



USER'S MANUAL



SINGLE-PHASE HYBRID STORAGE INVERTERS

1PH HYD3000-HYD6000-ZP1



ZUCCHETTI
Centro Sistemi



IMPORTANT COMMUNICATION

Inside the box of this product is available the manual in English. Please note that more up-to-date revisions of the supplied manual may be available. Therefore, in order to ensure the correct installation and maintenance procedure it is necessary to verify the manuals, available in all languages, within the documentation or products section of the www.zcsazzurro.com website, the same documentation is also available by scanning the qr code on the front of the product or directly within the app Azzurro Operators. Datasheets, technical notes, certifications and warranty terms and conditions are also available on the above platforms.

Hybrid Inverter 1PH HYD3000-HYD6000-ZP1 User Manual



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General instructions

This manual contains important safety instructions that must be followed during installation and maintenance of the equipment.

Please keep these instructions!

This manual must be considered an integral part of the equipment, and must be available at all times to everyone who interacts with the equipment. The manual must always accompany the equipment, even when it is transferred to another user or plant.

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Technical support

ZCS offers a support and technical consultancy service accessible by sending a request directly from the website www.zcsazzurro.com

The following toll-free number is available for the Italian territory: 800 72 74 64.

Preface

General information

Please read this manual carefully before installation, operation or maintenance.

This manual contains important safety instructions that must be followed during installation and maintenance of the system.

Scope

This manual describes the assembly, installation, electrical connections, commissioning, maintenance and troubleshooting of the 1PH HYD3000-HYD6000-ZP1 hybrid inverter.






Keep this manual so that it is accessible at all times.

Recipients

This manual is intended for qualified technical personnel (installers, technicians, electricians, technical support personnel or anyone who is qualified and certified to operate a photovoltaic system), who are responsible for installing and starting up the inverter in the photovoltaic and storage energy system and for operators of photovoltaic and storage systems.

Symbols Used

The following types of safety instruction and general information appear in this document as described below:

 Danger	<p>“Danger” indicates a hazardous situation which, if not avoided, will result in death or serious injury.</p>
 Warning	<p>“Warning” indicates a hazardous situation which, if not avoided, could result in death or serious injury</p>
 Caution	<p>“Caution” indicates a hazardous situation which, if not avoided, could result in minor or moderate injury</p>
 Attention	<p>“Attention” indicates there are potential risks, if fail to prevent, may lead to equipment cannot normally or property damage.</p>
 Note	<p>“Note” provides additional information and tips that are valuable for the optimal operation of the product, will help you to solve a problem or save your time.</p>

1. Introduction

The 1PH HYD3000-HYD6000-ZSP1 hybrid inverter single-phase household energy storage system consists of inverter module and lithium battery module. It adopts modular design and can be stacked with building blocks. The battery capacity varies from 5 to 20 kWh (in case of 4 batteries you need to buy the extension kit, code ZZT-ZBT5K-EXT-KIT). The system can manage the energy of photovoltaic, battery, utility grid and load according to the actual application, and realize the optimal distribution of system energy. Multiple working modes are available to meet diverse needs.

In the event of a power failure (or by switching on the inverter in Off-Grid mode), the 1PH HYD3000-HYD6000-ZP1 inverter can operate in Emergency Power Supply (EPS) mode. The 1PH HYD3000-HYD6000-ZP1 inverter will use both the energy created by the photovoltaic panels and the energy stored in the battery to supply energy to the critical load.

The main features are as follows:

- Stack integrated design, convenient installation, simple maintenance;
- Built-in battery pack equalization management unit to improve battery available capacity;
- Photovoltaic maximum input current 16A, applicable to large current and double-sided module;
- Battery side complete electrical isolation, safer system;
- EPS function to ensure the stable operation of critical load;
- Supports a mixture of new and old batteries;
- Supports battery switch off with a button.

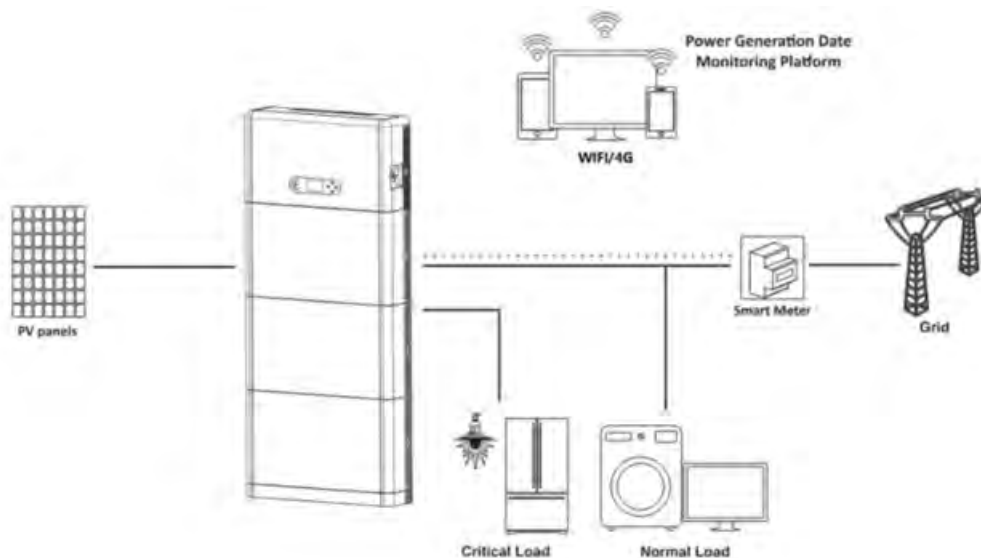


Figure 1 - Diagram of a system on which an 1PH HYD3000-HYD6000-ZP1 hybrid is installed

1.1. Product Model Description

1PH HYD3000-HYD6000-ZP1 series inverter model:

ZZT-HYD6.0K-ZP1

① ② ③

Figure 2 - Inverter model identifiers

Identifiers	Meaning	Specification
①	Product Model	Stacked optical storage all in one machine
②	Power Grade	5K, the power grade of inverter is 6kw Power grade list : 3kw/3.68kw/4kw/4.6kw/5kw/6kw
③	Inverter Model	Single-phase hybrid energy storage inverter

ZZT-BAT-ZBT5K

① ②

Figure 3 - Model identifiers

Identifiers	Meaning	Specification
①	Product series name	AZZURRO ZCS series battery module name
②	Battery module energy grade	5K: Battery module energy is 5kWh

1.2. Product capacity description

The 1PH HYD3000-HYD6000-ZP1 series residential energy storage system supports power and capacity expansion and supports up to six inverter modules in parallel. One inverter module supports up to four batteries expansion modules. (in case of 4 batteries you need to buy the extension kit, code ZZT-ZBT5K-EXT-KIT).

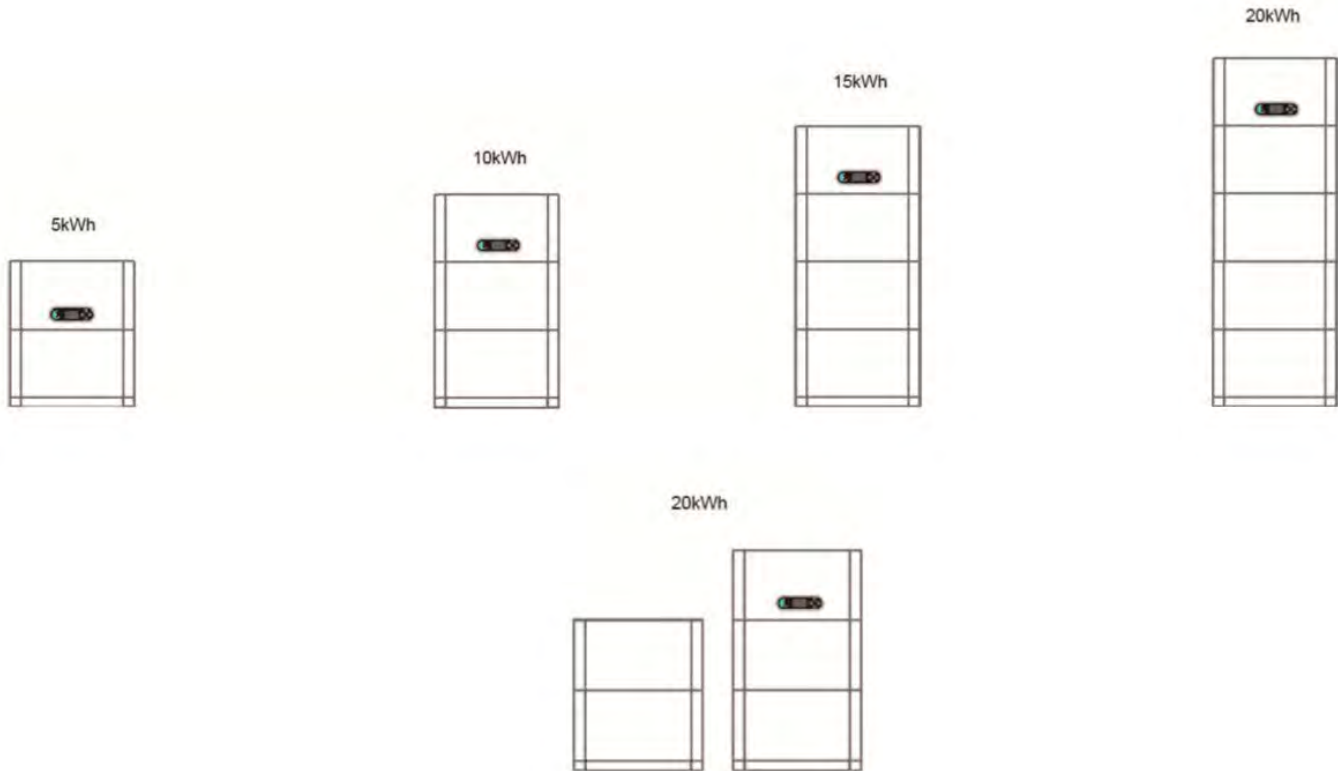


Figure 4 – Storage capacity description



1.3. Product Appearance

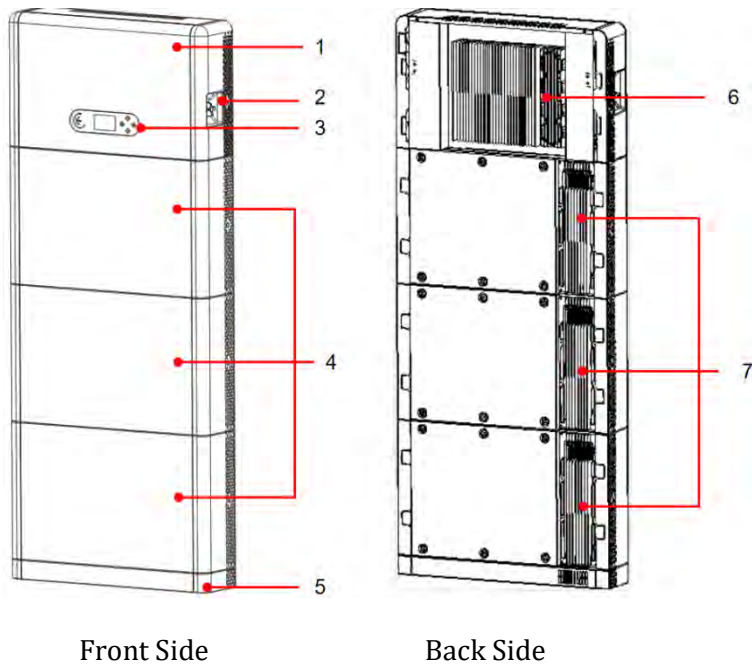


Figure 5 - Product front side and back side

1	Inverter	5	Pedestal
2	Dc switch	6	Inverter Radiator
3	LCD display screen	7	Battery Module Radiator
4	Battery module		

1.3.1. Inverter Port

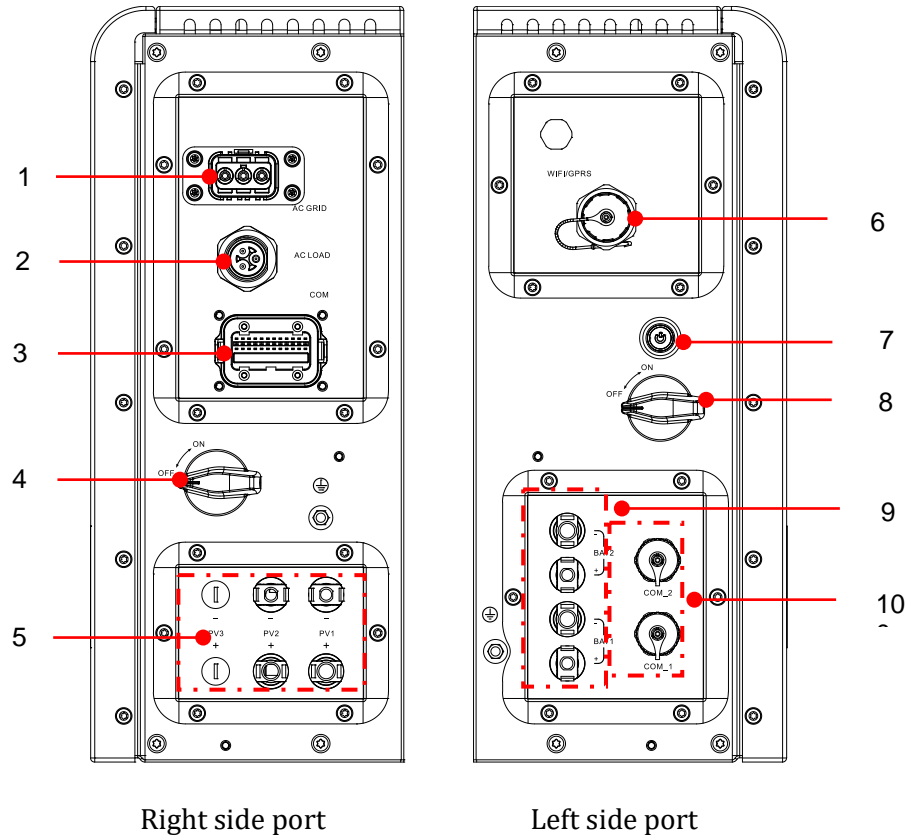
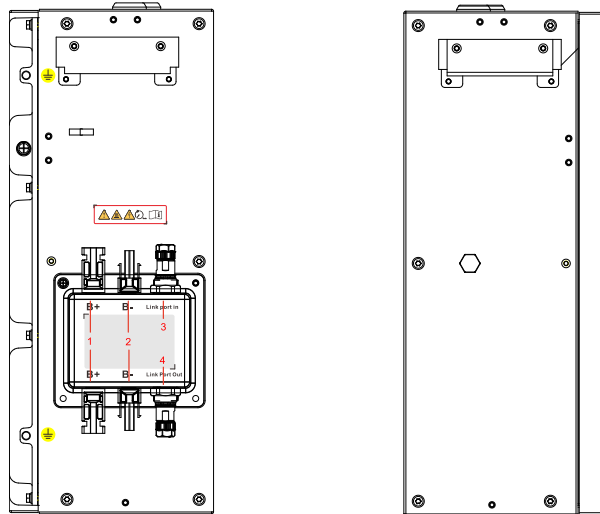


Figure 6 - Inverter port diagram

1	Grid connection port	6	WIFI/4G port
2	Load connection port	7	Battery black start switch
3	Inverter signal port	8	Battery input switch
4	Dc Switch	9	Battery connection port
5	PV input port	10	Battery signal port

1.3.2. Battery module port




Battery left side port

Battery right side port

Figure 7 - Battery module port diagram

1	Battery output terminal +	3	Link port in
2	Battery output terminal -	4	Link port out

Product label



Solar Grid-tied Inverter

Model No:	AZZURRO 1PH HYD6000 ZP1
Max.DC Input Voltage	550V
Operating MPPT Voltage Range	85~520V
Max.PV Isc	2x22.5A
Rated Battery Voltage	400V
Max.Charging/Discharging Current	20A
Max.Charging/Discharging Power	6000W
Rated Grid Voltage	230V,50/60Hz
Rated Output Voltage	230V,50/60Hz
Max.Output Current	30A
Power Factor	1 (adj. +/-0.8)
Rated Output Power	6000W
Backup Rated Current	26A
Backup Rated Apparent Power	6000VA
Ingress Protection	IP65
Operating Temperature Range	-10 ~ +50°C
Protective Class	Class I
Inverter Topology	Non-Isolated
Overvoltage Category	AC III , DC II

Zucchetti Centro Sistemi SpA
Via Lungarno 305/A
52028 Terranuova Bracciolini (AR) , Italy
Manufactured in EXTRA EU
VDE-AR-N4105,G99,AS/NZS 4777




Figure 8 – Battery module port diagram

Note: The picture is only for reference, please make the object as the standard

2. Requirement for installation and maintenance

Before installation, please read this manual carefully and make sure you fully understand its contents. The 1PH HYD3000-HYD6000-ZP1 inverter strictly complies with the safety, design and testing regulations provided for by the national standards.

During installation, operation and maintenance, operators must carefully observe the local safety standards.

Improper use may result in electrical shock and harm and damage to persons, the equipment and its components. Contact the nearest authorised service centre for any repairs or maintenance. Contact your distributor for information on the nearest authorised service centre. DO NOT carry out repairs yourself, as this may result in injury or damage.

Ensure that the operator has the necessary skills and training to operate the equipment. Personnel responsible for the use and maintenance of the equipment must be qualified and capable of performing the activities described, and must also have appropriate knowledge on how to correctly interpret the contents of this manual. For safety reasons, this inverter can only be installed by a qualified electrician with the necessary training and/or skills and knowledge. Zucchetti Centro Sistemi S.p.A. declines all responsibility for damage to property or personal injury caused by incorrect use of the device.

Install and start the inverter according to the following instructions. Place the inverter on suitable load-bearing supports with sufficient load capacity (such as walls or racks) and make sure that the inverter is positioned vertically. Choose a suitable location for the installation of the electrical equipment. Make sure there is sufficient space for heat dispersion and to accommodate future maintenance. Maintain adequate ventilation and ensure that there is enough air circulation for cooling.

If you have problems with the packaging that could damage the inverter or if you find any visible damage, immediately notify the transport company. If necessary, request assistance from an installer of photovoltaic systems or from Zucchetti Centro Sistemi SpA. Transport of the equipment, especially by road, must be carried out with vehicles suitable to protect the components (in particular, electronic components) against violent knocks, humidity, vibrations, etc.

2.1. Safety Notes

- Electrical installation and maintenance of the system must be carried out by qualified and certified electricians in compliance with national regulations.
- The 1PH HYD3000-HYD6000-ZP1 inverter may only be installed by qualified PERSONNEL and by those who have the appropriate certification, as required by the local authorities.
- DO NOT place materials explosives or flammable (e.g. gasoline, kerosene, oil, wood, cotton or similar) near the batteries or the 1PH HYD3000-HYD6000-ZP1 inverter.
- Before maintenance, disconnect the AC connection, then the batteries and the photovoltaic system (PV1&PV2), wait at least 5 minutes (capacitor discharge time) so as to prevent electric shock.
- The 1PH HYD3000-HYD6000-ZP1 inverter must be completely disconnected (BAT, PV & AC) during maintenance.

- The 1PH HYD3000-HYD6000-ZP1 inverter may reach high temperatures and have rotating parts inside during operation. Switch off the 1PH HYD3000-HYD6000-ZP1 inverter and wait for it to cool down before performing any maintenance.
- Keep children away from the batteries and from the 1PH HYD3000-HYD6000-ZP1 inverter.
- Do not open the front cover of the 1PH HYD3000-HYD6000-ZP1 inverter. Opening the front cover will void the product warranty.
- Damage caused by improper installation/operation is NOT covered by the product warranty.

2.2. Assembly and maintenance diagram

- The battery must be protected against short circuits during transport and installation.
- The inverter 1PH HYD3000-HYD6000-ZP1/batteries must be located in well-ventilated areas. Do not place the 1PH HYD3000-HYD6000-ZP1 inverter/batteries in a cabinet or in an airtight or poorly ventilated location. This could be extremely hazardous to the performance and life of the system.
- Keep the 1PH HYD3000-HYD6000-ZP1 inverter and batteries away from direct sunlight. Do not bring the 1PH HYD3000-HYD6000-ZP1 inverter and batteries near ovens, flames or other heat sources as the battery may catch fire and cause an explosion.
- Use a multimeter to check the battery polarity and voltage before turning on the power. Make sure that the connections are made according to the instructions in this manual.
- Use the multimeter to check the PV voltage and polarity before closing the PV switch. Make sure that the connections are made according to the instructions in this manual.
- If you want to store the batteries without using them, disconnect them from the 1PH HYD3000-HYD6000-ZP1 inverter and store them in a cool, dry and well-ventilated area.
- Battery maintenance workers must have the skills and knowledge required to carry out this activity.
- The 1PH HYD3000-HYD6000-ZP1 inverter does not have an isolation transformer so the positive and negative polarities of the PV string do NOT have to be grounded, otherwise the inverter may be damaged. All non-current-carrying metal parts (such as the PV module frame, PV rack, housing of the combiner box, and housing of the inverter) in the photovoltaic power system must be connected to the ground.
- Attention: Do not disassemble or break the battery. The electrolytes in the battery may be toxic and cause damage to skin and eyes.
- Attention: during installation and maintenance of the product, please follow the rules below.
 - a) Remove watches, rings and other metal objects.
 - b) Only use tools with insulated handles.
 - c) Wear rubber gloves and shoes.
 - d) Do not place tools or metal objects on top of the battery.
 - e) Turn off the 1PH HYD3000-HYD6000-ZP1 inverter and batteries before connecting/disconnecting the battery terminals.
 - f) Both the positive and negative polarities must be isolated from the ground.
- Please install the product according to the following section. Place inverter in an appropriate bearing capacity objects (such as solid brick wall, or strength equivalent mounting surface, etc.) and make sure inverter vertical placed. A proper installation location must have enough space for fire engine access in order for maintenance if faulty occur. Ensure the inverter is installed in a wall ventilated environment and have enough air cooling cycle. Air humidity should less than 90%.

2.3. Transportation Requirement

Inverter is in the good electrical and physical condition when it ship out from factory. During transport, inverter must be placed in its original package or other proper package. Transportation company should responsible for any damage during transport period.




If you find any packing problems that may cause the damage of inverter or any visible damage, please notice the responsible transportation company immediately. You can ask your installer or Zucchetti Centro Sistemi S.p.a. for help is necessary.

- This product contains battery module through UN38.3, belongs to the ninth category of dangerous goods. Therefore, loading and unloading must comply with local laws and regulations and industry standards during transportation. Rough loading and unloading may cause short circuit or damage to batteries in containers, which may result in battery leakage, breakage, explosion, or fire. Shipping complies with the IMDG CODE and the International Maritime Dangerous Goods CODE.
- For land transportation, comply with ADR or JT T617 shipping requirements
- Meet the regulatory requirements of the transport regulatory authorities of the country of origin, route and destination.



Comply with international regulations for the transport of dangerous goods and the supervision requirements of the corresponding national transport regulatory authorities.

2.4. Electrical Connection



Please comply with all the current electrical regulations about accident prevention in dealing with the current inverter.

	Before the electrical connection, use opaque material to cover the PV modules or disconnect PV string DC switch. PV arrays will produce dangerous voltage if it is exposure under sun When installing a battery, check the positive and negative terminals of the battery and turn off the battery.
Danger	
	All operation must accomplish by certified electrical engineer
Warning	<ul style="list-style-type: none"> • Must be trained; • Completely read the manual operation and understand all information.
	Must get permission by local utility company before connecting to grid and the connection must be done by certified electrical engineers.
Attention	

Operation Cautions

	Touching the utility grid or the terminal conductors can lead to lethal electric shock or fire! Do not touch non-insulated cable ends, DC conductors and any live components.
Danger	Attention to any electrical relevant instruction and document.
	Enclosure or internal components may get hot during operation. Please wear insulated gloves.
Attention	


Maintenance and Repair Cautions

	Before any repair work, turn OFF the AC circuit breaker between the product and electrical grid first, then turn OFF the DC switch.
Danger	After turning OFF the AC circuit breaker and DC switch wait for at least 5 minutes before carry any maintenance or repair work.
	Product should not work again until removing all faults. If any repair work is required, please contact local authorized service centre.
Attention	Should not open the product cover without authorized permit, Zucchetti Centro Sistemi S.p.a. does not take any responsibility for that.





EMC/Noise Level

Electromagnetic compatibility (EMC) refers to that on electrical equipment functions in a given electromagnetic environment without any trouble or error, and impose no unacceptable effect upon the environment. Therefore, EMC represents the quality characters of an electrical equipment.

- The inherent noise-immune character: immunity to internal electrical noise
- External noise immunity: immunity to electromagnetic noise of external system
- Noise emission level: influence of electromagnetic emission upon environment









	Electromagnetic radiation from the product may be harmful to health!
Danger	Please do not continue to stay away from the product in less than 20 cm when it is working

2.5. Symbols and signs




	High voltage of inverter may be harmful to health!
Danger	Only certified engineer can operate the product; Juveniles, Disable, should not use this product; Keep this product out of the reach of children;
	Caution of burn injuries due to hot enclosure!
Caution	Only touch the screen and pressing key of the product while it is working
	PV array should be grounded in accordance to the requirements of the local electrical grid company
Attention	
	Ensure the maximum DC voltage input is less than the product's maximum DC voltage (including in low temperature condition). Any damage cause by over-voltage, Zucchetti Centro Sistemi S.p.a. will not take the responsibility including warranty
Warning	

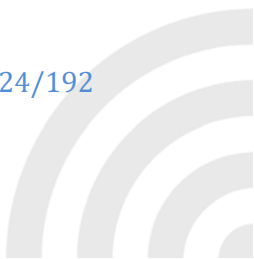
2.6. Signs on the inverter module:

Some safety symbols are located on the inverter. Read and understand the content of the symbols before installing the inverter.

	<p>This symbol indicates a hazardous situation which, if not avoided, will result in injury.</p>
	<p>Risk of electric shock; wait at least 5 minutes before switching off the 1PH HYD3000-HYD6000-ZP1 inverter.</p>
	<p>Be careful of high voltage and electric shock.</p>
	<p>Be careful of hot surface.</p>
	<p>Comply with the European Conformity (EC) certification.</p>
	<p>Ground terminal.</p>
	<p>Read this manual before installing the 1PH HYD3000-HYD6000-ZP1 inverter.</p>
	<p>Positive polarity and negative polarity of the DC voltage (Photovoltaic and Battery).</p>



	Indicated the temperature allowance range.
	This side up. The 1PH HYD3000-HYD6000-ZSP1 inverter must always be transported, handled and stored in such a way that the arrows are always pointing upwards.
	RCM (Regulatory Compliance Mark). The product complies with the requirements of the applicable Australian standards.



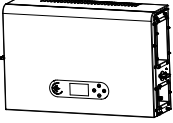

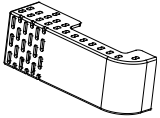
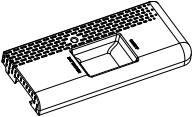
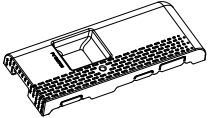

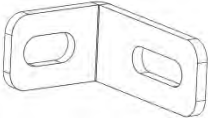
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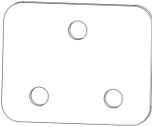
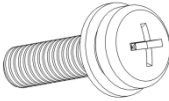
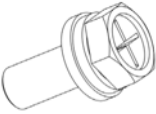
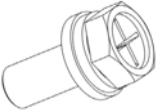

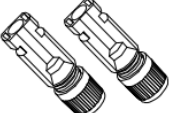




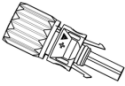
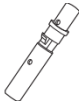
3.1. Checking before installation

Before opening the battery and inverter package, check whether the outer package is damaged, such as holes and cracks, and check the inverter and battery model. If any damage is found or the inverter and battery model does not match your requirements, please do not open the product package and contact your distributor as soon as possible.

3.2. Contents of the packaging

Carefully inspect the packaging and accessories before installation. The packaging should contain the following accessories:

No	Pictures	Description	Quantity
1		Inverter	1pcs
2		Pedestal	1pcs
3		Pedestal cover	2pcs
4		Left side cover	1pcs
5		Right side cover	1pcs
6		Hanging rack	2pcs
7		Fixed support rack B	2pcs

8		Side connector	2pcs
9		SEM screw M4*10	6pcs
10		Hexagon screws M5*10	4pcs
11		Hexagon screws M6*14	2pcs
12		PV+ input terminal	2pcs
13		PV- input terminal	2pcs
14		Metal terminals secured to PV+ input power cables	2pcs
15		Metal terminals secured to PV- input power cables	2pcs
16		Battery positive terminal + input terminal plastic case	2pcs
17		Parallel connection cable	1pcs
18		Battery negative terminal + input terminal plastic case	2pcs
19		Battery positive + input terminal metal core	2pcs


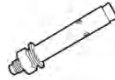
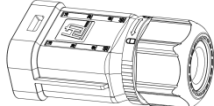

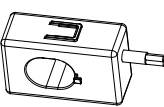
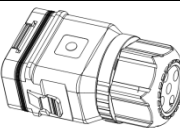




20		Battery negative - Input terminal metal core	1pcs
21		M6*60 Expansion bolt	4pcs
22		AC connector	1pcs
23		Load connector	1pcs
24		Current transformer (CT)	1pcs
25		COM 24pin connector	1pcs
26		BAT plug-in assembling and disassembling tool	1pcs
27		Manual	1pcs
28		The warranty card	1pcs
29		Quality Certificate	1pcs

Figure 9 - Inverter components and accessories inside in the packaging

3.3. Installation environment




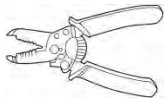

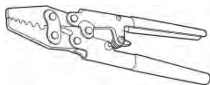
- Choose a dry, clean and orderly place, suitable for installation.
- Ambient temperature range: -10°C ~ 50°C.
- Relative humidity: 5 ~ 95% (non-condensing).
- The 1PH HYD3000-HYD6000-ZP1 inverter must be installed in a well-ventilated area.
- Do not place flammable or explosive materials near the 1PH HYD3000-HYD6000-ZP1 inverter.
- The AC overvoltage of the 1PH HYD3000-HYD6000-ZSP1 inverter belongs to Category III.
- Maximum altitude: 4000 m.

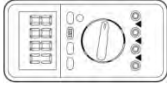


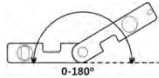
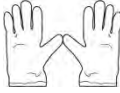


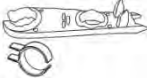

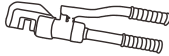
As far as installation compliance is concerned, IP65 does not permit outdoor installation.

In order to ensure that performance is maintained over time, the product must not be exposed to extreme temperatures.

3.4. Installation tools

Prepare the following tools before installation:

Number	Tool	Model	Function
1		Percussion drill Recommended diameter: 6 mm	Used to make holes in the wall
2		Screwdriver	Used for the wiring
3		Cross screwdriver	Remove and install screws and wires
4		Cable stripper	Used for stripping the wires
5		M6 socket head wrench	Secure backplane and inverter
6		Crimping tools	Use to crimp cable on grid side, load side and CT extensive cable

7		Multi-meter	Check whether the cable connection is correct, the positive and negative terminals of the battery are correct, and the grounding is reliable
8		Marker	Used for marking
9		Tape measure	Used for measuring distances
10		Level	Used for making sure that the rear panel is installed correctly
11		ESD gloves	Must be worn by operators
12		Safety goggles	Must be worn by operators
13		Dust mask	Must be worn by operators
14		Removal Tool	Remove the output terminal of the battery module
15		Sleeve	Install Fixed support rack
16		Crimping tools	Used to crimp OT connector

3.5. Installation position

The 1PH HYD3000-HYD6000-ZP1 inverter must be mounted vertically (to ensure rapid heat dissipation). Install the 1PH HYD3000-HYD6000-ZP1 inverter in a location protected from direct sunlight and from possible snow accumulation. Ensure that the installation position is well ventilated.

As far as installation compliance is concerned, IP65 does not permit outdoor installation.

In order to ensure that performance is maintained over time, the product must not be exposed to extreme temperatures.

3.6. Installation space

To ensure sufficient space for installation and heat dissipation, reserve sufficient space around the 1PH HYD3000-HYD6000-ZP1 inverter household energy storage system. The requirements are as follows:

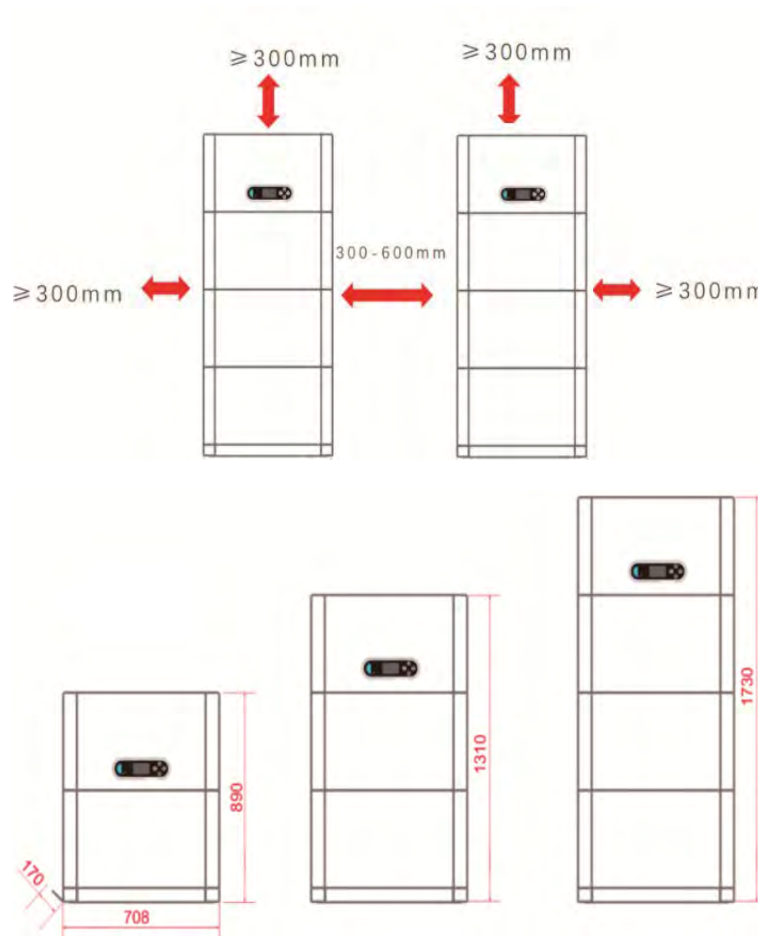


Figure 10 – Installation space diagram



3.7. Product installation

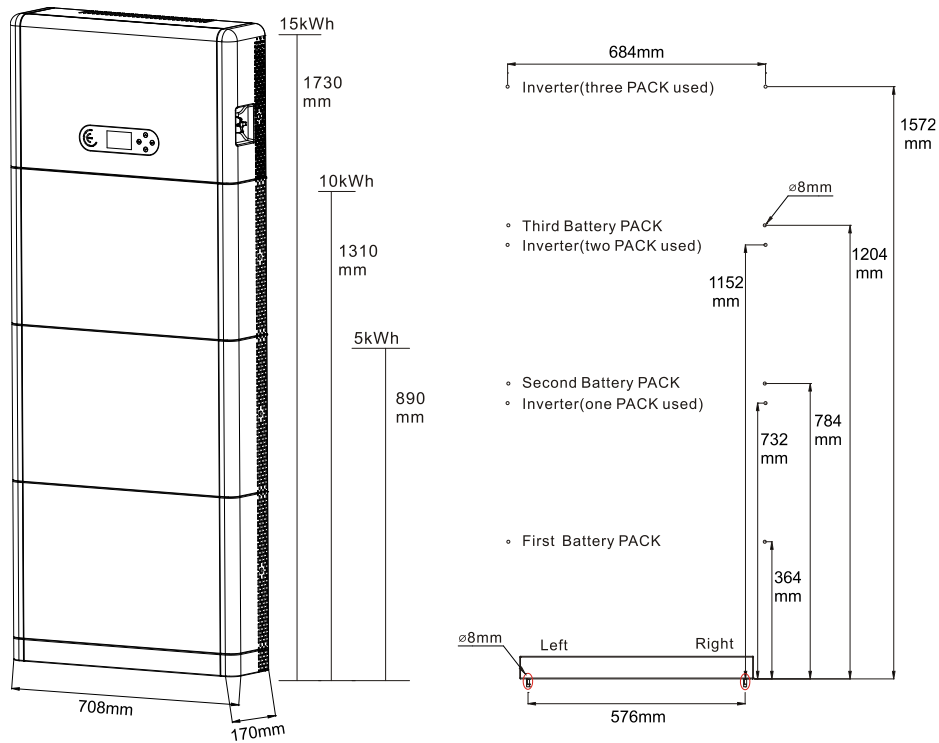


Figure 11 - Installation dimension diagram



Pedestal installation

Procedure :

Step 1: Place the pedestal against a wall and keep it 10 to 25mm away from the wall. Adjust the hole positions using a level, and mark the hole positions using a marker.

Step 2: To install the pedestal, remove the pedestal, drill holes using a hammer drill (\varnothing 8mm, depth range 60-65 mm), and tighten expansion screws to ensure that the base is securely installed.

Step 3: Use a marker to mark holes for securing the battery modules and inverters based on the dimensions shown in below Figure.

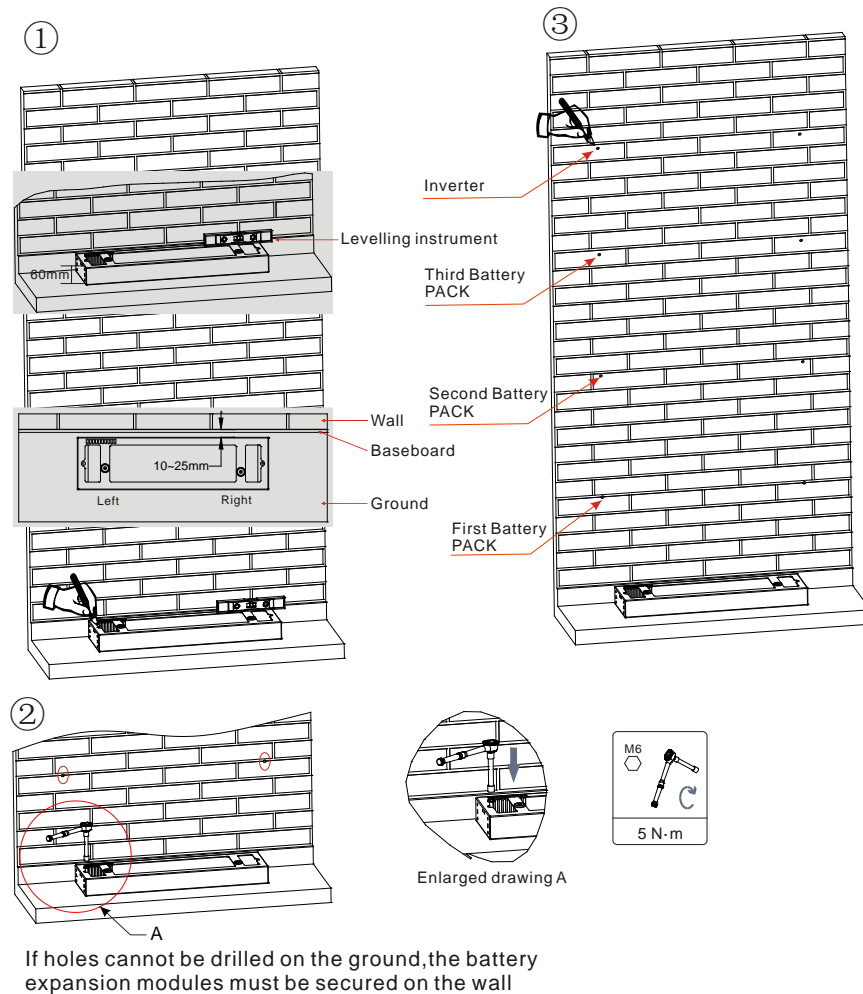


Figure 12 - Pedestal installation

Fixed installation between modules :

Procedure :

Step 1: Align the first battery module on the floor pedestal.

Step 2: Install connectors on both sides and tighten the six screws using a cross screwdriver.

Step 3: Install the remaining battery modules and inverters from bottom to top. (Before installing the next module, ensure that the screws on the side connectors of the previous module are firmly installed.)

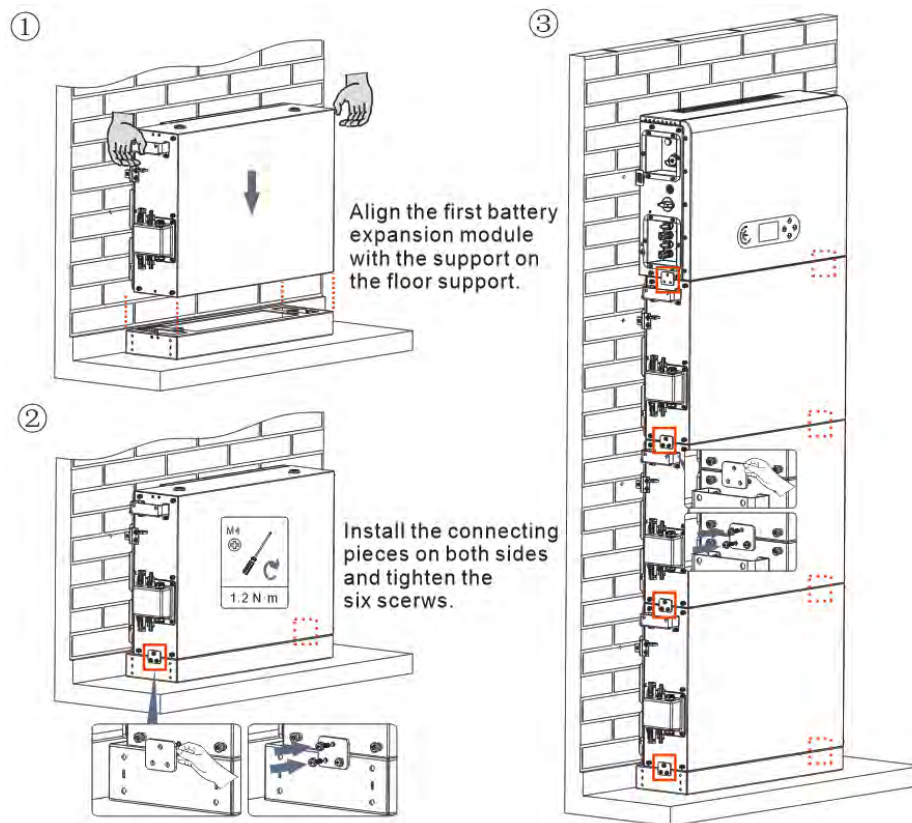


Figure 13 - Battery module and inverter installation diagram

Support rack installation :

Procedure :

Step 1: Drill holes with a hammer drill (\varnothing 8mm, depth range 60-65 mm). Reposition and drill the holes, if the original one has a large deviation.

Step 2: Install the support rack B on the wall, and fastening expansion bolt.

Step 3: Adjust the support rack A, make sure the holes are matched between rack A and rack B.

Step 4: Connect and fix the rack A and rack B with M6*16 screws.

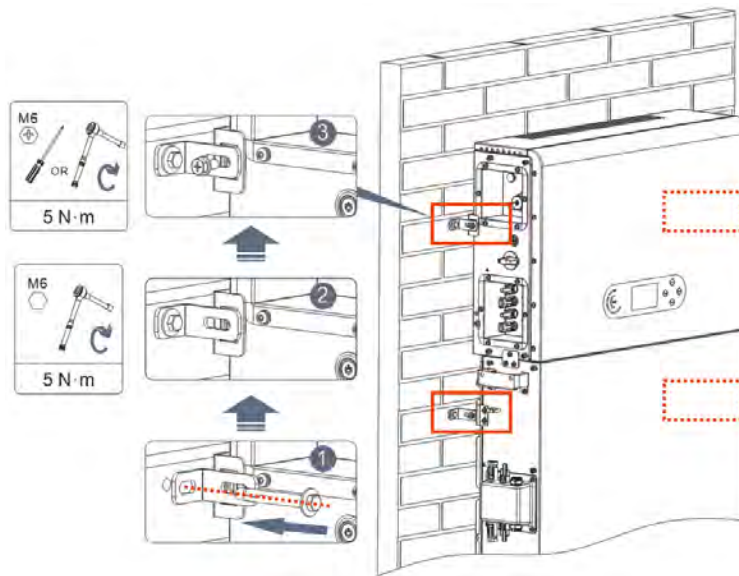


Figure 14 -Schematic diagram of wall fixing installation

4. Electrical connections

- Carefully assess the risks deriving from electric shocks and chemical hazards!
- Use a multi-metre to check the DC polarity of the battery and cables before connecting the power supply between the batteries and inverter.
NOTE: an inverted polarity connection may cause irreparable damage to the inverter and batteries.
- A 25A AC disconnecting device (circuit breaker) must be installed between the 1PH HYD3000-HYD6000-ZP1 inverter and the power grid. It is also recommended to use a differential with a trip threshold of 300 mA between the 1PH HYD3000-HYD6000-ZP1 inverter and power grid.
- For safety and proper functioning of the system, it is important to use a cable of the appropriate type and size for the electrical connections.
 - Battery connection: DC cable with cross-section of AWG8 or AWG6 (supplied).
 - Grid or load connection: AC cable with cross-section of AWG12.



!!!PLEASE NOTE!!!

If the storage capacity needs to be increased by adding one or more batteries to an existing system, make sure that all the batteries (installed and to be installed) are fully charged.

To check the charge status of each battery, connect them one at a time to the inverter and view the charge level on the display (all the instantaneous information can be accessed by pressing the “Down” key from the main menu).

The batteries can be recharged from the excess photovoltaic production or by using the forced charge mode indicated in the “% charge mode” section of this manual.

4.1. Attentions Before Connection

	<p>The voltage in the power conversion circuit of this product is very high. Fatal danger of electric shock or severe burns. All electrical connections of photovoltaic modules, inverters and battery systems must be carried out by qualified personnel. Wear rubber gloves and protective clothing (protective glasses and boots) when operating high voltage/current systems such as inverters and battery systems.</p>
<p>Attention</p>	
	<p>This product is mainly applied to photovoltaic energy storage systems for household use. If not used according to the instructions, the protection provided by the equipment may be damaged.</p>
<p>Attention</p>	

4.2. Preparation of Connection Cables

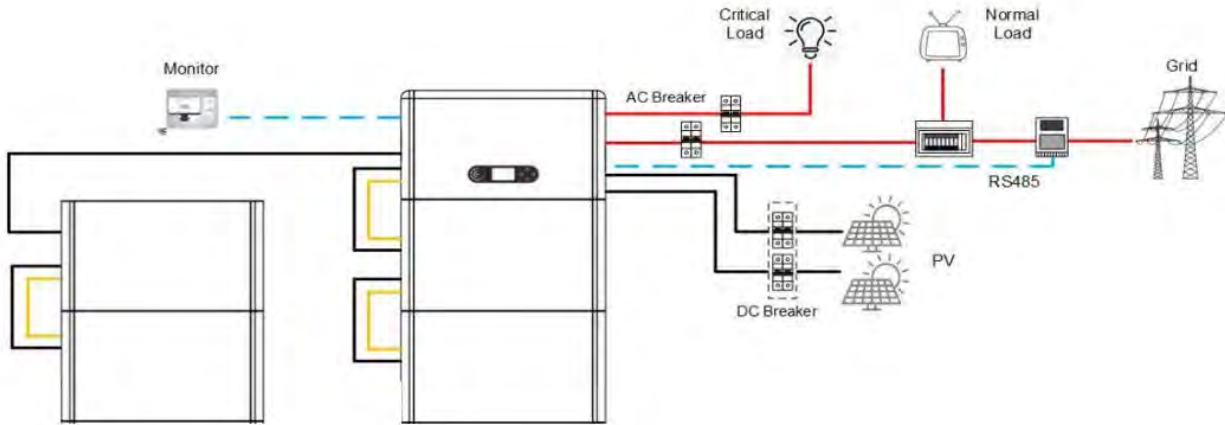


Figure 15 – System connection diagram

No	Cable	Recommended specifications
1	PV connection cable	UL10269 12AWG
2	AC Grid connection cable	UL10269 8AWG
3	EPS connection cable	UL10269 10AWG
4	Grounding cable	UL10269 8AWG

5. Electrical Connection for the internal system

5.1. Internal protection grounding cable connection up to 3 batteries

Connect the grounding cables of the battery module and inverter as shown in below Figure.

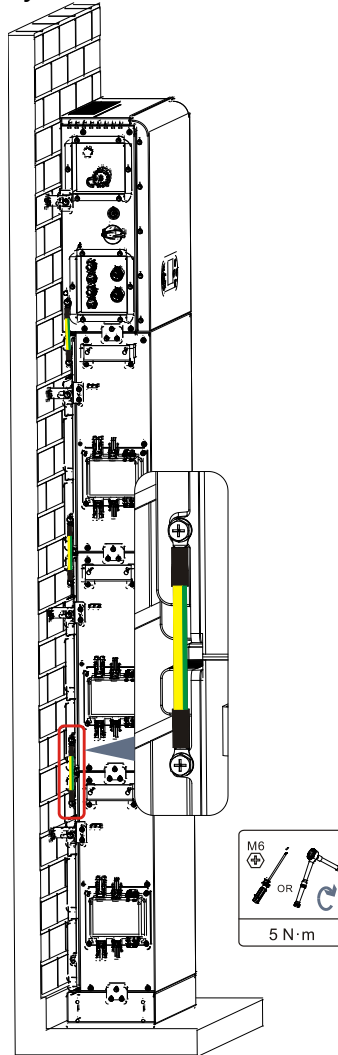



Figure 16- Internal grounding connection

	<p>Be sure to ground for safety</p> <ul style="list-style-type: none"> • The protective grounding of the chassis shell cannot replace the PGND cable of the LOAD Port. Ensure that the two PGND cables are reliably connected; • When multiple inverters are deployed, ensure that the protection ground points of all inverters are equipotential connected.
<p>Attention</p>	

5.2. Power cables connection up to 3 batteries

As shown in below Figure, connect the power ports (BAT+, BAT-) of the inverter to the cascading positive and negative power cables (B+, B-) of the battery module. Connect the remaining battery modules from top to bottom, and secure the cables with cable ties. Ensure that the cables are securely connected.

In detail:

- (BAT +, BAT -) inverter connected in parallel to (B+, B-) battery module 1.
- (B+, B-) battery module 1 connected in parallel to (B+, B-) battery module 2.
- (B+, B-) battery module 2 connected in parallel to (B+, B-) battery module 3.

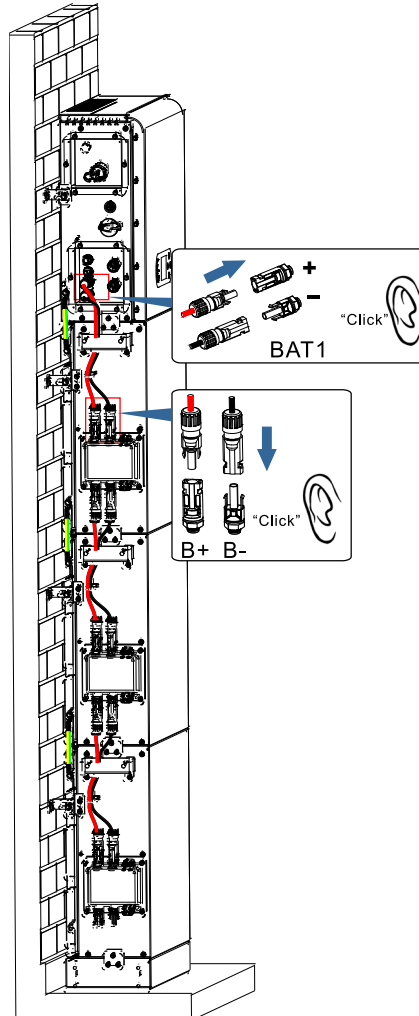


Figure 17 - Connection of battery internal DC terminal

5.3. Internal communication cable connection up to 3 batteries

Connect the communication terminals of the inverter and battery module from top to bottom according to internal protection grounding in the following figure, and secure them with cable ties. In addition, install a matching resistor on the communication interface of the last battery module in the system.

In detail:

- **COM 1** of the Inverter → **Link Port IN** of the **battery module 1**.
- **Link Port OUT** of the **battery module 1** → **Link Port IN** of the **battery module 2**.
- **Link Port OUT** of **battery module 2** → **Link Port IN** of **battery module 3**.
- Insert the termination resistor on **Link Port OUT** of the **battery module 3**.

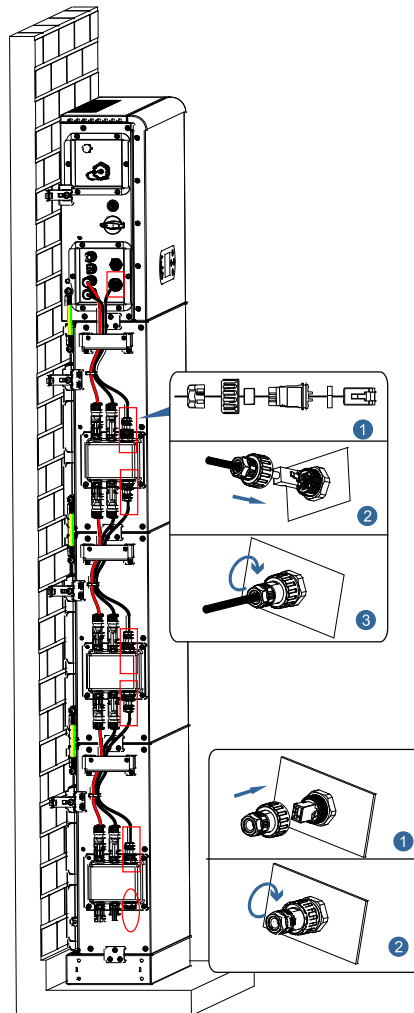
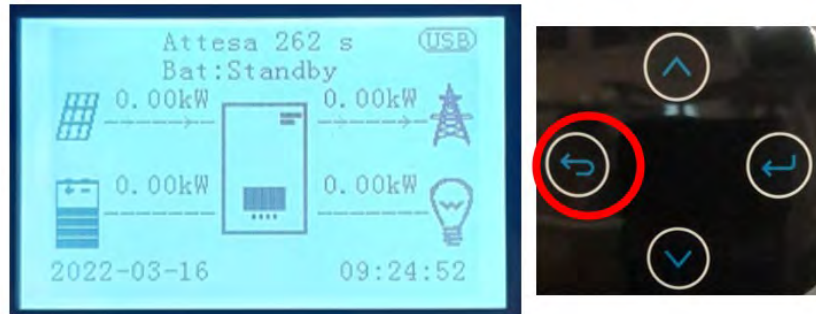


Figure 18 - Internal signal cable connection

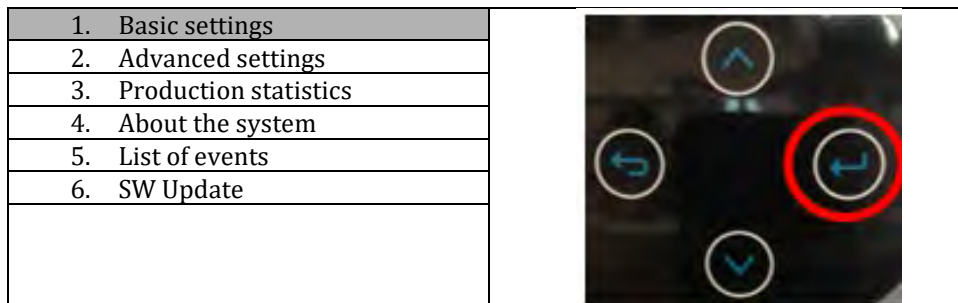
5.4. Configuration up to 3 batteries

To properly configure the inverter channels:

1. Press the first button on the left of the display:



2. Press the last right arrow (enter) to access the basic settings:




3. Access the advanced settings by pressing the last button on the right of the inverter (enter password 0715):



4. Access by pressing the last button on the right of the inverter under battery parameters:

1. Battery parameters
2. Active battery
3. Feed-in limitation
4. Scan curve IV
5. Logic Interface
6. Reset to factory
7. Parallel settings
8. Reset Bluetooth
9. CT calibration



5. Access by pressing the last button on the right of the inverter to the battery number:

1. Battery Number
2. Battery 1



6. Access by pressing the last button on the right of the inverter to the battery number:

1. Grup 1
X
2. Grup 2
0

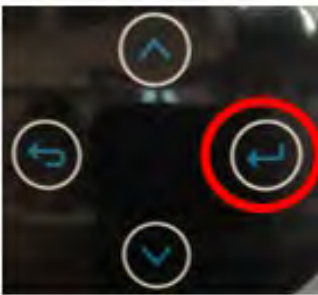


Set the number of batteries connected to channel 1 of the inverter (maximum 3) and check that Group 2 is set to 0.

7. Access by pressing the last button on the right of the inverter under Battery 1:

1. Battery Number	
2. Battery 1	

8. Access by pressing the last button on the right of the inverter under Discharge depth:

1. Depth of discharge	
2. Tax on forced labour	
3. Save	

Set the discharge depth and discharge depth in EPS.

For example, if the discharge depth = 50% and the discharge depth EPS = 80%, while the network is connected: the inverter does not discharge the battery when the SOC is less than 50%.

In case of power failure: the inverter will operate in EPS mode (if EPS mode is enabled) and will continue to drain the battery until the battery SOC is not less than 20%.

Discharge depth	50%
Depth of discharge EPS	80%
EPS Safety Safety Buffer	20%



5.5. Grounding cable connection for internal protection 4 batteries

In case of number 4 batteries you need to use both inverter battery channels and buy the extension kit, code **ZZT-ZBT5K-EXT-KIT**.

Connect the grounding cables of the battery module and inverter as shown in the following figures.

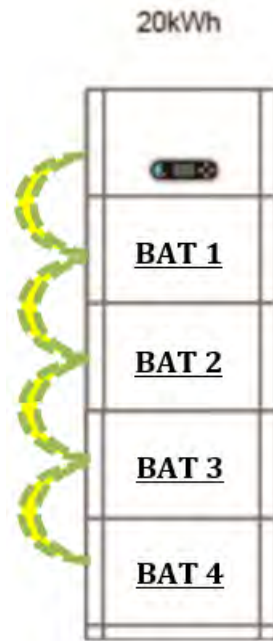


Figure 19- Internal grounding connection (single column)

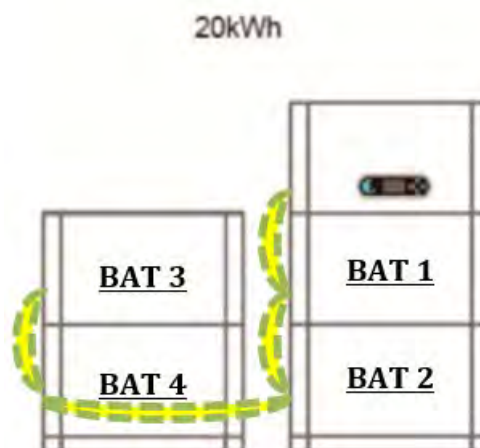


Figure 20- Internal earthing connection (double column)



Attention

Be sure to ground for safety

- The protective grounding of the chassis shell cannot replace the PGND cable of the LOAD Port. Ensure that the two PGND cables are reliably connected;
- When multiple inverters are deployed, ensure that the protection ground points of all inverters are equipotential connected.

5.6. Connecting power cables 4 batteries

As shown in the figure below, in case of number 4 batteries you need to use both battery channels of the inverter and purchase the extension kit, code **ZZT-ZBT5K-EXT-KIT**.

Connect the inverter power supply ports 1 (BAT+, BAT-) to the positive and negative cascade power cables (B+, B-) to the first battery module. Connect the first battery module to the second from top to bottom and secure the cables with cable ties.

Connect the inverter's Channel 2 (BAT+) power ports to the positive and negative cascade power cables (B+, B-) to the third battery module. Connect the third battery module to the fourth from top to bottom and secure the cables with cable ties.

Make sure the cables are connected securely.

In detail:

- **Channel 1 (BAT +, BAT -)** of the **inverter** connected in parallel to **(B+, B-)** of the **battery module 1**.
- **(B+, B-)** battery module **1** connected in parallel to **(B+, B-)** battery module **2**.
- **Channel 2 (BAT+, BAT -)** connected in parallel to **(B+, B-)** the battery module **3**.
- **(B+, B-)** of the battery module **3** connected in parallel to **(B+, B-)** of the battery module **4**.

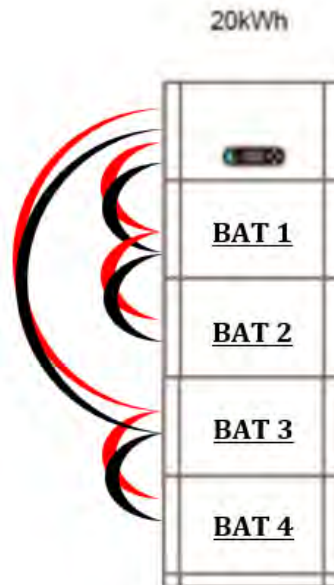


Figure 21 –Internal battery DC terminal connection (single column)

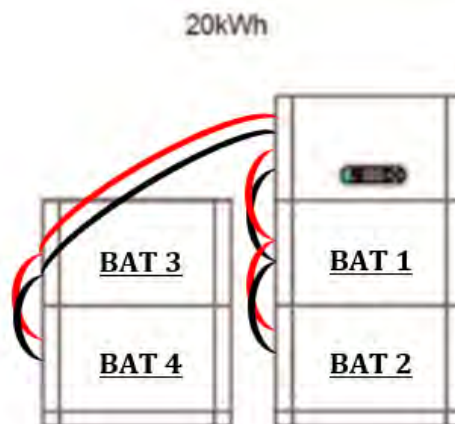


Figure 22 – Internal battery DC terminal connection (double column)

5.7. Internal communication cable connection 4 batteries

As shown in the figure below, in case of number 4 batteries you need to use both battery channels of the inverter and purchase the extension kit, code **ZZT-ZBT5K-EXT-KIT**.

Connect the inverter communication terminals, channel 1 COM_1 to the first battery module from top to bottom according to the following figure and fasten them with cable ties. Connect the second battery module to the first and install the supplied termination resistor on the communication interface of the second communication module.

Connect the inverter communication terminals, channel 2 COM_2 to the third battery module from top to bottom according to the following figure and fasten them with cable ties. Connect the third battery module to the fourth and install the supplied termination resistor on the communication interface of the fourth communication module.

In detail:

- **COM 1** of the Inverter → **Link Port IN** of the **battery module 1**.
- **Link Port OUT** of the **battery module 1** → **Link Port IN** of the **battery module 2**.
- Insert the termination resistor on **Link Port OUT** of the **battery module 2**.
- **COM 2** of the Inverter → **Link Port IN** of the **battery module 3**.
- **Link Port OUT** of **battery module 3** → **Link Port IN** of **battery module 4**.
- Insert the termination resistor on **Link Port OUT** of the **battery module 4**.

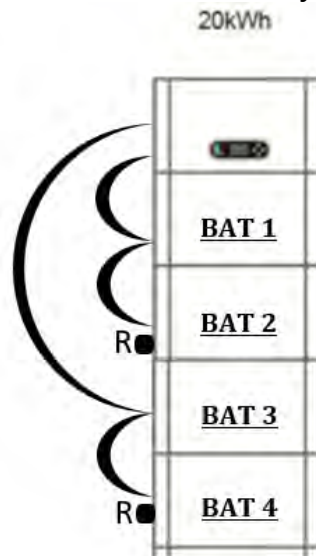


Figure 23 – Internal signal cable connection (single column)

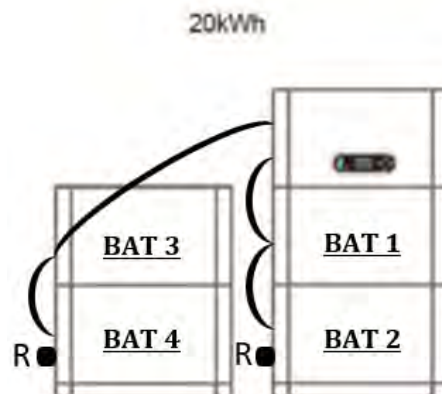
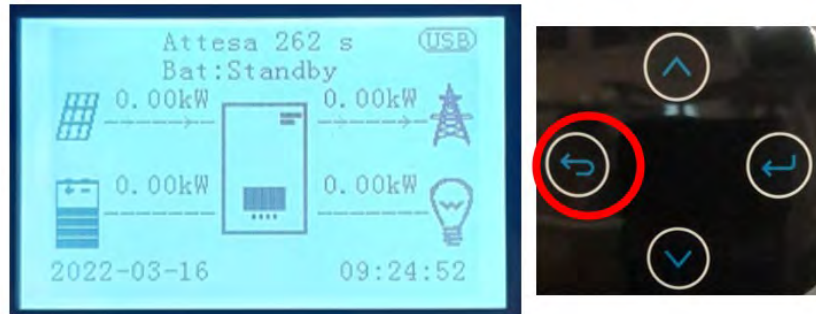


Figure 24 – Internal signal cable connection (double column)

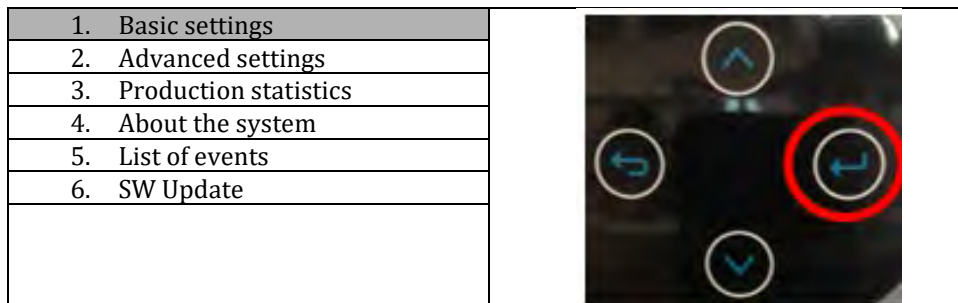
5.8. Configuration 4 batteries

To properly configure the inverter channels:

1. Press the first button on the left of the display:



2. Press the last right arrow (enter) to access the basic settings:




3. Access the advanced settings by pressing the last button on the right of the inverter (enter password 0715):



4. Access by pressing the last button on the right of the inverter under battery parameters:

1. Battery parameters
2. Active battery
3. Feed-in limitation
4. Scan curve IV
5. Logic Interface
6. Reset to factory
7. Parallel settings
8. Reset Bluetooth
9. CT calibration



5. Access by pressing the last button on the right of the inverter to the battery number:

1. Battery Number
2. Battery 1
3. Battery 2



6. Access by pressing the last button on the right of the inverter to the battery number:

1. Group 1
X
2. Group 2
X



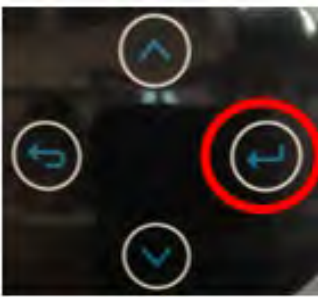
Set the number of batteries connected to channel 1 of the inverter (in this case 2).
Set the number of batteries connected to channel 2 of the inverter (in this case 2).



7. Access by pressing the last button on the right of the inverter under Battery 1:

1. Battery Number	
2. Battery 1	
3. Battery 2	

8. Access by pressing the last button on the right of the inverter under Discharge depth:

4. Depth of discharge	
5. Tax on forced labour	
6. Save	

Set the discharge depth and discharge depth in EPS.

For example, if the discharge depth = 50% and the discharge depth EPS = 80%, while the network is connected: the inverter does not discharge the battery when the SOC is less than 50%.


In case of power failure: the inverter will operate in EPS mode (if EPS mode is enabled) and will continue to drain the battery until the battery SOC is not less than 20%.

Discharge depth 50%
Depth of discharge EPS 80%
EPS Safety Safety Buffer 20%

9. Access by pressing the last button on the right of the inverter under Battery :

1. Battery Number	
2. Battery 1	
3. Battery 2	

10. Access by pressing the last button on the right of the inverter under Discharge depth:

1. Depth of discharge	
2. Tax on forced labour	
3. Save	

Set the discharge depth and discharge depth in EPS.

For example, if the discharge depth = 50% and the discharge depth EPS = 80%, while the network is connected: the inverter does not discharge the battery when the SOC is less than 50%.

In case of power failure: the inverter will operate in EPS mode (if EPS mode is enabled) and will continue to drain the battery until the battery SOC is not less than 20%.

Discharge depth
50%
Depth of discharge EPS
80%
EPS Safety Safety Buffer
20%



5.9. Data collector connection

Connect the standard WIFI/4G collector in the inverter package according to electrical connection in the following figure.

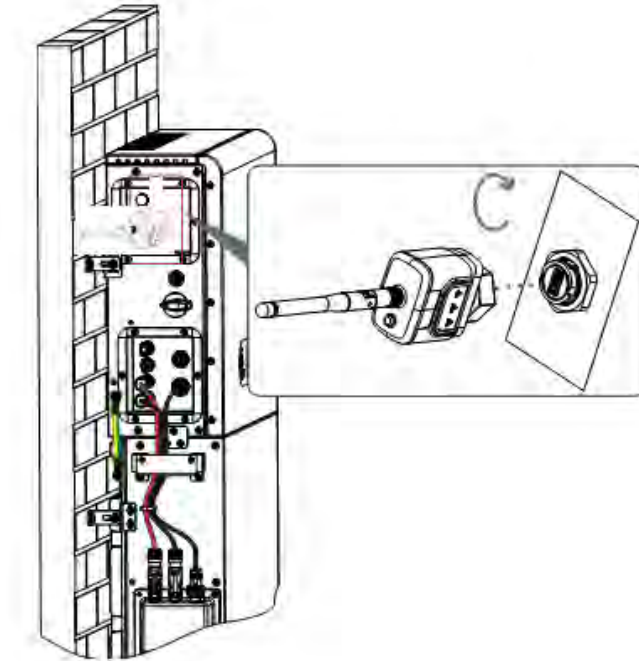


Figure 25 - WIFI/4G connection

6. External electrical connection

6.1. External ground connection of the PGND cable

Step 1: Crimp OT terminals

Precautions :

- 1) When stripping the cable, do not scratch the core of the cable.
- 2) The conductor crimping plate of an OT terminal is pressed to form a cavity that completely covers the conductor core and tightly binds the OT terminal.
- 3) The crimping line can be covered with heat shrink tubing or insulation tape.

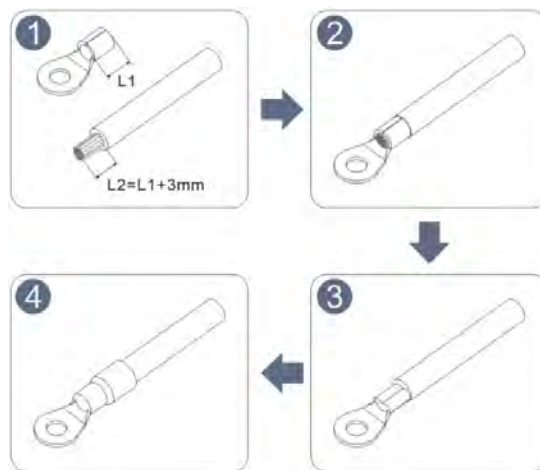


Figure 26 - Diagram of crimping OT terminal

Step 2: The OT terminal is crimped properly, and the ground cable is connected to the position shown in the following figure.

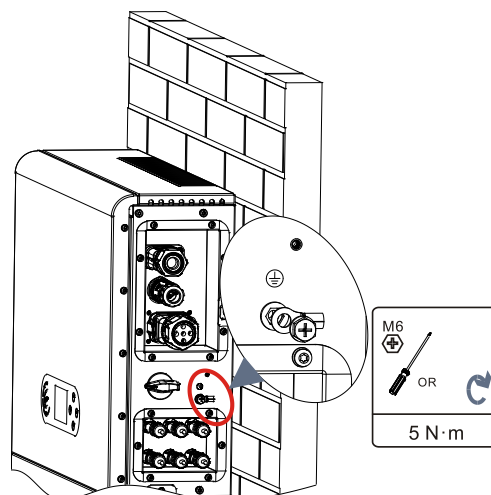


Figure 27 - Connection the grounding wire

6.2. Grid connection

Install AC wiring terminals

Take out AC wiring terminals from the carton of the inverter, strip and install cables according to the appropriate specifications

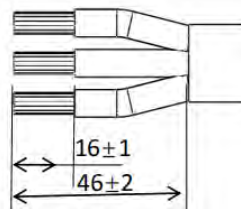
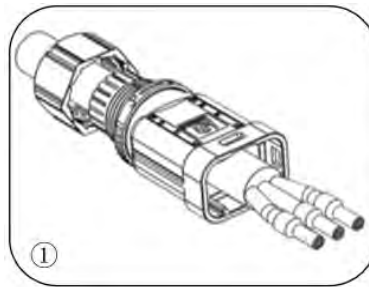
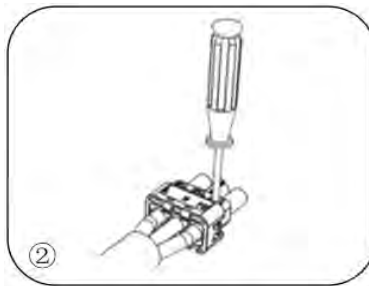


Figure 28 - Wire stripping size

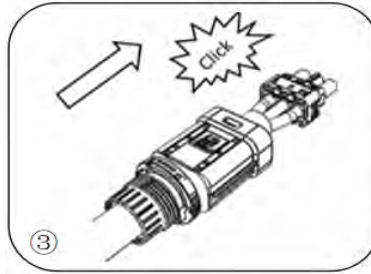
Step 1: After riveting the peeling wire to the insulation terminal, thread it into the lock wire nut and the main body.



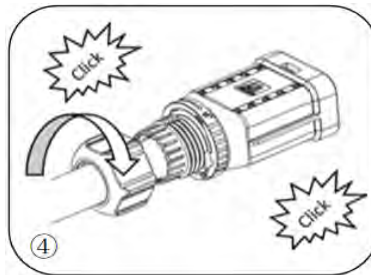
Step 2: Insert the cable into the rubber core according to the wire sequence, make the insulation terminal flush with the surface of the rubber core, and press the screw torque $2.0 \pm 0.1 \text{ n.m}$



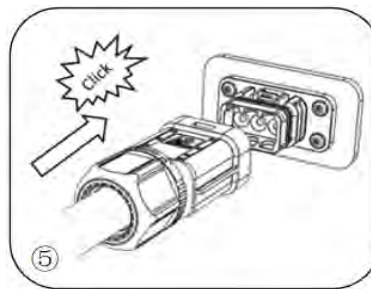
Step 3: The body is inserted into the core and a click is heard



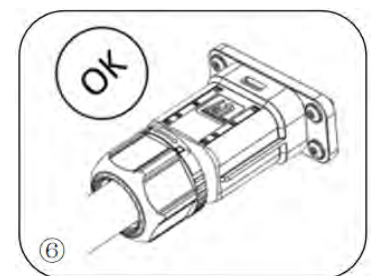
Step 4: Tighten the nut with an open wrench and make a "click" sound



Step 5: Insert the female end of the wire into the male end and hear a "click" sound

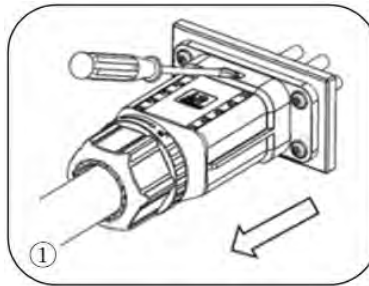


Step 6: Installation complete

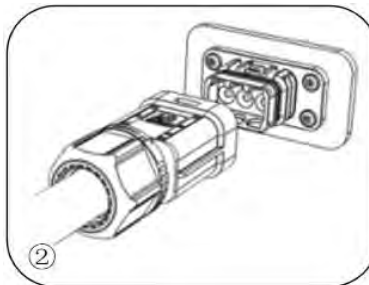


Removal step

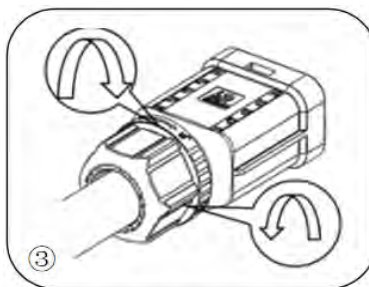
Step 1: Use a screwdriver to point at the unlocking position, hold the cable driver, and pull it back to separate the male and female



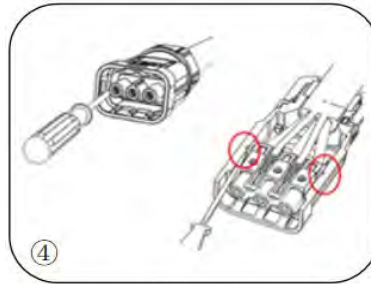
Step 2: Use a screwdriver to point at the unlocking position, hold the cable driver, and pull it back to separate the male and female



Step 3: Hold the unlocking buckle with one hand and rotate it in the direction indicated, while rotate the nut in the opposite direction with the other hand



Step 4: Remove the red circles on both sides using a screwdriver



Connect the AC wiring terminals to the corresponding AC Grid ports, as shown in the following figure.

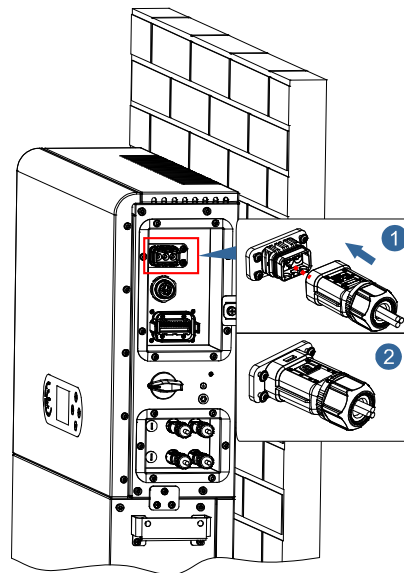


Figure 29 – Grid connection

6.3. Connecting a Critical Load (EPS function)


Critical Load (LOAD): in the event of a power failure (or operation in Off-Grid mode), if the EPS function is enabled, the 1PH HYD3000-HYD6000-ZP1 inverter will work in Emergency Power Supply (EPS) mode, using the energy stored in the battery to supply energy to the critical load via the LOAD connection port.

The LOAD connection port is only for connecting critical loads. The power of critical loads must not exceed 3000/3680/4000/4600/5000/6000VA according to the inverter model.

The procedure for connecting the LOAD port is the same as that for connecting the grid.

A change-over switch must be inserted between the EPS output of the inverter and the critical loads.

Change-over positions

	<p>The change-over switch is necessary.</p> <p>When checking/repairing critical loads, make sure that the change-over switch is in the 0 position.</p> <p>When checking/repairing the 1PH HYD3000-HYD6000-ZP1 inverter, make sure that the change-over switch is in the 0 position, and that the 1PH HYD3000-HYD6000-ZP1 inverter is disconnected from the grid.</p>
Caution	

- Under normal conditions: change-over switch is in position 1. The 1PH HYD3000-HYD6000-ZP1 inverter can supply power to critical loads in the event of a power failure.
- If the 1PH HYD3000-HYD6000-ZP1 inverter is faulty, manually move the switch to position 2. The grid will supply energy to the critical load.

Note: If the system is equipped with a production metre, take into account that the energy for the critical load is drawn before the meter and therefore this energy, even if produced by photovoltaic panels, is not counted as energy produced. If necessary, the system designer can use appropriate external switch contactors to ensure that the energy for the critical load is drawn downstream of the production meter during normal grid operation and that it only changes over to the EPS output of the inverter in the event of a power failure.

According to the cable specifications given in below table peel the cable according to the following below figure. Then install the EPS connector according to the in accordance with the previous chapters. Finally, insert the installed EPS connector into the corresponding position of the inverter according to the figures below

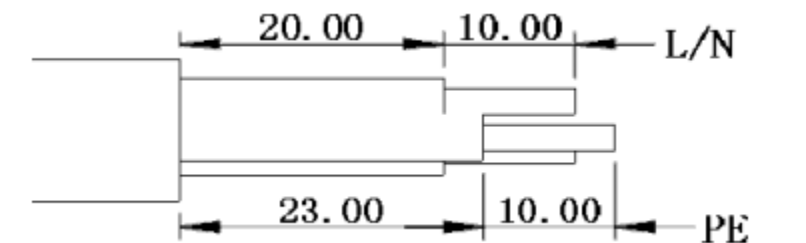
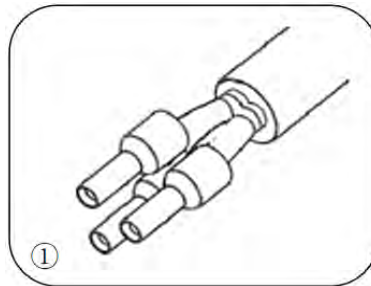


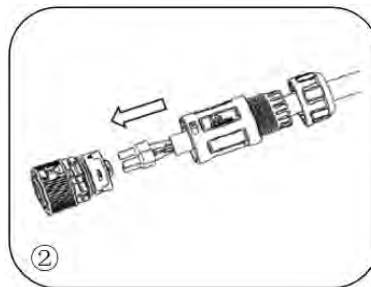
Figure 30 – Stripping diagram

Install procedure

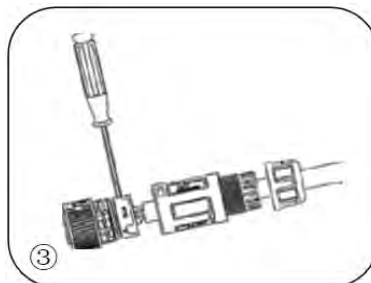
Step 1: Crimp terminal



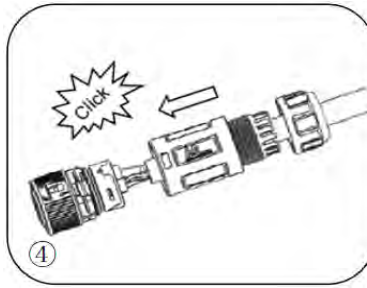
Step 2: Insert the cable into the butt terminal



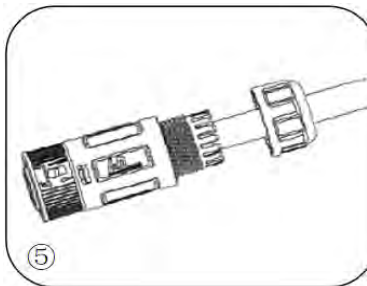
Step 3: Crimp the wire with an inner hexagon screwdriver with a screw torque of 1.2 ± 0.1 n.m



Step 4: Insert the subject into the corresponding clasp and hear a "click"



Step 5: Screw locking nut into main body, torque $2.5 \pm 0.5 \text{ n.m}$



Step 6: Installation complete

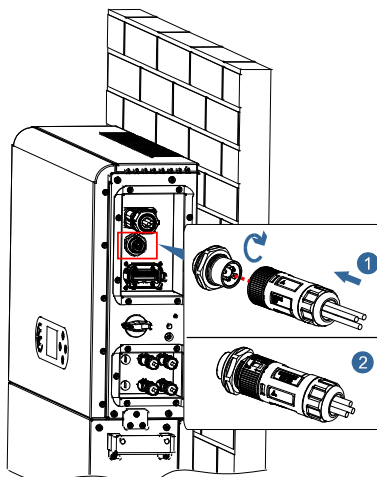
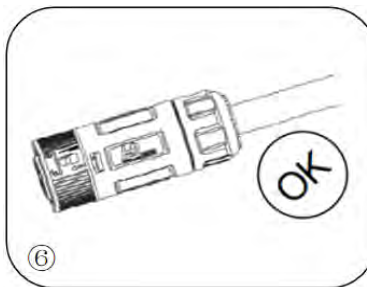


Figure 31 - EPS connection

6.4. Photovoltaic connection

Recommended specifications for DC input cables

Cross-sectional area (mm ² / AWG)		Outer diameter of cable (mm ²)
Range	Recommended value	
4.0-6.0 / 11-9	4.0 / 11	4.5~7.8

Procedure:

Step 1: Prepare the positive and negative photovoltaic cables.



Figure 32 - Preparing the positive and negative photovoltaic cables

Step 2: Insert the crimped positive and negative cables into the corresponding photovoltaic connectors.

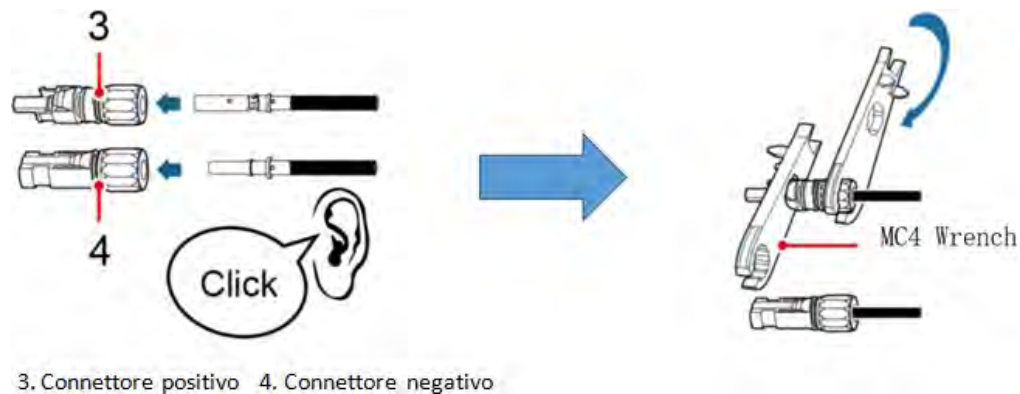


Figure 33 - Preparing the positive and negative photovoltaic connectors

Step 3: Make sure that the DC voltage of each photovoltaic string is less than 550V DC and that the polarities of the photovoltaic cables are correct. Insert the positive and negative connectors in the 1PH HYD3000-HYD6000-ZP1 inverter until you hear a “click” sound, as show in below Figure.

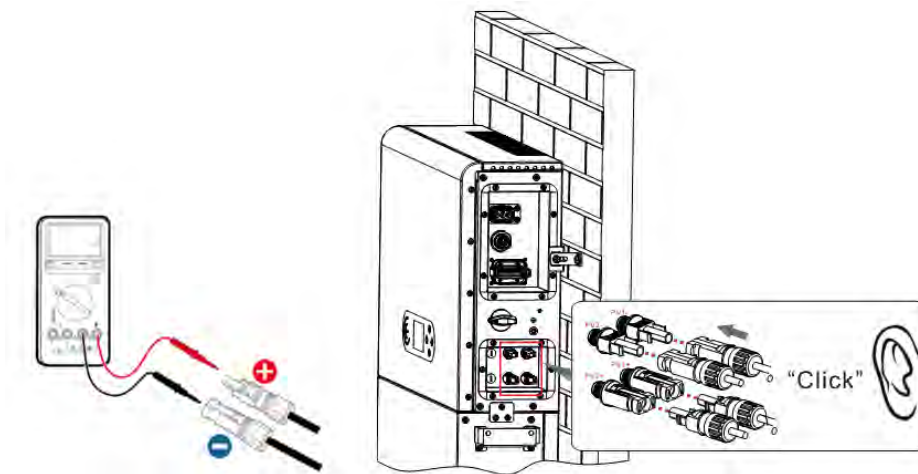


Figure 34 – Connecting the photovoltaic connectors



Caution

Before removing the positive and negative PV connectors, make sure that the DC CIRCUIT BREAKER is OPEN.

Removal procedure

Use a MC4 wrench to disconnect the photovoltaic connectors, as shown in figure below.

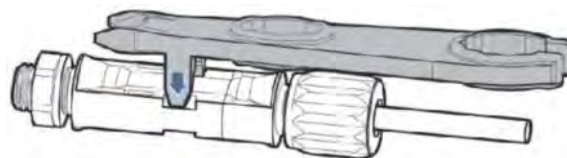


Figure 35 – Disconnecting the photovoltaic connectors

Connect the 1PH HYD3000-HYD6000-ZP1 inverter to the photovoltaic strings using the DC input power cables. Select the input mode: the 1PH HYD3000-HYD6000-ZP1 inverter has two MPPTs, which can function either independently or in parallel. The user can choose the appropriate MPPT operating mode according to the design of the system.

The inverter has two MPPTs, which can operate independently or in parallel. The inverter automatically recognizes the appropriate MPPT operating mode depending on the system design.

Independent mode

If the strings are different (e.g. installed on two separate flaps or consisting of a different number of panels), the input model in independent.

Parallel mode:

If the strings are connected in parallel.

Note:

Depending on the type of inverter, select the appropriate inverter accessories (cables, fuse holders, fuses, switches, etc). The open-circuit voltage of the photovoltaic system must be lower than the maximum DC input voltage of the inverter. The output voltage of the strings must be compatible with the MPPT voltage range.

The positive and negative polarities of the panel on the inverter must be connected separately. The power cable must be suitable for photovoltaic applications.

Note:

Both MPPT inputs of the inverter should be populated, even if the system only has one string. If the strings are arranged in parallel, it is recommended to use a Y or T connection cable to double the input currents from the PV field and to populate both MPPT inputs of the inverter, as shown in the figure. If the string arrangement is independent, simply connect the two strings to the two MPPTs of the inverter.



Figure 36 - Y-branch connection cable for solar panels



6.5. COM-Multi function communication connection

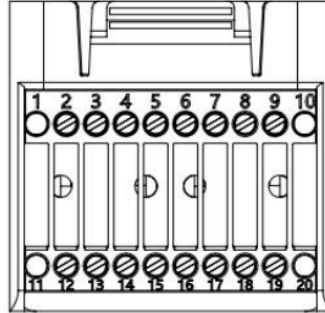


Figure 37 - COM port diagram

PIN	Definition	Function	Comment
1	N/A	N/A	
2	UC-A	RS485 differential signal A (+)	Inverter monitoring 485 signal
3	UC-B	RS485 differential signal B (-)	
4	EN+	RS485 differential signal +	Battery 485 signal
5	EN-	RS485 differential signal -	
6	MET-A	RS485 differential signal A (+)	Meter 485 signal
7	MET-B	RS485 differential signal B (-)	
8	CANH	CAN high data	Battery CAN communication signal
9	CANL	CAN low data	
10	N/A	N/A	
11	N/A	N/A	
12	GND	Logic interface signal	(DRMS) Logical interfaces uses for below standard Australia (AS4777) , Europe General (50549) , German (4105)
13	D1/5		
14	D4/8		
15	D2/6		
16	D0		
17	D3/7		
18	CT+	Current transformer output positive terminal	Current transformer communication signal
19	CT-	Current transformer output negative pole	
20	N/A	N/A	

6.6. Link Port

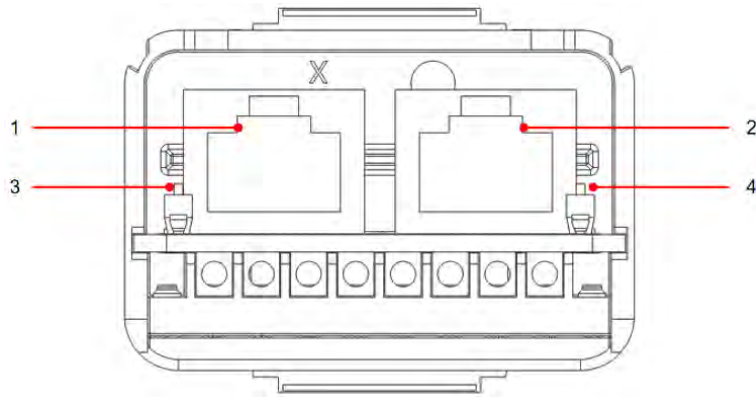


Figure 38 - Link Port diagram

Icon	Define	Function	Comment
1	Link Port 1	Parallel signal output	Parallel signal port (RJ45)
2	Link Port 0	Parallel signal input	
3	Link Port 1 dip switch	Match resistance on and off	The selector can take ON (up dial) and 1 (OFF-down dial). ON means enabled drag and 1(OFF) means disabled drag
4	Link Port 0 dip switch		

The wire stripping is divided into 2 to 9 holes and 12 to 19 holes. The wire stripping size is defined according to the cable connection position.

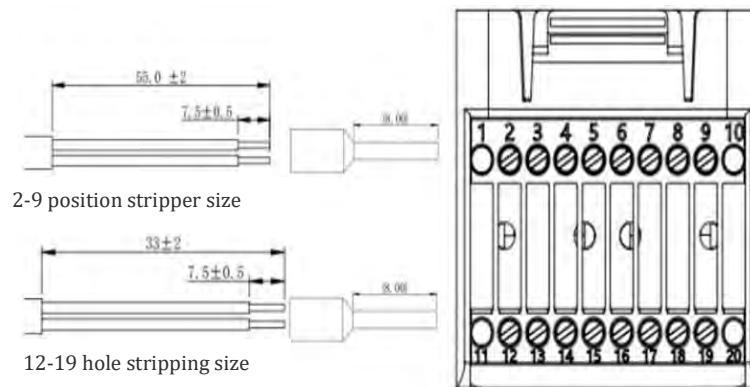


Figure 39 - Schematic diagram of wire stripping size

6.7. RS485 (Wired monitoring or inverter cascade monitoring)

Refer to the figure shown below, connect the RS485+ and RS485- of the inverter to the TX+ and TX- of the RS485→ USB adapter, and connect the COM port of the adapter to the computer. (NOTE : The length of the RS485 communication cable should be less than 1000 m).

Connect pins as shown (2pin and 3pin).

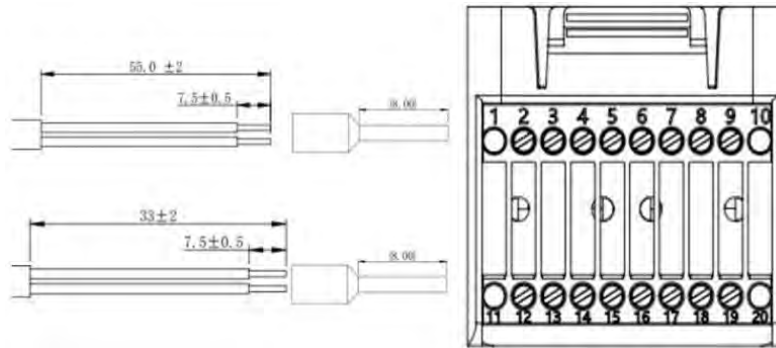


Figure 40 - RS 485 wiring diagram

RS485 wires are connected in parallel between inverters, (NOTE : When multiple inverters are connected via RS485 wires, set communication address to differentiate the inverters, please refer to this manual <6.3.1 System setting → 8. Communication Addr>).

6.8. Logic interface

The logic interface pin definitions and circuit connections are as follows:

Logic interface pin are defined according to different standard requirements

(a) Logic interface for AS/NZS 4777.2:2020, also known as inverter demand response modes (DRMs).

The inverter will detect and initiate a response to all supported demand response commands within 2 s. The inverter will continue to respond while the mode remains asserted.

Pin NO.	Function
12	GND
13	D1/5
14	D4/8
15	D2/6
16	D0
17	D3/7

(b) Logic interface for EN50549-1:2019, is in order to cease active power output within five seconds following an instruction being received at the input interface.

The inverter can be connected to a RRCR (Radio Ripple Control Receiver) in order to dynamically limit the output power of all the inverters in the installation.

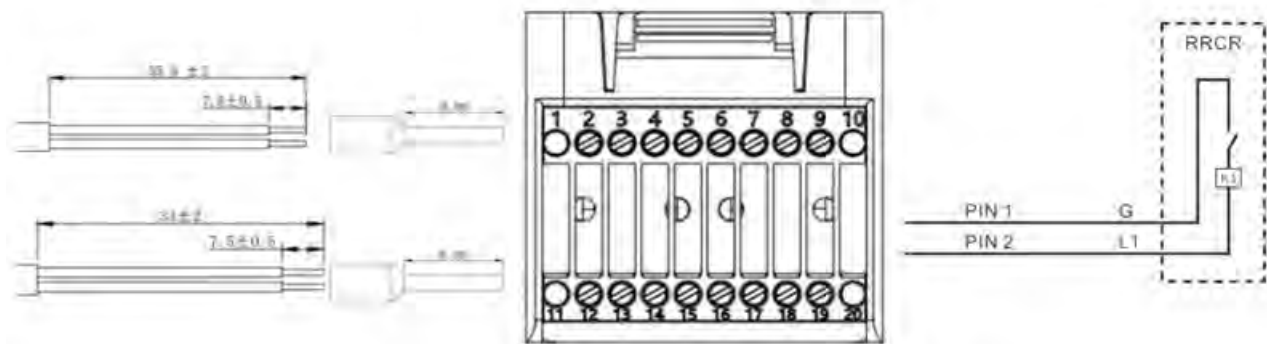


Figure 41 - DRMs wiring diagram

Function description of the terminal

COM Pin NO.	Pin name	Description	Connected to (RRCR)
PIN 13(PIN2)	L1	Relay contact 1 input	K1 - Relay 1 output
PIN 12(PIN1)	G	GND	K1 - Relay 1 output

The inverter is preconfigured to the following RRCR power levels, close is 1, open is 0

L1	Active Power	Power drop rate	Cos(φ)
1	0%	<5 seconds	1
0	100%	/	1

6.9. CT

If you need to use the CT alone, attach the CT to PIN18 and PIN19.

There are two ways to get grid current information :

Plan A:CT(default) Plan B:Meter

6.10. Meter single-phase DDSU

PIN6 and PIN7 are used for communication with the meter; the meter is shown in “Figure 1”, PIN6 and PIN7 on the inverter COM port correspond to points 24 and 25 respectively on the electricity meter, as shown in “Figure 3.”

The connection method in the case of reading at the exchange is shown in “Figure 2”.

In the case of external production reading, the connection method is shown in “Figure 4.”



Figure1

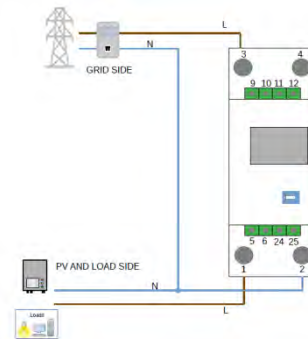


Figure 2

PIN INVERTER	PIN METER	Nota
6	24	Meter communication
7	25	

Figure 3

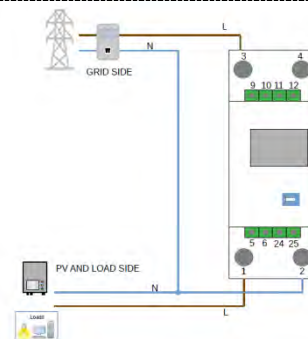


Figure 4

6.11. Meter three-phase DTSU

PIN6 and PIN7 are used for communication with the meter; the meter is shown in “Figure 1”, PIN6 and PIN7 on the inverter COM port correspond to points 24 and 25 respectively on the electricity meter, as shown in “Figure 3.”

The connection method in the case of reading at the exchange is shown in “Figure 2”.

In the case of external production reading, the connection method is shown in “Figure 4.”



Figure 1

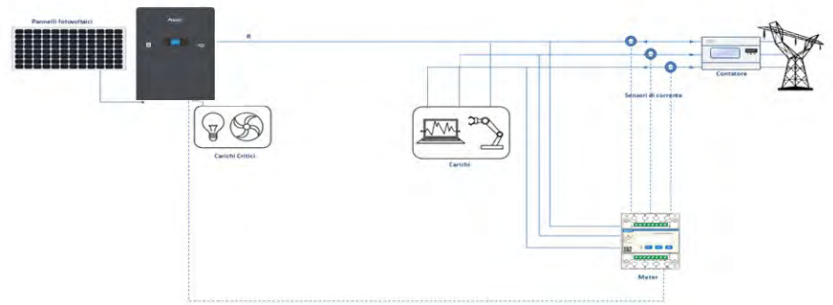


Figure 2

PIN INVERTER	PIN METER	Nota
6	24	Meter communication
7	25	

Figure 3

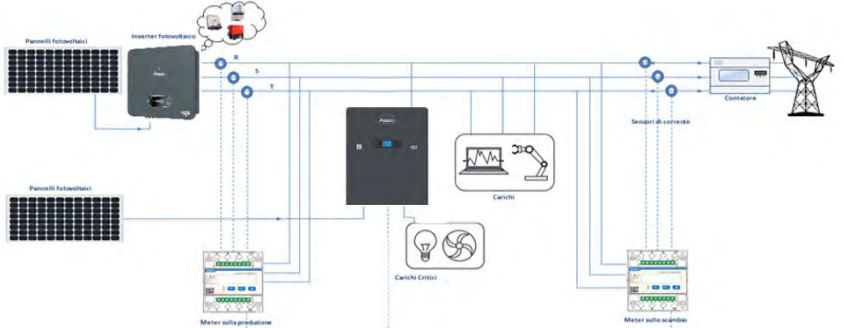
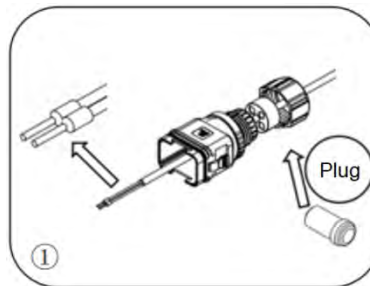


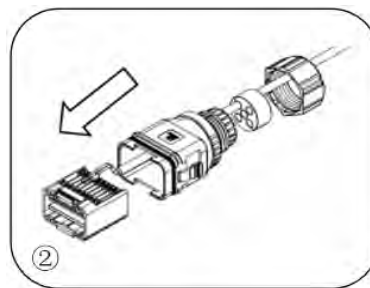
Figure 4

COM Installation procedure for connecting cables

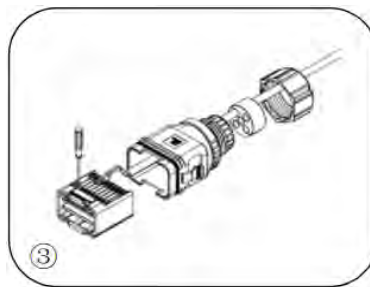
Step 1: Remove the plug from the plug and thread the terminal in the order shown



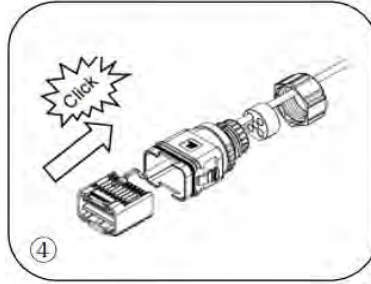
Step 2: Insert the wire into the corresponding terminal



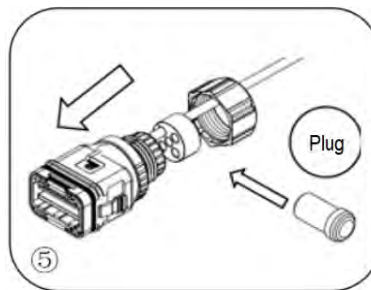
Step 3: Crimp the wire with a flat-head screwdriver with a torque of 1.2 ± 0.1 n.m



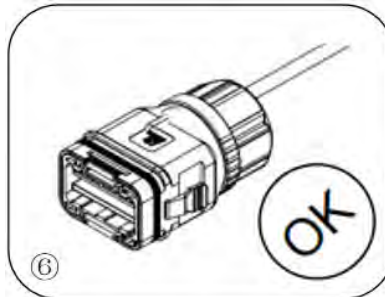
Step 4: Line core, rubber core area can not appear riding line phenomenon, rubber core into the main body with a "click" sound



Step 5: Insert the plug into the body and plug the unwired hole



Step 6: Screw the lock nut into the main body, torque $2.5 \pm 0.1 \text{ n.m}$, complete installation



Insert the stripped COM connector into the corresponding port of the inverter, as shown in the following figure.

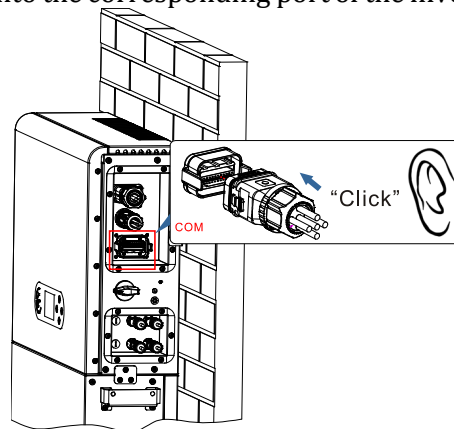


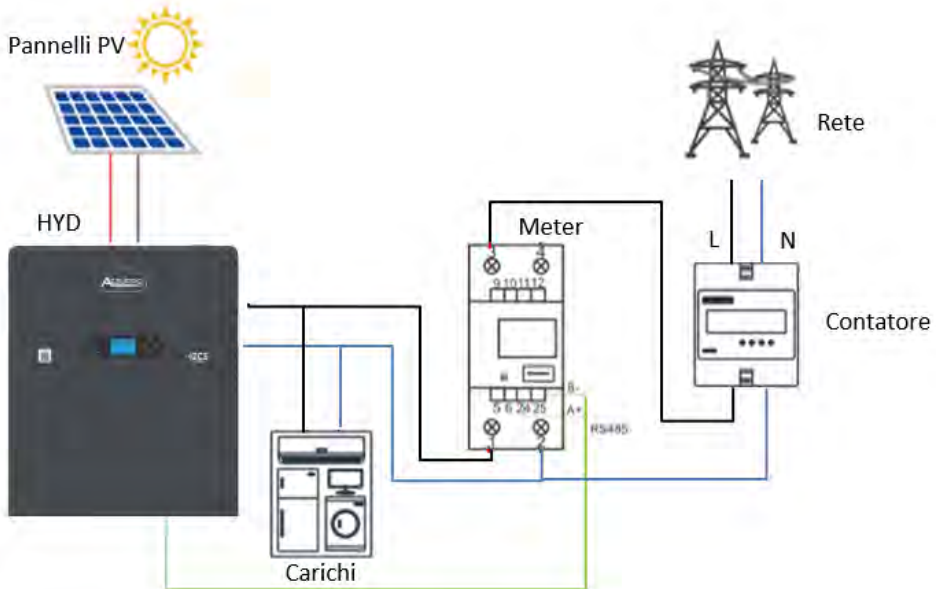
Figure 42 - COM connection

6.12. Measurement of exchange via the single-phase DDSU Meter

In order to be able to read the exchange via the meter, it is necessary to purchase a CHINT DDSU single-phase direct connect meter.

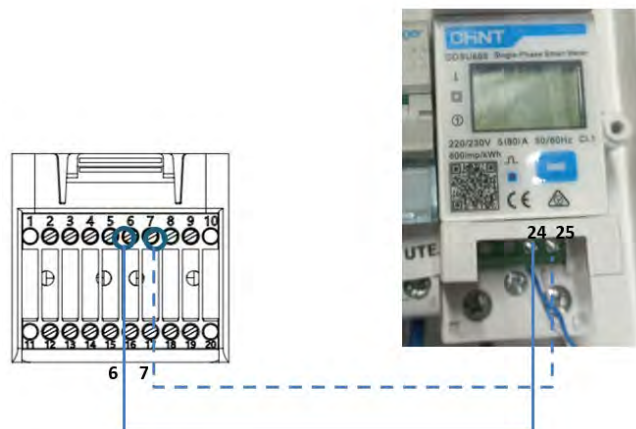


PIN INVERTER	PIN METER	Nota
6	24	Meter communication
7	25	

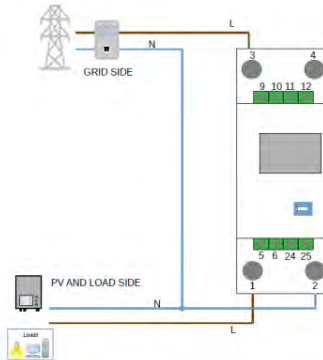


Meter connections:

1. Connect the Meter and inverter via the COM port. On the Meter side, connect to PINs 24 and 25 (as shown in the table) On the inverter side, use the connection port identified as "COM," connecting to PINs 6 and 7 (as shown in the figure).




2. Connect the Meter in “direct connection” mode, specifically:
 - ✓ Connect PIN 2 of the Meter to the neutral cable (N);
 - ✓ Connect PIN 3 respectively to the exchange meter direction phase;
 - ✓ Connect PIN 1 to the photovoltaic system and loads direction phase.



NOTE: For distances between the Meter and hybrid inverter **greater than 100 meters**, it is recommended to connect two 120 Ohm resistors along the 485 daisy chain: the first to the inverter (between PINs 6 and 7 of the inverter COM), and the second directly to the Meter (PINs 24 and 25).



Setting Meter on exchange

1. Press the  button to check that the Meter address is set to **001** and that the protocol is set to **8n1**. In addition to what is described above, the display shows the values of:
 - ✓ Current;
 - ✓ Voltage;
 - ✓ Power factor;
 - ✓ Power.



Protocol



Indirizzo



Corrente



Potenza



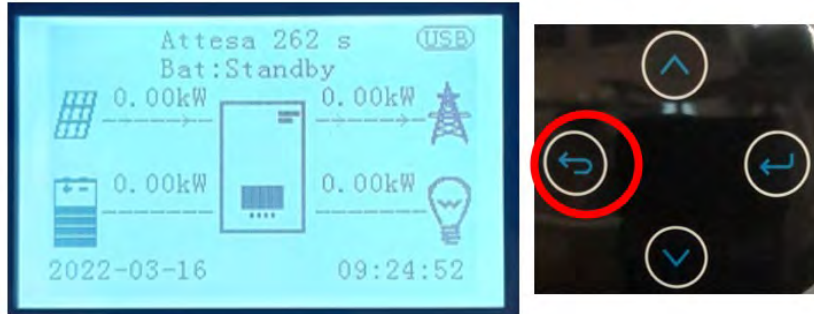
Tensione



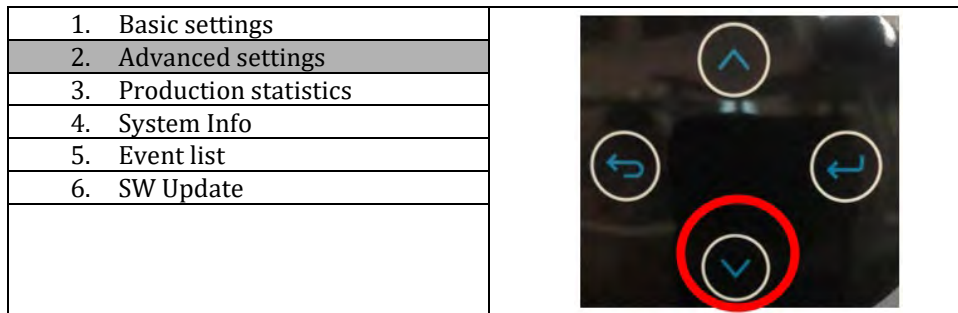
Power factor

To configure the Meter reading on the inverter:

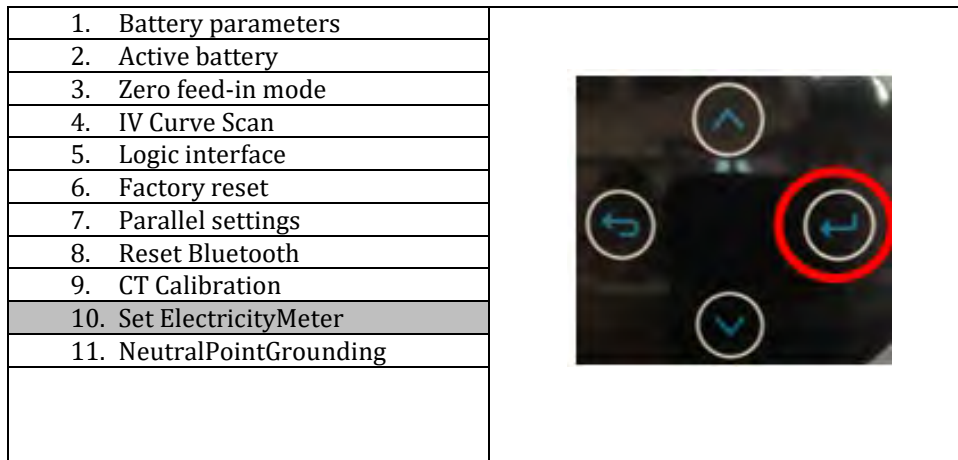
1. Press the first button on the left of the display:



2. Press the last arrow on the right (enter) to access the advanced settings (enter password 0715):



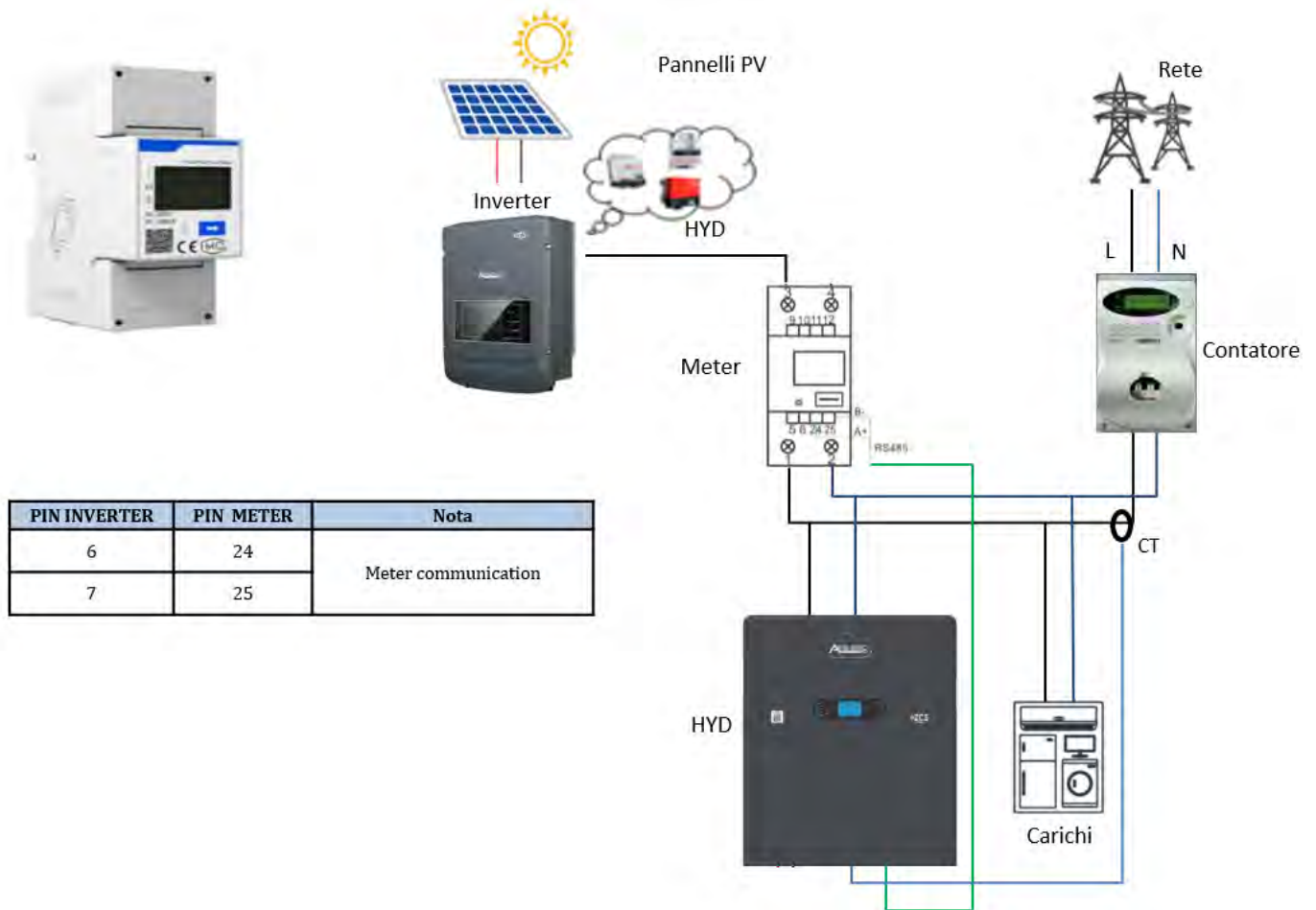
3. Now press the last arrow on the right to access the Set ElectricityMeter



4. Now press the last arrow to enable.

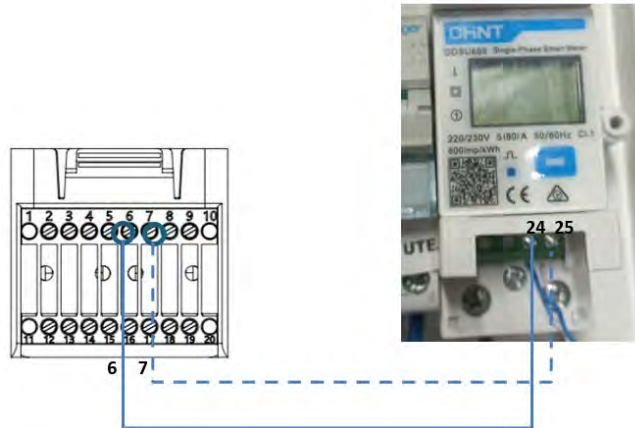
6.13. Measuring external production through the DDSU single-phase Meter

In order to be able to read the external production via the meter, it is necessary to purchase a CHINT DDSU single-phase direct connect meter.

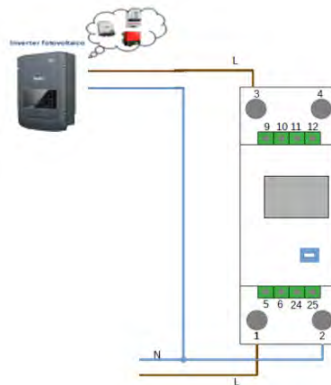


Meter connections:

1. Connect the Meter and inverter via the COM port. On the Meter side, connect to PINs 24 and 25. On the inverter side, use the connection port identified as “COM,” connecting to PINs 6 and 7 (as shown in the figure).




2. Connect the Meter in “direct connection” mode, specifically:
 - ✓ Connect PIN 2 of the Meter to the neutral cable (N);
 - ✓ Connect PIN 3 respectively to the exchange meter direction phase;
 - ✓ Connect PIN 1 to the photovoltaic system and loads direction phase.



NOTE: For distances between the Meter and hybrid inverter **greater than 100 meters**, it is recommended to connect two 120 Ohm resistors along the 485 daisy chain: the first to the inverter (between PINs 6 and 7 of the inverter COM), and the second directly to the Meter (PINs 24 and 25).



Setting Meter on external production

- Press the  button to check that the Meter address is set to **002** and that the protocol is set to **8n1**.
In addition to what is described above, the display shows the values of:
 - ✓ Current;
 - ✓ Voltage;
 - ✓ Power factor;
 - ✓ Power.

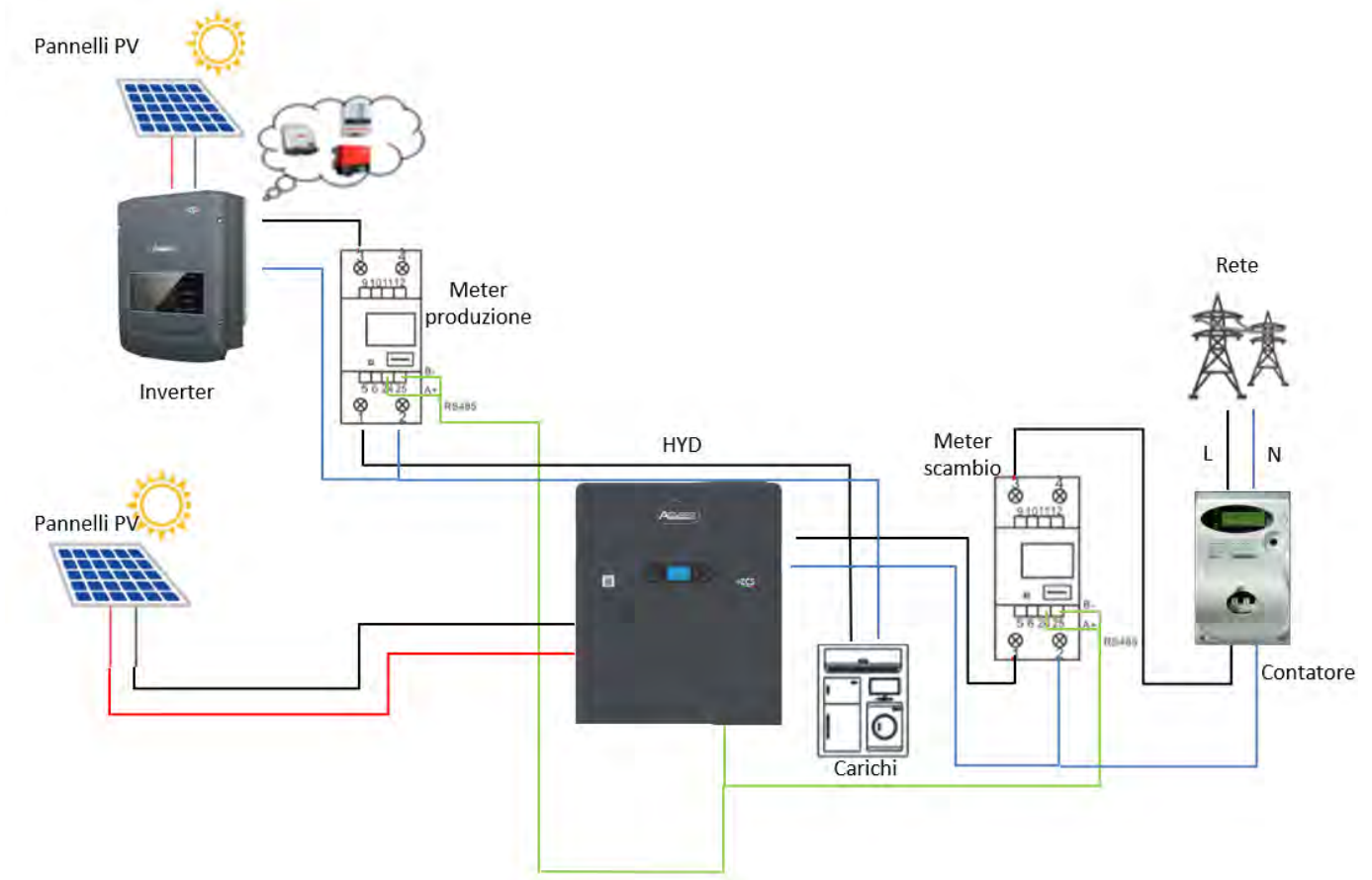


To change the parameters of the Meter and set it to external production:




6.14. Setting up exchange meter and production DDSU single-phase Meter

In order to be able to read the exchange and external production via the Meter, it is necessary to purchase two CHINT DDSU single-phase direct connect meters.



6.15. Checking correct reading of the DDSU single-phase Meter

In order to verify the correct reading of the meter on exchange, make sure that the hybrid inverter and any other PV production sources are switched off. Switch on loads greater than 1 kW. Stand in front of the meter and, using the  button to scroll through the items, check that P is:

1. Greater than 1 kW;
2. In line with household consumption;
3. The sign in front of each negative value (-).



In the case of a meter for reading the production of existing photovoltaic systems, repeat the previous steps:

1. The sign of the powers must be positive for P;
2. Switch on the Hybrid Inverter, leaving the DC-side PV switch in the OFF position, check that the total external PV power value (Pt) is in line with the value shown on the inverter's display.

6.16. Connection of the three-phase DTSU Meter to the exchange

In case of installation of inverter 1PH HYD3000-6000-ZSS-HP on three-phase system it is possible to install the three-phase Meter DTSU in addition to the sensors as shown in the figure.

Be sure to position the probes so that each toroid only reads the current flows related to the exchange. To do this it is advisable to place them at the output of the exchange counter.

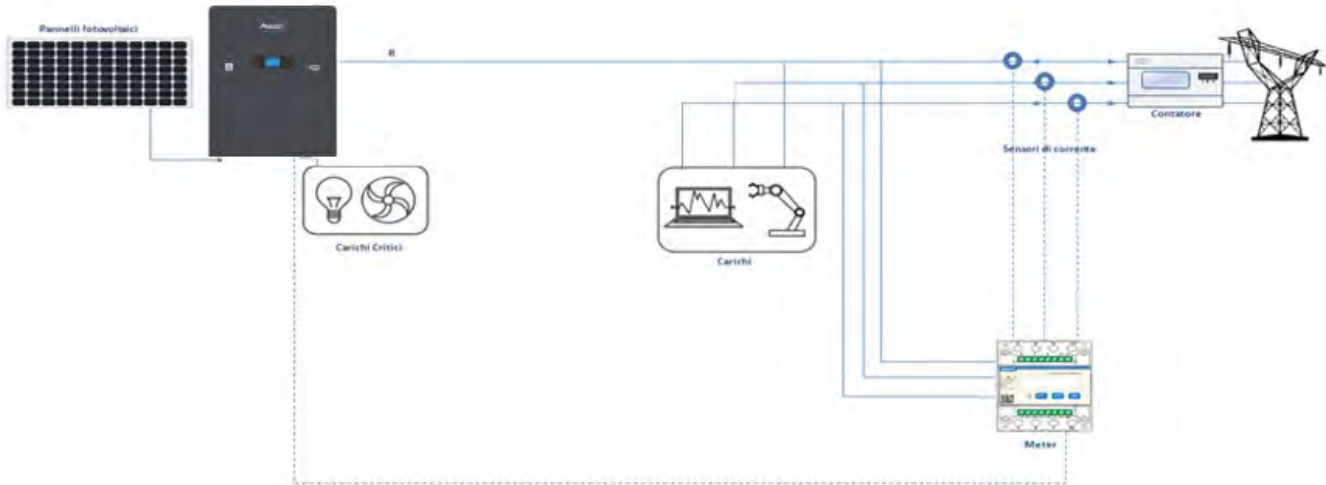


Figure 43 - Hybrid installation scheme with meter on the exchange

The use involves the connection of the sensors to the DTSU Meter and the connection of the latter to the inverter through the COM port.

The sensors connected to the Meter must not be stretched for any reason (use the supplied wiring).

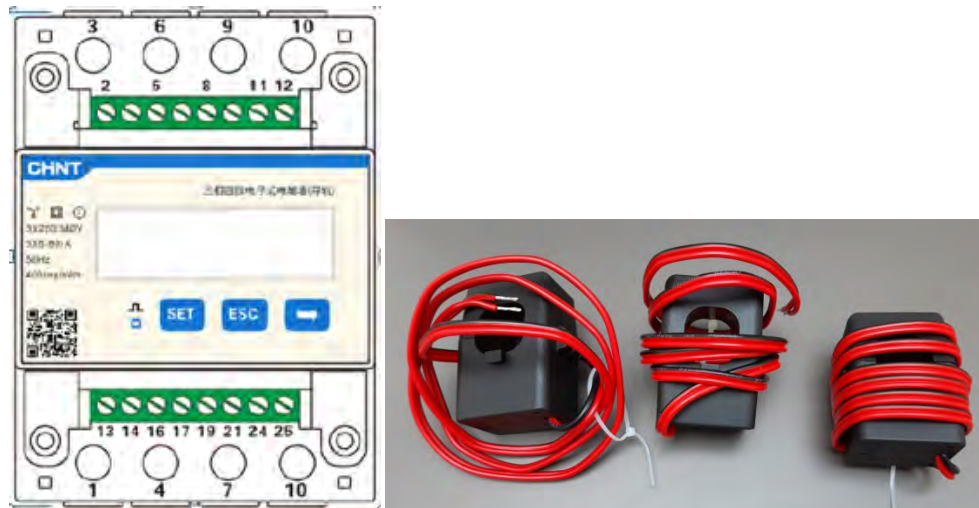


Figure 44 - Meter (left), CT sensors (right)

The connection between Meter and sensors is made by applying the diagram shown in the figure below. Connect the PIN 10 of the Meter with the neutral cable (N), connect the PIN 2, 5 and 8 respectively to the R, S and T phases.

As for the connections with the CT, the sensor positioned on the R phase must have the terminals connected on PIN 1 (red wire) and PIN 3 (black wire).

The sensor located on the S phase must have the terminals connected on PIN 4 (red wire) and PIN 6 (black wire).

The sensor located on the T phase must have the terminals connected on PIN 7 (red wire) and PIN 9 (black wire).

Place the sensors carefully on the sensor (arrow).

WARNING: Attach the CT to the phases only after connecting them to the Meter.

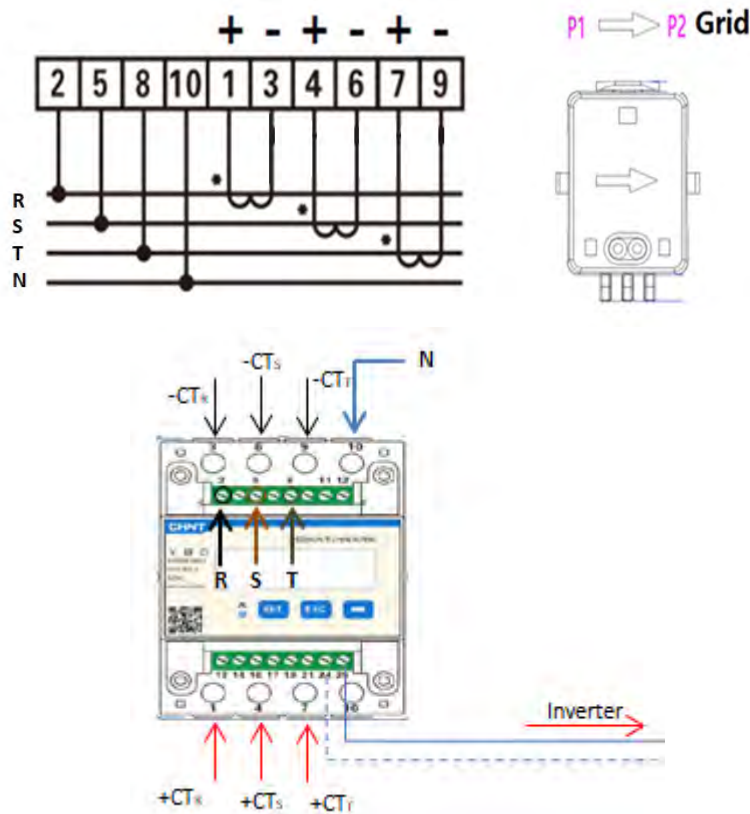


Figure 45 - Meter connection and sensors CT

The connection between Meter and inverter is through the RS485 serial port.

Meter side this port is identified by PIN 24 and 25.

On the inverter side, the connection port identified as "COM" is used by connecting PIN 6 and 7 as indicated in the figures and tables below.

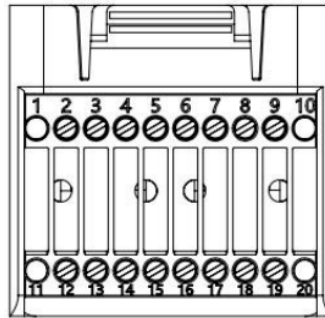


Figure 46 - COM interface

PIN Inverter	Definizione	PIN Meter	Note
6	RS485 differential signal +	24	Meter communication
7	RS485 differential signal -	25	

Table 1 - Interface descriptions

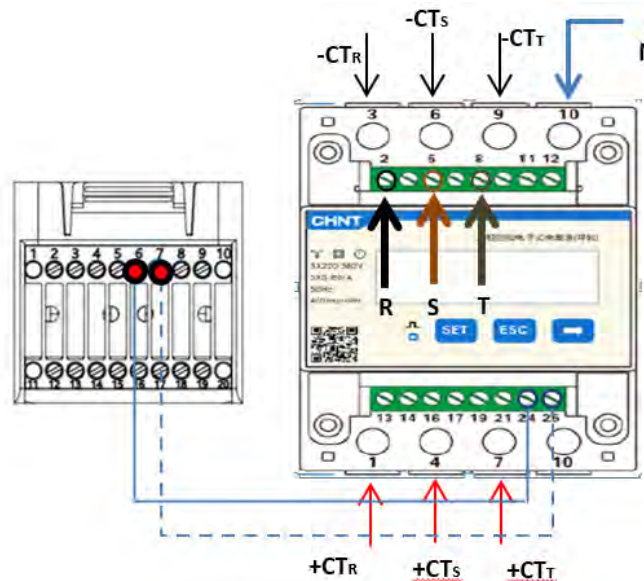
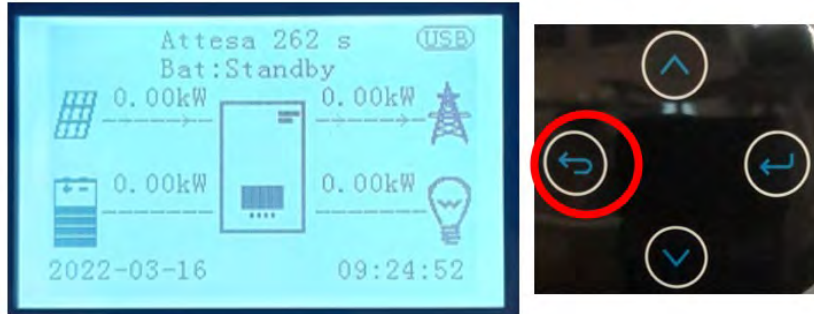


Figure 47 - Serial port connection Meter

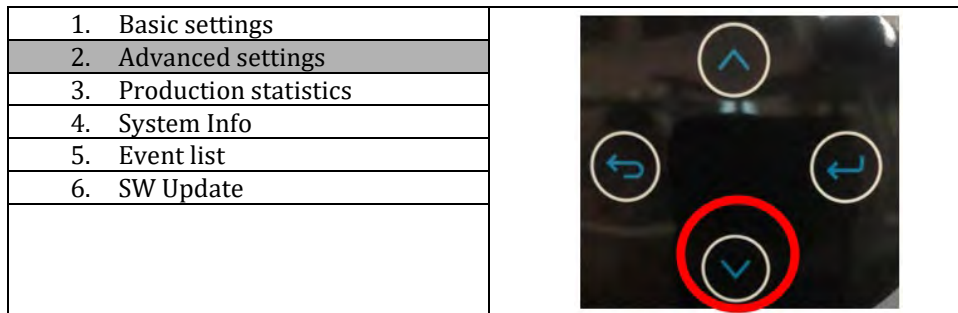
NOTE: For distances between meter and hybrid inverter over 100 meters it is recommended to connect along the 485 daisy chain two 120 Ohm resistors, the first to the inverter (between PIN 6 and 7 of the interface), the second directly to the Meter (PIN 24 and 25).

To configure the Meter reading on the inverter:

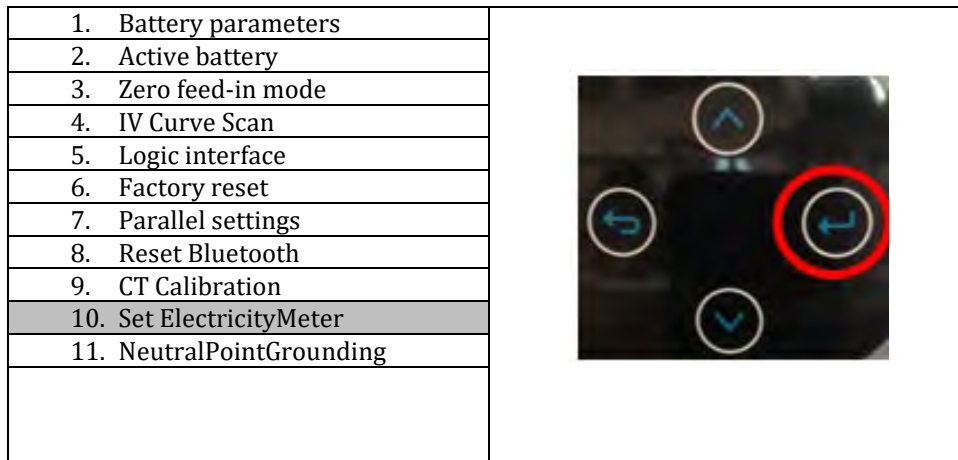
1. Press the first button on the left of the display:



2. Press the last arrow on the right (enter) to access the advanced settings (enter password 0715):



3. Now press the last arrow on the right to access the Set ElectricityMeter



4. Now press the last arrow to enable.

6.17. Measurement of photovoltaic production via three-phase meter DTSU

In the event that one or more three-phase photovoltaic inverters are already present in the system, it is mandatory for the Hybrid system to show the display not only the photovoltaic contribution of the panels connected to its entrances but also the power produced by three-phase photovoltaic external, in order to make the system work for accumulation in a correct way.

All this must be achieved thanks to the connection of a second three-phase DTSU Meter (or more up to a maximum of 3 at the reading of an external production) positioned in an appropriate way to read all the production of the pure photovoltaic system (except that of the Hybrid itself).

As for the RS485 (Meter - HYD) communication, all the Meters present must be connected to the COM port of the inverter in the inputs 6 and 7 of the COM port)

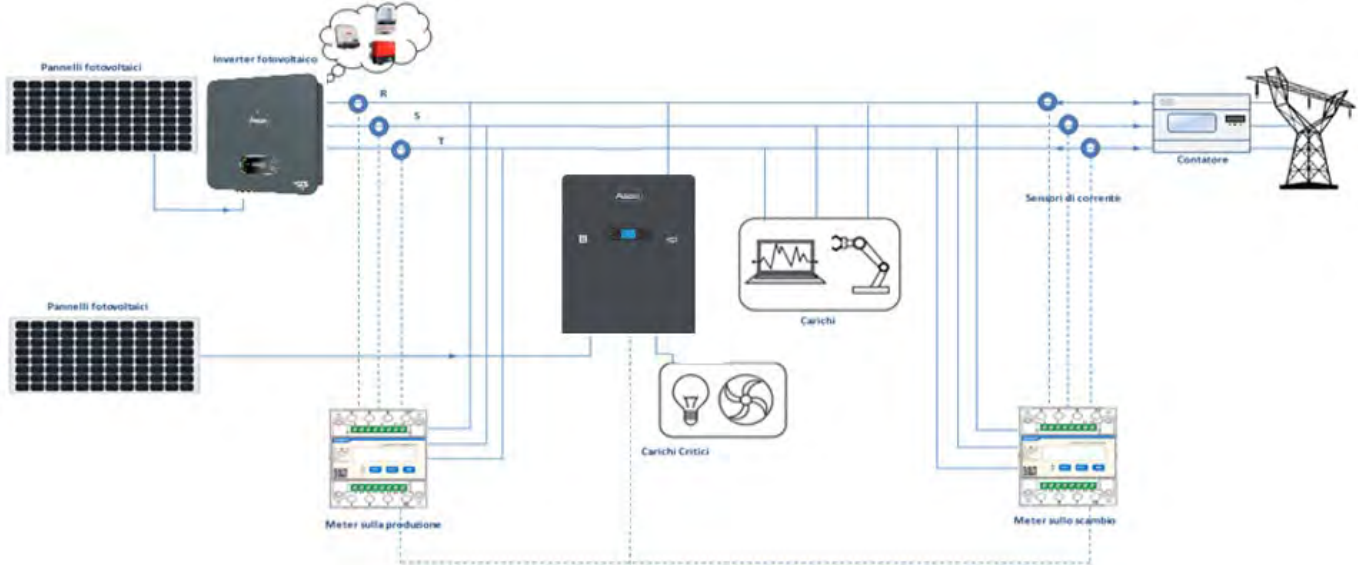


Figure 48 - Hybrid installation scheme with three-phase DTSU Meter on exchange and production

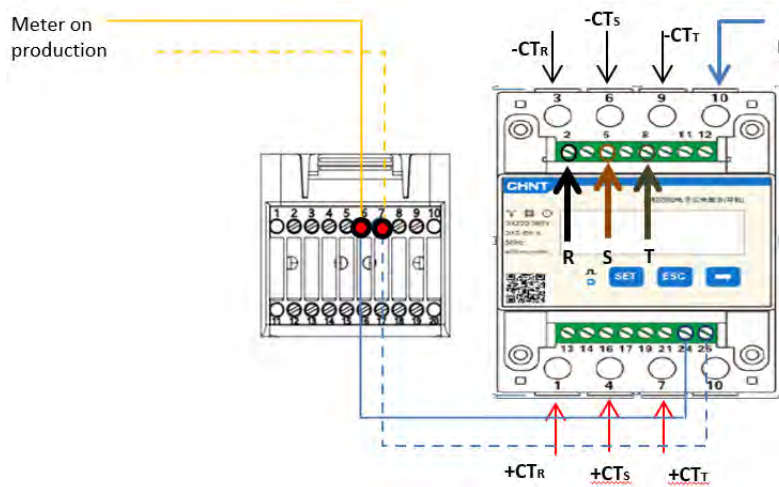


Figure 49 - COM serial port connection with more than one DTSU Meter

6.18. Three-phase DTSU Meter parameter configuration

After you have successfully connected the wiring, you need to set the correct parameters from the Meter display.



Figure 50 - Meter legend

1. Press to:
 - “Confirm”
 - “Move the cursor”
 (for entering values)
2. Press to “go back”
3. Press to “slide”

Three-phase DTSU Meter configuration to exchange

To view the device in read mode on the exchange you need to enter the settings menu, as indicated below:

1. Press **SET** the inscription will appear **CODE**



2. Press **SET**, the inscription will appear “600”:



3. Write the figure “701”:

 - a. From the first screen where the number “600” appears, press the “ ” key once to enter the number “601”.
 - b. Press “SET” twice to move the cursor to the left to highlight “601”;
 - c. Press the “ ” key once more until you enter the number “701” (701 is the access code to the settings).

Note: In case of error press “ESC” and then again “SET” to reset the required code.



1. Confirm by pressing **SET** until you enter the settings menu.
2. Enter the following menus and set the parameters indicated:

d. **CT:**

- i. Press **SET** to enter the menu
- ii. Write "40":
 1. From the first screen where the number "1" appears, press " " repeatedly until the number "10" appears.
 2. Press "**SET**" once to move the cursor to the left to highlight "10"
 3. Press the button "→" several times until you enter the number "40"

Note:In the event of an error, press "SET" until the number of thousands is highlighted and then press " " until only the number "1" appears; at this point repeat the procedure described above.



- iii. Press "ESC" to confirm "→" to scroll to the next setting

e. **ADDRESS:**

- i. Leave the address 01 (set by default) in this way the inverter will assign as power relative to the exchange the data sent by the meter.

Three-phase DTSU meter configuration on exchange and production

To view the device in read mode on the exchange you need to enter the settings menu, as indicated below:

4. Press **SET** the inscription will appear **CODE**



5. Press **SET**, the inscription will appear "600":



6. Write the figure "701":
 - a. From the first screen where the number "600" appears, press the " " key once to enter the number "601".
 - b. Press "SET" twice to move the cursor to the left to highlight "601";
 - c. Press the " " key once more until you enter the number "701" (701 is the access code to the settings).

Note: In case of error press "ESC" and then again "SET" to reset the required code.



3. Confirm by pressing **SET** until you enter the settings menu.
4. Enter the following menus and set the parameters indicated:
 - d. **CT:**
 - i. Press **SET** to enter the menu
 - ii. Write "40":
 1. From the first screen where the number "1" appears, press " " repeatedly until the number "10" appears.
 2. Press "**SET**" once to move the cursor to the left to highlight "10"
 3. Press the button "→" several times until you enter the number "40"

Note: In the event of an error, press "SET" until the number of thousands is highlighted and then press " " until only the number "1" appears; at this point repeat the procedure described above.



iii. Press “ESC” to confirm “→” to scroll to the next setting

a. **ADDRESS:**

i. Press **SET** for enter Menù:

ii. Write “02” (press one time “→” from the screen “01”). With address 02 the inverter will assign the data sent by the meter as relative power to the production. They can be set up to a maximum of 3 Meters for production (Addresses 02 03 04).



iii. Press “ESC” to confirm.

6.19. Correct installation verification DTSU three-phase meter

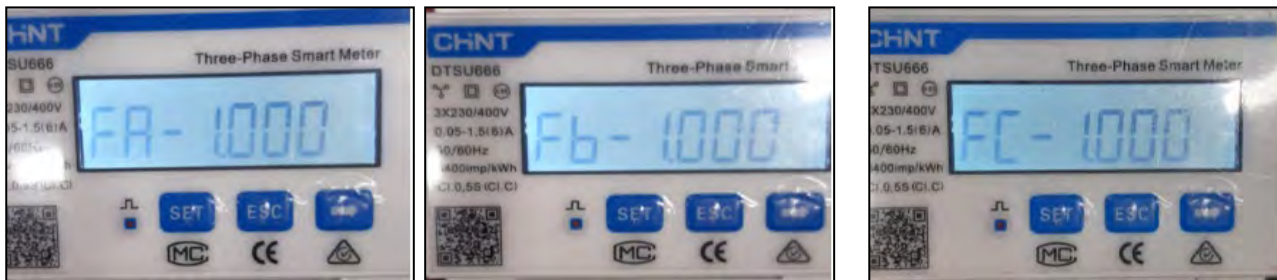
Three-phase DTSU meter verification at exchange

To carry out such verification it is necessary:

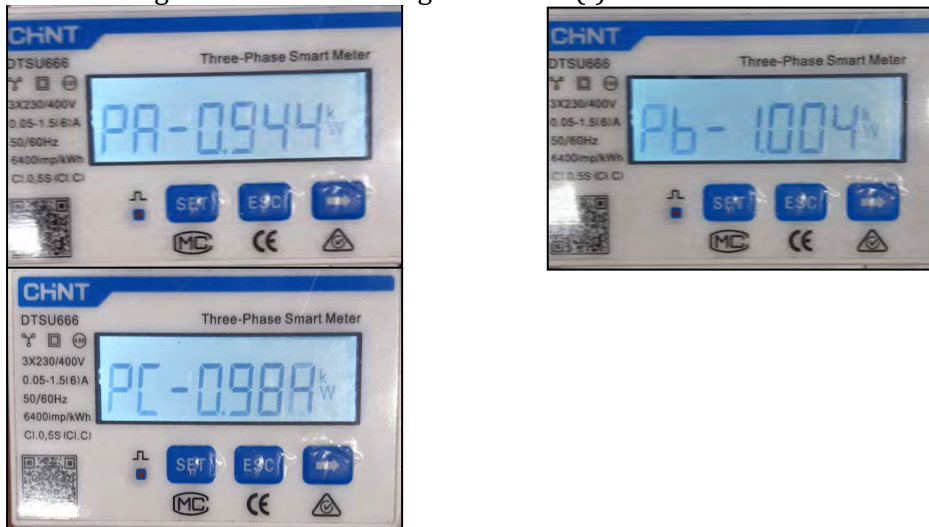
- Turn on the hybrid inverter only in alternation and turn off any other source of photovoltaic production (if any);
- Turn on carichi greater than 1kw for each of the three phases of the plant;

Bring yourself in front of the Meter and using the keys " " to scroll between the entries and "ESC" to go back, it must be verified that:

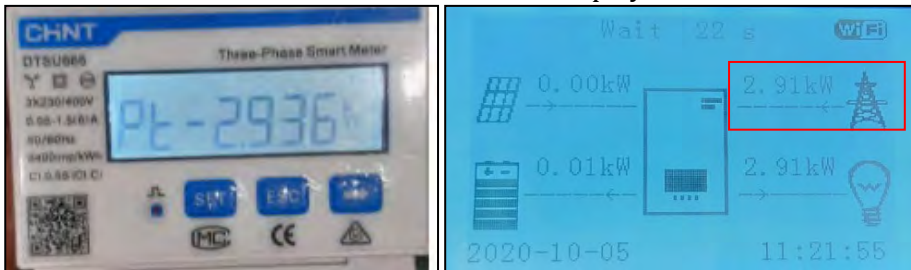
1. The Power Factor values for each phase Fa, Fb, and Fc (voltage to current offset), are between 0.8-1.0. In case of a lower value, the sensor must be moved in one of the other two phases until that value is between 0.8-1.0.



2. The Power Pa, Pb and Pc must be:
 - Greater than 1 kW.
 - In line with household consumption.
 - The sign in front of each negative value (-).



- Turn on the PV inverter via rotary switch on ON and batteries, verify that the total power value P_t is in line with the value shown on the inverter display

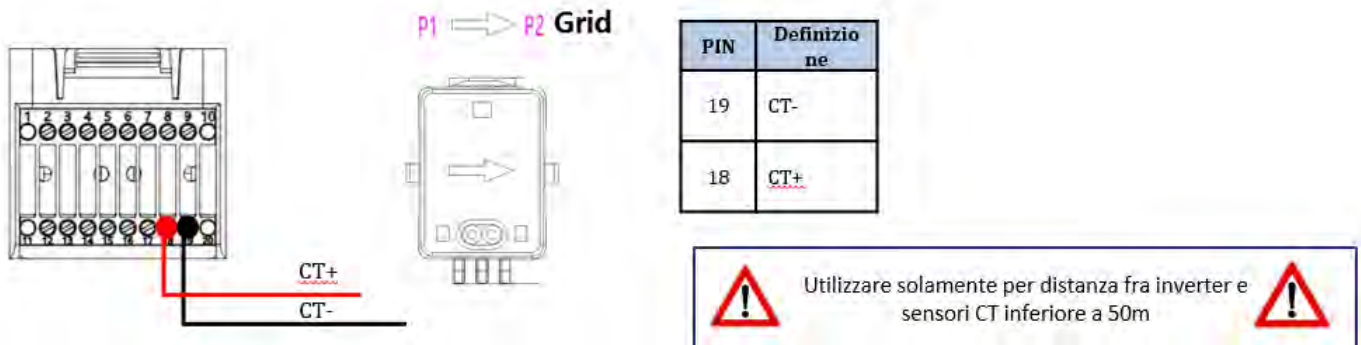


Three-phase DTSU Meter Verification on Production

In case of meter on the production it is necessary to repeat the previous operations:

- Switch off the hybrid inverter and leave on only the pure photovoltaic;
- Making pure photovoltaic go into production;
- Power factor verification as described in the previous case;
- The power sign P_a , P_b , and P_c must be in agreement;
- Turn on Hybrid Inverter, verify that the total power value P_t photovoltaic is in line with the value shown on the inverter display.

6.20. Measurement of exchange through current sensor



Connect the negative of the sensor to input 19 of the COM connector
Connect the positive of the sensor to input 18 of the COM connector

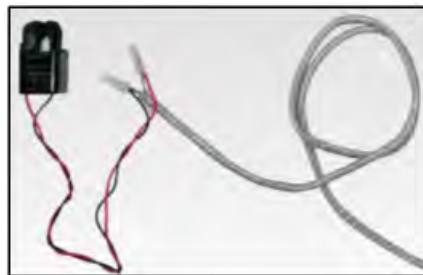
Correctly position the current sensor, in detail:

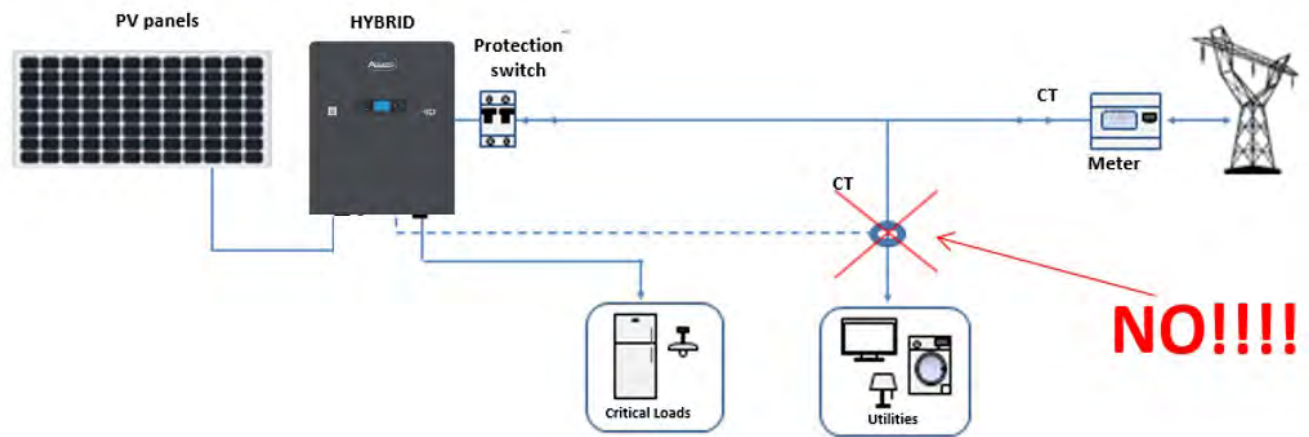
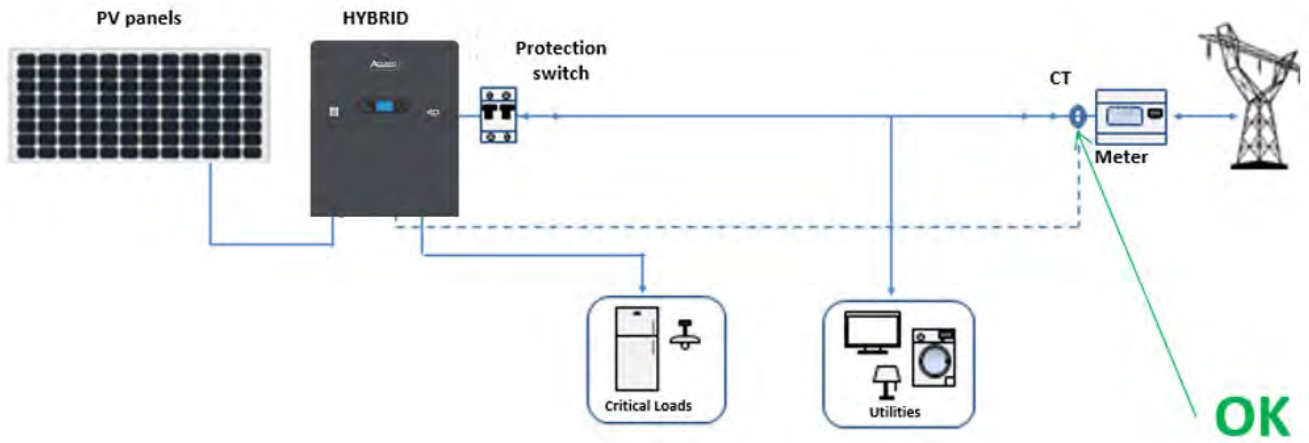
- ✓ CT (measures the current exchanged with the grid). Positioned at the output of the exchange meter so that all incoming and outgoing power flows can be read, it must include all phase cables entering or leaving the exchange meter.
- ✓ The direction of the CT is independent of the installation, and is recognised by the system during the first start-up, always verify by means of tests that the readings are correct.

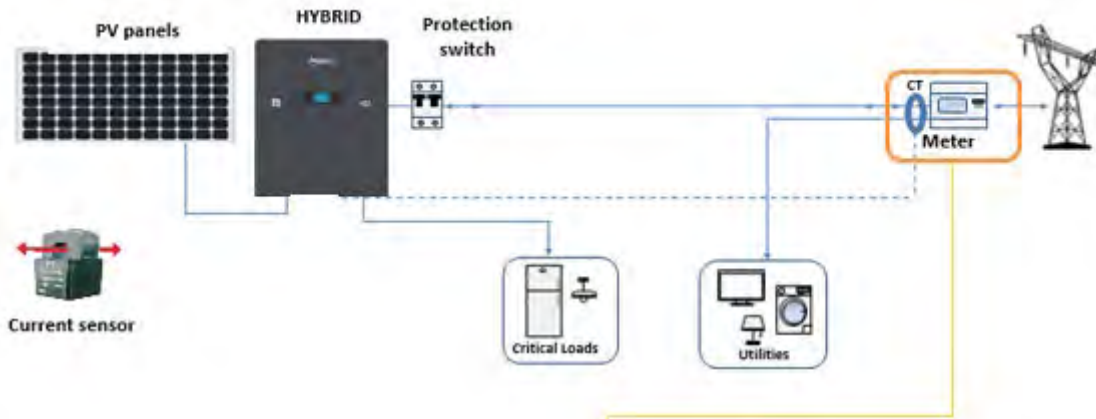
Use an 8-pin, STP category 6 cable as an EXTENSION CABLE; use all the coloured pins

(blue-orange-green-brown) to extend the positive cable of the CT and all the white/coloured pins (white/blue-white/orange-white/green/brown) to extend the negative cable of the CT.

The shield must be grounded on one of the two sides. To prevent the cables from breaking, it is recommended to use a cable with flexible and non-rigid conductors.







The sensor must include all phase cables entering or leaving the meter.



6.21. Install the cover

After electrical connections are complete and cable connections are correct and reliable, install the external protective cover and secure it using screws.

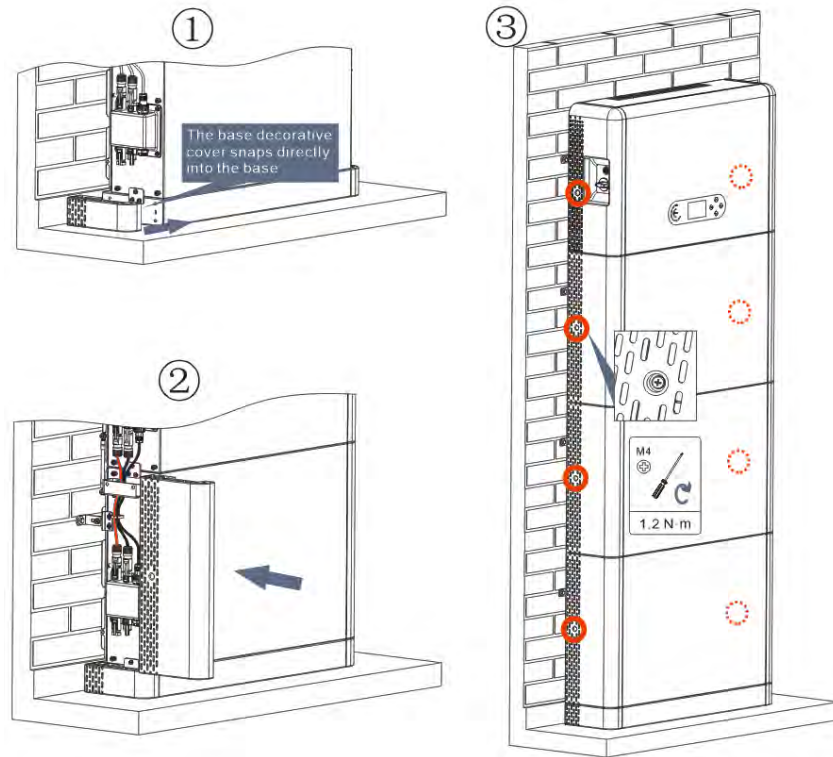


Figure 51- Install the cover

7. Buttons and indicator lights

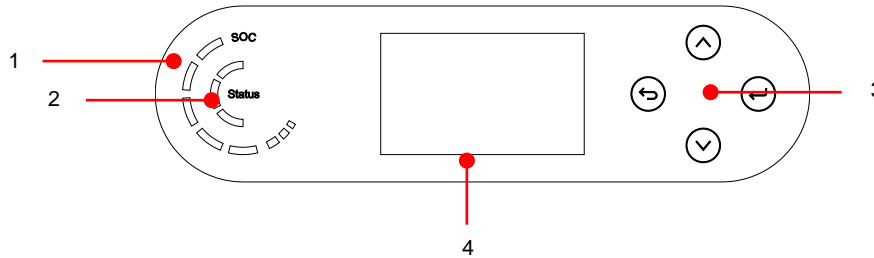






Figure 52- Buttons and indicator lights

1	System power indicator	3	Button
2	System status indicator	4	LCD screen






7.1. Buttons:

- Press  “back” to the previous screen or enter the main interface.
- Press  “up” to the upper menu option or value plus 1.
- Press  “down” to the lower menu option or value minus 1.
- Press  “ok” to select the current menu option or switch to the next digit.

7.2. System status indicator

System status	Indicator		
	Blue light	Green light	Red light
On-grid	On		
Standby (On-Grid)	Flashing		
Off-Grid		On	
Alarm			Intermittent

7.3. Battery capacity indicator

Icon	Battery capacity	Capacity explanation
	80%-100%	The battery capacity is full
	60%-80%	
	40%-60%	
	20%-40%	
	0-20%	The battery capacity is insufficient, and the battery generates a low voltage alarm.

8. Parallel system

Refer to figure below and connect the system in parallel according to the success of the master and slave (up to 6 units). The dip switches must be configured as shown, in detail:

- ✓ Link port 0 DIP ON master inverter;
- ✓ Link port 1 latest DIP ON slave inverter;
- ✓ All other Link ports DIP 1.

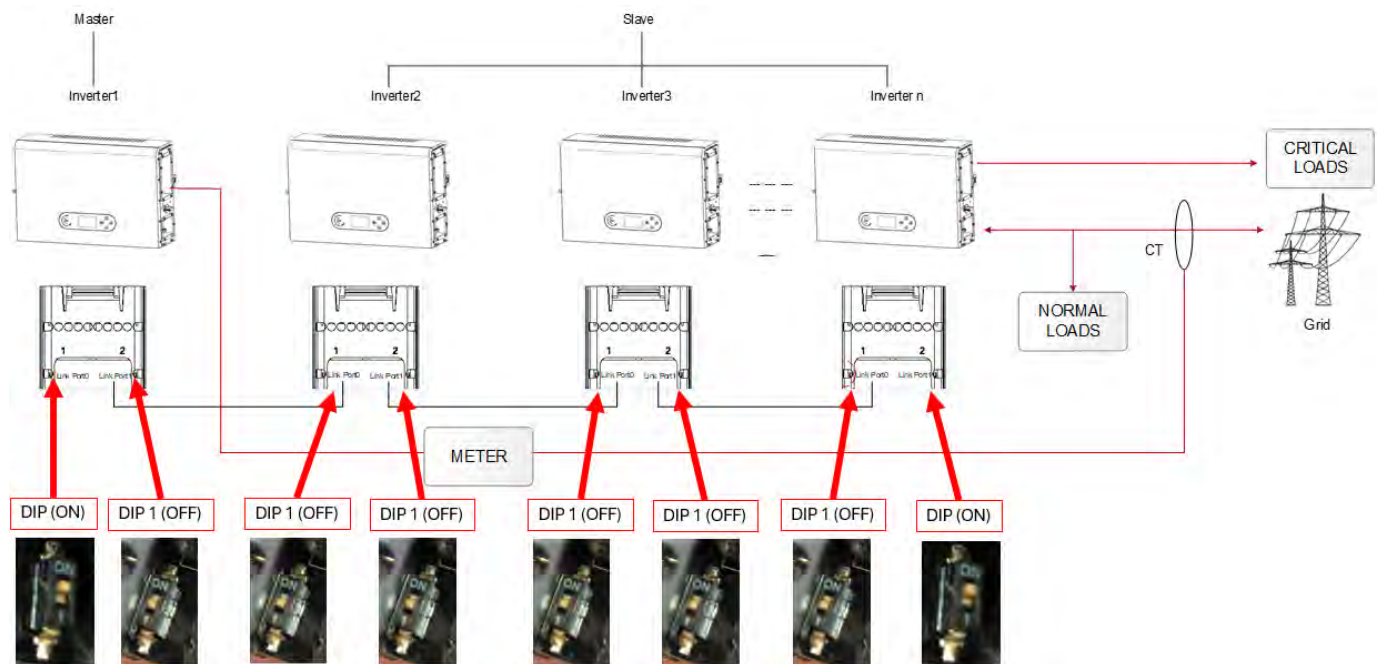


Figure 53- System parallel diagram

9. System Electrical Topology

Zucchetti Centro Sistemi S.p.a. has already integrated RCMU (residual current monitoring unit) inside inverter, If an external RCD is required, a type-A RCD with rated residual current of 100mA or higher is suggested.

1PH HYD3000-HYD6000-ZP1 inverter household energy storage system is mainly composed of PV modules, Azzurro battery modules, inverters, AC switches, load and distribution units, smart meters /CT, and power grid.

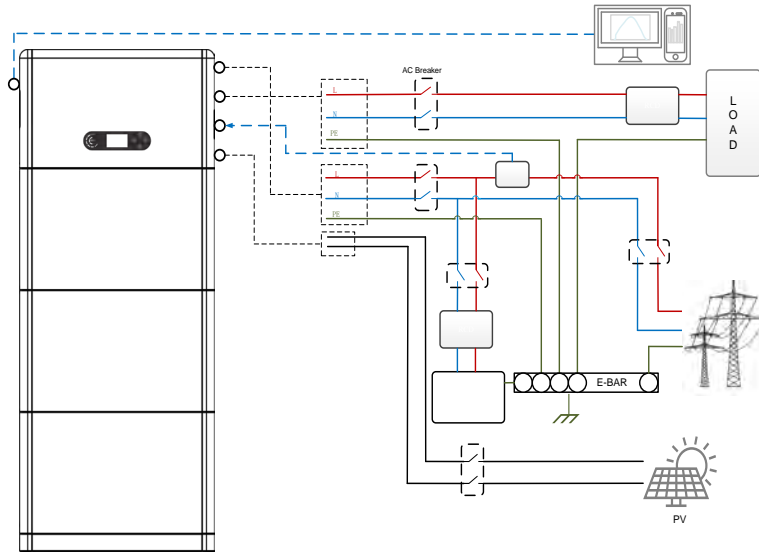


Figure 54 - System Electrical Topology (General)

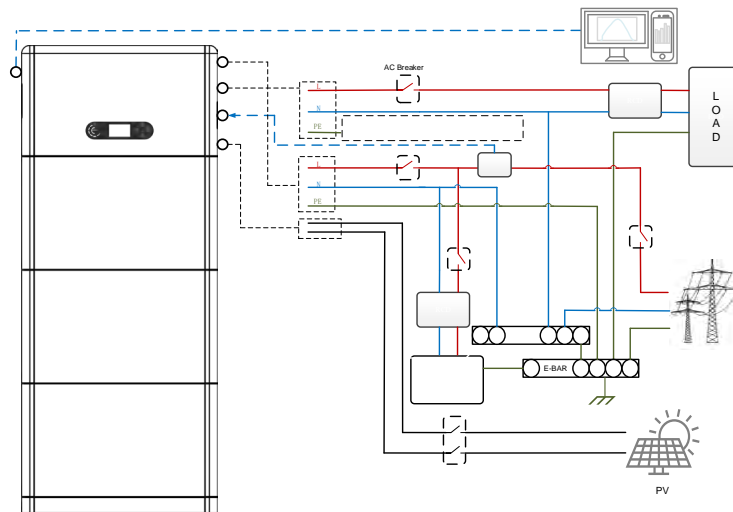


Figure 55 - System Electrical Topology (Australian version)

Note: If you need to select a cable connection mode based on the power distribution system, set the connection mode on the LCD. In advanced Settings, select off grid grounding to set the connection mode. If the connection mode is improperly set, grounding errors may occur.

10. Operation

10.1. Preliminary checks

Before starting the system, please check that:

1. The 1PH HYD3000-HYD6000-ZP1 inverter is securely fixed to the mounting bracket and the connection with the wall should be tight and firm;
2. The PV+/PV- cables are securely connected, and the polarity and voltage are correct, and the voltage is in line with the accessible range;
3. The BAT+/BAT- cables are securely connected, and the polarity and voltage are correct, and the voltage meets the accessible range;
4. The GRID/LOAD cables are securely/correctly connected;
5. An AC switch is correctly connected between the GRID port of the 1PH HYD3000-HYD6000-ZP1 inverter and the grid, and the switch is OFF.
6. An AC switch is correctly connected between the LOAD port of the 1PH HYD3000-HYD6000-ZP1 inverter and the critical load, and the switch is OFF.
7. The communication cable for lithium batteries has been correctly connected.

10.2. First start-up of the inverter

8. Make sure that the AC-side switch of the inverter is lowered so that no power is supplied to the device
9. Make sure that the rotating disconnection switch is in the OFF position

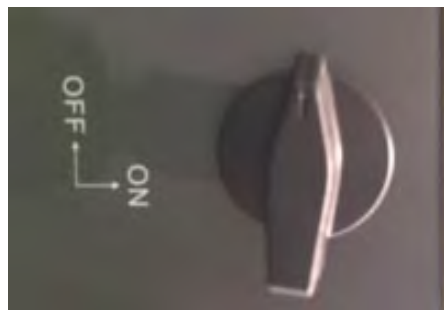


Figure 56 - Photovoltaic disconnecting switch

10. Make sure that the utility has a consumption of at least 200 W. Recommended loads for this operation are hair dryers (800W < P < 1600W), electric heaters (1000W < P < 2000W) and ovens (P > 1500W). Other types of loads, such as washing machines or heat pumps, although characterised by high energy consumption, may take some time to reach this level of absorption after starting.

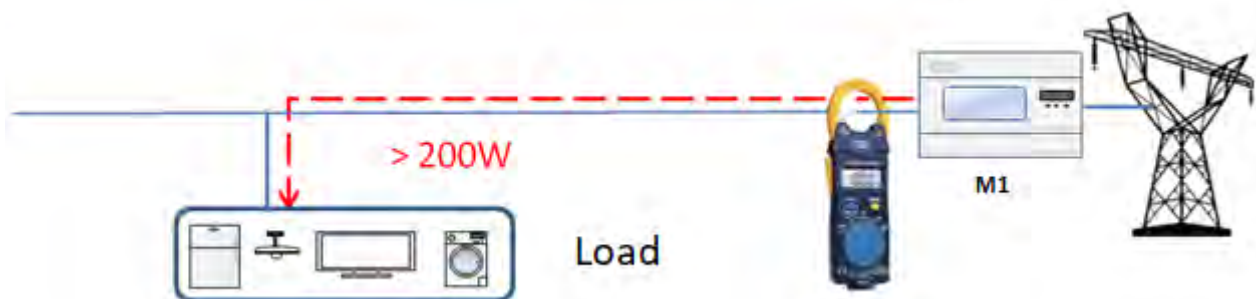


Figure 57 - Checking that the power consumption is above 200W

11. Supply DC power to the inverter by correctly switching on the batteries.
12. Supply AC power through the dedicated protection switch of the storage inverter. If there is more than one switch protecting the inverter (e.g. a circuit breaker and differential switch), they must all be set to ON to allow the inverter to be connected to the grid.



Figure 58 – Example of AC switch protecting the inverter

The following parameters must be configured before the 1PH HYD3000-HYD6000-ZP1 inverter starts working.

Parameter	Comment
1.Menu language selection	Default English
2.Set and confirm system time	If the collector or mobile APP is connected to the monitoring system, the time has been calibrated to the local time
*3.Safety parameter import	USB import: you need to find the safety parameters file (named by the corresponding safety country) on the website, download to the USB. Refer to the country code below and select country and code.
4.Setting the input channel	The default order: BAT1, BAT2, PV1, PV2)
5. Setup is complete	





- Safety parameter

Code		Region		Code		Region			
000	000	Germany	VDE4105	018	000	EU	EN50438		
	001		BDEW		001		EN50549		
	002		VDE0126	019	000	IEC EN61727	IEC EN61727		
				020	000	Korea	Korea		
001	000	Italy	CEI-021 Internal	021	000	Sweden	Sweden		
	001		CEI-016 Italy	022	000	Europe General	EU General		
	002		CEI-021 External					023	
	003		CEI-021 In Areti	024	000	Cyprus	Cyprus		
	004		CEI-021 In--HV						
	005		CEI-016--HV	025	000	India	India		
002	000	Australia	Australia-A	026	000	Philippines	PHI		
	008		Australia-B						
	009		Australia-C						
003	000	Spain	ESP-RD1699	027	000	New Zealand	New Zealand		
	002		NTS						
	003		UNE217002+RD647	028	000	Brazil	Brazil		
	004		Spian Island				001	Brazil-LV	
005	000	Denmark	Turkey	029	000	Slovakia	SK-VDS		
	001		Denmark						
	002		DK-TR322						
	003		Western Denmark						
006	000	Greece	GR-Continent	001	000	Czech	SK-SSE		
	001		GR-Island				002	SK-ZSD	
007	000	Netherlands	Netherlands	030	000	Czech	Czech		
				001			Czech-MV		
				031-032					
008	000	Belgium	Belgium	033	000	Ukraine	Ukraine		
009	000	UK	UK-G99	034	001	Norway	Norway-LV		
	001		UK-G98	035	000	Mexico	Mexico-LV		
010	000	China	China-B	039	000	60Hz wide range	Wide-Range-60Hz		
							000	EN50549-1	Ireland
							001	EN50549-1	Nor Ireland
							002	Nor Ireland G99	Nor Ireland
	001		Taiwan	040	000	Thailand	Thai-PEA		
	002		TrinaHome				001	Thai-MEA	
	003		HongKong	041-043					
	004		SKYWORTH						
	005		CSISolar						
	006		CHINT	044	000	South Africa	SA		
011	000	France	China-A	045	000	Dubai	DEWG		
	001		France				001	DEWG-MV	
	001		FAR Arrete23	047-106					
	003		France VFR 2019	107	000	Croatia	Croatia		
012	000	Poland	Poland	109-110					
	003		Poland-ABCD					111	000
013	000	Austria	Tor Erzeuger	112-120	001		Columbia-LV		



014				121	000	Saudi Arabia	IEC62116
				122	000	Latvia	
015	000	Switzerland	Switzerland-A	123	000	Romania	
	001		Switzerland-B				
16-17							



Caution

It is essential to make sure that you have selected the correct country code according to the requirements of the local authority.

For this purpose, consult a professional electrician or qualified personnel from the electrical safety authorities.

ZCS accepts no responsibility for consequences deriving from the selection of an incorrect country code.

Default values for other Settings

Item	Default status
Energy Storage Mode	Self-use Mode
EPS Mode	Disable
Anti Reflux	Disable
IV Curve Scan	Disable
Logic Interface	Disable



10.3. Commissioning

Main interface:

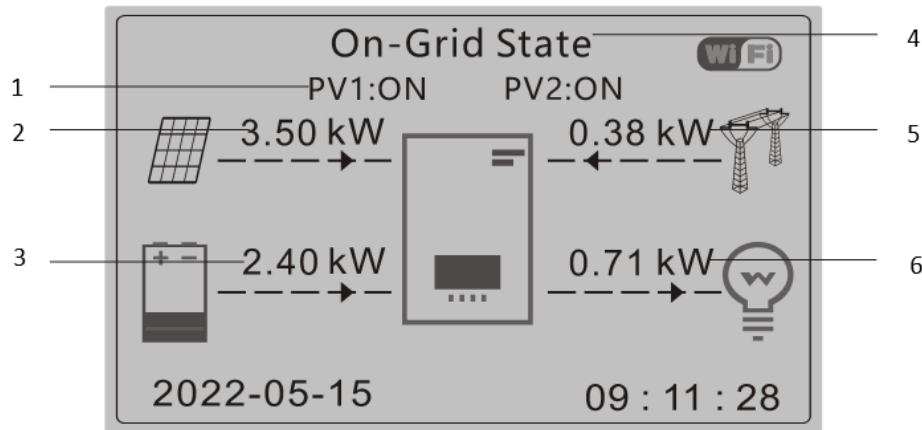


Figure 59 – Main interface

1	Circulates current PV and battery statue	4	Display current inverter status
2	PV Power	5	Grid Power
3	Battery Power	6	Loads Power

The default setting of the 1PH HYD3000-HYD6000-ZP1 inverter is “Automatic Mode” so if the setting has not been changed, the operating mode will be as follows:

- When “Photovoltaic Production” > “Household Consumption”
If the battery is not charged, the 1PH HYD3000-HYD6000-ZP1 inverter will charge the battery.
- When “Photovoltaic Production” < “Household Consumption”
If the battery is not discharged, the 1PH HYD3000-HYD6000-ZP1 inverter will discharge the battery and provide power to the domestic load.

10.4. Main menu

In the main interface, press the “Down” button to enter the page with the grid/battery/PV settings:

Main interface	Press “Down”
	Grid Output Information
	Grid(V)
	Grid(A)
	Frequency
	Battery information
	Battery(V)
	Battery current(A)
	Battery power(kW)
	Battery temperature(°C)
	Battery SOC(%)
	Battery cycles(T)
	PV Information
	PV1 Voltage(V)
	PV1 Current(A)
	PV1 Power(kW)
	PV2 Voltage(V)
	PV2 Current(A)
	PV2 Power(kW)
	Inverter Temperature(°C)

In the main interface, press “Back” to enter the main menu. The main menu has the following five options:

Main interface	Press “Back”
	1.System Settings
	2.Advanced Settings
“Up” ↑	3.Energy Statistic
	4.System Information
“Down” ↓	5.Event List
	6.Software Update
	7.Battery Real-time Information

10.5. Basic settings

1. System Setting	Press "OK"
"Up" ↑ "Down" ↓	1.Language Setting
	2.System Time
	3.Safety Param.
	4.Energy Storage Mode
	5.Auto Test
	6.Input channel Configuration
	7.EPS Mode
	8.Communication Addr.

10.5.1. Set language

Select "1. Language", then press "OK". Press "Up" or "Down" to select the language, then press "OK."

A quicker way: simultaneously press "Back" and "OK" to change the system language.

10.5.2. Set Time

Select "2. Time", press "OK" to enter the menu for setting the time, the format is Year-Month-Day Hours:Minutes:Seconds.

Press "Up" or "Down" to change the first digit, press "OK" to move to the next digit. After entering the current time, press "OK."

10.5.3. Safety Parameter.

User can modify the Safety Parameter. of the machine through the USB flash disk, and the user needs to copy the parameter information that needs to be modified into the USB flash disk card in advance.

10.5.4. Energy Storage Mode

Select "3. Energy Storage Mode" and press "OK" to enter the interface for setting the energy storage mode.

3.Energy Storage Mode	
"Up" ↑	1. Select automatic mode
	2. Select charge mode

“Down” ↓

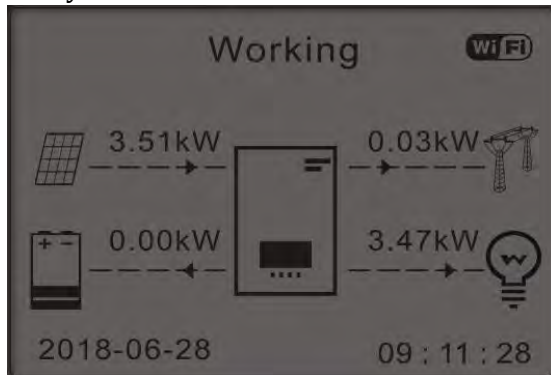
- | |
|--------------------------|
| 3. Select Time Zone mode |
| 4. Select Passive Mode |

1) Select automatic mode

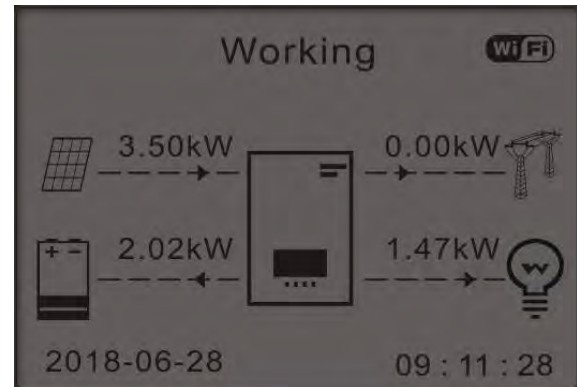
Select “1. Select automatic mode,” then press “OK.”

In automatic mode, the inverter will automatically charge and discharge the battery.

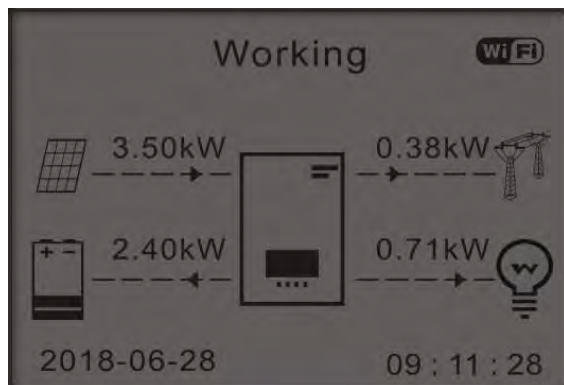
1) If PV production = LOAD consumption ($\Delta P < 100W$) the 1PH HYD3000-HYD6000-ZP1 inverter will not charge or discharge the battery.



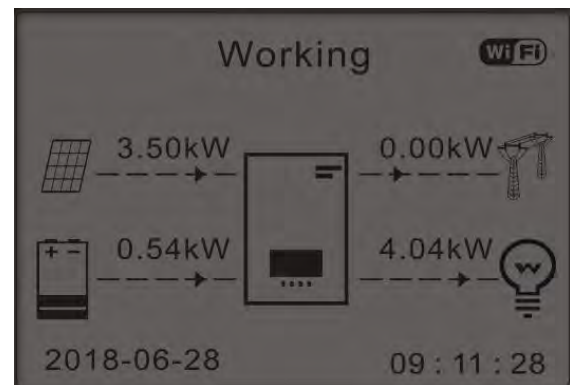
2) If PV production > LOAD consumption, the surplus power will be stored in the battery.



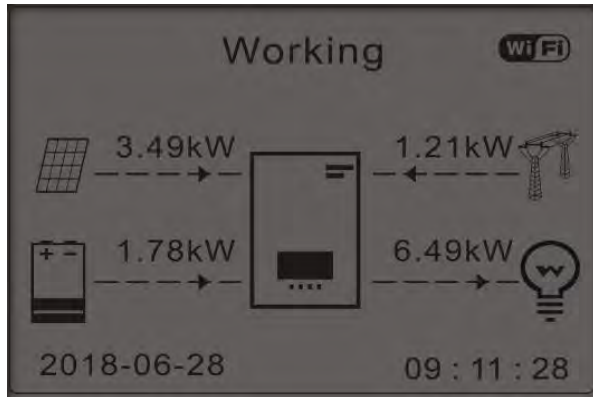
3) If the battery is fully charged (or already at max charge power), the surplus energy will be exported to the grid.



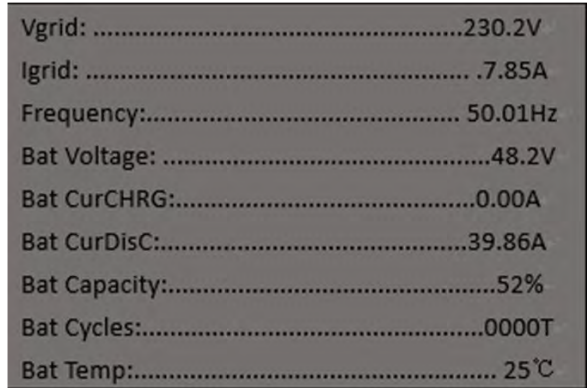
4) If PV production < LOAD consumption, then it will discharge the battery to supply power to the load.



5) If PV production + battery < LOAD consumption, the missing energy to feed the loads will be imported from the grid.



6) Press “DOWN” to display the current grid/battery parameters, press “UP” to go back to the main interface.



2) Time-of-ues Mode

You can set dates, days and times in which to set a forced charging of batteries up to the % of SOC set. Outside the non-peak charging period, the inverter operates in automatic mode.

You can set multiple Time-of-use rules to meet your more complex requirement. Right now we support 4 rules maximum (rule 0/1/2/3).

2.Time-of-use Mode

Time-of-use Mode			
Rules. 0: Disabled			
From	To	SOC	Charge
02h00m	- 04h00m	070%	01000W
Effective			
Date			
Dec. 22	-	Mar. 21	
Weekday select			
Mon. Tue. Wed. Thu. Fri. Sat. Sun.			

3) Timing Mode

Changing the value of a rule can set multiple timing rules.

3. Timing Mode

Timing Mode	
Rules. 0:	
Enabled/Disabled	
Charge Start	22 h 00 m
Charge End	05 h 00 m
Charge Power	02000 W
DisCharge Start	14 h 00m
DisCharge End	16 h 00m
DisCharge Power	02500 W

4) Passive Mode

4. Passive Mode

Passive mode allows the inverter to see the batteries but not let them intervene neither in charge nor in download. This setting is useful at the level of initial tests on the inverter for more detailed information regarding passive operation, ask Zucchetti Centro Sistemi S.p.A.

10.5.5. Photovoltaic Input Mode

Photovoltaic Input Mode selection: The 1PH HYD3000-HYD6000-ZP1 inverter has two MPPT channels. The two MPPTs can operate both independently and in parallel. If the PV strings are connected in parallel, "parallel mode" must be selected before connecting to the inverter; otherwise the default configuration (independent mode) must be used.

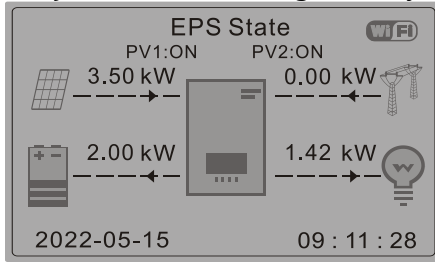
After changing the PV input mode, restart the 1PH HYD3000-HYD6000-ZP1 inverter to validate this change.

10.5.6. EPS Mode

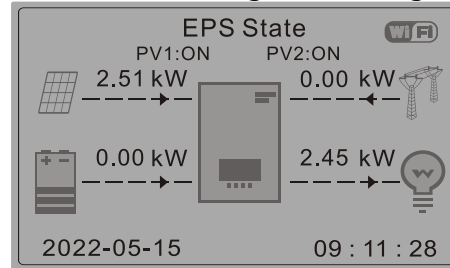
The EPS mode allows enabling the EPS output for critical loads.

5. Select EPS mode	1. EPS control mode	1. Enable EPS mode
		1. Disable EPS mode

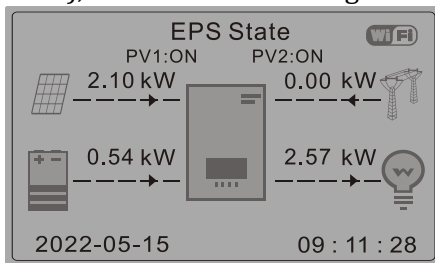
1) If PV generation > LOAD consumption ($\Delta P > 100W$), inverter will charge battery



2) If PV generation = LOAD consumption ($\Delta P > 100W$), inverter won't charge or discharge battery.



3) If PV generation < LOAD consumption ($\Delta P > 100W$), inverter will discharge battery.



10.5.7. Communication address

Select "6. Communication Address selection", then press "OK". Press "Up" or "Down" to change the first digit, press "OK" to move to the next digit. After changing the communication address-485 (**default: 01**), press "OK".

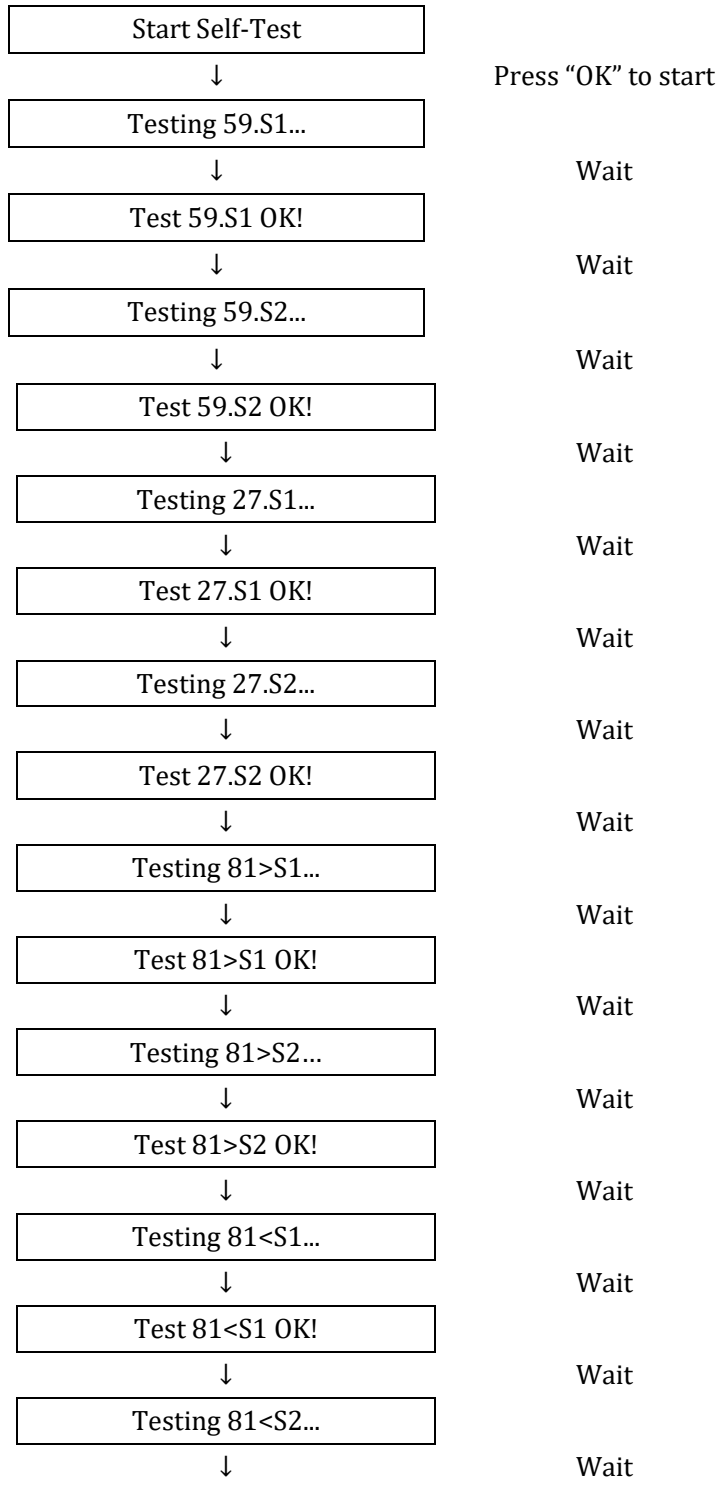
10.5.8. Self-test

Select "7. Self-test", press "OK" to enter the self-test interface.

7.Self-test	
"Up" ↑	1. Fast self-test
	2. STD Self-test
"Down" ↓	3. Set QF time
	3. Set QV time
	5. Control 81.S1

1) Fast self-test

Select "1. Fast self-test," then press "OK" to start the fast self-test.



Test 81<S2 OK!



OK self-test!



59.S1 threshold 253V 900ms



59.S1: 228V 902ms



59.S2 threshold 264.5V 200ms



59.S2: 229V 204ms



27.S1 threshold 195.5V 400ms

Press "OK"

Press "Down"

Press "Down"

Press "Down"

Press "Down"

Press "Down"

2) STD self-test

Select "2. STD self-test," the STD self-test. The same as the Fast Self-

then press "OK" to start test procedure is the Test, but much longer.

3) PF Time Setting

Select "3. PF Time Setting", then press "OK". The following will appear on the screen:

Set: *.*** s

Press "Up" or "Down" to change the first digit, press "OK" to move to the next digit. After changing all the digits, press "OK".

4) QV Time Setting

Select "4. QV Time Setting", then press "OK". The following will appear on the screen:

Set: ** s

Press "Up" or "Down" to change the first digit, press "OK" to move to the next digit. After changing all the digits, press "OK".

5) Control 81.S1

Select "5. Control 81.S1" and press "OK." Press "Up" or "Down" to "Enable 81.S1" or "Disable 81.S1", press "OK."

10.6. Advanced settings

2. Advanced settings	Enter password: 0715
"Up" ↑ "Down" ↓	1. Battery Parameter
	2. Battery Active
	3. Anti Reflux
	4. IV Curve Scan
	5. Logic interface
	6. Factory Reset
	7. Parallel Setting
	8. Reset Bluetooth
	9. CT Calibration
	10. Set Electricity Meter
	11. Neutral Point Grounding

Select "2. Advanced Settings" and press "OK", "Enter password" appears. Enter the password "0715", press "Up" or "Down" to change the first digit, press "OK" to move to the next digit, when "0715" appears on the screen press "OK" to enter the "Advanced Settings" interface.

If "Wrong, Try Again" appears on the screen, press "Back" and enter the password again.

10.6.1. Battery parameters

1. Battery Parameters	
"Up" ↑ "Down" ↓	1) Battery type
	2) Battery Number

10.6.2. Battery Quantity

Group 1 represents the number of cascading battery modules for the BAT1 port of the inverter.

Group 2 represents the number of battery modules connected to the BAT2 port of the inverter.

2 Battery 1

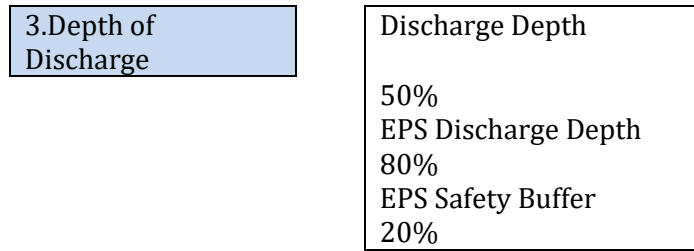
2. Battery 1	1. Max Charge (A)	4. Set ForceChargeTime
	2. Max Discharge (A)	5. Save
	3. Discharge Depth	

Depth of Discharge

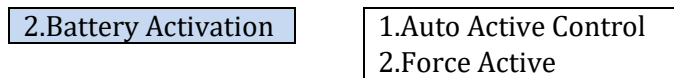
For example: if Discharge Depth = 50% & EPS Discharge Depth = 80%.

While grid is connected: Inverter won't discharge the battery when its SOC is less than 50%.

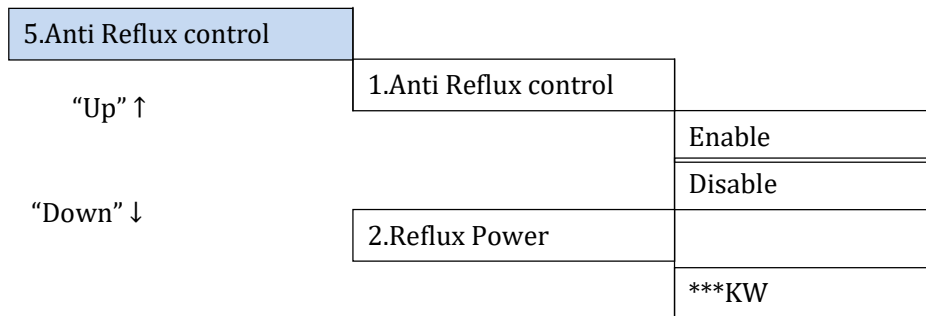
In case of blackout: Inverter will work in EPS mode (if EPS mode is enabled) & keep discharging the battery till battery SOC is less than 20%.



10.6.3. Battery Actiovation

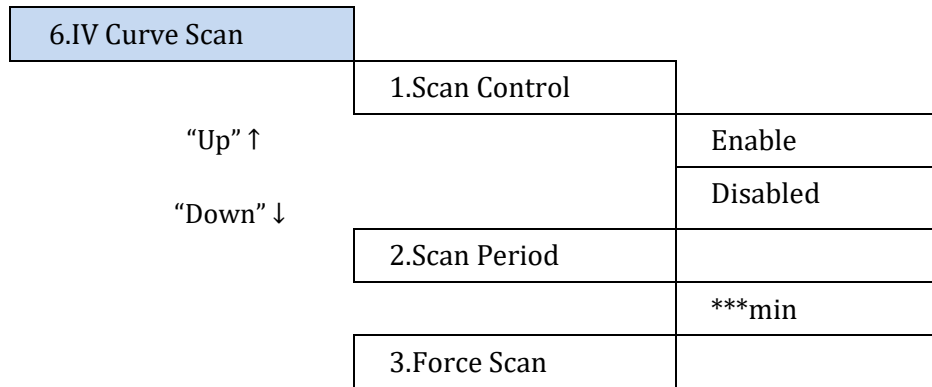


10.6.4. Anti Reflux



The user can enable the "Anti Reflux Control" to limit the maximum energy exported to the grid. Select "2. Reflux Power" to enter the maximum amount of energy exported to the grid.

10.6.5. IV Curve Scan

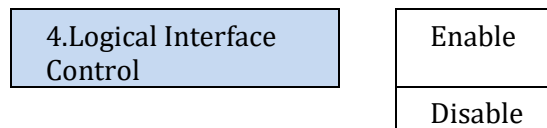


The user can enable the “IV Curve Scan” (scan MPPT) to have the 1PH HYD3000-HYD6000-ZP1 inverter periodically check the absolute maximum power points to provide maximum energy from a partially shaded PV array.

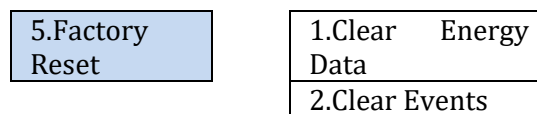
The user can enter the scan period or force an immediate scan.

10.6.6. Logical Interface Control

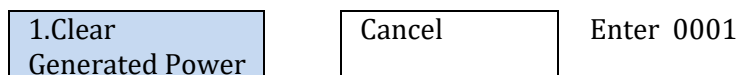
Enables or disables a logical interface. This feature is only available under certain safety regulations.



10.6.7. Factory Reset



Clear the total energy yield of the inverter.



Clear the history events of the inverter.



10.6.8. Parallel Setting

For the parallel system, please refer to <4.6 Parallel System > .

6.Parallel Setting	1.Parallel function control
	2.Parallel Primary-Replica
	3.Set Parallel Address
	4.Save

1. Parallel function control: Enable or disable the parallel function. This function must be enabled on both the master and slave machines.
2. Set master and slave: Set the master and slave. Select one inverter as the master and the others as slave machines.
3. Set parallel address: Set the parallel address for each inverter. In a parallel system, each inverter should have a parallel address that does not duplicate that of other machines. (Note: Parallel addresses are different from communications addresses used for monitoring.)
4. Save: Be sure to save after the Settings.

10.6.9. Bluetooth Reset

7.Bluetooth Reset	Please Confirm !	Succeed
-------------------	------------------	---------

10.6.10. CT Calibration

Used to calibrate the orientation and phase of the CT. The battery should be charged or discharged when using this feature.

For the inverter to perform this operation, it is necessary that:

- The system is connected to the grid
- The load output is not powered
- The batteries are present and switched on and at a maximum SOC of 40% to 80% (with depth of discharge $\leq 20\%$)
- The loads in the system are switched off
- Photovoltaic production is switched off
- Any other external production sources are switched off

8.CT Calibration	Start CT Calibration	Succeed/Failed
	Set CT Power Offset	***W

10.6.11. Set ElectricityMeter

This function is enabled when using a Mter (DDSU or DTSU) to read the exchange (address 001).

10.Set ElectricityMeter	Disable
	Enable

10.6.12. NeutralPointGrounding

11.NeutralPointGrounding

Disable

Enable

- **Safety parameters (and other functions not previously described that appear in the user interface)**

Contact ZCS Technical Support for more information.



10.7. Energy statistics

5. Energy Statistics							
1. Today	<table border="1"> <tr><td>Photovoltaic ***KWH</td></tr> <tr><td>Load ***KWH</td></tr> <tr><td>Export ***KWH</td></tr> <tr><td>Import ***KWH</td></tr> <tr><td>Charge ***KWH</td></tr> <tr><td>Discharge ***KWH</td></tr> </table>	Photovoltaic ***KWH	Load ***KWH	Export ***KWH	Import ***KWH	Charge ***KWH	Discharge ***KWH
Photovoltaic ***KWH							
Load ***KWH							
Export ***KWH							
Import ***KWH							
Charge ***KWH							
Discharge ***KWH							
2. Month	<table border="1"> <tr><td>Photovoltaic ***KWH</td></tr> <tr><td>Load ***KWH</td></tr> <tr><td>Export ***KWH</td></tr> <tr><td>Import ***KWH</td></tr> <tr><td>Charge ***KWH</td></tr> <tr><td>Discharge ***KWH</td></tr> </table>	Photovoltaic ***KWH	Load ***KWH	Export ***KWH	Import ***KWH	Charge ***KWH	Discharge ***KWH
Photovoltaic ***KWH							
Load ***KWH							
Export ***KWH							
Import ***KWH							
Charge ***KWH							
Discharge ***KWH							
3. Year	<table border="1"> <tr><td>Photovoltaic ***KWH</td></tr> <tr><td>Load ***KWH</td></tr> <tr><td>Export ***KWH</td></tr> <tr><td>Import ***KWH</td></tr> <tr><td>Charge ***KWH</td></tr> <tr><td>Discharge ***KWH</td></tr> </table>	Photovoltaic ***KWH	Load ***KWH	Export ***KWH	Import ***KWH	Charge ***KWH	Discharge ***KWH
Photovoltaic ***KWH							
Load ***KWH							
Export ***KWH							
Import ***KWH							
Charge ***KWH							
Discharge ***KWH							

4.Lifetime	
Photovoltaic	***KWH
Load	***KWH
Export	***KWH
Import	***KWH
Charge	***KWH
Discharge	***KWH

Select “5. Energy Statistics”, press “OK” to enter the Energy Statistics interface, which shows the energy production and consumption over a given period of time. Press “Up” or “Down” to check the energy statistics daily, weekly, monthly, annually, total.



10.8. System interface information

4. System information			
	Inverter information		
		Inverter Information (1)	SN Product
			Software version
			Hardware version
			Power Level
			Safety Firmware Version
		Inverter Information (2)	Software Version
			Country
			Safety Lib Version
		Inverter Information (3)	Input Channel 1
			Input Channel 2
			Input Channel 3
			Input Channel 4
		Inverter Information (4)	Energy Storage Mode
			RS485 Address
			Inverter Info (4)
			Energy Storage Mode
			RS485 Address
			Inverter Info (5)
			Logic Interface
			Power Factor
			Inverter Info (6)
			Anti Reflux
			Insulation Resistance



2.Battery Info	Battery Info (0)	Battery type
		Battery capacity
		Depth of discharge
		EPS Safety Buffer
	Battery Info (1)	Over (V) Protection
		Maximum charge (A)
		Maximum discharge (A)
		Charge Start
		Charge End
3.Safety Parameters	Safety parameters (0)	OVP 1
		OVP 2
		UVP 1
		UVP 2
	Safety parameters (1)	OFP 1
		OFP 2
		UFP 1
		UFP 2
	Safety parameters (2)	OVP 10mins



10.9. Event list

3. Event list	
"Up" ↑	1. List of current events
"Down" ↓	2. List of Historical events

1PH HYD3000-HYD6000-ZP1 inverter event list, including the lists of current and historical events.

1) List of current events

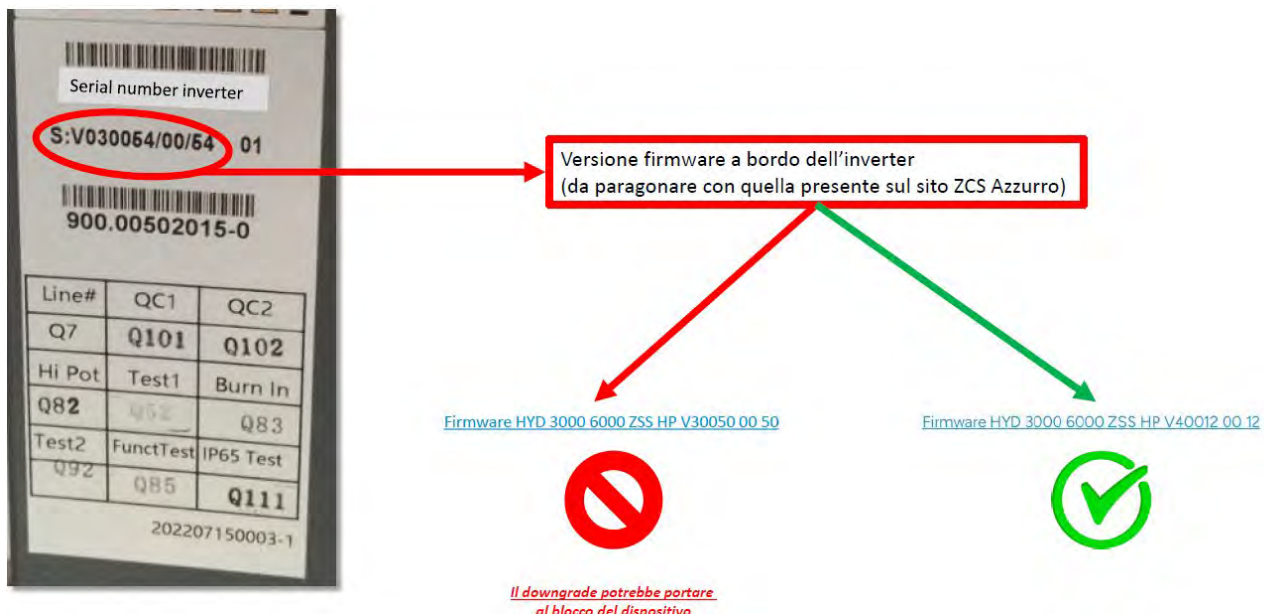
Select "1. List of Current Events", press "OK" to check the current events.

2) List of historical events

Select "2. List of Historical Events", press "OK" to check the historical events. Press "Up" or "Down" to check the historical events if there is more than one page of events.

10.10. Software Update

On first installation, all Zucchetti hybrid inverters must be updated to the latest firmware version found in the www.zcsazzurro.com website, unless the inverter is already updated to the version on the website or to a later version (see image below).



Serial number inverter
S:V030064/00/54 01
900.00502015-0

Line#	QC1	QC2
Q7	Q101	Q102
Hi Pot	Test1	Burn In
Q82	Q83	Q83
Test2	FunctTest	IP65 Test
Q92	Q85	Q111

202207150003-1

Versione firmware a bordo dell'inverter
(da paragonare con quella presente sul sito ZCS Azzurro)

Firmware HYD_3000_6000_ZSS_HP_V30050_00_50

Firmware HYD_3000_6000_ZSS_HP_V40012_00_12

Il downgrade potrebbe portare al blocco del dispositivo

ATTENTION!!! Downgrading the firmware version of the inverter could lead to a malfunction.
1PH HYD3000-HYD6000-ZP1 inverters must be upgraded using an 8 GB USB stick.

1PH HYD3000-HYD6000-ZP1 inverters offer software upgrade via USB flash drive to maximize inverter performance and avoid inverter operation error caused by software bugs.

Upgrade file folder name is firmware. The three upgrade file names are HYD-EP_ARM.bin, HYD-EP_DSPM.bin, HYD-EP_DSPS.bin.

Step 1: Insert the USB flash drive into the compute.

Step 2: Inside the website <https://www.zcsazzurro.com/it/> you will find the latest version of the software to carry out the update.. After user receive the file, please decompressing file and cover the original file in USB flash drive.

Step 3: Insert the USB flash drive into the USB/Wifi interface.

Step 4: Then turn on DC switch.

Step 5:

6.Software Update	OK	Input password	OK Input 0715
			Start Update
			Updating DSP1
			Updating DSP2
			Updating ARM

Step 6: If the following errors occur, please upgrade again. If this continues many times, contact technical support for help.

USB Fault	MDSP File Error	SDSP File Error
ARM File Error	Update DSP1 Fail	Update DSP2 Fail
Update ARM Fail		

Step 7: After the update is completed,turn off the DC breaker, wait for the LCD screen extinguish, then restore the WiFi connection and then turn on the DC breaker and AC breaker again,the inverter will enters the running state. User can check the current software version in SystemInfo>>SoftVersion.

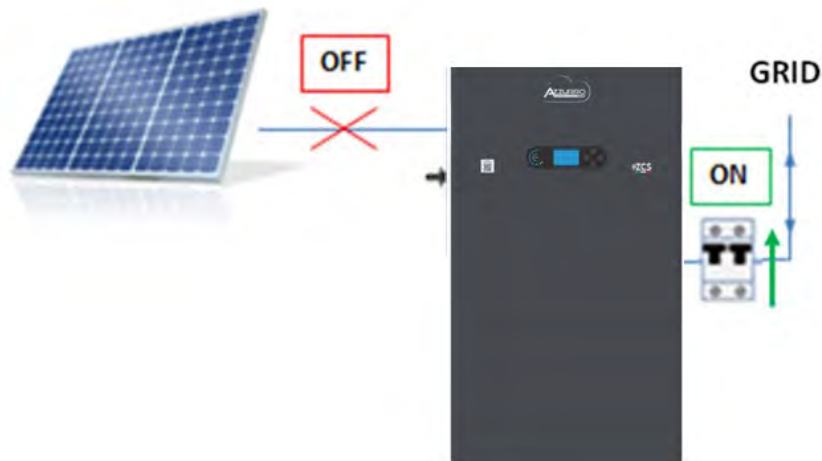
10.11. Verification of proper functioning

To check the proper functioning of the inverter, follow these steps:

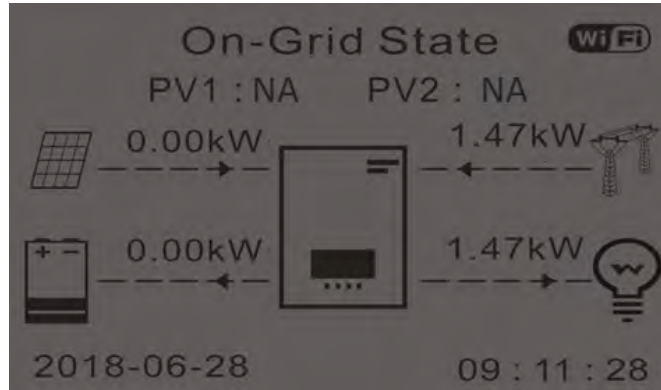
- Switch off any source of photovoltaic generation by turning the circuit breaker to the OFF position.
- Lower the protection switch of the 1PH HYD3000-HYD6000-ZP1 inverter. The inverter will remain switched on but will go into error due to a lack of AC power (if the EPS function is enabled, it will feed the priority loads).



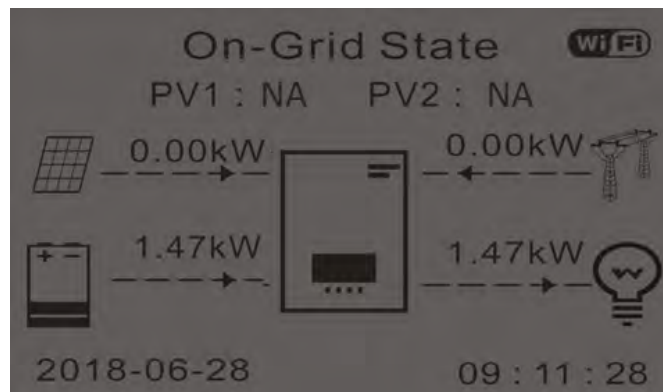
- Power up the inverter by pulling up the AC switch.



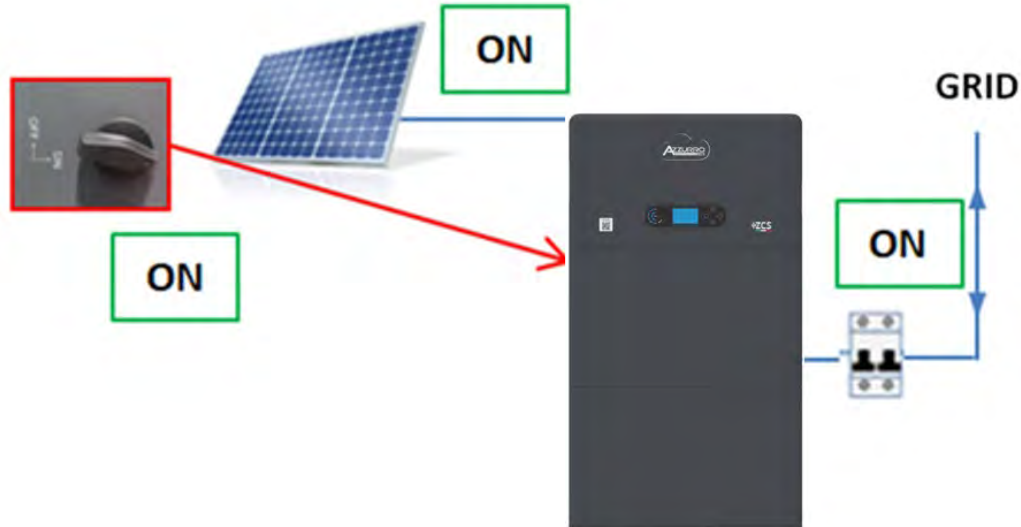
2. After pulling up the AC switch, the countdown will start according to the country code set (for CEI021-Internal, it will be 300s) to reconnect to the grid. During this period, check that the household loads are only powered by the grid and that there are no other power flows from either the photovoltaic system or the battery.



2. Once the countdown is over, the batteries will start to deliver power according to the availability towards the utility, trying to reset the consumption from the grid. During this period, check that the
3. value of the consumption remains constant* as the power supplied by the battery increases during discharge.
4. The power taken from the grid should decrease by an amount equal to the power supplied by the battery.

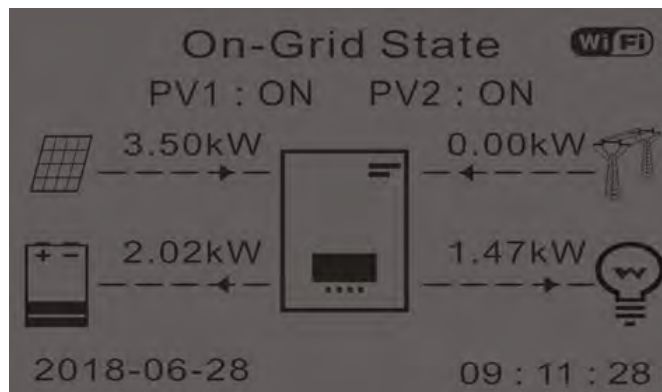


5. Switch on the photovoltaic system by turning the switch to the ON position.



6. Once the photovoltaic system has been activated, check that:

- The value of consumption shown on the screen remains constant as the photovoltaic power increases.
- Depending on the photovoltaic production, the system will operate according to its working mode.
- The value of PV production shown on the display is in line with the real photovoltaic production visible on the photovoltaic inverter.



7. If the above are not verified, check the positioning of the CTs and the direction by consulting the correct installation and initial start-up procedures.



11. Technical specifications

TECHNICAL DATA	1PH HYD 3000 ZP1	1PH HYD 3680 ZP1	1PH HYD 4000 ZP1	1PH HYD 4600 ZP1	1PH HYD 5000 ZP1	1PH HYD 6000 ZP1
DC input data (photovoltaic)						
Typical DC power*	4500W	5400W	6000W	6900W	7500W	9000W
Maximum DC power for each MPPT	2250W	2700W	3000W	3450W	3750W	4500W
No. of independent MPPTs / No. of strings per MPPT	2/1					
Maximum input voltage	550V					
Start-up voltage	100V					
Rated input voltage	360V					
MPPT DC voltage range	85V-520V					
MPPT DC voltage range at full load	140V-500V	170V-500V	100-500V	215V-500V	239V-500V	280V-500V
Maximum input current for each MPPT	16A/16A					
Maximum absolute current for each MPPT	22.5A/22.5A					
Battery technical data						
Type of compatible battery	HV 2BT 5K					
Rated voltage	400V					
Allowable voltage range	350V-435V					
Maximum charge/discharge power	3000W	3680W	4000W	4600W	5000W	6000W
Allowable temperature range**	0°C/+50°C (Charge) / -10°C/+50°C (Discharge)					
Number/capacity of installable batteries	1-4 / 5.1-20.4kWh					
Charge curve	Managed by integrated BMS					
Depth of Discharge (DoD)	0%-90% (programmable)					
Dimensions (H x L x D)	420mm x 708mm x 170mm					
Weight	50 kg					
AC output (grid side)						
Rated power	3000W	3680W	4000W	4600W	5000W	6000W
Maximum Power	3300VA	3680VA	4400VA	4600VA	5500VA	6600VA
Maximum current	15A	16.7A	20A	20.9A	25 A	30A
Connection type/Rated voltage	Single-phase L/N/PE 220, 230, 240V					
AC voltage range	180V-276V (according to the local standards)					
Rated frequency	50Hz/60Hz					
AC frequency range	44Hz-55Hz / 54Hz-66Hz (according to the local standards)					
Total harmonic distortion	< 3%					
Power factor	1 default (Programmable +/- 0.8)					
Grid feed-in limit	Programmable from display					
EPS Output (Emergency Power Supply)						
Maximum power supplied in EPS mode***	3000VA	3680VA	4000VA	4600VA	5000VA	6000VA
EPS output voltage and frequency	Single-phase 230V 50Hz/60Hz					
Current supplied in EPS mode	13A	16A	17.4A	20A	21.7A	26.1A
Total harmonic distortion	< 3%					
Switch time	< 10ms					
Efficiency						
Maximum efficiency	97.7%					
Weighted efficiency (EURO)	97.0%					
MPPT efficiency	>99.9%					
Consumption in stand-by	< 10W					
Protections						
Internal interface protection	Yes					
Safety protections	Anti-islanding, RCMU, Ground Fault Monitoring					
Reverse polarity protection DC	Yes					
DC circuit breaker	Integrated					
Overheating protection	Yes					
Overvoltage category/Protection class	Overvoltage Category III / Protection class I					
Integrated dischargers	AC/DC MOV: Type 3 Standard					
Battery soft start	Yes					
Standard						
EMC	EN 61000-3-2/3/11/12, EN 61000-6-2/3					
Safety standard	IEC 62116, IEC 61727, IEC 61683, IEC 60068-1/2/14/30, IEC 62109-1/2					
Grid connection standard	Connection certificates and standards available on www.zcsazzurro.com					
Communication						
Communication interfaces	Wi-Fi/4G/Ethernet (optional), RS485 (proprietary protocol), USB, CAN 2.0, Bluetooth					
Additional inputs or connections	Input for current sensor connection or meter					
Inverter general information						
Allowable ambient temperature range	-10°C...+50°C (power limit above 45°C)					
Topology	Transformerless / High-frequency isolation battery output					
Environmental protection class	IP65					
Allowable relative humidity range	5% - 95% without condensation					
Maximum operating altitude	4000m (derating above 2000m)					
Noise level	< 25dB @ 1mt					
Weight	22.5 kg					
Cooling	Natural convection					
Dimensions (H x L x D)	410mm x 708mm x 170mm					
Data monitoring	LCD Display + APP					
Warranty	10 years					


* The typical DC power does not represent a maximum applicable power limit. The online configurator available at www.zcsazzurro.com will provide any applicable configurations.

** Standard value for lithium batteries; maximum operating range between +10°C and +40°C;

*** Power output in EPS mode depends on the number and type of batteries, and the status of the system (i.e. residual capacity, temperature)

12. Troubleshooting

This section describes the potential errors for this product. Please read carefully for the following tips when doing the troubleshooting:

	Read the following section carefully. Check the warnings, messages and error codes shown on the screen.
Attention	

View the warning or error information and error codes displayed on the display to record all error information. If no error message is displayed on the LCD, perform the following steps to check whether the current installation status meets the operating requirements of the inverter:

- Is inverter be installed in a clean, dry, ventilated environment?
- Is the DC switch turn off?
- Are the cable cross section area and length meet the requirement?
- Are the input and output connection and wiring in good condition?
- Are the configuration settings correctly for the particular installation?
- Is the display panel properly connected to the communication cable and intact?

To view the recorded fault information, perform the following steps: On the home screen, press "XXX" to enter the main menu. Select "Events" and press "XXXX" to enter.

Ground fault alarm

The integrated inverters in this product comply with the ground fault alarm monitoring of IEC 62109-2 clause 13.9. If a grounding fault alarm occurs, the fault will be displayed on the LCD screen with red light on, and the fault can also be found in the fault history. For the machine equipped with WiFi/4G data collector, the alarm information can be seen on the corresponding monitoring website or received through the APP on the mobile phone.

ID No.	Name	Solution
ID001	The grid voltage is too high	If the alarm occurs occasionally, the possible cause is that the electric grid is abnormal occasionally. Inverter will automatically return to normal operating status when the electric grid's back to normal. If the alarm occurs frequently, check whether the grid voltage/frequency is within the acceptable range. If yes, please check the AC circuit breaker and AC wiring of the inverter. If the grid voltage/frequency is NOT within the acceptable range and AC wiring is correct, but the alarm occurs repeatedly, contact ZCS technical support to change the grid over-voltage, under-voltage, over-frequency, under-frequency protection points after obtaining approval from the local electrical grid operator.
ID002	The grid voltage is too low	
ID003	The grid frequency is too high	
ID004	The grid frequency is too low	
ID005	Charge Leakage Fault	Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If not, please contact ZCS technical support.
ID006	OVRT function is faulty	
ID007	LVRT function is faulty	
ID008	Island protection error	
ID009	Transient overvoltage of grid voltage 1	
ID010	Transient overvoltage of grid voltage 2	
ID012	Inverter voltage error	
ID017	Power grid current sampling error	
ID018	Wrong sampling of dc component of grid current	
ID019	Power grid voltage sampling error (DC)	
ID020	Power grid voltage sampling error (AC)	
ID022	Leakage current sampling error(AC)	
ID024	Input current sampling error	
ID025	DCI sampling error(AC)	

ID026	Branch current sampling	
ID029	Leakage current consistency error	
ID030	Grid voltage consistency error	
ID031	DCI consistency error	
ID032	Offgrid ground fault	
ID034	SPI communication error (AC)	
ID036	Chip error (AC)	
ID038	Inverter soft startup fails	
ID042	Low insulation impedance	Check the insulation resistance between the photovoltaic array and ground (ground), if there is a short circuit, the fault should be repaired in time. If not solved, please contact ZCS technical support.
ID043	Ground fault	Check ac output PE wire for grounding.
ID044	Error setting input mode	Check the PV input mode (parallel/independent mode) setting of the inverter. If not, change the PV input mode
ID045	CT Fault	Check whether the CT connection is correct
ID046	Input reverse connection error	Check whether the DC input connection is correct
ID047	Paralle lFault	Check whether parallel is enabled Check whether parallel addresses overlap Check whether the parallel network is connected properly
ID048	SN doesn't match Type	please contact ZCS technical support.
ID050	Radiator 1 temperature protection	Make sure the inverter is installed in a place free from direct sunlight. Make sure the inverter is installed in a cool/well-ventilated place. Ensure that the inverter is installed vertically and the ambient temperature is lower than the upper limit of the inverter temperature.
ID057	Temperature 1 protection	
ID065	Unbalanced bus voltage RMS	Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter.
ID066	The transient value of bus voltage is	

	unbalanced	Check whether the problem is solved. If not, please contact ZCS technical support.
ID067	Bus undervoltage during grid connection	
ID069	PV over-voltage	Check whether the PV series voltage (Voc) is higher than the maximum input voltage of the inverter. If yes, adjust the number of PV modules in series and reduce the PV string voltage to fit the input voltage range of the inverter. After correction, the inverter will automatically return to normal state.
ID070	Bat over-voltage	Check whether the battery overvoltage Settings are inconsistent with battery specifications
ID072	Inverter bus voltage RMS software overvoltage	Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If not, please contact ZCS technical support.
ID073	Inverter bus voltage instantaneous value software overvoltage	
ID081	Battery overcurrent protection by software	
ID082	Dci overcurrent protection	
ID083	Output instantaneous current protection	
ID085	Output effective value current protection	
ID086	PV overcurrent software protection	
ID087	PV flows in uneven parallel	
ID098	Inverter bus hardware overvoltage	
ID099	BuckBoosthardware overflows	
ID100	Reserved	
ID102	PV hardware overflows	
ID103	Ac output hardware overflows	
ID105	Meters communication fault	Check whether the meter is enabled Check whether the meter wiring is correct
ID107	Hardware version error	Internal faults of inverter, switch OFF inverter,

		wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If not, please contact ZCS technical support
ID110	Overload Protection 1	Check whether the inverter works in overload state.
ID111	Overload Protection 2	
ID112	Overload Protection 3	
ID113	Overtemperature derating	Make sure the inverter is installed in a place free from direct sunlight. Make sure the inverter is installed in a cool/well-ventilated place. Ensure that the inverter is installed vertically and the ambient temperature is lower than the upper limit of the inverter temperature.
ID114	Frequency derating	Make sure the grid frequency and voltage are within acceptable range.
ID124	Battery low voltage protection	Check whether the battery voltage is too low or the battery discharge depth is too low.
		Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If not, please contact ZCS technical support.
ID130	Permanent Bus overvoltage failure	
ID132	PV unbalance current permanent fault	
ID134	Output current imbalance permanent fault	Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If not, please contact ZCS technical support.
ID138	Output hardware overcurrent permanent failure	Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If not, please contact ZCS technical support.
		Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If not, please contact ZCS technical support.
ID140	Relay permanent fault	
ID142	DC SPD failure	Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If not, please contact ZCS technical support.
ID144	Grid relay permanent fault	Internal faults of inverter, switch OFF inverter,

		wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If not, please contact ZCS technical support.
ID152	The software version is inconsistent with the safety version	Internal faults of inverter, switch OFF inverter, wait for 5 minutes, then switch ON inverter. Check whether the problem is solved. If not, please contact ZCS technical support.
ID153	SCI communication error (DC)	
ID156	Inconsistent software versions	Contact technical support to obtain the upgrade software.
ID157	Lithium battery 1 communication error	Make sure the battery you use is compatible with the inverter. CAN communication is recommended. Check whether the communication cable or port between the battery and the inverter is faulty.
ID161	Force shutdown	The inverter is forced to shut down.
ID162	Remote shutdown	The inverter is shut down remotely.
ID163	Drms0 shutdown	The inverter is Drms0 shut down
ID165	Remote derating	The inverter is derating remotely
ID166	Logic interface derating	The inverter is Logic interface derating
ID167	Anti refluxderating	The inverter is Anti refluxderating
ID169	Fan 1 fault	Check whether fan 1 of the inverter works properly
ID170	Fan 2 fault	Check whether fan 2 of the inverter works properly
ID171	Fan 3 fault	Check whether fan 3 of the inverter works properly
ID172	Fan 4 fault	Check whether fan 4 of the inverter works properly
ID173	Fan 5 fault	Check whether fan 5 of the inverter works properly
ID174	Fan 6 fault	Check whether fan 6 of the inverter works properly

ID175	Fan 7 Fault	Check whether fan 7 of the inverter works properly
ID176	Communication failure of electricity meter	Make sure the battery you use is compatible with the inverter. CAN communication is recommended. Check whether the communication cable or port between the battery and the inverter is faulty.
ID177	BMS over-voltage alarm	The lithium battery is faulty. Shut down the inverter and lithium battery. Wait for 5 minutes and start the inverter and lithium battery. Check whether the problem is rectified. If not, contact technical support.
ID178	BMS under-voltage alarm	
ID179	BMS high temperature alarm	
ID180	BMS low temperature alarm	
ID181	BMS over-current alarm	
ID182	BMS Short circuit alarms	
ID183	BMS Version inconsistency	
ID184	BMSCAN Version inconsistency	
ID185	BMS CAN Version is too low	
ID189	Communication failure of arc equipment	
ID401 ~ ID432	Acr fault	
ID 801	The charging soft start failed	
ID 802	The discharging soft start failed	Restart the battery. If the problem is not resolved, please contact technical support .
ID 807	Pcu version inconsistency	Check whether the number of batteries is set correctly. If the setting is correct, please contact technical support to upgrade software.
ID 808	Radiator 1 high temperature alarm	Please make sure the battery is installed in a cool well-ventilated place. If The battery is installed correctly, please contact technical support .
ID 809	Ambient high temperature alarm	
ID 813	Charging prohibition alarm	If the battery is almost fully, no action is required. Otherwise, please contact technical support .

ID 814	Discharging prohibition alarm	If the battery is almost empty, no action is required. Otherwise, please contact technical support .
ID 864	Over temperature protection of radiator 1	Power off and wait for 2 hours. If the problem is not solved, please contact technical support.
ID 865	Over temperature protection of ambient temperature	
ID 867	Can1 communication failure	If this fault occurs occasionally, wait a few minutes to see whether the problem is solved. If this fault occurs frequently, please contact technical support.
ID 872	Bus software overvoltage	
ID 873	Bus software undervoltage	
ID 874	Battery software overvoltage	
ID 875	Battery software undervoltage	
ID 876	Battery software overcurrent	
ID 879	Hardware overcurrent	
ID 880	Permanent bus overvoltage	Restart the battery and wait for minutes. If the problem is not resolved, please contact technical support.
ID 881	Permanent battery undervoltage	
ID 882	Permanent Instant overcurrent	
ID 883	Permanent hardware overcurrent	
ID 894	Permanent battery activation failed	
ID 895	Permanent bus reverse connection	Check whether the wiring is correct and restart the battery. If the problem is not resolved, please contact technical support.
ID 896	Battery status error	Restart the battery. If the problem is not resolved, please contact technical support.
ID 897	PWM mode error	
ID 898	BMS version error	
ID 899	BMS overvoltage and overcurrent fault	If this fault occurs occasionally, wait a few minutes to see whether the problem is solved. If this fault occurs frequently, please contact technical support.
ID 900	Battery average overcurrent protection	
ID 901	Average overload protection	
ID 902	Bus software overcurrent	

ID 903	Software CBC overcurrent protection	
ID 904	Pack ID error	Restart the battery and wait for seconds. If the problem is not resolved, please contact technical support.
ID 928	Battery reversal	Check whether the wiring is correct and restart the battery. If the problem is not resolved, please contact technical support.
ID 929	Fusing failure	Restart the battery. If the problem is not resolved or occurs frequently, please contact technical support.

13. Maintenance

Inverters generally do not require daily or routine maintenance. In any case, for proper long-term operation of the inverter, make sure that the heatsink for cooling the inverter has enough space to ensure adequate ventilation and that it is not obstructed by dust or other items.

Cleaning the inverter and battery module

Please clean the inverter with an air blower, a dry & soft cloth or a soft bristle brush. Do NOT clean the inverter with water, corrosive chemicals, detergent, etc.

Cleaning the heatsink

In order to ensure the normal function and long service life of the product, it is necessary to ensure that there is enough air flow space around the radiator at the rear of the product, and there is no material around the radiator that obstructs the air flow, such as dust or snow, must be removed. Clean the radiator with compressed air, a soft cloth, or a soft brush. Do not use water, corrosive chemicals, cleaning agents, or strong detergents to clean the heat sink.

13.1. Store and charge the battery module

Battery module storage requirements:

1. Environment temperature : $-10^{\circ}\text{C}\sim 50^{\circ}\text{C}$, Recommended storage temperature : $25^{\circ}\text{C}\sim 35^{\circ}\text{C}$.
2. Storage relative humidity range : $5\%\sim 70\%$.
3. Store in a dry, clean, and ventilated environment, away from direct sunlight.
4. If the battery module is stored for a long time, replenish the power supply periodically. Battery module power supply requirements: the charging current is less than or equal to 7A, and the battery module needs to be charged to 50%SOC.

Recharge Requirements During Normal Storage

When the battery is stored for a long time, you need to perform regular maintenance. If the storage time is close to that shown in the following table, arrange supplementary power supply in time.

Recharge conditions when in storage

Storage Environment Temperature	Relative Humidity of Storage Environment	Storage Time	SOC
< -10°C	/	Prohibit	/
-10°C~25°C	5%~70%	≤12 months	30%≤SOC≤60%
25°C~35°C	5%~70%	≤6 months	30%≤SOC≤60%
35°C~45°C	5%~70%	≤3 months	30%≤SOC≤60%
> 45°C	/	Prohibit	/

Recharge Requirements When Over Discharged

Recharge the battery within the time range specified in the following table (90%DOD). Otherwise, the overdischarged battery module will be damaged.

Recharge conditions when battery is over discharged

Storage Environment Temperature	Storage Time	Note
-10°C~25°C	≤15 days	/
25°C~45°C	≤7 days	30%≤SOC≤60%
-10°C~45°C	≤12 hours	/

14. Uninstalling

14.1. Uninstallation steps

- Disconnect the inverter from the AC grid.
- Disconnect the DC switch (located on the battery or installed on the wall)
- Wait 5 minutes
- To remove the DC connectors from the inverter
- Remove the connectors for communication with the batteries, current sensors and NTC temperature probe.
- Remove the AC terminals.
- Unscrew the fixing bolt of the bracket and remove the inverter from the wall.

14.2. Packaging

If possible, pack the product in its original packaging.

14.3. Storage

Store the inverter in a dry place where the ambient temperature is between -25 and +60°C.

14.4. Disposal

Zucchetti Centro Sistemi S.p.a. is not liable for the disposal of the equipment, or parts thereof, that does not take place according to the regulations and standards in force in the country of installation.



The symbol of the crossed-out wheeled bin indicates that the equipment, at the end of its useful life, must be disposed of separately from household waste.

This product must be handed over to the waste collection point in your local community for recycling.

For more information, please contact the waste collection authority in your country.

Inappropriate waste disposal could have negative effects on the environment and on human health due to potentially hazardous substances.

With your cooperation in the correct disposal of this product, you contribute to the reuse, recycling and recovery of the product, and to the protection of our environment.

15. Monitoring systems

ZCS monitoring				
Product code	Product photo	APP monitoring	Portal monitoring	Possibility to send commands and to update the inverter remotely in case of technical support
ZSM-WIFI				
ZSM-ETH				
ZSM-4G				
Datalogger 4-10 Inverters				
Datalogger up to 31 Inverters				

15.1. External Wi-Fi adapter

15.1.1. Installation

Unlike the internal Wi-Fi card, the external adapter must be installed for all compatible inverters. However, the procedure is quicker and easier as there is no need to open the front cover of the inverter.

In order to monitor the inverter, the RS485 communication address must be set to 01 directly from the display.

Installation tools:

- Cross screwdriver
- External Wi-Fi adapter

- 1) Switch off the inverter following the procedure described in this manual.
- 2) Remove the cover for accessing the Wi-Fi connector on the bottom of the inverter by unscrewing the two cross-head screws (a), or by unscrewing the cover (b), as shown in the figure.

(a)



(b)



Figure 60- Port for external Wi-Fi adapter

- 3) Connect the Wi-Fi adapter to the appropriate port, making sure to follow the direction of the connection and ensure correct contact between the two parts.

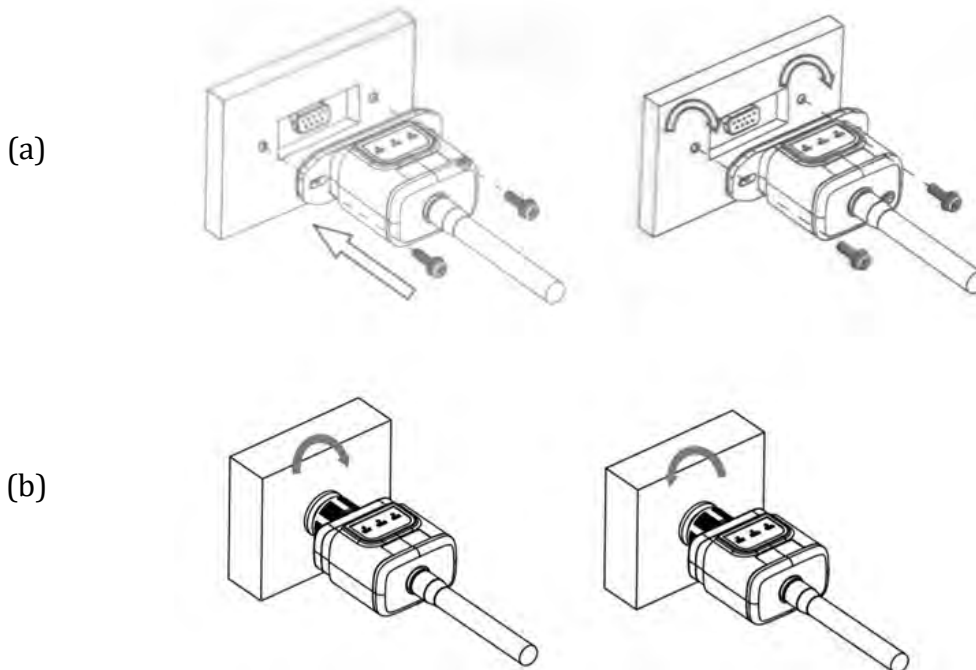


Figure 61- Inserting and securing the external Wi-Fi adapter

4) Switch on the inverter by following the procedure described in the manual.

15.1.2. Configuration

Configuration of the Wi-Fi adapter requires the presence of a Wi-Fi network near the inverter in order to achieve stable transmission of data from the inverter adapter to the Wi-Fi modem.

Tools required for configuration:

- Smartphone, PC or tablet

Go to front of the inverter and search for the Wi-Fi network using a smartphone, PC or tablet, making sure that the signal from the home Wi-Fi network reaches the place where the inverter is installed.

If the Wi-Fi signal is present at the location where the inverter is installed, the configuration procedure can begin.

If the Wi-Fi signal does not reach the inverter, a system must be installed to amplify the signal and bring it to the installation location.

- 1) Activate the search for the Wi-Fi networks on your telephone or PC so that all the networks visible by your device are displayed.



Figure 62 - Search for Wi-Fi networks on iOS smartphone (left) and Android smartphone (right)

Note: Disconnect from any Wi-Fi networks to which you are connected by removing automatic access.



Figure 63 - Disabling automatic reconnection to a network

- 2) Connect to a Wi-Fi network generated by the inverter's Wi-Fi adapter (i.e. AP_*****, where ***** indicates the serial number of the Wi-Fi adapter shown on the label of the device), which operates as an access point.

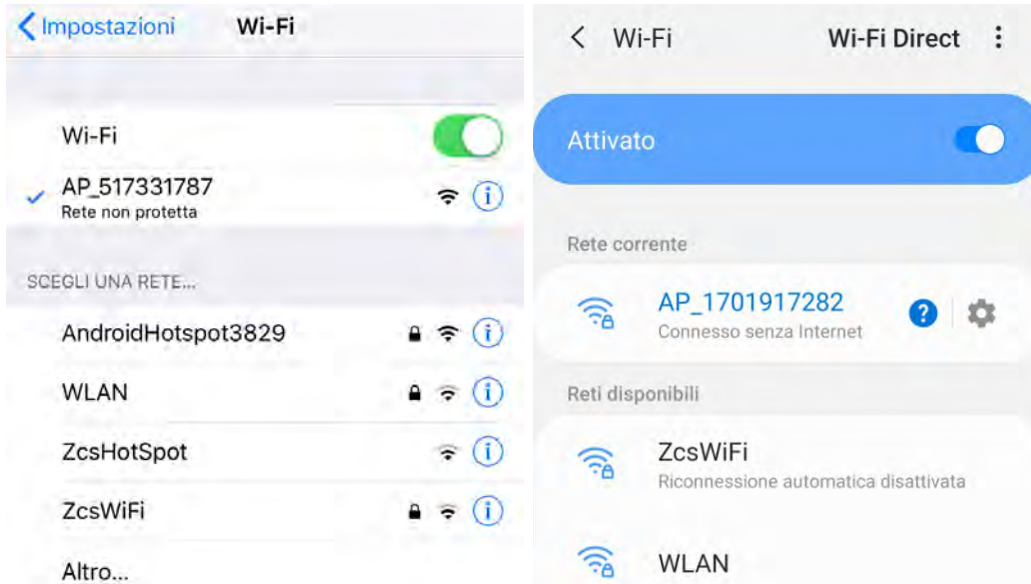


Figure 64 - Connection to Access Point for Wi-Fi adapter on iOS smartphone (left) and Android smartphone (right)

- 3) If you are using a second-generation Wi-Fi adapter, you will be prompted for a password to connect to the inverter's Wi-Fi network. Use the password found on the box or on the Wi-Fi adapter.



Figure 65 - Password of external Wi-Fi adapter

Note: To ensure that the adapter is connected to the PC or smartphone during the configuration procedure, enable automatic reconnection of the AP_***** network.

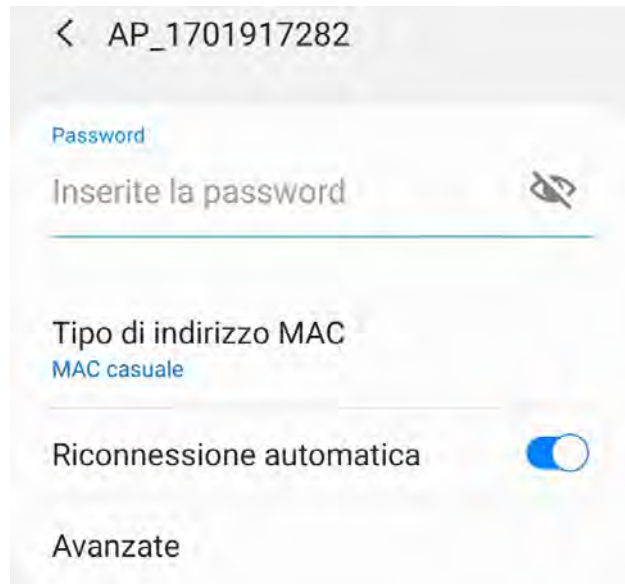


Figure 66 – Password entry prompt

Note: the Access Point is not able to provide internet access; confirm to maintain the Wi-Fi connection, even if the internet is not available



Figure 67 – Screen indicating that the Internet cannot be accessed

- 4) Open a browser (Google Chrome, Safari, Firefox) and enter the IP address 10.10.100.254 in the address bar at the top of the screen.
In the box that appears, enter “admin” as both the Username and Password.



Figure 68 – Screen for accessing the web server to configure the Wi-Fi adapter

- 5) The status screen will open, showing the logger information such as the serial number and firmware version.

Check that the Inverter Information fields are filled in with the inverter information.

The language of the page can be changed using the command in the top right-hand corner.

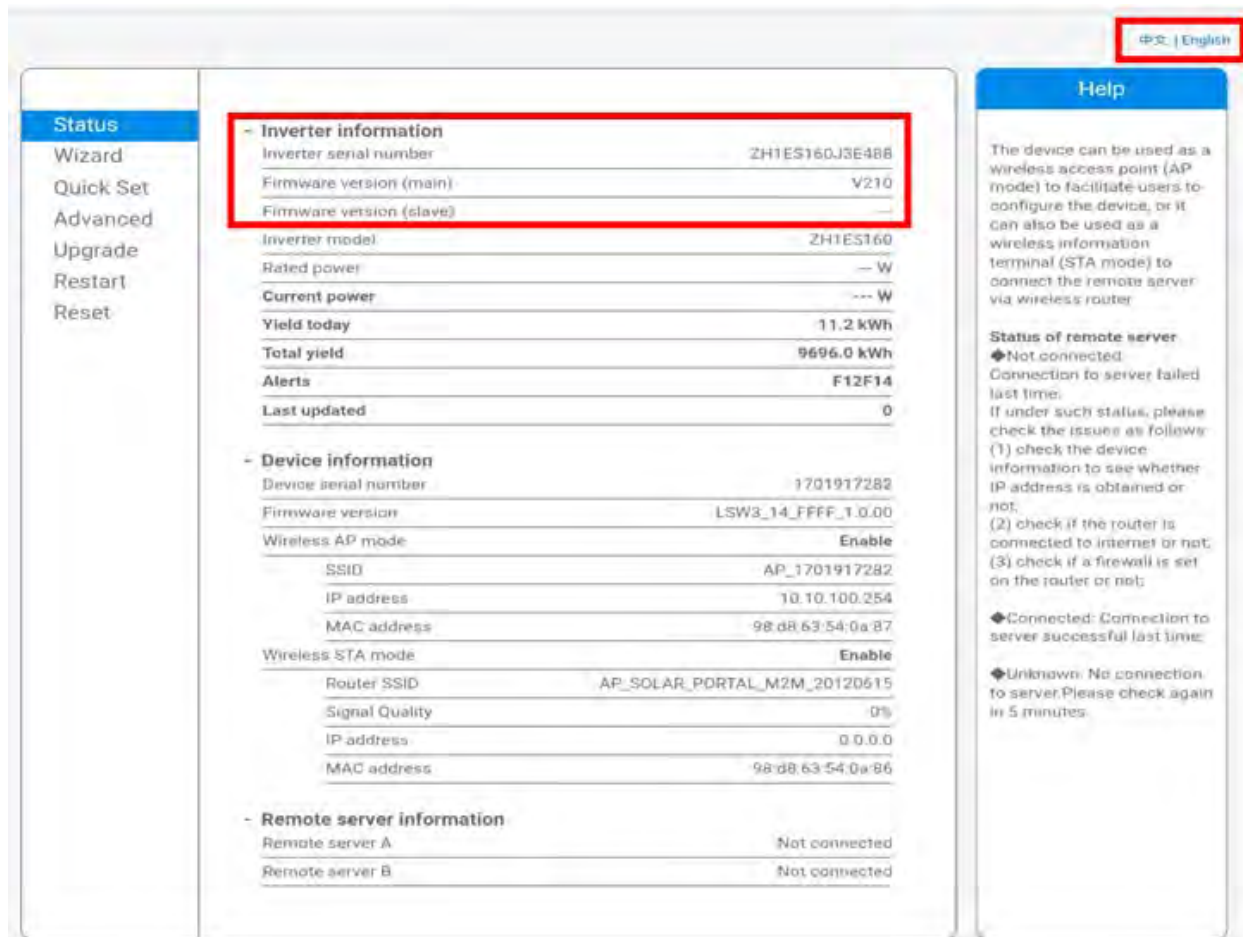


Figure 69 – Status screen

- 6) Click on the Wizard setup button in the left-hand column.
- 7) In the new screen that opens, select the Wi-Fi network to which you want to connect the Wi-Fi adapter, making sure that the Received Signal Strength Indicator (RSSI) is greater than 30%. If the network is not visible, press the Refresh button.
Note: check that the signal strength is greater than 30%, if not, bring the router closer or install a repeater or signal amplifier.
Click Next.

Please select your current wireless network:

Site Survey

SSID	BSSID	RSSI	Channel
<input checked="" type="radio"/> iPhone di Giacomo	EE:25:EF:6C:31:18	100	6
<input type="radio"/> ZcsWiFi	FE:EC:DA:1D:C3:9	86	1
<input type="radio"/> ZcsHotSpot	FC:EC:DA:1D:C3:9	86	1
<input type="radio"/> WLAN	E:EC:DA:1D:C3:9	86	1
<input type="radio"/> ZcsHotSpot	FC:EC:DA:1D:C8:A3	57	11
<input type="radio"/> WLAN	E:EC:DA:1D:C8:A3	57	11
<input type="radio"/> ZcsWiFi	FE:EC:DA:1D:C8:A3	54	11
<input type="radio"/> WLAN	E:EC:DA:1D:C8:8B	45	1
<input type="radio"/> ZcsWiFi	FE:EC:DA:1D:C8:8B	37	1
<input type="radio"/> ZcsHotSpot	FC:EC:DA:1D:C8:8B	35	1

★Note: When RSSI of the selected WiFi network is lower than 15%, the connection may be unstable, please select other available network or shorten the distance between the device and router.

Refresh

Add wireless network manually:

Network name (SSID)
(Note: case sensitive)

Encryption method

Encryption algorithm

Next

1 2 3 4

Figure 70 – Screen for selecting the available wireless network (1)

- 8) Enter the password of the Wi-Fi network (Wi-Fi modem), clicking on Show Password to make sure it is correct; the password should not contain special characters (&, #, %) and spaces.
 Note: During this step, the system is not able to ensure that the password entered is the one actually requested by the modem, therefore please make sure you enter the correct password.
 Also check that the box below is set to Enable.
 Then click “Next” and wait a few seconds for verification.

Please fill in the following information:

Password (8-64 bytes)
(Note: case sensitive)
 Show Password

Obtain an IP address automatically

IP address

Subnet mask

Gateway address

DNS server address

1 2 3 4

Figure 71 - Screen for entering the password of the wireless network (2)

9) Click "Next" again without ticking any of the options relating to the system security.

Enhance Security

You can enhance your system security by choosing the following methods

- Hide AP
- Change the encryption mode for AP
- Change the user name and password for Web server

1 2 3 4

Figure 72 - Screen for setting the security options (3)

10) Click “OK”.

Setting complete!

Click OK, the settings will take effect and the system will restart immediately.

If you leave this interface without clicking OK, the settings will be ineffective.

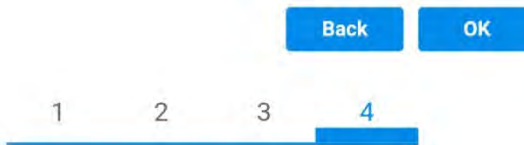


Figure 73 – Final configuration screen (4)

- 11) At this point, if the configuration of the adapter is successful, the last configuration screen will appear, and the telephone or PC will unpair from the inverter’s Wi-Fi network.
- 12) Manually close the web page with the Close key on the PC or remove it from the background of the telephone.

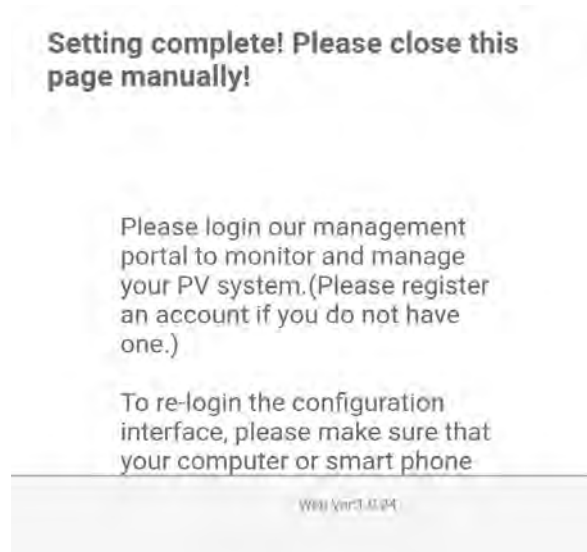


Figure 74 - Successful configuration screen

15.1.3. Verification

To verify the correct configuration, connect to it again and access the status page. Check the following information:

- a. Wireless STA mode
 - i. Router SSID > Router name
 - ii. Signal Quality > other than 0%
 - iii. IP address > other than 0.0.0.0
- b. Remote server information
 - i. Remote server A > Connected

Wireless STA mode		Enable
Router SSID	iPhone di Giacomo	
Signal Quality	0%	
IP address	0.0.0.0	
MAC address	98:d8:63:54:0a:86	
- Remote server information		
Remote server A	Not connected	

Figure 75 – Status screen

Status of LEDs present on the adapter

- 1) Initial status:
 - NET (left LED): off
 - COM (central LED): steady on
 - READY (right LED): flashing on



Figure 76 - Initial status of LEDs

- 2) Final status:
NET (left LED): steady on
COM (central LED): steady on
READY (right LED): flashing on



Figure 77 - Final status of LEDs

If the NET LED does not light up or if the Remote Server A option in the Status page still shows “Not Connected”, the configuration was not successful, i.e. the wrong router password was entered or the device was disconnected during connection.

It is necessary to reset the adapter:

- Press the Reset button for 10 seconds and release
- After a few seconds, the LEDs will turn off and READY will start to flash quickly
- The adapter has now returned to its initial state. At this point, the configuration procedure can be repeated again.

The adapter can only be reset when the inverter is switched on.



Figure 78 – Reset button on the Wi-Fi adapter

15.1.4. Troubleshooting

Status of LEDs present on the adapter

- 1) Irregular communication with inverter
- NET (left LED): steady on
 - COM (central LED): off
 - READY (right LED): flashing on



Figure 79 - Irregular communication status between inverter and Wi-Fi

- Check the Modbus address set on the inverter:

Enter the main menu with the ESC key (first key on the left), go to System Info and press ENTER to enter the submenu. Scroll down to the Modbus address parameter and make sure it is set to 01 (and in any case, other than 00).

If the value is not 01, go to “Settings” (basic settings for hybrid inverters) and enter the Modbus Address menu where the 01 value can be set.

- Check that the Wi-Fi adapter is correctly and securely connected to the inverter, making sure to tighten the two cross-head screws provided.
- Check that the Wi-Fi symbol is present in the top right-hand corner of the inverter's display (steady or flashing).



Figure 80 - Icons on the display of LITE single-phase inverters (left) and three-phase or hybrid inverters (right)

- Restart the adapter:
 - Press the reset button for 5 seconds and release
 - After a few seconds, the LEDs will turn off and will start to flash quickly
 - The adapter will now be reset without having lost the configuration with the router

2) Irregular communication with remote server

- NET (left LED): off
- COM (central LED): on
- READY (right LED): flashing on



Figure 81 - Irregular communication status between Wi-Fi and remote server

- Check that the configuration procedure has been carried out correctly and that the correct network password has been entered.
- When searching for the Wi-Fi network using a smartphone or PC, make sure that the Wi-Fi signal is strong enough (a minimum RSSI signal strength of 30% is required during configuration). If necessary, increase it by using a network extender or a router dedicated to inverter monitoring.
- Check that the router has access to the network and that the connection is stable; check that a PC or smartphone can access the Internet
- Check that port 80 of the router is open and enabled to send data
- Reset the adapter as described in the previous section

If, at the end of the previous checks and subsequent configuration, Remote server A is still “Not Connected” or the NET LED is off, there may be a transmission problem at the home network level and, more specifically, that data between the router and server is not being transmitted correctly. In this case, it is advisable to carry out checks at the router level in order to ensure that there are no obstructions on the output of data packets to our server.

To make sure that the problem lies in the home router and to exclude problems with the Wi-Fi adapter, configure the adapter using the Wi-Fi hotspot function on your smartphone as a reference wireless network.

- **Using an Android mobile phone as a modem**

- Check that the 3G/LTE connection is active on your smartphone. Go to the Settings menu of the operating system (the gear icon on the screen with a list of all the apps installed on the phone), select “Other” from the Wireless and networks menu and make sure that the Network type is set to 3G/4G/5G.
- In the Android settings menu, go to Wireless & networks > Other. Select Mobile Hotspot/Tethering, and then enable the Wi-Fi mobile hotspot option; wait a few seconds for the wireless network to be created. To change the name of the wireless network (SSID) or your password, select Configure Wi-Fi hotspot.

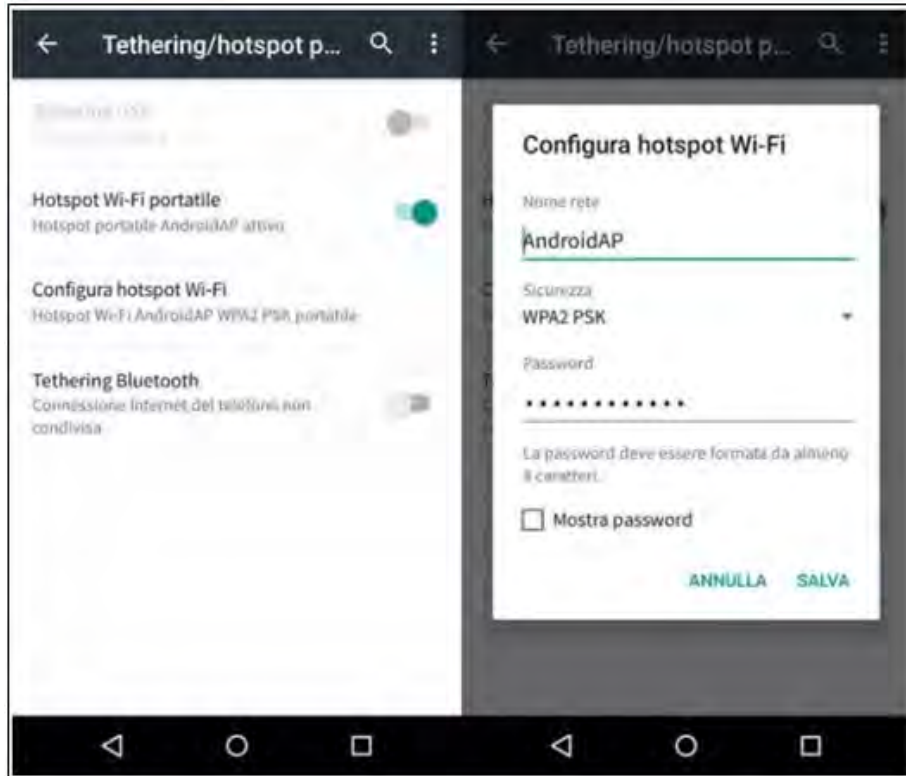


Figure 82 – Configuration of an Android smartphone as a hotspot router

- **Using an iPhone as a modem**

- In order to share the iPhone connection, verify that the 3G/LTE network is active by going to Settings > Mobile Phone, and making sure that the “Voice and data” option is set to 5G, 4G or 3G. To enter the iOS settings menu, click the grey gear icon on the home screen of your phone.
- Go to the Settings menu > Personal Hotspot and turn on the Personal Hotspot option. The hotspot is now enabled. To change the password of the Wi-Fi network, select Wi-Fi password from the personal hotspot menu.

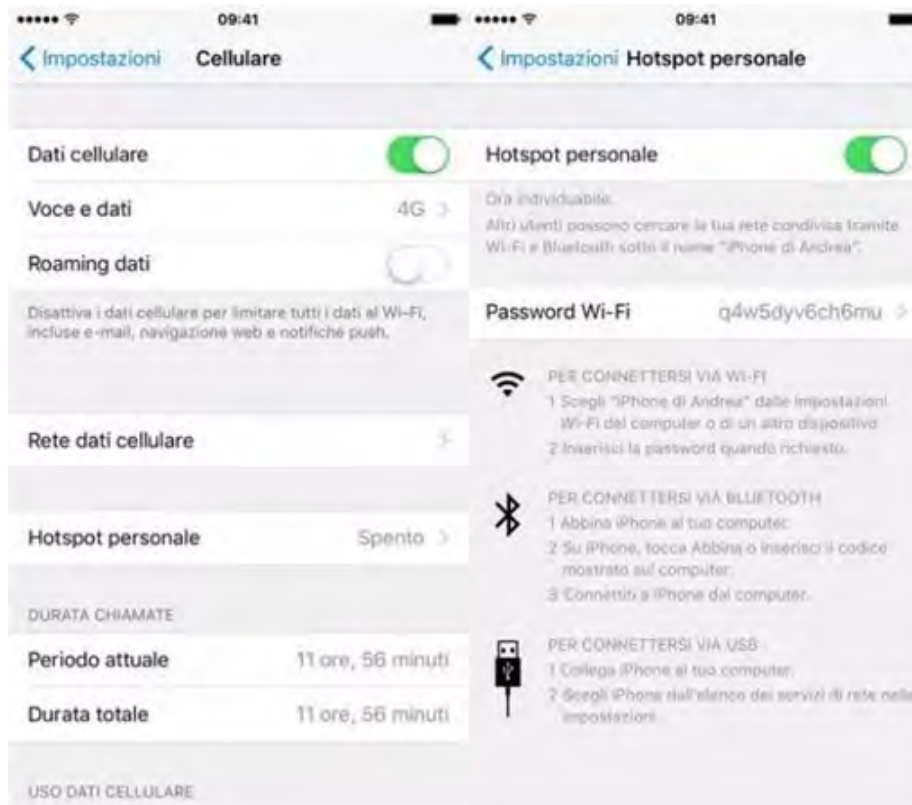


Figure 83 - Configuration of an iOS smartphone as a hotspot router

At this point, it is necessary to re-configure the Wi-Fi adapter using a PC or smartphone other than the one used as a modem.

During this procedure, when asked to select the Wi-Fi network, choose the one activated by the smartphone and then enter the password associated with it (which can be changed from the personal hotspot settings). If at the end of configuration, "Connected" appears next to "Remote Server A", then the problem is with the home router.

It is therefore advisable to check the brand and model of the home router you are trying to connect to the Wi-Fi adapter; some router brands may have closed communication ports. In this case, contact the customer service of the router's manufacturer and ask them to open port 80 (direct from the network to external users).

15.2. Ethernet adapter

15.2.1. Installation

Installation must be carried out for all inverters compatible with the adapter. However, the procedure is quicker and easier as there is no need to open the front cover of the inverter. Proper operation of the device requires the presence of a modem correctly connected to the network and in operation in order to achieve stable data transmission from the inverter to the server.

In order to monitor the inverter, the RS485 communication address must be set to 01 directly from the display.

Installation tools:

- Cross screwdriver
- Ethernet adapter
- Shielded network (Cat. 5 or Cat. 6) crimped with RJ45 connectors

- 1) Switch off the inverter following the procedure described in this manual.
- 2) Remove the cover for accessing the Wi-Fi/Eth connector on the bottom of the inverter by unscrewing the two cross-head screws (a), or by unscrewing the cover (b), depending on the inverter model, as shown in the figure.



Figure 84 - Port of the Ethernet adapter

- 3) Remove the ring nut and the waterproof cable gland from the adapter to allow the network cable to pass through; then insert the network cable network into the appropriate port on the inside of the adapter and tighten the ring nut and cable gland to ensure a stable connection.

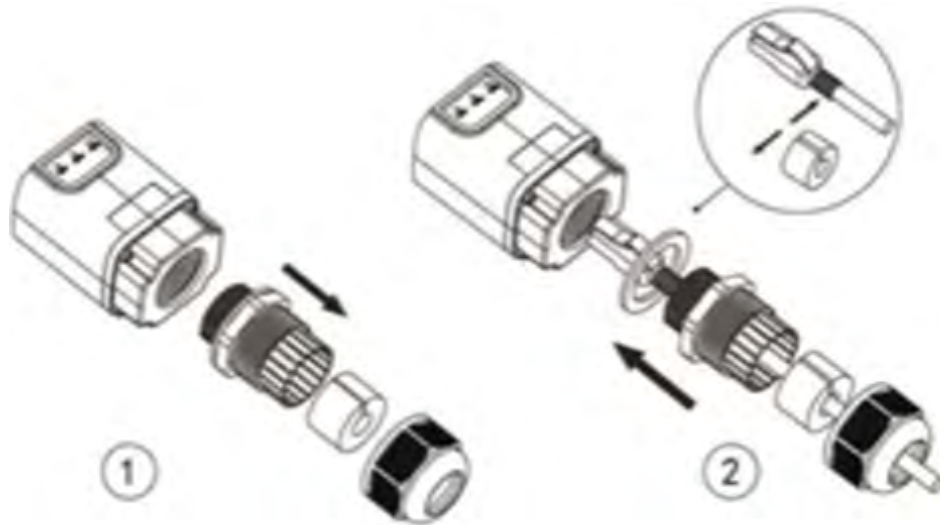


Figure 85 - Inserting the network cable inside the device

- 4) Connect the Ethernet adapter to the appropriate port, making sure to follow the direction of the connection and ensure correct contact between the two parts.

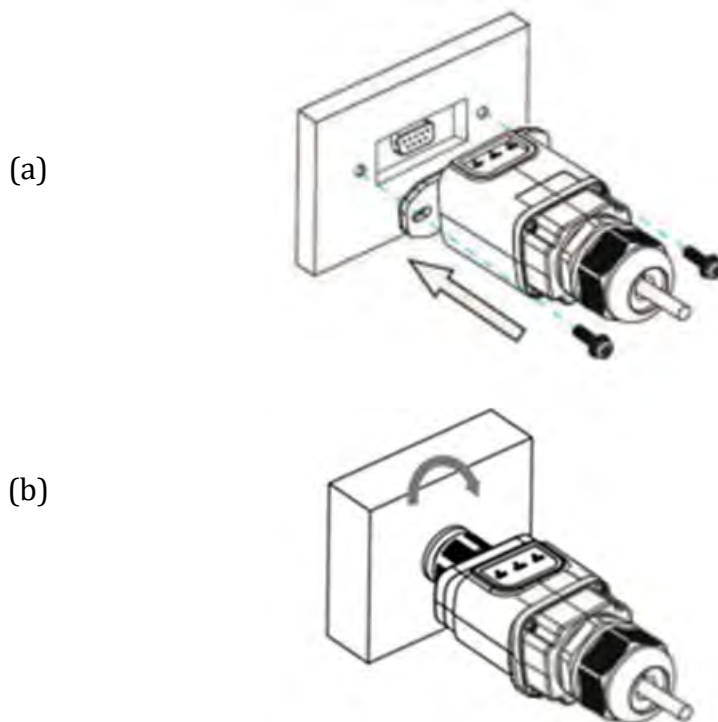


Figure 86 - Inserting and securing the ethernet adapter

- 5) Connect the other end of the network cable to the ETH output (or equivalent) of the modem or a suitable data transmission device.

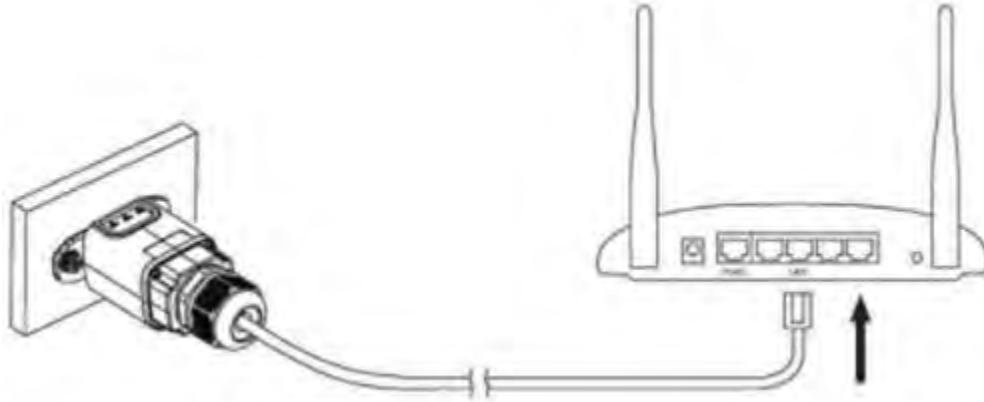


Figure 87 - Connecting the network cable to the modem

- 6) Switch on the inverter by following the procedure described in the manual.
- 7) Unlike Wi-Fi cards, the Ethernet adapter does not need to be configured and starts transmitting data shortly after the inverter is switched on.

15.2.2. Verification

Wait two minutes after installing the adapter, and check the status of the LEDs on the device.

Status of LEDs present on the adapter

- 1) Initial status:
 - NET (left LED): off
 - COM (central LED): steady on
 - SER (right LED): flashing on



Figure 88 - Initial status of LEDs

- 2) Final status:
NET (left LED): steady on
COM (central LED): steady on
SER (right LED): flashing on



Figure 89 - Final status of LEDs

15.2.3. Troubleshooting

Status of LEDs present on the adapter

- 1) Irregular communication with inverter
- NET (left LED): steady on
 - COM (central LED): off
 - SER (right LED): flashing on



Figure 90 - Irregular communication status between the inverter and adapter

- Check the Modbus address set on the inverter:
 Enter the main menu with the ESC key (first key on the left), go to System Info and press ENTER to enter the submenu. Scroll down to the Modbus address parameter and make sure it is set to 01 (and in any case, other than 00).
 If the value is not 01, go to “Settings” (basic settings for hybrid inverters) and enter the Modbus Address menu where the 01 value can be set.
- Check that the Ethernet adapter is correctly and securely connected to the inverter, making sure to tighten the two cross-head screws provided. Check that the network cable is correctly inserted into the device and modem, and that the RJ45 connector is correctly crimped.

2) Irregular communication with remote server

- NET (left LED): off
- COM (central LED): on
- SER (right LED): flashing on



Figure 91 - Irregular communication status between the adapter and remote server

- Check that the router has access to the network and that the connection is stable; check that a PC can access the Internet

Check that port 80 of the router is open and enabled to send data.

It is advisable to check the brand and model of the home router you are trying to connect to the Ethernet adapter; some router brands may have closed communication ports. In this case, contact the customer service of the router’s manufacturer and ask them to open port 80 (direct from the network to external users).

15.3. 4G adapter

The ZCS 4G adapters are sold with a virtual SIM integrated into the device with data traffic fee included for 10 years, which is adequate for the proper transmission of data to monitor the inverter.

In order to monitor the inverter, the RS485 communication address must be set to 01 directly from the display.

15.3.1. Installation

Installation must be carried out for all inverters compatible with the adapter. However, the procedure is quicker and easier as there is no need to open the front cover of the inverter.

Installation tools:

- Cross screwdriver
 - 4G adapter
- 4) Switch off the inverter following the procedure described in this manual.
- 5) Remove the cover for accessing the Wi-Fi/ GPRS connector on the bottom of the inverter by unscrewing the two cross-head screws (a), or by unscrewing the cover (b), depending on the inverter model, as shown in the figure.



Figure 92 – Port of the 4G adapter



- 6) Insert the 4G adapter into the appropriate port, making sure to follow the direction of the connection and ensure correct contact between the two parts. Secure the 4G adapter by tightening the two screws inside the package.

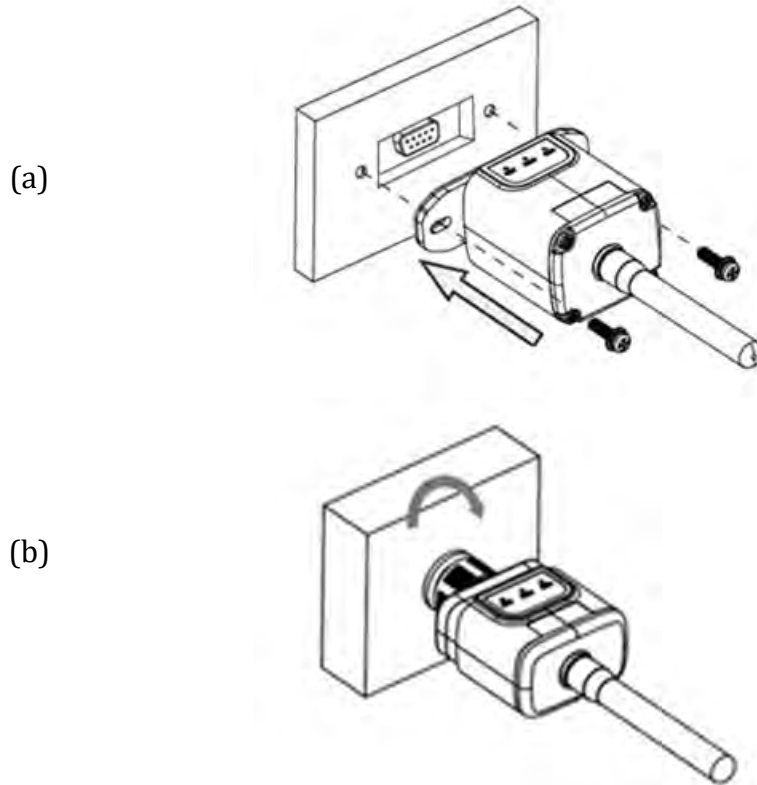


Figure 93 - Inserting and securing the 4G adapter

- 7) Switch on the inverter by following the procedure described in the manual.
- 8) Unlike Wi-Fi cards, the 4G adapter does not need to be configured and starts transmitting data shortly after the inverter is switched on.

15.3.2. Verification

After installing the adapter, within the next 3 minutes check the status of the LEDs on the device to ensure that the device is configured correctly.

Status of LEDs present on the adapter

- 1) Initial status:
- NET (left LED): off
 - COM (central LED): flashing on
 - SER (right LED): flashing on



Figure 94 - Initial status of LEDs

2) Registration:

- NET (left LED): flashes rapidly for about 50 seconds; the registration process takes about 30 seconds
- COM (central LED): flashes rapidly 3 times after 50 seconds

3) Final status (approx. 150 seconds after the inverter has started):

- NET (left LED): flashing on (off and on at equal intervals)
- COM (central LED): steady on
- SER (right LED): steady on



Figure 95 - Final status of LEDs

Status of LEDs present on the adapter

1) Irregular communication with inverter

- NET (left LED): on
- COM (central LED): off
- SER (right LED): on



Figure 96 - Irregular communication status between inverter and adapter

- Check the Modbus address set on the inverter:
Enter the main menu with the ESC key (first key on the left), go to System Info and press ENTER to enter the submenu. Scroll down to the Modbus address parameter and make sure it is set to 01 (and in any case, other than 00).

If the value is not 01, go to “Settings” (basic settings for hybrid inverters) and enter the Modbus Address menu where the 01 value can be set.
- Check that the 4G adapter is correctly and securely connected to the inverter, making sure to tighten the two cross-head screws provided.

2) Irregular communication with remote server:

- NET (left LED): flashing on
- COM (central LED): on
- SER (right LED): flashing on



Figure 97 - Irregular communication status between the adapter and remote server

- Check that the 4G signal is present in the installation location (the adapter uses the Vodafone



network for 4G transmission; if this network is not present or the signal is weak, the SIM will use a different network or will limit the data transmission speed). Ensure that the installation location is suitable for 4G signal transmission and that there are no obstacles that could affect data transmission.

- Check the status of the 4G adapter and that there are no external signs of wear or damage.



15.4. Datalogger

15.4.1. Preliminary notes on how to configure the datalogger

The AzzurroZCS inverters can be monitored via a datalogger connected to a Wi-Fi network present at the place of installation or via an ethernet cable connected to a modem.

ZCS monitoring				
Product code	Product photo	APP monitoring	Portal monitoring	Possibility to send commands and to update the inverter remotely in case of technical support
ZSM-WIFI				
ZSM-ETH				
ZSM-4G				
Datalogger 4-10 Inverters				
Datalogger up to 31 Inverters				

The inverters are connected in a daisy chain to the datalogger via a RS485 serial line.

- Datalogger up to 4 inverters (code ZSM-DATALOG-04): allows to monitor up to 4 inverters.
It can be connected to the network via an Ethernet or Wi-Fi network.
- Datalogger up to 10 inverters (code ZSM-DATALOG-10): allows to monitor up to 10 inverters.
It can be connected to the network via an Ethernet or Wi-Fi network.



Figure 98 – Diagram for connecting the ZSM-DATALOG-04 / ZSM-DATALOG-10 datalogger

- Datalogger up to 31 inverters (code ZSM-RMS001/M200): allows to monitor up to 31 inverters or a system with a maximum installed power of 200kW.

It can be connected to the network via an Ethernet cable.

- Datalogger up to 31 inverters (code ZSM-RMS001/M1000): allows to monitor a maximum of 31 inverters or a system with a maximum installed power of 1000kW.

It can be connected to the network via an Ethernet cable.



Figure 99 – Diagram showing the operation of the ZSM-RMS001/M200 / ZSM-RMS001/M1000 datalogger

All these devices carry out the same function, i.e. they transmit data from the inverters to a web server to allow remote monitoring of the system either through the “Azzurro System” app or through the www.zcsazzurroportal.com website.

All the Azzurro ZCS inverters can be monitored using the datalogger; different models or families of inverters can also be monitored.

15.4.2. Electrical connections and configuration

All the Azzurro ZCS inverters have at least one RS485 connection point.

The connections can be made via the green terminal block or via the RJ45 plug inside the inverter.

Use positive and negative conductors. There is no need to use a conductor for the GND. This applies to both the terminal block and the plug.

The serial line can be created using a shielded RS485 certificated cable.

In case of monitoring of multiple inverters, continue the shielding of the cables when entering the exit under the COM port of the inverter. Connect the shield to the ground on one side (inverter side).

- 4) In the case of three-phase inverters, a suitably crimped network cable with a RJ45 connector can also be used:
 - a. Place the blue cable in position 4 of the RJ45 connector and the white-blue cable in position 5 of the RJ45 connector, as shown in the figure below.
 - b. Insert the connector into the 485-OUT terminal.
 - c. If there is more than one three-phase inverter, insert another connector in the 485-IN terminal to connect to the 485-OUT input of the next inverter.

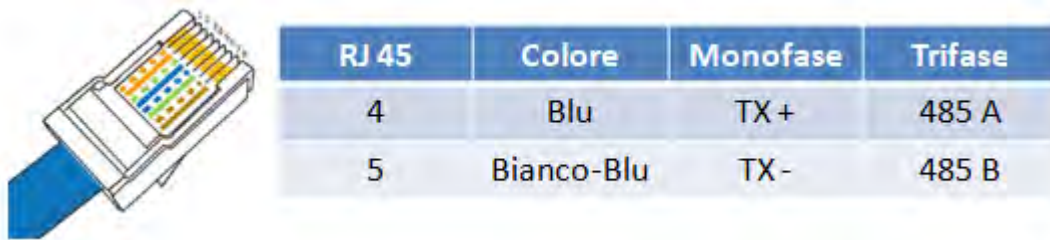


Figure 100 – Pin out for connecting the RJ45 connector

- 5) Daisy chain
 - a. Insert the blue cable into input A1 and the white-blue cable into input B1.
 - b. If there is more than one three-phase inverter, insert a blue cable into input A2 and a white-blue cable into input B2 and connect them to the respective A1 and B1 inputs of the next inverter.

Some inverters have both an RS485 terminal block and RJ45 plugs. This is shown in detail in the figure below.

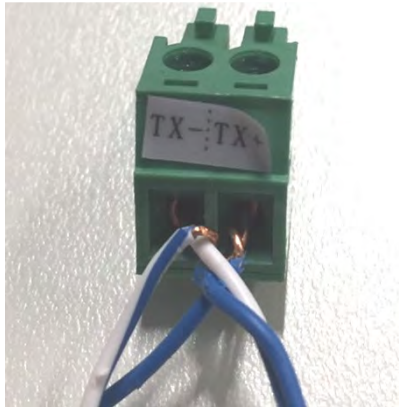


Figure 101- Tightening the network cable to the RS485 terminal block

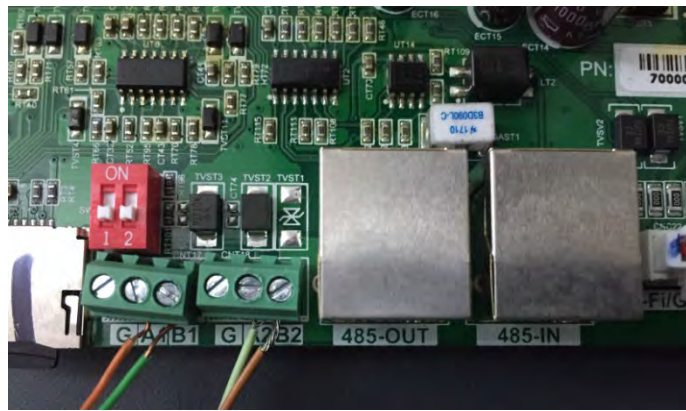


Figure 102- Connecting the serial line via the RS485 terminal block and via the RJ45 plug

For the 3PH HYD5000-HYD20000-ZSS three-phase hybrid inverter, use only one positive and one negative of those shown in the figure below.

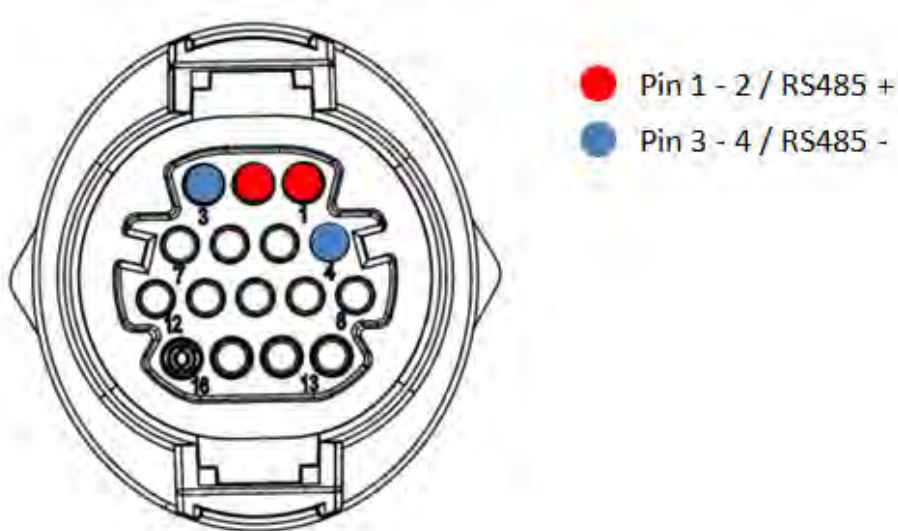
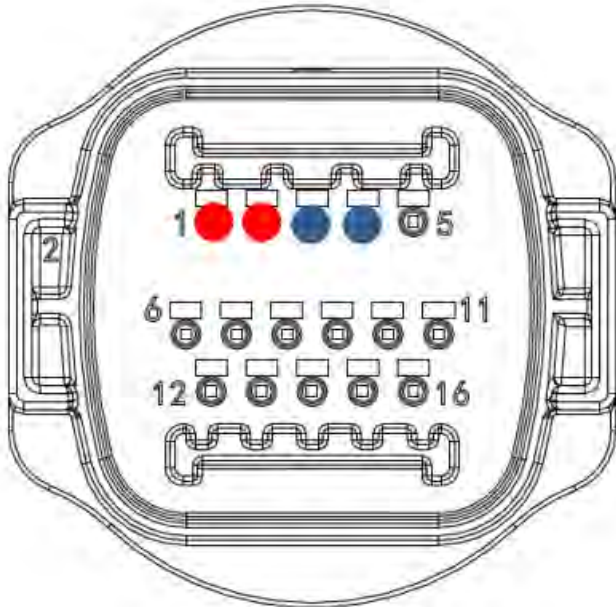


Figure 103a- Connecting the serial line via the communication connector for 3PH HYD5000-HYD20000-ZSS

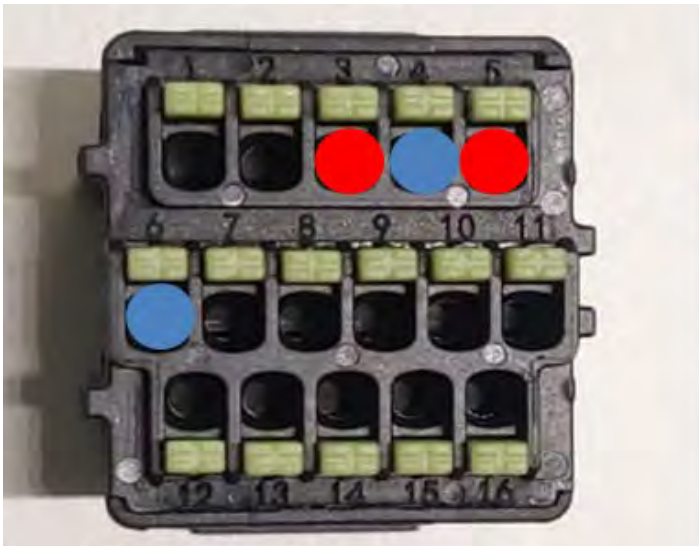
For the 3PH HYD5000-HYD20000-ZSS three-phase hybrid inverter and the 3000-6000 TLM-V3 photovoltaic inverter, use only one positive and one negative of those shown in the figure below.



- Pin 1 - 2 / RS458+
- Pin 3 - 4 / RS485-

Figure 104b- Connecting the serial line via the communication connector for 1PH 3000-6000 TLM-V3, 3PH HYD5000-HYD20000-ZSS

For the 1PH HYD3000-HYD6000-ZSS-single-phase hybrid inverter, use only one positive and one negative of those shown in the figure below.



- Pin 3 - 5 / RS485 +
- Pin 4 - 6 / RS485 -

Figure 105c - Connecting the serial line via the communication connector for 1PH HYD3000-HYD6000-HP

For the 1PH HYD3000-HYD6000-ZP1-single-phase hybrid inverter, use only one positive and one negative of those shown in the figure below.

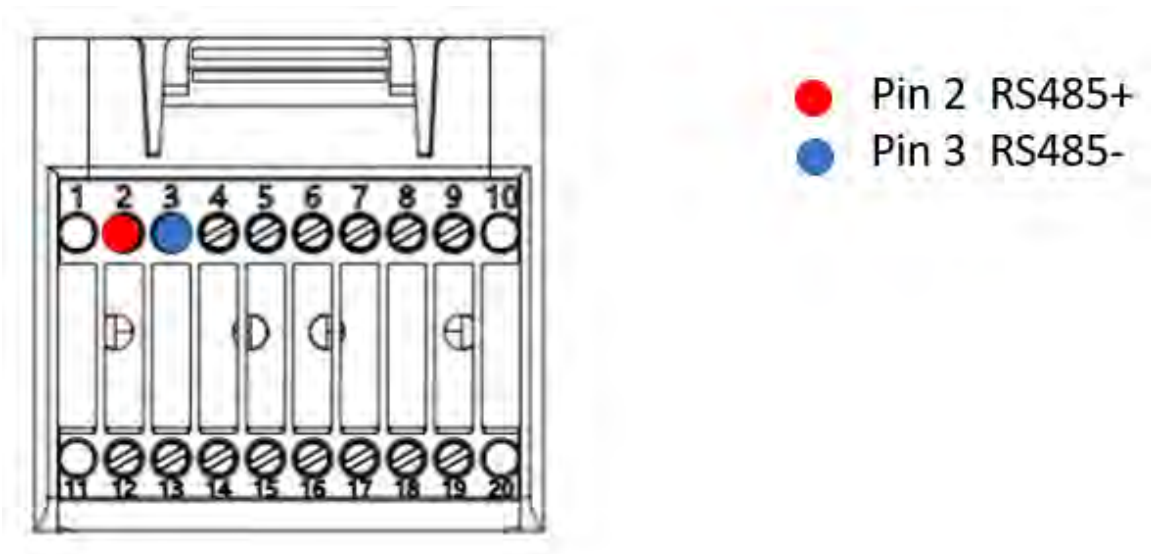


Figure 106d – Connecting the serial line via the communication connector for 1PH HYD3000-HYD6000-HP

- c. Position the dip switches of the last inverter of the daisy chain as shown in the figure below for activating the 120 Ohm resistor and closing the communication chain. If there are no switches, physically connect a 120 Ohm resistor to terminate the bus.

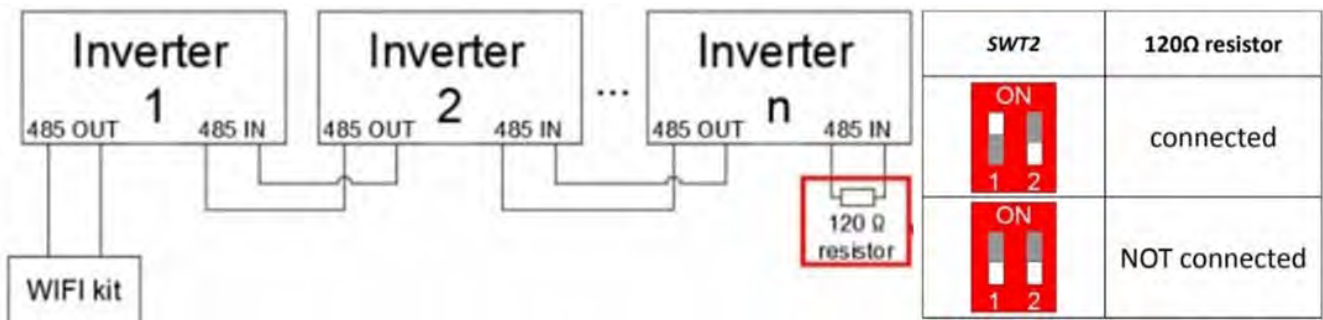


Figure 107 – Positioning of dip switches to connect the isolation resistor

- 6) Check that the RS485 icon is shown on the display of all the inverters. This indicates that the inverters are actually connected via the serial line. If this symbol does not appear, check that the connection is correct, as indicated in this guide.

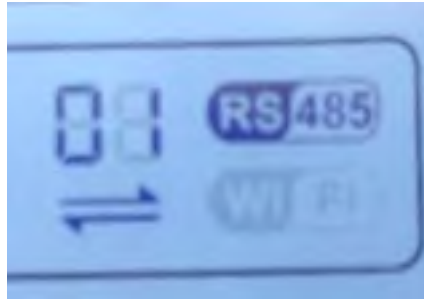


Figure 108 – RS485 symbol on the display of the inverter

- 7) Set a sequential Modbus address on each inverter connected:
 - a. Enter the “Settings” menu.
 - b. Scroll to the submenu “Modbus Address.”
 - c. Change the digits and set an increasing address on each inverter, starting from 01 (first inverter) to the last inverter connected. The Modbus address will be shown on the display of the inverter alongside the RS485 symbol. There should be no inverters with the same Modbus address.

15.5. ZSM-DATALOG-04 AND ZSM-DATALOG-10 DEVICES

The initial status of the LEDs on the datalogger will be:

- POWER steady on
- 485 steady on
- LINK off
- STATUS steady on

15.5.1. WI-FI CONFIGURATION

To configure the datalogger via Wi-Fi, please refer to the chapter on monitoring systems, as the configuration is similar to that of any type of Wi-Fi adapter.

15.5.2. Ethernet configuration

- 1) Insert the RJ45 connector of the Ethernet cable in the ETHERNET input of the datalogger.



Figure 92 - Ethernet cable connected to the datalogger

- 2) Connect the other end of the Ethernet cable to the ETH output (or equivalent) of the modem or a suitable data transmission device.
- 3) Activate the search for Wi-Fi networks on your phone or PC in order to display all the networks visible from your device.



Figure 109 - Wi-Fi network search on iOS smartphone (left) and Android (right)

Note: Disconnect from any Wi-Fi networks to which you are connected by removing automatic access.



Figure 110 - Disabling automatic reconnection to a network

- 4) Connect to a Wi-Fi network generated by the datalogger (i.e. AP_*****, where ***** indicates the serial number of the datalogger shown on the label of the device), which operates as an Access Point.
- 5) Note: To ensure that the datalogger is connected to the PC or smartphone during the configuration procedure, enable automatic reconnection of the AP_***** network.

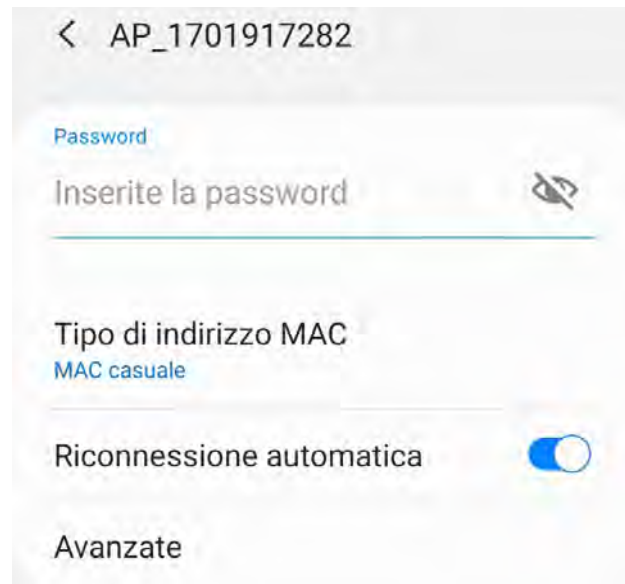


Figure 111 - Password entry prompt

Note: the Access Point is not able to provide internet access; confirm to maintain the Wi-Fi connection, even if internet is not available.



Figure 112 - Screen showing that the Internet cannot be accessed

- 6) Open a browser (Google Chrome, Safari, Firefox) and enter the IP address 10.10.100.254 in the address bar at the top of the screen.
In the box that appears, enter “admin” as both Username and Password.



Figure 113 - Screen for logging into the web server to configure the datalogger

- 7) The status screen will open, showing the datalogger information such as serial number and firmware version.

Check that the fields relating to the Inverter Information are filled in with the information of all the inverters connected.

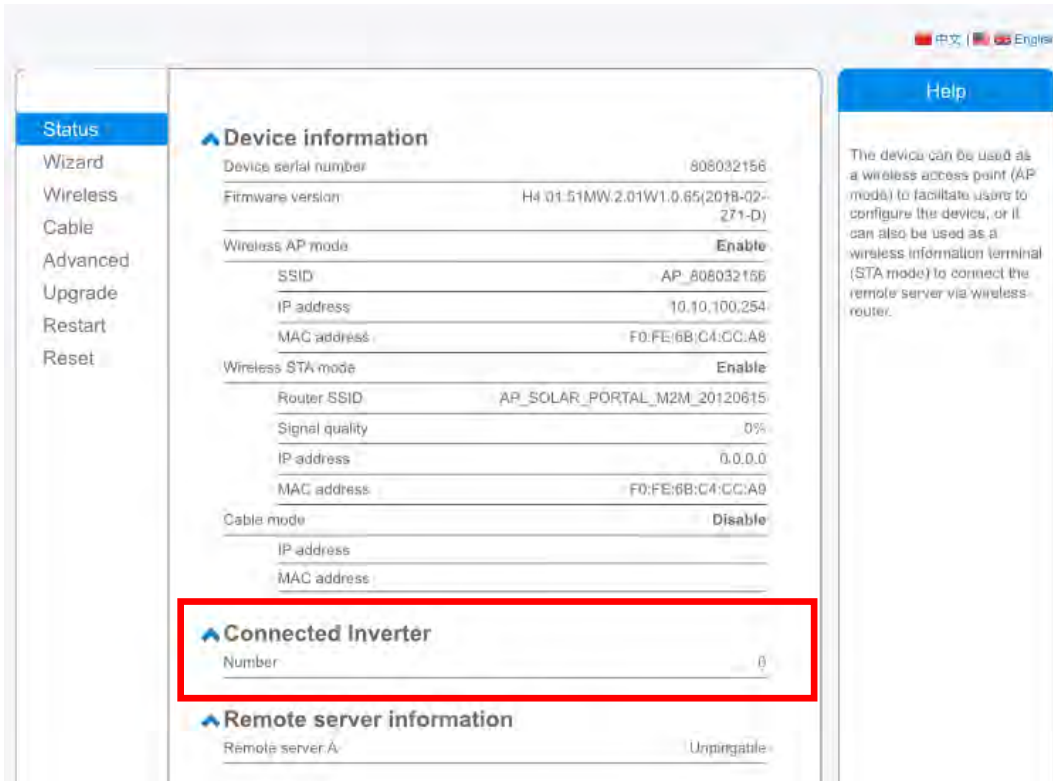


Figure 114 – Status Screen

- 8) Click on the Wizard setup button in the left-hand column.
- 9) Now click on the Start button to start the configuration wizard.

Dear user:

Thank you for choosing our device.
Next, you can follow the setup wizard to complete the network setting step by step;
or you can select the left menu for detailed settings.

★Note: Before setting, please make sure that your wireless or cable network is working.

Start



Figure 115 – Screen for starting (1) the Setup Wizard

10) Check the “Cable Connection” option and then click “Next.”

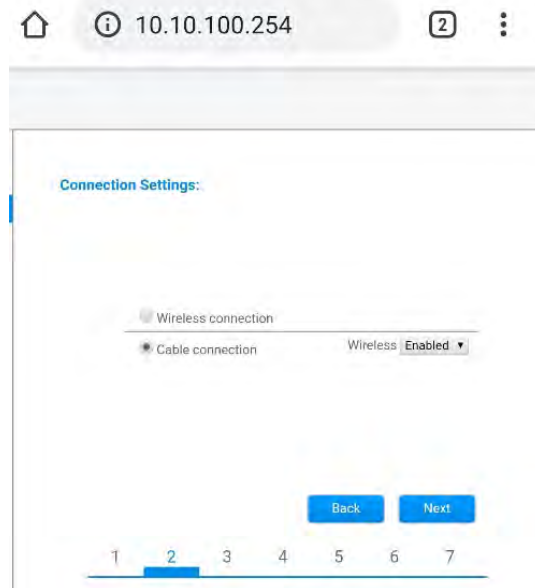


Figure 116 - Network cable connection selection screen

11) Make sure that the “Enable” option is selected to automatically obtain the IP address from your router, then click Next.

Please fill in the following information:

Obtain an IP address automatically	Enable ▾
IP address	0.0.0.0
Subnet mask	0.0.0.0
Gateway address	0.0.0.0
DNS server address	

Back **Next**

1 2 3 4 **5** 6 7

Figure 117 – Screen for automatically obtaining the IP address (5)

12) Click on Next without making any changes.

Enhance Security

You can enhance your system security by choosing the following methods

- Hide AP**
- Change the encryption mode for AP**
- Change the user name and password for Web server**

Back **Next**

1 2 3 4 5 **6** 7

Figure 118 - Screen for setting the security options (6)

13) Complete the configuration procedure by clicking OK, as shown in the following screen.

Configuration completed!

Click OK, the settings will take effect and the system will restart immediately.

If you leave this interface without clicking OK, the settings will be ineffective.



Figure 119 - Final configuration screen (7)

14) If the configuration procedure is successful, the following screen will appear.

If this screen does not appear, try refreshing the browser page.

The screen will prompt you to manually close the page; close the page from the background of your phone or from the close button on your PC.

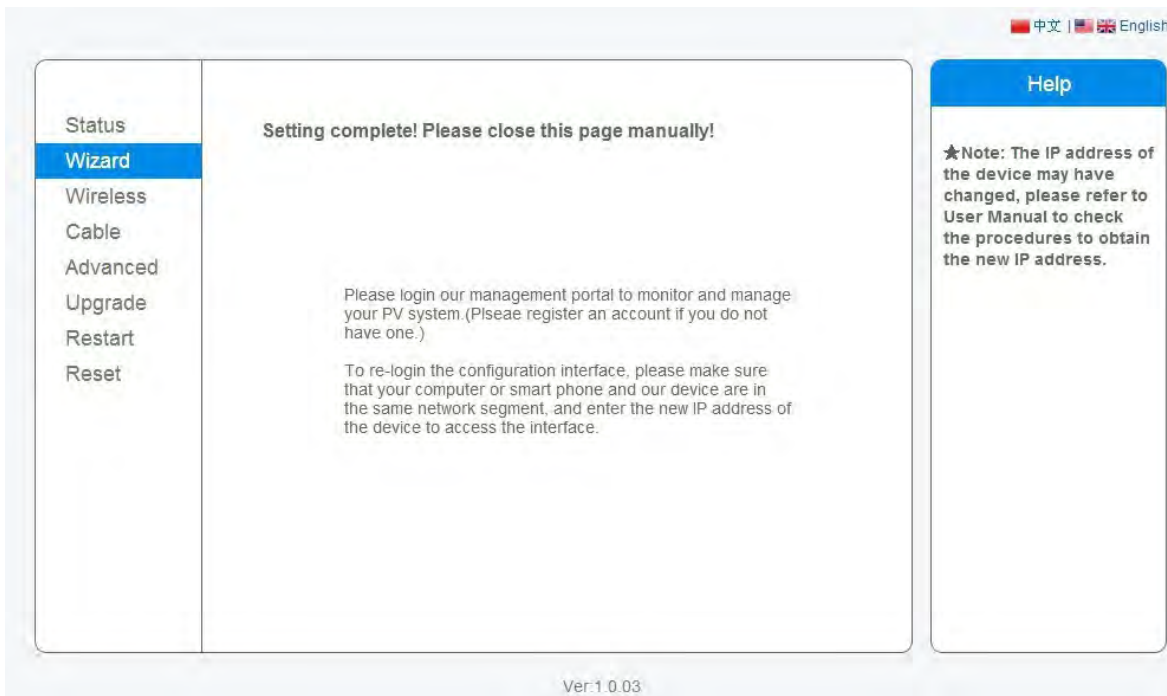


Figure 120 - Successful configuration screen

15.5.3. Checking that the datalogger has been configured correctly

Wait two minutes after completing the configuration of the device.
First of all, check that the LINK LED on the device is on and steady.



Figure 121 - LED indicating the correct configuration of the datalogger

Enter the IP address 10.10.100.254 again, and the login credentials (“admin” for both username and password). Once logged in, the Status screen will appear, where the following information can be checked:

- Check Wireless STA mode (if the datalogger has been configured via Wi-Fi)
 - Router SSID > Router name
 - Signal Quality > other than 0%
 - IP address > other than 0.0.0.0
- Check Cable mode (if the datalogger has been configured via Ethernet cable)
 - IP address > other than 0.0.0.0
- Check Remote server information
 - Remote server A > Pingable

Device information

Device serial number	508263482
Firmware version	H4.01.51MW/2.01W1.0.74(2019-03-143-D)
Wireless AP mode	Enable
SSID	AP_508263482
IP address	10.10.100.254
MAC address	BC:54:F9:F6:B9:74
Wireless STA mode	Enable
Router SSID	iPhone di Giacomo
Signal quality	100%
IP address	172.20.10.10
MAC address	BC:54:F9:F6:B9:75
Cable mode	Disable
IP address	
MAC address	

Connected Inverter

Type	ZCS
Number	1
Inverter serial number	ZA1ES111G8R273 ▼
Firmware version (main)	V550
Firmware version (slave)	—
Inverter model	ZA1ES111
Rated power	1 00 W
Current power	0 W
Yield today	0 kWh
Total yield	0 kWh
Alerts	F12F14
Last updated	0 min ago

Remote server information

Remote server A	Pingable
-----------------	----------

Figure 122 – Main status screen and checking of correct configuration

Cable mode	Enable
IP address	192.168.0.177
MAC address	BC:54:F9:F6:B9:77

Figure 123 - main status screen and checking of correct configuration

If the Remote Server A item in the Status page is still “Unpingable”, the configuration was not successful, i.e. the incorrect router password was entered or the device was disconnected during connection.

It is necessary to reset the device:

- Select the Reset button in the left-hand column
- Press the OK button to confirm



- Close the web page and enter the Status page again. At this point, the configuration procedure can be repeated again.

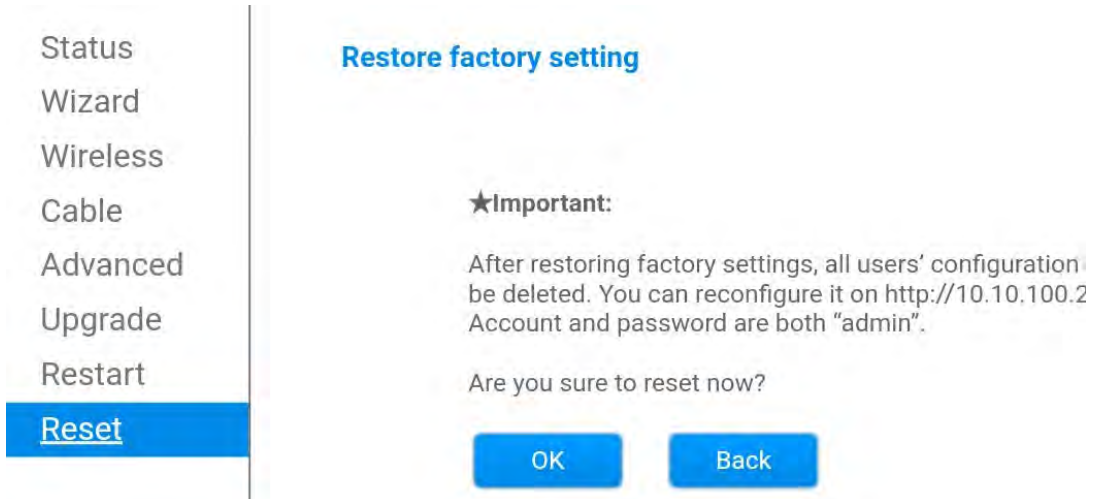


Figure 124 – Reset Screen

15.6. ZSM-RMS001/M200 and ZSM-RMS001/M1000 Devices

15.6.1. Mechanical description and Datalogger interface

Mechanical Dimensions: 127mm x 134 x 52 mm

Protection rating: IP20

The usable ports are indicated below.

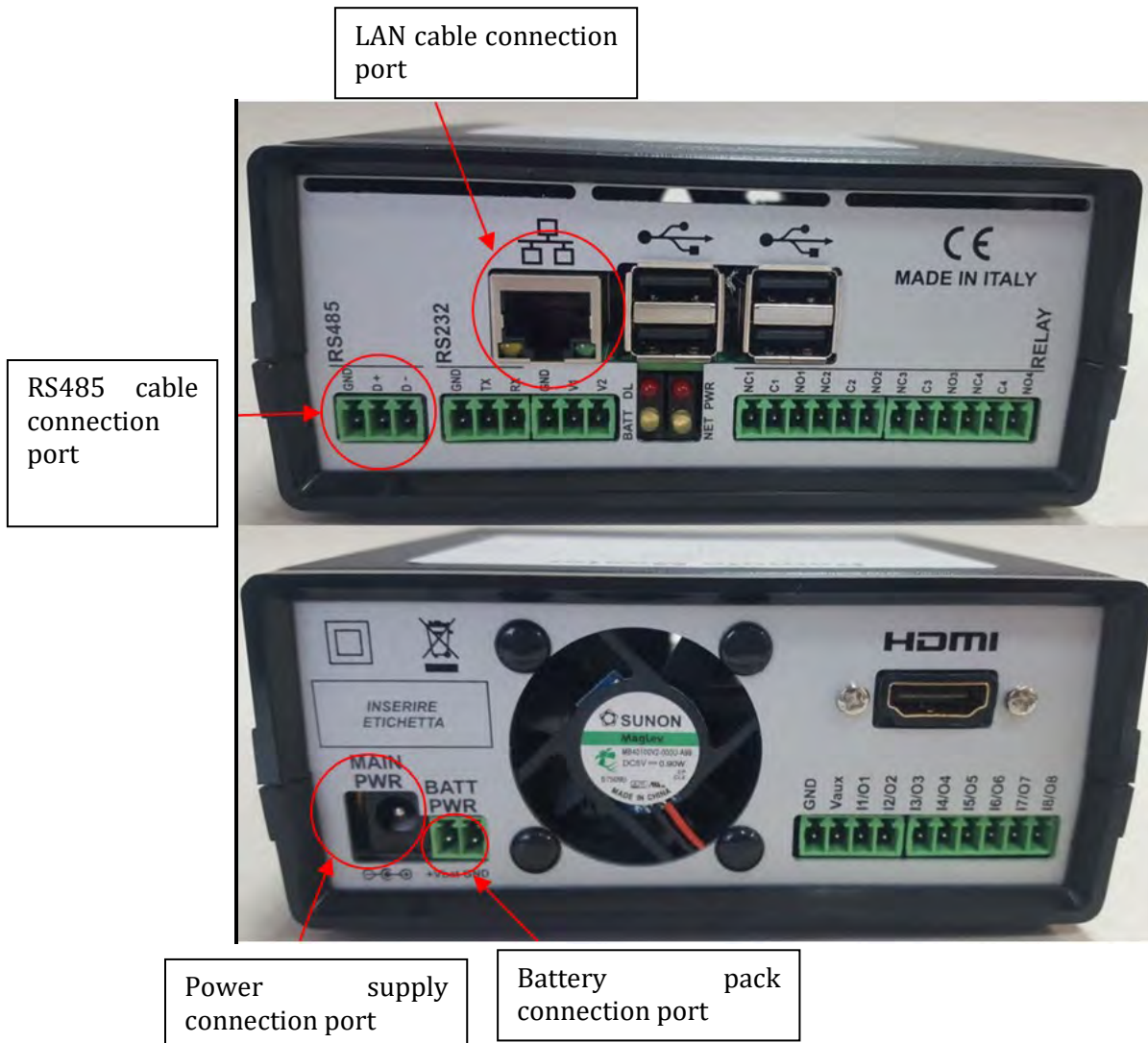


Figure 125: Datalogger rear panel

15.6.2. Connecting the Datalogger to the inverters

A serial communication via RS485 cable is provided for connecting to the inverters.

The GND cable does not need to be connected to the inverters. Follow the connections as shown in the table below.

Datalogger SIDE	BUS Signal	SENSOR SIDE (ZSM-IRR-TEMP-LM2)	Inverter SIDE
D+ terminal	+	RS485+ IB terminal	+Tx terminal
D- terminal	-	RS485- IA terminal	-Tx terminal

Table 3: Connecting the Datalogger to the inverters

15.6.3. Internet connection via Ethernet cable

In order to display the data measured and processed by the Datalogger in the portal, it is necessary to connect to the internet via LAN cable and open the following router ports:

- VPN ports: 22 and 1194
- HTTP ports: 80
- DB ports: 3050
- FTP ports: 20 and 21

The local network of the device is configured for DHCP, and it is not necessary to activate any communication port on the router. If you want to set a fixed network address, this must be provided at the time of ordering together with the gateway address.

15.6.4. Connecting the power supply and battery pack to the Datalogger

Once the RS485 Half Duplex cable has been connected, power the Datalogger by connecting the power supply unit (supplied with the datalogger) to the MAIN PWR input (12V DC - 1A).

In order to prevent possible voltage drops and/or power failures, it is recommended to also connect the battery pack, which is supplied with the datalogger. The battery pack should be connected to the +V_{bat} and GND inputs of the BATT PWR connector, positive and negative respectively (i.e. red to the +V_{bat} input and black to the GND input).

The battery pack (ZSM-UPS-001) can be purchased separately.

15.6.5. Connecting the LM2-485 PRO cell irradiance and temperature sensor to the datalogger

For proper installation, make sure to connect the sensor signal cable and the power cable.



In particular, the sensor of the signal cables must be connected in a daisy chain configuration to the remaining devices on the RS485 bus, as shown in the table below.

Datalogger SIDE	BUS Signal	SENSOR SIDE (ZSM-IRR-TEMP-LM2)	Inverter SIDE
D+ terminal	+	RS485- IB terminal	+Tx terminal
D- terminal	-	RS485- IA terminal	-Tx terminal

To supply power to the sensor, the datalogger can be directly connected to the mains power, as shown in the table below, or connected to an external +12Vdc power supply.

Datalogger SIDE	SENSOR SIDE
V1 terminal (12Vdc output voltage)	RED +12V Terminal
GND terminal (GND/RTN)	BLACK 0V Terminal
V2 terminal (12Vdc driveable voltage)	

Table 4: Electrical connection of the sensor to the datalogger (power supply)

A stable communication in terms of signal and power supply, up to 200m, is guaranteed by using the RS485 cable, type Te.Co. 15166 (2x2x0,22+1x0,22)st/pu.

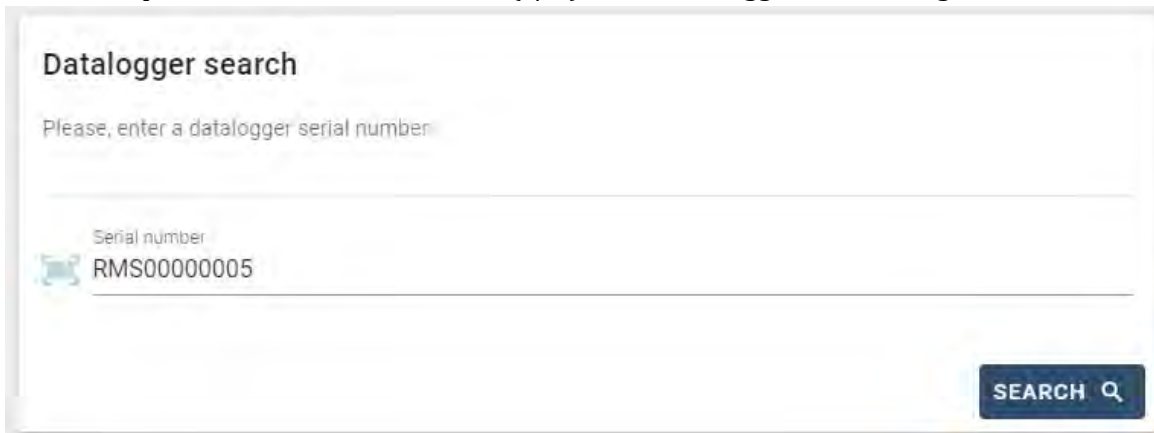
For longer distances, a connection to the signal side of the datalogger is recommended, and a connection to the +12V power supply via an external power supply unit.

15.6.6. Configuring the Datalogger

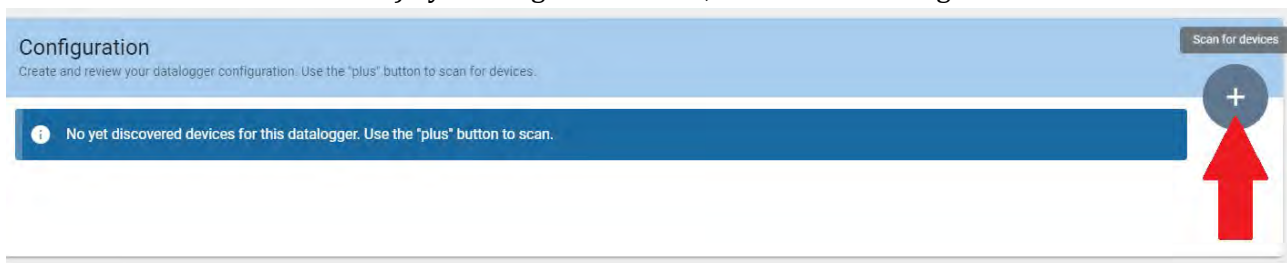
Connect to the website dlconfig.it and login by entering the temporary credentials: Username = admin and Password = admin.



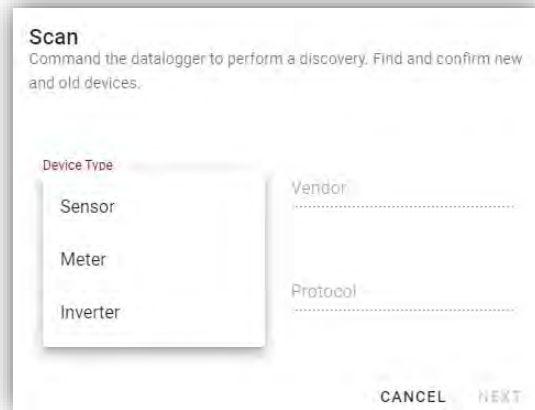
In the screen that opens, enter the serial number(S/N) of the datalogger to be configured and click “SEARCH”.



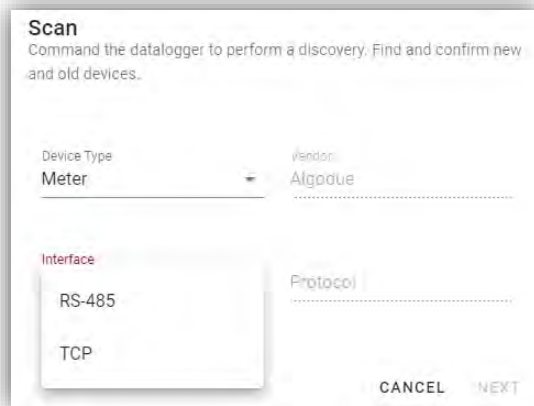
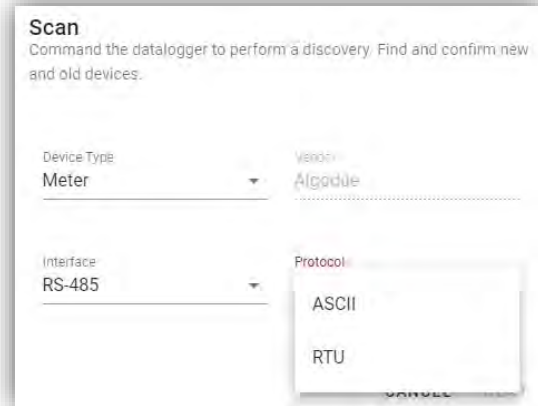
In the configuration page, you can search for any devices connected to the datalogger (inverter, meter or sensors) by clicking the + button, as shown in the figure.



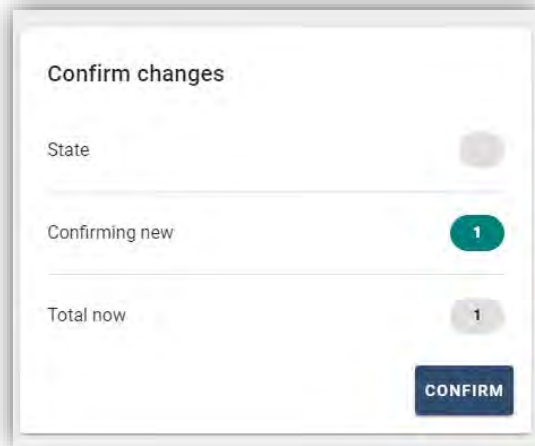
A window will open where you can search for each type of device connected to the Datalogger, after indicating the range of addresses associated with the relative devices.



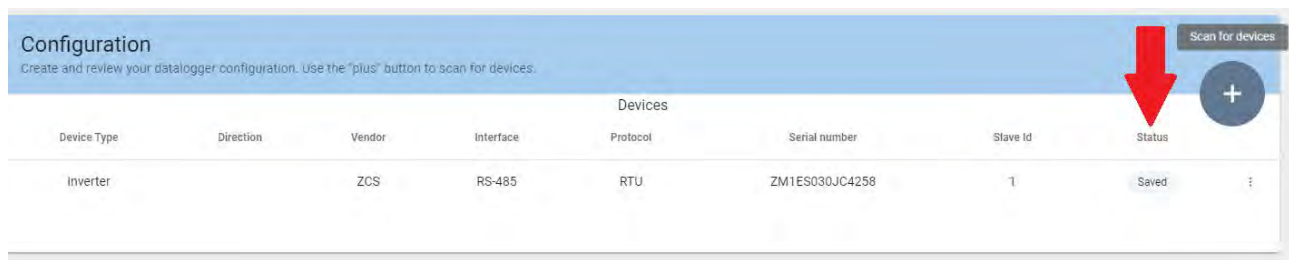
If a meter is one of the devices connected to the Datalogger, select the type of Meter/Datalogger communication interface and the relative communication protocol.

Once this operation has been completed, update the new configuration by clicking “Confirm,” which will allow you to register the devices associated with the datalogger.



From this moment, the datalogger is correctly configured (all devices must be in the “saved” status) and therefore a new installation can be created on the ZCS Azzurro portal for associating the datalogger and the devices connected to it.

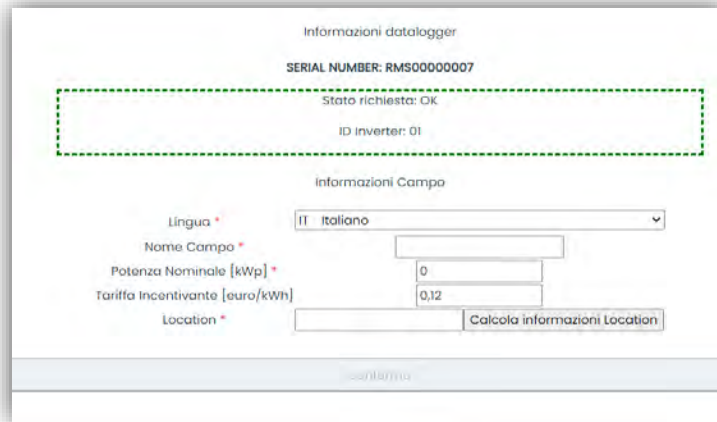


15.6.7. Configuring the Datalogger on the ZCS Azzurro portal

Access the ZCS Azzurro portal (<https://www.zcsazzurroportal.com>). For new users, click “Sign up now” to register on the portal by entering your email, username and password. After logging into the portal, click “Configuration Panel”, and then select the option “Create field with Datalogger.” The “Create New Field” operation will be possible only if the user’s privileges allow acquiring new fields (at the time of registration the limit will be equal to 1, an upgrade is required to increase the limit).



Enter the serial number (S/N) of the datalogger and click “Check RMS”. If the datalogger has been configured correctly, a screen will open where you can enter the required information relating to the field to be installed.

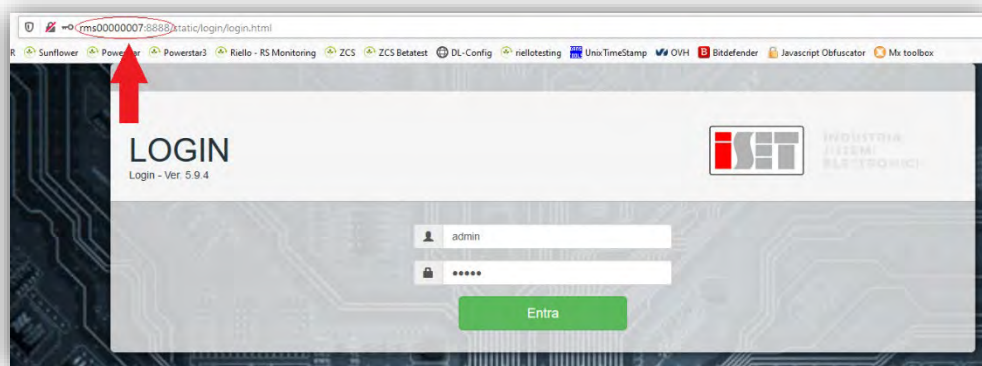


Once the “location” of the field has been entered, click “Calculate Location Information” to allow the system to obtain the latitude, longitude and time zone of the installation. Click “Confirm” to complete the configuration of the field. You only need to wait a few minutes to view the data flow on the ZCS Azzurro portal.

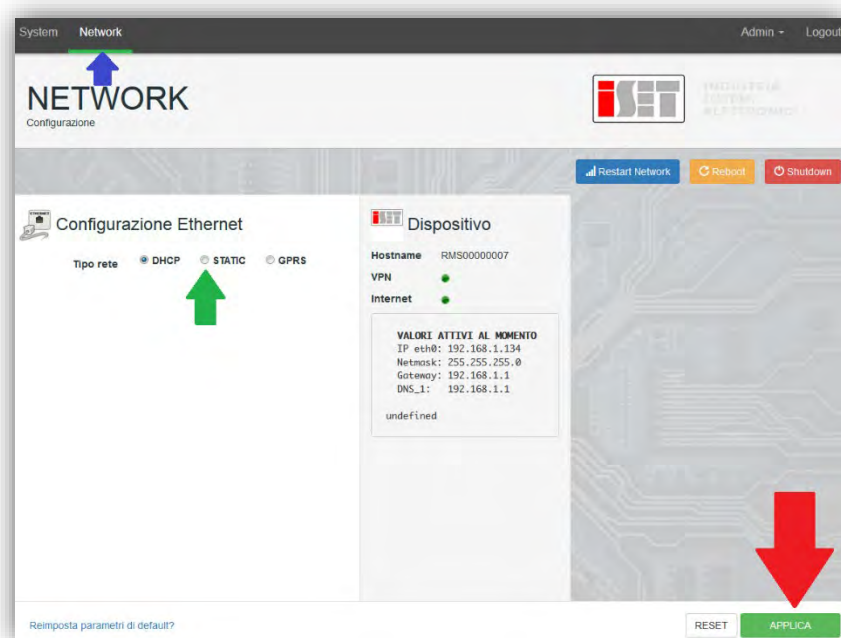
ATTENTION: The location data is essential for the correct operation of the datalogger in the ZCS system. It is important to define it very carefully.

15.6.8. Network configuration

At the time of purchase, the Datalogger is configured in DHCP, i.e. dynamic configuration. However, if you want to set up a static configuration for your Datalogger, you can access the internet page via the link RMSxxxxxxx: 8888, as shown in the figure (e.g. RMS00000007).



By entering the credentials: username = admin and password = admin, you can change the configuration from dynamic to static by selecting the network window (see [blue arrow](#)) and then the “STATIC” option (see [green arrow](#)).



To complete the operation, click “Apply” (see red arrow).

15.7. Local monitoring

The datalogger makes it possible to obtain an additional monitoring system (**local monitoring**), which can be used locally on a web page (therefore, also without an internet connection) and accessed from any device present in the same local network as the datalogger.

15.7.1. Requirements for installation of local monitoring

In order to install the local monitoring system on the datalogger, the customer must ensure that:

- The datalogger is connected to the local network and to the internet (the internet connection is only required during installation and configuration of the local monitoring system).
- A static address (to be provided by the customer) with gateway and subnet mask is available for viewing the page locally.

15.7.2. Features of local monitoring

After installation and configuration, local monitoring makes it possible to monitor the fundamental parameters of the photovoltaic system, even without an internet connection, from any device connected to the same local network.

In particular, it is possible to monitor the power and energy of the inverters and the storage systems over the last 7 days. It is also possible to view alarms, and other information such as temperature, peak daily power, CO₂ gains and savings.

Below is an example of a local monitoring page.



Figure 126: Example of local monitoring page

16. Warranty terms and conditions

To view the “Warranty Terms and Conditions” offered by ZCS Azzurro, please refer to the documentation inside the product box and on the website www.zcsazzurro.com.

As far as installation compliance is concerned, IP65 does not permit outdoor installation.

In order to ensure that performance is maintained over time, the product must not be exposed to extreme temperatures.



THE INVERTER THAT LOOKS AT THE FUTURE

zcsazzurro.com



Zucchetti Centro Sistemi S.p.A.
Green Innovation Division
Palazzo dell'Innovazione - Via Lungarno, 167
52028 Terranuova Bracciolini - Arezzo, Italy
zcscompany.com

