and maintenance

 Any installation or maintenance operation must be done only after the equipment has been disconnected from any source of power. Check there is no live voltage.
All remote switch disconnectors must be locked with an appropriate padlock to make sure no one will turn them on.

 The UPS functions with IT, TN-C, TN-S and TT systems. The output neutral status is the same as the input neutral status.
For IT electrical supply systems, a three-phase input UPS must install four-pole protective devices in the external distribution, and a single-phase input UPS must install two-pole protective devices in the external distribution.
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.

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.

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.

The equipment and workplace must be kept completely clean. Do not use oils or chemical products for cleaning because they could scratch, corrode or damage certain parts of the equipment. Upon completion of the installation/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. Depositing flammable material near the equipment is forbidden.

While maintenance operations are being carried out, “Maintenance work in progress” signs must be affixed in the department in such a way that they can be easily seen from any access area.

The skilled technician must not leave at the disposal of the operator the installation and maintenance manual and the keys for opening the rack cabinet where the UPS is installed.

2.7 Cybersecurity

Physical security is essential to ensure the security of assets supplied by the UPS. The UPS must be installed in a restricted access area with access control and surveillance.

Only limited authorized personnel should be given access to the area where the UPS is installed.

The UPS is designed to be connected and share data via a network interface through the optional SNMP card, which should be connected to a secure network. It is the customer sole responsibility to provide and continuously ensure a secure connection between the equipment and any network and to establish and maintain appropriate measures to protect the UPS, the network and the whole system against any kind of security breaches, unauthorized access, interference, intrusion, leakage or theft of data.

LEGRAND is not liable for damages or losses related to security breaches, unauthorized access, interference, intrusion, leakage or theft of data.
The customer is responsible to have periodical checks to ensure the system functionality and the security measures implemented have not been compromised.

3. Equipment check and transportation

3.1 Visual check

Carefully inspect the packaging and the equipment for any damage that might have occurred during transport.
If there is possible or ascertained damage, immediately inform:
- the transporter and the shipping company.
- 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.

 Mechanical damage to the electrical components constitutes a danger to persons and property. In case of doubt regarding the non-integrity of the package or of the product contained therein, contact the manufacturer before carrying out the installation and/or the start-up.

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.
- 5 kinds of metal bars.
- 4 wires to connect the bypass and the input in case of single input configuration.
- installation and maintenance manual.

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

3.3 Transportation

Avoid turnover during the transport of the UPS. Cabinets must always be handled in upright position. During loading and unloading operations, always respect the indications marked on the package.

Avoid bending or deforming the components and altering the insulation distances while transporting and handling the product.

Do not ship the equipment along with any inflammable, explosive, corrosive item. Do not expose the package to rain or other adverse climatic conditions.

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.

3.4 Positioning constraints

The UPS must be installed only inside a rack cabinet in an environment with flat floor, no vibration and vertical gradient less than 5°. Keep good ventilation around the UPS. Poor ventilation can reduce the service life of inner components and affect the life span of the UPS.

4. Installation

All UPS installation operations must be carried out exclusively by a SKILLED TECHNICIAN qualified and authorized by LEGRAND (paragraph 2.2.1).

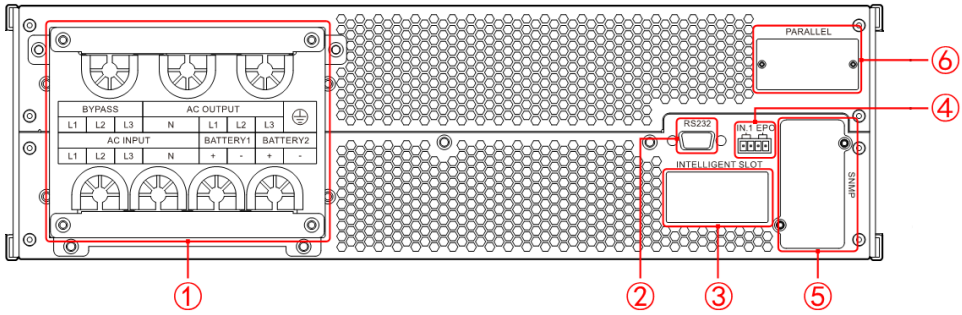
4.1 Safety regulations

Follow these instructions before carrying out any electrical connection:

- The UPS has a high leakage current. The earthing of the UPS via the relevant terminal is mandatory and it must be carried out before any other connection. 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. Connection to the mains via traditional type plug is not allowed.
- The disconnector switch must be installed near the equipment and must be easily accessible.
- Do not carry out the installation in presence of water or humidity.
- Check that the UPS is turned off and no voltage is present.
- No live wire must be connected to the UPS. Check that all input, output, bypass and battery breakers are turned off.
- Check that the mains input voltage and frequency correspond with the values indicated in the technical data on the UPS rating plate.
- The energy quality of the electrical network should comply with the individual voltage harmonics compatibility levels defined by IEC 61000-2-2. For more severe conditions, a power quality audit is required during the UPS commissioning by the LEGRAND Technical Support Service to check the compatibility.

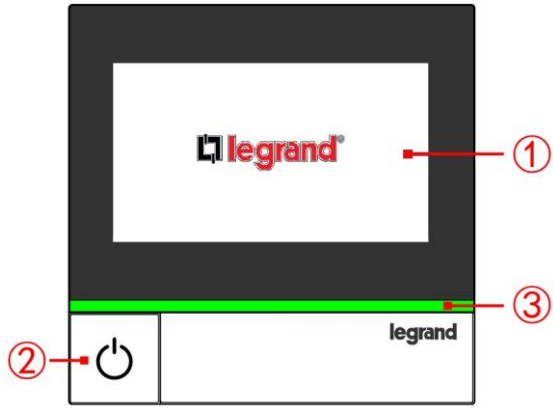
4.2 Views

4.2.1 Rear Panel



1. Wiring terminals
2. RS232
3. Intelligent slot
4. EPO and input dry contact
5. SNMP slot
6. Parallel slot

4.2.2 Operation Panel

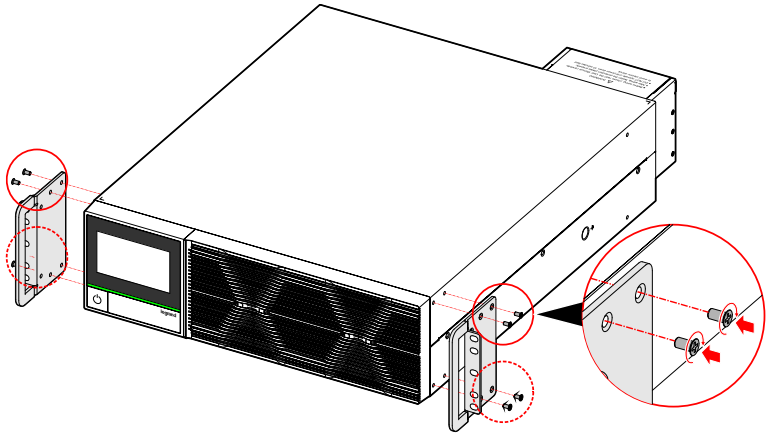


1. Touchscreen: it shows the working status and the system set
2. ON/OFF button
    a. When powering on, long press it for 3 seconds to power off.
    b. When powering off, long press it for 3 seconds to power on.
    c. Battery cold start, long press it for 10 seconds to perform the battery cold start operation.
3. Three-color led bar
    a. Green light on: the UPS is running in mains inverter mode.
    b. Yellow light on: the UPS is running in battery inverter mode.
    c. Yellow light flickers slowly: the UPS is running in battery inverter mode, and with battery under-voltage alarm.
    d. Yellow light flickers quickly: the UPS is running in bypass mode.
    e. Red light on: the UPS has one or several alarm and fault.
    f. Light off: the UPS has no output (when the UPS is initializing after powering on or when it is turned off).

4.3 Mechanical Installation

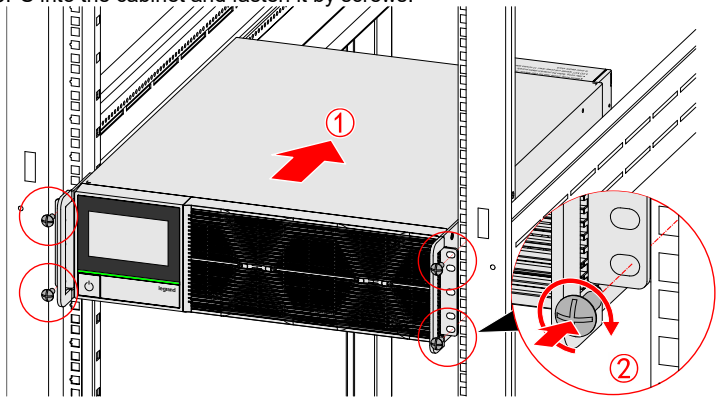
The UPS must be installed always at the lower part of the rack and at the top of other equipment like battery cabinets and additional distribution box for easy wiring and operation.

1. Fasten the two handles onto the two sides of the UPS by sunk screws M4×8.



Do not transport the UPS, battery cabinet or additional distribution box by handles. The front panel can be dismantled during transporting, do not make it bear any force.
The device needs to be transported by two or more people.

2. Push the UPS into the cabinet and fasten it by screws.



The battery cabinet is heavy, so it must be installed from bottom to top of the rack cabinet and located below the UPS.

4.4 Electrical connection

The electrical connection is part of the work that is not performed by LEGRAND, and it is the sole responsibility of the Skilled Technician. Therefore, the following recommendations are only an indication, and it is recommended that the electrical installation is carried out in compliance with local and national standards.

 Cables must be selected bearing in mind technical, financial and safety aspects. The selection and the sizing of cables from a technical viewpoint depend on the voltage, current, ambient temperature, voltage drop and cable laying.
The cables used for the installation must have a maximum operating temperature of at least 90°C.
For more explanations regarding the selection and the sizing of cables, refer to relevant IEC standards like IEC 60364.
The mains input and bypass input must use the same neutral wire.
Check chapter 9 and 10 for all the technical data.

4.4.1 Protection from overloads, short-circuits and electrical shock

Short-circuit currents (very high currents with a short duration) and overload currents (relatively high currents with a long duration) are among the main causes of cable damage. The protection systems normally used to protect the cables are thermal magnetic circuit breakers or fuses.
Protection circuit breakers must be selected according to the maximum short-circuit current (max Isc) that is needed to determine the breaking power of automatic circuit breakers, and to the minimum current (min Isc) that is needed to determine the maximum length of the line protected. The protection against short-circuit must operate on the line before any thermal and electrothermal effects of the overcurrent may damage the cable and relevant connections.

 This product 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 the UPS.

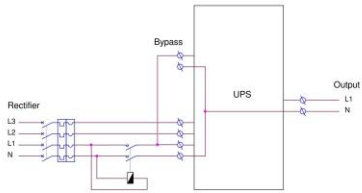
4.4.2 Backfeed protection

If the UPS is installed with the additional distribution box 3 113 74, the backfeed protection is integrated in this accessory and the backfeed protection is guaranteed.
Otherwise, an external protection against voltage backfeed must be provided according to the following diagrams:

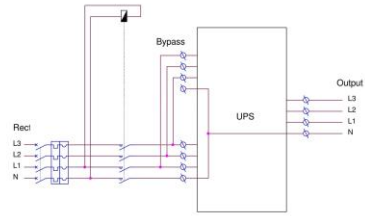
Connection to an IT, TT or TN-S type distribution network:

UPS single input (bypass line in common with the input line)

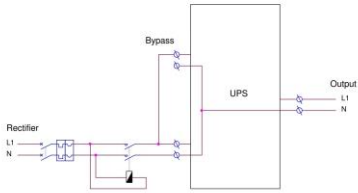
3/1 mode



3/3 mode

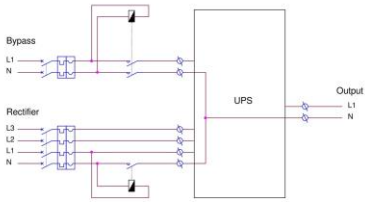


1/1 mode

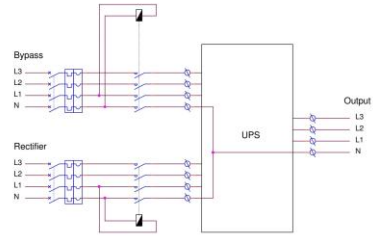


UPS dual input (bypass line separate the input line)

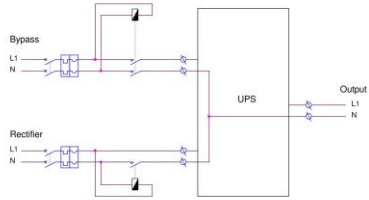
3/1 mode



3/3 mode

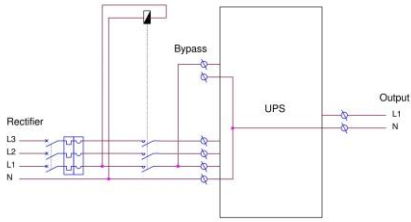


1/1 mode

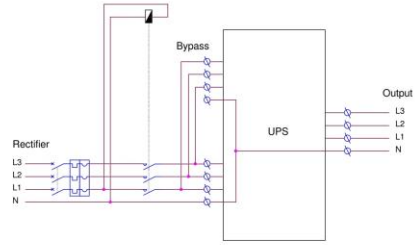


Connection to a TN-C type distribution network and backfeed circuit connection diagrams with the UPS single input (bypass line in common with the input line)

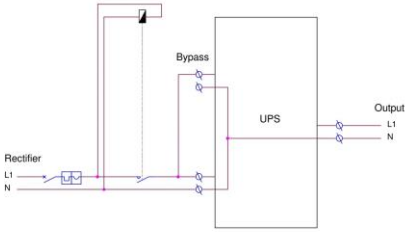
3/1 mode



3/3 mode

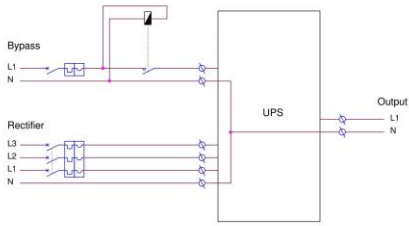


1/1 mode

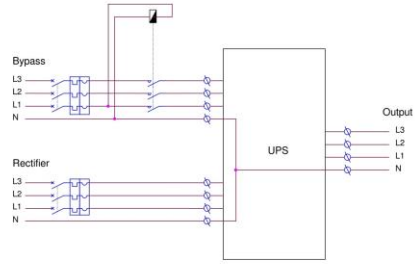


Connection to a TN-C type distribution network and backfeed circuit connection diagrams with the UPS dual input (bypass line separate the input line)

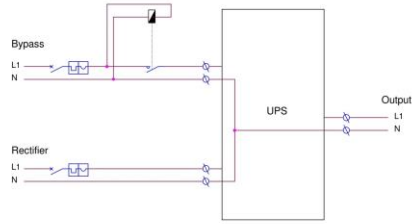
3/1 mode



3/3 mode



1/1 mode



A warning label must be placed on all the mains disconnector 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

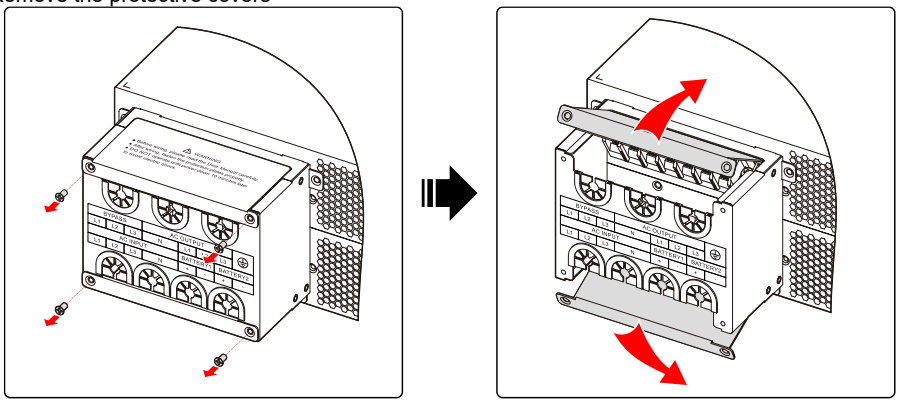
Risk of Voltage Backfeed

The rated current of the backfeed protection contactor must be greater than the rated operating current of the UPS.

4.4.3 Wiring operation

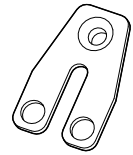
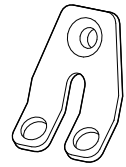
If the UPS is installed with the additional distribution box 3 113 74, follow the instructions of the manual of the distribution box for the installation.

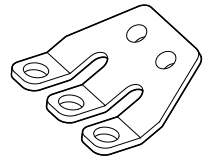
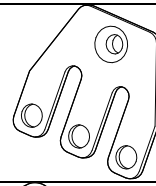
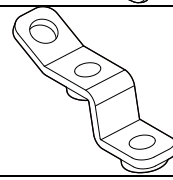
1. Remove the protective covers



2. Install the metal bars according to the mode of UPS and connect the wires. While connecting the wires, connect the bottom wires first and then connect the top wires.

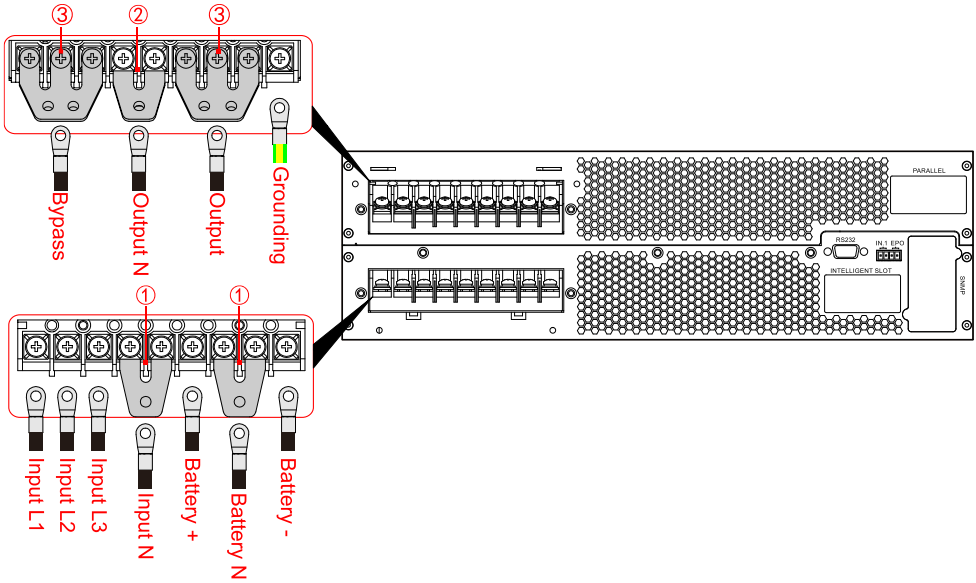
The default mode of the UPS is 3/1, so for this mode the metal bars have already been installed before delivering. For the 3/3 mode, the top two metal bars ③ must be removed, and for the 1/1 the bottom metal bar ④ must be installed.

Metal bar ID	Description	Picture
①	2PIN metal bar	
②	2PIN metal bar	

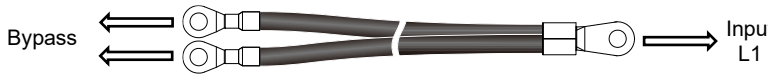
③	3PIN metal bar	
④	3PIN metal bar	
⑤	Grounding metal bar	

The grounding metal bar is used when two ground wires need to be connected.

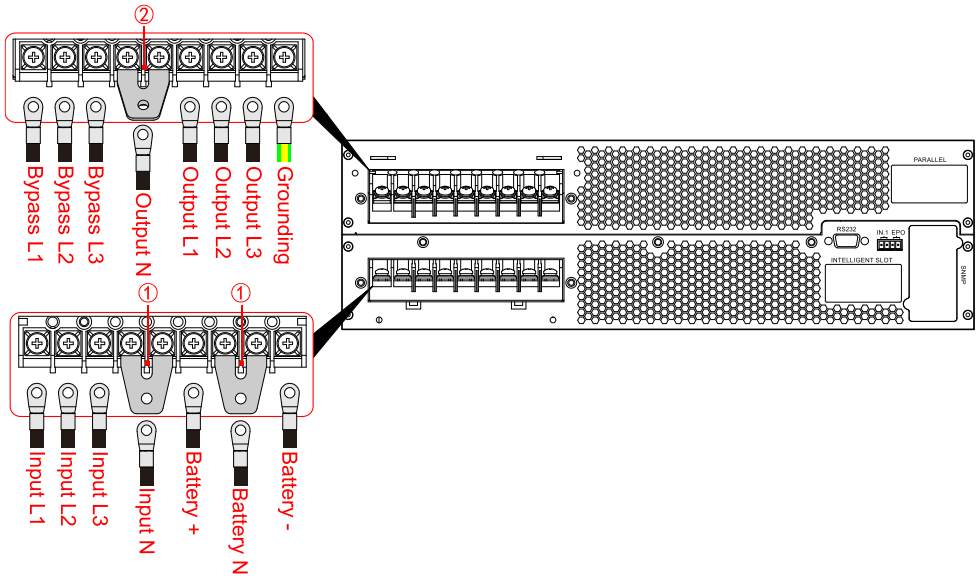
3/1 mode



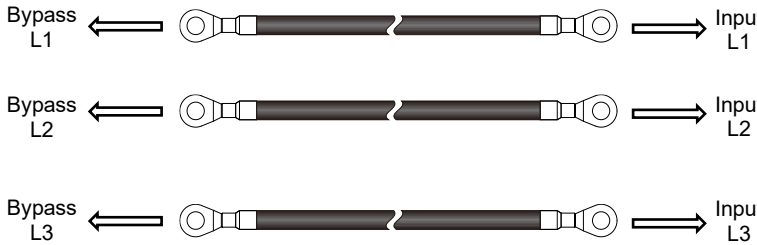
If the installation must be done as single input (bypass line in common with the input line), the metal bars of input/bypass must be connected using the following cable:



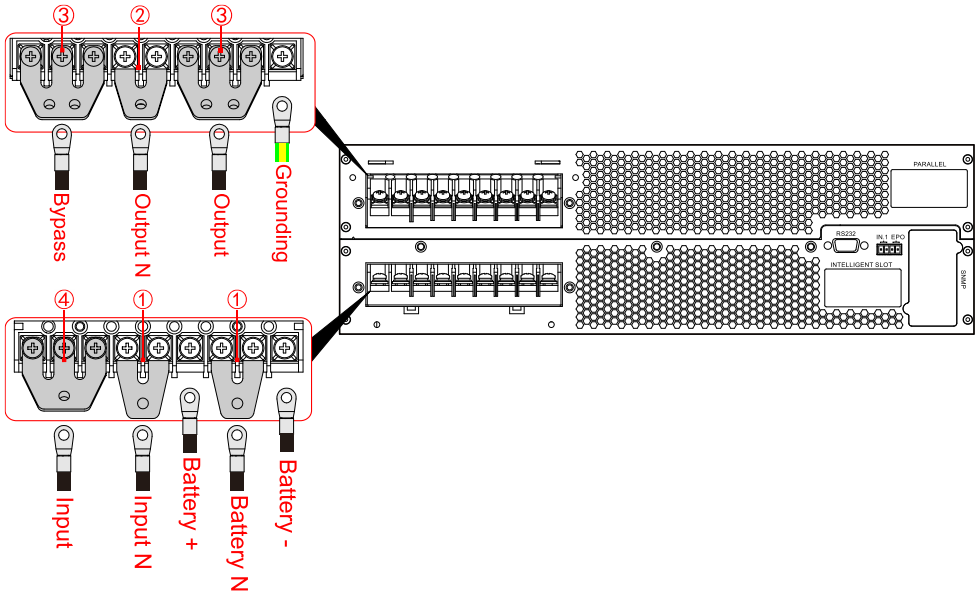
3/3 mode



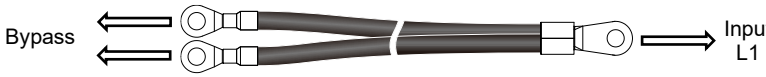
If the installation must be done as single input (bypass line in common with the input line), the metal bars of input/bypass must be connected using the following cables:



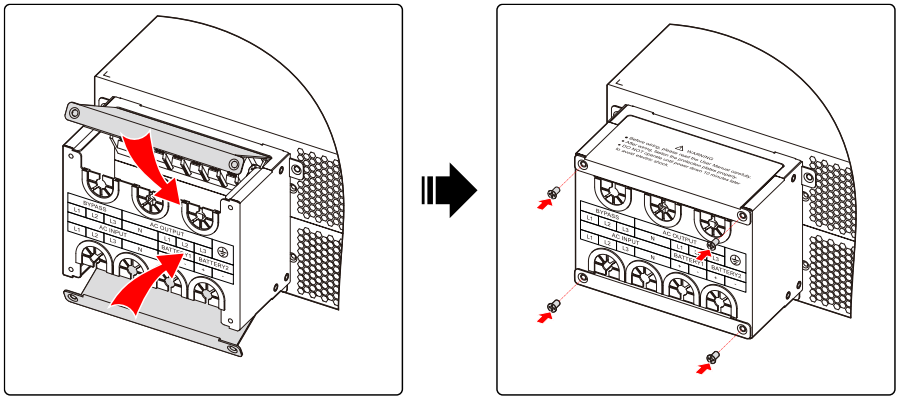
1/1 mode



If the installation must be done as single input (bypass line in common with the input line), the metal bars of input/bypass must be connected using the following cable:



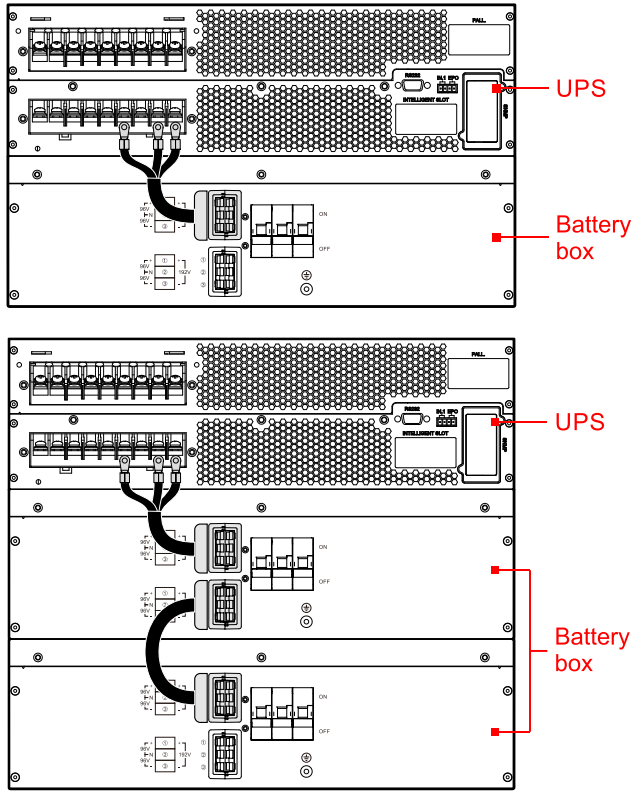
3. Reinstall and fix the wiring covers.



4.4.4 Wiring between UPS and Battery Cabinet

The only battery cabinets that can be installed with the UPS Keor DK Rack are the item 3 113 65 (with batteries included) or 3 113 71 (without batteries included).

For the 10kVA version, the configured battery cabinet quantity can be 1 to 4 (with multiples of 1).

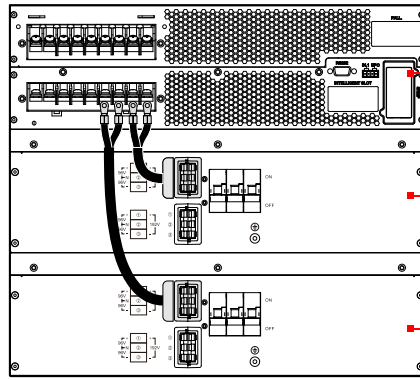


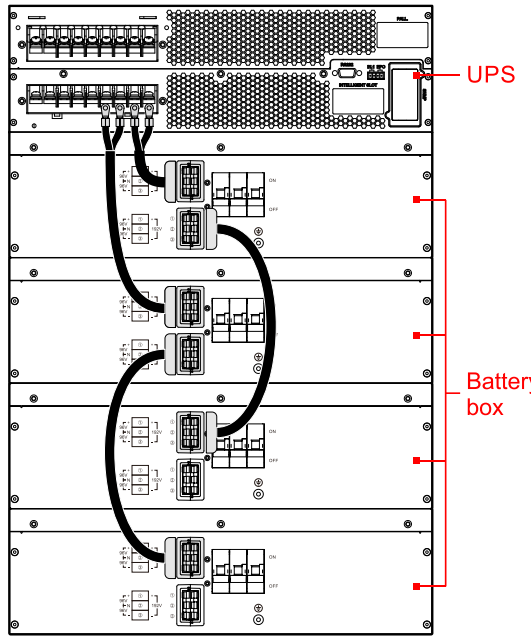
The cables to be used are the following ones:

to connect the battery cabinet to the UPS

to connect the battery cabinets among themselves

For the 15kVA and 20kVA version, the configured battery cabinet quantity can be from a minimum of 2 to 8 (only with multiples of 2).



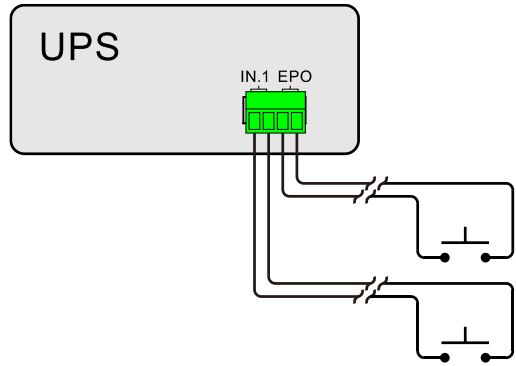


The cables to be used are the following ones:

to connect the battery cabinet to the UPS

to connect the battery cabinets among themselves

4.5 EPO and input dry contacts



IN.1 is the input dry contact. It can be configured via touchscreen as:

- no function (none).
- external maintenance bypass (BMD).
- charge disabled (genset).
- discharge disabled.
- transformer overtemperature.

The status of IN.1 can be set to NO (Normally Open) or NC (Normally Close) via touch screen.
The default function of IN.1 is BMD, and its default status is NC. A switch can be connected to the IN.1 port. When the switch is open, the two pins of IN.1 will not be shorted, the UPS will turn to bypass power supply; at the same time, the display will show “maintenance bypass ON”. When the switch is closed, the two pins of IN.1 will be shorted again, and the fault will be removed automatically.

The status of the EPO can be set to NO (Normally Open) or NC (Normally Close) via touch screen.
The default status of EPO is NC. A switch can be connected to the EPO port. When the switch is closed, the UPS will shut down all inverter and bypass output; at the same time, the display will show “EPO fault”. In this case, completely power off the UPS and restart it again with the EPO switch open.

5. Configuration and starting-up

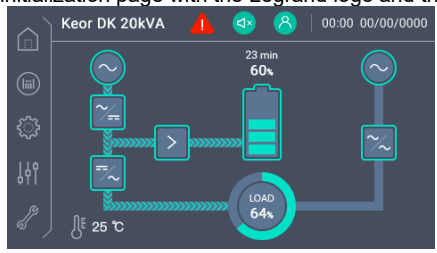
All configurations and start-up operations must be carried out exclusively by a SKILLED TECHNICIAN (paragraph 2.2.1).

5.1 Pre-start-up checks

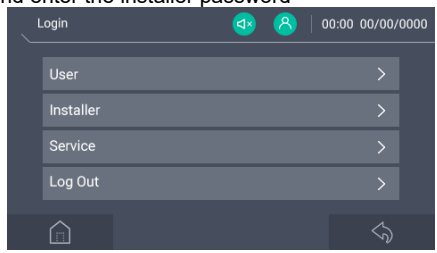
Before powering the equipment, carry out the following checks:
1. Check that the mains, bypass, output, and battery disconnectors are open (OFF position).
2. Check that all wiring has been done and that all connections have been tightened up properly.
3. Check if the installation and wiring are good for transformation, expansion and maintenance in future.
4. Check the correct phase sequence of the input and bypass line.
5. Check that the parameters (voltage and frequency) of the mains input are compatible with those shown on the UPS rating plate.
6. Check if the voltage between the neutral wire and grounding wire is less than 5Vac.
7. Check that there is no short-circuit in the output of the UPS and the load capacity isn't beyond the rated capacity of the UPS.
8. Check that the IN.1 and EPO ports are properly configured and connected.

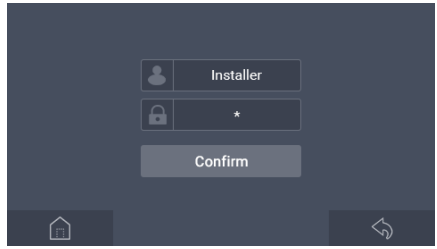
5.2 Start-up procedure

1. Turn on the external mains, bypass and battery disconnectors.
2. The display will enter the initialization page with the Legrand logo and then will show the homepage.



3. Tap the *Login* icon on the top 
4. Select the user *Installer* and enter the installer password



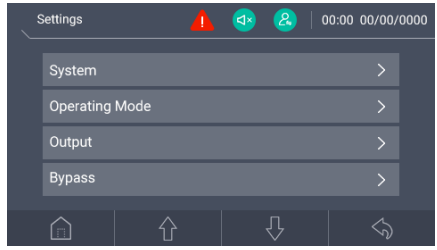


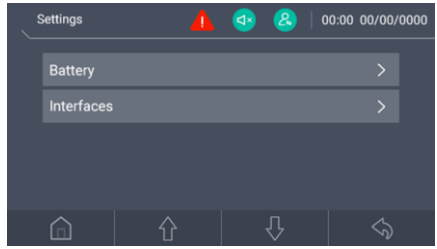
The default installer password is 222222.

The skilled technician must change the default password for the installer.

5. The screen will show the homepage and the *Login* icon on the top will change to as a confirmation.

6. On the homepage, tap the *Settings* icon
7. Configure each function page of the *Settings* page as shown in the following tables according to the parameters desired and the type of installation:





Function page	Set item1	Set item2	Set value	Function instructions
System	Display & Buzzer	Language	English, French, Italian, Spanish, German, Portuguese, Chinese	-
		Orientation	Horizontal	
		Brightness	10 - 100 %	-
		Backlight time	10-300 seconds	-
		Audible alarm	Yes / No	-
	Date / Time	Date	YYYY/MM/DD	-
		Time	hh:mm:ss	-
	Password	Old password	-	Used to change level 1 (User) and level 2 (Installer) passwords. The default password for level 1 is 111111. The default password for level 2 is 222222.
		New password	-	
		Confirm new password	-	
	Startup	Auto restart	Yes / No	
		Startup UPS on inverter mode	Yes / No	If disabled, the UPS use bypass during startup (the load inrush is absorbed by the inverter). (Check NOTE 1)
		Require password at startup	Yes / No	If a "user" password is set, it must be requested before starting the UPS
		Require password on shutdown	Yes / No	If a "user" password is set, it must be requested before turning off the UPS
	Parallel Configuration	Parameters	No. Redundancy / Expand / Parallel bus	-
		Rectifier delay start	0-60 seconds	-
	Others	IN /OUT configuration	3/3, 3/1, 1/1	
		Phase sequence correction	Yes / No	When input phase rotate, bypass will disable, UPS will keep running on inverter mode without transfer to battery
		Short circuit duration time	10 – 200 ms	-
	ECO Mode	Voltage range	10% / 15%	

Operating Mode		Frequency range	5% / 10%	The function can only be used in single unit mode.
		Enable ECO mode	Yes / No	
	Frequency Converter	Frequency converter function	Yes / No	After the frequency converter function is set to yes, the output power of the UPS will be derated to 75% of rated power, once the load exceeds 80% of rated power, the UPS will enter protection mode immediately.
		Frequency converter frequency (Hz)	50/60	
Output	Voltage	Nominal voltage	220, 230, 240	-
		Voltage adjustment	range +/-5V	-
		Rated operating frequency	50/60 Hz	When powering on for the first time, the UPS will preferentially adapt to the grid voltage.
Bypass	-	Bypass disable when short circuit	Yes / No	-
		Bypass disabled	Yes / No / Shutdown	Yes: the internal bypass is always disabled. No: the internal bypass can intervene if necessary (it is also activated when the UPS is turned off - the load will be powered by the bypass) Shutdown: the internal bypass will not be activated when the UPS is turned off (the UPS output is disabled)
		Bypass voltage lower limit	10%/15%/20%	-
		Bypass voltage upper limit	10%/15%/20%	-
		Bypass frequency range	5%/10%	-
Battery	Main Parameters	Battery type	Pb/Li-Ion	-
		Total battery capacity	5-999 Ah	When multiple sets of batteries are

				connected in parallel, the total battery capacity should be set as the sum of the capacities of the multiple sets of batteries.
		Number of batteries per string	16-40	
		Battery installation date	YYYY/MM/DD	-
		Low battery signal	0 - 255 minutes (0 means "disabled")	
		Battery cut-off voltage	9.6, 9.9, 10.2, 10.5, 10.8 V/cell	-
		Battery test cut-off voltage	10-13.8	-
		Battery disconnect alerts	Yes / No	-
	Charging Parameters	Equally charging voltage	12.8-14.8V	-
		Float charging voltage	12.8-14.0V	-
		Battery charging current	1-10 A	-
		Force charging on	Yes / No	-
		Temperature compensation	Yes / No	-
		Temperature compensation coefficient (mV/°C/Cell)	0-5	-
Interfaces	Remote	EPO contact	NC / NO	-
		Input dry contact 1	NC/NO + None, External maintenance bypass, Charge disabled (Genset), Discharge disabled, Transformer overtemperature	-

NOTE 1

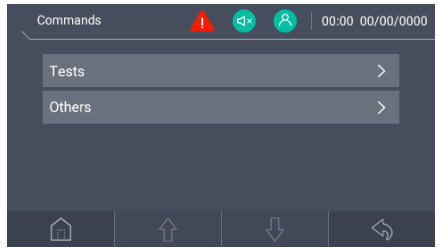
Impact loads Impact loads are characterized with periodic or non-periodic, irregular, non-stationary and transient sudden change. The Keor DK Rack supports the commonly used impact loads like transformer and generator. Due to the electrical structure of 3-phase transformer, exciting current would be induced when large voltage is suddenly added to the two terminals of the transformer, which would cause severe damage to the UPS.

For this type of loads enable the “Impact load mode” function on the screen by setting “Startup UPS on inverter mode” to “On”.

8. Go back to the homepage by tapping the  icon.

9. On the homepage, tap the *Commands* icon  .

10. Configure each function page of the *Commands* page as shown in the following tables according to the parameters desired:



Function page	Set item1	Set item2	Set value	Function instructions
Tests	Battery Test	Type	Quick, Timed, Deep, Abort	Quick = "classic" battery test Timed = battery test for a specified period Deep = autonomy calibration test OR battery test until low battery signal Abort = cancel the current running battery test
		Status	/	None = no test is running Running = a test is running Aborted = a test was aborted by the user Ok = the test was ok Failed = result of the test is KO Impossible = impossible to execute the test
	Self Load Test	Test load function	On / Off	When the function is on, the inverter will feed back to the grid through bypass input, simulating a load test. The function can only be used in single unit mode.
		Test load rate (%)	10-110%	
Others	Dedust mode	Dedust mode	Standard / Timing / Regular / Abort	The fan will vary its speed to flow out dust. This command should be performed when the load is less than 50% of the rated power.
		Dedust Time	1-60min	
		Dedust Cycle	1-720h	

11. Go back to the homepage by tapping the  icon.

12. Long press the ON/OFF button for 3 seconds to start the UPS. When the display shows the message “Confirm to power on?”, press the button “Confirm”.

13. About 30 seconds later, if the UPS works steadily, turn on the loads.

Start the load according to "high power device→small power device" to avoid overload protection when starting high power devices.

It is also possible to turn on the UPS in battery mode (cold start). In this case, long press the ON/OFF button for 10 seconds. When the display shows the message “Confirm to power on?”, press the button “Confirm”.

The UPS is equipped with an auto-restart system. In case of return of the input mains after the end of battery operation, the UPS turns on to normal operation by supplying the output loads.

5.3 Shutdown

1. Remove the load or turn off the output disconnector and keep the UPS running with no load for about 10 min to exhaust heat.
2. Long press the ON/OFF button for 3 seconds, When the display shows the message “Confirm to power off?”, press the button “Confirm”. to shut down the UPS.
3. Turn off the external battery, bypass and mains switch.

6. Maintenance

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.

Keep a register in which to enter the date, time, type and any other useful information about any routine and extraordinary maintenance operation.

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.

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.

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 Troubleshooting

6.3.1 Common faults

Fault	Possible reason
After starting the UPS, it outputs normally on mains power, but switches to battery mode intermittently, causing the buzzer to beep.	1. Check if the contactors and wiring terminals in the input circuit are in good condition. 2. Verify if the input voltage amplitude or frequency displayed on the touch screen is within the allowable range for the UPS. 3. Check if the mains input breaker is disconnected. If it is, close the breaker again.
After installing the UPS, connecting it to power causes the fuse to blow or the circuit breaker to trip.	Short circuit in the UPS input or output wiring
After starting, the touch screen display and output are normal. However, once a load is connected, the UPS stops outputting immediately.	1. The UPS is seriously overloaded, or the output circuit is short-circuited. Please reduce the load to an appropriate capacity or identify the cause of the short circuit. Common reasons include a short circuit in the output changeover socket or an input short circuit due to UPS damage. 2. The load is not started according to the sequence “high power device → small power device”. Restart the UPS, and once it is operating steadily, start the high-power load first, followed by the smaller power loads successively.
The buzzer emits long beeps, the fault indicator lights up, the UPS operates in bypass mode, and there is an inverter failure.	1. The output is overloaded. The load is too heavy and exceeds the rated power of the UPS. Please reduce the load or select a UPS with a larger power capacity. If the bypass is temporary and caused by the impact of load start, and it recovers automatically, this is still considered normal. 2. UPS over-temperature protection. Check if the air inlet and outlet of the UPS are blocked or if the operating temperature of the UPS is beyond the allowable range.
The UPS usually works normally, but during a power failure, it either doesn’t transfer to battery mode or it transfers to battery mode and soon triggers battery under-voltage protection.	1. Battery aging and capacity loss. Please replace the battery. 2. Battery charger fault. The battery cannot be charged during normal operation. 3. Poor connection of battery wires or bad contact at the terminals.
When the load is a PC, everything works normally. However, during a power failure, the UPS operates normally, but the computer system halts	The grounding connection is not adequate. The floating voltage between the neutral wire and the grounding wire is too high.

6.3.2 Faults symbols and buzzer status

No.	Fault symbol	Buzzer status	Meaning
1	EPO	Long beep	Emergency protection activated (if equipped with EPO function), and both the bypass output and inverter output are closed.
2	Input & output configuration error	Long beep	The UPS system mode setting and the actual wiring do not match. Check the main power or bypass wiring and ensure the actual system is consistent with the set mode.
3	Maintenance bypass open	Long beep	UPS maintenance bypass protection is active, and the inverter output is closed. Check if the maintenance bypass detection port on the backboard is shorted.
4	Output short circuit	Long beep	Please test the UPS output for short circuit
5	Output configuration mismatch	Long beep	The UPS output mode in parallel does not match the actual system
6	Inverter voltage mismatch	Long beep	The UPS output voltage in parallel does not match the actual system
7	Inverter frequency mismatch	Long beep	The UPS frequency in parallel does not match the actual system
8	Bypass voltage range mismatch	Long beep	The UPS bypass voltage in parallel does not match the actual system
9	Bypass frequency range mismatch	Long beep	The UPS bypass frequency in parallel does not match the actual system
10	Parallel mode mismatch	Long beep	The UPS parallel mode setting does not match the actual system
11	Power mismatch	Long beep	The UPS output power setting in parallel does not match the actual system
12	Battery quantity mismatch	Long beep	The UPS battery number settings in parallel do not match the actual system
13	Parallel parameter mismatch	Long beep	The UPS parameter settings in parallel do not match the actual system
14	Short to bypass mismatch	Long beep	The UPS short turn to bypass setting in parallel does not match the actual system

No.	Fault symbol	Buzzer status	Meaning
15	Parallel cable double-end disconnected	Long beep	Fall-off fault at both ends of the parallel wire.
16	Parallel cable single-end disconnected	Slow beep	Fall-off fault at one ends of the parallel wire.
17	15V auxiliary power abnormal	Long beep	UPS internal 15V working power supply fault. If abnormal and cannot be automatically restored, report for maintenance in time.
18	Fan fault	Urgent beep (alarm once about every 0.2s)	Fan fault warning prompt. Check the fan for damage or blockage.
19	CAN communication abnormal	Slow beep (alarm once about every 2.0s)	CAN communication of the parallel system is abnormal. Check if the parallel wire is damaged or if there is only one UPS working in the parallel system.
20	SCI communication fault	Long beep	UPS internal communication is abnormal. If the continuous alarm cannot be restored, report for repair promptly.
21	Parallel UPS without redundancy alarm	Slow beep (alarm once about every 2.0s)	The total output load of the UPS parallel system exceeds the full load of a single unit. Check that the output load meets the requirements for redundant backups.
22	Mains abnormal	Long beep	The mains power input phase sequence is abnormal. Check the main power input wiring.
		3 continuous alarms at 10s intervals	The main power input has a lack N fault, power down failure, overvoltage protection, undervoltage protection, over-frequency fault, or under-frequency fault. Check whether the main power input status is normal.
23	Bypass abnormal	Slow beep (alarm once about every 2.0s)	At mains status, the bypass voltage is abnormal, frequency is abnormal, phase sequence is abnormal, or the mode setting does not match the wiring. Check if the bypass breaker is closed, if the bypass phase sequence is normal, and if the bypass wiring matches the system mode setting.
24	Battery abnormal	Slow beep (alarm once about every 2.0s)	Battery has overpressure protection, charging fuse failure, or overpressure alarm fault. Check if the battery status is normal.
		Urgent beep (alarm once about every 0.2s)	Battery wiring fault, charging short, under-voltage protection, undervoltage warning problem. Check the battery wiring and the current state is normal.

No.	Fault symbol	Buzzer status	Meaning
		No buzzer warning	The battery charging temperature is too high
25	Rectifier abnormal	Long beep	UPS rectifier fault
26	Inverter abnormal	Long beep	UPS inverter failure

6.4 Ordinary and extraordinary maintenance

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

 Before carrying out any maintenance work, the UPS needs to be powered off for at least 10min. It is necessary to follow all safety instructions listed in chapter 2.

7. Warehousing

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

A SKILLED TECHNICIAN must check that there is no voltage present before disconnecting the cables.

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).
The package box must be raised off the ground by at least 200 mm and kept at a distance of at least 500 mm from wall, heat source, cold source, window or air inlets.
In the warehouse, any inflammable, explosive, corrosive object or harmful gas is not allowed. The environment must also be free from strong mechanical shakes, impacts or magnetic fields.

7.2 Batteries

It is possible to store batteries without recharging them in the following conditions:
- up to 6 months if the temperature is between +20°C (+68°F) and +30°C (+86°F);
- up to 3 months if the temperature is between +30°C (+86°F) and +40°C (+104°F);
- up to 2 months if the temperature is over +40°C (+104°F).

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

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 regulations 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.

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. Technical characteristics

MAIN FEATURES

	3 113 53	3 113 54	3 113 55
Nominal Power (kVA)	10	15	20
Active Power (kW)	10	15	20
Output Power Factor	1		
Technology	Online, double conversion VFI-SS-11 (EN IEC 62040-3) 3-Level IGBT Technology		
IN/OUT configuration	Configurable Three-phase / One-phase (default) Three-phase / Three-phase One-phase / One-phase		
Functions available	Frequency converter ECO mode for energy saving Parallel function Dual input 3U PDU input/output/bypass/MBS with bypass backfeed contactor (optional) Generator compatible (Genset disabled during battery charging) Cold start (start in stored energy mode)		
Neutral system	Neutral passing through		
Bypass	Automatic (static) External Manual (optional)		
Overvoltage category	OVC II		
Protection class (EN/IEC 61140)	I		
AC power distribution system compatibility	TN, TT		

INPUT AND BYPASS ELECTRICAL CHARACTERISTICS

	3 113 53	3 113 54	3 113 55
Input current	3/1, 3/3, 1/1 mode 3W+N+PE ~ 380/400/415 V 17.5/16.7/16.0 A 1~ 220/230/240 V 52.5/50.1/48.0 A	3/1, 3/3, 1/1 mode 3W+N+PE ~ 380/400/415 V 26.8/25.7/24.6 A 1~ 220/230/240 V 80.4/77.2/73.9 A	3/1, 3/3, 1/1 mode 3W+N+PE ~ 380/400/415 V 34.8/33.4/32.0 A 1~ 220/230/240 V 104.4/100.3/96.1 A
Input voltage (V)	L-N: 220/230/240 (default 230) L-L: 380/400/415 (default 400)		

Input voltage range (V)	L-N: 80 to 176 (with linear load derating from 100% to 15%) L-N: 176 to 280 (full load)		
Input frequency (Hz)	50/60		
Range of the input frequency (Hz)	40 to 70		
Input Power Factor	≥ 0.99		
Total harmonic distortion of the input current	THDi ≤ 3% (at full resistive load) THDi ≤ 5% (at full non-linear load)		
Icp Prospective short-circuit current (kA)	10		
Bypass input current	3/1, 3/3, 1/1 mode 3W+N+PE ~ 380/400/415 V 15.3/14.6/14.0 A 1~ 220/230/240 V 45.9/43.9/42.1 A	3/1, 3/3, 1/1 mode 3W+N+PE ~ 380/400/415 V 23.0/22.0/21.0 A 1~ 220/230/240 V 69.0/65.9/63.1 A	3/1, 3/3, 1/1 mode 3W+N+PE ~ 380/400/415 V 30.6/29.3/28.1 A 1~ 220/230/240 V 91.8/87.8/84.2 A
Bypass input voltage range (V)	L-N: 220/230/240 (default 230) L-L: 380/400/415 (default 400)		
Bypass input voltage range (V)	L-N: ± 20%		
Bypass synchronism track range (Hz)	50/60±10% (50/60 self-adaption)		

OUTPUT ELECTRICAL CHARACTERISTICS

	3 113 53	3 113 54	3 113 55
Output current	3/1, 3/3, 1/1 mode 3W+N+PE ~ 380/400/415 V 15.2/14.5/13.9 A 1~ 220/230/240 V 45.5/43.5/41.7 A	3/1, 3/3, 1/1 mode 3W+N+PE ~ 380/400/415 V 22.8/21.7/20.8 A 1~ 220/230/240 V 68.3/65.2/62.5 A	3/1, 3/3, 1/1 mode 3W+N+PE ~ 380/400/415 V 30.3/29.0/27.8 A 1~ 220/230/240 V 90.9/87.0/83.3 A
Output voltage (V)	L-N: 220/230/240 (default 230) L-L: 380/400/415 (default 400)		
Output voltage range	L-N: ± 1%		
Output frequency (Hz)	50 / 60 (selectable by the user, default 50)		
Range of the output frequency	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 ≤ 2% (at full linear load) THDv ≤ 5% (PF 0.9 non-linear load)		
Efficiency in Normal Mode (%)	up to 96		
Efficiency in Eco Mode (%)	98.5		
Overload capacity	Normal mode Load≤105%: continuous 105%<load≤110%: 60 min 110%<load≤130%: 10 min 130%＜load≤155%: 1 min 155%＜load≤200%: 200ms load>200%: 20 ms (immediate protection) Bypass mode <130%: continue 130% to ~155%: 1 min ＞155%: 200 ms Stored energy mode *Number of batteries：±13~±20* Load≤105%: continuous 105%<Load≤110%: 60 min 110%<Load≤130%: 10 min 130%＜Load≤155%: 1 min 155%＜Load≤200%: 200ms Load>200%: 20 ms (immediate protection) *Number of batteries：±8~±12* Load≤105%: continuous 105%<Load≤115%: 5 min 115%<Load≤130%: 1 min 130%＜Load≤155%: 30 sec 155%＜Load≤200%: 200 ms Load>200%: 20 ms (immediate protection)		
Transfer time (ms)	synchronization: ＜1 asynchronization: ＜10		
Output short-circuit	3/3 mode 39.0A/16.7ms 3/1 and 1/1 mode 117.0A/16.7ms	3/3mode 52A/16.7ms 3/1 and 1/1 mode 156A/16.7ms	3/3mode 78A/16.7ms 3/1 and 1/1mode 220A/16.7ms

BATTERIES AND BATTERY CHARGER CHARACTERISTICS

	3 113 53	3 113 54	3 113 55
Nominal battery voltage (Vdc)	± 96	± 192	
Nominal battery current (A)	55.4	41.5	55.4
Battery wiring	only external batteries hot-swappable (VRLA)		
Battery voltage range (Vdc)	±96 to ±240	± 192 to ±240	
Battery string	± 8 to ± 20 (±48 cells to ±120 cells)	± 16 to ± 20 (±96 cells to ±120 cells)	
Charging current (A)	Settable 1-10 (4 default)		

MECHANICAL CHARACTERISTICS

	3 113 53	3 113 54	3 113 55
Net weight (kg)	19		
Dimensions H x W x D (mm)	130 (3U) x 438 x 535		

OTHER FEATURES

	3 113 53	3 113 54	3 113 55
Display	4.3” LCD colour touchscreen with led bar		
Communication ports	RS232 SMNP input dry contacts USB host port Parallel Sync		
Protections	Emergency Power Off (EPO) Electronic against overtemperature, overloads, short-circuit and excessive battery discharge Block of functions due to the end of autonomy In-rush limiter on start up Fan speed control according to the load percentage and temperature		
Remote management	available		

ENVIRONMENTAL CONDITIONS

	3 113 53	3 113 54	3 113 55
Operating temperature (°C)	0 to +40 (full load) 0 to +50 (80% load)		
Relative humidity during operation (%)	0 to 95 (non-condensing)		
Storage temperature (°C)	-20 to +50		
Noise level at 1 metre (dBA)	≤ 55		
Ingress Protection Marking	IP 20		
Pollution degree	PD2		
Climatic class (EN IEC 60721-3-3)	3K22		
Special climatic class (EN IEC 60721-3-3)	3Z2		
Biological class (EN IEC 60721-3-3)	3B2		
Mechanical class (EN IEC 60721-3-3)	3M11		
Mechanically active substances class (EN IEC 60721-3-3)	3S5		
Operating height	up to 2000 metres above sea level without derating		
Heat dissipation with full load and fully charged battery in recharge (BTU/h)	1952	3007	3905

REFERENCE DIRECTIVES AND STANDARDS

Marks	CE, CMIM, UKCA
Safety	2014/35/EU Directive EN IEC 62040-1
EMC	2014/30/EU Directive EN IEC 62040-2
Performance and test requirements	EN IEC 62040-3

10. Technical data

LEGRAND is not responsible for the correct sizing of the cables which are specific of each electrical installation (see paragraph 4.4).

TABLE 1
UPS max steady phase current

	3 113 53 Keor DK 10 kVA			3 113 54 Keor DK 15 kVA			3 113 55 Keor DK 20 kVA		
IN/OUT configuration	3/3	3/1	1/1	3/3	3/1	1/1	3/3	3/1	1/1
AC input (A)	18	18	53	27	27	81	35	35	105
Bypass input (A)	16	46	46	23	69	69	31	92	92
DC input (A)	56	56	56	42	42	42	56	56	56
AC output (A)	16	46	46	23	69	69	31	91	91

TABLE 2
Recommended wire cross-sections (unit: mm^2, environment temperature:25 °C)

	3 113 53 Keor DK 10 kVA			3 113 54 Keor DK 15 kVA			3 113 55 Keor DK 20 kVA		
IN/OUT configuration	3/3	3/1	1/1	3/3	3/1	1/1	3/3	3/1	1/1
AC input live wire	4x3	4x3	10x1	6x3	6x3	16x1	10x3	10x3	10x2
AC input neutral wire (N)	4x1	10x1	10x1	6x1	16x1	16x1	10x1	10x2	10x2
Bypass input live wire	4x3	10x1	10x1	6x3	16x1	16x1	10x3	10x2	10x2
AC output live wire	4x3	10x1	10x1	6x3	16x1	16x1	10x3	10x2	10x2
AC output neutral wire (N)	4x1	10x1	10x1	6x1	16x1	16x1	10x1	10x2	10x2
DC input (+/BAT N/-)	10x3	10x3	10x3	10x3	10x3	10x3	10x3	10x3	10x3
Grounding wire (PE)	4x1	10x1	10x1	6x1	16x1	16x1	10x1	10x2	10x2

The recommended cross-section is calculated for wires having a maximum length of about 5 meters. If the length of wire exceeds 20 meters, the cross-section should be increased accordingly.

PVC copper wires must be used with an operating temperature of at least 90°C (194°F)

The terminals block is made up of M5 bolts. The recommended tightening torque is 2.5 Nm.

When the UPS is set to 3/1 or 1/1 mode it is equipped with input and output three-phase connector, so the bypass input and output wires are recommended as single wire. When the UPS is set to 1/1 mode, the UPS is not equipped with the input and output three-phase connector, thus the AC input wires are recommended as three wires. When the UPS is single phase input, the three fire wires need to be connected to the same phase of power input.

TABLE 3
Insulated ring terminals to use according to the wire cross-sections

WIRE CROSS-SECTION	INSULATED CRIMP RING TERMINALS
4	RV3.5-6
6	RV5.5-6
10	RNBS8-6
16	RNBS14-6
25	RNBS22-6
35	RNBS38-6

TABLE 4
Recommended breakers

	3 113 53 Keor DK 10 kVA			3 113 54 Keor DK 15 kVA			3 113 55 Keor DK 20 kVA		
IN/OUT configuration	3/3	3/1	1/1	3/3	3/1	1/1	3/3	3/1	1/1
AC input (A)	32*3P	32*3P	80*1P	50*3P	50*3P	125*1P	63*3P	63*3P	150*1P
Bypass input (A)	32*3P	63*1P	63*1P	50*3P	100*1P	100*1P	50*3P	125*1P	125*1P
DC input (A)	100*3P	100*3P	100*3P	80*3P	80*3P	80*3P	100*3P	100*3P	100*3P
AC output (A)	32*3P	63*1P	63*1P	50*3P	100*1P	100*1P	50*3P	125*1P	125*1P

The DC input breaker should have a rating voltage above $250V_{DC}$

TABLE 5
Residual current breaker recommended for input and bypass line

POWER	RESIDUAL CURRENT BREAKER (IΔn)
10 kVA	≥ 300 mA type B
15 kVA	
20 kVA	

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