SUN NEVER SETS

INSTRUCTION MANUAL

- OPERATION
- INSTALLATION
- MAINTENANCE

CAREFULLY READ THIS INSTRUCTIONS BEFORE USE.

DLX 500AC-600AC-800AC-1000AC

GB

TRANSLATED FROM THE ORIGINAL IN ITALIAN LANGUAGE

Code: 240.010.0026
Date: 23/09/2022
Rev.: 02

IMPORTANT SAFETY INSTRUCTIONS

This manual contains important safety information, which must be followed during the installation and maintenance operations of the equipment.
It is compulsory for the operators to read this manual and to strictly follow the instructions contained herein, as DELIOS s.r.l. shall not be accountable for injuries caused to people and/or damages to things or to the equipment if the following instructions conditions are not followed.

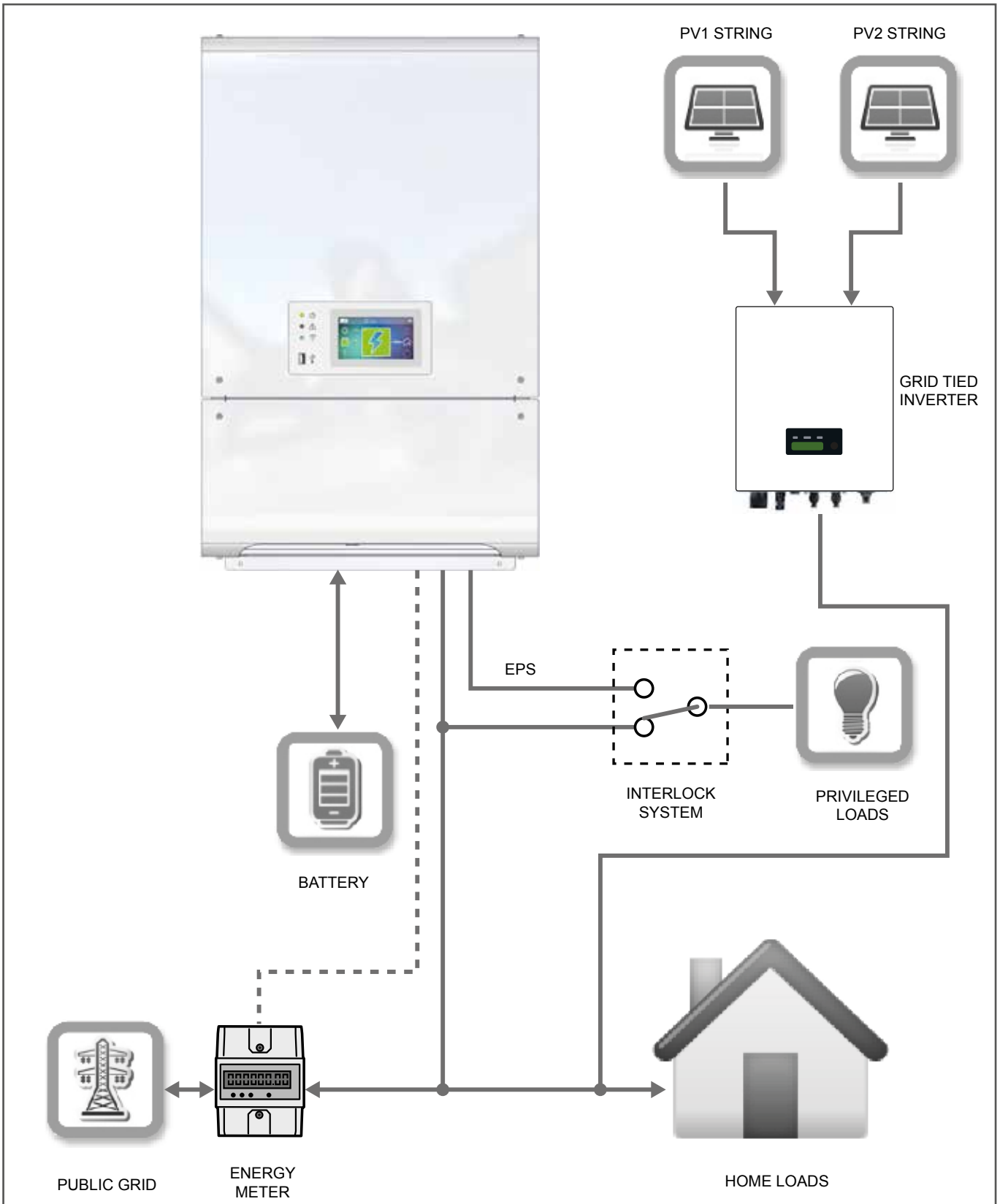


Fig. 00

Cod.: 240.010.0026

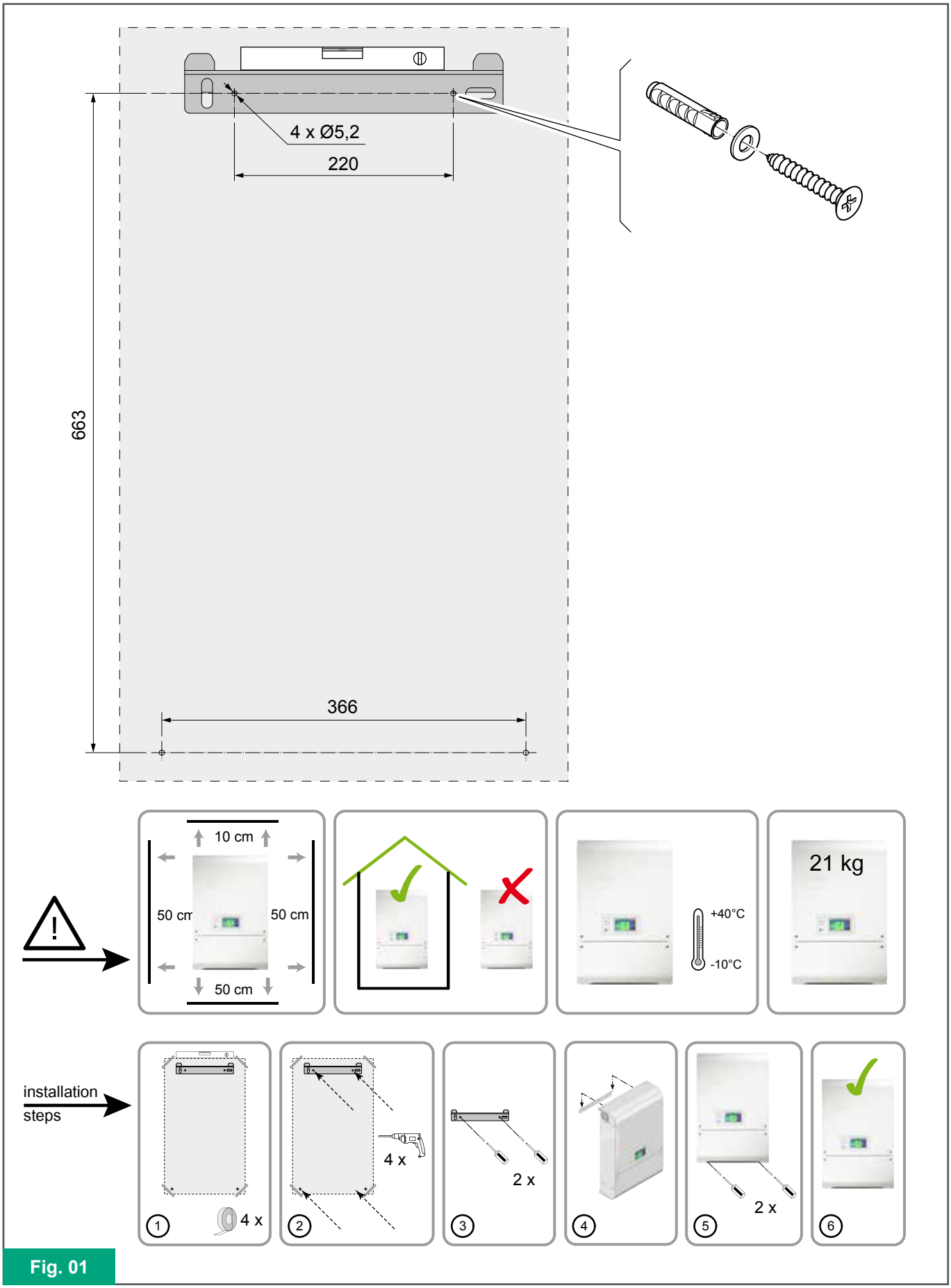
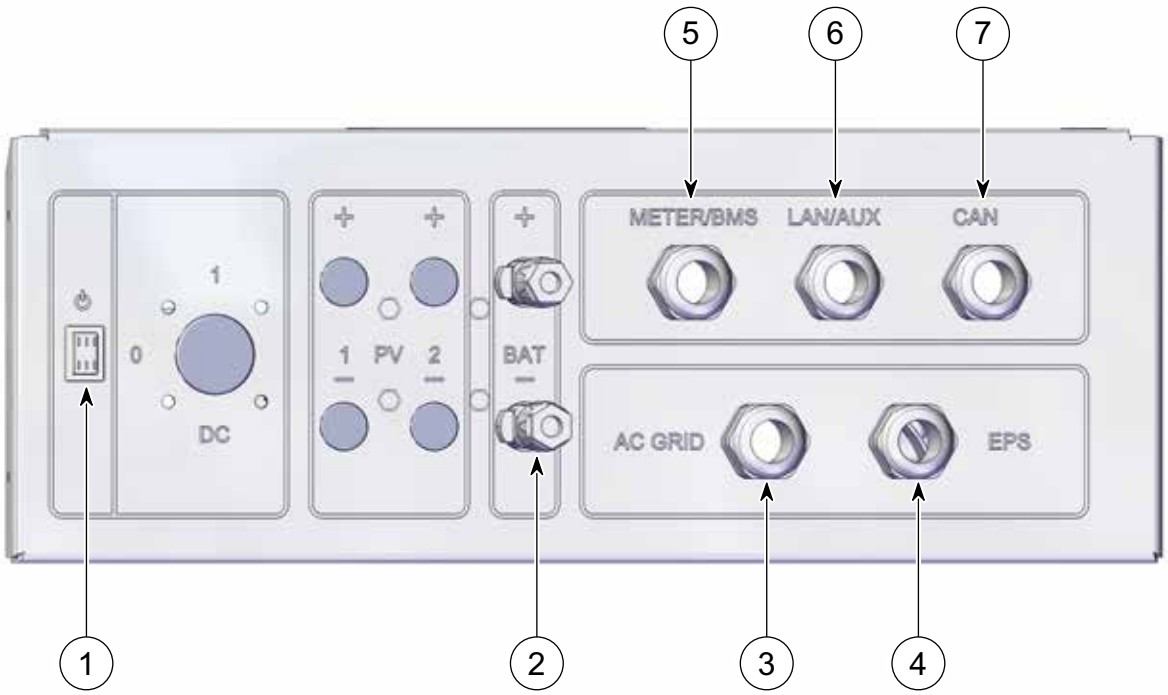


Fig. 01

Cod.: 240.010.0026



1 - ON/OFF switch
2 - BATTERY input
3 - AC GRID output
4 - EPS output
5 - ENERGY METER and BATTERY BMS wiring input
6 - LAN and AUX wiring input
7 - CAN wiring input

Fig. 02

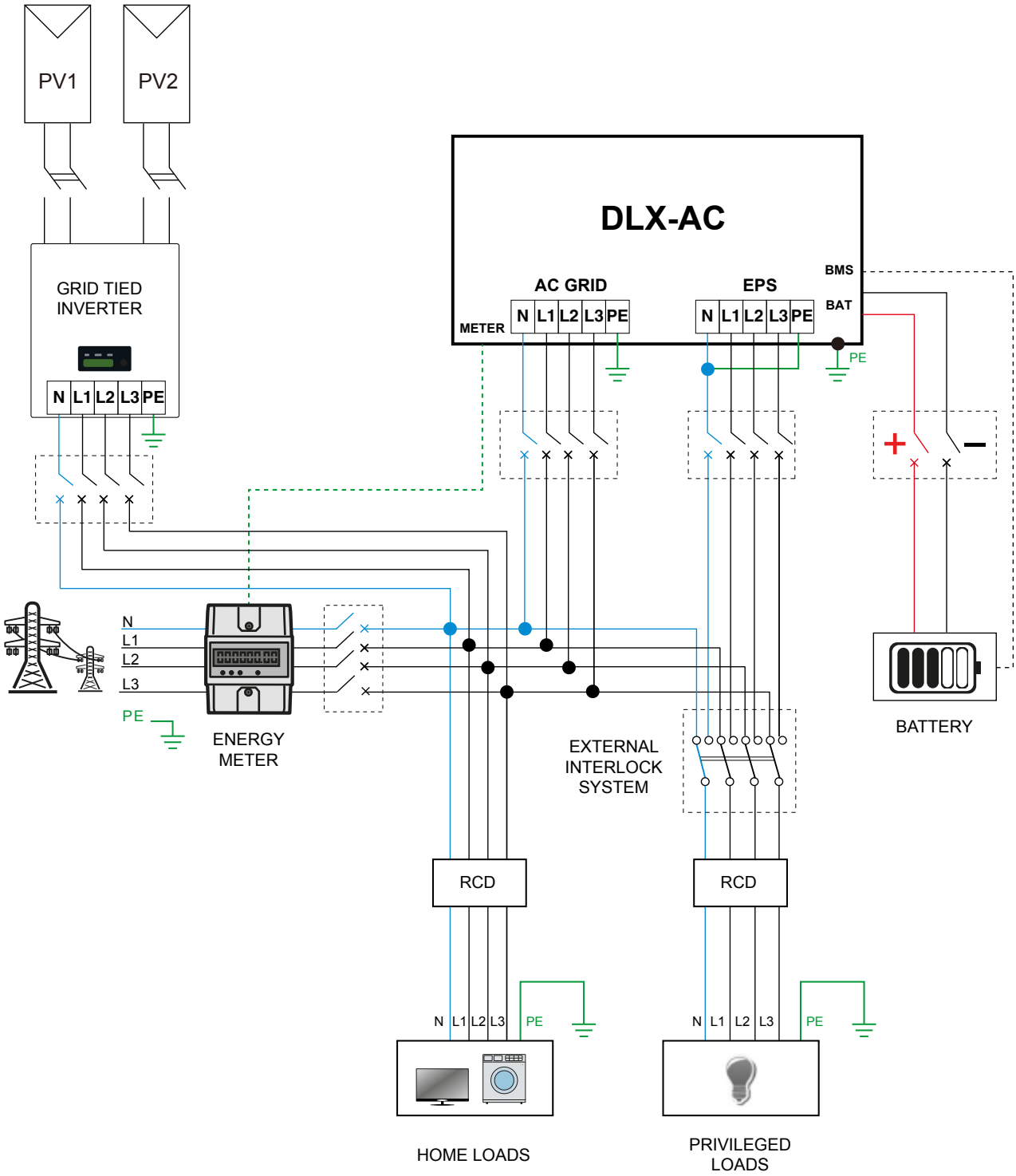


Fig. 03

Cod.: 240.010.0026

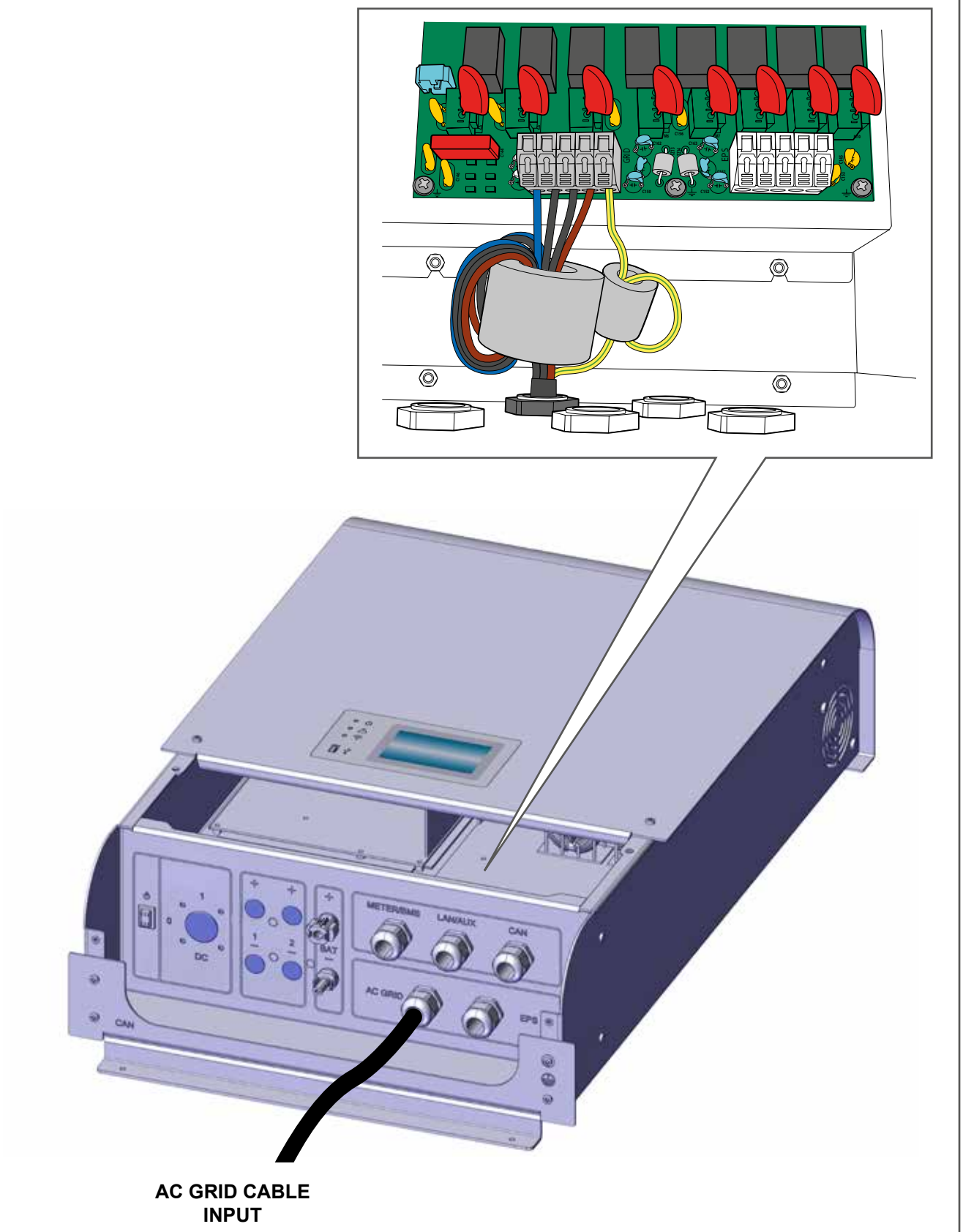
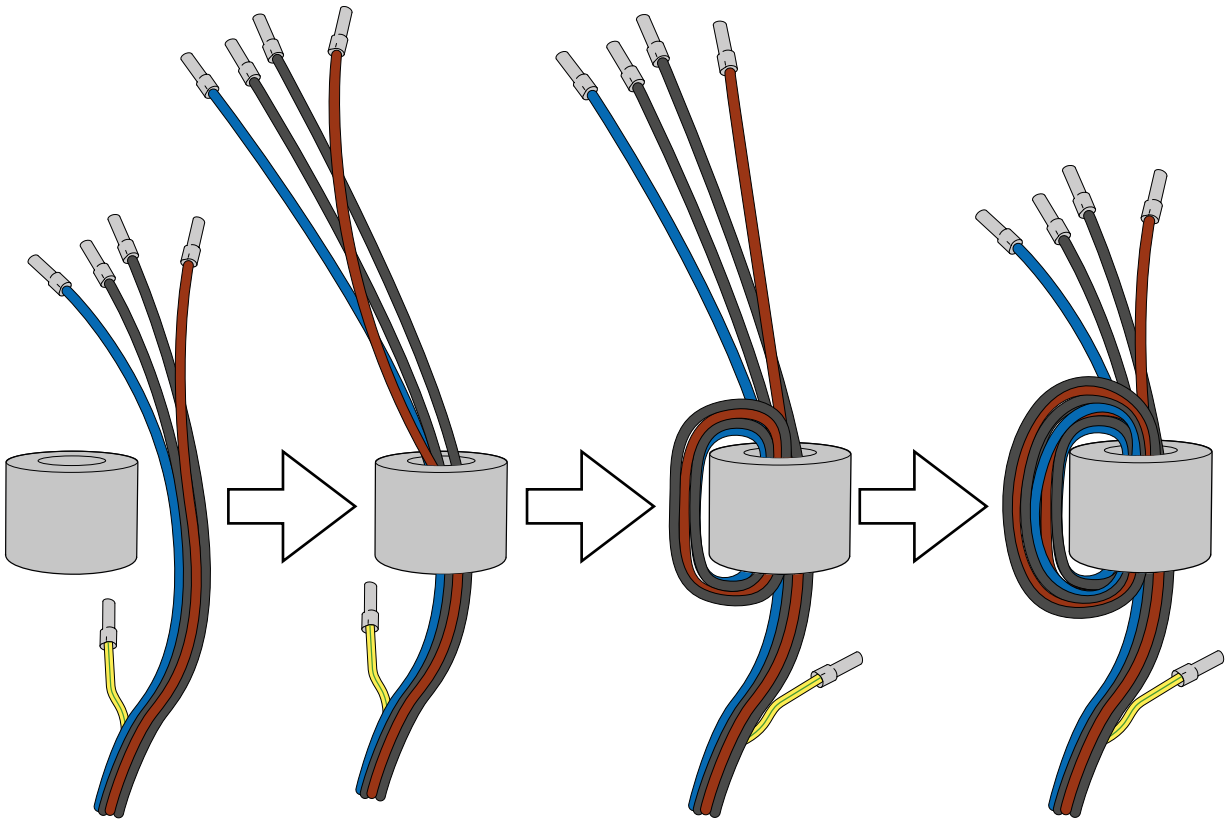
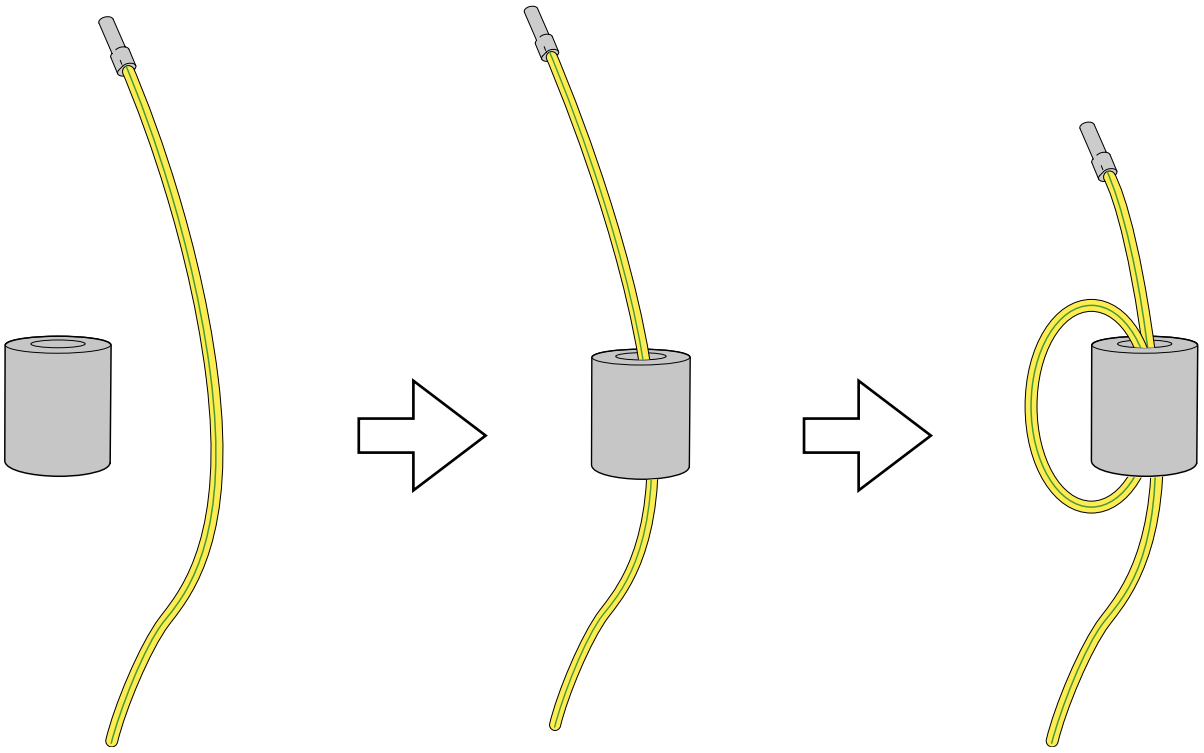

METER/BMS
LAN/AUX
CAN
AC GRID
EPS
BAT
DC
CAN
AC GRID CABLE
INPUT

Fig. 04

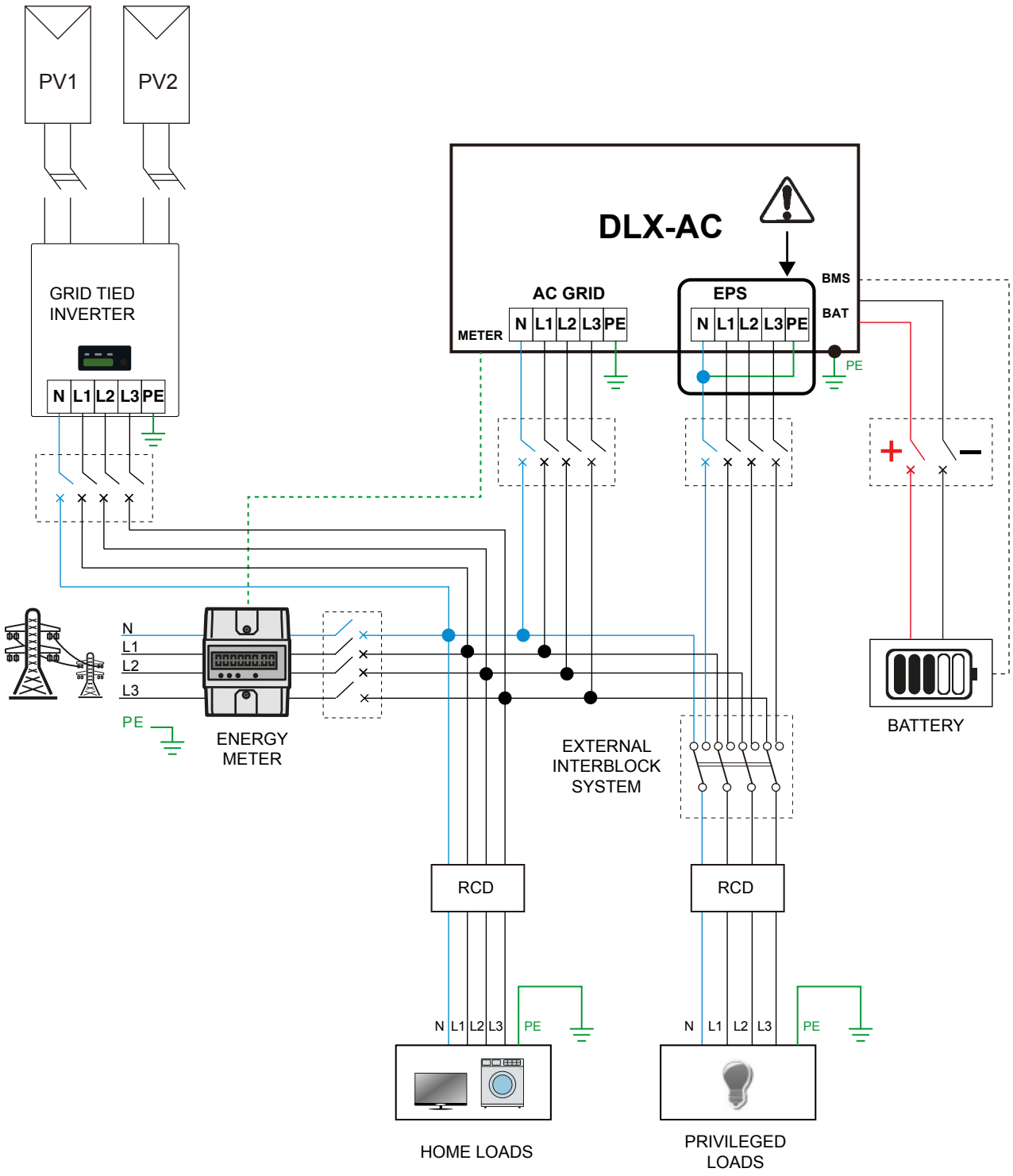


Ferrite core installation sequence on AC GRID cable.



Ferrite core installation sequence on PE cable.

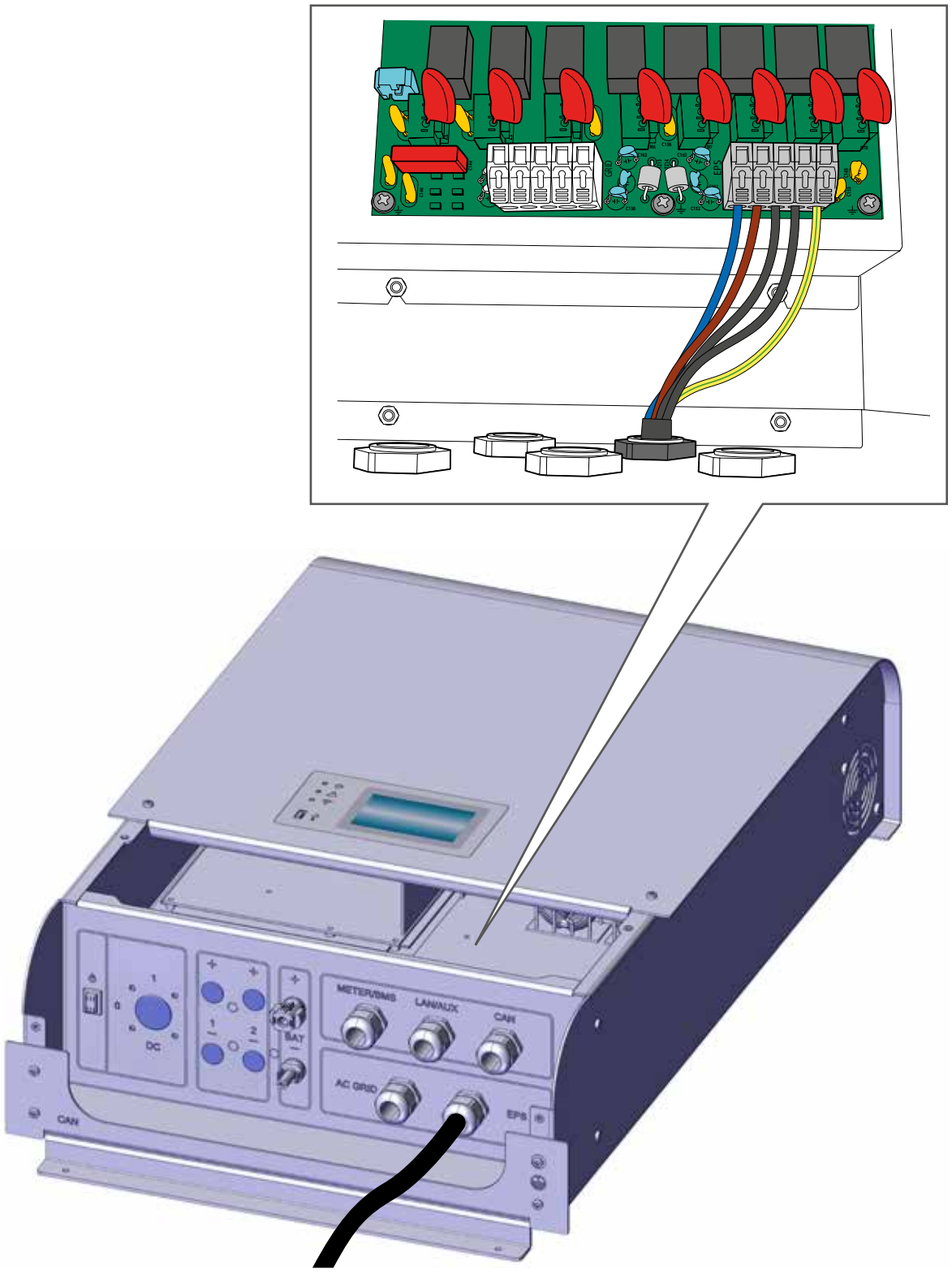
Fig. 05



Ground connection to PE on the neutral conductor (N)
(Where required by law)

Fig. 06

Cod.: 240.010.0026



EPS CABLE INPUT

Fig. 07

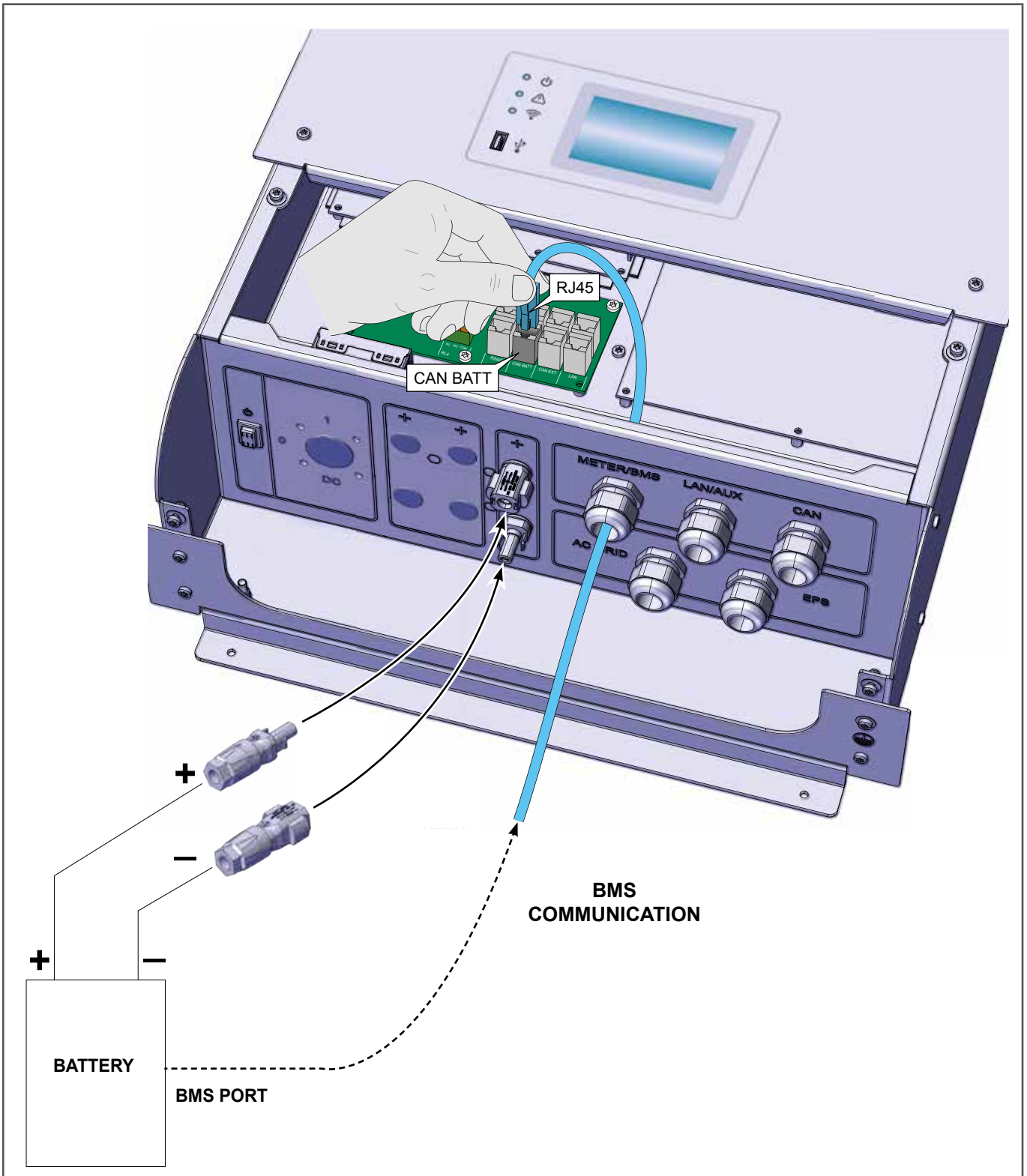
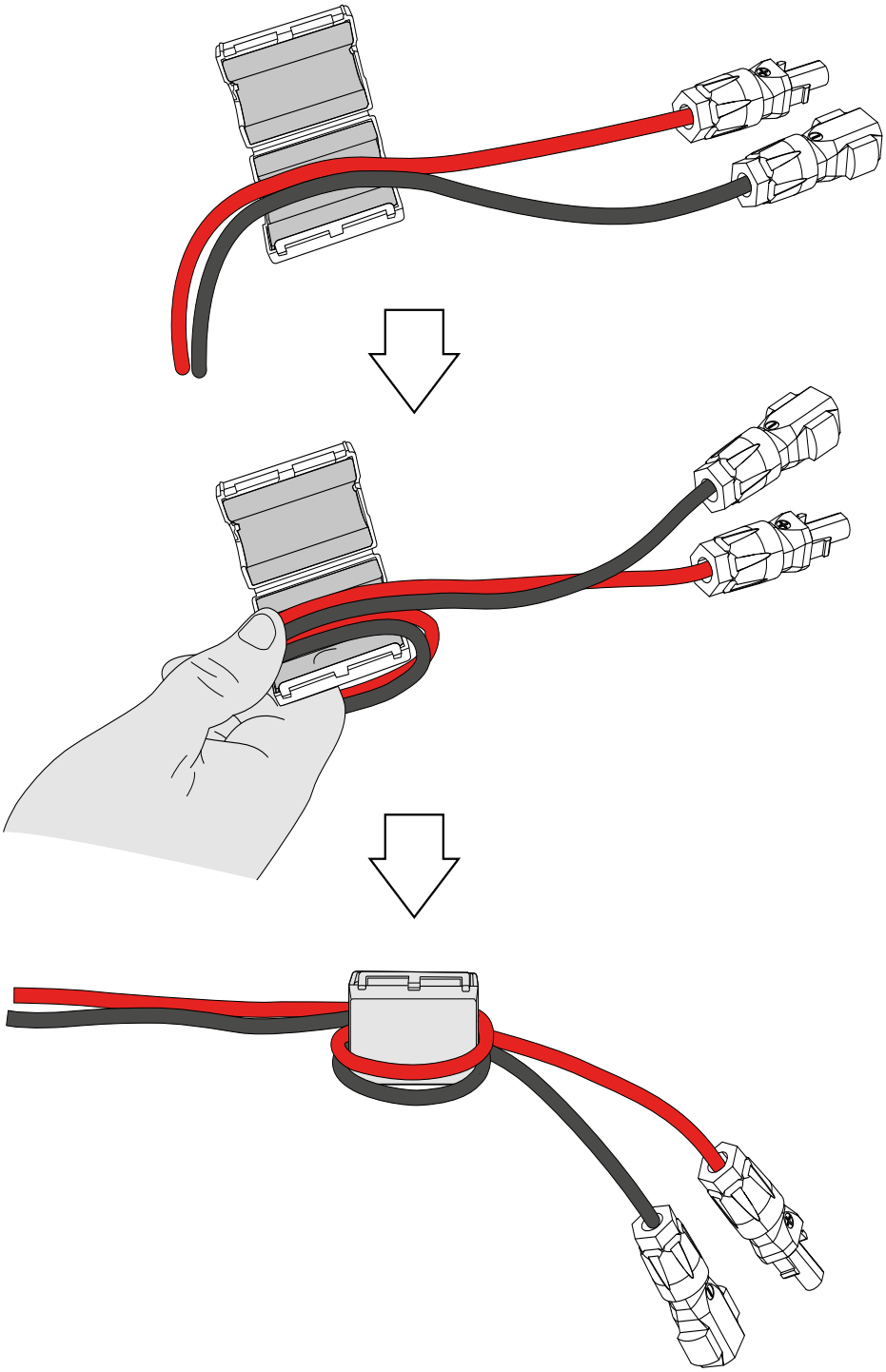


Fig. 08

Cod.: 240.010.0026



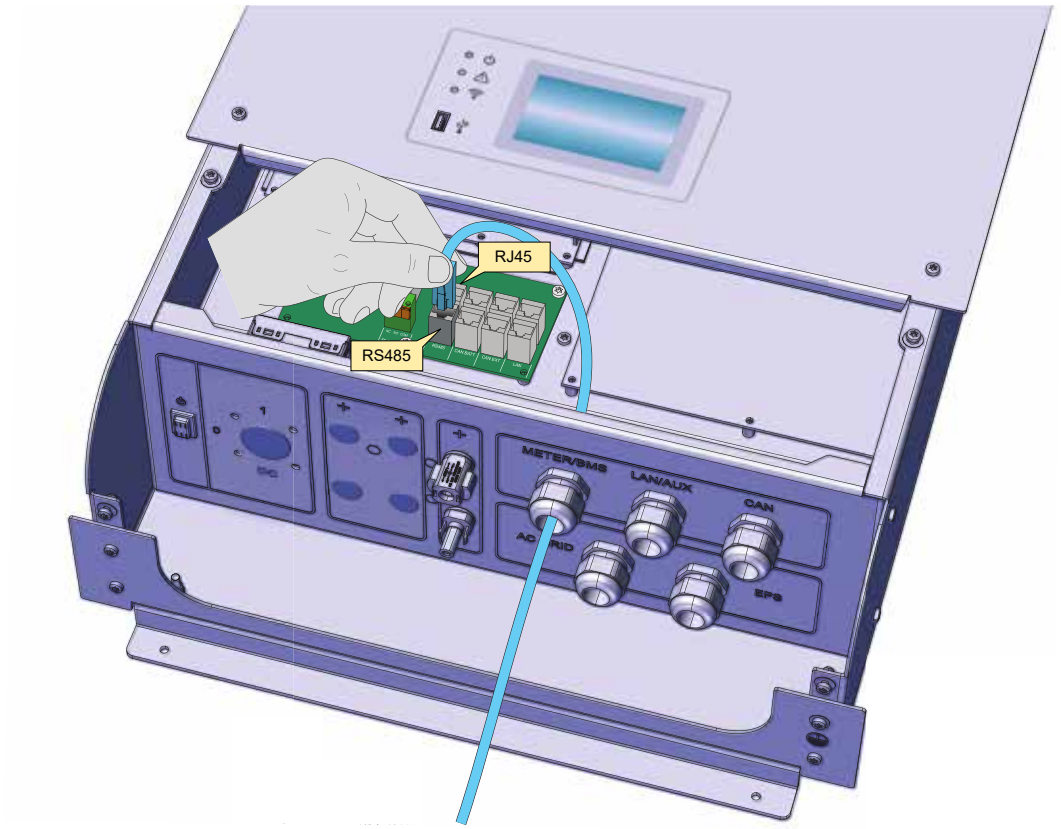
Ferrite core installation sequence on BAT cables.

Fig. 09

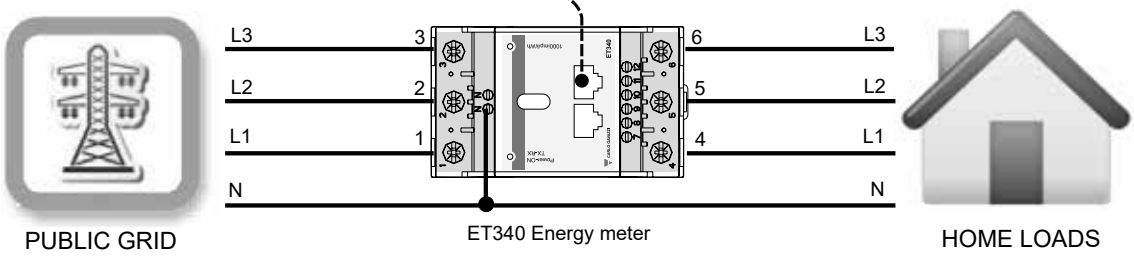
Cod.: 240.010.0026

The connection of the external earth terminal to the PE protective conductor is mandatory.

Fig. 10



METER
COMMUNICATION

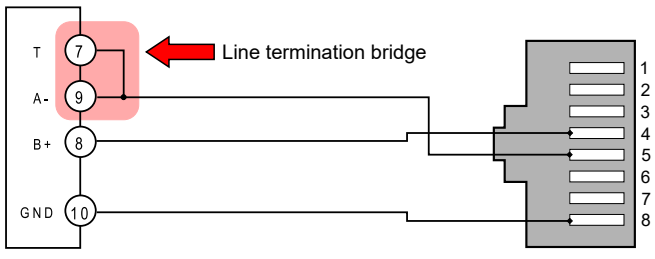


PUBLIC GRID

ET340 Energy meter

HOME LOADS

ET340 - RS485 MODBUS terminals connection*
(*) Refer to ET340 datasheet for further details



RJ45

RJ45 PINOUT

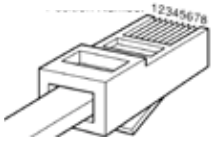


Fig. 11

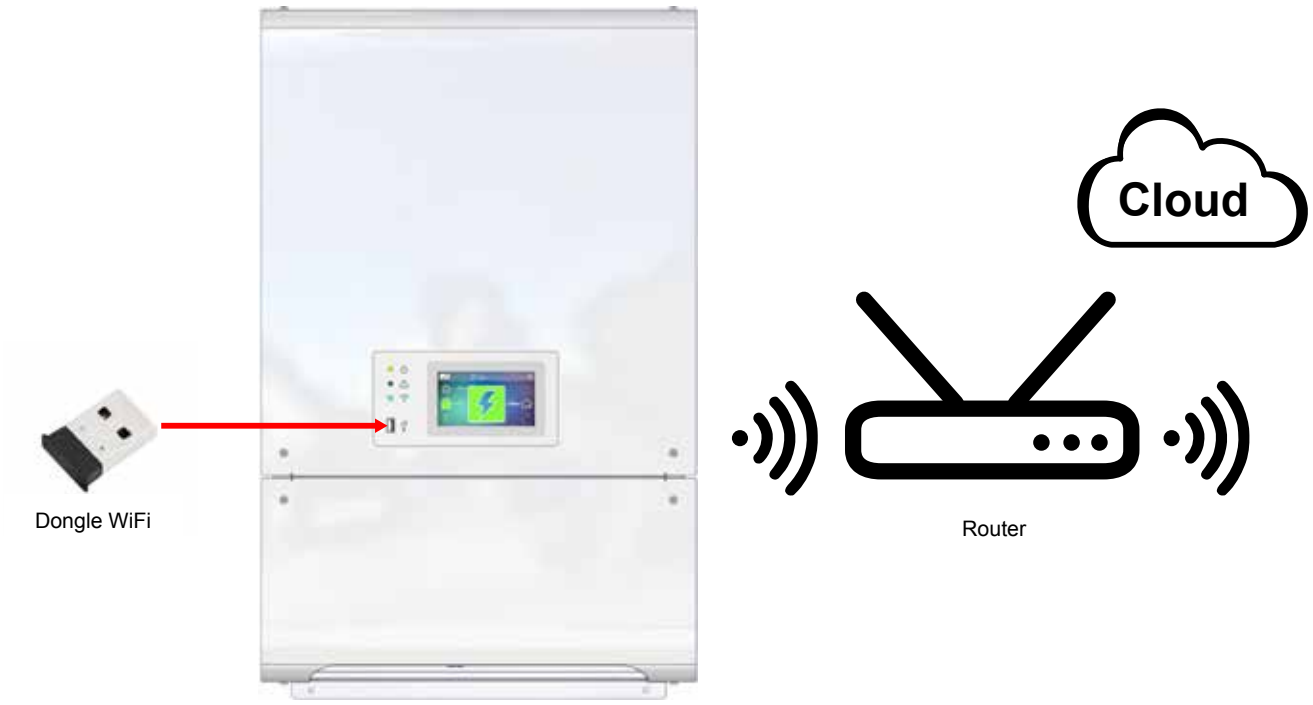


Fig. 12

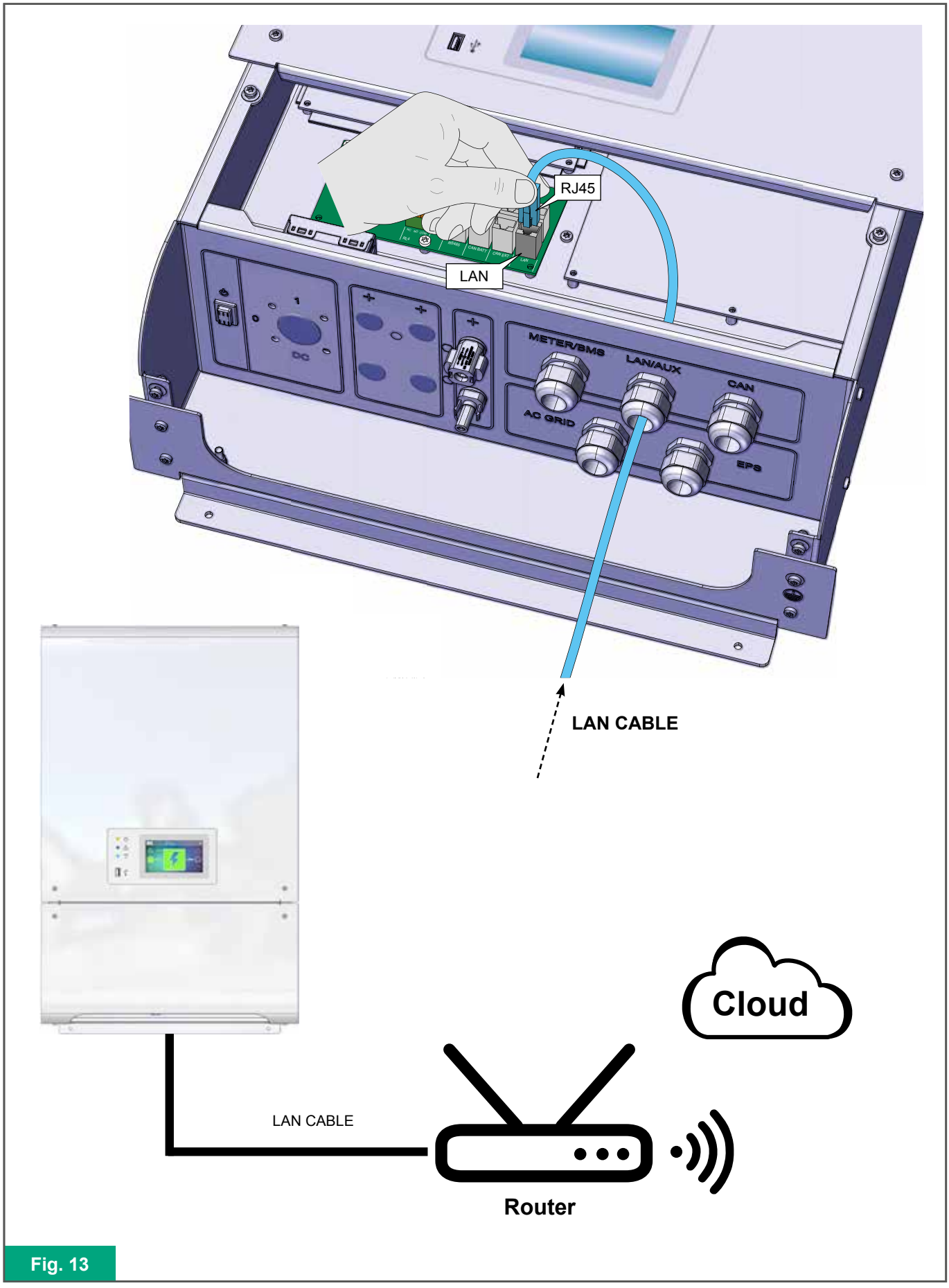
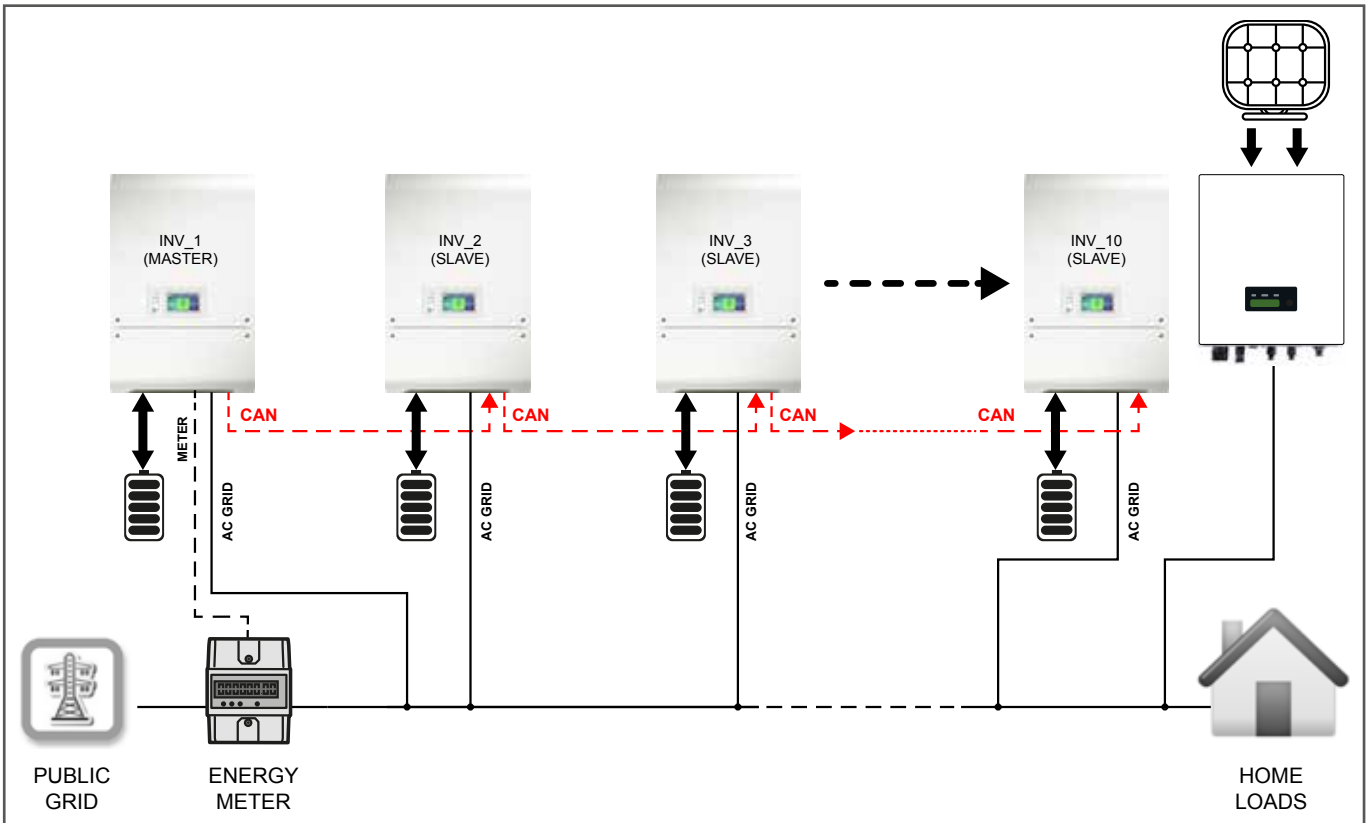
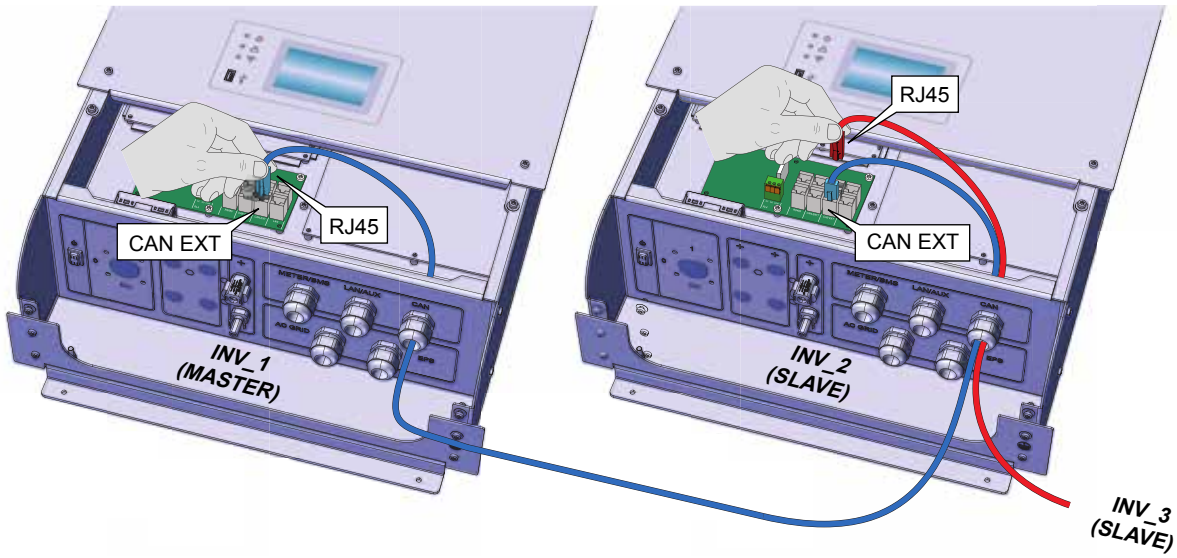

RJ45
LAN
METER/BMS
LAN/AUX
CAN
AC GRID
EPS
LAN CABLE
Cloud
LAN CABLE
Router

Fig. 13





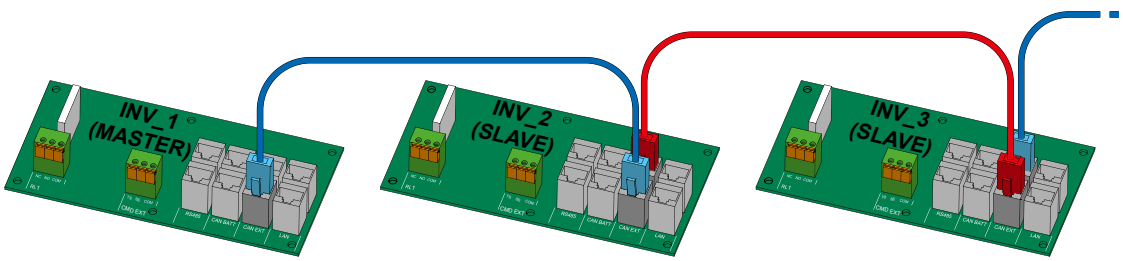
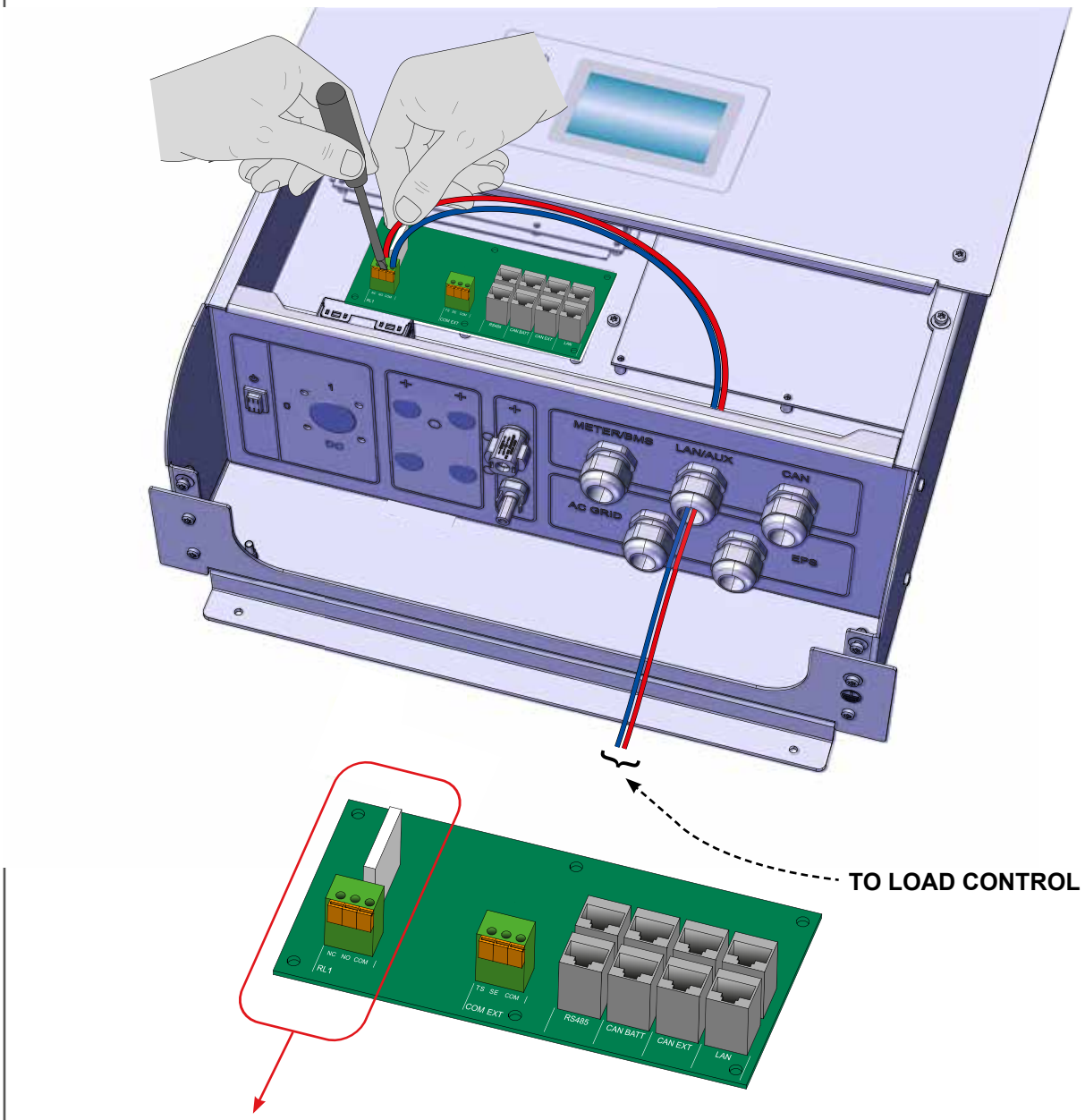


Fig. 14

Cod.: 240.010.0026


METER/BMS
LAN/AUX
CAN
AC GRID
EPS
TO LOAD CONTROL
NC NO COM
RL1
TS SE COM
COM EXT
RS485
CAN BATT
CAN EXT
LAN

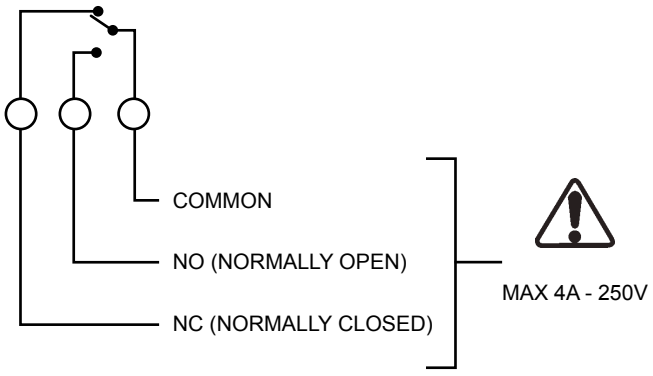

COMMON
NO (NORMALLY OPEN)
NC (NORMALLY CLOSED)
MAX 4A - 250V

Fig. 15

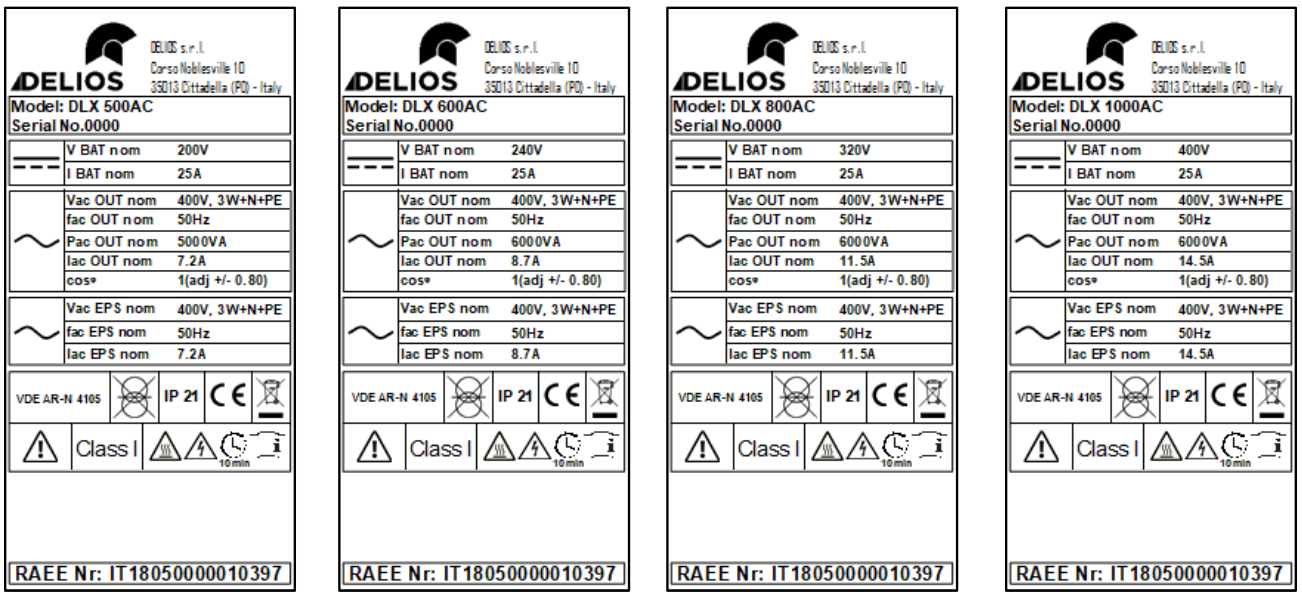

DELIOS s.r.l.
Corso Noblesville 10
35013 Cittadella (PD) - Italy
Model: DLX 500AC
Serial No.0000
V BAT nom 200V
I BAT nom 25A
Vac OUT nom 400V, 3W+N+PE
fac OUT nom 50Hz
Pac OUT nom 5000VA
Iac OUT nom 7.2A
cos⌀ 1(adj +/- 0.80)
Vac EPS nom 400V, 3W+N+PE
fac EPS nom 50Hz
Iac EPS nom 7.2A
VDE AR-N 4105
IP 21
Class I
10 min
RAEE Nr: IT18050000010397
DELIOS s.r.l.
Corso Noblesville 10
35013 Cittadella (PD) - Italy
Model: DLX 600AC
Serial No.0000
V BAT nom 240V
I BAT nom 25A
Vac OUT nom 400V, 3W+N+PE
fac OUT nom 50Hz
Pac OUT nom 6000VA
Iac OUT nom 8.7A
cos⌀ 1(adj +/- 0.80)
Vac EPS nom 400V, 3W+N+PE
fac EPS nom 50Hz
Iac EPS nom 8.7A
VDE AR-N 4105
IP 21
Class I
10 min
RAEE Nr: IT18050000010397
DELIOS s.r.l.
Corso Noblesville 10
35013 Cittadella (PD) - Italy
Model: DLX 800AC
Serial No.0000
V BAT nom 320V
I BAT nom 25A
Vac OUT nom 400V, 3W+N+PE
fac OUT nom 50Hz
Pac OUT nom 6000VA
Iac OUT nom 11.5A
cos⌀ 1(adj +/- 0.80)
Vac EPS nom 400V, 3W+N+PE
fac EPS nom 50Hz
Iac EPS nom 11.5A
VDE AR-N 4105
IP 21
Class I
10 min
RAEE Nr: IT18050000010397
DELIOS s.r.l.
Corso Noblesville 10
35013 Cittadella (PD) - Italy
Model: DLX 1000AC
Serial No.0000
V BAT nom 400V
I BAT nom 25A
Vac OUT nom 400V, 3W+N+PE
fac OUT nom 50Hz
Pac OUT nom 6000VA
Iac OUT nom 14.5A
cos⌀ 1(adj +/- 0.80)
Vac EPS nom 400V, 3W+N+PE
fac EPS nom 50Hz
Iac EPS nom 14.5A
VDE AR-N 4105
IP 21
Class I
10 min
RAEE Nr: IT18050000010397

Fig. 16

INDEX

1 INTRODUCTION

1.1 Fields of Application

This installation manual is intended for qualified installers. It describes how to securely install and boot the following DLX systems:

- DLX 500AC
- DLX 600AC
- DLX 800AC
- DLX 1000AC

1.2 Symbols Used in This Manual

Imminent dangers causing serious injuries. Danger of death.

Hazardous behaviours that could cause serious injuries.
Hazardous behaviours that could cause death.

Behaviours that could cause minor injuries to people or minor damages to things.

The notes preceded by this symbol relate to technical issues and ease operations.

These instructions are intended for qualified engineers.

1.3 Warranty

Our quality control program ensures that each DLX product is manufactured exactly to specifications and is subjected to exhaustive tests before leaving our factory.

The warranty conditions and the relative terms of application are available in detail on the website http://www.delios-srl.it/download-dlx/ in the CERTIFICATES section of the product.

2 CAUTIONS

Le presenti istruzioni sono destinate a tecnici abilitati.

Before carrying out any operations, make sure to have read and understood this manual. Do not make changes and do not carry out maintenance operations not described in this manual. The manufacturer does not accept responsibility for injuries to people and damages to things occurred because the information within this manual has not been read and followed.

The installation must only be carried out by qualified personnel.
The operations described here must be carried out only by qualified technicians.
The customer is civilly liable for the qualification and mental or physical state of the professional figures who operate this equipment. They must always use the personal protective equipment required by the laws of the country of destination and anything else provided to their employer.

The DLX system can also operate without the connection to the mains (off-grid). Under these conditions and based on the system settings, the inverter output can be automatically switched to the EPS port which, by means of an external interlock system, will feed the loads connected to a privileged line. According to the safety provisions in force in the country of installation, the NEUTRAL line may have to be connected to the earth potential to guarantee the operation of the protection systems against direct discharge provided for the privileged line and located downstream of the inverter and / or to ensure the correct operation of the loads connected to the EPS port. If, due to particular needs, this connection should not be made, the inverter output remains floating.

Emergency power to the EPS port is automatically turned on and off based on PV panels irradiation conditions and battery charge status. This means that during an emergency the power supply of the EPS port can be unexpectedly restored even in standby mode. For this reason, in order to avoid possible injuries from electric shock, before carrying out any installation or maintenance work on the home network, it is necessary to deactivate the DLX operation using the ON/OFF switch and disconnect it both from the AC power supply, by opening the main circuit breaker, and from the photovoltaic field, by opening the DC disconnector integrated in the DLX.

The DLX system operates with high voltage lithium batteries (HV). Batteries produce electricity and can cause electric shock or fire in the event of a short circuit or incorrect installation.

Only high voltage (HV) lithium batteries approved by DELIOS s.r.l. can be connected to the DLX system. The use of non-approved batteries can affect the correct functioning of the system and relieves DELIOS s.r.l. from all liabilities and invalidates the warranty.

Batteries must be installed in a suitable area that complies with local regulations. The installation area must ensure enough ventilation and the absence of open flames and sparks as potentially explosive gases may be generated during operation.

It is strictly prohibited to open the DLX system except as listed in this manual. The installation of the equipment must not be carried out by unqualified, under the influence of alcohol or drugs, have prosthetic heart valves or pacemakers.

For any doubts or problems regarding the use of the system, even if not described here, please contact qualified staff.

The DLX system must not be subjected to any type of modification. DELIOS s.r.l. declines any responsibility if the rules for correct installation are not respected and is not responsible for the system upstream or downstream of the equipment it supplies.
The exclusion of protective devices is extremely dangerous and relieves the manufacturer of any responsibility for damage to people and things.

A first aid kits must be provided. Do not underestimate burns or wounds.

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2.1 Operating Environment and Restrictions

Each system must be used exclusively for the operations it was designed for and within the operative ranges specified in the nameplate and / or in this manual, according to the national and international safety standards.
Any use different from the intended use specified by the manufacturer is to be considered totally inappropriate and dangerous and in this case the manufacturer declines all responsibility.

This equipment is an integrated system capable of converting a direct current (DC), coming from a battery, into an alternating current (AC) suitable for use by local loads and / or fed into the public grid.

Check the regulations applied by the electricity provider.
Check the batteries manufacturer’s instructions.

Operating Range Limits:
A high voltage lithium ion battery (HV) can be connected to the DLX system at the BAT input, which acts as a storage element for the excess energy produced by the photovoltaic generator. The stored energy is then released to the system which will make it available, at the time and in the most appropriate way, to local loads in order to fully or drastically reduce the drawn of energy from the distribution network.

The DLX system can be connected to the distribution network only in the countries which is certified for.

The DLX system can be used only respecting all the technical characteristics

Improper or Unauthorized Use:

Although carefully constructed, all electrical appliances can catch fire.

The DLX system is intended for indoors installation.

Optimal operation of the DLX system is ensured at a maximum ambient temperature of 40°C (104°F).

The DLX system must be transported and stored in indoor location with temperature range of -30°C to +70°C (-22°F and 158°F).

The DLX system must be used in locations with no acids, gases or other corrosive substances.

The DLX system must be used and stored in locations with relative humidity ranging from 5% to 95% without condensation.

The DLX system must be transported in locations with relative humidity ranging from 5% to 95%.

The DLX system must be used and stored in locations with atmospheric pressure ranging from 86kPa to 106kPa.

The DLX system must be transported in locations with atmospheric pressure ranging from 70kPa to 106kPa.

The DLX system must be used at a maximum altitude above sea level of 3000m (9750 feet). For altitudes above 2000m, due to the rarefaction of the air, specific conditions may occur which must be considered when choosing the place of installation. All installations at altitudes above 2000m must be assessed case by case considering the following critical issues:

- less efficient cooling
- decrease in the dielectric strength of the air and, in the presence of high voltages, the creation of electric arcs
- presence of cosmic radiation that can affect the correct functioning of the electronic components.

2.2 Dismantling, Decommissioning and Disposal

To comply with the 2002/96 / EC European Directive relating to electrical and electronic waste and its implementation as national law, electrical equipment that has reached the end of its useful life and discharged batteries must be separated from general waste and disposed to the appropriate authorized collection and recycling centers.

Any device that is no longer needed must therefore be returned to the distributor or disposed to an authorized collection and recycling center in your area. Ignoring this European Directive can have potentially negative effects on the environment and your health!

2.3 Protecting Staff and Third Parties

The equipment was built according to the strictest safety standards and equipped with safety devices suitable for the protection of components and operators.
For obvious reasons, the manufacturer cannot envisage all potential type of installations and locations where the equipment will be installed; the Customer must therefore clearly inform the manufacturer of specific conditions of installation. DELIOS s.r.l. declines any responsibility if the DLX system is incorrectly installed and shall not be liable for other systems located upstream or downstream of the equipment supplied.

- The operators must be correctly informed. The operators must therefore read and follow the technical instructions contained in the manual and in the enclosed documentation.
- The instructions provided in this manual do not replace the safety regulations and the installation and operational technical data printed on the products, nor do they replace the current safety standards enforced in the country where the equipment is installed and the rules dictated by common sense.
- The manufacturer is available to provide the theoretical or practical training to operators, both on their site or on the customer's premises, as specified at the time of drawing up the contract.
- The equipment must not be used if any operating fault is identified.
- Temporary repairs should be avoided; repair work must be carried out only with genuine spare parts, which must be installed according to the intended use.
- The responsibilities deriving from the commercial components are delegated to the respective manufacturers.

Avoid touching the inverter enclosure during the equipment operation.
The inverter enclosure could overheat during its operation and cause burns by contact.

Guards or covers can be removed only 10 minutes after disconnecting the inverter from the power supply to allow its components to cool down and any static electricity storage devices to discharge.

As soon as it is switched off, the surface of the equipment could be hot, therefore great care must be taken.
In the event of fire, CO2 foam extinguishers must be used and selfvacuum systems must be used to put out fires in enclosed spaces.

Should the noise level exceed legal limits, the working area must be circumscribed and all the people who have access to the area must wear ear defenders or ear plugs.
The noise level produced by the inverter in normal working conditions is: < 50db.

During the installation process, special attention must be paid to fixing the equipment and its components. During this stage, circumscribing and preventing access to the installation area is recommended.

Clothing and PPE Worn by Staff
Installers are recommended to wear clothing and PPE provided by their employer. Staff must not wear clothes or accessories that could start fires or produce static electricity or, generally speaking, any item of clothing that could affect personal safety. When carrying out any operation on the equipment, clothes and instruments must be suitably insulated.
Ex: class 0, category RC insulated gloves

Maintenance operations must be strictly carried out with the equipment disconnected from the mains, from the PV generator and from the batteries.
Staff must NOT access the equipment with bare feet or wet hands.
The maintenance engineer must always ensure that nobody else is able to reset or operate the equipment during the maintenance stages and must report any fault or deterioration caused by wear or by aging, in order to restore the correct safety conditions.
The installer or maintenance engineer must always pay attention to the working environment, to ensure it is well lit and has a suitable escape route.

A first aid kits must be provided.
Do not underestimate burns or wounds

2.4 Protection from Electric Shock

An electric shock can be fatal.
Avoid touching internal or external normally live parts whilst the system is powered on.

Cables and connections must always be secured, in good conditions, insulated and suitably sized.

The equipment contains capacitors that store static electricity, which could produce dangerous electric discharges. Make sure that the devices have discharged their energy before carrying out any work on the equipment.

2.5 Electromagnetic Fields and Interferences

Electromagnetic fields may have harmful effects (unknown to date) on the health of people who are subjected to long exposure. Avoid standing for long periods of time at a distance of less than 20cm from the inverter.

The installer must be an expert in the field and must therefore be responsible for commissioning the system according to the manufacturer's instructions and local legislation. Should electromagnetic interferences be detected, the installer must solve the problem by contacting the manufacturer's technical support service.

In any case, electromagnetic interferences must be reduced so that they no longer cause disruptions. Use the ferrite cores kit supplied in the box to limit electromagnetic disturbances according to the instructions provided in this manual.

Connect to ground the DLX external frame or other conductive parts to ensure best protection to the system and best safe to the operators.

National standards related to grounding must be complied with.

2.6 IP Protection Class Rating

IP21

- Casing protected from access of solid objects larger than 12.5mm.
- Casing protected from dripping, with a maximum gradient of 15°.

2.7 Warning Decals and Rating Plate

The labels on the equipment must NOT be removed, damaged, soiled or hidden.
The labels must always be visible and in good conditions.
The technical data shown in this manual do not however replace those shown on the data plates on the equipment.

2.8 Residual Risks

Despite the cautions and the safety systems, some residual risks will still be present, which cannot be removed. These risks are listed in the following table, alongside a few recommendations to prevent them.

Residual Risks Table

RISK ASSESSMENT	RECOMMENDED SOLUTION
Noise pollution caused by installations in unsuitable environments or where staff works on a regular basis.	Reassess the installation environment or site.
Unsuitable ventilation in the location, causing equipment to overheat but sufficient to prevent the discomfort of people who are on the site.	Restore adequate ambient conditions and ventilate the site.
Protection from the elements such as water seepage, low temperatures, high humidity, etc..	Keep adequate ambient conditions for the equipment.
Overheating of temperature surfaces (transformers, batteries, coils, etc...) can cause burns. In addition, pay attention not to obstruct openings or cooling systems on the equipment.	Use suitable PPE or wait for the equipment to cool down before accessing it.
Lack of cleanliness: this affects the cooling system and prevents the safety labels from being read.	Adequately clean the equipment, the labels and the workplace.
Storage of static energy can produce dangerous electrical discharges.	Wait until these devices have discharged their energy before carrying out any work.
Poorly trained staff.	Request an additional training course.
During the installation stage, fixing the equipment or its components with provisional means can be hazardous	Take care and prevent access to the installation area.
Accidentally disconnecting the quick connectors whilst the equipment is operational or making incorrect connections can produce electric arcs.	Take care and prevent access to the installation area.

3 GENERAL DESCRIPTION

3.1 DLX AC Inverter

The DLX AC inverter (see **Figure 00**) is a DC - AC inverter, designed for use in indoor environments. It has been designed to be used in combination with an existing PV plant and connected to the electricity grid and a high voltage (HV) storage battery to optimize selfconsumption. In the event of a temporary or permanent power outage, the DLX automatically enables the off-grid operation on the EPS port supplying, with the backup energy, the part of the home system connected to it. For more information visit www.delios-srl.it

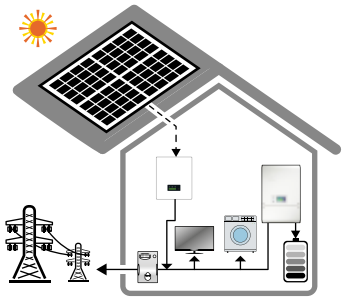
All adjustment and control operations can be performed on the LCD (touch screen) located on the front of the DLX.

3.2 Operating Modes

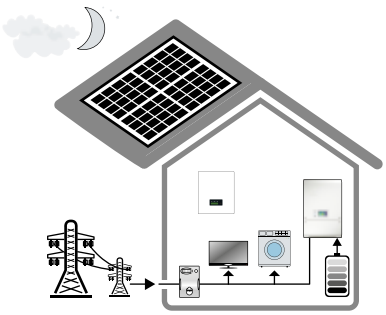
The DLX AC inverter can operate in different operating modes in order to meet the specific needs of the user.

3.2.1 “SELF-CONSUMPTION” Mode

Th is operating mode is mainly indicated in installations with a low tariff for the energy fed into the network and a high cost for the energy purchased from the distributor.



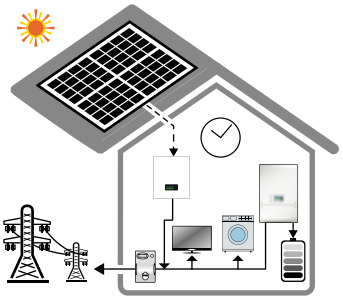
In the presence of sunshine, the energy from the photovoltaic plant is used primarily to supply the domestic loads and secondly to charge the battery. Further energy in excess is transferred to the network. If the energy required by the loads is high and the available energy from photovoltaic field and battery is not enough, the missing part is drawn from the network.



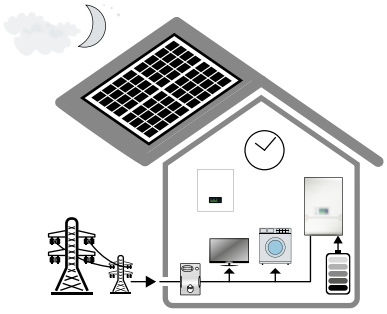
In the absence of energy from the photovoltaic plant, the battery is discharged to supply domestic loads. If the energy required by the loads is high and the energy from the battery is not enough, the missing part is drawn from the network. The energy stored in the battery is never fed into the grid but is used exclusively to supply the home loads.

3.2.2 "BATTERY MANAGER" Mode

This operating mode is mainly indicated in installations where it is convenient to the enable the battery charge during the high photovoltaic production time over the day and operate a delayed discharge of the battery when the energy demand of the home is higher or the cost of energy is higher.



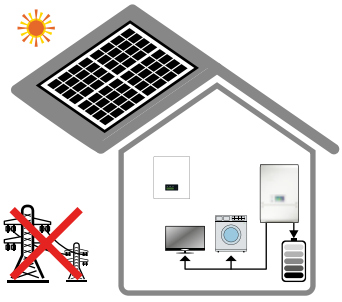
In the presence of sunshine, the energy from the photovoltaic plant is used primarily to supply the domestic loads and secondly to charge the battery starting from the set charge start time. This allows you to start charging at the most convenient time of the day.



In the absence of energy from the photovoltaic plant, the battery is discharged to supply the domestic loads only starting from the set time in order to keep the energy reserve ready for the moments of maximum demand and minimize any consumption from the mains in case of absorption peaks. It is also possible to set a usage time limit to disable the battery use and keep an energy reserve for the day after to support the energy demand from the loads.

3.2.3 "EMERGENCY POWER SUPPLY (EPS)" Mode

In case of a power outage, this operating mode allows an emergency output (EPS) to be activated to supply the privileged domestic loads. In order to activate this operating mode, the presence of the battery is required.



In case of a power outage the energy required by the loads will be totally supplied by the battery.

WARNING: In order to preserve the health of the battery, the automatic enabling of the EPS port occurs only if the state of charge is greater than or equal to 5%. **Below this value the EPS mode is inhibited**.

WARNING: The "EPS" mode is automatically ended if, during the discharge, the battery status reaches the minimum value of 0%.

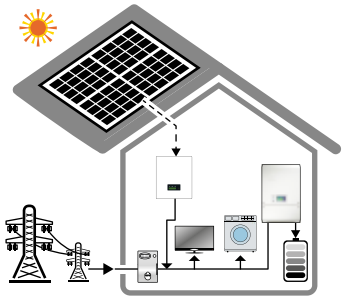
WARNING: The activation of the EPS port in case of a power outage can take a predetermined time which depends on the regulations in force in the country of installation. **For this reason, the DLX system cannot be used as a UPS as it does not guarantee the continuity of power supply to the loads connected to it**.

WARNING: The total power of the loads connected to the EPS output must be within the range specified in the technical data. If the total load is higher, the DLX will enter in protection mode, disabling the output power and signaling the overload event. After a few seconds it will attempt to restore the regular operation of the EPS port. This restart mode will continue until the total load connected to the EPS port is compatible with the maximum ratings specified in the technical data. It is therefore recommended to connect only essential loads to the EPS port.

WARNING: In EPS mode, some loads may not work properly even if their total rated power is within the limits specified in the technical data. This can happen because the inrush currents could be too high (refrigerators, air conditioners, hydraulic pumps, etc.). In these cases, the DLX inverter will enter in protection mode, disabling the output power and signaling the overload event. After a few seconds it will attempt to restore the regular operation of the EPS port. This restart mode will continue until the total load connected to the EPS port is compatible with the maximum ratings specified in the technical data. It is therefore recommended to connect only essential loads to the EPS port.

3.2.4 BACKUP RESERVE" Mode

This operating mode allows you to maintain a reserve of energy stored in the battery always ready to be used in the event of a power outage and is particularly suitable for installations in areas where blackouts are frequent.



In this operating mode the battery is forced to be charged up to a preset minimum level and is never discharged below that level during normal self-consumption operation. The reserve of charge is manteined by the energy produced by the photovoltaic plant or drawn from the network. in order to guarantee the pre-established safety level. The energy stored in the battery is never fed into the grid, but is used exclusively to supply the loads.

3.3 HV Lithium Battery

The DLX AC inverter uses a high voltage lithium storage battery (HV) to store the energy from the PV panels and optimize self-consumption.

The DLX inverter can operate with various high voltage (HV) batteries which have been specifically tested and approved by DELIOS s.r.l. to ensure the safety and optimal operation of the system.

WARNING: Connect only the battery models approved by DELIOS s.r.l. to the DLX inverter Contact the DELIOS s.r.l. or consult the website www.delios-srl.it to identify the supported batteries.

3.3.1 Calibration Charge

Based on the state of health of the battery and to get an accurate and reliable state of charge (SOC) indication, the control module integrated in the battery (BMS) cyclically requests the DLX inverter to carry out a calibration charge up to 100%. This allows you to make the best use of the battery and maximize the useful life of the internal cells.

The calibration charge is primarily carried out by means of the energy from the PV plant which is destined for the purpose. If the energy available from the PV plant is not enogh then the missing part is drawn from the network.

WARNING: During the calibration charge, normal system functionalities are disabled, and the battery cannot be used by the system. They are automatically restored at the end of the calibration process.

WARNING: During the calibration charge the EPS mode is disabled. It is automatically restored at the end of the calibration process.

WARNING: Calibration charge is required by the battery integrated control module (BMS). The DLX inverter cannot in any way disable the command from the battery.

The duration of the calibration charge depends on the capacity and on the health of the cells of the battery.

The calibration charge status is shown on the display status bar.

3.3.2 Maintenance Charge

During the winter period or after long periods of inactivity, the battery may remain at the minimum state of charge for a long time with the risk of a deep discharge phenomena with consequent risk of structural damage to the internal cells. Therefore, to avoid damages of the battery, the control module integrated in the battery (BMS) may require the DLX AC inverter to carry out a maintenance charge.

The maintenance charge brings the state of charge from the minimum value to a value determined by the BMS based on the state of health of the cells. The charging current is also determined by the BMS module based on the health and temperature of the battery itself.

WARNING: The maintenance charge is a safety function of the battery to avoid damages. For this reason, the DLX AC inverter can activate grid charging if the available solar energy is not enough.

WARNING: During the maintenance charge, normal system functionalities are disabled, and the battery cannot be used by the system. They are automatically restored at the end of the maintenance process.

WARNING: During the maintenance charge the EPS mode is disabled. It is automatically restored at the end of the maintenance process.

WARNING: Maintenance charge is required by the battery integrated control module (BMS). The DLX AC inverter cannot in any way disable the command from the battery.

The duration of the maintenance charge depends on the energy available from the solar panels and on the health of the cells of the battery. This process can also take a long time (hours) especially during the winter when the available solar energy can be very low.

The maintenance charge status is shown on the display status bar.

3.4 Protective Devices

To ensure maximum performance, DLX systems have been designed without transformer, i.e. without galvanic isolation between the DC input (BAT) and the AC outputs (AC GRID and EPS). Therefore, ensure a safe operation and to comply with current standards even without an isolation transformer, the DLX systems have been fitted with all the required safety devices, as described in the following paragraphs.

3.4.1 Anti-islanding

The DLX systems are equipped with an advanced anti-islanding protection system, i.e. with a protective automatic disconnecting system that is enabled in the event of a grid power outage or of voltage and / or frequency faults detected on the grid avoid off-grid operation, which could be dangerous for the members of staff who work on the grid and for the loads connected to it. The safety system is fully compliant with the national relevant standards and legislation.

3.4.2 Earth Leakages of the battery

The DLX systems must be used with HV battery isolated from the protective conductor (earth), i.e. with the positive and negative terminals without direct connections to ground. To this effect, a built-in protective and monitoring circuit constantly monitors the connection to ground and disables the DLX system when a fault is detected on the system by immediately displaying the associated alarm through the graphic interface.

3.4.3 Converter Earth Leakages

The DLX systems are fitted with a residual current monitoring unit (**RCMU**) in compliance with the requirements of IEC / EN 62109-2 safety standard. The device in question only protects the system from earth leakages occurring upstream of the AC GRID terminals (i.e. towards the DC side of the battery). Leakage currents that could occur in the AC section between the PPC (Point of Common Coupling) point and the DLX are not detected and require an external RCD.

3.4.4 Battery Overcurrent Protection and Safety Fuse

The battery input is electronically protected from overcurrent. In case of an internal fault in the control system, the battery input is protected by a safety fuse (30A 1000V gPV)

3.4.5 Automatic Battery Switch

The DLX system is equipped with an automatic battery disconnecting switch which guarantees the correct connection / disconnection and operation of the batteries. When the system detects anomalous operating conditions and in cases where the ON/OFF switch is disabled for maintenance and / or malfunction of the system itself, the disconnector switch is automatically enabled, and the battery is safely disconnected from the system. In these conditions it is possible to carry out the battery maintenance.

3.4.6 Additional Protective Devices

The DLX system is fitted with additional protective devices to ensure safe operation in various operating conditions:

- Active temperature control and automatic power derating in case of abnormal operating conditions or outside the limits allowed in order to prevent the system from overheating.
- Battery polarity reversal protection.
- BAT, AC GRID, EPS input/output overvoltage protection.
- AC GRID, EPS short-circuit protection.

3.5 Touch-screen Control Panel

The control panel fitted on the DLX is a graphic touchscreen display. To input commands, simply touch the surface of the display with a finger or with objects suitable for the purpose.

Metallic or excessively sharp materials must not be used.

The display backlighting is turned off when the display is not used by the user. The LCD display remains operational even if it appears to be off. To reactivate it, simply touch the display surface.

4 INSTALLATION

The installation must be carried out only by experienced staff, authorized by the manufacturer.

During the installation, make sure that the inverter is powered off.

4.1 Lifting, Transport and Unloading Instructions

Transport and Handling
Transport of the equipment, especially on the road, must be carried out with means able to protect the system components (especially electronic components) from major impacts, humidity, vibrations, etc.
During handling, sudden or fast movements which could create dangerously sway the system must be avoided.

Lifting
DELIOS s.r.l. normally packs and protects each component by using devices able to ease its transport and handling operations but, generally speaking, these operations must be carried out by staff specialized in loading and unloading components.
The ropes and vehicles used for lifting must be suitable for withstanding the weight of the equipment.
Do not lift multiple units or parts of the equipment at the same time, unless otherwise stated.

The DLX is not equipped with specific lifting means.

Do not underestimate the weight of the DLX, check technical characteristics.
Do not move or stop the hanging load above people or things.
Do not let it drop or lay with too much force.

4.2 Unpacking and Checks

Remember that the packaging elements (cardboard, cellophane, staples, adhesive tape, straps, etc.) can cut and / or injure, if not handled with care. They must be removed with appropriate means and must not be handled by non-responsible people (i.e. children).
The packaging components must be removed of and disposed of according to the regulations in force in the country of installation.
Check the integrity of the packaging before opening.
Open the packaging and remove the DLX with care to avoid damages to the external casing or the internal electronic part.
Before starting the commissioning operations, make sure that the external casing of the DLX is in good condition and free from transport damages.

4.3 Checking the Box Contents

The DLX box must contain the following parts:

- DLX hybrid inverter.
- Top and bottom bracket for wall mounting.
- Support for wall mounting.
- Instruction manual - Operation, installation, maintenance.
- Quick connectors and related contacts for BATTERY wiring and connection.
- Ferrite cores kit for EMI suppression.
- Wi-Fi dongle for connection to a local wireless network.

4.4 Positioning the DLX

With reference to **Figure 01**, the installation position of the DLX must meet the following conditions:

- The DLX must be installed indoors in a room with relative humidity ranging from 5% to 95% without condensation.
- The DLX optimal operation is ensured if the maximum ambient temperature of 40°C is not exceeded. Should the temperature become too high, the automatic power derating will trip to prevent the system from overheating.
- Do not install the DLX in a position directly exposed to the sun.
- Install the DLX as close as possible to the meter panel.
- Install the DLX in such a way as to Ensure easy access to the controls and to the connections
- Install the DLX in such a way as to have the LCD display at eye height.
- Install the DLX and the power lines in such a way as to prevent access to pets (rodents in Particular).
- The DLX, in some specific conditions, can produce a slight buzzing noise during its operation. This noise is normal and does not affect its performance, but can be annoying if the unit is mounted onto a wall of an inhabited area, onto a wall adjacent to an inhabited area or onto certain type of materials (such as thin wooden panels or metal plates).
- The position must not be accessible to children.
- The wall must be vertical, with a maximum tilt of ±5°.
- The surface where the DLX will be installed must withstand its weight (25 kg).
- The DLX must be installed leaving a 500mm clearance where the bottom of the unit is located to Ensure easy cabling and connection. There are no restrictions for the top of the unit as the ventilation system does not require vertical outlets.
- In the case of multiple installation of several DLX, a side clearance of 500 mm between the units must be provided.
- The DLX system must be used at a maximum altitude above sea level of 3000m (9750 feet). For altitudes above 2000m, due to the rarefaction of the air, specific conditions may occur which must be considered when choosing the place of installation. All installations at altitudes above 2000m must be assessed case by case considering the following critical issues:

- less efficient cooling
- decrease in the dielectric strength of the air and, in the presence of high voltages, the creation of electric arcs
- presence of cosmic radiation that can affect the correct functioning of the electronic components.

- Do not mount the DLX on or under flammable building materials.
- Do not install the DLX in areas where highly flammable substances are present.
- Do not install the DLX in areas subject to explosion hazard.

To prevent the risk of electric shock or other injury, check that there are no electrical or hydraulic lines in the walls before drilling the mounting holes of the DLX. Please note that the appropriate type of plastic plugs and screws must be selected by qualified installer, based on the following considerations:

- the installation location, as well as
- the type of the wall on which the system is to be mounted

to ensure that the mounting of the hybrid inverter is done as safely as possible.

Make sure there is enough free space for air circulation around the DLX. Local regulations may require larger clearances.
If you mount the DLX in a cabinet, a piece of furniture or in another relatively small closed space, it is necessary to ensure enough air circulation to dissipate the heat generated by the unit.

4.5 Mounting the DLX

The DLX is delivered with a wall mounting bracket suitable for use on most walls.

How to mount the DLX:

1. Fix the top and bottom mounting brackets to the DLX body (Follow the instructions shown in **Figure 01**).
2. Drill the holes to fix the DLX mounting support on the wall.
3. Fix the mounting support to the wall
4. Install the DLX.
5. Fix the DLX to the wall using the bottom bracket fixing screw.

5 ELECTRICAL CONNECTIONS

5.1 Cautions

The installation must be carried out only by experienced staff.

Refer to Figure 02 to identify the connection terminals of the DLX inverter.

Refer to Figure 03 for the electrical connection diagram of the DLX inverter.

For safety reasons, an appropriately rated input load disconnector must be provided (20A) for each individual DLX. No load should be connected directly to the DLX inverter.

The disconnector of the battery lines is integrated and automatic. It is normally managed by the system control, but it can be voluntarily controlled by turning the ON/OFF switch to the “0” position in cases of maintenance/malfunction which require disconnection of the battery from the system.

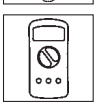
WARNING: Local regulations in force in the country of installation may require the installation of an external additional DC breaker switch for the positive and negative lines of the battery. It must be rated according to the maximum voltage and current values specified in the technical data of the DLX.

DLX systems are equipped with a Residual Current Monitoring Unit compliant with the requirements of the IEC / EN 62109-2: 2011 safety standard (refer to paragraph 4.8.3.5 of the Standard). They are equipped with a redundancy on the earth leakage current sensitive to all components of the current, both direct and alternating. The measurement is carried out simultaneously by two different processes: it is enough that only one of the two detects a fault to disconnect the converter from the network.
It must be noted that the device integrated in the converter protects the system against the faults only occurring upstream of the inverter AC terminals (i.e. from the inverter to the battery). The leakage currents that can occur in the AC section between the PCC (Point of Common Coupling) and the DLX are not detected.
If, in compliance with local regulations or specific cases, the use of an external RCD is necessary, it is recommended to use a type A protection RCD with a fault current of at least 100mA.

DELIOS s.r.l. declares that the construction of the DLX does not produce direct earth fault currents and therefore, in accordance with article 712.413.1.1.1.2 of section 712 of the Standard CEI 64-8/7 standard, a type B RCD, according to IEC 60755/A2 standard, is not required.

Connect only one DLX system for each load circuit breaker.

A threaded plug fuse cannot be used as a load circuit breaker.



Do not use measuring instruments with a maximum input voltage lower than 1000V.

The protective earth conductor must have a crosssection at least equal to or greater than the crossection of the cables for connection to the public grid (AC) and in any case in accordance with the requirements of local regulations.

5.2 AC grid Connection

See the connection instructions shown in **Figure 04**.

Make sure to be compliant with the local regulations.
Make sure to be compliant with the grid code of the distribution network operator.

For safety reasons, an appropriately rated input load disconnector must be provided (20A) for each individual DLX. No load should be connected directly to the DLX inverter.

The connection of multiple inverters to the public grid must comply with current legislation relating to maximum power imbalance.

The power losses on the AC GRID line must be less than 1% of the rated power. The indicative data of the connection are reported below:

Wire cross-section	Line maximum length	
	DLX 500AC DLX 600AC	DLX 800AC DLX 1000AC
2.5 mm^2	18 m	12 m
4.0 mm^2	29 m	19 m
6.0 mm^2	45 m	30 m

Before starting the connection operations, make sure that the external AC line main switch is disconnected and that the AC GRID and EPS circuit breakers are disconnected.

Before starting the connection operations, make sure that the ON/OFF switch is in the “0” position.

Do not carry out other operations on the inverter for at least 10 minutes. The inverter contains capacitors that need a minimum time to discharge.

Remove the cover of the connection compartment by removing the screws as shown in **Figure 04**.

Connect the phase (L1, L2, L3), neutral (N) and earth (PE) wires of the AC grid input to the GRID terminal block respecting the correct assignment:

- Phase (L1) → L1 terminal
- Phase (L2) → L2 terminal
- Phase (L3) → L3 terminal
- Neutral (N) → N terminal
- Earth (PE) → PE terminal

Be careful not to reverse the phases with the neutral. If this happens, the system may present malfunctions. In this case, the DLX detects the fault by disabling the operation and signaling the problem with a specific alarm code.

5.2.1 Reduction of Electromagnetic Disturbances – EMI Suppression Ferrite Cores Installation

In order to minimize electromagnetic disturbances, it is required to install the EMI Suppression Toroidal Ferrite Cores supplied in the box on the cable connected to the AC GRID input.

Refer to the installation instructions shown in **Figure 05**.

The DLX may be not compliant with the EMC standards requirements if the ferrite cores are not installed according to the instructions provided.

5.3 EPS Connection

Refer to the application wiring diagram shown in **Figure 06**.

WARNING: Make sure to comply with the local regulations to set up an auxiliary off-grid power supply system in case of a power outage.

WARNING: The power supply system of the loads connected to the EPS port **for off-grid operation relies on an external interlocking system that automatically disconnect the part of the system composed by the DLX and the loads connected to it from the distribution network**. The interlock system must be provided in compliance with the safety requirements of the current standard.

WARNING: The NEUTRAL conductor (N) of the EPS port is floating. If local regulations require that the NEUTRAL conductor (N) must be connected to the earth potential, **it is necessary to provide an external electrical connection between the PE protective conductor and the NEUTRAL conductor connected to the EPS port**. Not providing the connection between NEUTRAL and PE can lead to the malfunction of the RCD protection systems provided for the privileged line and placed downstream of the inverter and / or to the malfunction of the connected loads.

WARNING: For safety reason, the operation of the EPS port is disabled as per DLX default factory setting. To enable the operation of the EPS port, it is necessary to access the “SETTINGS” configuration menu in INSTALLER mode, access the “SYSTEM” menu and select “ON” in the “EPS” menu. Refer to the SYSTEM PROGRAMMING section

See the connection instructions shown in **Figure 07**.

For safety reasons, an appropriately rated input load disconnector must be provided (20A) for each individual DLX. No load should be connected directly to the DLX inverter.nato, per ogni singolo DLX. Nessun carico dovrebbe essere connesso direttamente all’inverter DLX.

The power losses on the EPS line must be less than 1% of the rated power. The indicative data of the connection are reported below.

Wire cross section	Line maximum length	
	DLX 500AC DLX 600AC	DLX 800AC DLX 1000AC
2.5 mm^2	18 m	12 m
4.0 mm^2	29 m	19 m
6.0 mm^2	45 m	30 m

Before starting the connection operations, make sure that the external AC line main switch is disconnected and that the AC GRID and EPS circuit breakers are disconnected.

Before starting the connection operations, make sure that the ON/OFF switch is in the “0” position.

Do not carry out other operations on the inverter for at least 10 minutes. The inverter contains capacitors that need a minimum time to discharge.

Remove the cover of the connection compartment by removing the screws as shown in **Figure 07**.

Connect the phase (L1, L2, L3), neutral (N) and earth (PE) wires of the EPS output to the EPS terminal block respecting the correct assignment:

- Phase (L1) → L1 terminal
- Phase (L2) → L2 terminal
- Phase (L3) → L3 terminal
- Neutral (N) → N terminal
- Earth (PE) → PE terminal

WARNING: The total power of the loads connected to the EPS output must be within the range specified in the technical data. If the total load is higher, the DLX will enter in protection mode, disabling the output power and signaling the overload event. After a few seconds it will attempt to restore the regular operation of the EPS port. This restart mode will continue until the total load connected to the EPS port is compatible with the maximum ratings specified in the technical data. It is therefore recommended to connect only essential loads to the EPS port.

WARNING: In EPS mode, some loads may not work properly even if their total rated power is within the limits specified in the technical data. This can happen because the inrush currents could be too high (refrigerators, air conditioners, hydraulic pumps, etc.). In these cases, the DLX inverter will enter in protection mode, disabling the output power and signaling the overload event. After a few seconds it will attempt to restore the regular operation of the EPS port. This restart mode will continue until the total load connected to the EPS port is compatible with the maximum ratings specified in the technical data. It is therefore recommended to connect only essential loads to the EPS port.

5.4 HV Lithium Battery Connection

Before connecting the battery to the DLX system, make sure to have read and understood all the instructions provided in the operating and installation manual supplied by the battery manufacturer. Failure to follow the instructions provided in this manual may affect the correct operation of the system, lead to potentially hazardous situations, relieves DELIOS s.r.l. from any liability and invalidates the warranty conditions.

Contact the DELIOS s.r.l. or consult the website www.delios-srl.it to identify the supported batteries.

WARNING: The default factory setting of the DLX is set to operate without any battery connected to the system. To enable HV battery operation, access the “SETTINGS” configuration menu in INSTALLER mode, access the “BATTERY” menu and select the correct HV battery model from those listed in the “LITHIUM” menu. Refer to the SYSTEM PROGRAMMING section.

See the connection instructions shown in **Figure 08**.

The DLX system can operate with high voltage (HV) lithiumion batteries. Batteries produce electricity and can cause electric shock or fire in the event of a short circuit or incorrect installation.

WARNING: Local regulations in force in the country of installation may require the installation of an external DC circuit breaker in addition to the automatic disconnector integrated in the DLX. The DC circuit breakers must be properly rated for the + and - lines in order to guarantee the safe disconnection of the battery from the inverter in case of maintenance.

The DLX is fitted with a safety fuse against battery short circuits. The fuse is **30A 1000Vdc gPV rated**. In the event of replacement, the fuse ratings must not be exceeded in any way as this could cause electric shock or fire in the event of a short circuit.

Before starting the connection operations, make sure that the battery cables are disconnected from the battery and that the poles are insulated to prevent short circuits.

Before starting the connection operations, make sure that the AC GRID and EPS circuit breakers are disconnected.

Before starting the connection operations, make sure that the ON/OFF switch is in the “0” position. In this way the automatic battery switch is controlled and the battery lines are disconnected.

Use battery cables with cross section of 6 mm2 and with a maximum length of 3 m per cable. Use in the quick connectors supplied to connect the cables to the battery inputs of the DLX. **Failure to comply with the following indications can lead to dangerous overheating of the connection cables as well as non-compliance with the EMC standard requirements**.

Use FTP or STP CAT5 cable with RJ45 connector for communication connections between the DLX system and the battery with a maximum length of 3 m. **Failure to comply with the following indications can lead to dangerous malfunctions of the battery as well as non-compliance with the EMC standard requirements**.

1. Make sure the battery is turned off.
2. Connect the battery cables to the DLX respecting the indicated polarity (red for the positive terminal, black for the negative terminal).
4. Connect an FTP or STP CAT5 cable with RJ45 connector between the BMS connector of the DLX and the battery communication connector. For the appropriate settings, refer to the “SYSTEM PROGRAMMING” section, “BATTERY” paragraph.
5. Where required, connect the battery cables to the battery according to the manufacturer’s instructions and using any connectors provided in the battery connection kit.

Batteries must be located in specific areas reserved for them, in compliance with local regulations.

During the wiring operations, isolate the battery poles to prevent short circuits. Shorted poles can cause sparks, fire hazard or damage to batteries.

The incorrect connection of the battery cables (polarity reversal) does not damage the DLX thanks to the integrated protection, but disable the operation of the system until the correct polarity of the connection is restored. The incorrect connection message is displayed on the LCD.

5.4.1 Reduction of Electromagnetic Disturbances – EMI Suppression Ferrite Cores Installation

In order to minimize electromagnetic disturbances, it is required to install the EMI Suppression Clip Ferrite Core supplied in the box on the cables connected to the BAT input.

Refer to the installation instructions shown in **Figure 09**.

The DLX may be not compliant with the EMC standards requirements if the ferrite cores are not installed according to the instructions provided.

5.5 Earth Connection (MANDATORY)

The DLX inverter is equipped with an external earthing contact which must be connected to the protective conductor in addition to the earth connection provided by the GRID terminal block for connection to the public AC grid.

See the connection instructions shown in **Figure 10**.

5.6 Energy Meter Connection

The DLX inverter uses an external energy meter to monitor the energy flows between the home loads and the distribution grid to implement the available operating modes.

To ensure the correct operation of the system, it is necessary to connect the energy meter to the inverter otherwise the system will enter into protection mode disabling the operation and signaling the failure to communicate with the device.

The DLX inverter can operate only with the approved energy meter models. Contact the DELIOS s.r.l. or consult the website www.delios-srl.it to identify compatible models.

See the connection instructions shown in **Figure 11**.

5.7 Wi-Fi Connection

By using a Wi-Fi dongle, the DLX inverter can access a local Wi-Fi network allowing to activate the remote connection and system monitoring functions.

See the connection instructions shown in **Figure 12**.

Insert the Wi-Fi dongle supplied with the inverter accessories the USB port and wait for the system to recognize the device (transparent Wi-Fi icon).

WARNING: Use only the Wi-Fi dongle supplied with the inverter accessory. The correct functioning of Wi-Fi connectivity is not guaranteed with not approved similar devices.

To set the correct operation of the connection it is necessary to access the configuration menu “SETTINGS” and set the networking parameters of the “WLAN” menu according to the characteristics of the local network to be accessed. Refer to the SYSTEM PROGRAMMING - NETWORKING section.

To ensure optimal Wi-Fi connectivity, make sure that the Wi-Fi signal available near the installation of the DLX system is high enough to allow a stable connection. For this purpose, during the configuration of the network parameters, the scanning and selection of the Wi-Fi network carried out by the DLX reports the signal strength of the wireless network to which you intend to connect: select a network with signal strength S> - 60dBm. **If the detected signal is weak (S <-60dBm), the connection is not guaranteed and therefore it is necessary to provide for the use of a Wi-Fi repeater**.

If the configuration operations are carried out correctly, the effective connection to the local Wi-Fi network is shown by the Wi-Fi icon (icon highlighted) on the status bar of the display and by the stable lighting of the blue LED on the control panel.

5.8 LAN Connection

If the Wi-Fi connection is weak and / or not very stable, alternatively the DLX inverter can access a wired local network via the LAN port allowing to activate the remote connection functions and system monitoring.

See the connection instructions shown in **Figure 13**.

Insert the network cable from the router into the LAN port and wait for the system to recognize the connection (NETWORK icon highlighted).

To set the correct operation of the connection it is necessary to access the “SETTINGS” configuration menu and set the networking parameters of the “LAN” menu based on the characteristics of the local network to be accessed. Refer to the SYSTEM PROGRAMMING - NETWORKING section.

If the configuration operations are carried out correctly, the effective connection to the local LAN is shown by the NETWORK icon (icon highlighted) on the status bar of the display and by the stable lighting of the blue LED on the control panel.

5.9 DLX Connection for Parallel Operation

Several DLX inverters can be connected in parallel on the same distribution network in order to create a plant of nominal power equal to the sum of the nominal power of the individual DLX inverters connected in parallel. The respective HV battery is connected to each DLX inverter. The energy management between the various devices and batteries is managed in MASTER and SLAVE mode where one of the inverters acts as MASTER unit and the other inverters operate as SLAVE units.

See the connection instructions shown in **Figure 14**.

The multi-DLX inverter system uses an external energy meter to monitor the energy flows between the home loads and the distribution grid to implement the available operating modes. The data from the energy meter are shared between the units connected in parallel through the external CAN communication connection.

WARNING: To set the correct operation of the system with paralleled DLX units it is necessary to access the “SETTINGS” configuration menu in INSTALLER mode and set the “SYSTEM” parameters of the “IND. CAN” according to the characteristics of the system layout. Refer to the SYSTEM PROGRAMING section.

WARNING: The system configuration with several DLX units in parallel is **possible up to a maximum of 10 units**.

WARNING: The system configuration with several DLX units in parallel can only be carried out by the AC GRID port. **The configuration of several units in parallel carried out by EPS port is not permitted**. Any parallel connection of multiple units carried out by the EPS port can affect the correct functioning of the system and relieves the manufacturer from all liabilities and invalidates the warranty.

5.10 SMART LOAD Connection

The DLX inverter provides 1 isolated change over relay contact (4A - 250Vac max) which allows activating secondary storage systems and / or domestic loads based on the state and energy balance of the system.

See the connection instructions shown in **Figure 15**.

WARNING: The relay contact can switch loads with absolute maximum ratings up to 4A - 250Vac. If you intend to control loads with higher rated power, it is necessary to install an external switch and use the DLX contact to create the control circuit of the external switch.

WARNING: To set the contact operating mode it is necessary to access the “SETTINGS” configuration menu and set the “LD1 - SMART LOAD” parameters of the “HOME AUTOMATION” menu according to the desired energy management needs. Refer to the SYSTEM PROGRAMMING section.

5.11 System Switching On

Before starting the system, carry out the following checks:

1. Check that the inverter is correctly fixed to the wall.
2. Check that the AC GRID and EPS (if present) connections have been made correctly.
3. Check that the BATTERY connections have been made correctly.
4. Check that the EARTH connection (MANDATORY) has been made correctly.
5. Verify that the ENERGY METER connections have been made correctly.
6. Verify that SMART LOAD connections (if present) have been made correctly.
7. Check that the connection cover is closed and secured with the fixing screws.

If the checks listed above were successful, proceed as follows:

1. Turn on the external main AC line switch.
2. Turn on the AC GRID and EPS (if present) circuit breakers.
3. Turn on the BATTERY circuit breaker (if present) and turn on the HV battery.
4. Wait for the display to turn on.
5. Start the inverter by turning the ON/OFF switch in position 1.

AUTO-TEST execution (Italy - CEI 0-21) - The self-test is relevant only for Italy (CEI-021). If the DLX is configured for Italy, the self-test is available through the service menu on the display. The self-test for Italy is aimed at verifying the upper and lower limits of the voltage and frequency of the network, after exceeding which the DLX disconnects from the network. If the test fails, the DLX will not be able to connect to the electrical network. Refer to the SYSTEM PROGRAMMING section for operational details.

5.12 System Switching Off

Proceed as follows to switch off the system:

1. Enable the inverter stand-by by turning the ON/OFF switch in the “0” position.
2. Turn off the AC GRID and EPS (if present) circuit breakers.
3. Turn off the BATTERY circuit breaker (if present) and turn off the HV battery.
4. Wait for the display to turn off.
5. Do not carry out other operations on the inverter for at least 10 minutes.
   The inverter contains capacitors that need a minimum time to discharge.

6 CONTROL PANEL

6.1 General Information

1 – Power supply

- LED on: the DLX is powered and is operating regularly.
- LED blinking: the DLX is in the start-up and self-test phase.
- LED off: the DLX is not powered.

2 – General alarm

- LED on: the DLX has detected a fault. The LCD display activates the corresponding alarm icon and shows the information related to the alarm occurred on the status bar (see the “Troubleshooting” section).
- LED off: the DLX has not detected any fault.

3 – Communication

- LED on: communication with external devices is enabled.
- LED off: communication with external devices is disabled.

4 – USB port

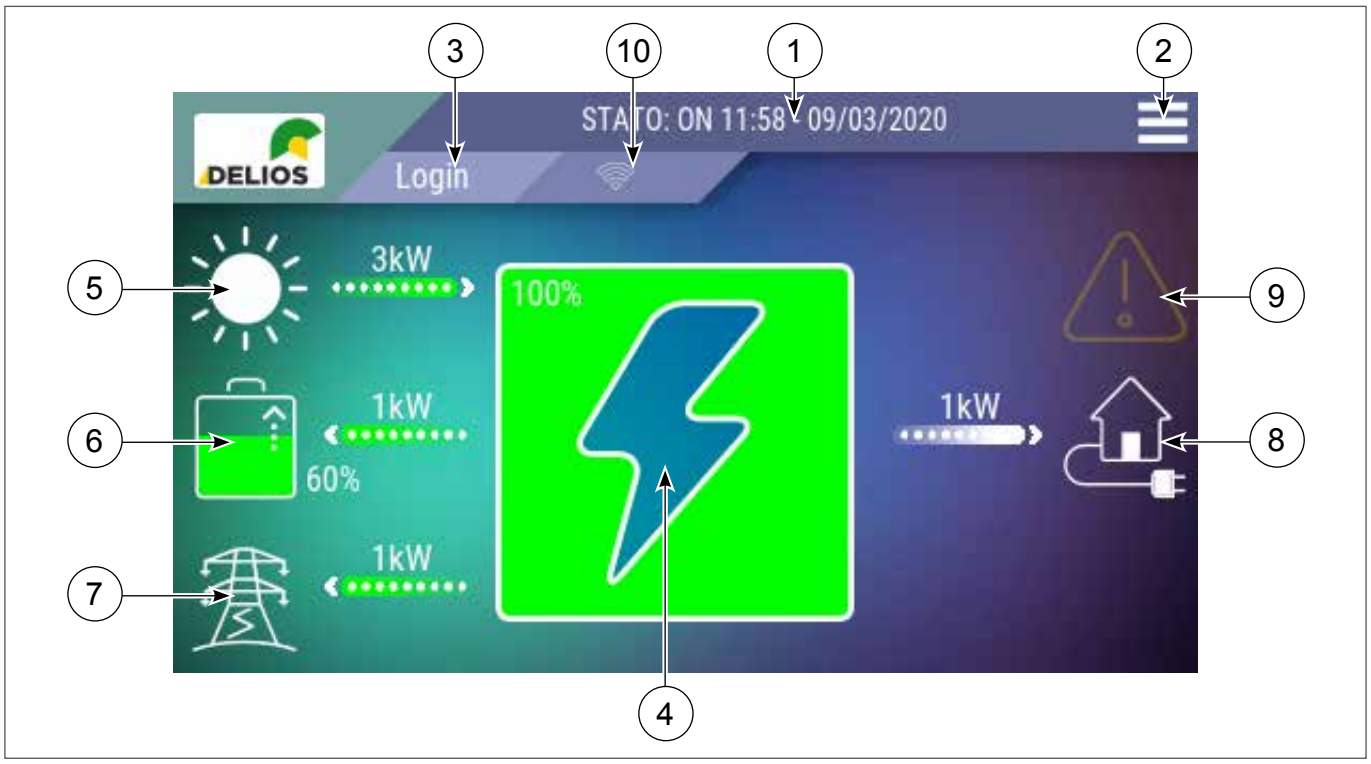
- USB port available for data download, firmware update, Wi-Fi dongle connection.

Do not connect portable hard disks, MP3 players, computers and any other device other than a flash USB memory or Wi-Fi dongle to the USB port. The system is compatible with most of the flash USB memorys on the market. However, the system may not recognize some types of USB memory, in this case it is recommended to try again replacing it with another model.

5 – Graphic touch-screen display

- Graphic touch screen graphic display which displays the system status and user / installer settings.

6.2 “HOME” Page



The “HOME” screen displays and analyzes in real time all parts of the DLX system. All the power sources supplied to meet the demands of the domestic needs and their operating parameters are constantly monitored and displayed in real time. Similarly, the central indicator will display in real time the system energy balance.

1. System status bar: The system indicator bar shows the DLX operating status, the current date and time. If faults are detected, the alarm codes detected by the system are displayed (see the section “Troubleshooting).

2. Access to the “MENU” page: This key allows the operator to access the built in datalogger (graphics, data and statistical data), system configuration and programming menus.

3. Access to the “LOGIN”: This key allows the operator to view the login page to access the different programming level of the system by entering the access password.

4. “ENERGY BALANCE” icon: This dynamic icon shows the system energy balance in real time: the green colour shows the percentage of energy produced by renewable sources (PV and batteries), the purple colour shows the energy drawn from the grid in order to meet the demands of the residential system connected to the DLX.

5. “SUN” icon: The “SUN icon shows if a PV solar system is connected to the system. The flow of energy coming from that source is displayed on the bar located next to the icon. The numbers shown above the bar, which can be scrolled by simply pressing the bar itself, display in real time the voltage, current and power values related to the PV generator. **This function is available only with the use of optional items (auxiliary energy meter to detect the photovoltaic production of the existing PV plant) – Contact the Technical Service of DELIOS s.r.l. for further details.**

6. “BATTERY” icon: The “BATTERY” icon shows if a battery is connected to the system. The icon also shows the battery charge / discharge status and the percentage of energy available to the system. The flow and the direction of energy coming from that source is displayed on the bar located next to the icon. The

numbers shown above the bar, which can be scrolled by simply pressing the bar itself, display in real time the voltage, current and power values related to the battery.

7. "GRID" icon: The "GRID" icon shows if energy is being drawn from the national grid. The flow and the direction of energy coming from that source is displayed on the bar located next to the icon. The numbers shown above the bar, which can be scrolled by simply pressing the bar itself, display in real time the voltage, current and power parameters of to the national grid.

8. "HOME" icon: The "HOME" icon shows if there are loads which draw power from the system. The flow of energy drawn by the residential system is displayed on the bar located next to the icon. The number shown above the bar displays in real time the power drawn by the system.

9. "GENERAL ALARM" icon: If the "GENERAL ALARM" icon is on, the system has detected a fault. The code of the alarm detected by the system is displayed on the system status bar (see the "Troubleshooting" section). By touching the icon, the list of alarms recorded by the system will be displayed.

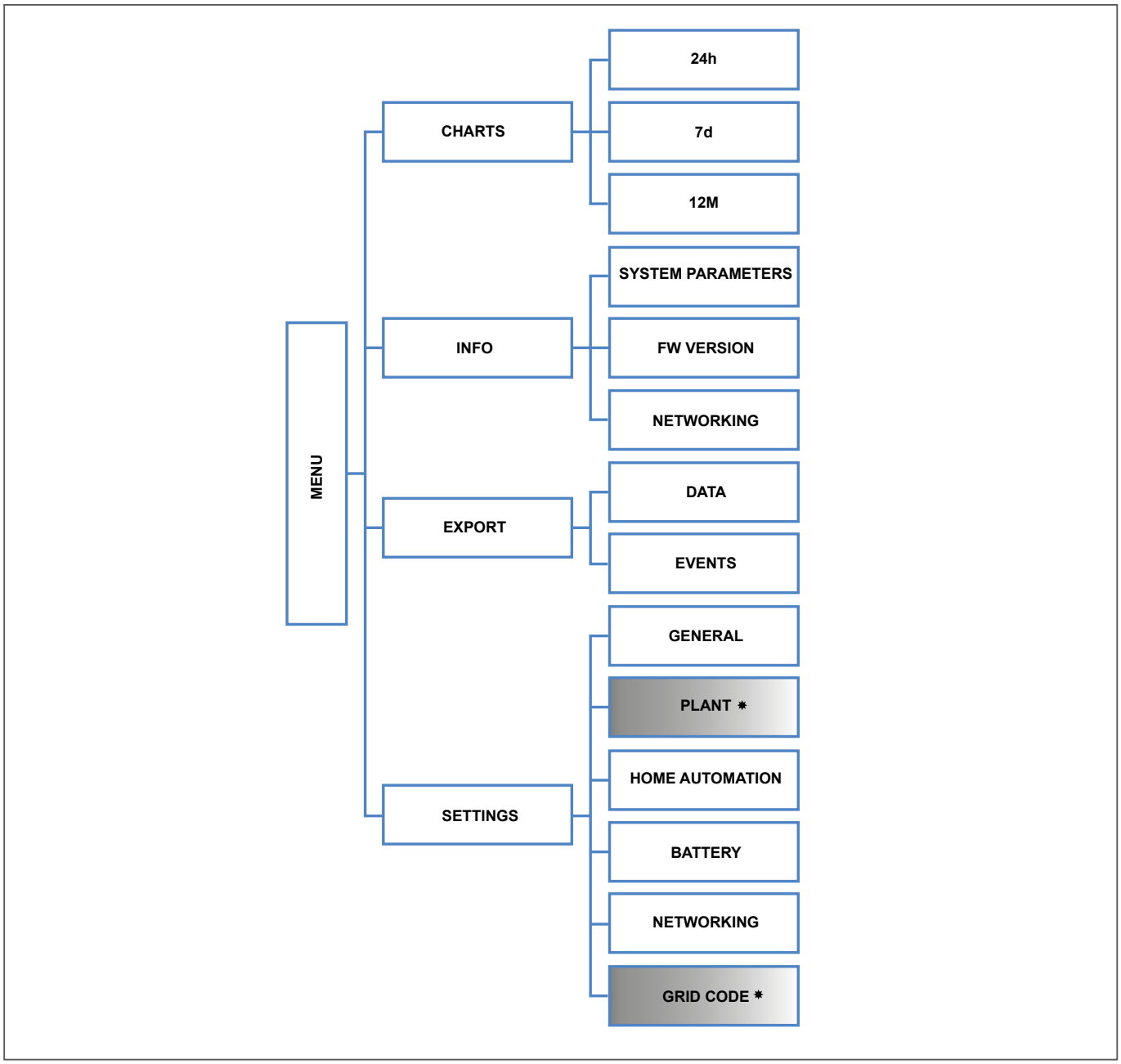
10. "USB/Wi-Fi" icon: Activation of the "USB" icon indicates that an external USB memory is connected to the port on the control panel. Similarly, the activation of the "Wi-Fi" icon indicates that a Wi-Fi dongle has been connected (transparent icon) and that a connection to a local Wi-Fi network has been estab-lished (icon highlighted)

WARNING: The display cannot be considered a measuring instrument. The measurements shown on the display are indicative and therefore are not suitable for calculating the efficiency or production yield.

7 SYSTEM PROGRAMMING

7.1 "MENU" Structure and System Navigation

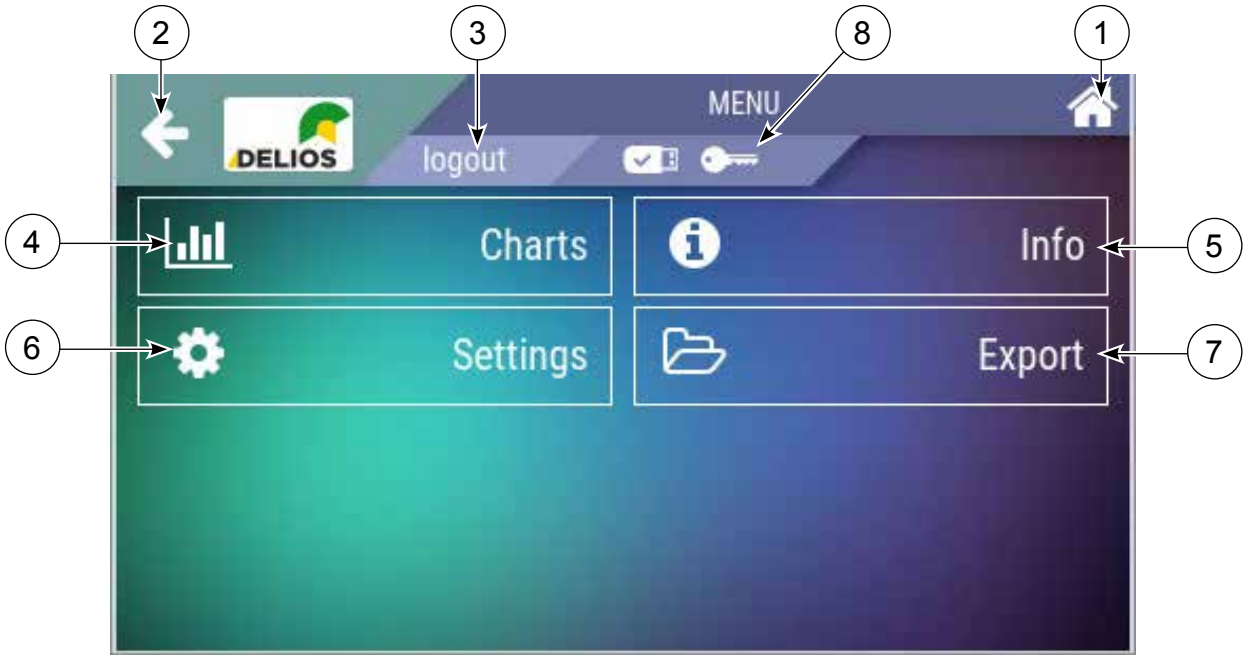
The structure of the menus available from the control panel is as follows:



To access the menus marked with "✱" it is necessary to perform the "LOGIN" as INSTALLER with password which must be compulsorily requested from DELIOS srl.

WARNING: The parameters at INSTALLER level can be accessed only by qualified staff. Changing the parameters at the installer level by unqualified staff can affect the correct functioning of the system and relieves the manufacturer from all liabilities and invalidates the warranty.

7.2 “MAIN” Menu



1. “HOME” key - By pressing this key, the “HOME” screen is displayed.

2. “BACK” key - By pressing this key, the previous page is reloaded.

3. “LOGIN/LOGOUT” key - By pressing this key, the identification page can be accessed with password or the installer mode can be exited.

4. “CHARTS” key - By pressing this key the related menu can be accessed.

5. “INFO” key - By pressing this key the related menu can be accessed.

6. “SETTINGS” key - By pressing this key the related menu can be accessed.

7. “EXPORT” key - By pressing this key the related menu can be accessed.

8. “KEY” icon - The icon shows that the INSTALLER mode is enabled.

7.3 "LOGIN/LOGOUT" Menu

The "LOGIN / LOGOUT" menu allows the operator to access the system programming menu reserved to INSTALLERS.

Identification takes place by entering a PASSWORD which must be previously and compulsorily requested from DELIOS srl.

WARNING: The parameters at INSTALLER level can be accessed only by qualified staff. Changing the parameters at the installer level by unqualified staff can affect the correct functioning of the system and relieves the manufacturer from all liabilities and invalidates the warranty.

Once the settings have been made in the INSTALLER mode, make sure that you have LOGOUTED from this mode in order to prevent unqualified personnel from accessing settings that can compromise the correct functioning of the system.

1. Numeric keypad to enter the ID password.

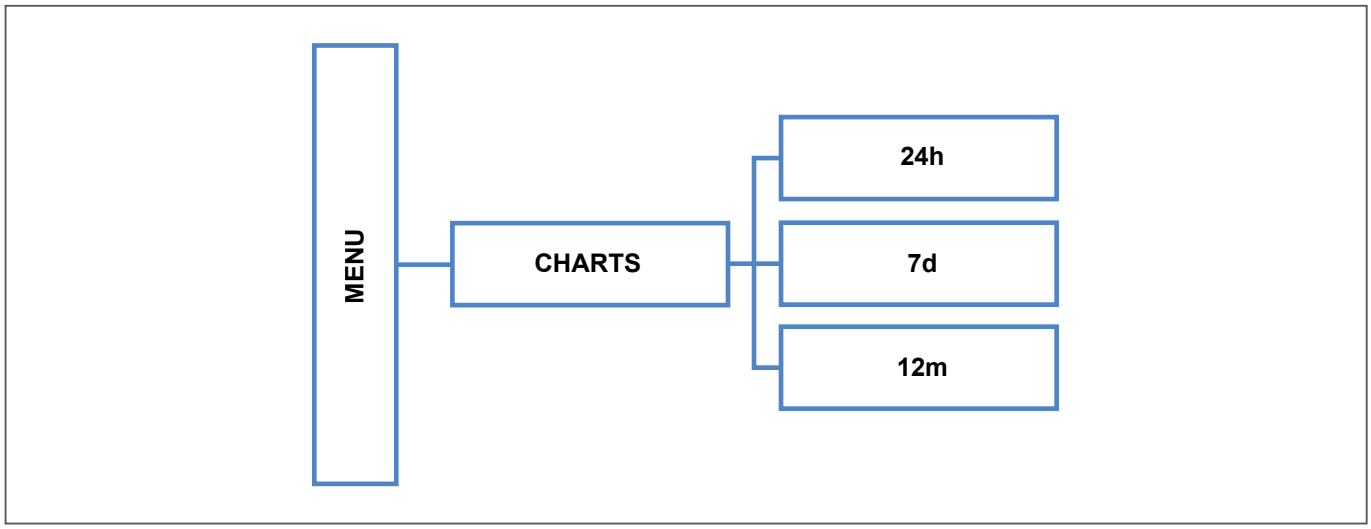
2. "BACKSPACE" Key - Press this key to delete the last digit entered.

3. "ENTER" Key - Enter / Submit key.

7.4 "CHARTS" Menu

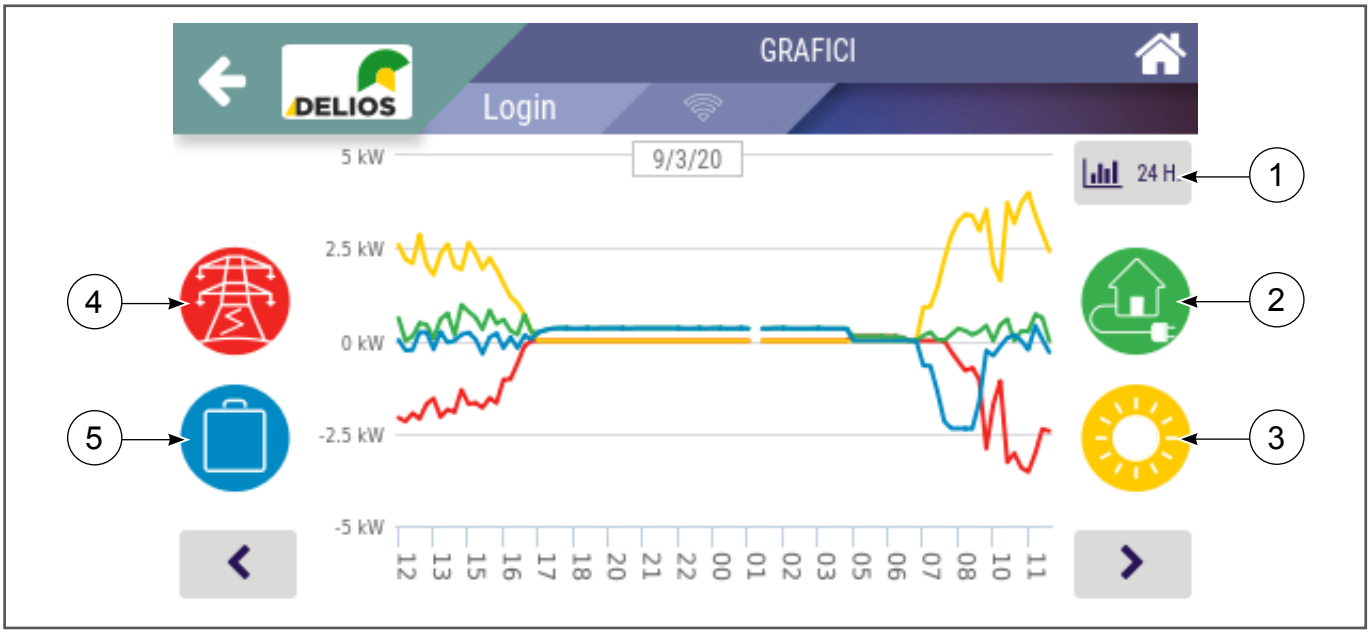
Access to the "GRAPHICS" menu allows the installer to view the following data recorded by the built in datalogger:

- Daily time related data of PV system, battery, grid, load powers.
- Weekly calculation, with daily partition, of energy produced by the PV generator, power sent to the grid, power drawn from the grid, load.
- Yearly calculation, with monthly partition, of energy produced by the PV generator, power sent to the grid, power drawn from the grid, load.



Access to the different graphics is made by scrolling down by using the key associated with the selection of the type of graphics.

7.4.1 "24h" Chart



Cod.: 240.010.0026

1. "CHART SELECTION" key - Press this key to select the different chart (24 hours →7 days →12 months).

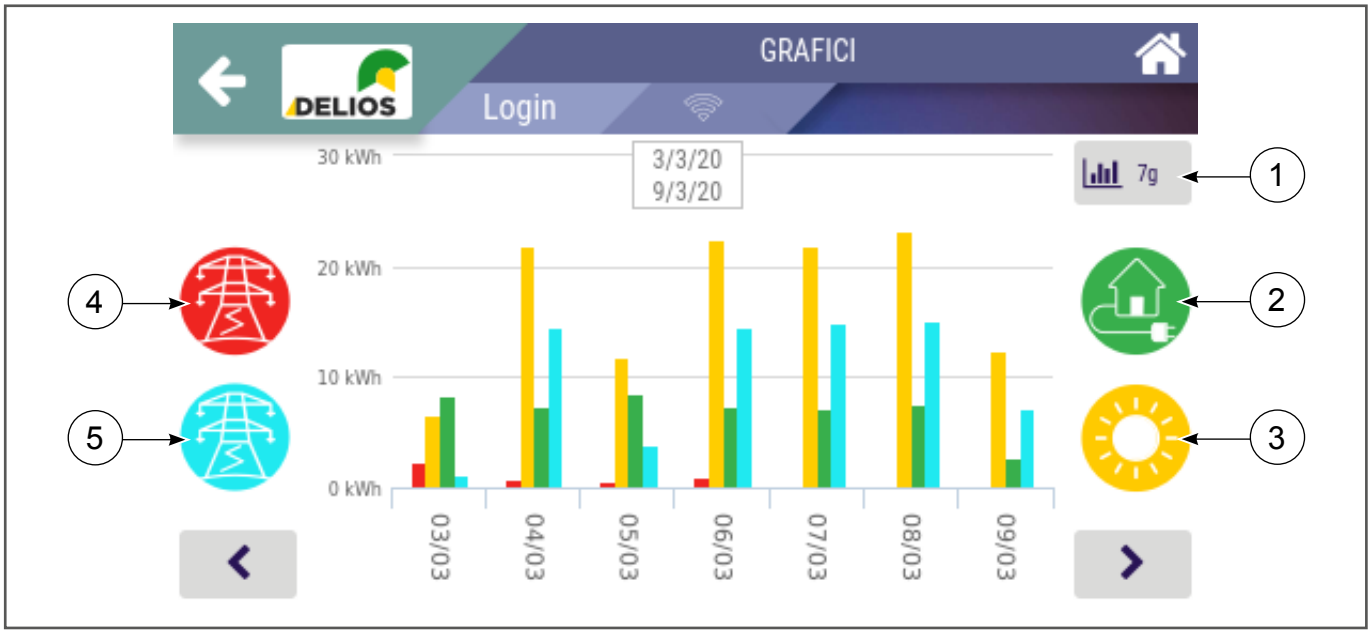
2. "HOME" key - Press this key to enable / disable the display of the associated value and trace on the graphics area.

3. "SUN" key - Press this key to enable / disable the display of the associated value and trace on the graphics area. **This function is available only with the use of optional items (auxiliary energy meter to detect the photovoltaic production of the existing PV plant) – Contact the Technical Service of DELIOS s.r.l. for further details.**

4. "GRID" key - Press this key to enable / disable the display of the associated value and trace on the graphics area.

5. "BATTERY" key - Press this key to enable / disable the display of the associated value and trace on the graphics area.

7.4.2 "7d" Chart



1. "CHART SELECTION" key - Press this key to select the different chart (24 hours →7 days →12 months).

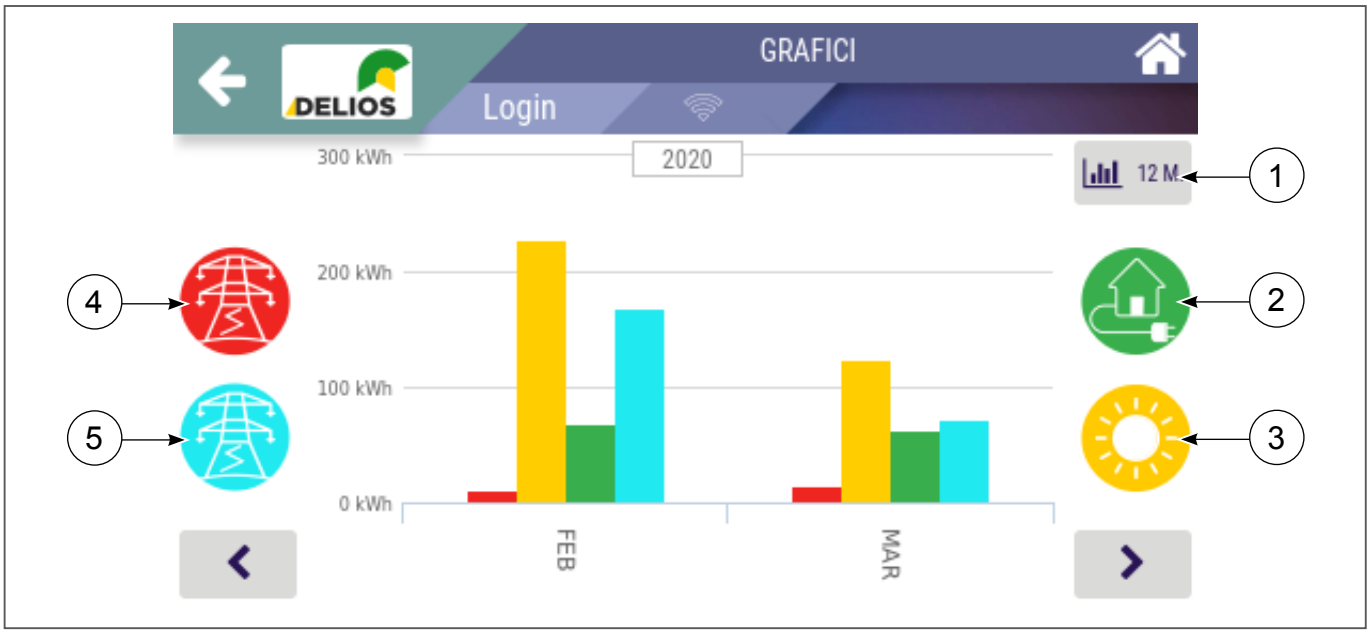
2. "HOME" key - Press this key to enable / disable the display of the associated value and trace on the graphics area.

3. "SUN" key - Press this key to enable / disable the display of the associated value and trace on the graphics area. **This function is available only with the use of optional items (auxiliary energy meter to detect the photovoltaic production of the existing PV plant) – Contact the Technical Service of DELIOS s.r.l. for further details.**

4. "GRID – CONSUMPTION" key - Press this key to enable / disable the display of the associated value and trace on the graphics area.

5. "GRID – FEED IN" key - Press this key to enable / disable the display of the associated value and trace on the graphics area.

7.4.3 “12m” Chart



1. “CHART SELECTION” key - Press this key to select the different chart (24 hours →7 days →12 months).

2. “HOME” key - Press this key to enable / disable the display of the associated value and trace on the graphics area.

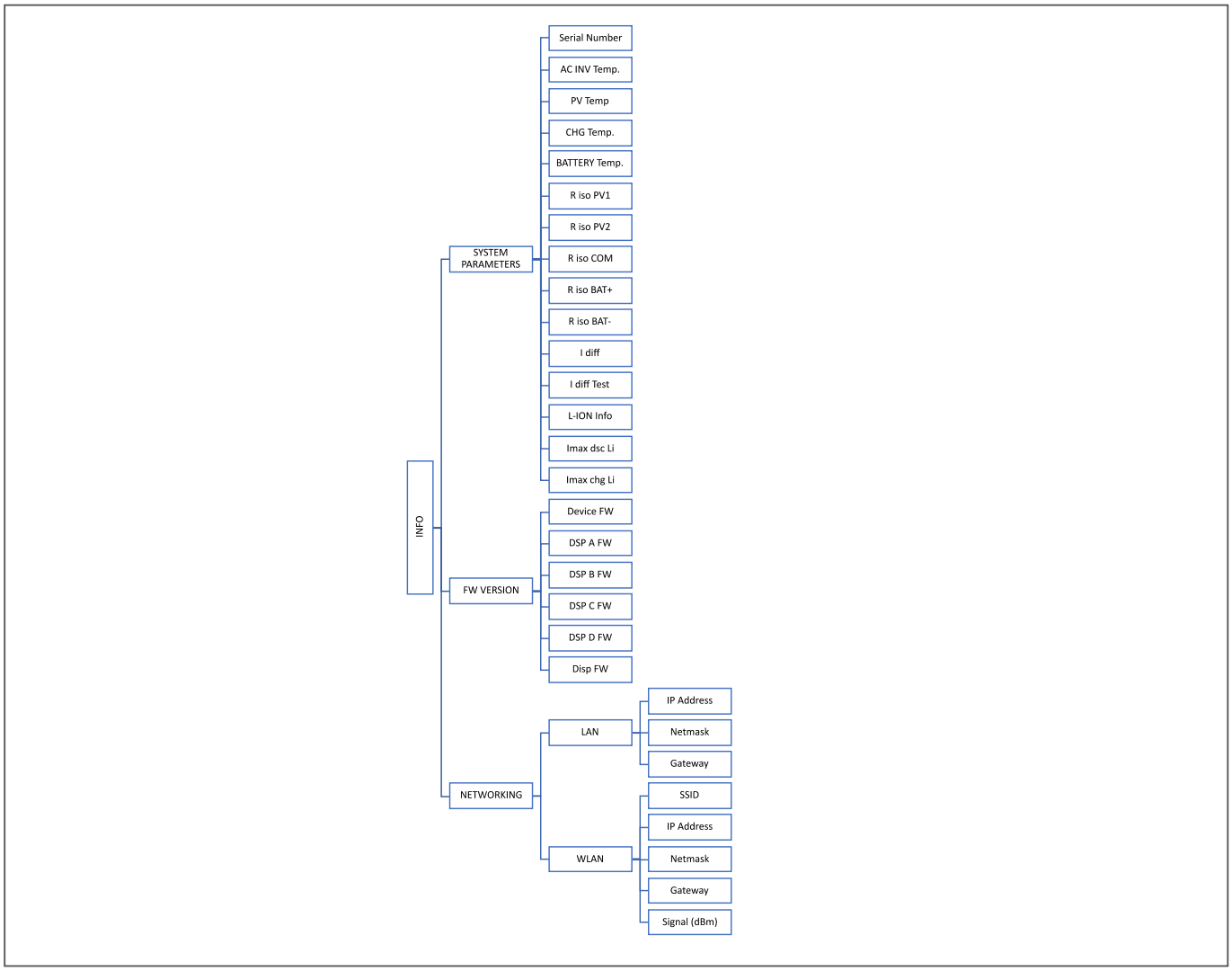
3. “SUN” key - Press this key to enable / disable the display of the associated value and trace on the graphics area. **This function is available only with the use of optional items (auxiliary energy meter to detect the photovoltaic production of the existing PV plant) – Contact the Technical Service of DELIOS s.r.l. for further details.**

4. “GRID – CONSUMPTION” key - Press this key to enable / disable the display of the associated value and trace on the graphics area.

5. “GRID – FEED IN” key - Press this key to enable / disable the display of the associated value and trace on the graphics area.

7.5 “INFO” Menu

Access to the “INFO” menu to view general system information:



1. “SYSTEM PARAMETRS” - The page displays the operating parameters monitored by the system such as:

Serial Number	Unit serial number
AC Inv Temp	Inverter internal temperature
PV Temp	Inverter internal temperature (*)
CHG Temp	Inverter internal temperature
Battery Temp	Battery temperature
R iso PV1	Insulation resistance + PV1 to earth (*)
R iso PV2	Insulation resistance + PV2 to earth (*)
R iso COM	Insulation resistance – PV1 and - PV2 to earth
R iso BAT+	Insulation resistance + BAT to earth
R iso BAT-	Insulation resistance - BAT to earth
I diff	Measured leakage current to earth
I diff Test	Measured test leakage current to earth
L-ION info	Battery info (if transmitted by battery BMS)

Imax dsc Li	Battery discharge current set point from BMS
Imax chg Li	Battery charge current set point from BMS

(*) Not applicable for this inverter model

2. "FW VERSION" - The page displays the firmware versions installed on the system:

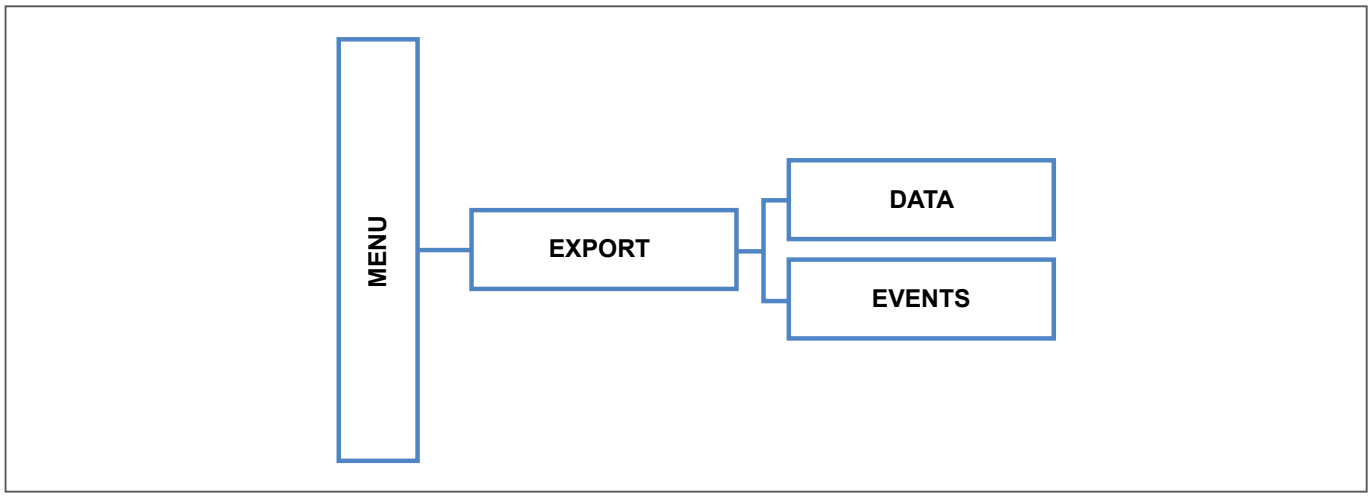
Device FW	Main inverter firmware
DSP A FW	DSP A Firmware
DSP B FW	DSP B Firmware
DSP C FW	DSP C Firmware
DSP D FW	DSP D Firmware
Disp FW	UI firmware

3. "NETWORKING" - The page displays the information of the local network to which the system is connected:

LAN	**IP Address**	IP address assigned to the inverter within the local network
	Netmask	Network Subnet mask
	Gateway	Network Gateway
WLAN	**SSID**	Wi-Fi network ID accessed by the inverter
	IP Address	IP address assigned to the inverter within the local network
	Netmask	Network Subnet mask
	Gateway	Network Gateway
	Signal (dBm)	Signal strength

7.6 "EXPORT" Menu

Access to the "EXPORT" menu to export the data stored in the internal data-logger to an external USB memory:



1. "DATA" - The page allows to access the system production data download function on an external USB memory. Enter the start and end dates to define the time period to download the data.

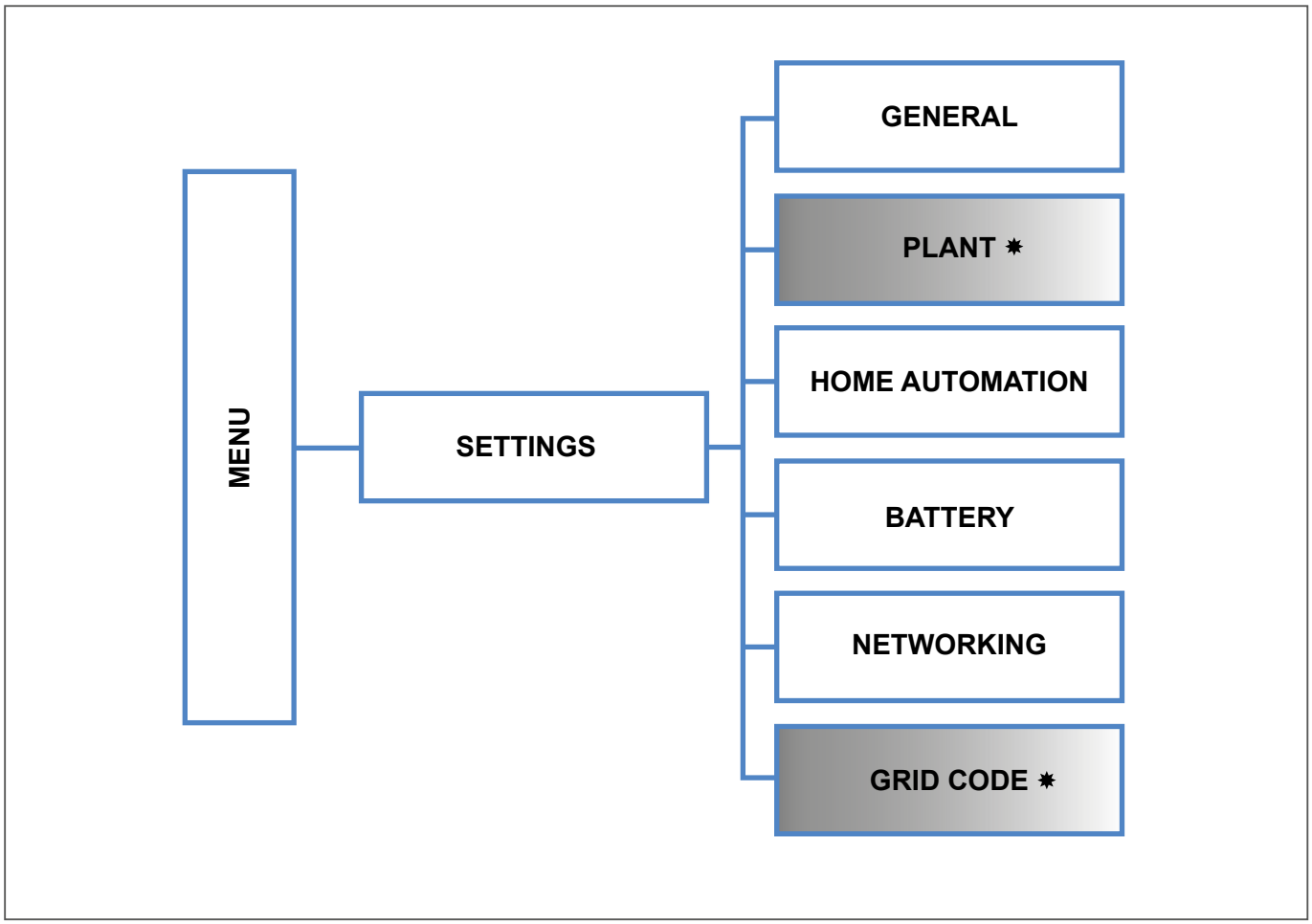
2. "EVENTS" - The page allows to access the download function of the events (alarm queue, parameter

modification) recorded by the system on an external USB memory. Enter the start and end dates to define the time period to download the data.

Make sure to have connected an external USB memory before performing the export procedure. The external USB memory must be large enough and must have at least 128Mb of free space.

7.7 "SETTINGS" Menu

Access to the "SETTINGS" menu to access to the following submenus:



1. "GENERAL" - The page allows to access general system settings and utilities.

2. "PLANT" - The page allows to access the plant settings. The settings are accessible only in the INSTALLER mode which require a password to be logged in (see the "LOGIN menu" section).

3. "HOME AUTOMATION" - The page allows you to access the home automation functions setting.

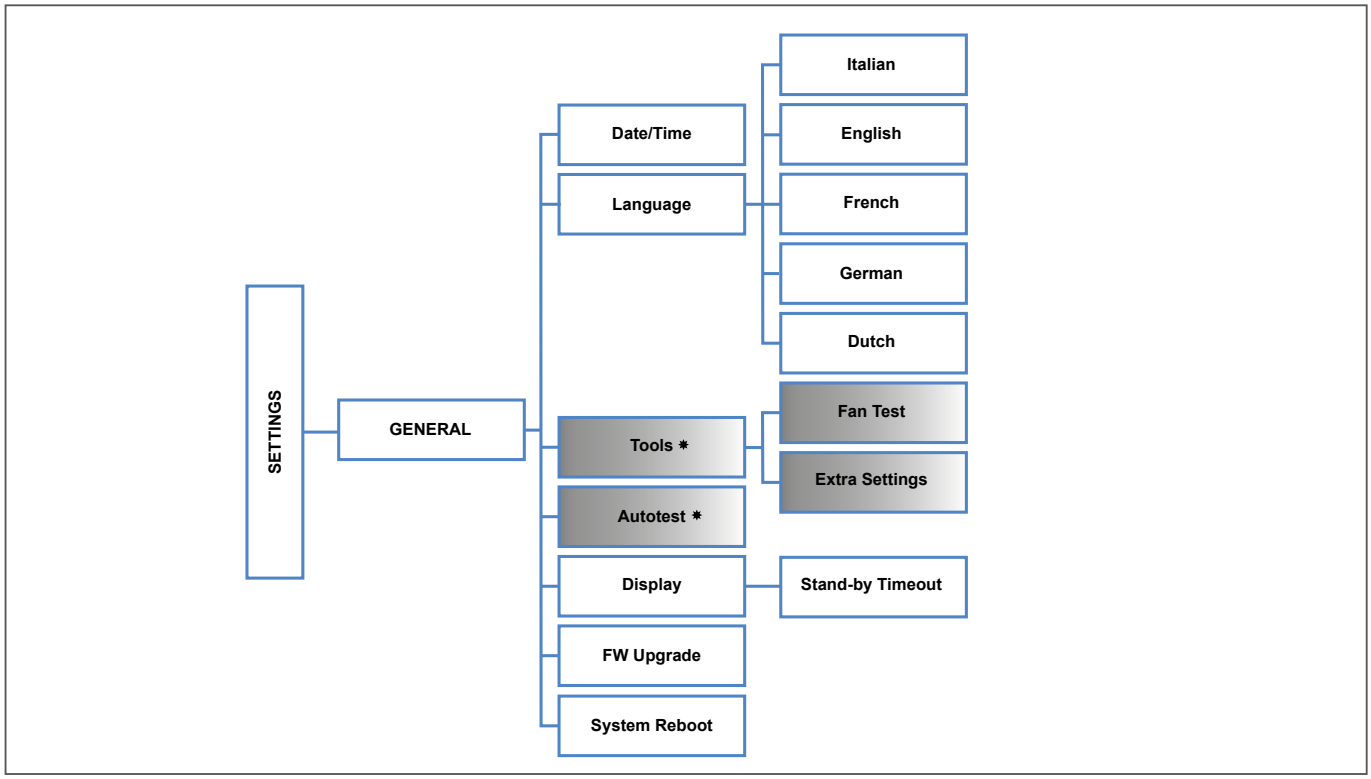
4. "BATTERY" - The page allows to access the battery settings. Some of the settings are accessible only in the INSTALLER mode which require a password to be logged in (see the "LOGIN menu" section).

5. "NETWORKING" - The page allows to access the settings to connect the system to a local data network LAN or Wi-Fi. Some settings are accessible only in the INSTALLER mode which require a password to be logged in (see the "LOGIN menu" section).

6. "GRID CODE" - The page allows to access the settings of the specific connection rules for the country where the system is installed. The settings are accessible only in the INSTALLER mode which require a password to be logged in (see the "LOGIN menu" section).

7.7.1 "GENERAL" Menu

Access to the "GENERAL" menu to access to the following submenus:



1. "DATE / TIME" - The page allows to set the current date and time.

2. "LANGUAGE" - The page allows to select the language of the current displa**y.**

3. "TOOLS" - The page allows to access system tools. The settings are accessible only in the INSTALLER mode which require a password to be logged in (see the "LOGIN menu" section).

PARAMETER	VALUE	DESCRIPTION
Fan Test	**ON/OFF**	Forced ventilation enabling to check the correct operation of the fans.
Extra Settings	**0 - 99999**	The EXTRA parameters must be used only by qualified staff. **The modification of parameters by unqualified staff can affect the correct functioning of the system, relieves the manufacturer from any liabilities and invalidates the warranty**.

4. "AUTOTEST" - The page allows to start the self-test and verify its correct execution. It is also possible to export the complete self-test report to external USB memory. The self-test procedure is only relevant for Italy (CEI 0-21). It is possible to export the complete self-test report in TXT format to external USB memory. Make sure to connect an external USB memory before carrying out the export procedure. The settings are accessible only in the INSTALLER mode which require a password to be logged in (see the "LOGIN menu" section).

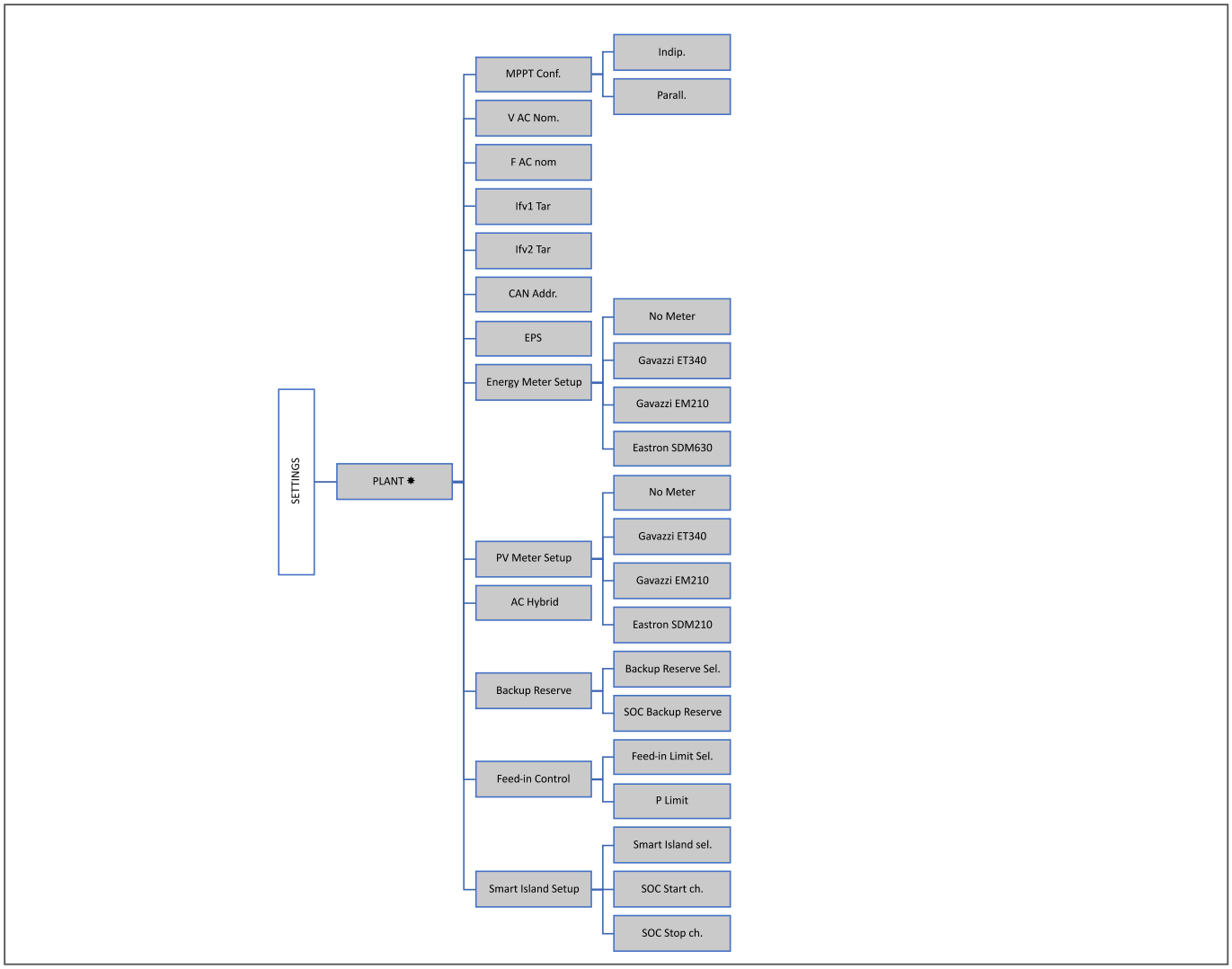
5. "DISPLAY" - The page allows to set the time before the display enters the stand-by mode.

6. “FW UPGRADE” - The page allows to update the system firmware using a guided procedure. See the “SYSTEM UPDATE” section

7. “SYSTEM REBOOT” - The page allows you to restart the display operative system.

7.7.2 “PLANT” Menu

Access to the “PLANT” menu allows to set the advanced operating modes of the system. The settings are accessible only in the INSTALLER mode which require a password to be logged in (see the “LOGIN menu” section).



1. “MPPT CONF.” - The page allows to set the INDEPENDENT or PARALLEL operating mode based on the type of system. The default factory is INDEPENDENT mode.

PARAMETER	VALUE	DESCRIPTION
MPPT Conf.	**Indip./Parall.**	PV string inputs configuration selection (Default = INDEPENDENT) (*)

(*) Not applicable for this inverter model

2. “V AC NOM” - The page allows to set the nominal grid phase voltage.

3. "F AC NOM" - The page allows to set the nominal grid frequency.

4. "IFV1 TAR" - The page allows to calibrate the current reading of the photovoltaic string connected to the PV1 input.
(*) Not applicable for this inverter model

5. "IFV2 TAR" - The page allows to calibrate the current reading of the photovoltaic string connected to the PV2 input.
(*) Not applicable for this inverter model

6. "CAN ADDR." - The page allows to perform MASTER / SLAVE settings in the case of systems consisting of several units in parallel according to the following table:

PARAMETER	VALUE	DESCRIPTION
CAN Addr.	0	Single unit (default)
	1	MASTER unit
	2 - 10	SLAVE unit

7. "EPS" - The page allows to enable / disable the EPS functionality.

PARAMETER	VALUE	DESCRIPTION
EPS	ON/OFF	EPS port operation enable (Default = OFF)

8. "ENERGY METER SETUP" - The page allows to select the type, brand and model of any external energy meter connected to the AC distribution network among those supported by the DLS system. The selection of one of the en-ergy meters indicated configures the DLX system to interact exclusively with the type, brand and model of energy meter selected. The settings are accessible only in the INSTALLER mode which re-quire a password to be logged in (see the "LOGIN menu" section). **WARNING - The type, brand and model of the approved and listed energy meters may be subject to change at any time and wi-thout notice.**

PARAMETER	VALUE	DESCRIPTION
Meter Ext.	No meter	External energy meter disabled (Default)
	Gavazzi ET340	Carlo Gavazzi ET340 external energy meter enable
	Gavazzi EM210	Carlo Gavazzi EM210 external energy meter enable
	Eastron SDM630	Eastron SDM630 external energy meter enable

9. "PV METER SETUP" - The page allows you to configure the functionality of a possible auxiliary energy meter connected to the production line of an existing ON-GRID inverter to collect its production data to be combined with a DLX inverter coupled on AC network. The selection of one of the energy meters indicated config-ures the DLX system to interact exclusively with the type, brand and model of energy meter selected. The settings are accessible only in the INSTALLER mode which require a password to be logged in (see the "LOGIN menu" section). **WARNING - The type, brand and model of the approved and listed energy meters may be subject to change at any time and without notice.**

PARAMETER	VALUE	DESCRIPTION
Meter Ext.	No meter	External energy meter disabled (Default)
	Gavazzi ET340	Carlo Gavazzi ET340 external energy meter enable
	Gavazzi EM210	Carlo Gavazzi EM210 external energy meter enable
	Eastron SDM630	Eastron SDM630 external energy meter enable

10. “AC HYBRID” - Not applicable for this inverter model.

11. “BACKUP RESERVE” - The page allows to enable / disable the RESERVE BACKUP mode and set the SOC reserve level to be used in EPS mode.

PARAMETER	VALUE	DESCRIPTION
Backup Reserve Sel.	**ON/OFF**	BACKUP RESERVE operation enable (Default = OFF)
SOC Backup Reserve	**0 – 100%**	Reserve level SOC

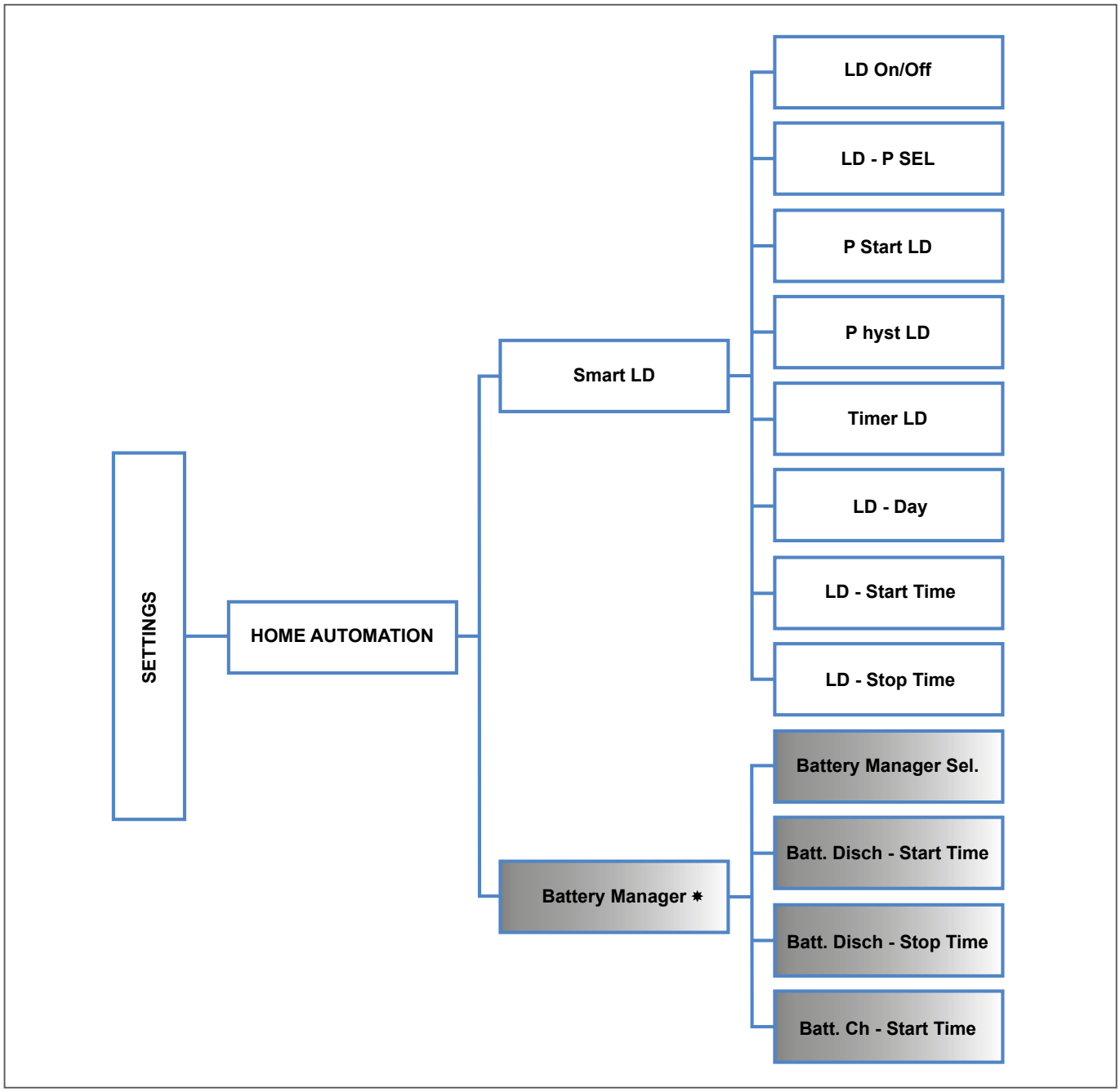
12. “FEED IN CONTROL” - Not applicable for this inverter model.

13. “SMART ISLAND SETUP” - Non applicabile per il modello di inverter in oggetto.

7.7.3 "HOME AUTOMATION" Menu

Access to the "HOME AUTOMATION" menu allows to configure the operation of the isolated change over contact (4A - 250Vac max) according to SMART LOAD modes.

Access to the "HOME AUTOMATION" menu also allows the activation of the BATTERY MANAGER mode, mainly indicated in installations where it is convenient to enable the battery charge during the high photovoltaic production time over the day and operate a delayed discharge of the battery when the energy demand of the home is higher or the cost of energy is higher.



1. "SMART LD" - The page allows to set the SMART LOAD operating mode for the load controlled by the isolated changeover contact (4A - 250Vac max) available in the DLX. Through the contact it is possible to enable secondary storage systems and / or domestic loads based on the status and energy balance of the system.

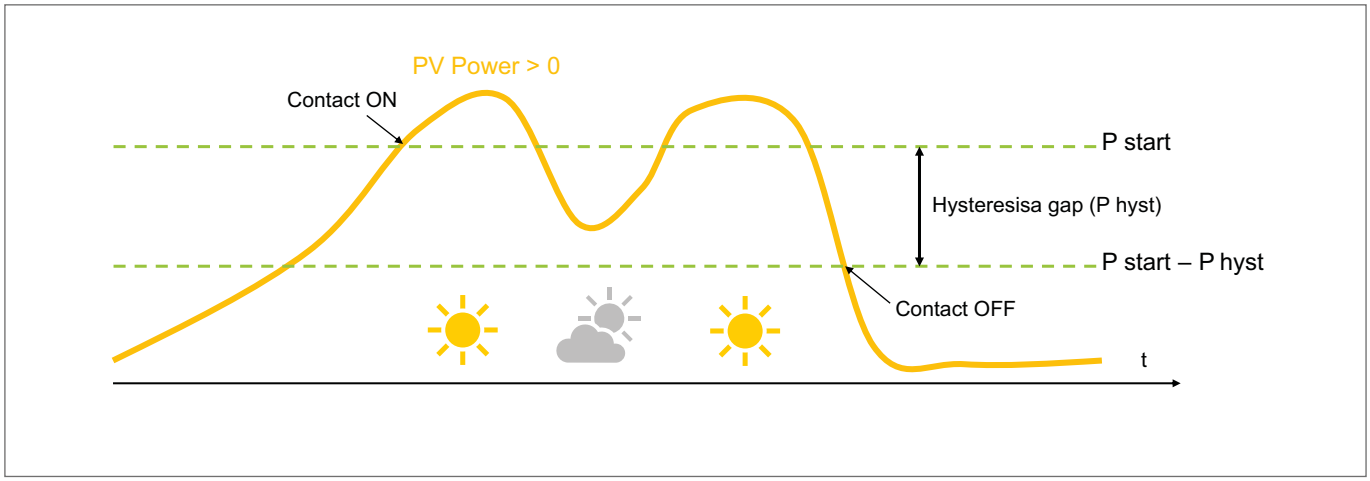
PARAMETER	VALUE	DESCRIPTION
LD On/Off	**ON/OFF**	LD program enable (Default = OFF)
LD – P sel	**PV / GRID**	Selection of the activating power type
P start LD	**-99999 – 99999 W**	Power on threshold setting
P hyst LD	**0 – 99999 W**	Hysteresis power off setting
Timer LD	**0 - 1440 min**	Power off timer (Default = 0 min)
LD – Day	**Mon - Sun**	Day selection for enabling LD program
LD – Start time	**hh:mm**	LD program start time setting (Default = 00:00)
LD – Stop time	**hh:mm**	LD program stop time setting (Default = 00:00)

The contact activation logic, based on the settings, is summarized in the following table:

LD-SEL	Pstart LD	TRIGGER CONDITION	STATUS
PV (*)	**P (W) > 0**	PPV > Pstart LD	ON
		PPV < (Pstart LD – Physt LD)	OFF
P_{GRID}	**P(W) > 0 (drawn)**	PGRID > Pstart LD	ON
		PGRID < (Pstart LD – Physt LD)	OFF
P_{GRID}	**P(W) < 0 (feed-in)**	PGRID < Pstart LD	ON
		PGRID > (Pstart LD + Physt LD)	OFF

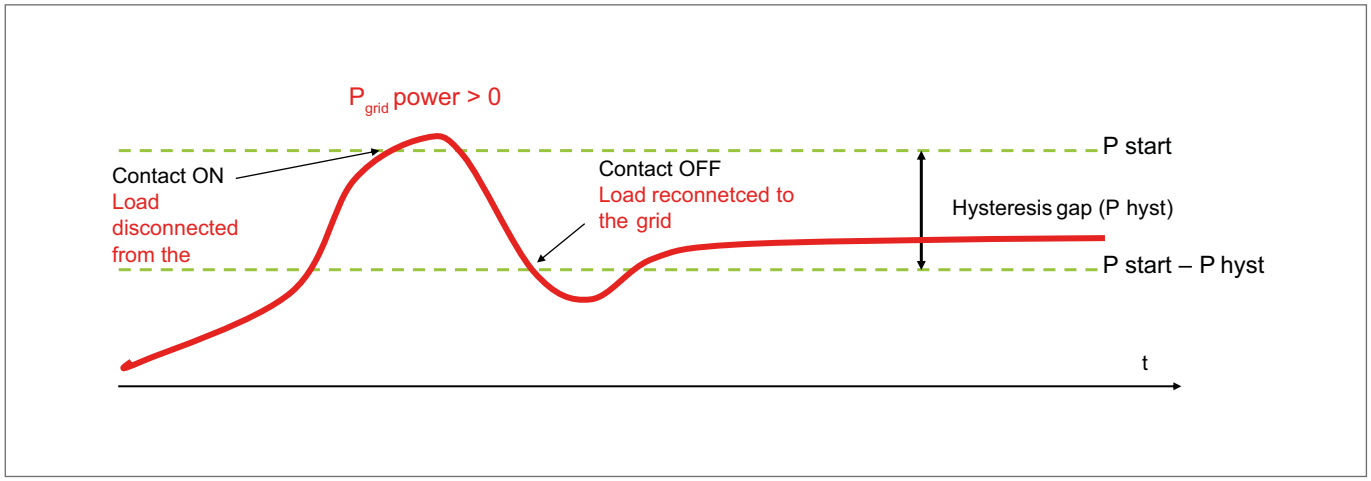
(*) Not applicable for this inverter model

- **Contact triggering on “PV” threshold**



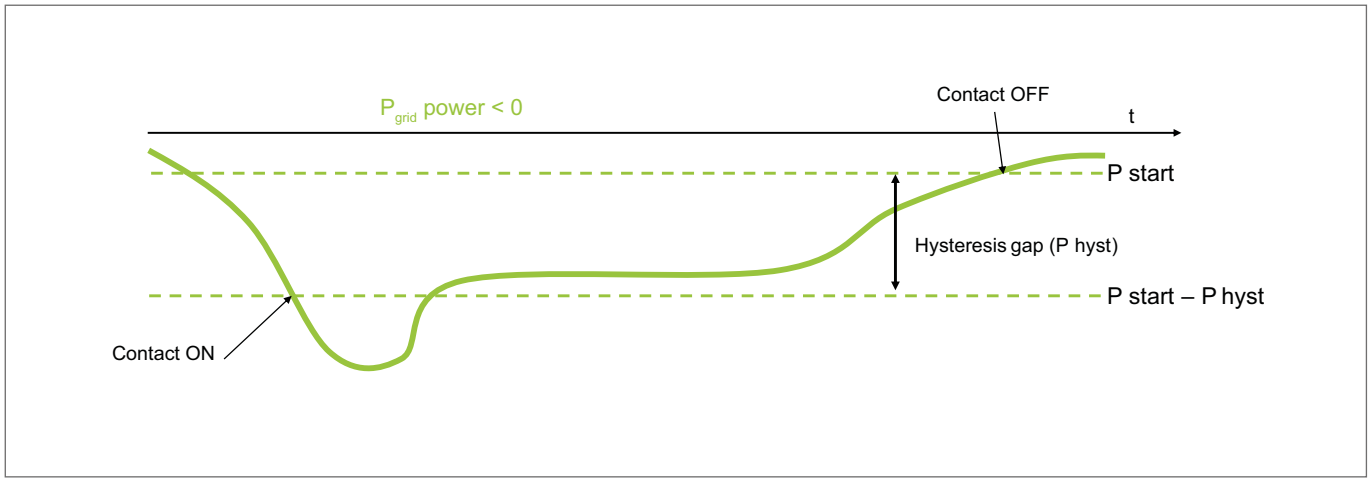
When the enrgy produced by photovoltaic panels exceeds the set threshold, the load/secondary storage system (e.g. heater, heat pump, air conditioner) is activated through the SMARTLOAD contact.
The function is usefuel to maximize the self-consumption of the energy produced by the plant.

- **Contact triggering on "P_{GRID} > 0 - Power consumption from the grid"**



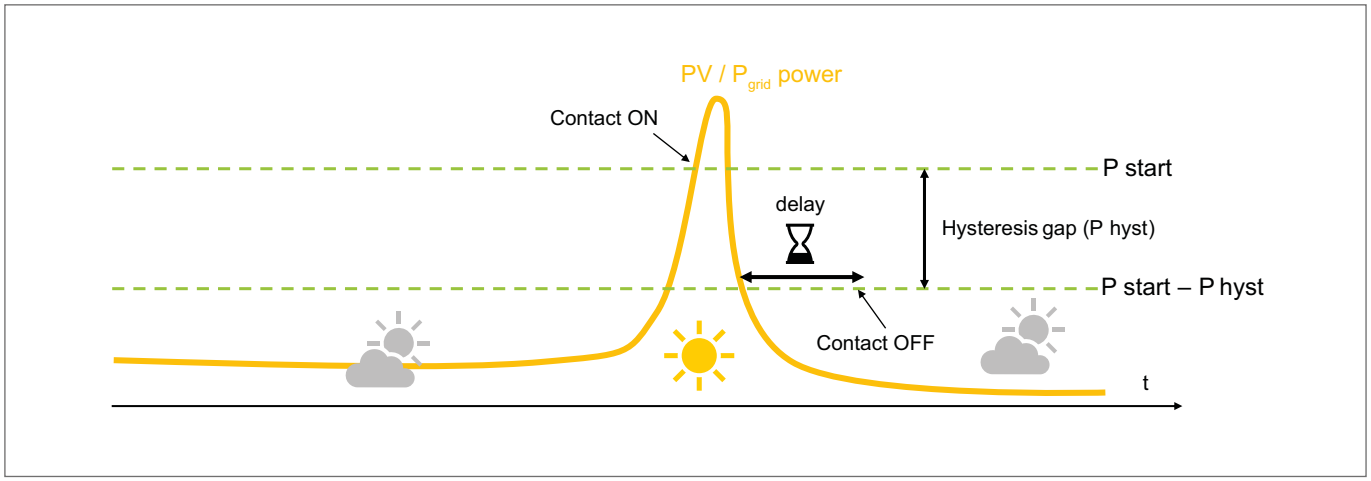
The load is normally connected to the grid. When the consumption exceeds the set threshold, the SMART LOAD contact disconnects the oad from the grid and reconnects when the consumption falls within the set limits.
The function is usefuel you to reduce grid consumption.

- **Contact triggering on "P_{GRID} < 0 - Power feed-in the grid"**



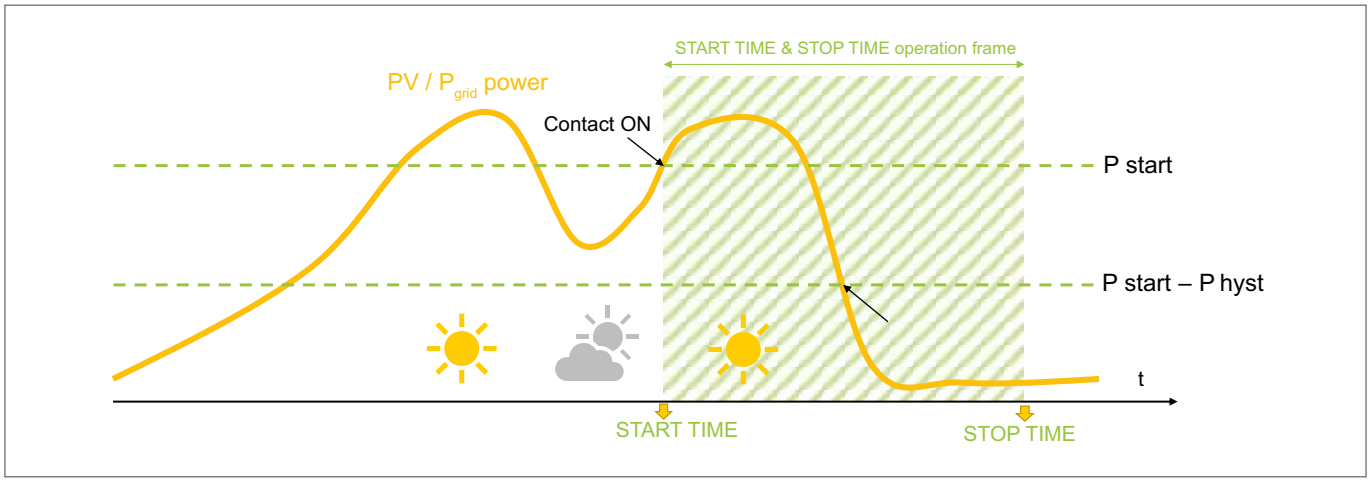
When the ernergy fed into the grid exceeds the set threshold, the SMARTLOAD contact activates the secondary load/storage system (e.g. heater, heaat pummp, air conditioner).
The function is usefuel to maximize the self-consumption of the energy produced by the plant.

- **"TIMER LD" Function**



The TIMER LD function allows you to set a smart load contact deactivation delay.
The function is useful to prevent sudden and repeated activations/deactivations of the contact that could damage the loads subjected to it (e.g. heat pump, air conditioner).

- **-"START TIME & STOP TIME" Function**



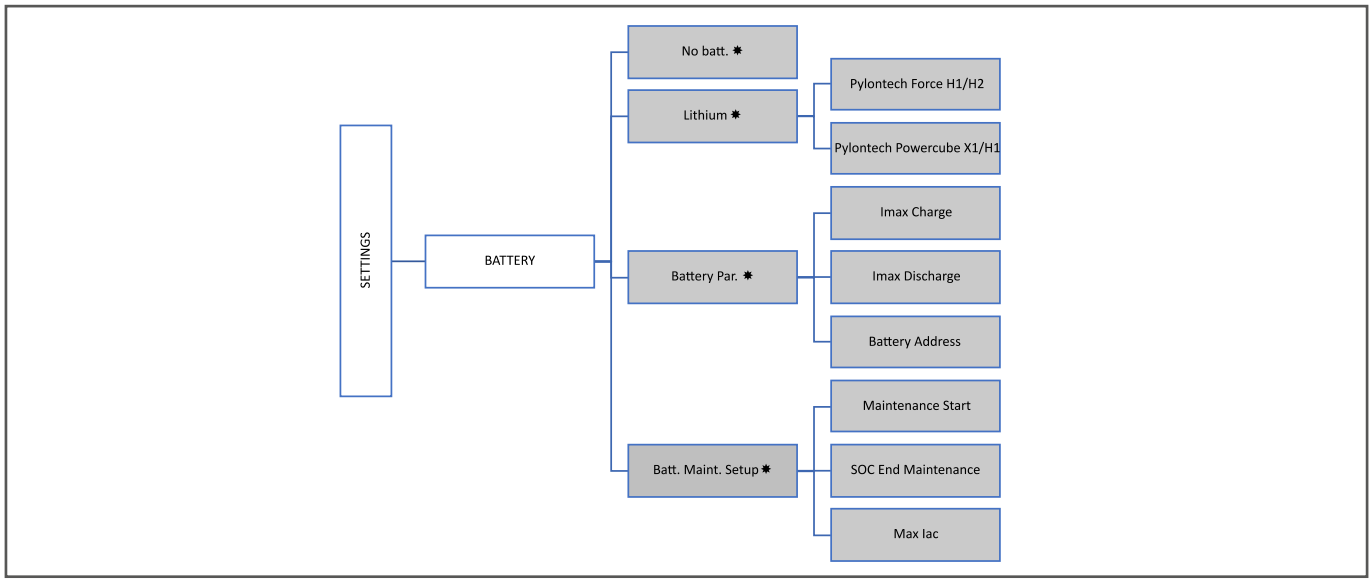
The START TIME & STOP TIME time function allows you to set a time frame to activate the SMART LOAD contact.
Events that exceed the set thresholds outside the set time frame are ignored by the system.

2. "BATTERY MANAGER" - The page allows to set the BATTERY MANAGER operating mode. The settings are accessible only in the INSTALLER mode which require a password to be logged in (see the "LOGIN menu" section).

PARAMETER	VALUE	DESCRIPTION
Battery Manager Sel.	**ON/OFF**	BATTERY MANAGER operation enable (Default = OFF)
Batt. Disch. - Start Time	**hh:mm**	Battery discharge start time
Batt. Disch. - Stop Time	**hh:mm**	Battery discharge stop time
Batt. Ch. Start Time	**hh:mm**	Battery charge start time

7.7.4 "BATTERY" Menu

Access to the "BATTERY" menu allows to configure the type, brand and the model of the lithium battery among those supported by the DLX system and perform further settings of the usage parameters. The settings are accessible only in the INSTALLER mode which require a password to be logged in (see the "LOGIN menu" section).



1. "NO BATT" – The page allows to set the operating mode without a battery connected to the system. The DLX inverter acts like an on grid inverter and the advanced features of SELF-CONSUMPTION, BATTERY MANAGEMENT, EPS and BATTERY MANAGEMENT are not available. The settings are accessible only in the INSTALLER mode which require a password to be logged in (see the "LOGIN menu" section).
(*) Not applicable for this inverter model

2. "LITHIUM" – The page allows to select the type, brand and model of the lithium battery among those supported by the DLX system. The selection of a lithium battery configures the DLX system to interact exclusively with the type, brand and model of battery selected. The settings are accessible only in the INSTALLER mode which require a password to be logged in (see the "LOGIN menu" section). **WARNING - The type, brand and model of the approved and listed batteries may be subject to change at any time and without notice.**

3. "CH/DISCH PAR." – TThe page allows to set the maximum charge and discharge current. The set value represents the maximum value allowed by the inverter. The charge/discharge setpoint is anyway defined by the battery BMS which is based on the state of charge and the temperature of the battery itself. The settings are accessible only in the INSTALLER mode which require a password to be logged in (see the "LOGIN menu" section).

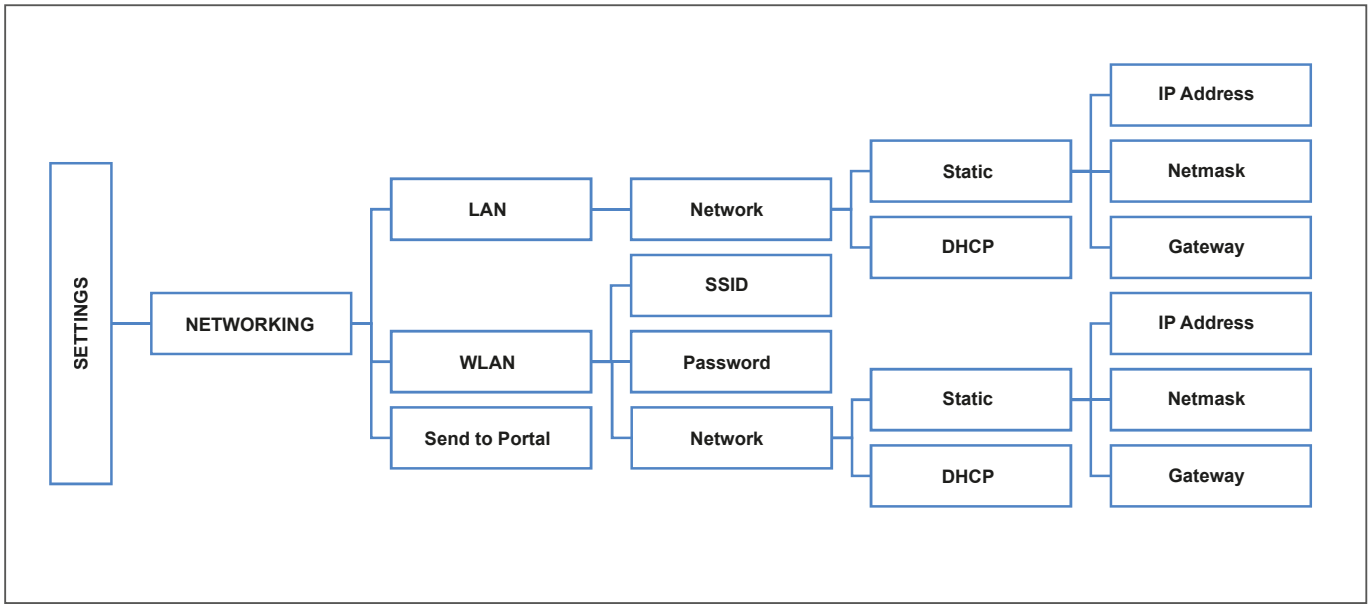
PARAMETER	VALUE	DESCRIPTION
Imax Charge	**0 - 25**	Max charge current (Default = 25A)
Imax Discharge	**0 - 25**	Max discharge current (Default = 25A)
Battery Address	**0 - 10**	Battery CAN address (Default = 1)

4. "BATT. MAINT. SETUP" – The page allows to set the battery maintenance parameters. The settings are accessible only in the INSTALLER mode which require a password to be logged in (see the "LOGIN menu" section).

PARAMETER	VALUE	DESCRIPTION
Batt. Maint. Setup	**ON/OFF**	BATTERY MAINTENANCE FROM GRID enable (Default = ON). If OFF the maintenance charge is carried out only with PV energy and can take a long time.
SOC End Maintenance	**0 - 100%**	SOC level of deactivation of the maintenance charge from the grid.
Max Iac	**0 - Inom**	Max AC current from grid during maintenance (Default = 7A)

7.7.5 "NETWORKING" Menu

Access to the "NETWORKING" menu allows to configure how to access a local Wi-Fi or LAN network to enable the remote connection and system monitoring functions.



1. "LAN" – The page allows to set the network parameters for access to a local wired LAN.

PARAMETER	VALUE	DESCRIPTION
Network	**Static/DHCP**	Network parameter setting (Default = DHCP). In the case of a STATIC setting, to access the local network it is necessary to specify IP AD-DRESS, NETMASK and GATEWAY.

2. "WLAN" - La pagina permette di impostare i parametri di rete per l'accesso ad una rete locale wireless con connessione Wi-Fi.

PARAMETER	VALUE	DESCRIPTION
SSID	**--**	Automatic scan for available wireless networks and network selection.
Password	**--**	Network password setting.
Network	**Static/DHCP**	Network parameter setting (Default = DHCP). In the case of a STATIC setting, to access the local network it is necessary to specify IP ADDRESS, NETMASK and GATEWAY.

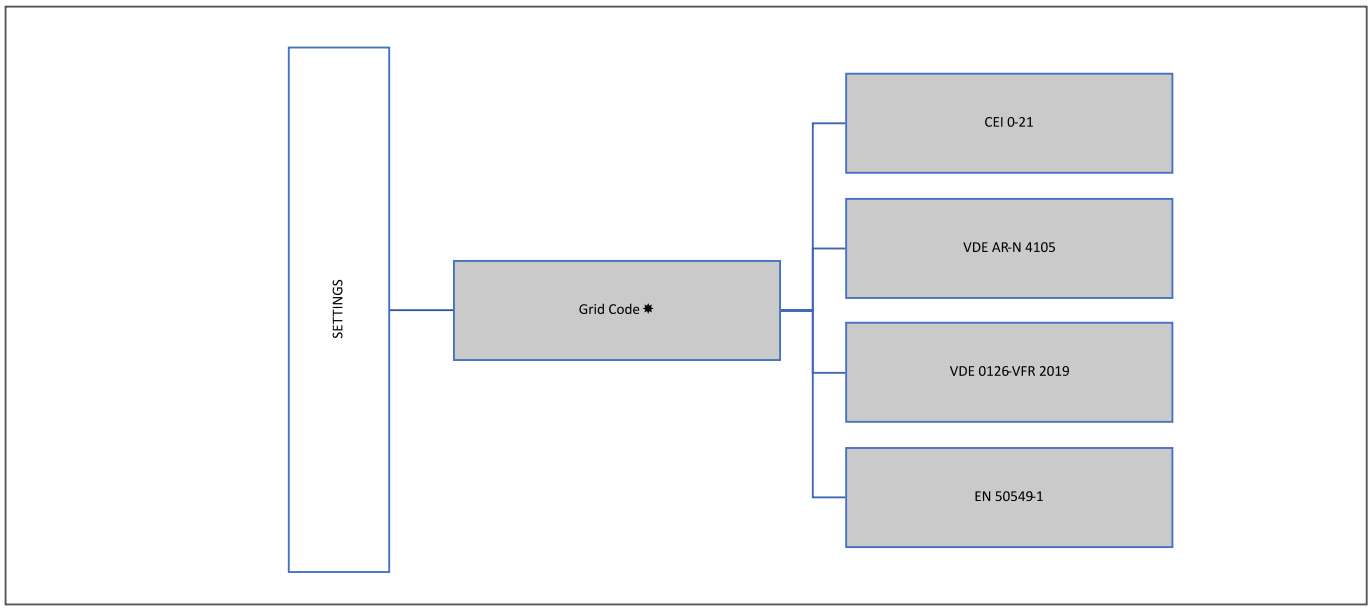
3. "SEND TO PORTAL" - The page allows to enable the sending of data to the monitoring portal.

PARAMETER	VALUE	DESCRIPTION
Send To Portal	**ON/OFF**	Data sending enable to the monitoring portal (Default = OFF)

7.7.6 "GRID CODE" Menu

Access to the "GRID CODE" menu allows advanced settings related to the local regulations in force for the connection to the public network in the country of installation. The settings are accessible only in the INSTALLER mode which require a password to be logged in (see the "LOGIN menu" section).

WARNING – The settings of the GRID CODE can be accessed only by qualified personnel. Changing the parameters at the installer level by unqualified staff can affect the correct functioning of the system and relieves the manufacturer from all liabilities and invalidates the warranty.



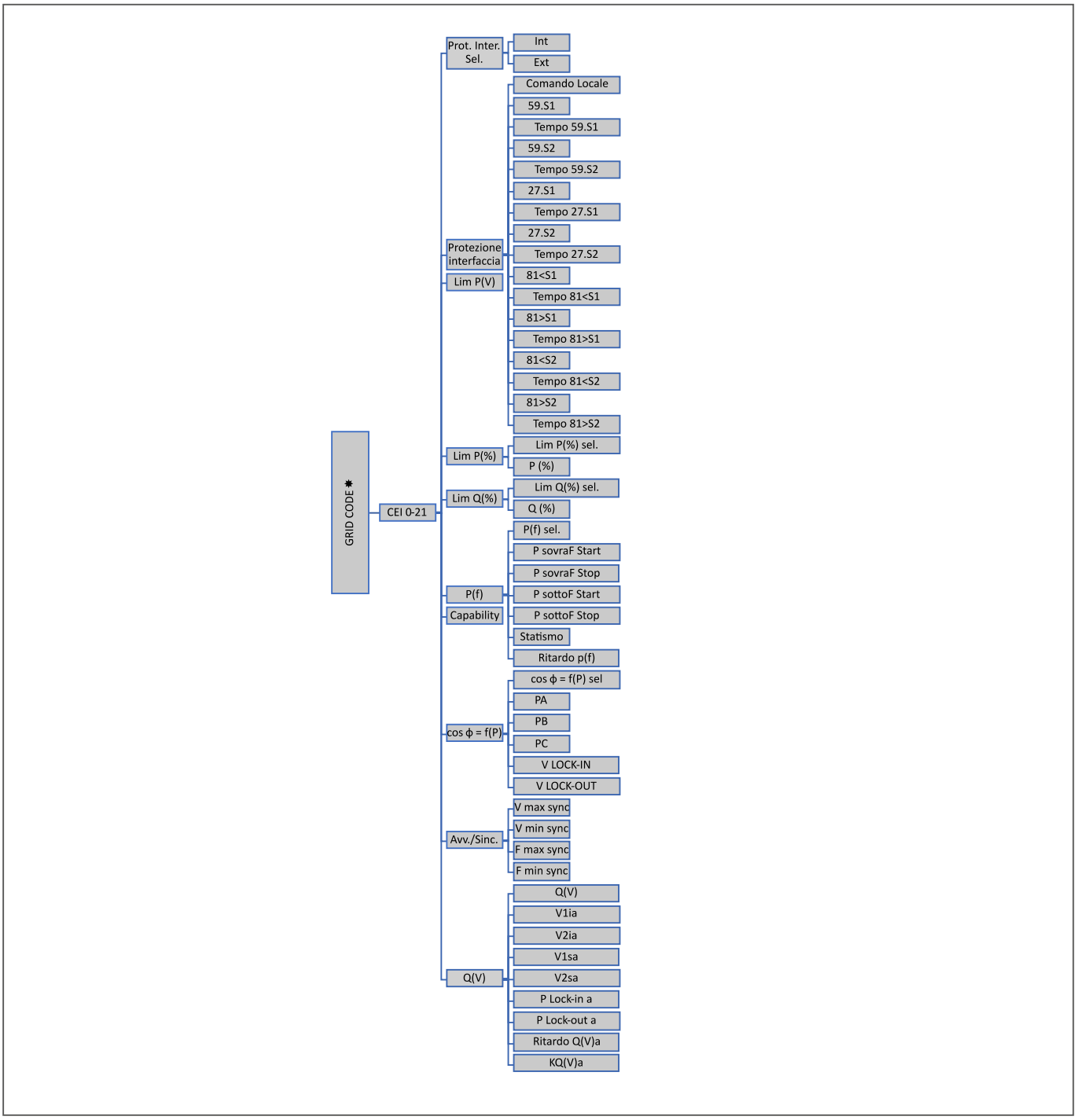
1. "GRID CODE" - The page allows to select the grid code and the related parameter setting.

PARAMETER	DESCRIPTION
CEI 0-21	CEI 0-21 (IT) enable and parameters setting
VDE AR-N 4105	VDE AR-N 4105 (DE) enable and parameters setting
VDE 0126-VFR 2019	VDE 0126-1-1 VFR 2019 (FR) enable and parameters setting
EN 50549-1	EN 50549-1 enable and parameters setting

7.7.6.1 “CEI 0-21” Menu

Access to the CEI 0-21 menu allows to change the standard settings.

WARNING – The modification of the parameters shall be made only with the authorization of the distribution network operator and can be performed only by qualified personnel. The modification of these parameters without authorization can affect the correct functioning of the system and relieves the manufacturer from all liabilities and invalidates the warranty.

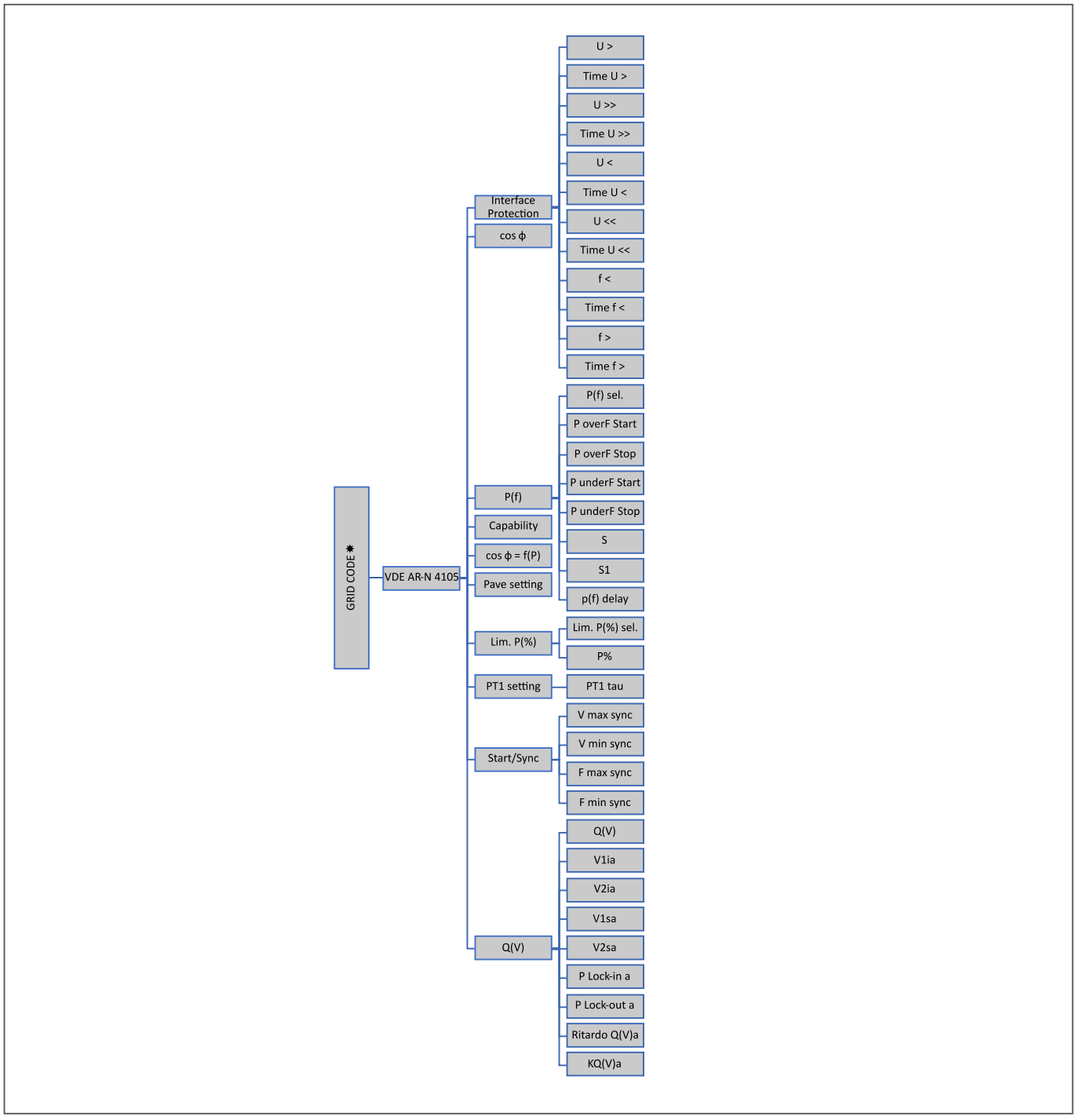


Contact the Technical Service of DELIOS s.r.l. for further details.

7.7.6.2 "VDE AR-N 4105" Menu

Access to the VDE AR-N 4105 menu allows to change the standard settings.

WARNING – The modification of the parameters shall be made only with the authorization of the distribution network operator and can be performed only by qualified personnel. The modification of these parameters without authorization can affect the correct functioning of the system and relieves the manufacturer from all liabilities and invalidates the warranty.

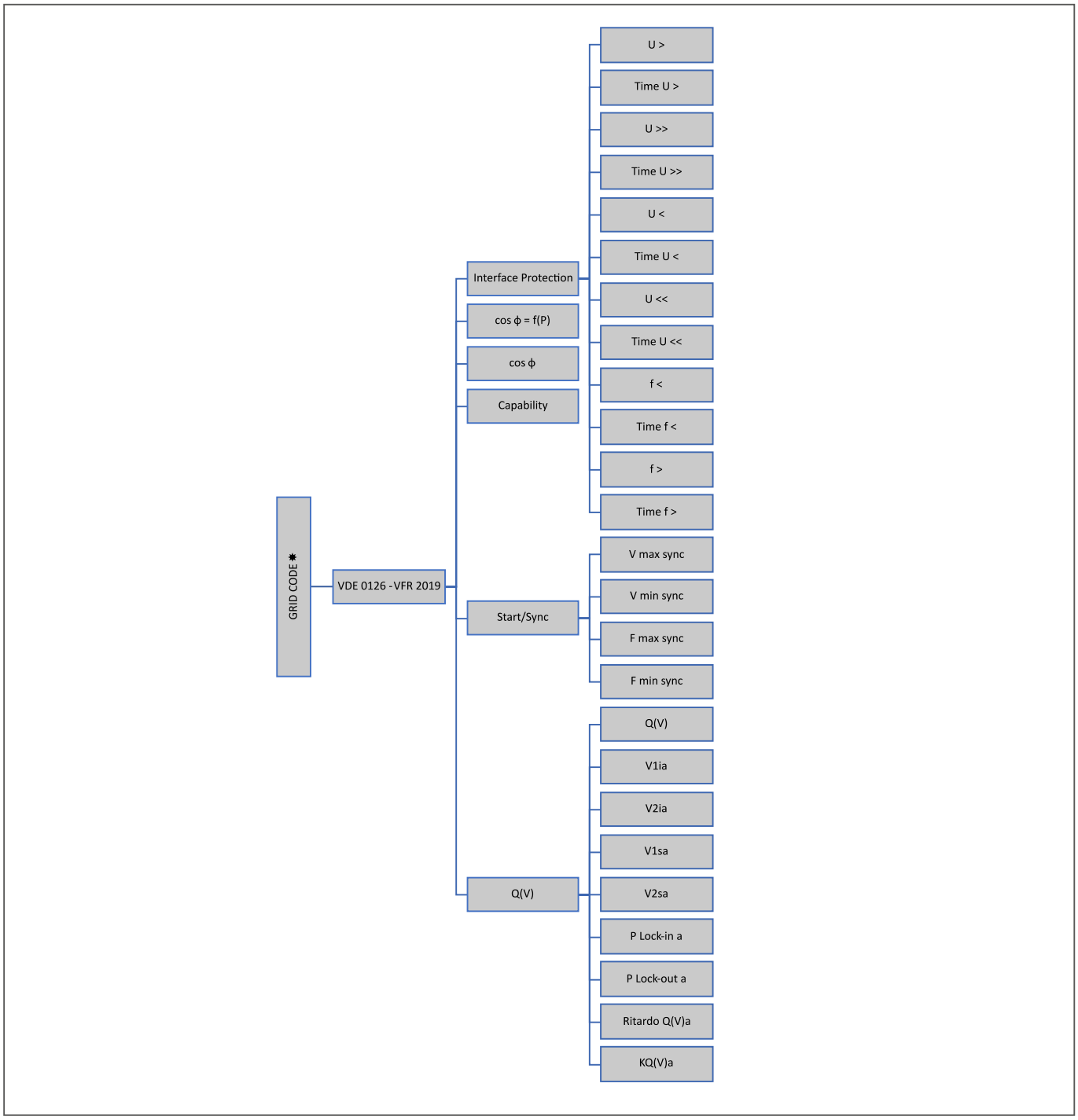


Contact the Technical Service of DELIOS s.r.l. for further details.

7.7.6.3 “VDE 0126-1-1 VFR 2019” Menu

Access to the G98-G99 menu allows to change the standard settings.

WARNING – The modification of the parameters shall be made only with the authorization of the distribution network operator and can be performed only by qualified personnel. The modification of these parameters without authorization can affect the correct functioning of the system and relieves the manufacturer from all liabilities and invalidates the warranty.

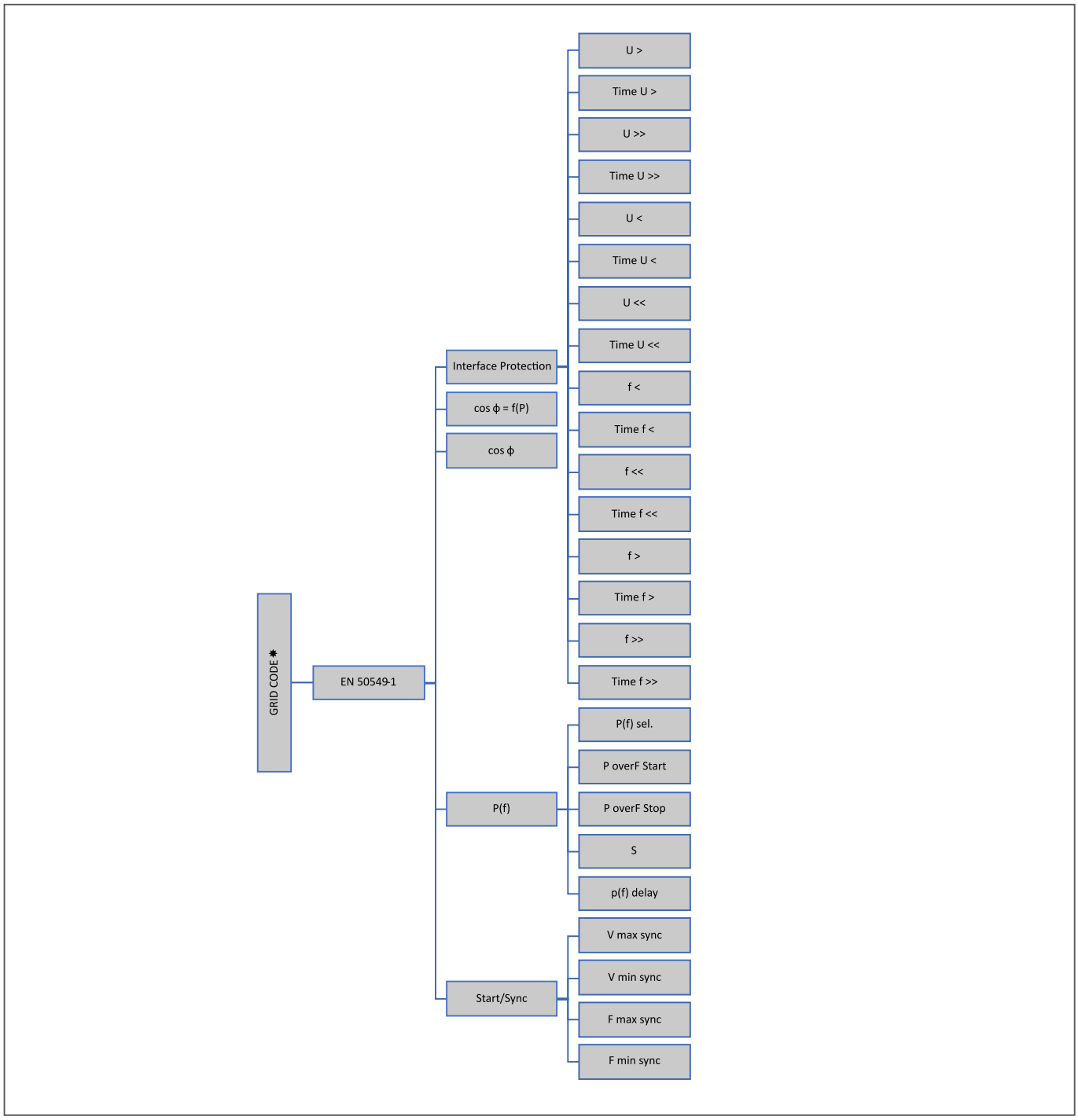


Contact the Technical Service of DELIOS s.r.l. for further details.

7.7.6.4 “EN 50549-1” Menu

Access to the EN 50549-1 menu allows to change the standard settings.

WARNING – The modification of the parameters shall be made only with the authorization of the distribution network operator and can be performed only by qualified personnel. The modification of these parameters without authorization can affect the correct functioning of the system and relieves the manufacturer from all liabilities and invalidates the warranty.



Contact the Technical Service of DELIOS s.r.l. for further details.

7.8 System Update

The firmware of the DLX inverter can be updated by using an external USB memory which must be connected to the USB port available on the control panel.

Before starting the update procedure, make sure that the ON/OFF switch is in the “0” position and that the inverter is STAND-BY mode.

Make sure you have connected an external USB memory where has been uploaded the “.DLX” update file. The external USB memory must be large enough and must have at least 128Mb of free space.

Make sure that the external USB memory has been recognized by the system (the USB icon in the status bar of the display is shown)

Access the menu “SETTINGS → GENERAL → FW UPGRADE”.

Perform the update procedure following the instructions displayed on the front panel.

During the update procedure the DLX enters safety mode and interrupts its functions for the entire duration of the procedure (a few minutes).

WARNING - Do not power-off (AC and DC) the system during the update procedure. A power supply outage during the update procedure could affect the correct operation of the system and relieves the manufacturer from all liabilities, as well as invalidate the warranty.

WARNING - Do not remove the external USB memory during the update procedure. Removal of the external USB memory during the update could affect the correct operation of the system and relieves the manufacturer from all liabilities, as well as invalidate the warranty.

The inverter restarts automatically once the update is complete.

If the update procedure is not successful and a control panel lockout occurs, please contact the Technical Service of DELIOS s.r.l. to carry out a recovery procedure.

8 MONITORING SYSTEM

8.1 General Information

The DELIOS monitoring system is an integrated and online datalogging platform (for registered devices) that allows to access DLX devices and check their operating status at any time and from anywhere in the world if an INTERNET connection is available.

Registered DLX systems send operating data at regular intervals which are collected and organized by the integrated data logger and the DELIOS portal in order to provide system status in a simple and immediate way.

There are two types of remote access to DLX systems:

a. DIRECT access on local Wi-Fi / LAN network via web browser

b. WEB access via https://webportal.delios-srl.it/ portal or via **Delios Solar App** available for Android and iOS devices on local Wi-Fi / LAN network with INTERNET access

8.2 Getting Started – Preparing to Wi-Fi/LAN connection

Make sure the DLX system is operating (green LED (1) blinking or steady on).

Make sure that the home Wi-Fi / LAN router is switched on and working properly.

Refer to the ELECTRICAL CONNECTIONS - Wi-Fi CONNECTION section for creating a Wi-Fi connection with the router.

Refer to the ELECTRICAL CONNECTIONS - LAN CONNECTION section for creating a wired LAN connection with the router.

8.2.1 Connecting to a Wi-Fi network

1. Access, from the user panel, to the setup page through the following path:

- **MENU → SETTINGS → NETWORKING → WLAN**

2. Access the "**SSID**" menu and start scanning the available Wi-Fi networks.

3. Select the Wi-Fi network for the router to which the inverter is to be connected. The selection will be confirmed by a check mark next to the selected network.

4. Access the "**PASSWORD**" menu and enter the security password for the selected Wi-Fi network and confirm.

5. Wait for the connection to be established (blue LED (3) on and icon (5) highlighted)

6. The DLX system is now connected to the Wi-Fi network of the selected router.

8.2.2 Wi-Fi/LAN network settings

Based on the connection you made, access the "NETWORK" menu to perform the Wi-Fi / LAN network settings by following the following paths:

- **MENU → SETTINGS → NETWORKING → WLAN → NETWORK**
- **MENU → SETTINGS → NETWORKING → LAN → NETWORK**

8.2.2.1 STATIC IP

This type of setting allows you to keep the DLX configured to the selected IP even when the router is re-started. This functionality is useful if you want to make direct remote access to the DLX system using a smartphone / tablet / PC device using any browser and the selected IP address.

1. Access the "**STATIC**" menu to assign a static IP address to those available on the router network. The selected IP address must be selected between the free and currently unassigned to other devices attached to the selected Wi-Fi / LAN network.

2. Access the "**GATEWAY**" menu to assign the IP address of the router

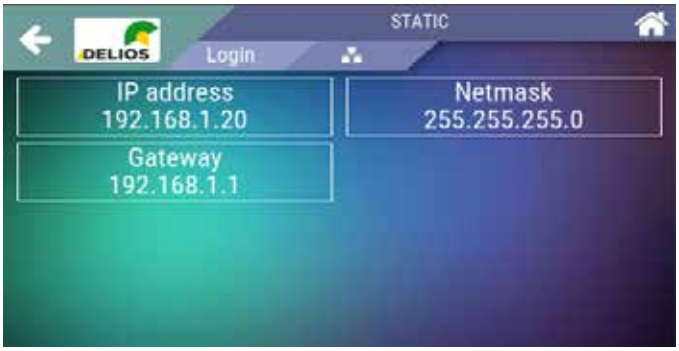
3. Access the "**NETMASK**" menu to assign the value (255.255.255.0 default setting).

8.2.2.2 Dynamic IP (DHCP)

In this type of setting the router dynamically and automatically assigns the IP address to the DLX system within the selected Wi-Fi / LAN network.

It is important to note that the IP address assigned automatically by the router to the inverter may vary when the router restarts. At any time, the IP address assigned to the DLX system can be retrieved by accessing the "INFO" menu and the "NETWORKING" submenu:

- **MENU → INFO → NETWORKING → WLAN**
- **MENU → INFO → NETWORKING → LAN**



8.3 DIRECT Access over local Wi-Fi/LAN network

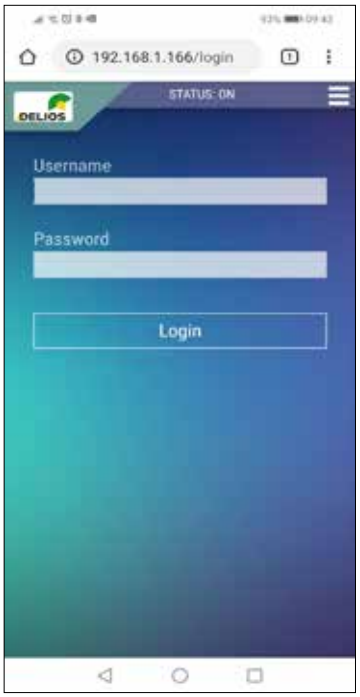
The following remote access mode to the DLX system allows to get the system control panel onto the device used for the remote connection. No parameters changes are allowed on the remote control panel, but only system checks.

1. Make sure that the DLX system is operating (green LED (1) blinking or steady on) and that the Wi-Fi connection to the local network is active (blue LED (3) on and icon (5) highlighted).

2. Make sure that the remote device (smartphone / tablet / PC / Laptop) that you want to use to access the DLX is connected to the same local LAN / WLAN.

3. Start the system web browser on the remote device (smartphone / tablet / PC / Laptop) and enter the IP address assigned to the DLX system on the search bar to visit the login page. In the case of STATIC assignment, type in the chosen IP address, while, in the case of dynamic DHCP assignment, retrieve the address assigned by the router to the DLX by consulting the "INFO" menu on the "**NETWORKING**" page.

• Login page:

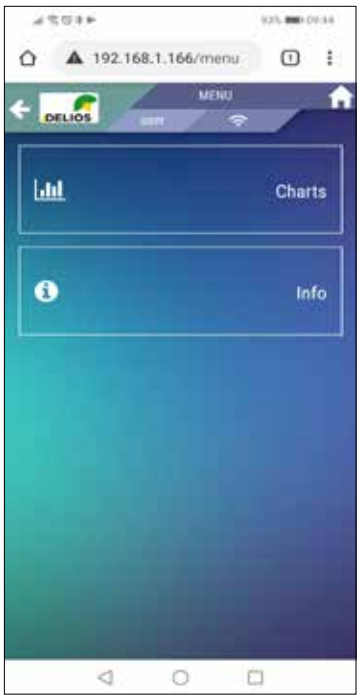


• Enter the default credentials on the system login page:

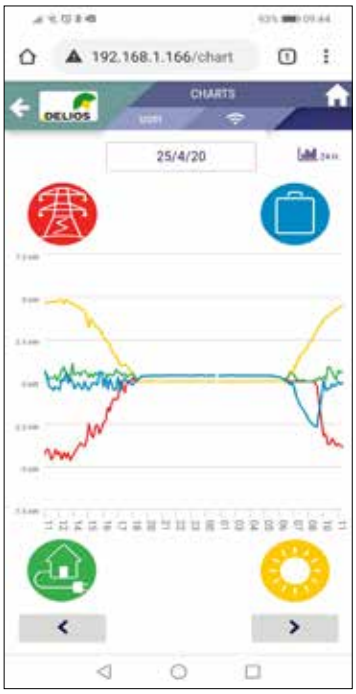
Username: **user**
Password: **user**

• "**HOME**" page:

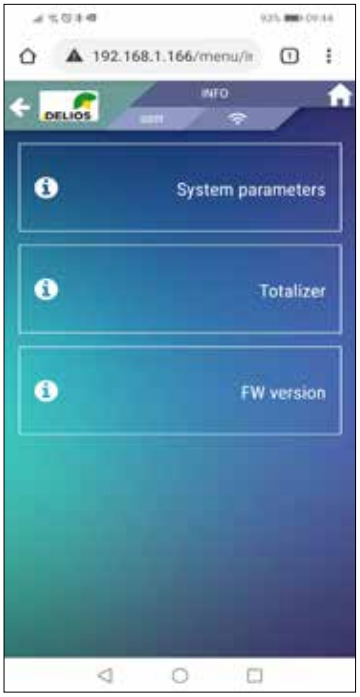
• Main “**MENU**” – Select the “**MENU**” button to see the “**CHARTS**” or “**INFO**” section of the system.



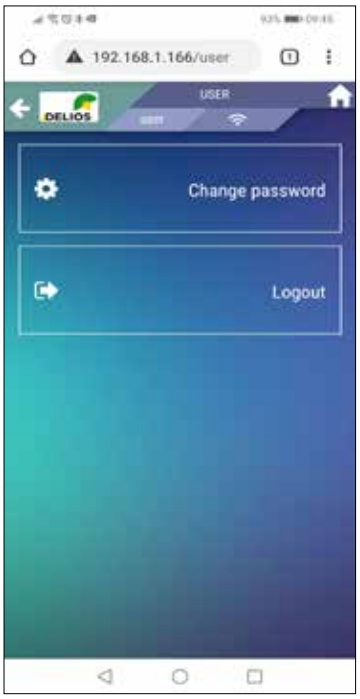
• “**CHARTS**” menu - Access to the “**CHARTS**” menu allows you to view the data stored by the integrated data logger with the same functionality provided by the DLX control panel. Refer to the DLX user manual for operating details.



• “**INFO**” menu - Access to the “**INFO**” menu allows you to view general system information. Refer to the DLX user manual for operating details.



• “**USER**” menu - Access the “**USER**” menu to change the default access password (“**PASSWORD CHANGE**” menu) or to disconnect from the system (“**LOGOUT**” menu).



8.4 DELIOS WEB Portal DELIOS and DELIOS SOLAR APP Access

THE DELIOS MONITORING SYSTEM IS AN INTEGRATED AND ONLINE DATALOGGING PLATFORM (FOR REGISTERED DEVICES) THAT ALLOWS TO ACCESS DLX DEVICES AND CHECK THEIR OPERATING STATUS AT ANY TIME AND FROM ANYWHERE IN THE WORLD IF AN INTERNET CONNECTION IS AVAILABLE.

Registered DLX systems send operating data at regular intervals which are collected and organized by the integrated data logger and the DELIOS portal in order to provide system status in a simple and immediate way.

From the portal it is also possible to set the remote signaling of specific events (alarms) by an automatic forwarding of a notification email containing all the indications of the event and the time when it was detected by the system.

WEB access can be made from the portal https://webportal.delios-srl.it/ or via **Delios Solar App** available for Android and iOS devices and downloadable for free from the respective online stores.

GET IT ON Google play

Download on the App Store

8.4.1 Getting Started

Before to access online services, it is necessary to configure the DLX for the data sending to the portal and check that the connection to the INTERNET is working properly.

Proceed following the instructions reported below:

1. Make sure that the DLX system is operating (green LED (1) blinking or steady on) and that the Wi-Fi connection to the local network is active (blue LED (3) on and icon (5) highlighted).

2. Make sure that the Wi-Fi / LAN network to which the DLX system is connected has access to the INTERNET.

3. Enable the DLX system to send data to the portal. At this purpose, access the setting page from the control panel through the following path:

➢ **MENU → SETTINGS → NETWORKING**

Cod.: 240.010.0026

4. Access the "**SEND DATA TO PORTAL**" menu and select "**ON**".

5. After having set "**ON**", make sure that the blue LED (3) remains permanently on. This confirms that the DLX system has effective access to the INTERNET. The DLX system is now enabled to send data to the DELIOS portal.

6. If the blue LED (3) remains off after having enabled the data sending to the portal, it means that the DLX system is unable to access the INTERNET. Check the router settings which may block data transmission.

7. Make sure that the remote device (smartphone / tablet / PC / Laptop) used to access the remote monitoring system is connected to the network and has access to the Internet.

8.4.2 User Registration

Before being able to access the online services, it is necessary to create an user account through the registration procedure available on the portal page

Proceed following the instructions reported below:

1. Access the DELIOS portal via smartphone / tablet / PC / Laptop by typing the following address on the web browser:

https://webportal.delios-srl.it/

2. Access the registration page and fill out the proposed form.

3. After registration, the portal will send an automatic e-mail to confirm the registration and set the access password.

4. Register and keep the credentials for future access via the portal or Delios Solar App.

9 MANTEINANCE

9.1 General Information

Any repair or replacement of parts of the system must be performed exclusively by qualified staff.
The repair or replacement of parts of the system by unauthorized staff will immediately invalidate the product warranty.
Only genuine spare parts must be used. Using non genuine spare parts will immediately invalidate the product warranty.
Immediately replace the components that do not appear in perfect conditions.

Before starting any maintenance operations, make sure that the system has been switched off, and that the AC line external main switch has been set to off.

Do not carry out other operations on the inverter for at least 10 minutes. The inverter contains capacitors that need a minimum time to discharge.

Never disconnect the AC or DC connectors connected to the DLX system before having disconnected the protection switches (external and internal). Any disconnection of the connectors during operation can generate large electrical arcs.

An electric shock shock can be fatal.
An electric discharge can set fire to the inverter.
An electrical discharge can cause fires capable of spreading to the surrounding areas.

It is absolutely forbidden to open the DLX system except as provided in this manual.

The DLX system must not be subjected to any type of modification.
If the operator does not comply with what is described, the manufacturer declines all responsibility.

9.2 System Switching Off

Proceed as follows to switch off the system:

1. Enable the inverter stand-by by placing the ON/OFF switch in the “0” position.
2. Disconnect the AC GRID and EPS (if present) circuit breakers.
3. Disconnect the BATTERY circuit breaker (where present) and turn off the HV battery.
4. Wait for the display to turn off.
5. Do not carry out other operations on the inverter for at least 10 minutes. The inverter contains capacitors that need a minimum time to discharge.

9.3 Uninstall

Before starting any maintenance operations, make sure that the system has been switched off, and that the AC line external main switch has been set to off.

Wait at least 10 min. before removing the DLX system from the wall.
The inverter enclosure could overheat during its operation and cause burns by contact.

Do not carry out other operations on the inverter for at least 10 minutes. The inverter contains capacitors that need a minimum time to discharge.

Batteries produce electricity and can cause electric shock or fire in the event of a short circuit or incorrect installation.

The conductors from the solar panels are always live. The voltage from a string of solar panels can reach 1000 V!!

1. Disconnect the battery cable connectors from the BAT inputs.
2. Open the connection compartment by removing the fixing screws.
3. Disconnect the AC GRID and EPS (if present) conductors.
4. Disconnect the communication wires and external controls where present
5. The DLX can now be removed for disposal or repair.

9.4 Disposal

To comply with the 2002/96 / EC European Directive relating to electrical and electronic waste and its implementation as national law, electrical equipment that has reached the end of its useful life and discharged batteries must be separated from general waste and disposed to the appropriate authorized collection and recycling centers.

Any device that is no longer needed must therefore be returned to the distributor or disposed to an authorized collection and recycling center in your area. Ignoring this European Directive can have potentially negative effects on the environment and your health!

10 TROUBLESHOOTING

ALARM	TYPE	SOLUTION
E001	Converter control system fault.	• Procedere con lo spegnimento e il riavvio del sistema. • Fare riferimento alle sezioni “Spegnimento del sistema” e “Accensione del sistema” • Se il problema persiste contattare il servizio di assistenza tecnica.
E002	Converter control system fault.	• Switch off and restart the system. • Refer to the sections “System switching off” and “System switching on” • Should the problem persist, contact our technical support service.
E003	Incorrectly configured system.	• Contact the Technical Support Service.
E004	AC overcurrent.	• Check the sizing and the output connections to the system. • Refer to the section “Electrical connections”. • If the problem persists, contact the technical support service.
E005	Faulty protection interface device integrated in the system.	• Switch off and restart the system. • Refer to the sections “System switching off” and “System switching on” • Should the problem persist, contact our technical support service.
E006	Faulty interlock device integrated in the system.	• Switch off and restart the system. • Refer to the sections “System switching off” and “System switching on” • Should the problem persist, contact our technical support service.
E007	High internal temperature	• Check the correct positioning of the inverter and that the installation complies with the provisions contained in this manual in the “Positioning” and “Mounting” sections. • Check that the ambient temperature is within the allowed range. • Check the correct operation of the cooling fans. • Check that there is no accumulation of dust near the ventilation openings. • If the problem persists, contact the technical support service.
E008	Internal current leakage	• Switch off and restart the system. • Refer to the sections “System switching off” and “System switching on” • Should the problem persist, contact our technical support service.
E009	NEUTRAL line wrongly connected	• Check that the connections of the AC input and output lines respect the assigned polarity. • If the problem persists, contact the technical support service.
E010	Failed AUTOTEST (relevant only for CEI 0-21)	• Check the integrity of the electrical connections. • Make sure that the mains voltage and frequency are within the range allowed by the CEI 0-21 standard. • If the problem persists, contact the technical support service.

ALARM	TYPE	SOLUTION
E011	High grid voltage	• Make sure that the mains voltage is within the range allowed by local regulations. • Check the network impedance. • If the mains voltage is not within the permitted range for reasons due to the local grid conditions, contact the grid operator to evaluate the possibility of adapting the voltages at the connection point or request approval for the change to the operating limits. • If the mains voltage is within the allowed range, but the alarm persists, contact the technical support service.
E012	High grid voltage	• Make sure that the mains voltage is within the range allowed by local regulations. • Check the network impedance. • If the mains voltage is not within the permitted range for reasons due to the local grid conditions, contact the grid operator to evaluate the possibility of adapting the voltages at the connection point or request approval for the change to the operating limits. • If the mains voltage is within the allowed range, but the alarm persists, contact the technical support service.
E013	Low grid voltage	• Make sure that the mains voltage is within the range allowed by local regulations. • Check the network impedance. • If the mains voltage is not within the permitted range for reasons due to the local grid conditions, contact the grid operator to evaluate the possibility of adapting the voltages at the connection point or request approval for the change to the operating limits. • If the mains voltage is within the allowed range, but the alarm persists, contact the technical support service.
E014	Low grid voltage	• Make sure that the mains voltage is within the range allowed by local regulations. • Check the network impedance. • If the mains voltage is not within the permitted range for reasons due to the local grid conditions, contact the grid operator to evaluate the possibility of adapting the voltages at the connection point or request approval for the change to the operating limits. • If the mains voltage is within the allowed range, but the alarm persists, contact the technical support service.
E015	High grid frequency	• Make sure that the grid frequency is within the range allowed by local regulations. • If the grid frequency is not within the permitted range for reasons due to the local grid conditions, contact the grid operator to request approval for the change to the operating limits. • If the grid frequency is within the allowed range, but the alarm persists, contact the technical support service.
E016	High grid frequency	• Make sure that the grid frequency is within the range allowed by local regulations. • If the grid frequency is not within the permitted range for reasons due to the local grid conditions, contact the grid operator to request approval for the change to the operating limits. • If the grid frequency is within the allowed range, but the alarm persists, contact the technical support service.

ALARM	TYPE	SOLUTION
E017	High grid frequency	• Make sure that the grid frequency is within the range allowed by local regulations. • If the grid frequency is not within the permitted range for reasons due to the local grid conditions, contact the grid operator to request approval for the change to the operating limits. • If the grid frequency is within the allowed range, but the alarm persists, contact the technical support service.
E018	Low grid frequency	• Make sure that the grid frequency is within the range allowed by local regulations. • If the grid frequency is not within the permitted range for reasons due to the local grid conditions, contact the grid operator to request approval for the change to the operating limits. • If the grid frequency is within the allowed range, but the alarm persists, contact the technical support service.
E019	Disconnection from the gird imposed by the distribution network operator.	• Intervention of the interface device imposed by the network operator.
E020	Feeding in a direct current with a value higher than the admitted threshold.	• Make sure that there is a direct current fed into the grid. • If the direct current fed into the grid does not fall within the permitted range for reasons due to the local grid conditions, contact the grid operator to request approval for the modification to the operating limits. • If the direct current fed into the grid it is within the allowed range, but the alarm persists, contact the technical support service.
E021	Feeding in a direct current with a value higher than the maximum instantaneous admitted threshold.	• Make sure that there is a direct current fed into the grid. • If the direct current fed into the grid does not fall within the permitted range for reasons due to the local grid conditions, contact the grid operator to request approval for the modification to the operating limits. • If the direct current fed into the grid it is within the allowed range, but the alarm persists, contact the technical support service.
E022	Converter control system fault.	• Switch off and restart the system. • Refer to the sections “System switching off” and “System switching on” • Should the problem persist, contact our technical support service.
E023	DC overcurrent.	• Check the sizing and connections to the DC inputs of the system. • Refer to the section “Electrical connections”. • If the problem persists, contact the technical support service.
E024	DC overcurrent.	• Check the sizing and connections to the DC inputs of the system. • Refer to the section “Electrical connections”. • If the problem persists, contact the technical support service.
E025	Loss of isolation of the PV generator.	• Check the DC lines leakage to ground.
E026	DC voltage out of range.	• Immediately disconnect the system from the photovoltaic generator as it could be damaged. • Check the sizing of the system. • Check the noload voltage of the photovoltaic generator.
E027	BATTERY overcurrent.	• Check the sizing and connections at the BATTERY inputs. • Refer to the section “Electrical connections”. • If the problem persists, contact the technical support service.

ALARM	TYPE	SOLUTION
E028	Battery not recognized.	• Check the connections and polarity at the BATTERY inputs. • Check the battery voltage and make sure it is within the limits allowed for operation. • Refer to the section “Electrical connections”. • If the problem persists, contact the technical support service.
E029	Circuit breaker tripped.	• Check the correct positioning of the inverter and that the installation complies with the provisions contained in this manual in the “Positioning” and “Mounting” sections. • Check that the ambient temperature is within the allowed range. • Check the correct operation of the cooling fans. • Check that there is no accumulation of dust near the ventilation openings. • If the problem persists, contact the technical support service.
E030	Overload protection (EPS & SMART ISLAND operating mode).	• Check the sizing and the output connections to the system. • Reduce the domestic load connected to the inverter. • Refer to the section “Electrical connections”. • If the problem persists, contact the technical assistance service.
E031	Wrong AC connection.	• Check the sizing and the output connections to the system. • Refer to the section “Electrical connections”. • If the problem persists, contact the technical assistance service.
E032	External energy meter communication fault.	• Switch off and restart the system. • Refer to the sections “System switching off” and “System switching on” • Should the problem persist, contact our technical support service.
E033	Converter control system fault.	• Switch off and restart the system. • Refer to the sections “System switching off” and “System switching on” • Should the problem persist, contact our technical support service.
E034	Converter control system fault.	• Switch off and restart the system. • Refer to the sections “System switching off” and “System switching on” • Should the problem persist, contact our technical support service.
E035	Converter control system fault.	• Switch off and restart the system. • Refer to the sections “System switching off” and “System switching on” • Should the problem persist, contact our technical support service.
E036	Battery temperature out of range (only LEAD ACID).	• Check the presence and connections of the battery temperature sensor (leadacid battery). • Check the battery voltage and make sure it is within the limits allowed for operation. • Check that the ambient temperature is within the allowed range. • Check the correct positioning of the battery and that the installation complies with the requirements contained in this manual. • Refer to the section “Electrical connections”. • If the problem persists, contact the technical support service.
E037	Converter control system fault.	• Switch off and restart the system. • Refer to the sections “System switching off” and “System switching on” • Should the problem persist, contact our technical support service.

ALARM	TYPE	SOLUTION
E038	Converter control system fault.	• Switch off and restart the system. • Refer to the sections “System switching off” and “System switching on” • Should the problem persist, contact our technical support service.
E039	Master-Slave communication fault.	• Check the communication cable and connections between the master and slave inverters. Check the system settings. • Switch off and restart the system. • Refer to the sections “System switching off” and “System switching on” • Should the problem persist, contact our technical support service.
E040	Converter control system fault.	• Switch off and restart the system. • Refer to the sections “System switching off” and “System switching on” • Should the problem persist, contact our technical support service.
E041	Exceeding the regulatory power threshold	• Check the sizing and the output connections to the system. • Reduce the domestic load connected to the inverter. • Refer to the section “Electrical connections”. • If the problem persists, contact the technical assistance service.
E042	Converter control system fault.	• Switch off and restart the system. • Refer to the sections “System switching off” and “System switching on” • Should the problem persist, contact our technical support service.
E043	PV energy meter communication fault.	• Check the communication cable and connections with the PV energy meter. Check the PV energy meter and system settings. • Switch off and restart the system. • Refer to the sections “System switching off” and “System switching on” • Should the problem persist, contact our technical support service.
E044	Loss of isolation of the battery.	• Check the battery + and - lines leakage to ground.
E045	Battery fuse fault.	• Possible damage to the battery charger stage. • Switch off and restart the system. • Refer to the sections “System switching off” and “System switching on” • Should the problem persist, contact our technical support service.
E046	High internal temperature of the BATTERY CHARGER stage.	• Check the correct positioning of the inverter and that the installation complies with the provisions contained in this manual in the “Positioning” and “Mounting” sections. • Check that the ambient temperature is within the allowed range. • Check the correct operation of the cooling fans. • Check that there is no accumulation of dust near the ventilation openings. • If the problem persists, contact the technical support service.
E047	High internal temperature of the PV stage.	• Check the correct positioning of the inverter and that the installation complies with the provisions contained in this manual in the “Positioning” and “Mounting” sections. • Check that the ambient temperature is within the allowed range. • Check the correct operation of the cooling fans. • Check that there is no accumulation of dust near the ventilation openings. • If the problem persists, contact the technical support service.

ALARM	TYPE	SOLUTION
E048	Battery safety - High battery voltage	• Possible malfunction of the battery BMS. Check the condition of the battery. • Switch off and restart the system. • Refer to the sections “System switching off” and “System switching on” • Should the problem persist, contact our technical support service.
E049	Battery safety - Battery voltage not consistent	• Possible malfunction of the battery BMS. Check the condition of the battery. • Switch off and restart the system. • Refer to the sections “System switching off” and “System switching on” • Should the problem persist, contact our technical support service.
E050	Battery safety - Low battery voltage	• Possible malfunction of the battery BMS. Check the condition of the battery. • Switch off and restart the system. • Refer to the sections “System switching off” and “System switching on” • Should the problem persist, contact our technical support service.
E051	NEUTRAL to EARTH voltage out of range	• Check the sizing and the output connections to the system, in particular the connections of the NEUTRAL and EARTH conductors. • Check that the protective conductor is really connected to the EARTH of the power supply system. • Check that the neutral conductor is really connected to the NEUTRAL of the power supply system. • Check that the potential difference between the NEUTRAL and EARTH conductors of the system is less than 10Vac. • Refer to the section “Electrical connections”. • If the problem persists, contact the technical assistance service.
E001LI ÷ E0031LI	Lithium battery alarms from battery BMS.	• Check the connections and polarity at the BATTERY inputs of the system. • Check the battery voltage and make sure it is within the limits allowed for operation. • Refer to the section “Electrical connections”. • If the problem persists, contact the technical support service.
W001LI ÷ W0031LI	Lithium battery warnings from battery BMS.	• Check the connections and polarity at the BATTERY inputs of the system. • Check the battery voltage and make sure it is within the limits allowed for operation. • Refer to the section “Electrical connections”. • If the problem persists, contact the technical support service.
EV001LI ÷ EV0031LI	Lithium battery messaging from battery BMS.	• Check the connections and polarity at the BATTERY inputs of the system. • Check the battery voltage and make sure it is within the limits allowed for operation. • Refer to the section “Electrical connections”. • If the problem persists, contact the technical support service.

11 TECHINCAL DATA

11.1 Rating Plate

To locate the rating plate on the equipment, refer to **Figure 18**.

The technical specifications shown in this manual do not replace those appearing on the rating plate attached to the equipment.

The labels attached on the equipment must NEVER be removed, damaged, soiled or hidden for any reason.

The information reported on the rating plate:
1. Manufacturer
2. Model
3. Ratings
4. Certification marks
5. Warnings and usage instructions.

The labels must NOT be hidden with foreign objects (rags, boxes, equipment etc.); they must be periodically cleaned and kept always clearly visible.

11.2 Technical datasheet

	DLX-500AC	DLX-600AC	DLX-800AC	DLX-1000AC
AC output				
Grid connection	200 V			
Sn nominal power	5 kVA	6 kVA	8 kVA	10 kVA
P maximum active power	5 kW	6 kW	8 kW	10 kW
AC voltage range	400Vac ± 15% (*)			
Output nominal current	7.2A	8.7A	11.5A	14.5A
Grid nominal frequency	50 Hz			
Frequency range	47 Hz - 53 Hz (*)			
Cos ϕ	1 (adj ± 0.80)			
THD	< 3%			
Max ouput overcurrent protection	25A			
Max output fault current	25A			
Battery charger				
Battery type	Lithium			
Battery voltage range	170V - 500V			
Max charging/discharging current	25A			
Nominal battery voltage	200V	240V	320V	400V
Max charging/discharging power	5kW	6kW	8kW	10kW
Communication interfaces	CAN/RS485			

	DLX-500AC	DLX-600AC	DLX-800AC	DLX-1000AC
EPS output				
Maximum Smax power	5kVA	6kVA	8kVA	10kVA
AC voltage range	400Vac ± 15% (*)			
Output nominal current	7.2A	8.7A	11.5A	14.5A
Grid nominal frequency	50Hz			
Intervention time	< 5 sec (*)			
THD	< 3%			
Max ouput overcurrent protection	25A			
Max output fault current	25A			
Operating performance				
Maximum Effciency	97 %			
Weighted effciency (Euro)	96 %			
Protective devices				
BATTERY polarity reversal	As standard			
BATTERY overload protection	As standard			
AC short-circuit protection	As standard			
Isolation monitoring unit	As standard			
Interface protection and anti-islanding	In compliance with local legislation			
RCMU (Residual Current Monitoring Unit)	As standard			
AC Overvoltage protective device	As standard			
BATTERY Overvoltage protection	As standard			
Accessories supplied				
AC connectors	Spring contacts terminal strip, M25 cable gland			
BATTERY connection	Quick connectors			
BATTERY automatic switch	Built-in			
User Interface	Graphic Touch Screen 4.3” colour LCD			
Communication interfaces	USB / CAN Bus / RS485 / Ethernet / Wi-Fi			
External alarm signal	As standard			
Datalogger	Built-in			
Warranties	5 years (as standard)/10 year (optional)			
Environmental conditions				
Ambient temperature	-20°C…+60°C			
Power derating temperature range	40°C…+60°C			
Storage temperature	-30°C…+70°C			
Relative humidity	5%...95% without condensation			
Noise levels	< 50 dB(A) @ 1m			
Maximum operating altitude without derating	2000m			
Pollution degree classifcation	PD 3			
Installation environmental category	Indoor, unconditioned			
Physical				
Protection rating	IP 21			

	DLX-500AC	DLX-600AC	DLX-800AC	DLX-1000AC
Overvoltage category (IEC 62109-1)	II (BATTERY inputs) III (AC output)			
Cooling concept	I-cool, forced cooling			
Dimensions (W x H x D) mm	476 x 735 x 170			
Weight	21 kg			
Fitting system	Wall bracket			

Safety	
Protection class	I
BATTERY to AC	Trasformerless
Certifcations	CE
EMC and Safety standards	EN62109-1; EN62109-2; EN61000-6-2; EN61000-6-3; EN61000-3-2; EN61000-3-3; EN61000-3-11; EN61000-3-12
Grid codes	CEI 0-21; VDE AR-N 4105; VDE 0126-1-1 VFR 2019; EN 50549-1

Other features	
BACKUP/OFF-GRID mode operation	Yes, with external interlock
ON-GRID/BACKUP/OFF-GRID selection mode	Yes, automatic
Grid support (grid services)	Yes, if required by the applied grid code
Residential loads management	Yes, 1 dry contact 4A 250Vac

(*) The specifed range may vary according to the mains connection standard.

Power Derating

In order to allow the DLX system to operate in both thermal and electrical safety conditions, the unit automatically reduces the value of the managed power.
Power limitation can occur due to adverse environmental conditions or inadequate input voltage values.
The conditions for power reduction due to environmental conditions and input voltage can also occur simultaneously, but the power reduction will always be relative to the most stringent condition.

NOTE

TECHNICAL SERVICE:

+39 334 1690149 (8:30 - 12:30 / 14:00 - 17:30)

+39 334 1690149

service@delios-srl.it

The contact information listed above is intended to be used exclusively by qualified installers