USER'S MANUAL

AZZURRO ZCS

SINGLE-PHASE HYBRID STORAGE INVERTERS

1PH HYD3000-HYD6000-ZSS-HP

ZUCCHETTI Centro Sistemi

GREEN INNOVATION

IMPORTANT MESSAGE

Dear Customer,
inside the box of this product you can find the manuals in English.
Please note that revised and/or updated versions of the aforementioned documentation may be available, therefore in order to guarantee the correct installation procedure it is necessary to check the documentation available on the website www.zcsazzurro.com in the documentation or products section or directly by scanning the QrCode placed on the front of the product.

Thank you
Team Azzurro Zcs

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Reg. Impr. AR n.03225010481 - REA AR - 94189
Azienda Certificata
ISO 9001 - Certificato n. 9151 - CNS0 - IT-17778
ISO14001 - Certificato n.1425 - CNSQ - IT-134812
EPD Italy - Certificati al link epditaly.it

Hybrid Inverter
1PH HYD3000-HYD6000-ZSS-HP
User Manual

Identification: MD-AL-GI-00 (System info)
Rev. 1.6 of 06/09/2025 - Application: GID

Summary

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

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.

Copyright statement

Technical support
ZCS offers a technical support and advice service that can be accessed by making a request directly from the website www.zcsazzurro.com
The following toll-free number is available for Italy: 800 72 74 64.

Preface
General information

Please read this manual carefully before proceeding with installation, operation or maintenance.
This manual contains important safety precautions that must be followed and observed during the installation and maintenance of the equipment.

Scope

This manual describes the assembly, installation, electrical connections, commissioning, maintenance and troubleshooting of the 1PH HYD3000-HYD6000-ZSS-HP 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 system and storage system, and also for operators of this system and storage systems.

1. Introduction

The 1PH HYD3000-HYD6000-ZSS-HP hybrid inverter is used in photovoltaic systems with battery storage. The system can be combined with AZZURRO, WECO and PYLONTECH batteries supplied in kit form by ZCS Azzurro.
The energy produced by the photovoltaic system will be optimised for maximum self-consumption.
The 1PH HYD3000-HYD6000-ZSS-HP inverter can operate in automatic mode and in charge mode for the time of use and charge/discharge. In automatic mode, when the energy produced by the PV field is greater than that required by the utilities, the 1PH HYD3000-HYD6000-ZSS-HP inverter charges the battery using the excess PV energy, and when it is lower than required, the inverter uses the energy stored in the battery to supply power to the local load.
In the event of no power supply (or with the inverter in OFF-Grid mode), the 1PH HYD3000-HYD6000-ZSS-HP inverter can operate in Emergency Power Supply (EPS) mode. The 1PH HYD3000-HYD6000-ZSS-HP inverter will use both the energy produced by the photovoltaic panels and the energy stored in the battery to supply energy to the critical load.

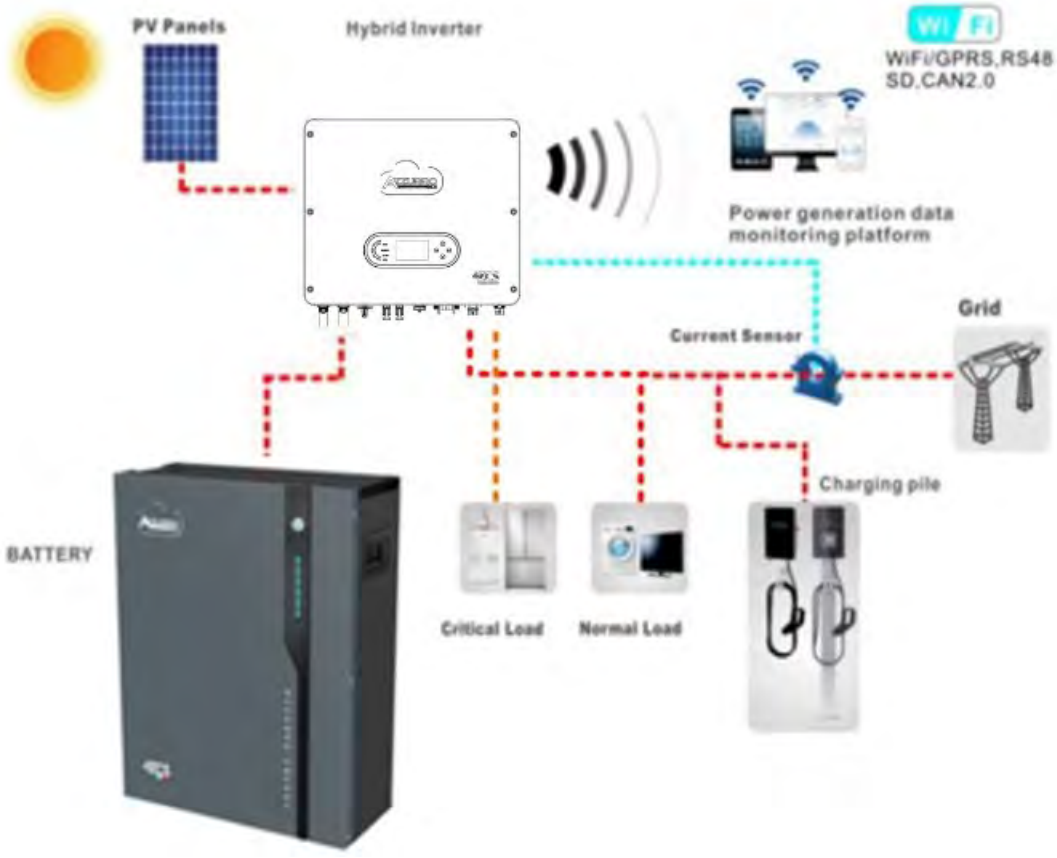


Figure 1 - Diagram of a system on which an 1PH HYD3000-HYD6000-ZSS-HP hybrid inverter is installed

2. Preliminary safety instructions

Before installation, please read this manual carefully and make sure you fully understand its contents The 1PH HYD3000-HYD6000-ZSS-HP inverter fully complies with the safety, design and testing regulations provided for by the national regulations.
During installation, operation and maintenance, operators must strictly comply with the local safety regulations.

Improper use may result in electric shock and injury, as well as damage to the equipment and its parts.
Contact Zucchetti Centro Sistemi S.p.A. for any doubts or problems. DO NOT carry out repairs yourself, as this could cause injury or damage.
Make sure that the operator has the necessary skills and training to use the equipment. Personnel in charge of the operation and maintenance of the equipment must be qualified and capable of performing the tasks described, and must have adequate knowledge of how to correctly interpret the contents of this manual. For safety reasons, the inverter may only be installed by a qualified electrician who has the necessary training and/or skills and knowledge. Zucchetti Centro Sistemi S.p.A. accepts no liability for material damage or injury caused by improper 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 ensure that the inverter is positioned vertically. Choose a suitable location for installation of the electrical equipment. Make sure that there is enough space for heat dissipation and future maintenance. Maintain adequate ventilation and ensure that there is enough air circulation for cooling.
In case of problems with the packaging that could damage the inverter or if visible defects are found, please notify the transport company immediately. If necessary, request the assistance of a PV installer or Zucchetti Centro Spas SpA. The equipment must be transported by means of vehicles suitable to protect the components (especially the electronic components) against violent knocks, humidity, vibrations, etc.

2.1. Safety Notes

- The electrical installation and maintenance of the system must be carried out by qualified and certified electricians in accordance with the national regulations.
- The 1PH HYD3000-HYD6000-ZSS-HP inverter may only be installed by qualified personnel and anyone holding the appropriate certification, as required by local authorities.
- DO NOT place explosive or flammable materials (e.g. gasoline, kerosene, oil, wood, cotton or similar) near the batteries or the 1PH HYD3000-HYD6000-ZSS-HP inverter.
- Before maintenance, disconnect the AC connection, then the batteries and the photovoltaic system (PV1 and PV2), wait at least 5 minutes (capacitor discharge time) to avoid electric shock.
- The 1PH HYD3000-HYD6000-ZSS-HP inverter must be completely disconnected (BAT, PV and AC) during maintenance.
- The 1PH HYD3000-HYD6000-ZSS-HP inverter can reach high temperatures and contains moving parties during operation. Switch off the 1PH HYD3000-HYD6000-ZSS-HP inverter and wait for it to cool down before performing any maintenance.
- Keep children away from the batteries and from the 1PH HYD3000-HYD6000-ZSS-HP inverter.

- Do not open the front cover of the 1PH HYD3000-HYD6000-ZSS-HP inverter. Opening the front cover invalidates the product warranty.
- Damage caused by improper installation/operation is NOT covered by the product warranty.

2.2. Assembly and maintenance diagram

- The batteries must be protected against short circuits during transport and installation.
- The inverter 1PH HYD3000-HYD6000-ZSS-HP inverter and batteries must be placed in well-ventilated areas. Do not positive the 1PH HYD3000-HYD6000-ZSS-HP inverter or 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-ZSS-HP inverter and batteries away from direct sunlight. Do not bring the 1PH HYD3000-HYD6000-ZSS-HP 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 switching on the unit. 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 would like to preserve the batteries without using them, disconnect them from the 1PH HYD3000-HYD6000-ZSS-HP inverter and store them in a cool, dry and well-ventilated area.
- Battery maintenance personnel must have the necessary training and knowledge to perform this task.
- The 1PH HYD3000-HYD6000-ZSS-HP inverter does not have an isolation transformer, therefore, the positive and negative polarities of the PV string do NOT have to be grounded, otherwise the inverter may be damaged. All metal parts not under load (e.g. the PV module frame, PV rack, connection box housing and inverter housing) in the PV power supply system must be grounded.
- Attention: Do not dismantle or break the battery. Electrolytes in the battery can be toxic and cause skin or eye injuries.
- Attention: follow these rules when installing and maintaining the battery.
  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) Switch off the 1PH HYD3000-HYD6000-ZSS-HP inverter and batteries before connecting/disconnecting the battery terminals
  f) Both positive and negative polarities must be isolated from the ground.

2.3. Symbols on the inverter

Some safety symbols are present on the inverter. Before installing the inverter, it is important to read and understand the contents of the symbols.

	This symbol indicates a hazardous situation which, if not avoided, will result in injury.
	Risk of electric shock; wait at least 5 minutes before switching off the 1PH HYD3000-HYD6000-ZSS-HP inverter.
	Beware of high voltage and electric shock.
	Beware of hot surfaces.
	Compliance with European Conformity Certification (CE).
	Ground terminal.
	Read this manual before installing the 1PH HYD3000-HYD6000-ZSS-HP inverter.
	Indicates the degree of protection of the equipment according to IEC 70-1 (EN 60529 June 1997).

	Positive polarity and negative polarity of the DC voltage (Photovoltaic and Battery).
	This side up. The 1PH HYD3000-HYD6000-ZSS-HP inverter must always be transported, handled and stored in such a way that the arrows are always pointing upwards.

3. Installation

3.1. Product overview

The 1PH HYD3000-HYD6000-ZSS-HP inverter is subjected to strict controls and inspection before packaging and delivery. Do not turn the 1PH HYD3000-HYD6000-ZSS-HP inverter upside down during delivery.

Caution	Carefully check the packaging and accessories before installation.
Note	The 1PH HYD3000-HYD6000-ZSS-HP inverter has two panel styles, the pictures may not be consistent with the physical appearance, but the structure and function are not different, both can be operated according to the user manual.

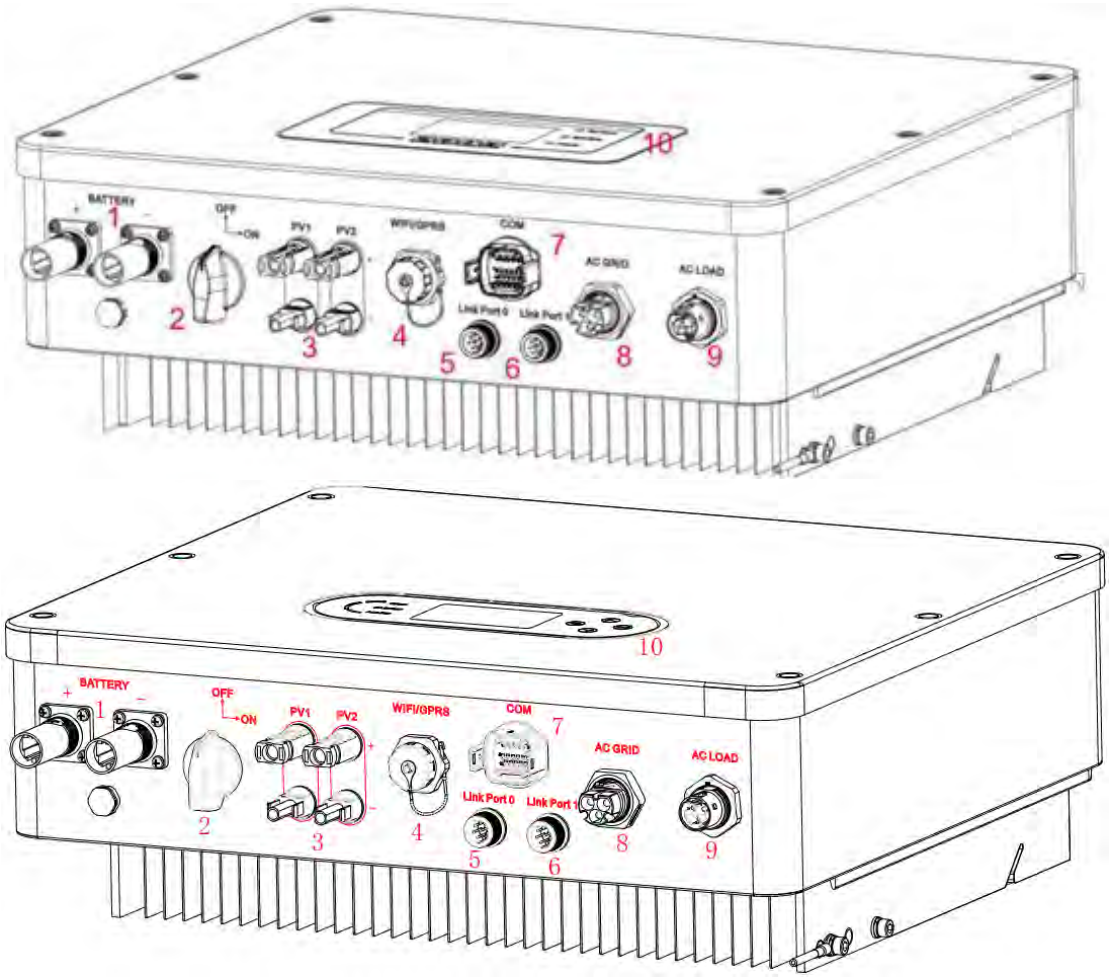
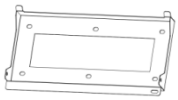
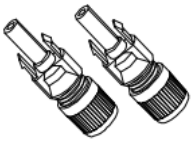
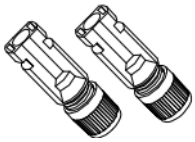
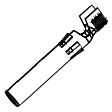
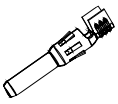
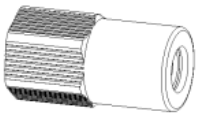
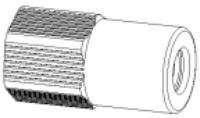
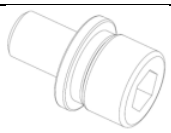
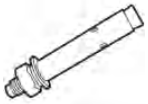
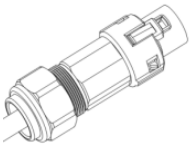
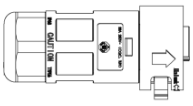


Figure 2 - Diagram of a system on which an 1PH HYD3000-HYD6000-ZSS-HP hybrid inverter is installed

1	Battery input terminals	6	Connection port 1
2	DC switch	7	COM
3	PV input terminals	8	Grid connection port
4	Wi-Fi/GPRS/Ethernet USB adapter	9	Critical load connection port
5	Connection port 0	10	LCD

3.2. Package contents

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

 1 x Inverter	 1 x rear panel	 2 x PV+ input terminals	 2 x PV- input terminals
 2 x metal terminals fixed to PV+ input power cables	 2 x metal terminals fixed to PV- input power cables	 1 x BAT+ input terminal	 1 x BAT- input terminal
 3 x M6 hexagonal screws	 4 x M8x80 expansion bolts use to fix the mounting bracket to the wall	 1 x AC grid connector (grid)	 1 x critical load output connector (load)

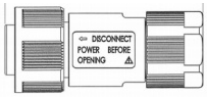
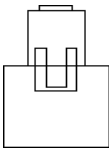
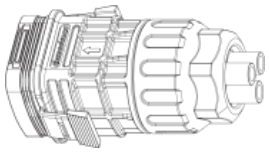
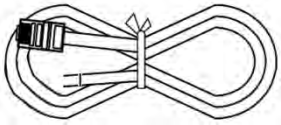
 1 x connector for the connection port (parallel system)	 1 x 8-pin terminal Corresponding terminating resistor (parallel system)	 1 x current transformer	 1 x 16-pin connector
 2 x communication cables	 1 x user manual	 2 x warranty	 1 x Test report, output test
 1 x quality certificate			

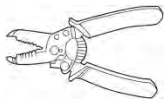
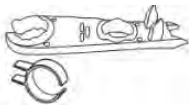
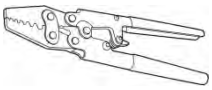
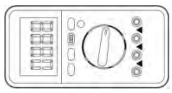
Table 1 – Components and accessories inside the package

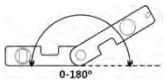
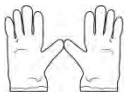
3.3. Installation area

- Choose a dry, clean and tidy place suitable for installation.
- Ambient temperature range: -25 ~ 60 °C.
- Relative humidity: 0 ~ 100% (without condensation).
- Install the 1PH HYD3000-HYD6000-ZSS-HP inverter in a well-ventilated area.
- Do not place flammable or explosive materials near the 1PH HYD3000-HYD6000-ZSS-HP inverter.
- The AC overvoltage of the 1PH HYD3000-HYD6000-ZSS-HP inverter belongs to Category III.
- Maximum altitude: 4000 m.

3.4. Installation tools

Prepare the following tools before installation:

Number	Tool	Model	Function
1		Percussion drill Recommended diameter: 10 mm	For drilling holes in the wall
2		Screwdriver	For wiring
3		Cross screwdriver	For removing and installing the AC terminal screws
4		Cable stripper	For stripping wires
5		Removal tool	For removing the PV terminal
6		4 mm Allen key	For tightening the screws to connect the rear panel to the inverter
7		Crimping tools	For crimping the power cables
8		Multi-meter	For checking the ground connection
9		With an open end of larger than or greater than 32 mm	Used to tighten expansion bolts

10		Marker	For marking
11		Tape measure	For measuring distances
12		Spirit level	For making sure that the rear panel is installed correctly
13		ESD gloves	Must be worn by operators
14		Safety goggles	Must be worn by operators
15		Dust mask	Must be worn by operators

3.5. Wall installation position

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

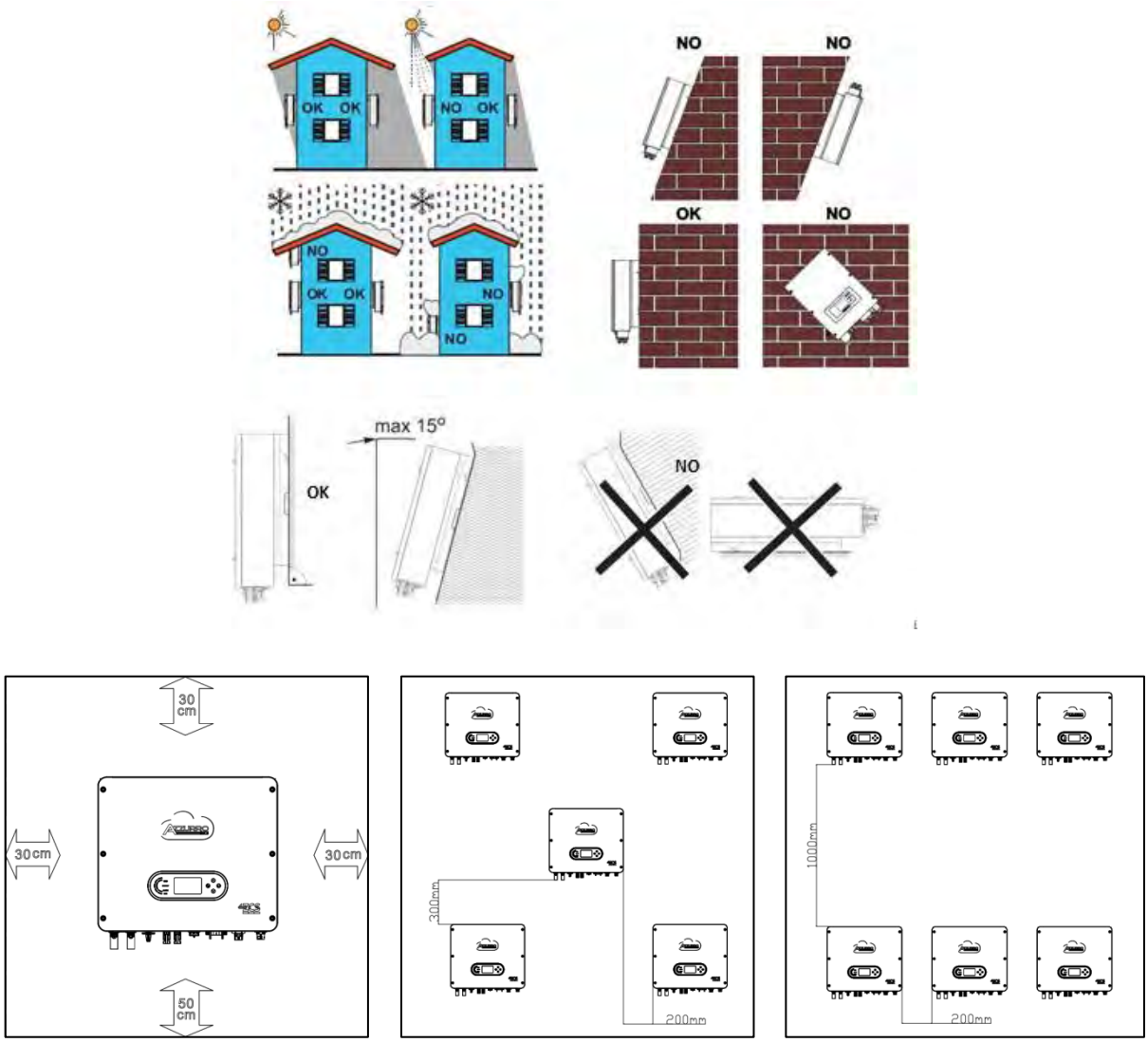


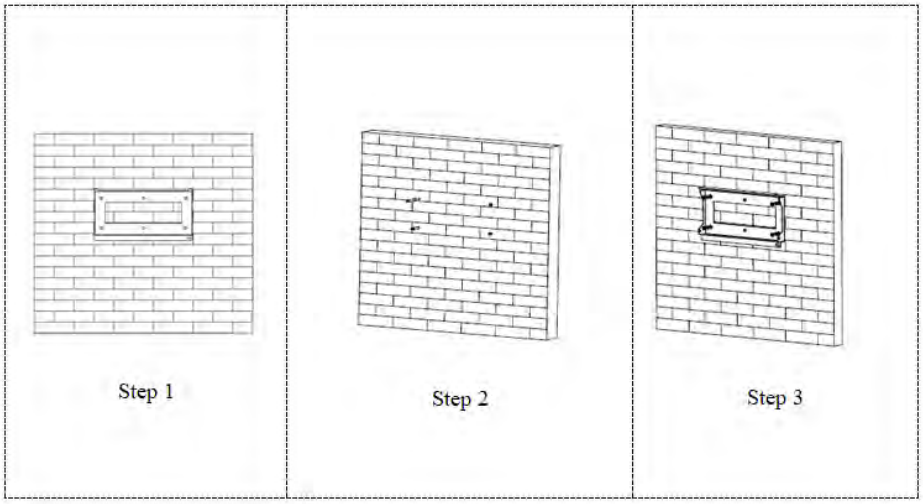
Figure 3 – Installation position of the 1PH HYD3000-HYD6000-ZSS-HP inverter

3.6. Installation instructions

Step 1: Position the mounting bracket on the wall, mark the fixing points using the marker. Drill holes (10 mm drill bit) in the wall.

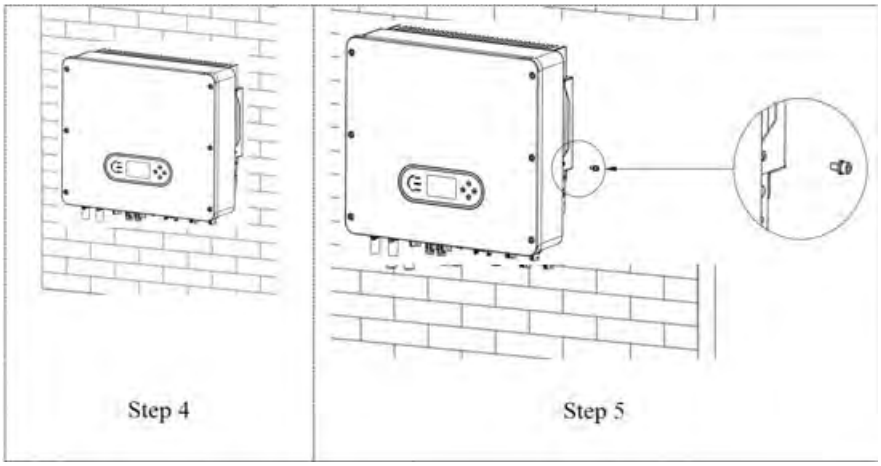
Step 2: Insert the expansion bolts vertically into the hole, ensure that the insertion depth is neither too shallow nor too deep.

Step 3: Fix the mounting bracket to the wall using dowels and flat washers.



Step 4: Position the 1PH HYD3000-HYD6000-ZSS-HP inverter on the mounting bracket.

Step 5: Use the grounding hole of the heat sink to ground the 1PH HYD3000-HYD6000-ZSS-HP inverter.



Note: For safety reasons, Zucchetti Centro Sistemi Spa and/or its partners may not perform any technical repairs or maintenance or move the inverter or battery pack if they are installed at a height of more than 180 cm above the ground.

Inverters and/or battery packs installed at greater heights must be moved to the ground before they can be repaired or serviced.

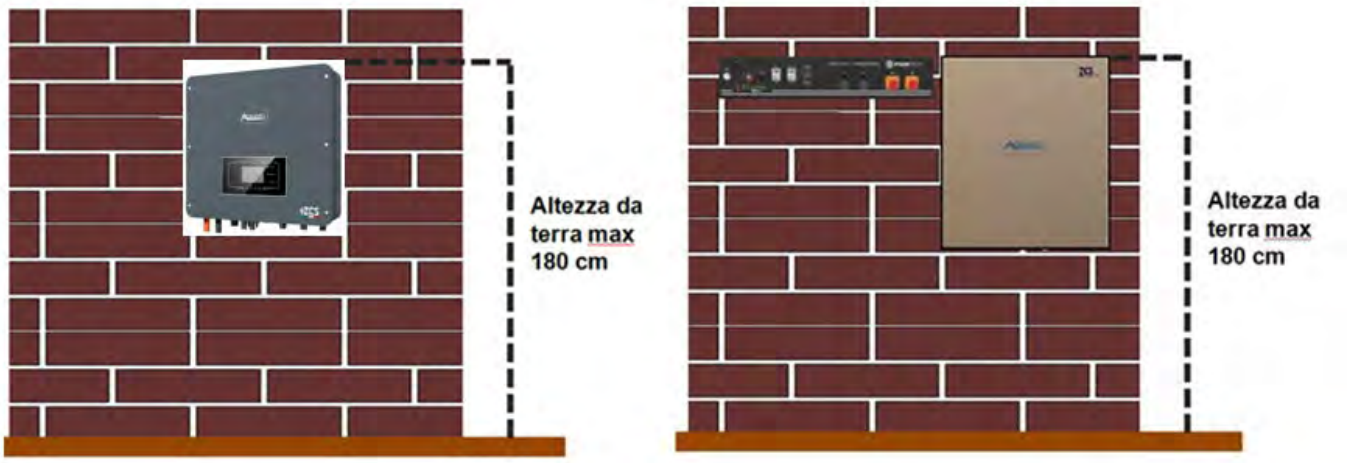


Figure 4 – Instructions for installing the storage inverter and battery pack

4. Electric connections

- Carefully assess the risks of electric shock and chemical hazards!
- Use a multi-metre to check the DC polarity of the battery and cables before connecting the power between the batteries and inverter.

NOTE: an inverted polarity connection may cause irreparable damage to the inverter and batteries.

Note: all batteries supplied by ZCS do not require a disconnect device for connection to the storage inverter. The cable kit, which contains crimped power cables for connecting Pylontech and AZZURRO batteries to the1PH HYD3000-HYD6000-ZSS-HP storage inverter, is supplied separately. Make sure that the storage kit includes this accessory. In the case of WeCo batteries, the connection kit is already inside the battery package.

- A 25A AC isolating device (circuit breaker) must be installed between the 1PH HYD3000-HYD6000-ZSS-HP 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-ZSS-HP inverter and power grid.

- For safety and correct operation 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 AWG8 or AWG6 cross-section (supplied).
  - Grid or load connection: AC cable with AWG12 cross-section.

The 1PH HYD3000-HYD6000-ZSS-HP inverter is intended for use in photovoltaic systems with battery storage. If not used as intended, the protection provided by the equipment may be impaired.

 Attention	The inverter must be installed and serviced by a professional electrician. Wear rubber gloves and protective clothing (safety goggles and boots) when working on high voltage/high current systems, such as inverters and battery systems.
 Danger	Photovoltaic modules generate electricity when exposed to sunlight and may pose a risk of electric shock. Therefore, cover the PV modules with a dark covering before connecting the DC input power cable.
 Note	For the 1PH HYD3000-HYD6000-ZSS-HP inverter, the open-circuit voltage (Voc) of the module arrays connected in series must be ≤ 580V

The PV modules must have an IEC 61730 Class A rating.

Model	IscPV (absolute max)	Max output overcurrent protection
1PH HYD 3000 ZSS HP	22.5A/22.5A	15A
1PH HYD 3600 ZSS HP		16A
1PH HYD 4000 ZSS HP		20A
1PH HYD 4600 ZSS HP		20.9A
1PH HYD 5000 ZSS HP		21.7A
1PH HYD 6000 ZSS HP		27.3A

NOTE: DVC represents the voltage of a circuit constantly present between the two live parts under worst-case operating conditions during intended use.

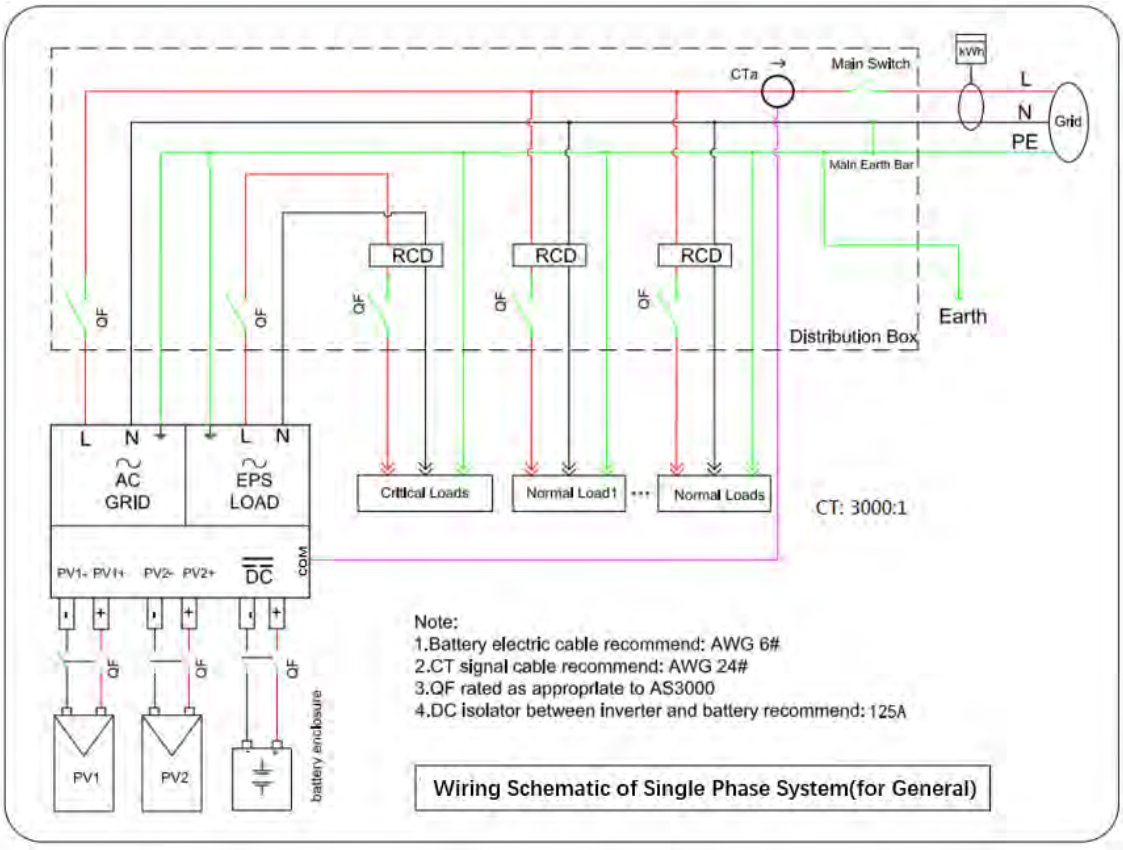


Figure 5 – Electrical connections

4.1. System electrical topology

The RCMU (residual current monitoring unit) are already integrated inside inverter. If an external RCD is required, a type-A RCD with rated residual current of 100mA or higher is suggested.

The household energy storage system is mainly composed of PV modules, battery modules, inverters, load modules, grid modules, generator modules, and smart meters /CT.

The inverters AC GRID and AC LOAD are wired with different N and PE wires depending on the regulatory requirements in different regions.

System 1: N and PE lines are wired separately in the distribution box

The wiring method in Figure below is applicable to areas without special requirements for distribution system wiring.

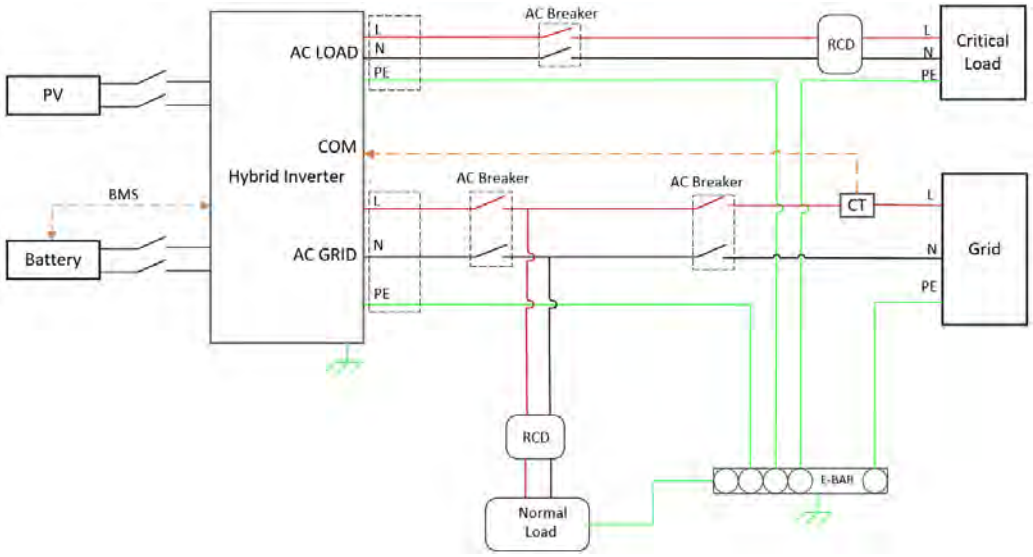


Figure 6 - System Electrical Topology (Internal relay controls N-PE shorting)

Ensure that the AC LOAD PE line and AC GRID PE line must be connected to the PE-BAR in the distribution box, as shown in the diagram. Otherwise the inverter may be abnormal in off-grid mode.

Check whether NeutralPointGrounding is enabled, if not, enable it manually.

2. Advanced Settings	OK	**Input 0715** 11. NeutralPointGrounding
11. NeutralPointGrounding	OK	Enable Disable

System 2: N and PE lines are connected together in the distribution box

The wiring method in figure below is applicable to areas where N and PE are connected together in the distribution box, such as Australia, South Africa, New Zealand, etc.

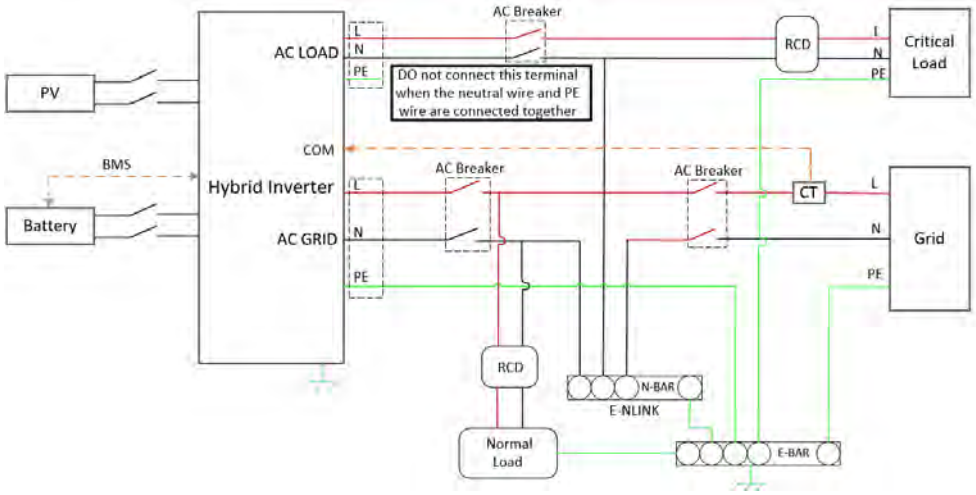
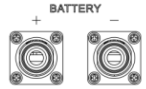
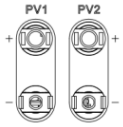


Figure 7 - System Electrical Topology (N and PE wires are connected together)

Danger	**Install Residual current device (RCD)in front of the load** • **RCD is necessary for critical load, but optional for normal load.** • In off-grid mode, the Entry master switch is unprotected and load leakage could lead to shock danger. • All RCDs connected to Loads are Type B and its rated earth leakage action current <30mA.
Danger	**Ensure that the output is grounded** • In system 1, the PE line of the inverter's GRID port and AC LOAD port must be grounded through the PE-Bar, otherwise there may be a risk of leakage.
Note	• In system 2, NeutralPointGrounding is disabled by default. No manual setup required.

4.2. Wiring instructions

Component	Description		Recommended cable type	Recommended cable specification
	+ : Connect the positive electrode of the lithium battery		Multi-core copper cable for outdoor use	Cross-section area of the conductor: 16~20 mm²
	- : Connect the negative electrode of the lithium battery			
	+ : Connect the positive electrode of the PV cell		Common photovoltaic sector cable for outdoor use	Cross-section area of the conductor: 4~6 mm²
	- : Connect the negative electrode of the PV cell			
	Load	L	Multi-core copper cable for outdoor use	Cross-section area of the conductor: 6~10 mm²
		N		
		PE		
	AC	L	Multi-core copper cable for outdoor use	Cross-section area of the conductor: 10~16 mm²
		N		
		PE		

4.3. Connecting PGND cables

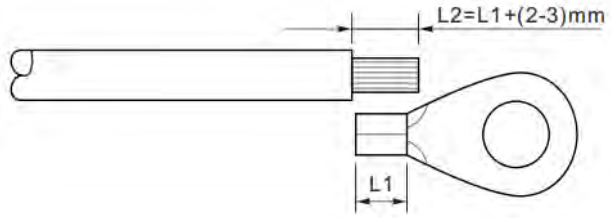
Connect the inverter to the grounding electrode using protective ground cables (PGND).

⚠ **Attention**	The inverter does not include a transformer, the positive and negative polarities of the PV array DO NOT need to be grounded. Otherwise, it will cause the inverter to fail. All non-current-carrying metal parts (such as the PV module frame, PV rack, combiner box housing, inverter housing) in the PV power system must be grounded. The protective grounding of the chassis shell cannot replace the PGND cable of the AC LOAD Port. Ensure that the two PGND cables are reliably connected. When multiple inverters are deployed, ensue that the protecton ground points of all inverters are equipotential connected.

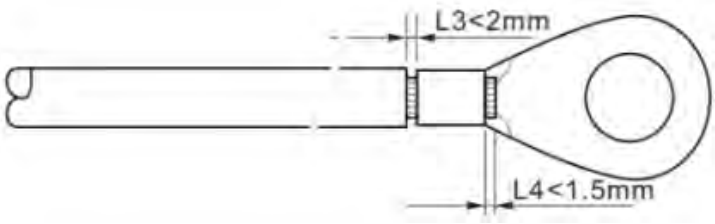
The PGND cables are prepared (external power supply cables ≥ 4mm² are recommended for grounding purposes), the cable must be a yellow-green colour.

Procedure:

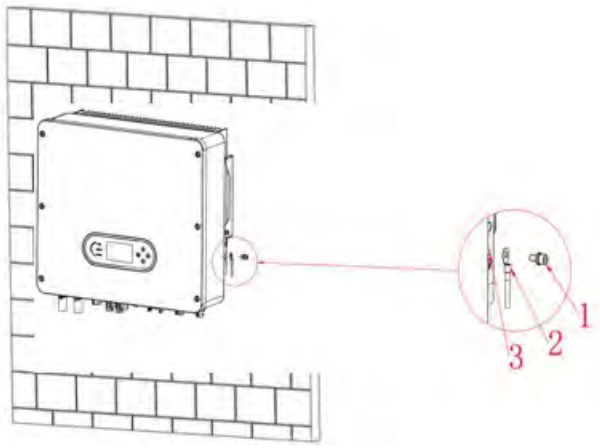
Step 1: Remove a suitable length of the insulating layer using a wire stripper.



Step 2: Insert the bare wires into the OT terminal and crimp them using a suitable tool.



Step 3: Install the crimped OT terminal, flat washer using the M5 screw and tighten the screw at a torque of 3 Nm using an Allen key. 1. Screw; 2. OT terminal; 3. Threaded hole



Note 1: L3 is the length between the insulation layer of the ground cable and the crimped part. L4 is the distance between the crimped part and the conductor wires protruding from the crimped part.

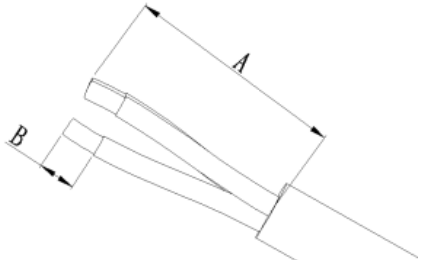
Note 2: The cavity formed after crimping the conductor crimp strip will completed envelop the wires. The wires must be in close contact with the terminal.

4.4. Connecting to grid

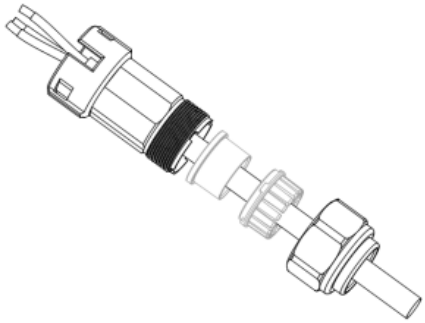
The inverter is equipped with an integrated residual current monitoring unit. When the inverter detects a residual current of more than 300 mA, the grid connection will quickly disconnect.

If the external AC circuit breaker includes a leakage protection function, its rated leakage action current must be ≥ 300mA.

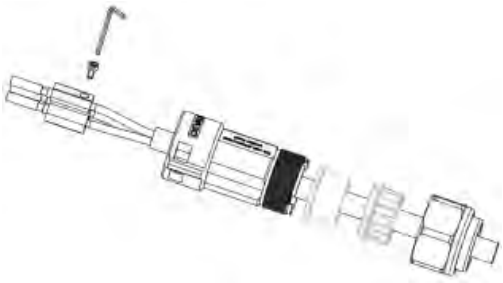
Step 1: Select the appropriate cable type and specifications. A: 30~50 mm; B: 3~5 mm.



Step 2: Pass the cable through the terminal.

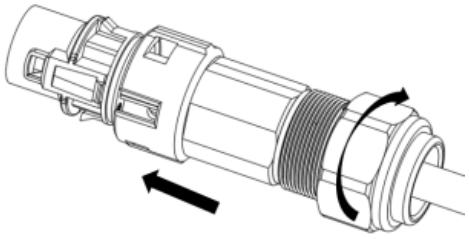


Step 3: According to the mark, lock the cable in the hole on the terminal and tighten it with the Allen key.



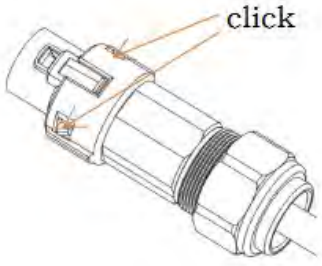
Step 4: Push the terminal forward until a 'click' sound is heard.

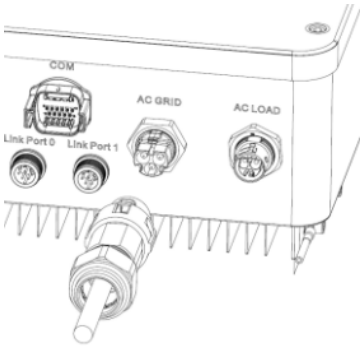
Step 5: Connect the terminal to the inverter port and push the terminal forward until a 'click' is heard to indicate that the terminal is connected.

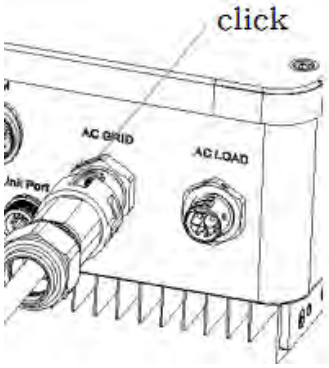


Steps 1, 2 and 3 indicate the steps for connecting the connector to the AC terminal block.

Steps 4, 5 and 6 indicate the steps for disconnecting the connector from the AC terminal block.

<table>
<tr>
<td> 

Step 1</td>
<td> 

Step 2</td>
<td> 

Step 3</td>
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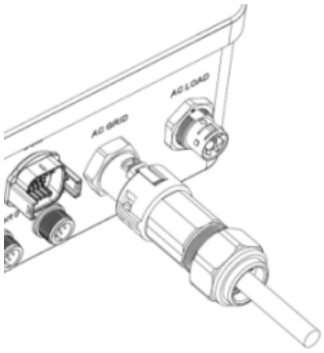
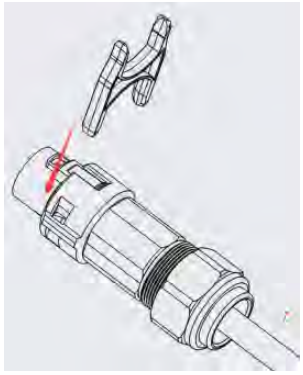
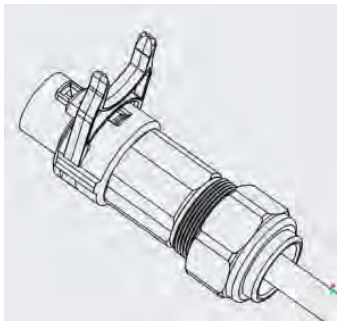
<td> 

Step 4</td>
<td> 
Step 5</td>
<td> 
Step 6</td>
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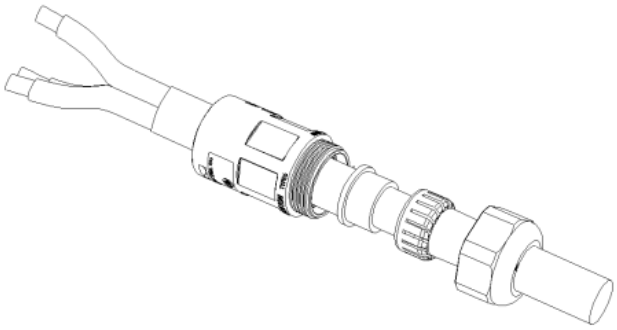
4.5. Connecting a Critical Load (EPS function)

Critical Load (LOAD): in the event of a power failure (or OFF-GRID operation), if the EPS function is enabled, the 1PH HYD3000-HYD6000-ZSS-HP inverter will operate in Emergency Power Supply (EPS) mode using the energy stored in the battery to supply power to the critical load via the LOAD connection port.
The LOAD connection port is only for connecting critical loads.
Do not connect loads with high inrush current (motors, pumps, etc.) under the load port, as they could damage the inverter.
The procedure for connecting the LOAD port is identical to that for the grid connection.

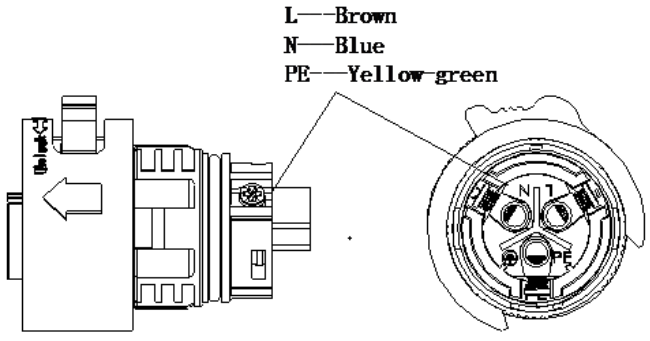
Step 1: Select the appropriate cables according to the table above, remove the insulation layer of the load output cable using a wire stripper as per the figure below: A: 15~25 mm B: 6~8 mm.

Step 2: Disassemble the load connector according to the figure shown below. Thread the load output cable (with the insulation layer stripped according to step 1) through the waterproof locking cable gland.

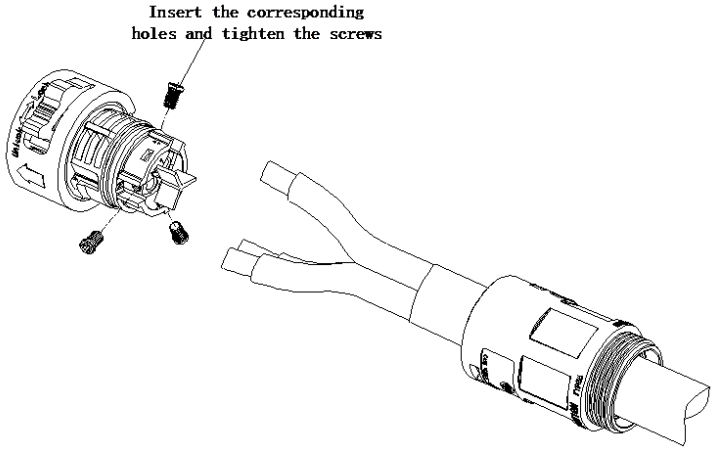


Step 3: Connect the load output cable according to the following requirements:

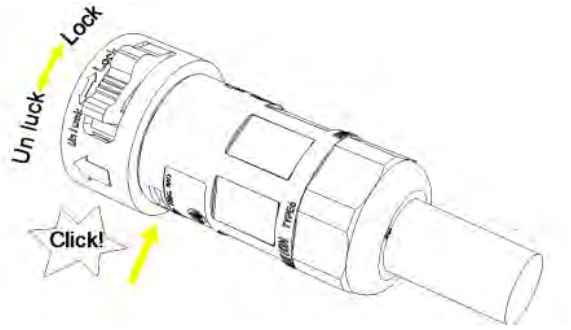
- Connect the yellow-green wire to the hole labelled “PE,” and fix the wire using a cross screwdriver
- Connect the brown wire to the hole labelled “L,” and fix the wire using a cross screwdriver
- Connect the blue wire to the hole labelled “N,” and fix the wire using a cross screwdriver

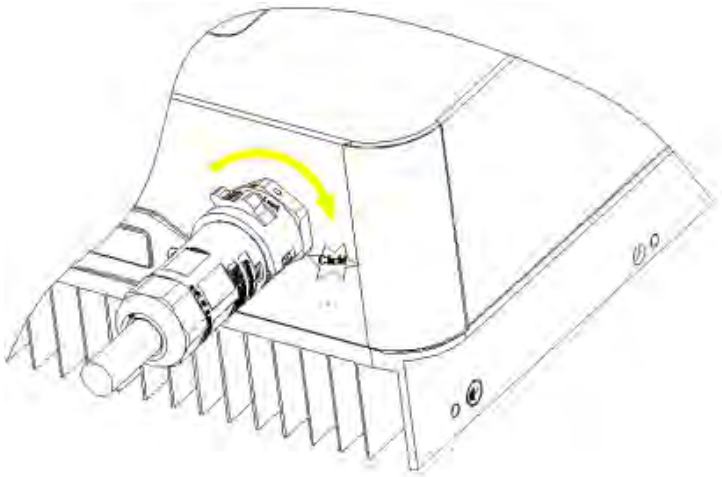


Step 4: Insert the load connector until a “click” sound is heard, then tighten the retaining nut to the instant value, as shown in the figure below, to ensure the wire is securely connected.

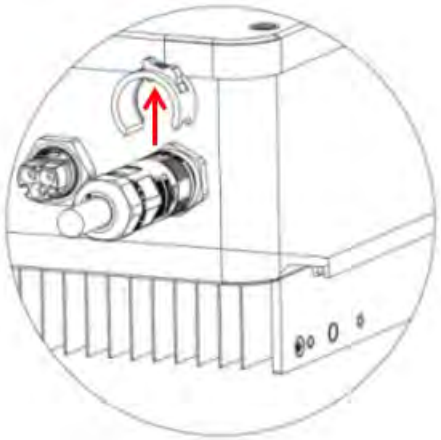


Step 5: Connect the connected load connector to the inverter's load connector. Turn the knob of the AC connector to lock it until a “click” sound is heard and until the closure is in place.

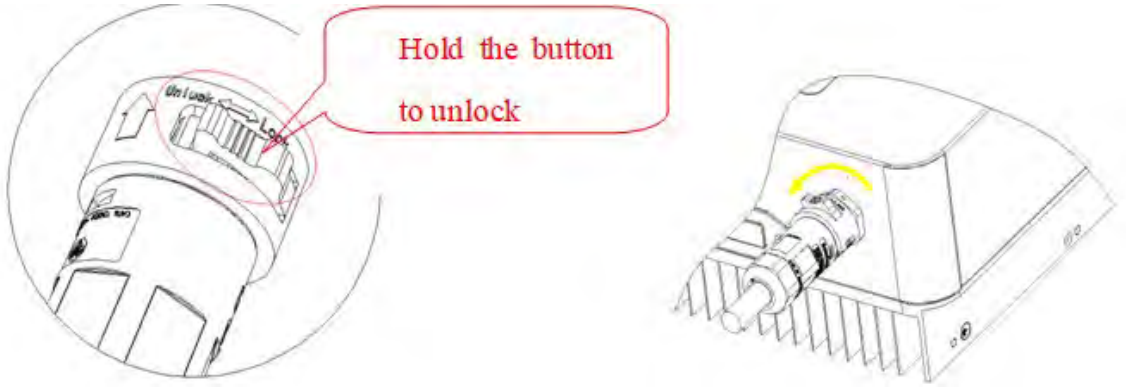




Step 6: After installation, remove the unlocking tool to prevent the Load port from being unlocked.



Removing the load connector: Press and hold the button to unlock and turn the knob counter-clockwise to the unlocked position, then pull out the load connector. Make sure the grid is correctly disconnected before removing the load connector.



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

Change-over positions

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

- Under normal conditions: the change-over switch is in position 1. The 1PH HYD3000-HYD6000-ZSS-HP inverter can supply power to critical loads in the event of a power failure.

- If the 1PH HYD3000-HYD6000-ZSS-HP 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 upstream of the meter, so this energy, even if produced by photovoltaic panels, is not counted as energy produced. If necessary, the system designer can use suitable external change-over contactors to ensure that the energy for the critical load is drawn downstream of the production meter during normal grid operation and only flows to the EPS output of the inverter in the event of a power failure.

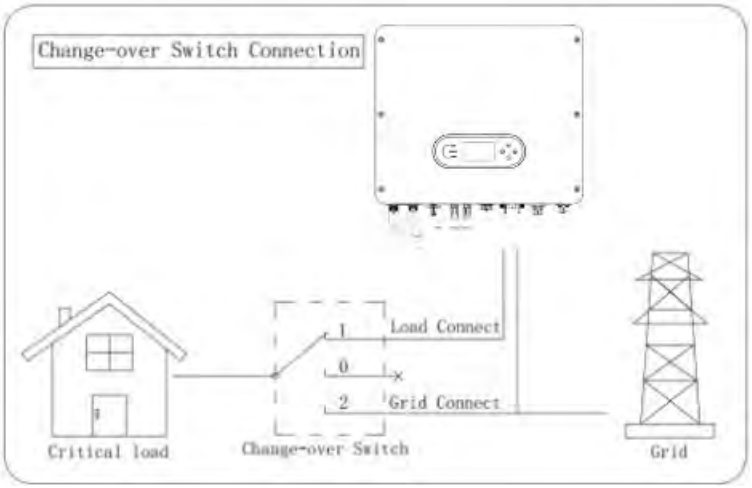


Figure 8 – Connecting the change-over switch

4.6. Photovoltaic connection

Recommended specifications for DC input cables

Cross section (mm²/AWG)		Cable outer diameter (mm²)
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 9 – Preparing the positive and negative PV cables

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

Figure 10 – Preparing the positive and negative photovoltaic connectors

Step 3: Make sure that the DC voltage of each photovoltaic string is less than 600 V DC and that the polarities of the photovoltaic cables are correct. Insert the positive and negative connectors into the 1PH HYD3000-HYD6000-ZSS-HP inverter until a "click" sound is heard.

Figure 11 – Connecting the photovoltaic connectors

Caution	Before removing the positive and negative connectors, make sure that the automatic DC circuit breaker is OPEN.

Removal procedure

Use a MC4 wrench to disconnect the photovoltaic connectors.

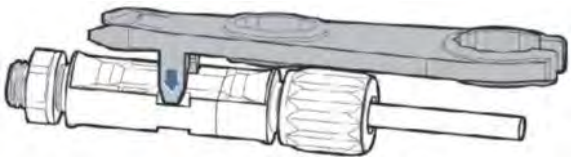


Figure 12 – Disconnecting the photovoltaic connectors

Connect the 1PH HYD3000-HYD6000-ZSS-HP inverter to the photovoltaic strings using DC input power cables. Select input mode: the 1PH HYD3000-HYD6000-ZSS-HP inverter has two MPPTs, which can operate independently or in parallel. The user can choose the appropriate MPPT operating mode depending on how the system is designed.

If the inverter is an display LCD version, the configuration is automatic, otherwise to configure the inverter channels correctly:

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

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

1.	Basic settings
2.	Advanced settings
3.	Production statistics
4.	System Info
5.	Event list
6.	SW Update

3. Basic settings, press the down arrow until the PV input mode item is highlighted. Now press the last arrow to the right to access the settings:

1.	Language
2.	Date and Time
3.	Safety parameters
4.	Working mode
5.	Self-Test
6.	PV Input Mode
7.	EPS Mode
8.	Communication address

Independent mode (default):

If the strings are different (e.g. installed on two separate pitches or consisting of a different number of panels), the input model must be set to “independent mode.”

Parallel mode:

If the strings are connected in parallel, the input mode must be set to “parallel mode.”

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 supply cable must be suitable for photovoltaic applications.

Note:

Both MPPT inputs of the inverter must 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 array 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 12 – Y connection cable for solar panels

4.7. Battery connection

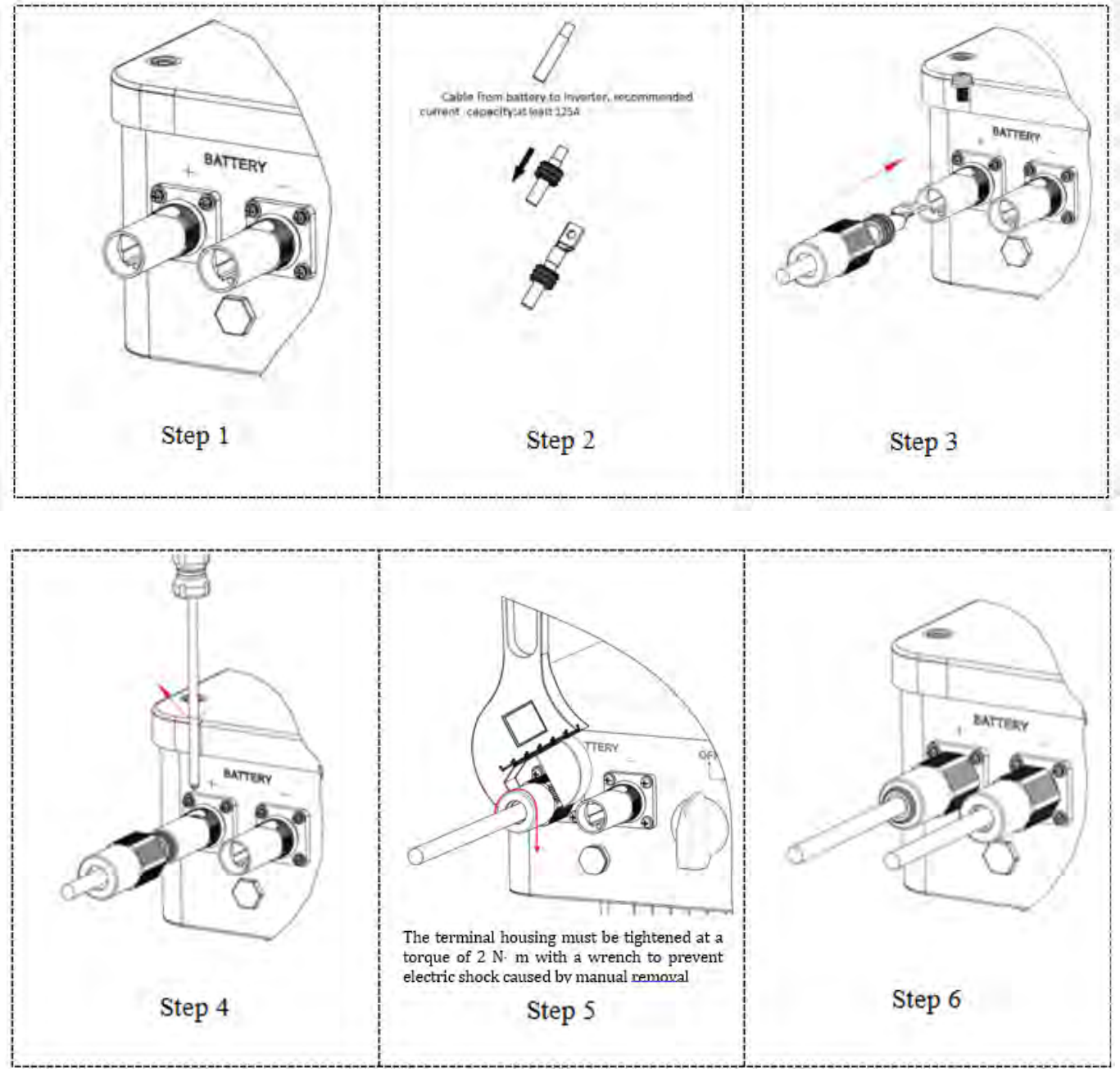


Figure 7 – Installing the battery connection

NOTE
If the storage capacity needs to be increased by adding one or more batteries to an existing system, ensure that all the batteries (present 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 instant information can be accessed by pressing the "down" key from the main menu).
Batteries can be recharged from the excess photovoltaic production or using the forced charge mode indicated in the "% charge mode" section of this manual.

4.8. Connecting the Pylontech US2000 battery

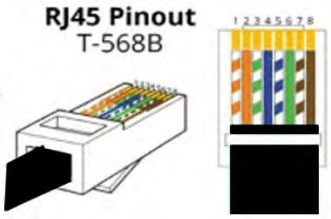
4.8.1. Connecting a single Pylontech US2000 battery

Inside the inverter box there is the cable for communication between the battery and inverter.
This cable must be connected to the battery by inserting the RJ45 (8 pin) plug into the appropriate connection:

1. In the case of Pylontech batteries, insert the connector into the CAN port of the single battery.

Inverter PIN	Battery communication	Note
1	CAN H (blue wire)	Communication with the BMS of the battery, the CAN of the inverter adapts to the BMS of the lithium battery.
2	CAN L (white-blue wire)	

Figure 13 - Pylontech communication cable to be inserted into the battery communication input

Communication cable pinout between Pylontech battery and inverter, from left to right	
Inverter 	PIN 1: blue PIN 2: white-blue
Pylontech 	PIN 1: white orange PIN 2: orange PIN 3: white green PIN 4: blue PIN 5: white blue PIN 6: green PIN 7: white brown PIN 8: brown

2. Make sure that the order of the DIP switches remains at factory settings (all in the OFF position).
3. Connect the ground cable to the battery through the threaded hole.

NOTE: when connecting the Pylontech batteries, use the communication cable contained in the inverter kit, as shown in the figure.

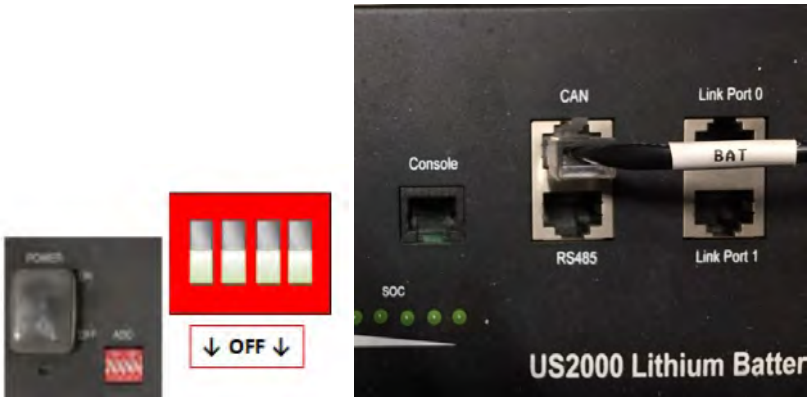


Figure 14- Connecting the communication cable to the Pylontech battery

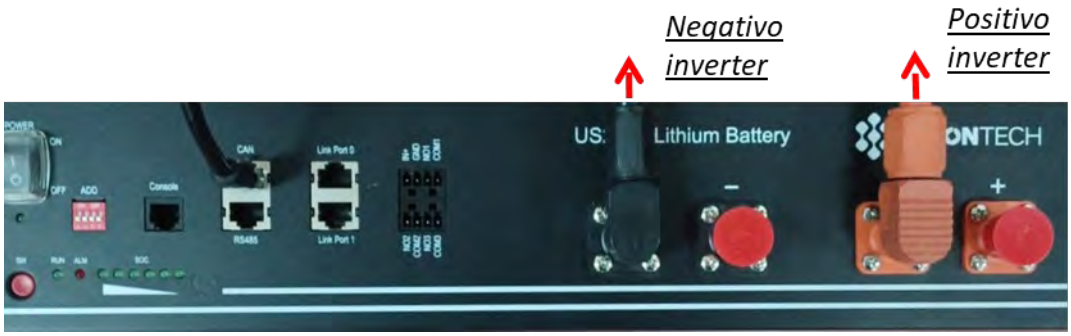


Figure 15- Connecting the power cable from the Pylontech battery to the inverter

In the case of a single battery, two power cables (positive and negative) will then be connected to the positive and negative outputs of the inverter respectively, as shown in the figure.

4.8.2. Connecting multiple batteries in parallel Pylontech US2000

The communication cables must be connected by starting from the master battery and inserting either the short jumper (supplied with the battery) or a 0.6 or 1.5 m long jumper (available on request, codes ZST-CABLE-0.6M and ZST-CABLE -1.5M) into the LINK connection port; insert this cable into LINK connection port 0 of the second battery, which will be called slave 1. If there are additional batteries, a new jumper must be inserted into LINK connection port 1 of slave 1 battery; insert the free end of this cable into the third battery, which will be called slave 2. This procedure will be repeated for all the elements of the battery pack.
At the end, all the link ports will be occupied by the communication cable, except for the master battery (LINK PORT 0 free) and the last slave battery (LINK PORT 1 free).

Figure 16- Connecting the communication cable between three Pylontech batteries

NOTE: the position of the DIP switches (white on a red background, as shown in the figure below) must all be in the down position (OFF) and must not be changed. If it is changed by accident, please contact the ZCS Service Centre at the toll-free number 800 72 74 64 (available only in Italy) or open a ticket by going to the "support" section of our website https://www.zcsazzurro.com/it/support.

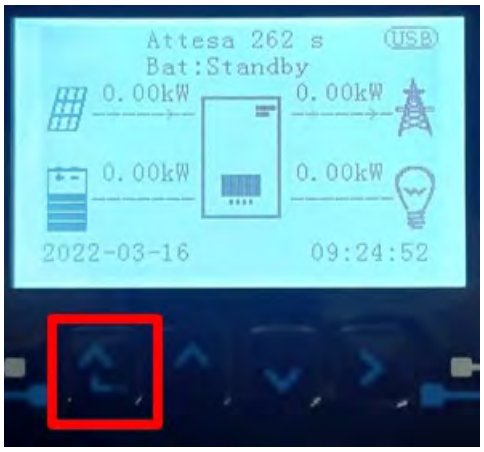
As for the power connections, in the case of Pylontech batteries, connect one of the two power cables (e.g. the orange positive one) to the master battery, inserting the quick contact in the appropriate terminal. Then connect the other cable (e.g. the black negative one) to the last battery in the group, as shown in the figure below. Finally, run the batteries in parallel using the short jumpers (supplied with the battery) or the 0.6 or 1.5 m long jumpers (available on request, codes ZST-CABLE-0.6M and ZST-CABLE-1.5M), connecting respectively the positive and negative polarities of one battery with those of the next battery.

Figure 17 – Connecting three Pylontech batteries in parallel

4.8.3. Pylontech US2000 configuration

To correctly configure the battery parameters:

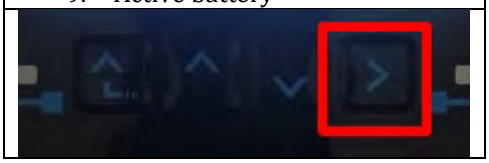
4. Press the first button on the left of the display:



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

1. Basic settings
2. Advanced settings
3. Production statistics
4. System Info
5. Event list
6. SW Update


6. Now press the last arrow on the right to access the battery parameters

1. Battery parameters
2. Zero feed-in mode
3. IV Curve Scan
4. Logic interface
5. Factory reset
6. Parallel settings
7. Reset Bluetooth
8. CT Calibration
9. Active battery


7. Check that the parameters are set correctly:

1.Battery type	Pylon-AH US2000
4.Depth of Discharge	80%
6.Save	

4.9. Pylontech US5000 battery connection

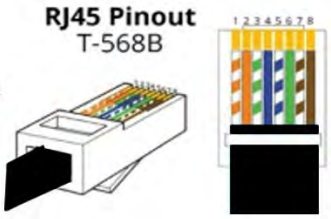
4.9.1. Connecting a single Pylontech US5000 battery

Inside the inverter box there is the cable for communication between the battery and inverter.
This cable must be connected to the battery by inserting the RJ45 (8 pin) plug into the appropriate connection:

1. In the case of Pylontech batteries, insert the connector into the CAN port of the single battery.

Inverter PIN	Battery communication	Note
1	CAN H (blue wire)	Communication with the BMS of the battery, the CAN of the inverter adapts to the BMS of the lithium battery.
2	CAN L (white-blue wire)	

Figure 18 - Pylontech communication cable to be inserted into the battery communication input

Communication cable pinout between Pylontech battery and inverter, from left to right	
Inverter 	PIN 1: blue PIN 2: white-blue
Pylontech 	PIN 1: white orange PIN 2: orange PIN 3: white green PIN 4: blue PIN 5: white blue PIN 6: green PIN 7: white brown PIN 8: brown

2. Make sure that the order of the DIP switches remains at factory settings (all in the OFF position).
3. Connect the ground cable to the battery through the threaded hole.

NOTE: when connecting the Pylontech batteries, use the communication cable contained in the inverter kit, as shown in the figure.

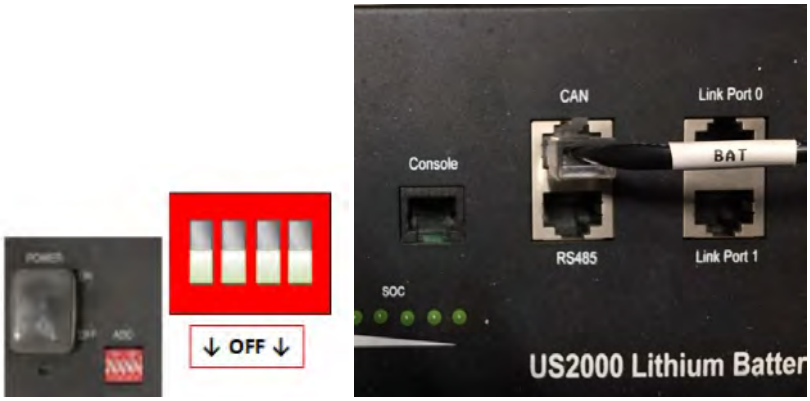


Figure 19- Connecting the communication cable to the Pylontech battery

Figure 20- Connecting the power cable from the Pylontech battery to the inverter

In the case of a single battery, two power cables (positive and negative) will then be connected to the positive and negative outputs of the inverter respectively, as shown in the figure.

4.9.2. Connecting multiple batteries in parallel Pylontech US5000

The communication cables must be connected by starting from the master battery and inserting either the short jumper (supplied with the battery) or a 0.6 or 1.5 m long jumper (available on request, codes ZST-CABLE-0.6M and ZST-CABLE -1.5M) into the LINK connection port; insert this cable into LINK connection port 0 of the second battery, which will be called slave 1. If there are additional batteries, a new jumper must be inserted into LINK connection port 1 of slave 1 battery; insert the free end of this cable into the third battery, which will be called slave 2. This procedure will be repeated for all the elements of the battery pack.
At the end, all the link ports will be occupied by the communication cable, except for the master battery (LINK PORT 0 free) and the last slave battery (LINK PORT 1 free).

Figure 21- Connecting the communication cable between three Pylontech batteries

NOTE: the position of the DIP switches (white on a red background, as shown in the figure below) must all be in the down position (OFF) and must not be changed. If it is changed by accident, please contact the ZCS Service Centre at the toll-free number 800 72 74 64 (available only in Italy) or open a ticket by going to the "support" section of our website https://www.zcsazzurro.com/it/support.

As for the power connections, in the case of Pylontech batteries, connect one of the two power cables (e.g. the orange positive one) to the master battery, inserting the quick contact in the appropriate terminal. Then connect the other cable (e.g. the black negative one) to the last battery in the group, as shown in the figure below. Finally, run the batteries in parallel using the short jumpers (supplied with the battery) or the 0.6 or 1.5 m long jumpers (available on request, codes ZST-CABLE-0.6M and ZST-CABLE-1.5M), connecting respectively the positive and negative polarities of one battery with those of the next battery.

Figure 22 – Connecting three Pylontech batteries in parallel

4.9.3. Pylontech US5000 configuration

To correctly configure the battery parameters:

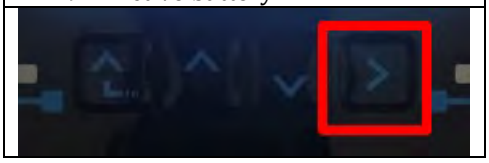
1. Press the first button on the left of the display:

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

1. Basic settings
2. Advanced settings
3. Production statistics
4. System Info
5. Event list
6. SW Update

3. Now press the last arrow on the right to access the battery parameters

1. Battery parameters
2. Zero feed-in mode
3. IV Curve Scan
4. Logic interface
5. Factory reset
6. Parallel settings
7. Reset Bluetooth
8. CT Calibration
9. Active battery



4. Check that the parameters are set correctly:

1.Battery type	Pylon-AH US5000
4.Depth of Discharge	80%
6.Save	

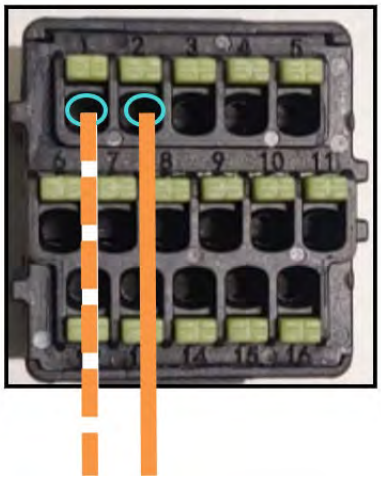
4.10. Connecting a WeCo 4k4 battery

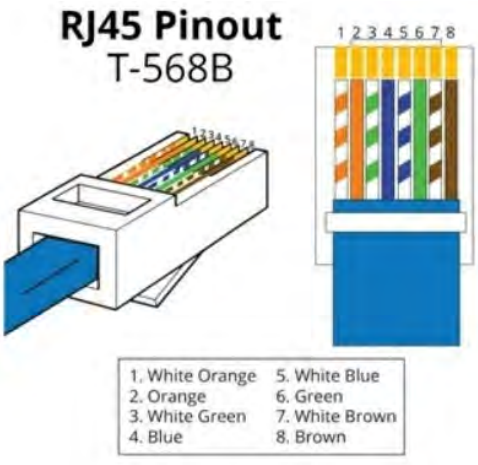
4.10.1. Connecting a single 4k4 battery

Inside the battery box is the cable for communication between the battery and inverter.
This cable must be connected to the battery by inserting the RJ45 (8 pin) plug into the appropriate Input:

1. Insert the connector into the BMS-CAN port of the single battery.

Inverter PIN	Battery communication	Note
1	CAN (white-orange wire)	Communication with the BMS, the CAN of the inverter adapts to the BMS of the lithium battery.
2	CAN (orange wire)	





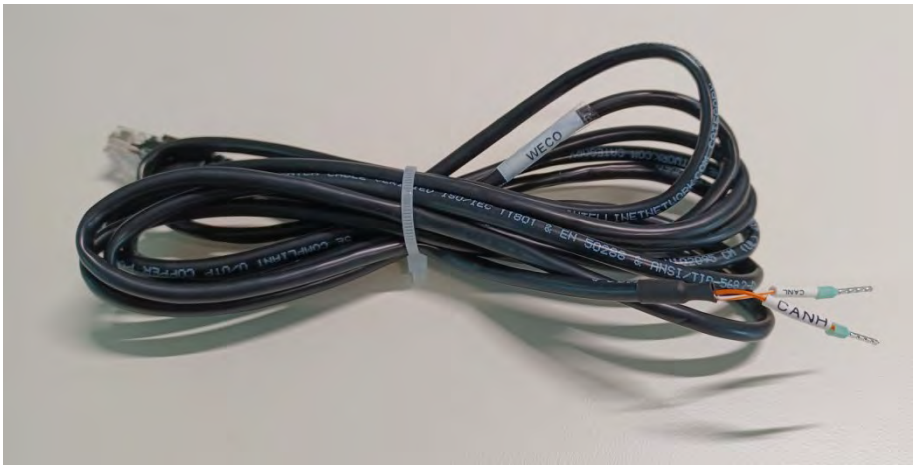


Figure 23 - Communication cable between the inverter and WeCo 4k4 battery

a. Make sure that the DIP switches are set as shown in the figure.

b. Connect the ground cable to the battery through the threaded hole.

NOTE: to connect the WeCo batteries, use the communication cable labelled WECO contained in the inverter kit (or otherwise use the one inside the battery kit, leaving the RJ45 side intact and cutting the other side to use orange and white-orange, connecting them to the COM port of the inverter).

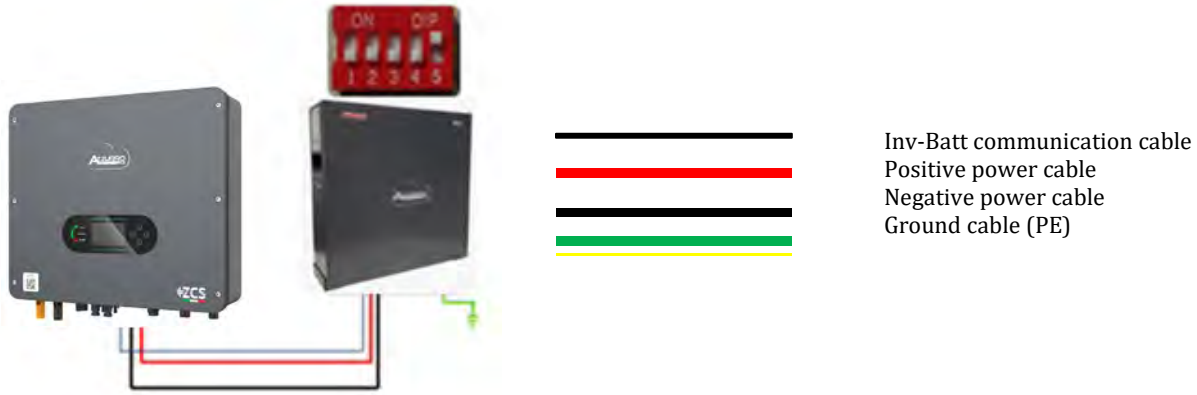


Figure 24 – Connecting the WeCo 4k4 battery

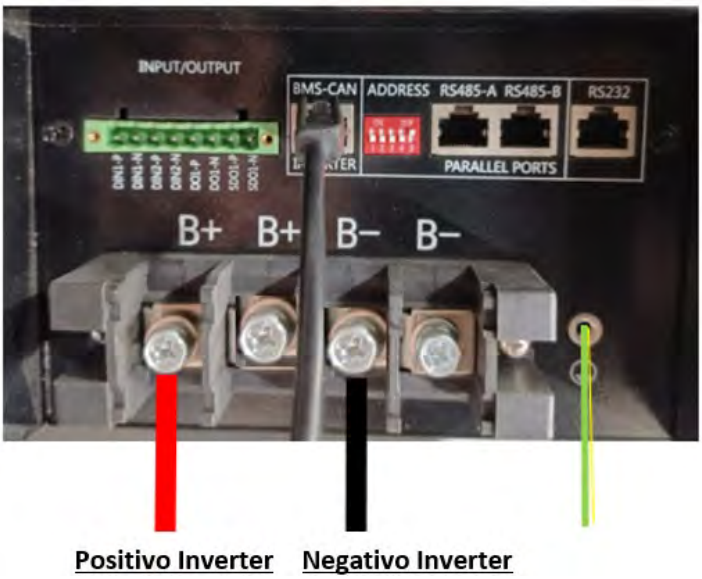


Figure 25- Connecting the power cable from the WeCo battery to the inverter

In the case of a single battery, two power cables (positive and negative) will then be connected to the positive and negative outputs of the inverter respectively, as shown in the figure.

4.10.2. Connecting multiple batteries in parallel 4k4

If there are multiple batteries:

a. Check that the batteries have the same voltage level by switching them off, disconnecting them and switching them on one at a time, measuring the + and - terminals with a tester. Make sure that the difference between the voltages of all the batteries is less than 2 Volt.

b. Set the DIP switches correctly according to the number of batteries connected, as shown in the figure below. (Attention: only make changes when the battery is switched off)

c. Connect the communication cable inserted in the COM port of the inverter to the CAN-BUS port of one of the batteries, making it the master battery.

d. Connect the master battery to the communication cable inside the battery pack starting from the **RS485-B** port and arriving at the **RS485-A** communication port of slave 1 battery. **(Attention: do not connect the RS485-A port to the master battery).**

Figure 26 – Communication cable between WeCo 4k4 batteries

e. In the case of additional batteries, the communication cable should be connected as shown above for connecting the master battery to slave 1 battery.

f. The last battery will only have the **RS485-A** port connected.

g. As for the power connections, connect one of the two power cables (e.g. the red positive one) to the master battery, inserting the metal ring in the appropriate terminal. Then connect the other cable (e.g. the black negative one) to the last battery in the group, as shown in the figure below. Finally, run the batteries in parallel using the parallel cables (supplied with the battery), connecting respectively the positive and negative polarities of one battery to those of the next battery.

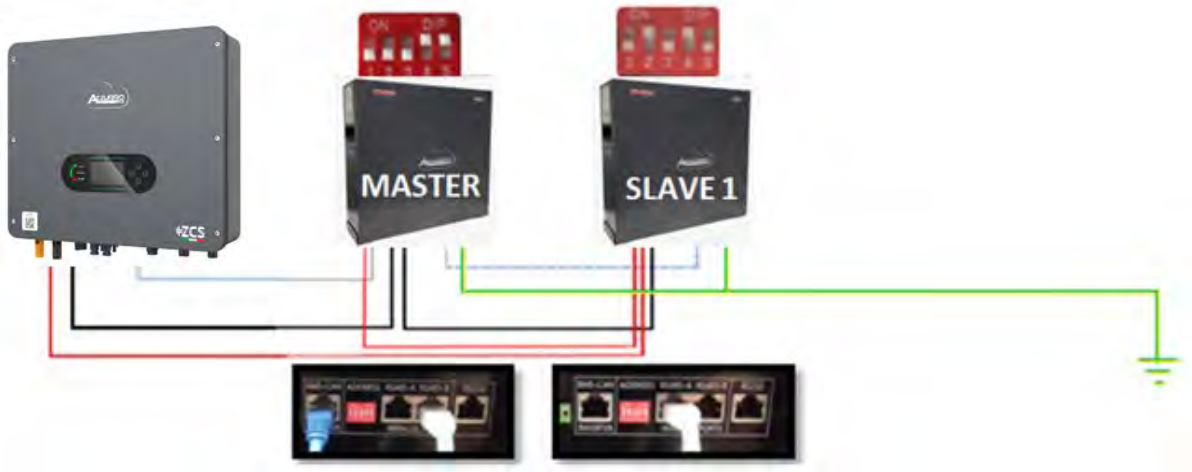


Figure 27 – Connecting two WeCo 4k4 batteries in parallel

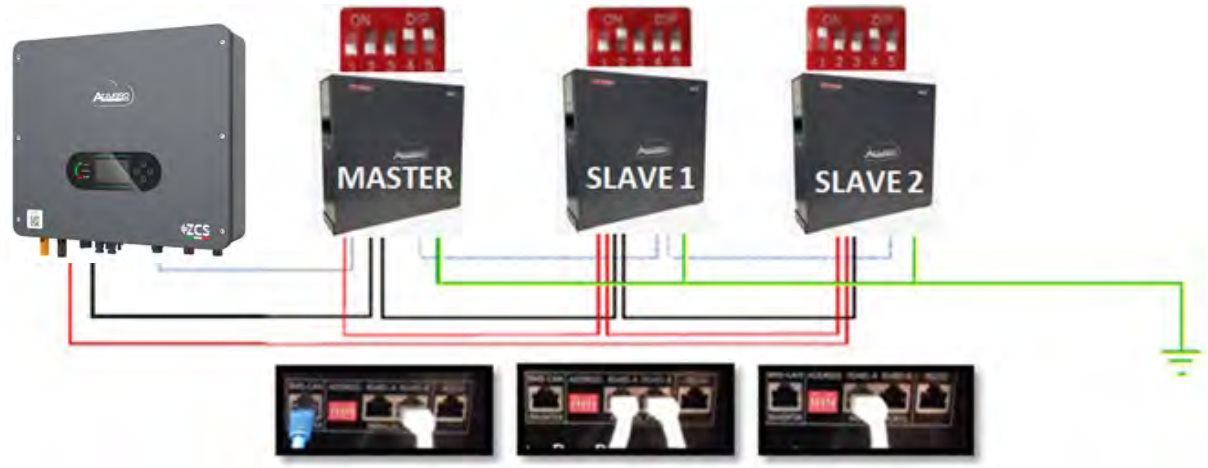


Figure 28 – Connecting three WeCo 4k4 batteries in parallel

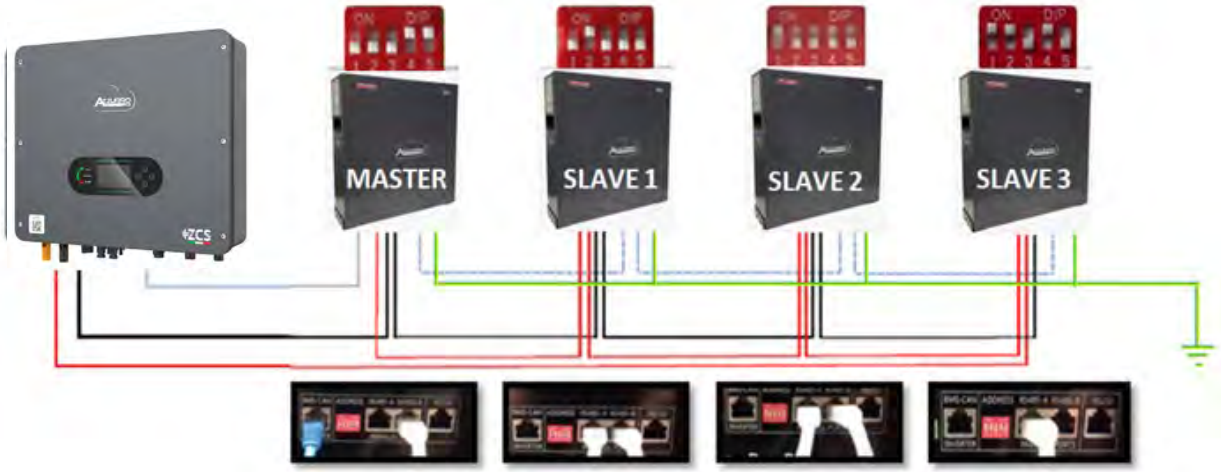


Figure 29 – Connecting four WeCo 4k4 batteries in parallel

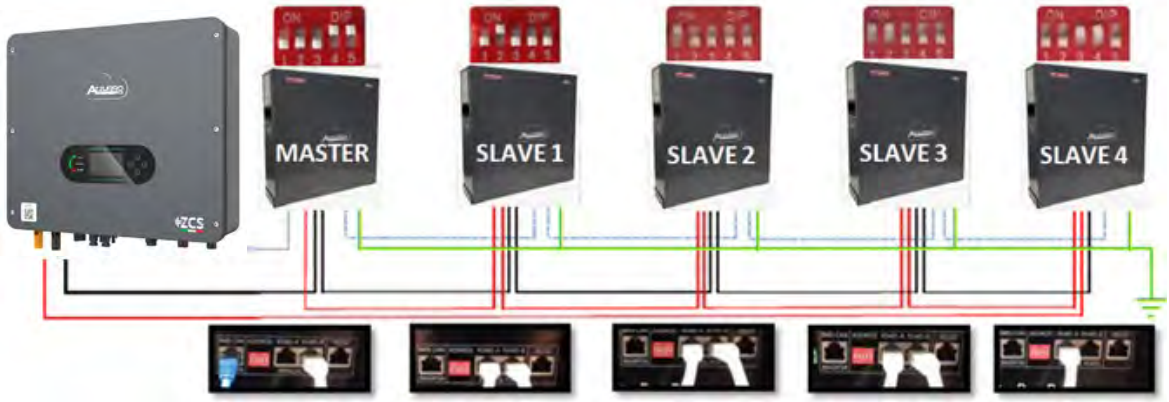


Figure 30 – Connecting five WeCo 4k4 batteries in parallel

4.10.3. WeCo 4k4 configuration

To correctly configure the battery parameters:

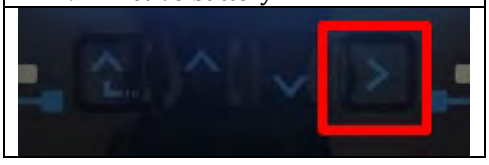
1. Press the first button on the left of the display:

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

1. Basic settings
2. Advanced settings
3. Production statistics
4. System Info
5. Event list
6. SW Update

3. Now press the last arrow on the right to access the battery parameters

1. Battery parameters
2. Zero feed-in mode
3. IV Curve Scan
4. Logic interface
5. Factory reset
6. Parallel settings
7. Reset Bluetooth
8. CT Calibration
9. Active battery



4. Check that the parameters are set correctly:

1.Battery type	WeCo
4.Depth of Discharge	80%
6.Save	

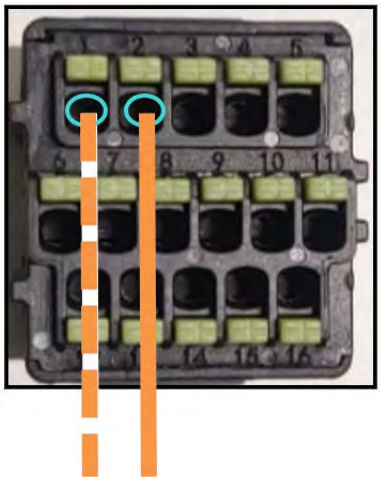
4.11. Connecting a WeCo 4k4 PRO battery

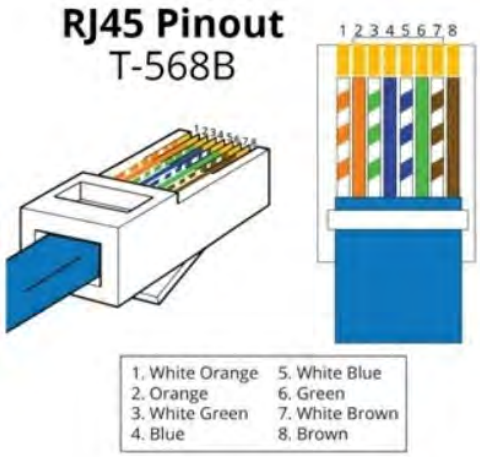
4.11.1. Connecting a single 4k4 PRO battery

Inside the battery box is the cable for communication between the battery and inverter.
This cable must be connected to the battery by inserting the RJ45 (8 pin) plug into the appropriate Input:

a. Insert the connector into the CAN-A port of the single battery.

Inverter PIN	Battery communication	Note
1	CAN (white-orange wire)	Communication with the BMS, the CAN of the inverter adapts to the BMS of the lithium battery.
2	CAN (orange wire)	





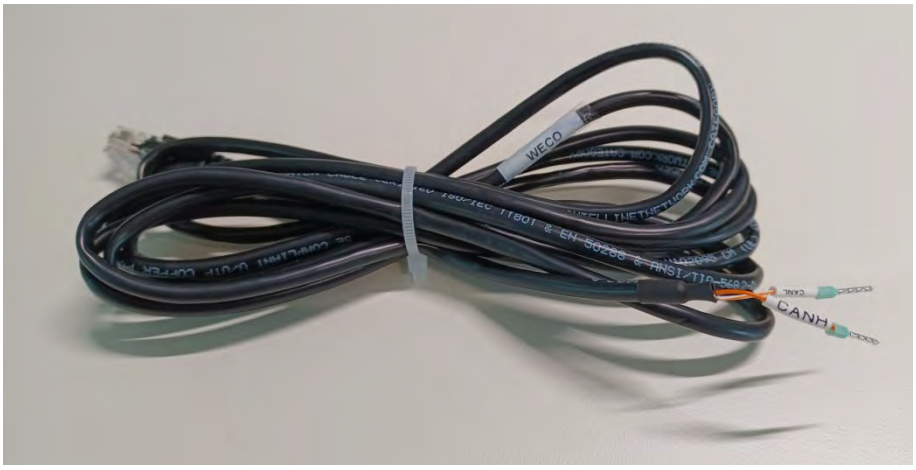


Figure 31 - Communication cable between the inverter and WeCo 4k4 PRO battery

b. Make sure that the DIP switches are set as shown in the figure.

c. Connect the ground cable to the battery through the threaded hole.

NOTE: to connect the WeCo batteries, use the communication cable labelled WECO contained in the inverter kit (or otherwise use the one inside the battery kit, leaving the RJ45 side intact and cutting the other side to use orange and white-orange, connecting them to the COM port of the inverter).

Inv-Batt communication cable
Positive power cable
Negative power cable
Ground cable (PE)

Figure 32 – Connecting the WeCo 4k4 PRO battery

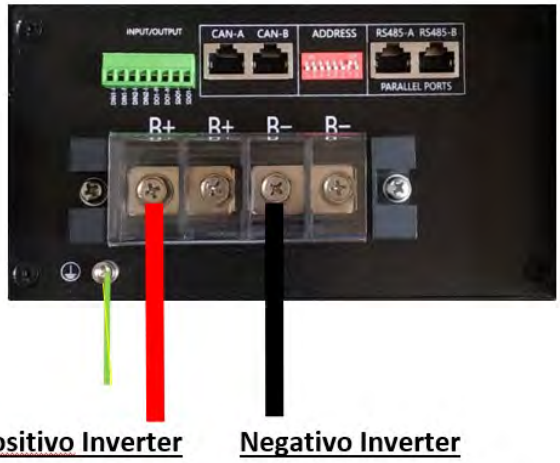


Figure 33- Connecting the power cable from the WeCo 4k4 PRO battery to the inverter

In the case of a single battery, two power cables (positive and negative) will then be connected to the positive and negative outputs of the inverter respectively, as shown in the figure.

4.11.2. Connecting multiple batteries in parallel 4k4 PRO

If there are multiple batteries:

a. Check that the batteries have the same voltage level by switching them off, disconnecting them and switching them on one at a time, measuring the + and - terminals with a tester. Make sure that the difference between the voltages of all the batteries is less than 2 Volt.

a. Set the DIP switches correctly according to the number of batteries connected, as shown in the figure below. (Attention: only make changes when the battery is switched off)

b. Connect the communication cable inserted in the COM port of the inverter to the CAN-A port of one of the batteries, making it the master battery.

c. Connect the master battery to the communication cable inside the battery pack starting from the **RS485-B** port and arriving at the **RS485-A** communication port of slave 1 battery. **(Attention: do not connect the RS485-A port to the master battery).**

Figure 34 – Communication cable between WeCo 4k4 PRO batteries

d. In the case of additional batteries, the communication cable should be connected as shown above for connecting the master battery to slave 1 battery.

e. The last battery will only have the **RS485-A** port connected.

f. As for the power connections, connect one of the two power cables (e.g. the red positive one) to the master battery, inserting the metal ring in the appropriate terminal. Then connect the other cable (e.g. the black negative one) to the last battery in the group, as shown in the figure below. Finally, run the batteries in parallel using the parallel cables (supplied with the battery), connecting respectively the positive and negative polarities of one battery to those of the next battery.

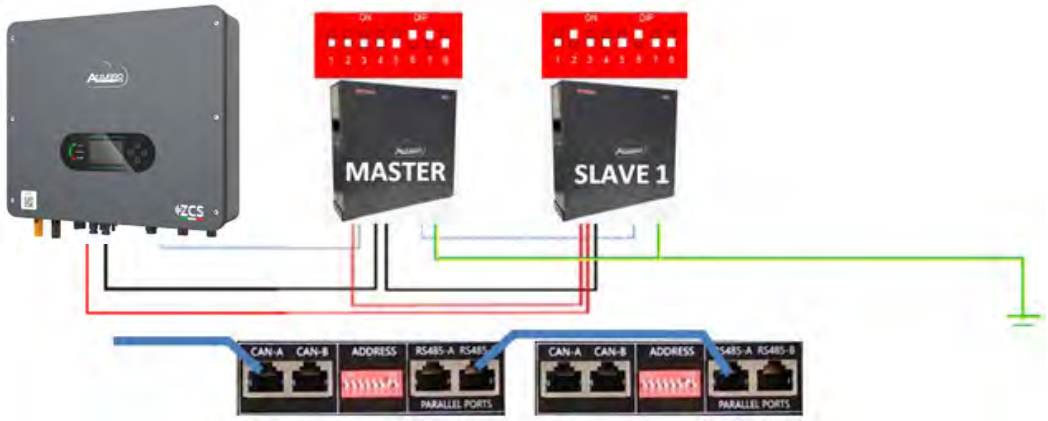


Figure 35 – Connecting two WeCo 4k4 PRO batteries in parallel

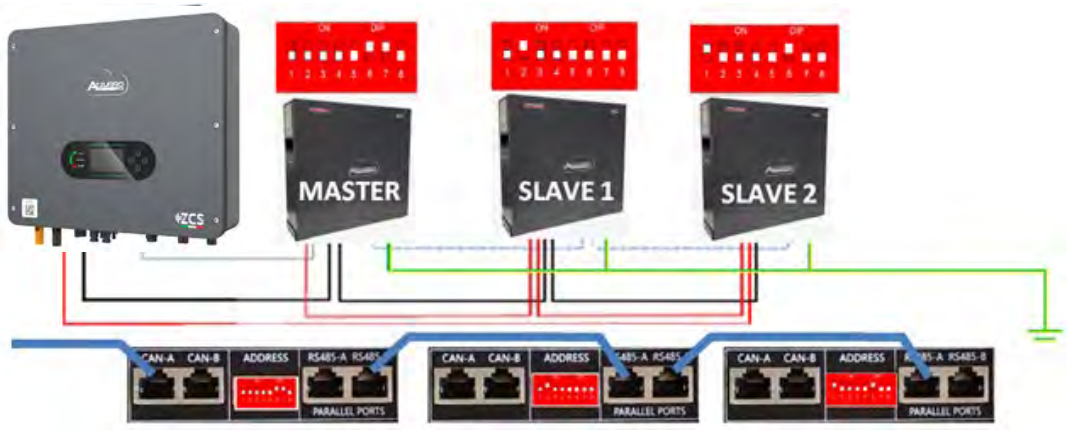


Figure 36 – Connecting three WeCo 4k4 PRO batteries in parallel

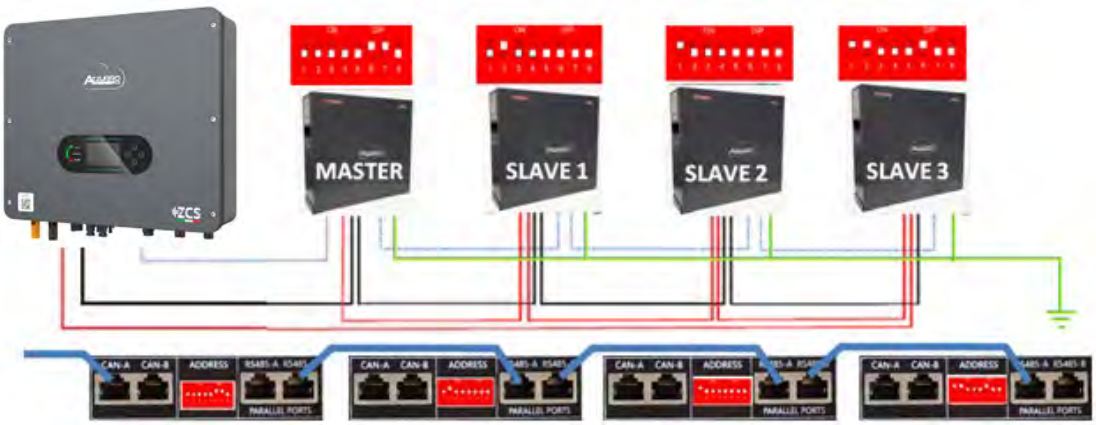


Figure 37 – Connecting four WeCo 4k4 PRO batteries in parallel

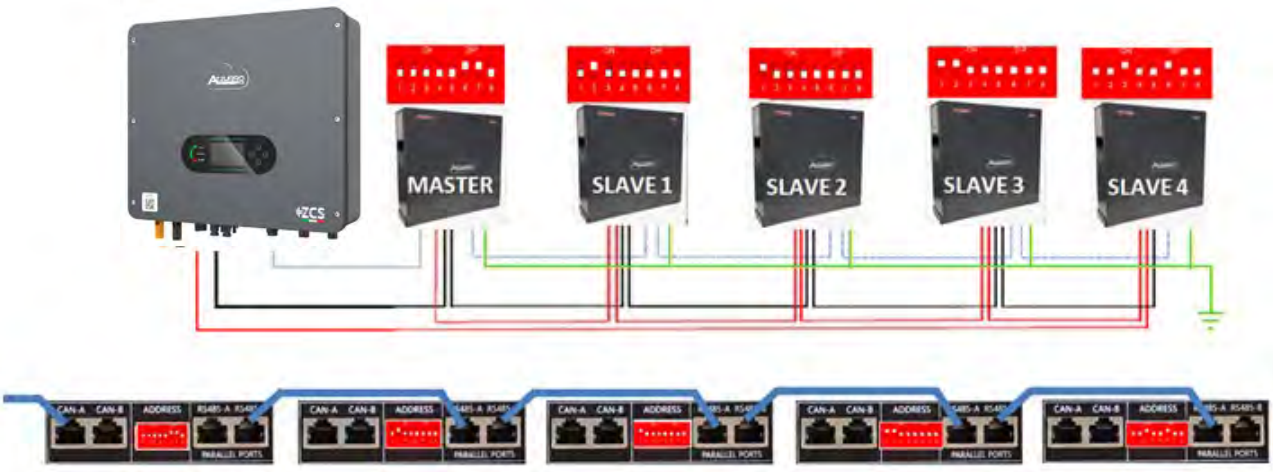


Figure 38 – Connecting five WeCo 4k4 PRO batteries in parallel

4.11.3. WeCo 4k4 PRO configuration

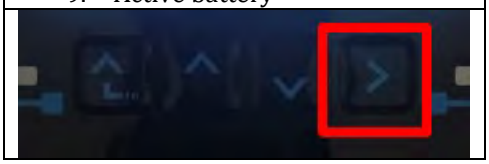
To correctly configure the battery parameters:

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):

1. Basic settings
2. Advanced settings
3. Production statistics
4. System Info
5. Event list
6. SW Update


3. Now press the last arrow on the right to access the battery parameters

1. Battery parameters
2. Zero feed-in mode
3. IV Curve Scan
4. Logic interface
5. Factory reset
6. Parallel settings
7. Reset Bluetooth
8. CT Calibration
9. Active battery


4. Check that the parameters are set correctly:

1.Battery type	WeCo
4.Depth of Discharge	80%
6.Save	

NOTE: When switched on for the first time, the WeCo batteries receive a command from the inverter to start regular operation only when all of them have collectively reached a state of full charge (i.e. a SOC level of 100%).

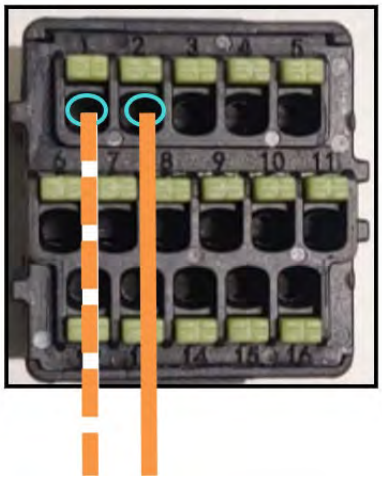
4.12. Connecting a WeCo 4k4-LT battery

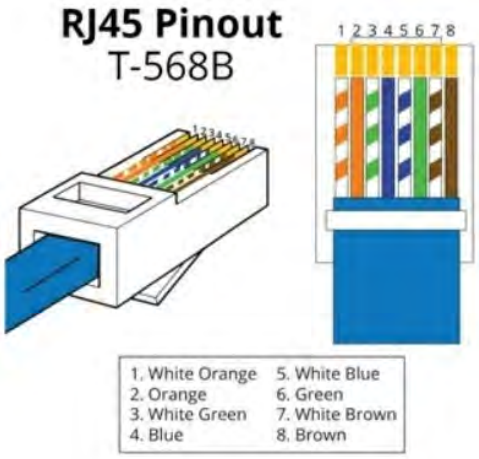
4.12.1. Connecting a single 4k4-LT battery

Inside the battery box is the cable for communication between the battery and inverter.
This cable must be connected to the battery by inserting the RJ45 (8 pin) plug into the appropriate Input:

a. Insert the connector into the CAN-A port of the single battery.

Inverter PIN	Battery communication	Note
1	CAN (white-orange wire)	Communication with the BMS, the CAN of the inverter adapts to the BMS of the lithium battery.
2	CAN (orange wire)	





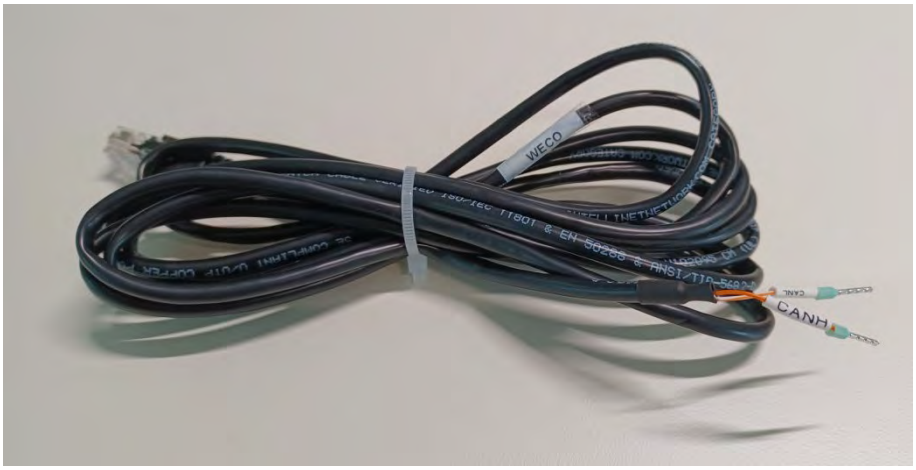


Figure 39 - Communication cable between the inverter and WeCo 4k4-LT battery

b. Make sure that the DIP switches are set as shown in the figure.

c. Connect the ground cable to the battery through the threaded hole.

NOTE: to connect the WeCo batteries, use the communication cable labelled WECO contained in the inverter kit (or otherwise use the one inside the battery kit, leaving the RJ45 side intact and cutting the other side to use orange and white-orange, connecting them to the COM port of the inverter).

Inv-Batt communication cable
Positive power cable
Negative power cable
Ground cable (PE)

Figure 40 – Connecting the WeCo 4k4-LT battery

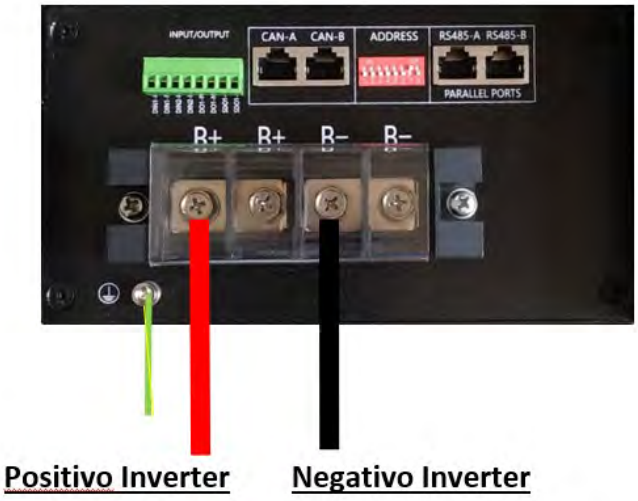


Figure 41- Connecting the power cable from the WeCo 4k4-LT battery to the inverter

4.12.2. Connecting multiple batteries in parallel 4k4-LT

If there are multiple batteries:

a. Check that the batteries have the same voltage level by switching them off, disconnecting them and switching them on one at a time, measuring the + and - terminals with a tester. Make sure that the difference between the voltages of all the batteries is less than 2 Volt.

b. Set the DIP switches correctly according to the number of batteries connected, as shown in the figure below. (Attention: only make changes when the battery is switched off)

c. Connect the communication cable inserted in the COM port of the inverter to the CAN-A port of one of the batteries, making it the master battery.

d. Connect the master battery to the communication cable inside the battery pack starting from the **RS485-B** port and arriving at the **RS485-A** communication port of slave 1 battery. **(Attention: do not connect the RS485-A port to the master battery).**

Figure 42 – Communication cable between WeCo 4k4-LT batteries

e. In the case of additional batteries, the communication cable should be connected as shown above for connecting the master battery to slave 1 battery.

f. The last battery will only have the RS485-A port connected.

g. As for the power connections, connect one of the two power cables (e.g. the red positive one) to the master battery, inserting the metal ring in the appropriate terminal. Then connect the other cable (e.g. the black negative one) to the last battery in the group, as shown in the figure below. Finally, run the batteries in parallel using the parallel cables (supplied with the battery), connecting respectively the positive and negative polarities of one battery to those of the next battery.

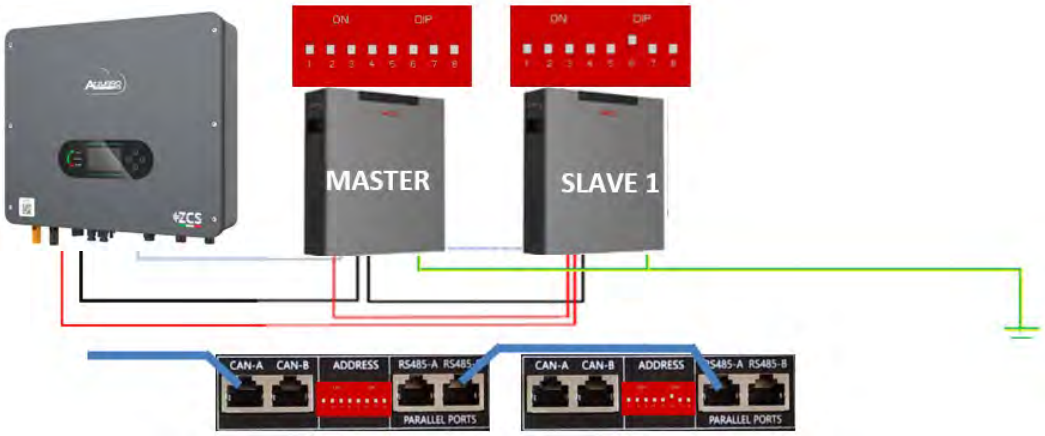


Figure 43 – Connecting two WeCo 4k4-LT batteries in parallel

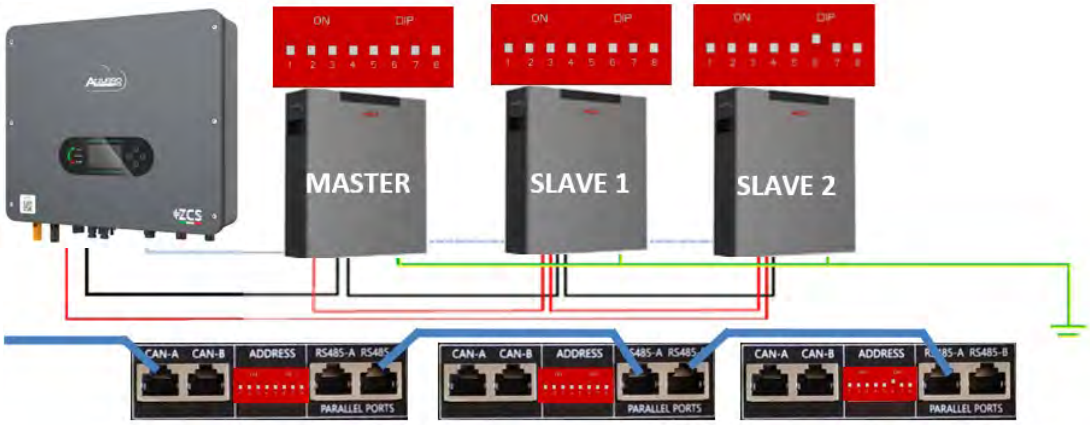


Figure 44 – Connecting three WeCo 4k4-LT batteries in parallel

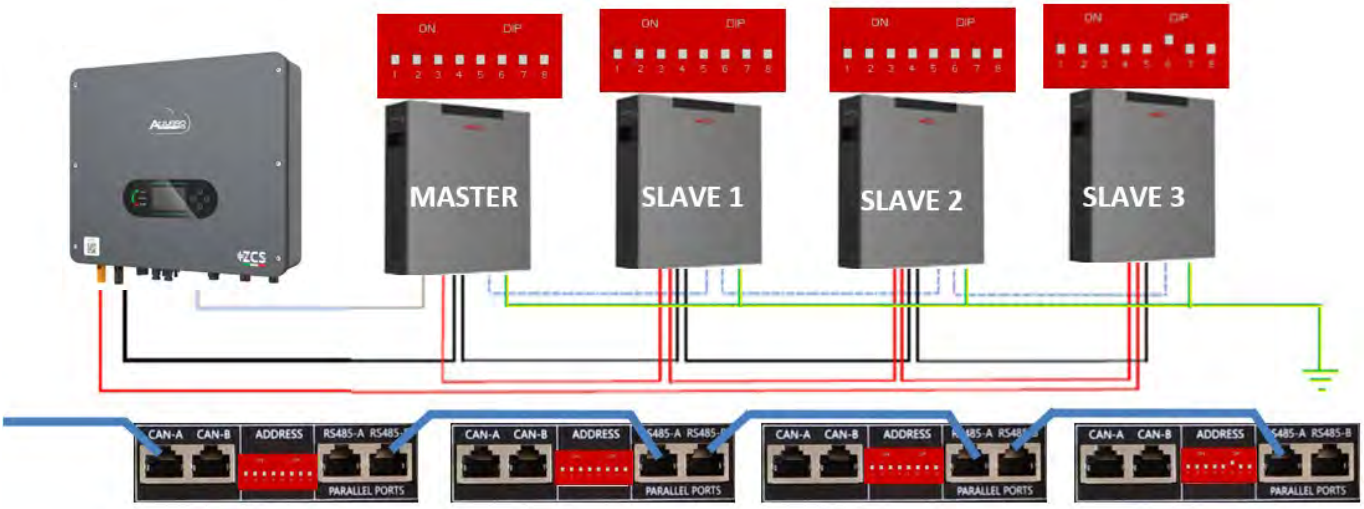


Figure 45 – Connecting four WeCo 4k4-LT batteries in parallel

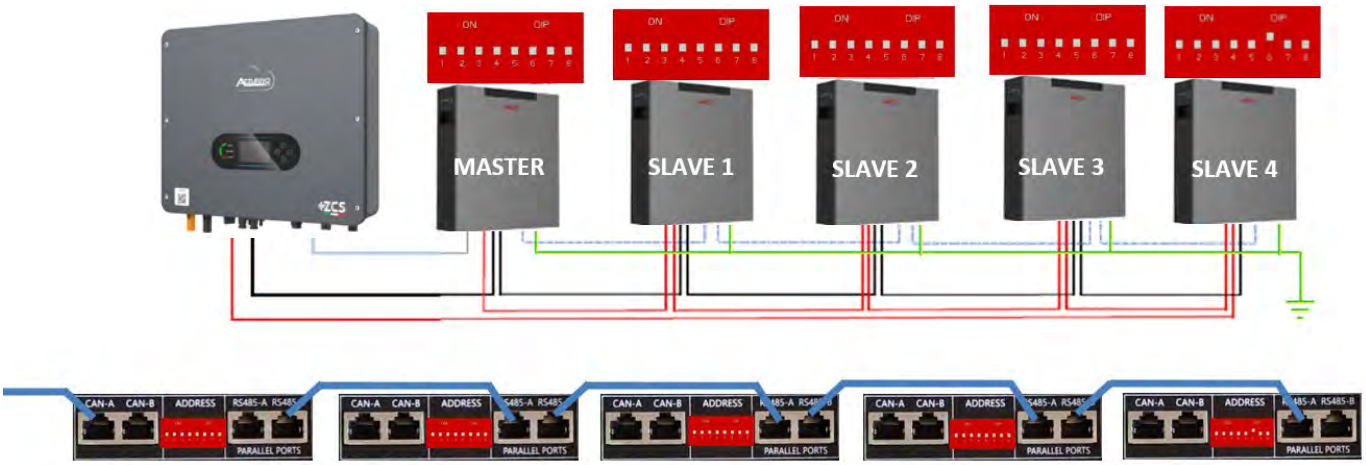
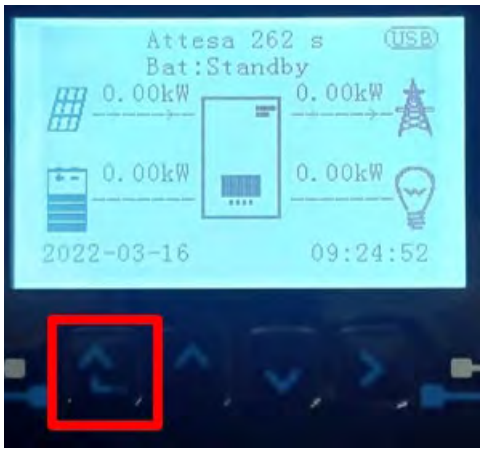


Figure 46 – Connecting five WeCo 4k4-LT batteries in parallel

4.12.3. WeCo 4k4-LT configuration

To correctly configure the battery parameters:

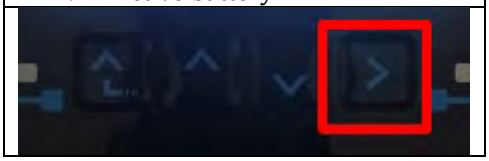
1. Press the first button on the left of the display:



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

1. Basic settings
2. Advanced settings
3. Production statistics
4. System Info
5. Event list
6. SW Update

3. Now press the last arrow on the right to access the battery parameters

1. Battery parameters
2. Zero feed-in mode
3. IV Curve Scan
4. Logic interface
5. Factory reset
6. Parallel settings
7. Reset Bluetooth
8. CT Calibration
9. Active battery


4. Check that the parameters are set correctly:

1.Battery type	WeCo
4.Depth of Discharge	80%
6.Save	

4.12.4. Switching on WeCo 4k4-LT batteries

In order to carry out the correct switch-on procedure:

1. The batteries must all be switched off (side switch to 0);

2. Inverter DC rotary switch set to OFF;

3. Set all batteries, via the side switch, to 1 without switching them on (do not press the round metal button);

4. Switch on the master battery ONLY by pressing the button until the LED lights up;

5. The batteries will automatically switch on in succession (each module will turn on independently and the side switch will flash for 3 seconds; then a steady GREEN light will confirm that each module is powered on);

NOTE: During the commissioning phase, the installer must ensure that the communication between the master battery and the inverter is connected properly. Do not leave the system powered when there is no communication between the master battery and inverter, as prolonged standby of the system could cause an imbalance due to natural self-discharge.

NOTE: When switched on for the first time, the WeCo batteries receive a command from the inverter to start regular operation only when all of them have collectively reached a state of full charge (i.e. a SOC level of 100%).

4.13. WeCo 4k4-LT battery and WeCo 4k4 PRO batteries in parallel

For a new system, we do not recommend installing a mixed solution with WeCo 4k4PRO and WeCo 4k4-LT batteries.

When using WeCo 4k4PRO and WeCo 4k4-LT batteries, the **WeCo 4k4-LT batteries must be installed first and then the 4k4PRO batteries** as shown in the figure.

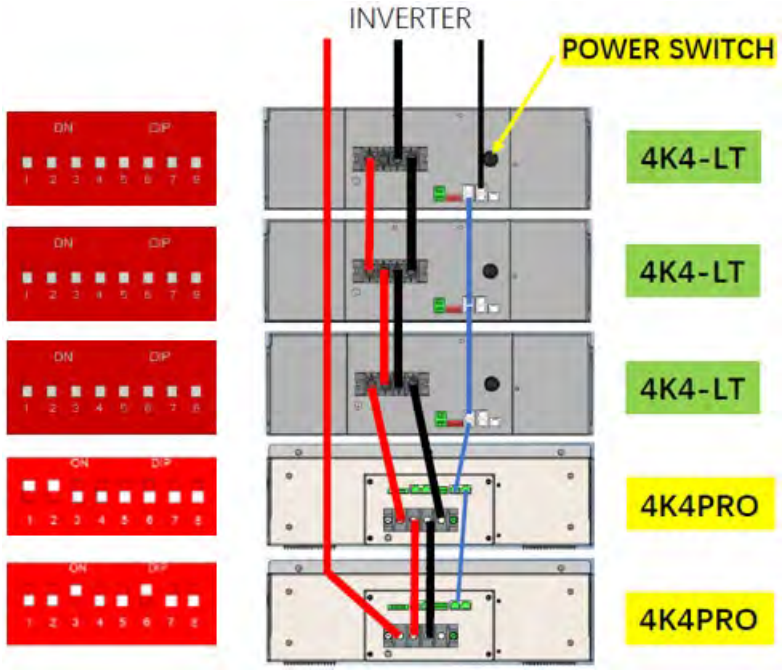


Figure 47 – Connecting the WeCo 4k4-LT and 4k4 PRO batteries

Communication connections between batteries and inverter:

Batteries are connected IN PARALLEL to each other:

a. CAN-A of master battery → COM Port of inverter

b. RS485-B of master battery → RS485-A of slave 1 battery

c. RS485-B of slave 1 battery → RS485-A of slave 2 battery

d. …

e. RS485-B of slave N-1 battery (second last) → RS485-A of slave N battery (last)

Power connections between batteries and inverter:

Batteries must be connected in a "loop."

a. Positive input (+) of master battery connected to positive input (+) of inverter.

b. Positive input (+) of master battery connected to positive input (+) of slave 1 battery.

c. Negative input (-) of master battery connected to negative input (-) of slave 1 battery.

d. .....

e. Positive input (+) of slave N-1 battery (second-last) connected to positive input (+) of slave N battery (last).

f. Negative input (-) of slave N-1 battery (second-last) connected to negative input (-) of slave N battery (last).

g. Negative input (-) of slave N battery (second-last) connected to negative input (-) of inverter.

NOTE: When switched on for the first time, the WeCo batteries receive a command from the inverter to start regular operation only when all of them have collectively reached a state of full charge (i.e. a SOC level of 100%).

4.14. Connecting a WeCo 5K3 battery

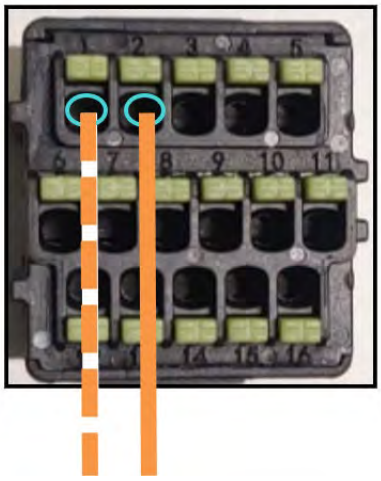
4.14.1. Connecting a single 5K3 battery

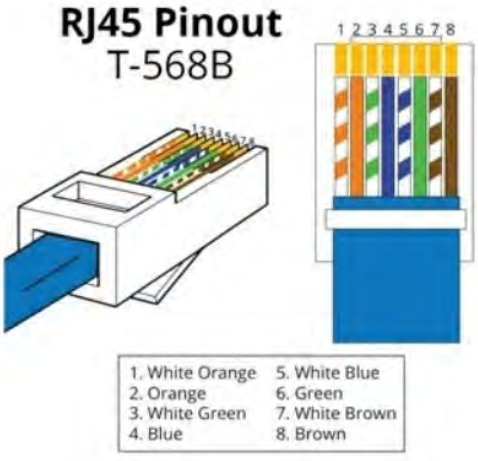
Inside the battery box is the cable for communication between the battery and inverter.
This cable must be connected to the battery by inserting the RJ45 (8 pin) plug into the appropriate Input:

NOTE: to connect the WeCo batteries, use the communication cable labelled WECO contained in the inverter kit (or otherwise use the one inside the battery kit, leaving the RJ45 side intact and cutting the other side to use orange and white-orange, connecting them to the COM port of the inverter).

h. Insert the connector into the CAN-A port of the single battery.

Inverter PIN	Battery communication	Note
1	CAN (white-orange wire)	Communication with the BMS, the CAN of the inverter adapts to the BMS of the lithium battery.
2	CAN (orange wire)	





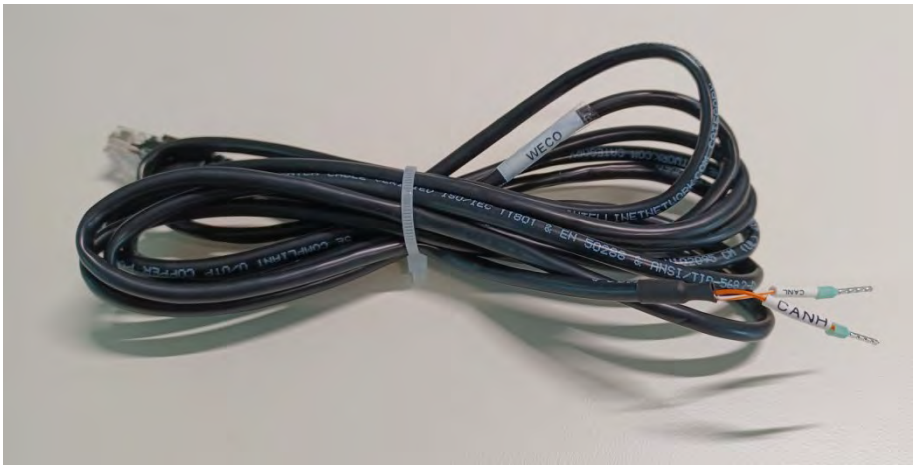


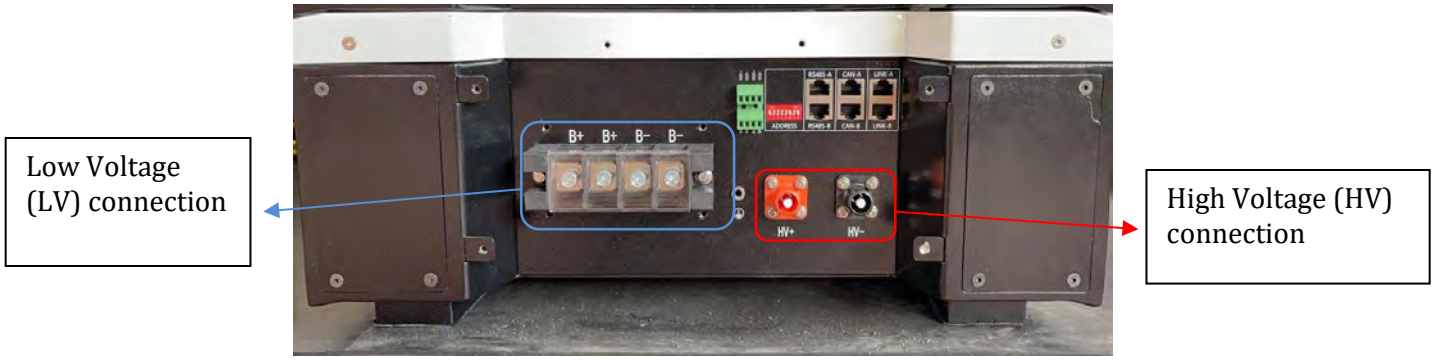
Figure 48 - Communication cable between the inverter and WeCo 5k3 battery

i. Make sure that the DIP switches are set as shown in the figure.

j. Connect the ground cable to the battery through the threaded hole.

Note: Switch off the batteries each time the position of the DIP switches is changed.

To access the battery connection, remove the cover of the LV section located on the left side by unscrewing the screws with a cross screwdriver. Refer to the figure to identify the LV section.



Attention: When connecting 5k3 batteries to single-phase hybrid inverters, only use the low voltage section. To avoid damage to batteries or inverters, do not use the high voltage section.
In case of a single battery:

1. Connect the CAN-A input
2. Set the DIP switches as shown in the figure.

3. Connect the power cables by connecting the appropriate B+ and B- connectors to the corresponding output.
4. Connect the ground cable to the battery through the threaded hole.

Inv-Batt communication cable
Positive power cable
Negative power cable
Ground cable (PE)

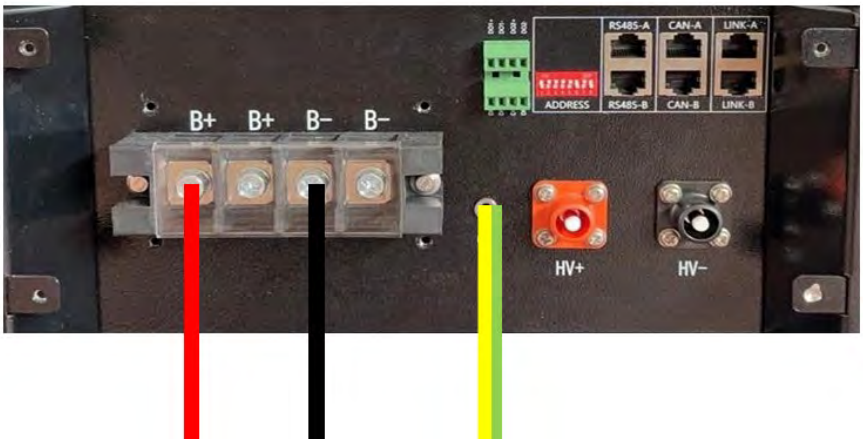


Figure 49 – Connecting the WeCo 5k3 battery

4.14.2. Connecting multiple batteries in parallel 5K3

If there are multiple batteries:

a. Check that the batteries have the same voltage level by switching them off, disconnecting them and switching them on one at a time, measuring the + and - terminals with a tester. Make sure that the difference between the voltages of all the batteries is less than 2 Volt.

a. Set the DIP switches correctly according to the number of batteries connected, as shown in the figure. (Attention: only make changes when the battery is switched off).

b. Connect the communication cable inserted in the COM port of the inverter to the CAN-A port of one of the batteries, making it the master battery.

c. From the master battery, connect the communication cable from the **RS485-B** port to the **RS485-A** communication port of the slave 1 battery. **(Attention: do not connect the RS485-A port to the master battery).**

Figure 50 – Communication cable between WeCo 5k3 batteries

d. In the case of additional batteries, the communication cable should be connected as shown for connecting the master battery to slave 1 battery.

e. The last battery will only have the **RS485-A** port connected.

As for the power connections, all batteries must be connected in parallel using the power cables (LV KIT), taking care that the cable does not exceed a length of 2.5 metres.
The "**NEGATIVE**" power cable coming from the inverter must be connected to the **MASTER** battery on the **NEGATIVE** terminal, while the **"POSITIVE**" power cable must be connected to the **SLAVE N** battery on the **POSITIVE** terminal.

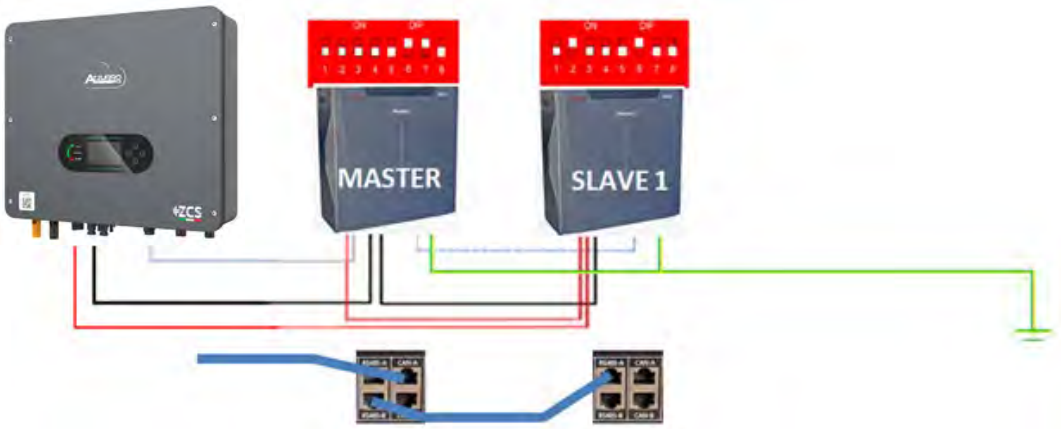


Figure 51 – Connecting two WeCo 5k3 batteries in parallel

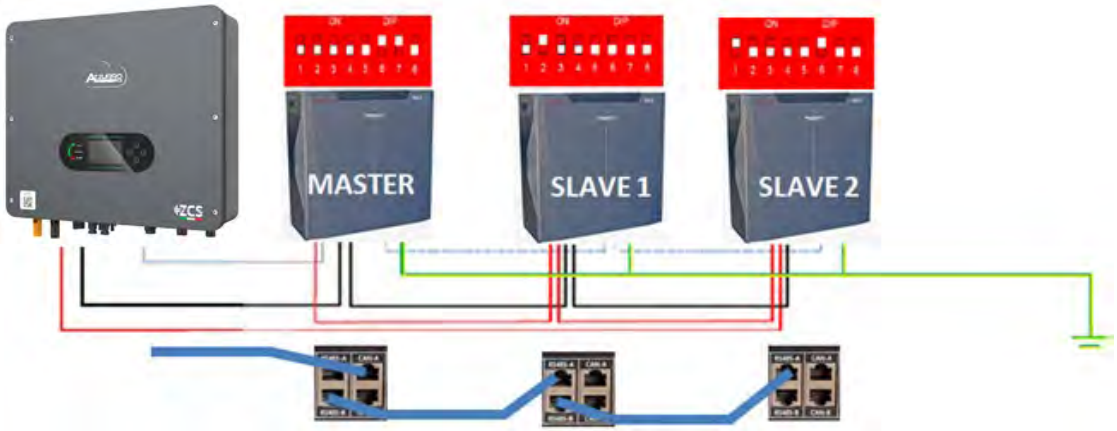


Figure 52 – Connecting three WeCo 5k3 batteries in parallel

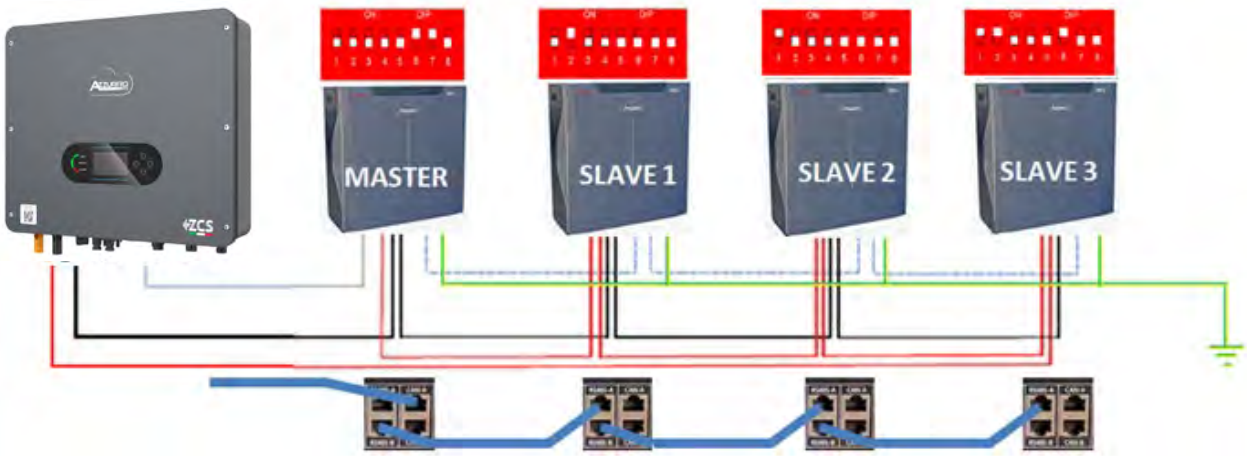


Figure 53 – Connecting four WeCo 5k3 batteries in parallel

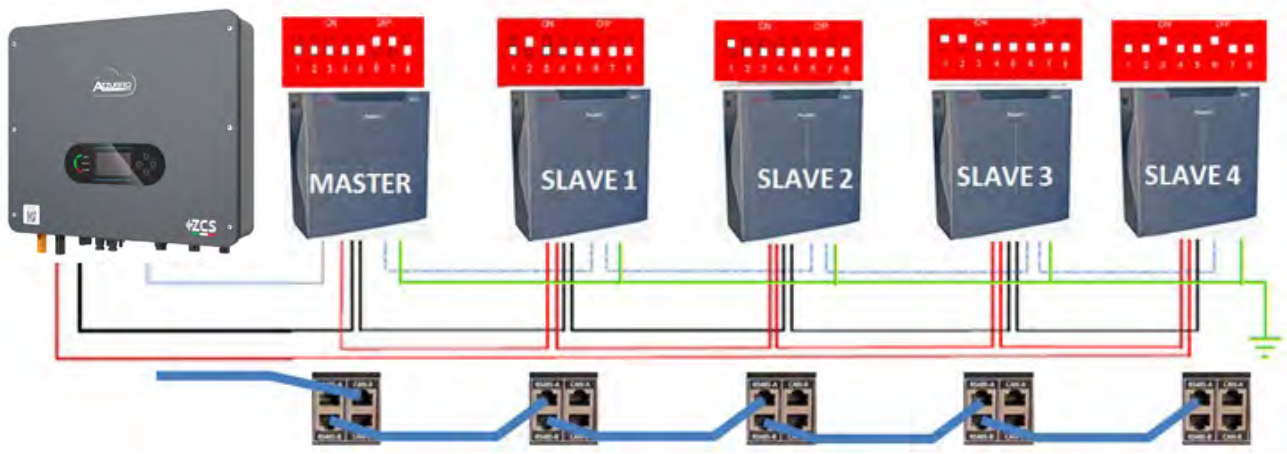


Figure 54 – Connecting five WeCo 5k3 batteries in parallel

4.14.3. WeCo 5K3 configuration

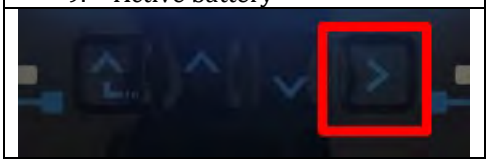
To correctly configure the battery parameters:

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):

1. Basic settings
2. Advanced settings
3. Production statistics
4. System Info
5. Event list
6. SW Update

3. Now press the last arrow on the right to access the battery parameters

1. Battery parameters
2. Zero feed-in mode
3. IV Curve Scan
4. Logic interface
5. Factory reset
6. Parallel settings
7. Reset Bluetooth
8. CT Calibration
9. Active battery


4. Check that the parameters are set correctly:

1.Battery type	WeCo
4.Depth of Discharge	80%
6.Save	

NOTE: When switched on for the first time, the WeCo batteries receive a command from the inverter to start regular operation only when all of them have collectively reached a state of full charge (i.e. a SOC level of 100%).

4.15. Connecting a WeCo 5K3XP battery

4.15.1. Connecting a single 5K3XP battery

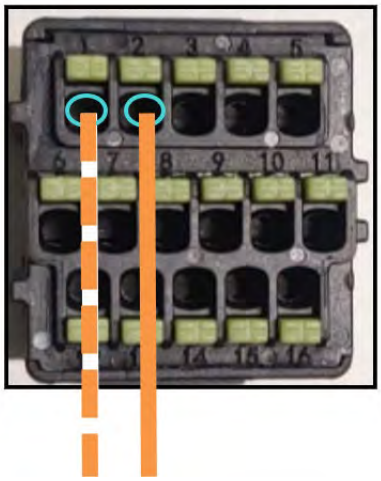
Inside the battery box is the cable for communication between the battery and inverter.

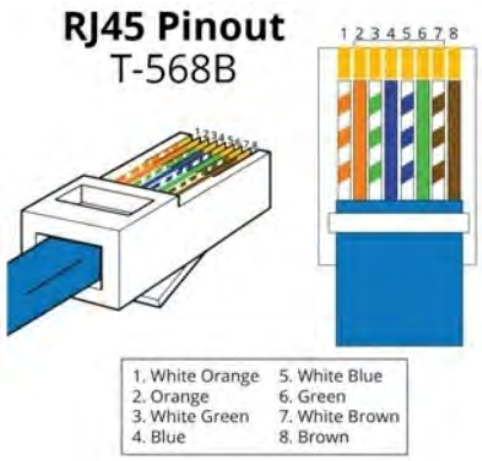
This cable must be connected to the battery by inserting the RJ45 (8 pin) plug into the appropriate Input:

NOTE: to connect the WeCo batteries, use the communication cable labelled WECO contained in the inverter kit (or otherwise use the one inside the battery kit, leaving the RJ45 side intact and cutting the other side to use orange and white-orange, connecting them to the COM port of the inverter).

k. Insert the connector into the CAN-A port of the single battery.

Inverter PIN	Battery communication	Note
1	CAN (white-orange wire)	Communication with the BMS, the CAN of the inverter adapts to the BMS of the lithium battery.
2	CAN (orange wire)	





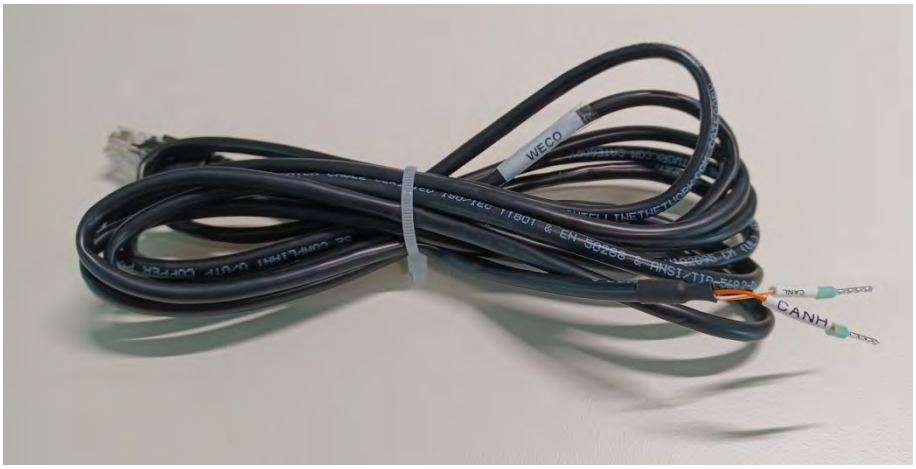


Figure 55 - Communication cable between the inverter and WeCo 5K3XP battery

l. Make sure that the DIP switches are set as shown in the figure.

m. Connect the ground cable to the battery through the threaded hole.

Note: Switch off the batteries each time the position of the DIP switches is changed.

To access the battery connection, remove the cover of the LV section located on the left side by unscrewing the screws with a cross screwdriver. Refer to the figure to identify the LV section.

Attention: When connecting 5K3XP batteries to single-phase hybrid inverters, only use the low voltage section. To avoid damage to batteries or inverters, do not use the high voltage section.
In case of a single battery:

5. Connect the CAN-A input
6. Set the DIP switches as shown in the figure below.
7. Connect the ground cable to the battery through the threaded hole.
8. Connect the power cables by connecting the appropriate B+ and B- connectors to the corresponding output.

Inv-Batt communication cable
Positive power cable
Negative power cable
Ground cable (PE)

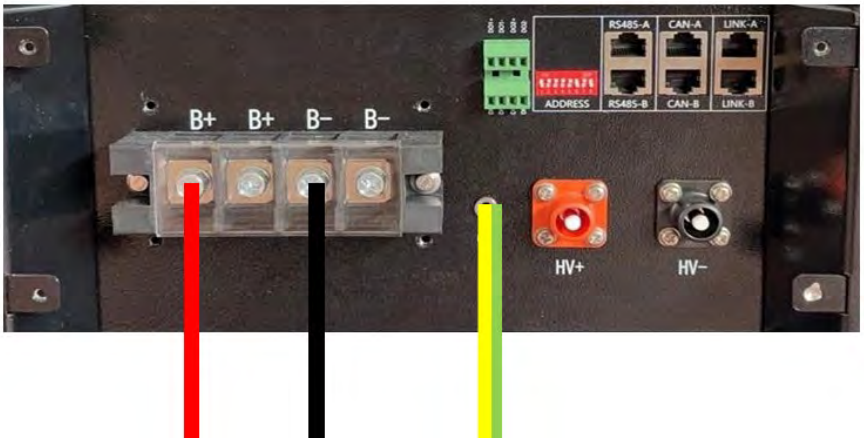


Figure 56 – Connecting the WeCo 5K3XP battery

4.15.2. Connecting multiple batteries in parallel 5K3XP

If there are multiple batteries:

a. Check that the batteries have the same voltage level by switching them off, disconnecting them and switching them on one at a time, measuring the + and - terminals with a tester. Make sure that the difference between the voltages of all the batteries is less than 2 Volt.

f. Set the DIP switches correctly according to the number of batteries connected, as shown in the figure. (Attention: only make changes when the battery is switched off).

g. Connect the communication cable inserted in the COM port of the inverter to the CAN-A port of one of the batteries, making it the master battery.

h. From the master battery, connect the communication cable from the **RS485-B** port to the **RS485-A** communication port of the slave 1 battery. **(Attention: do not connect the RS485-A port to the master battery).**

Figure 57 – Communication cable between WeCo 5K3XP batteries

i. In the case of additional batteries, the communication cable should be connected as shown for connecting the master battery to slave 1 battery.

j. The last battery will only have the **RS485-A** port connected.

As for the power connections, all batteries must be connected in parallel using the power cables (LV KIT), taking care that the cable does not exceed a length of 2.5 metres.
The "**NEGATIVE**" power cable coming from the inverter must be connected to the **MASTER** battery on the **NEGATIVE** terminal, while the **"POSITIVE**" power cable must be connected to the **SLAVE N** battery on the **POSITIVE** terminal.

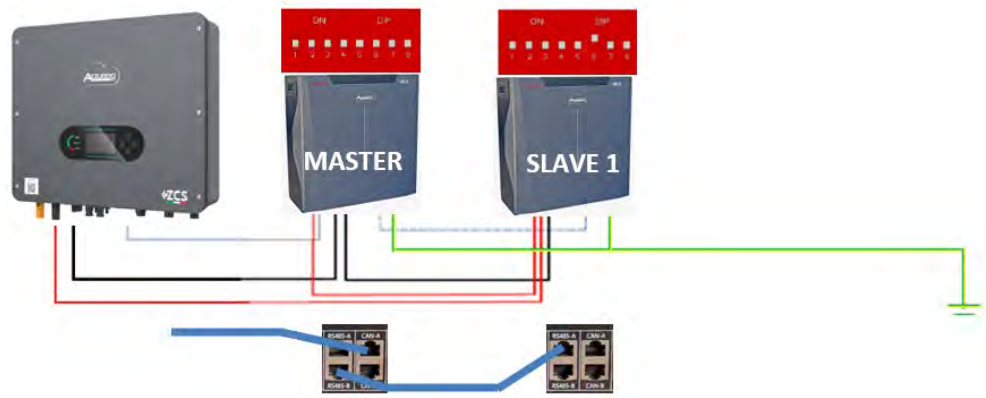


Figure 58 – Connecting two WeCo 5K3XP batteries in parallel

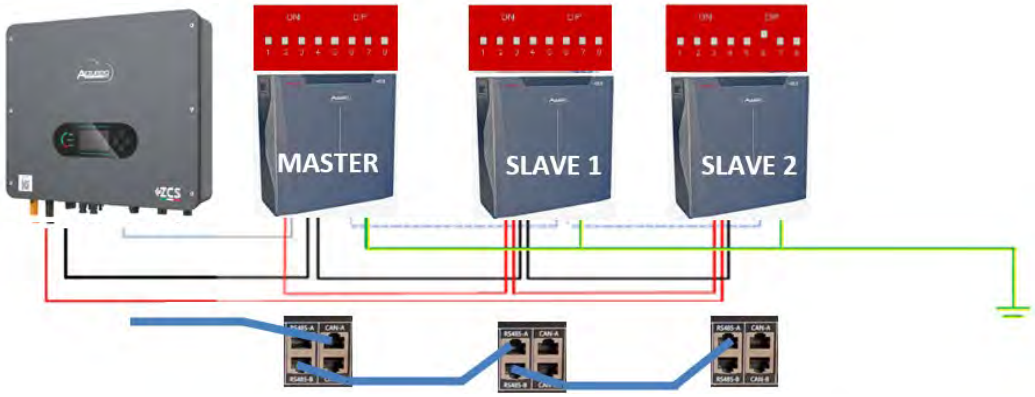


Figure 59 – Connecting three WeCo 5K3XP batteries in parallel

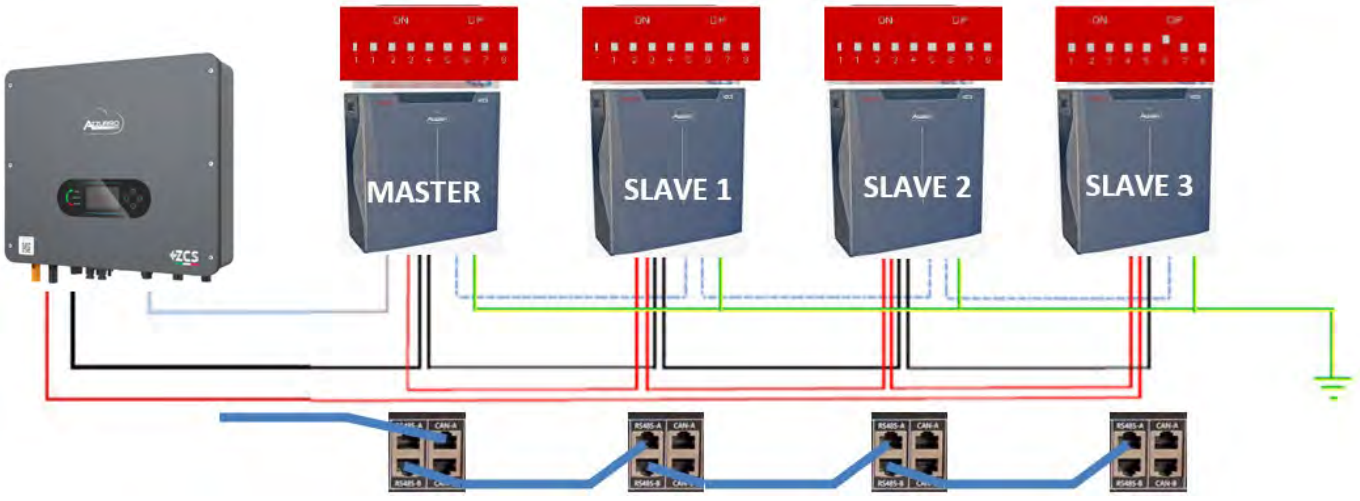


Figure 60 – Connecting four WeCo 5K3XP batteries in parallel

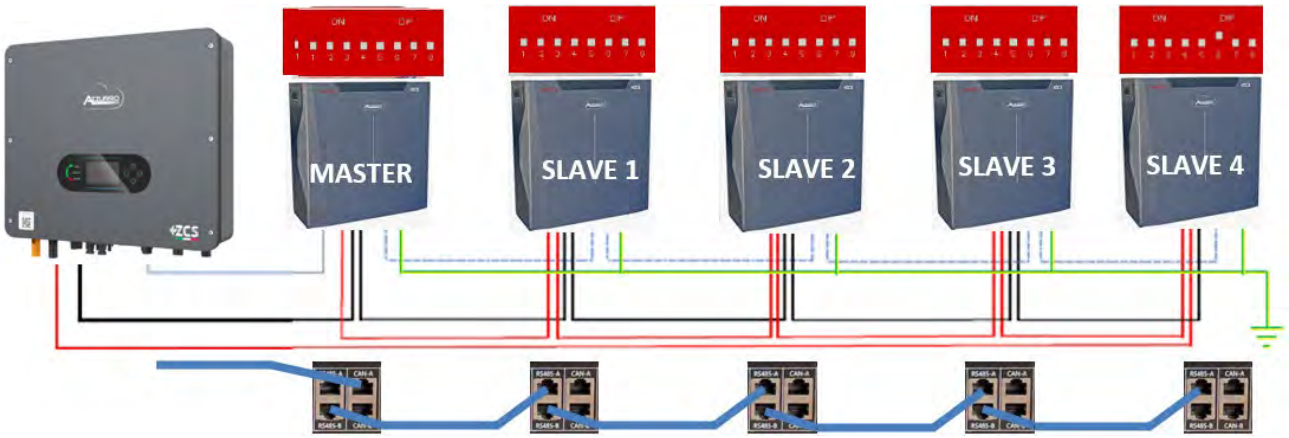
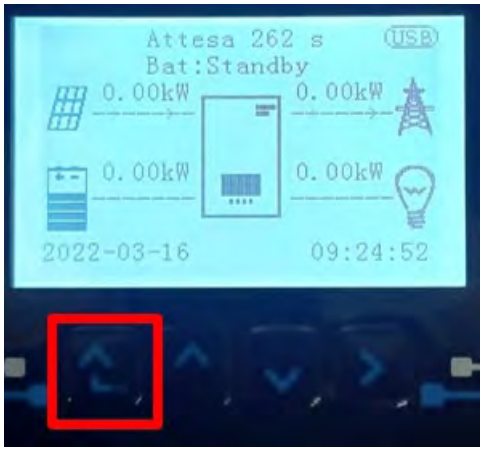


Figure 61 – Connecting five WeCo 5K3XP batteries in parallel

4.15.3. WeCo 5K3XP configuration

To correctly configure the battery parameters:

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):

1. Basic settings
2. Advanced settings
3. Production statistics
4. System Info
5. Event list
6. SW Update

3. Now press the last arrow on the right to access the battery parameters

1. Battery parameters
2. Zero feed-in mode
3. IV Curve Scan
4. Logic interface
5. Factory reset
6. Parallel settings
7. Reset Bluetooth
8. CT Calibration
9. Active battery


4. Check that the parameters are set correctly:

1.Battery type	WeCo
4.Depth of Discharge	80%
6.Save	

4.15.4. Switching on WeCo 5K3XP batteries

In order to carry out the correct switch-on procedure:

6. The batteries must all be switched off (side switch to 0);

7. Inverter DC rotary switch set to OFF;

8. Set all batteries, via the side switch, to 1 without switching them on (do not press the round metal button);

9. Switch on the master battery ONLY by pressing the button until the LED lights up;

10. The batteries will automatically switch on in succession (each module will turn on independently and the side switch will flash for 3 seconds; then a steady GREEN light will confirm that each module is powered on);

NOTE: During the commissioning phase, the installer must ensure that the communication between the master battery and the inverter is connected properly. Do not leave the system powered when there is no communication between the master battery and inverter, as prolonged standby of the system could cause an imbalance due to natural self-discharge.

NOTE: When switched on for the first time, the WeCo batteries receive a command from the inverter to start regular operation only when all of them have collectively reached a state of full charge (i.e. a SOC level of 100%).

4.16. WeCo 5K3XP battery and 5K3 batteries in parallel

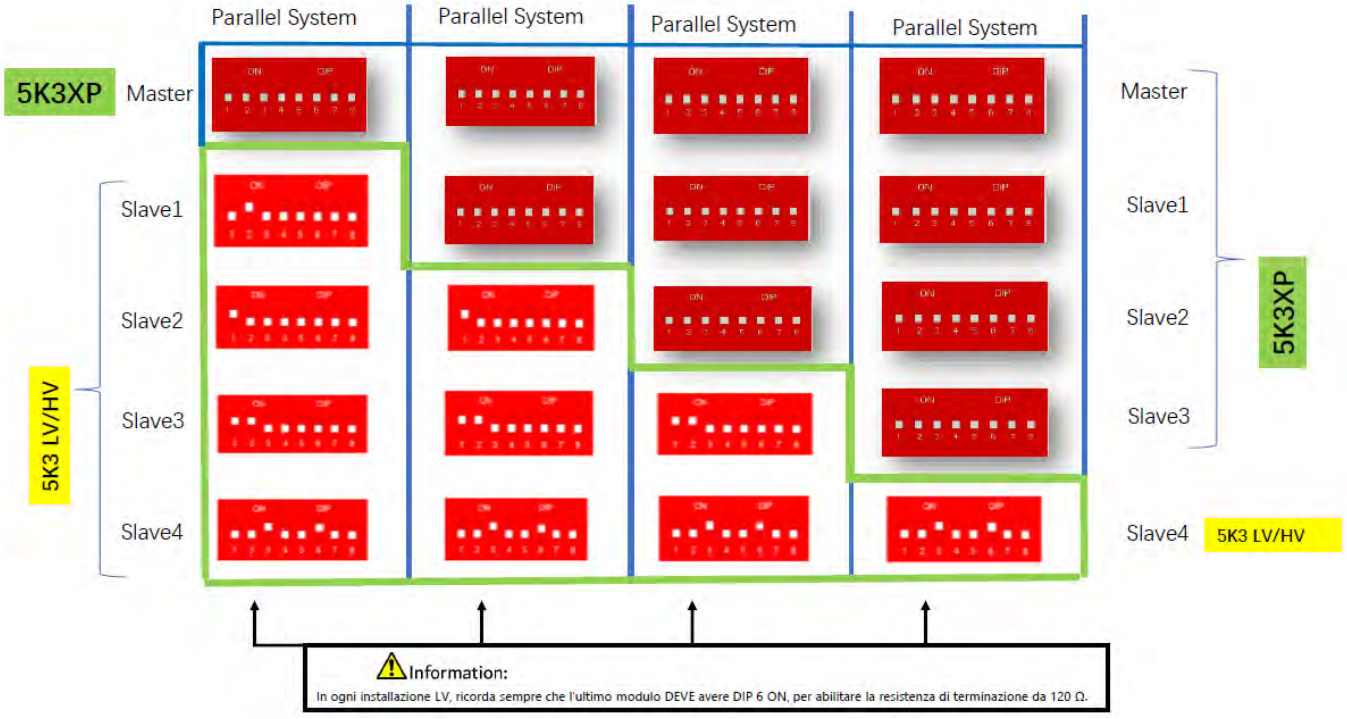


Figure 62 – Connecting WeCo 5K3XP and WeCo 5K3 batteries in parallel (Example 1)

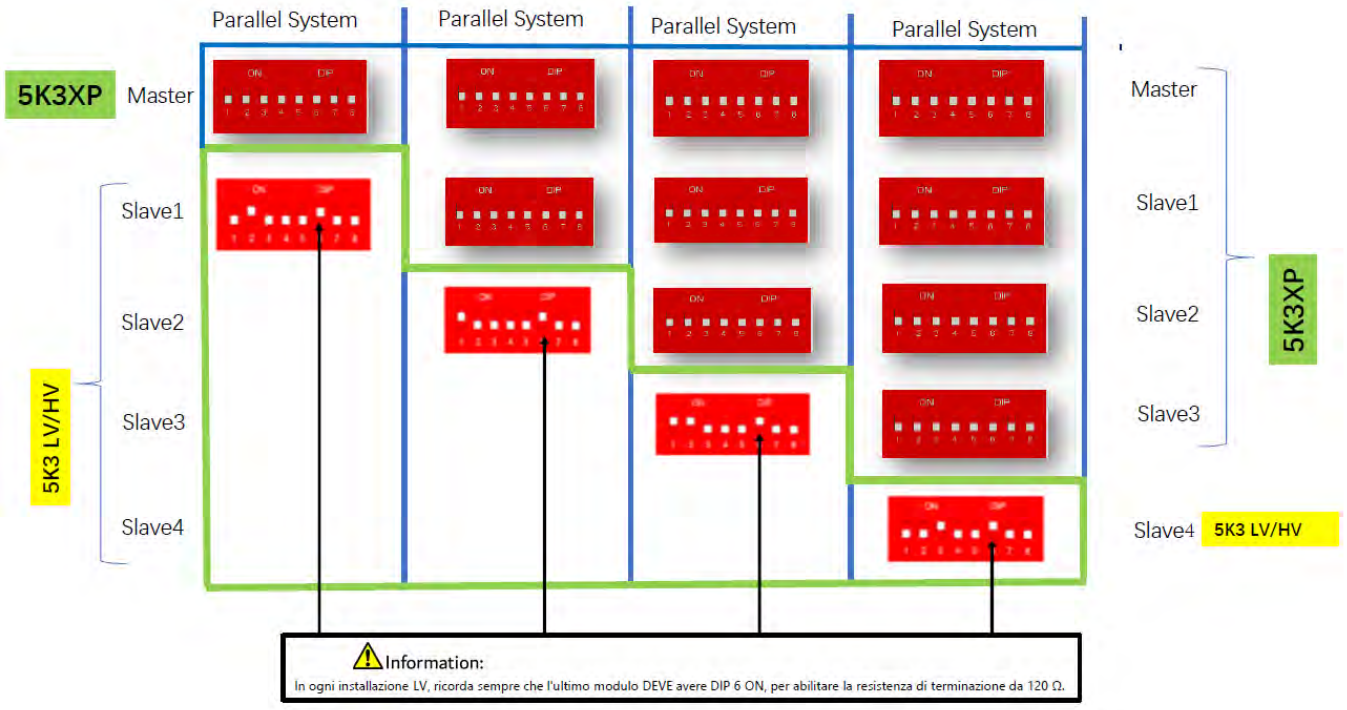


Figure 63 – Connecting WeCo 5K3XP and WeCo 5K3 batteries in parallel (Example 2)

In case of 5K3XP and 5K3 in parallel:

- ✓ Always provide as master the 5K3XP battery (if they are more than one set them as first Slaves);
- ✓ The DIP switches of the 5K3 batteries must be set according to the Slave number as shown in the table above;
- ✓ The setting of the DIP switches of the last 5K3 battery must be set according to the number of extra Slaves with the DIP 6 in ON as indicated in the example table

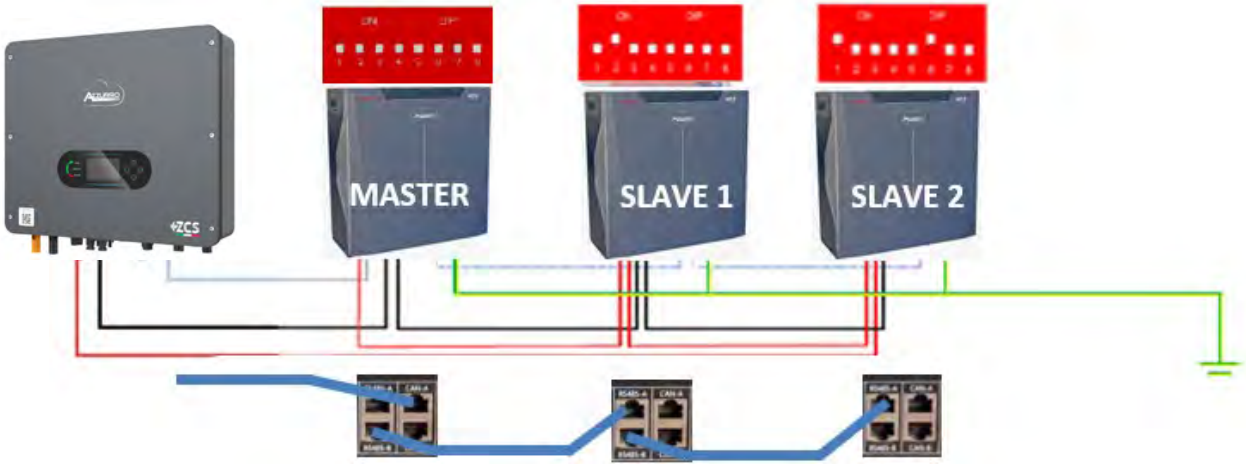


Figure 64 – Connecting 5K3XP Master and 5K3 Slave in parallel

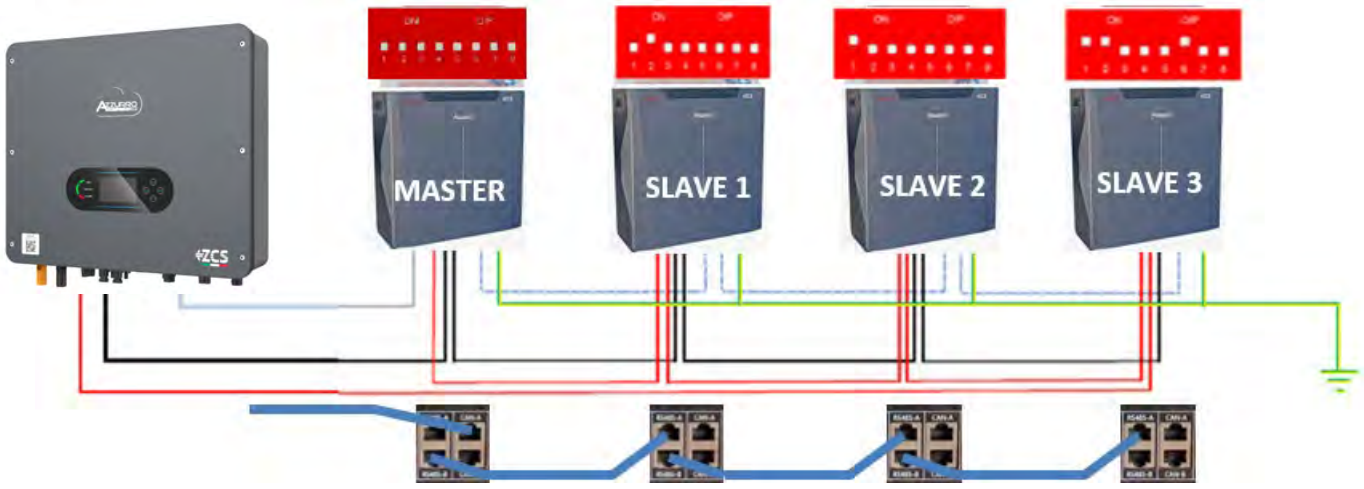


Figure 65 – Connecting 5K3XP Master and 5K3 Slave in parallel

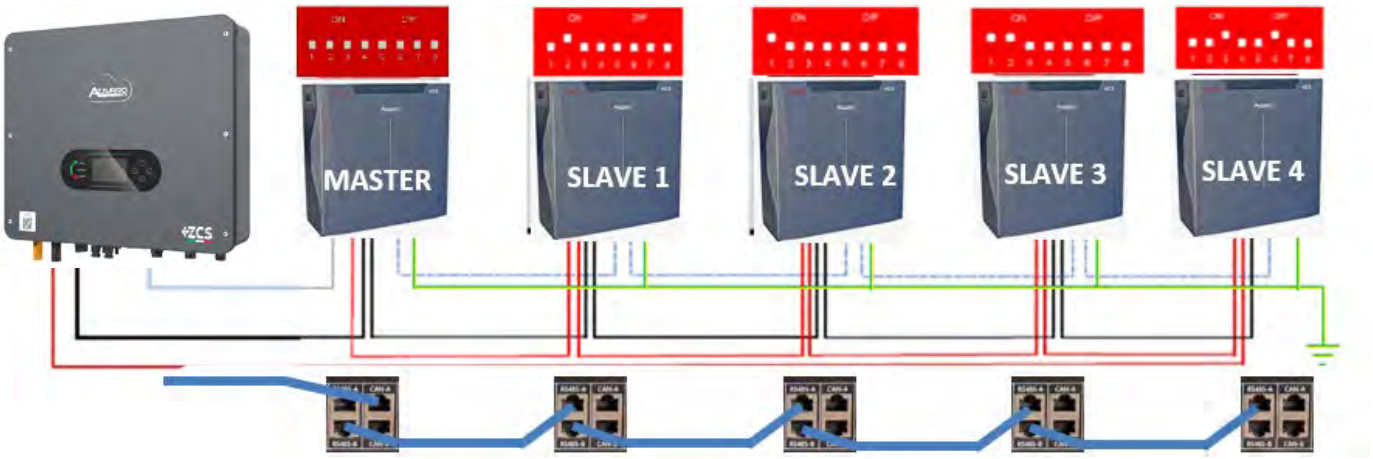


Figure 66 – Connecting 5K3XP Master and 5K3 Slave in parallel

NOTE: When switched on for the first time, the WeCo batteries receive a command from the inverter to start regular operation only when all of them have collectively reached a state of full charge (i.e. a SOC level of 100%).

4.17. Connecting an AZZURRO 5000 battery

4.17.1. Connecting a single AZZURRO 5000 battery

Inside the inverter box there is the cable for communication between the battery and inverter.
This cable must be connected to the battery by inserting the RJ45 (8 pin) plug into the appropriate Input:

a. Insert the connector into the CAN port of the single battery.

Inverter PIN	Battery communication	Note
1	CAN H (blue wire)	Communication with the BMS, the CAN of the inverter adapts to the BMS of the lithium battery.
2	CAN L (white-blue wire)	

Figure 67 - Communication cable between the inverter and AZZURRO 5000 battery

Communication cable pinout between Azzurro battery and inverter, from left to right	
Inverter 	PIN 1: blue PIN 2: white-blue
Azzurro 	PIN 1: white orange PIN 2: orange PIN 3: white green PIN 4: blue PIN 5: white blue PIN 6: green PIN 7: white brown PIN 8: brown

b. Connect the ground cable to the battery via the appropriate contact.

NOTE: The communication cable is located inside the inverter kit.

Inv-Batt communication cable
Positive power cable
Negative power cable
Ground cable (PE)

Figure 68 – Connecting the AZZURRO 5000 battery

In case of a single battery:

1. Connect the **CAN** input for communication between the inverter and battery.
2. Connect the ground cable to the battery through the threaded hole indicated by the ground symbol.
3. Connect the power cables by connecting the appropriate P+ and P- connectors to the corresponding output (as shown in the figure). The power cables are located inside the appropriate KIT (not included with the battery).

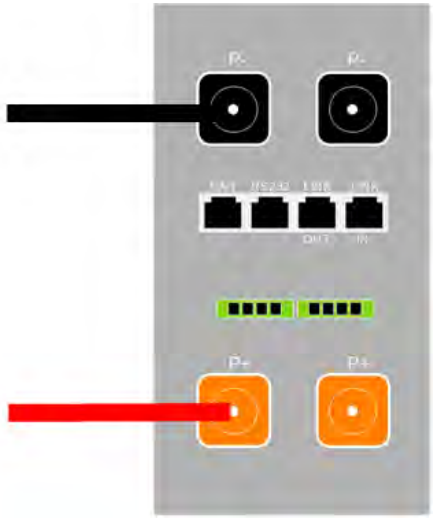


Figure 69 – Terminal block of the AZZURRO 5000 battery

4. Press the button on the front of the battery to switch it on.

Figure 70– Power button of the AZZURRO 5000 battery

4.17.2. Connecting multiple batteries in parallel AZZURRO 5000

The **AZZURRO 5000** and **AZZURRO 5000PRO** batteries can be connected to the same inverter.
However, **the AZZURRO 5000**, **AZZURRO 5000PRO** and **AZZURRO 5000S** batteries are not compatible with the **AZZURRO ZSX 5120** batteries and cannot be connected together.
As for the **AZZURRO 5000S model**:

- **In case of new installation**, it is strongly recommended to avoid pairing with previous models (AZZURRO 5000 and/or AZZURRO 5000PRO).

- **In case of expansion of the existing system** with **AZZURRO 5000** and/or **5000PRO** batteries or replacement of a battery with the **AZZURRO 5000S** model, it is necessary to consult with Zucchetti Centro Sistemi Spa, as a specific kit is required to ensure correct integration (kit code ZSP-CAB-RJ45-PRO/S).

	AZZURRO 5000	AZZURRO 5000PRO	AZZURRO 5000S	AZZURRO 5120
AZZURRO 5000	COMPATIBLE	COMPATIBLE	COMPATIBLE WITH SPECIAL KIT ZSP-CAB-RJ45-PRO/S	NOT COMPATIBLE
AZZURRO 5000PRO	COMPATIBLE	COMPATIBLE	COMPATIBLE WITH SPECIAL KIT ZSP-CAB-RJ45-PRO/S	NOT COMPATIBLE
AZZURRO 5000S	COMPATIBLE WITH SPECIAL KIT ZSP-CAB-RJ45-PRO/S	COMPATIBLE WITH SPECIAL KIT ZSP-CAB-RJ45-PRO/S	COMPATIBLE	NOT COMPATIBLE
AZZURRO 5120	NOT COMPATIBLE	NOT COMPATIBLE	NOT COMPATIBLE	COMPATIBLE

Battery compatibility table AZZURRO

If there are multiple batteries:

a. Check that the batteries have the same voltage level by switching them off, disconnecting them and switching them on one at a time, measuring the + and - terminals with a tester. Make sure that the difference between the voltages of all the batteries is less than 2 Volt. The power cables are located inside the appropriate KIT (not included with the battery).

b. Connect the communication cable from the COM port of the inverter to the CAN port of the master battery. The master battery must be connected via the communication cable found inside the appropriate KIT (not included with the battery) starting from the LINK OUT port and arriving at the LINK IN communication port of the slave 1 battery. **(Attention: do not connect the LINK IN port to the master battery).**

Figure 71 – Communication cable between AZZURRO 5000 batteries

c. In the case of additional batteries, the communication cable should be connected as shown above for connecting the master battery to slave 1 battery.

d. The last battery will only have the **LINK IN** port connected.

As for the power connections, all batteries must be connected in parallel using the power cables supplied in the KIT (not included with the battery), taking care that the cable does not exceed a length of 2.0 metres.
The "**NEGATIVE**" power cable exiting the inverter must be connected to the **MASTER** battery on **NEGATIVE** terminal, while the **"POSITIVE"** cable must be connected to the last **SLAVE N** battery on the **POSITIVE** terminal.

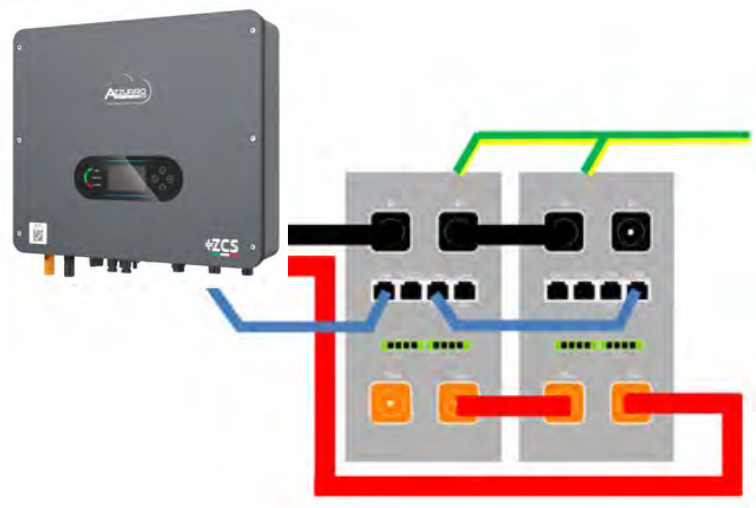


Figure 72 – Connecting two AZZURRO 5000 batteries in parallel

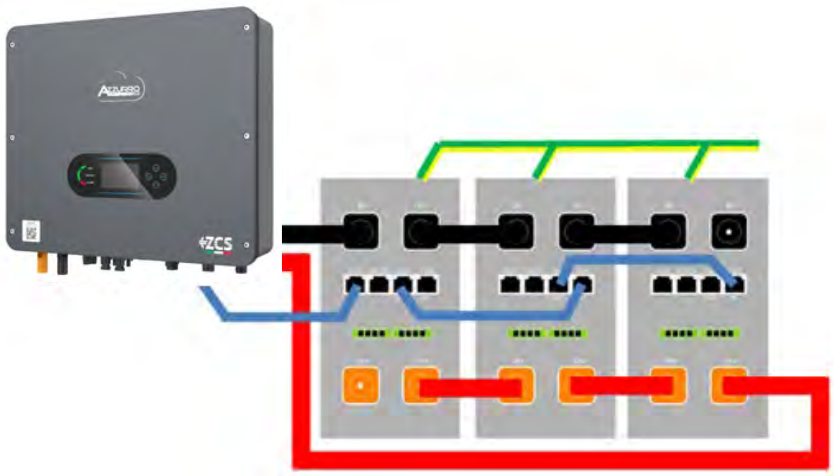


Figure 73 – Connecting three AZZURRO 5000 batteries in parallel

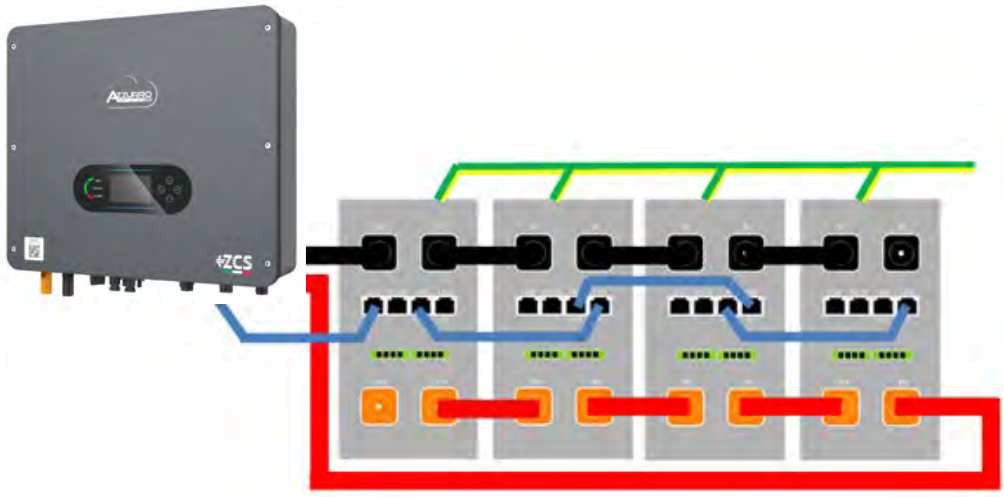


Figure 74 – Connecting four AZZURRO 5000 batteries in parallel

4.17.3. 5000 AZZURRO configuration

To correctly configure the battery parameters:

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):

1. Basic settings
2. Advanced settings
3. Production statistics
4. System Info
5. Event list
6. SW Update

3. Now press the last arrow on the right to access the battery parameters

1. Battery parameters
2. Zero feed-in mode
3. IV Curve Scan
4. Logic interface
5. Factory reset
6. Parallel settings
7. Reset Bluetooth
8. CT Calibration
9. Active battery

4. Check that the parameters are set correctly:

1.Battery type	Azzurro
4.Depth of Discharge	80%
6.Save	

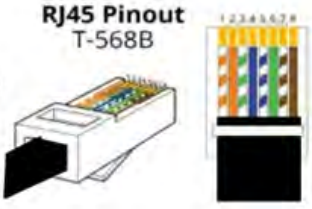
4.17.4. Connecting a single AZZURRO 5000 PRO battery

Inside the inverter box there is the cable for communication between the battery and inverter.
This cable must be connected to the battery by inserting the RJ45 (8 pin) plug into the appropriate Input:

c. Insert the connector into the CAN port of the single battery.

Inverter PIN	Battery communication	Note
1	CAN H (blue wire)	Communication with the BMS, the CAN of the inverter adapts to the BMS of the lithium battery.
2	CAN L (white-blue wire)	

Figure 75 - Communication cable between the inverter and AZZURRO 5000 PRO battery

Communication cable pinout between Azzurro battery and inverter, from left to right	
Inverter 	PIN 1: blue PIN 2: white-blue
Azzurro 	PIN 1: white orange PIN 2: orange PIN 3: white green PIN 4: blue PIN 5: white blue PIN 6: green PIN 7: white brown PIN 8: brown

d. Connect the ground cable to the battery via the appropriate contact.

NOTE: The communication cable is located inside the inverter kit.

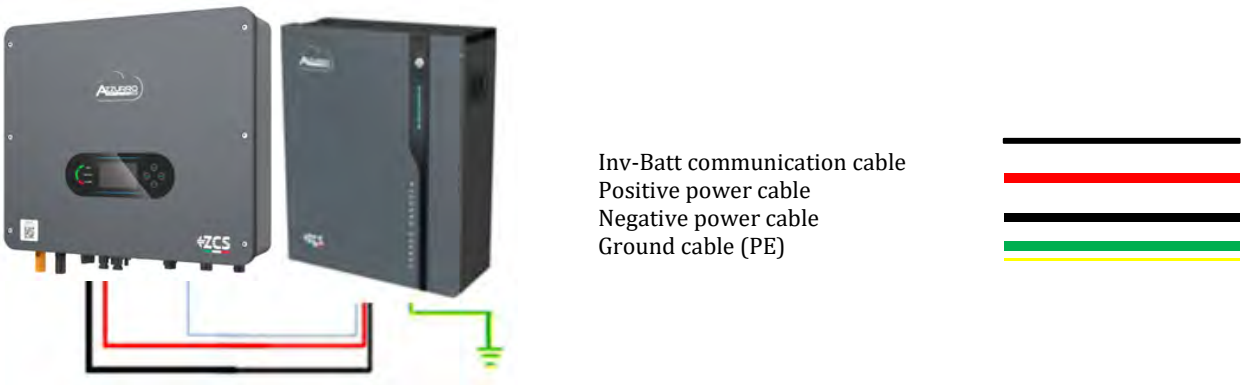


Figure 76 – Connecting the AZZURRO 5000 PRO battery

In case of a single battery:

5. Connect the **CAN** input for communication between the inverter and battery.
6. Connect the ground cable to the battery through the threaded hole indicated by the ground symbol.
7. Connect the power cables by connecting the appropriate P+ and P- connectors to the corresponding output (as shown in the figure). The power cables are located inside the appropriate KIT (not included with the battery).

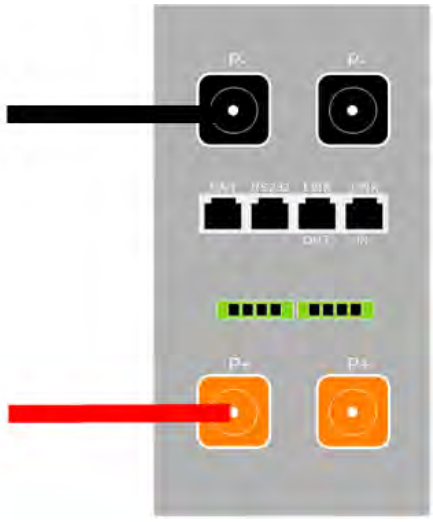


Figure 77 – Terminal block of the AZZURRO 5000 PRO battery

8. Press the button on the front of the battery to switch it on.

Figure 78– Power button of the AZZURRO 5000 PRO battery

4.17.5. Connecting multiple batteries in parallel AZZURRO 5000 PRO

The **AZZURRO 5000** and **AZZURRO 5000PRO** batteries can be connected to the same inverter.
However, **the AZZURRO 5000**, **AZZURRO 5000PRO** and **AZZURRO 5000S** batteries are not compatible with the **AZZURRO ZSX 5120** batteries and cannot be connected together.
As for the **AZZURRO 5000S model**:

- **In case of new installation**, it is strongly recommended to avoid pairing with previous models (AZZURRO 5000 and/or AZZURRO 5000PRO).

- **In case of expansion of the existing system** with **AZZURRO 5000** and/or **5000PRO** batteries or replacement of a battery with the **AZZURRO 5000S** model, it is necessary to consult with Zucchetti Centro Sistemi Spa, as a specific kit is required to ensure correct integration (kit code ZSP-CAB-RJ45-PRO/S).

	AZZURRO 5000	AZZURRO 5000PRO	AZZURRO 5000S	AZZURRO 5120
AZZURRO 5000	COMPATIBLE	COMPATIBLE	COMPATIBLE WITH SPECIAL KIT ZSP-CAB-RJ45-PRO/S	NOT COMPATIBLE
AZZURRO 5000PRO	COMPATIBLE	COMPATIBLE	COMPATIBLE WITH SPECIAL KIT ZSP-CAB-RJ45-PRO/S	NOT COMPATIBLE
AZZURRO 5000S	COMPATIBLE WITH SPECIAL KIT ZSP-CAB-RJ45-PRO/S	COMPATIBLE WITH SPECIAL KIT ZSP-CAB-RJ45-PRO/S	COMPATIBLE	NOT COMPATIBLE
AZZURRO 5120	NOT COMPATIBLE	NOT COMPATIBLE	NOT COMPATIBLE	COMPATIBLE

Battery compatibility table AZZURRO

If there are multiple batteries:

e. Check that the batteries have the same voltage level by switching them off, disconnecting them and switching them on one at a time, measuring the + and - terminals with a tester. Make sure that the difference between the voltages of all the batteries is less than 2 Volt. The power cables are located inside the appropriate KIT (not included with the battery).

f. Connect the communication cable from the COM port of the inverter to the CAN port of the master battery. The master battery must be connected via the communication cable found inside the appropriate KIT (not included with the battery) starting from the LINK OUT port and arriving at the LINK IN communication port of the slave 1 battery. **(Attention: do not connect the LINK IN port to the master battery).**

Figure 79 – Communication cable between AZZURRO 5000 PRO batteries

g. In the case of additional batteries, the communication cable should be connected as shown above for connecting the master battery to slave 1 battery.

h. The last battery will only have the **LINK IN** port connected.

As for the power connections, all batteries must be connected in parallel using the power cables supplied in the KIT (not included with the battery), taking care that the cable does not exceed a length of 2.0 metres.
The "**NEGATIVE**" power cable exiting the inverter must be connected to the **MASTER** battery on **NEGATIVE** terminal, while the **"POSITIVE"** cable must be connected to the last **SLAVE N** battery on the **POSITIVE** terminal.

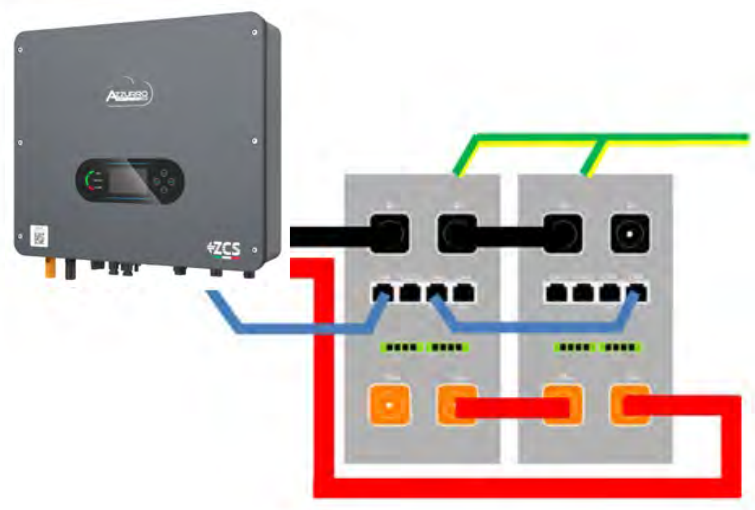


Figure 80 – Connecting two AZZURRO 5000 PRO batteries in parallel

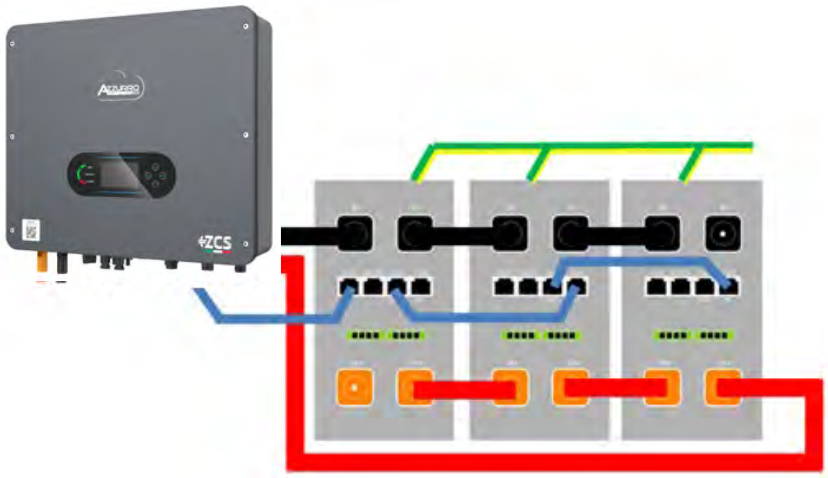


Figure 81 – Connecting three AZZURRO 5000 PRO batteries in parallel

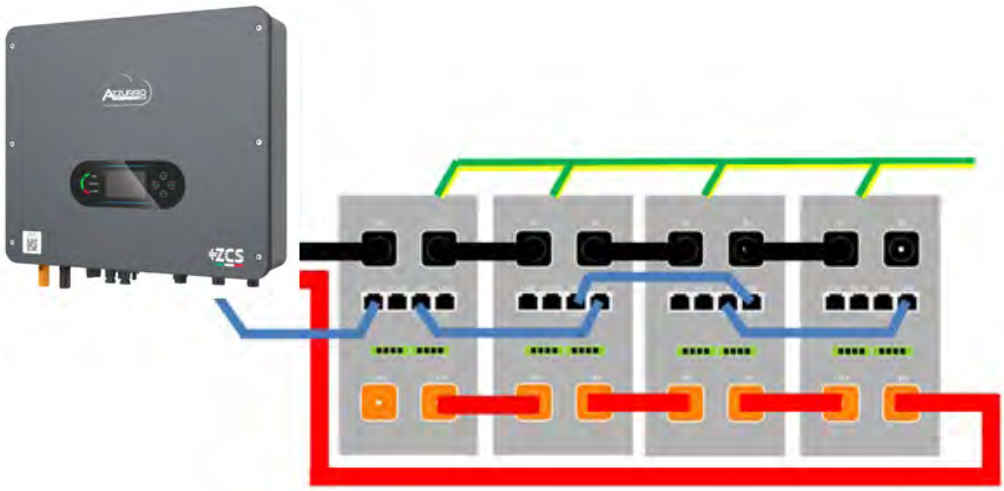


Figure 82 – Connecting four AZZURRO 5000 PRO batteries in parallel

4.17.6. AZZURRO 5000 PRO configuration

To correctly configure the battery parameters:

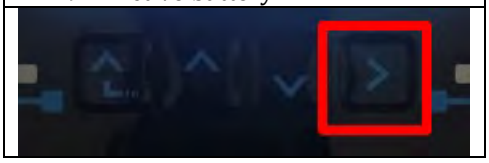
1. Press the first button on the left of the display:

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

1. Basic settings
2. Advanced settings
3. Production statistics
4. System Info
5. Event list
6. SW Update

3. Now press the last arrow on the right to access the battery parameters

1. Battery parameters
2. Zero feed-in mode
3. IV Curve Scan
4. Logic interface
5. Factory reset
6. Parallel settings
7. Reset Bluetooth
8. CT Calibration
9. Active battery



4. Check that the parameters are set correctly:

1.Battery type	Azzurro
4.Depth of Discharge	80%
6.Save	

4.18. Connecting an AZZURRO ZSX 5120 battery

4.18.1. Connecting a single AZZURRO ZSX 5120 battery

Inside the inverter box there is the cable for communication between the battery and inverter.
This cable must be connected to the battery by inserting the RJ45 (8 pin) plug into the appropriate Input:

a. Insert the connector into the CAN port of the single battery.

Inverter PIN	Battery communication	Note
1	CAN H (blue wire)	Communication with the BMS, the CAN of the inverter adapts to the BMS of the lithium battery.
2	CAN L (white-blue wire)	

Figure 83 - Communication cable between the inverter and AZZURRO ZSX 5120 battery

Communication cable pinout between Azzurro battery and inverter, from left to right	
Inverter 	PIN 1: blue PIN 2: white-blue
Azzurro 	PIN 1: white orange PIN 2: orange PIN 3: white green PIN 4: blue PIN 5: white blue PIN 6: green PIN 7: white brown PIN 8: brown

b. Connect the ground cable to the battery via the appropriate contact.

NOTE: The communication cable is located inside the inverter kit.

Inv-Batt communication cable
Positive power cable
Negative power cable
Ground cable (PE)

Figure 84 – Connecting the AZZURRO ZSX 5120 battery

In case of a single battery:

1. Connect the **CAN** input for communication between the inverter and battery.
2. Connect the ground cable to the battery through the threaded hole indicated by the ground symbol.
3. Connect the power cables by connecting the appropriate P+ and P- connectors to the corresponding output (as shown in the figure). The power cables are located inside the appropriate KIT (not included with the battery).

Figure 85 – Terminal block of the AZZURRO ZSX 5120 battery

4. Press the switch and turn it to the ON position, then press the SW button of the battery to switch it on.

Figure 86– Power button of the AZZURRO ZSX 5120 battery

4.18.2. Connecting multiple batteries in parallel AZZURRO ZSX 5120

The **AZZURRO 5000** and **AZZURRO 5000PRO** batteries can be connected to the same inverter.
However, **the AZZURRO 5000**, **AZZURRO 5000PRO** and **AZZURRO 5000S** batteries are not compatible with the **AZZURRO ZSX 5120** batteries and cannot be connected together.
As for the **AZZURRO 5000S model**:

- **In case of new installation**, it is strongly recommended to avoid pairing with previous models (AZZURRO 5000 and/or AZZURRO 5000PRO).

- **In case of expansion of the existing system** with **AZZURRO 5000** and/or **5000PRO** batteries or replacement of a battery with the **AZZURRO 5000S** model, it is necessary to consult with Zucchetti Centro Sistemi Spa, as a specific kit is required to ensure correct integration (kit code ZSP-CAB-RJ45-PRO/S).

	AZZURRO 5000	AZZURRO 5000PRO	AZZURRO 5000S	AZZURRO 5120
AZZURRO 5000	COMPATIBLE	COMPATIBLE	COMPATIBLE WITH SPECIAL KIT ZSP-CAB-RJ45-PRO/S	NOT COMPATIBLE
AZZURRO 5000PRO	COMPATIBLE	COMPATIBLE	COMPATIBLE WITH SPECIAL KIT ZSP-CAB-RJ45-PRO/S	NOT COMPATIBLE
AZZURRO 5000S	COMPATIBLE WITH SPECIAL KIT ZSP-CAB-RJ45-PRO/S	COMPATIBLE WITH SPECIAL KIT ZSP-CAB-RJ45-PRO/S	COMPATIBLE	NOT COMPATIBLE
AZZURRO 5120	NOT COMPATIBLE	NOT COMPATIBLE	NOT COMPATIBLE	COMPATIBLE

Battery compatibility table AZZURRO

If there are multiple batteries:

a. Check that the batteries have the same voltage level by switching them off, disconnecting them and switching them on one at a time, measuring the + and - terminals with a tester. Make sure that the difference between the voltages of all the batteries is less than 2 Volt. The power cables are located inside the appropriate KIT (not included with the battery).

b. Connect the communication cable from the COM port of the inverter to the CAN port of the master battery. The master battery must be connected via the communication cable found inside the appropriate KIT (not included with the battery) starting from the LINK OUT port and arriving at the LINK IN communication port of the slave 1 battery. **(Attention: do not connect the LINK IN port to the master battery).**

Figure 87 – Communication cable between AZZURRO ZSX 5120 batteries

c. In the case of additional batteries, the communication cable should be connected as shown above for connecting the master battery to slave 1 battery.

d. The last battery will only have the **LINK IN** port connected.

As for the power connections, all batteries must be connected in parallel using the power cables supplied in the KIT (not included with the battery), taking care that the cable does not exceed a length of 2.0 metres.
The "**NEGATIVE**" power cable exiting the inverter must be connected to the **MASTER** battery on **NEGATIVE** terminal, while the **"POSITIVE"** cable must be connected to the last **SLAVE N** battery on the **POSITIVE** terminal.

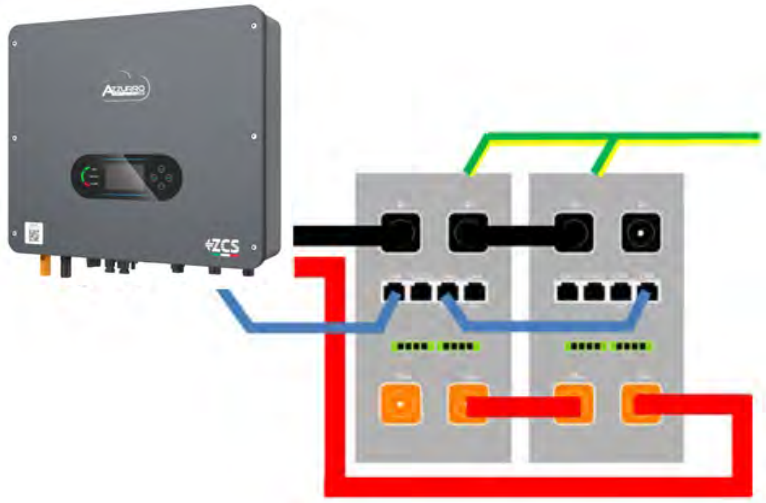


Figure 88 – Connecting two AZZURRO ZSX 5120 batteries in parallel

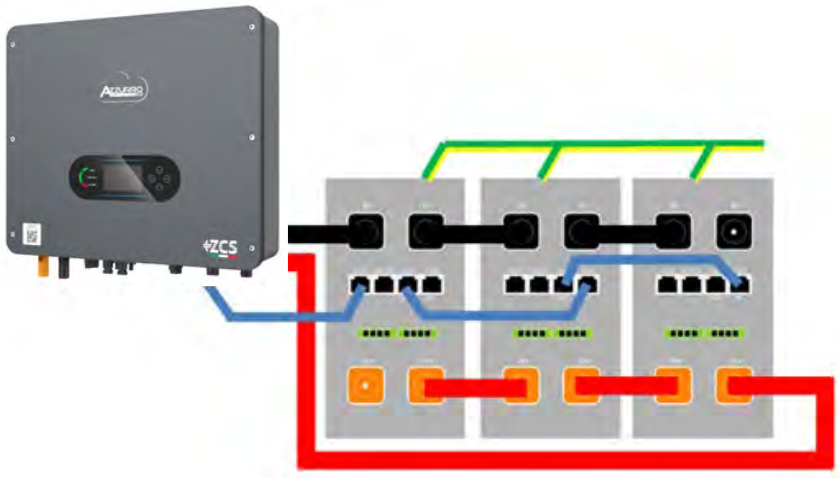


Figure 89 – Connecting three AZZURRO ZSX 5120 batteries in parallel

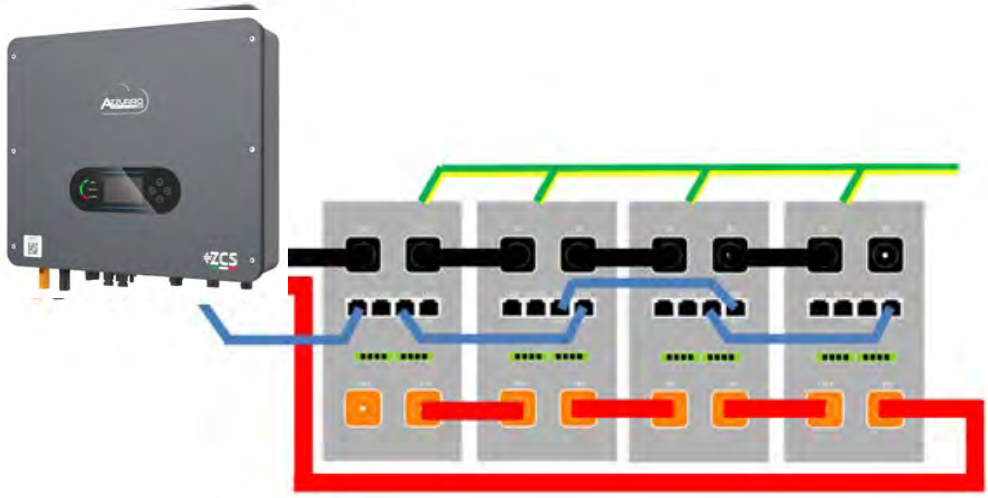


Figure 90 – Connecting four AZZURRO ZSX 5120 batteries in parallel

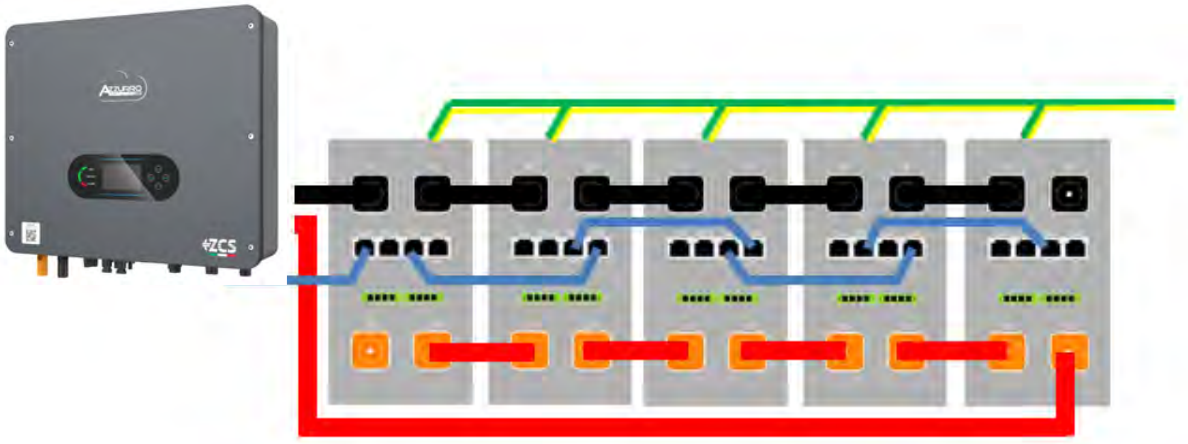
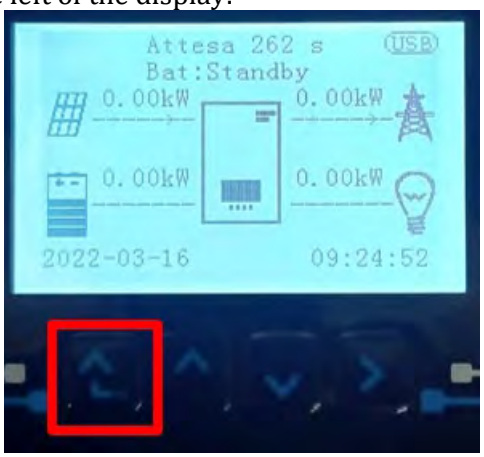


Figure 91 – Connecting five AZZURRO ZSX 5120 batteries in parallel

4.18.3. AZZURRO ZSX5120 configuration

To correctly configure the battery parameters:

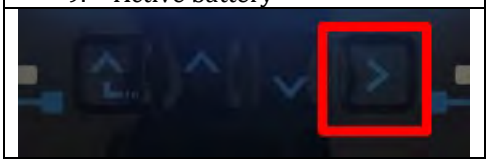
1. Press the first button on the left of the display:



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

1. Basic settings
2. Advanced settings
3. Production statistics
4. System Info
5. Event list
6. SW Update

3. Now press the last arrow on the right to access the battery parameters

1. Battery parameters
2. Zero feed-in mode
3. IV Curve Scan
4. Logic interface
5. Factory reset
6. Parallel settings
7. Reset Bluetooth
8. CT Calibration
9. Active battery


4. Check that the parameters are set correctly:

1.Battery type	Azzurro
4.Depth of Discharge	80%
6.Save	

4.19. Connecting an AZZURRO 5000S battery

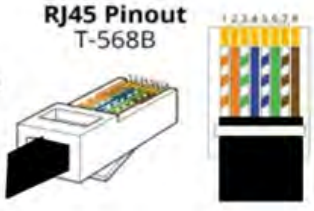
4.19.1. Connecting a single AZZURRO 5000S battery

Inside the inverter box there is the cable for communication between the battery and inverter.
This cable must be connected to the battery by inserting the RJ45 (8 pin) plug into the appropriate Input:

e. Insert the connector into the CAN port of the single battery.

Inverter PIN	Battery communication	Note
1	CAN H (blue wire)	Communication with the BMS, the CAN of the inverter adapts to the BMS of the lithium battery.
2	CAN L (white-blue wire)	

Figure 92 - Communication cable between the inverter and AZZURRO 5000S battery

Communication cable pinout between Azzurro battery and inverter, from left to right	
Inverter 	PIN 1: blue PIN 2: white-blue
Azzurro 	PIN 1: white orange PIN 2: orange PIN 3: white green PIN 4: blue PIN 5: white blue PIN 6: green PIN 7: white brown PIN 8: brown

f. Connect the ground cable to the battery via the appropriate contact.

NOTE: The communication cable is located inside the inverter kit.

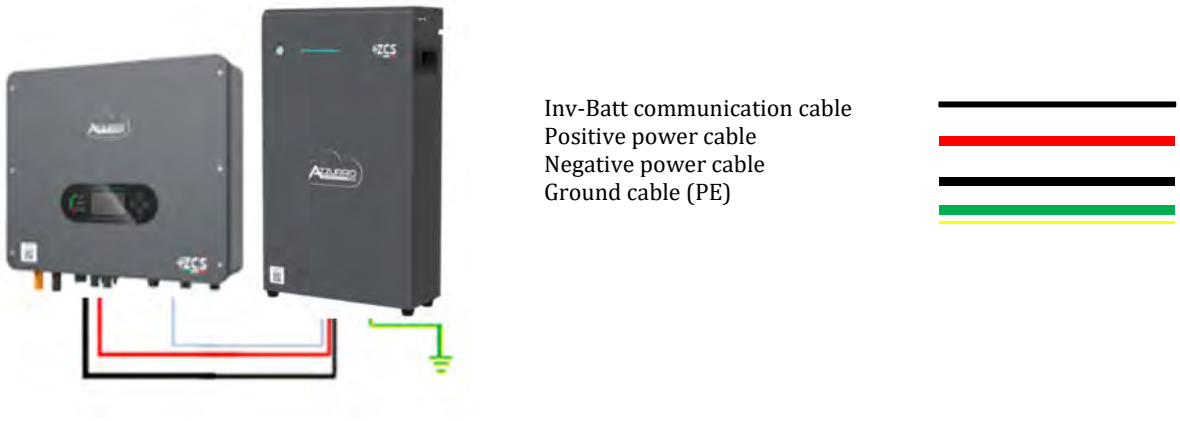


Figure 93 – Connecting the AZZURRO 5000S battery

In case of a single battery:

1. Connect the **CAN/Link In** input for communication between the inverter and battery.
2. Connect the ground cable to the battery through the threaded hole indicated by the ground symbol.
3. Connect the power cables by connecting the appropriate P+ and P- connectors to the corresponding output (as shown in the figure). The power cables are located inside the appropriate KIT (not included with the battery).

Figure 94 – Terminal block of the AZZURRO 5000S battery

4. Press the button on the front of the battery to switch it on.

Figure 95– Power button of the AZZURRO 5000S battery

4.19.2. Connecting multiple batteries in parallel AZZURRO 5000S

The **AZZURRO 5000** and **AZZURRO 5000PRO** batteries can be connected to the same inverter.
However, **the AZZURRO 5000**, **AZZURRO 5000PRO** and **AZZURRO 5000S** batteries are not compatible with the **AZZURRO ZSX 5120** batteries and cannot be connected together.
As for the **AZZURRO 5000S model**:

- **In case of new installation**, it is strongly recommended to avoid pairing with previous models (AZZURRO 5000 and/or AZZURRO 5000PRO).

- **In case of expansion of the existing system** with **AZZURRO 5000** and/or **5000PRO** batteries or replacement of a battery with the **AZZURRO 5000S** model, it is necessary to consult with Zucchetti Centro Sistemi Spa, as a specific kit is required to ensure correct integration (kit code ZSP-CAB-RJ45-PRO/S).

	AZZURRO 5000	AZZURRO 5000PRO	AZZURRO 5000S	AZZURRO 5120
AZZURRO 5000	COMPATIBLE	COMPATIBLE	COMPATIBLE WITH SPECIAL KIT ZSP-CAB-RJ45-PRO/S	NOT COMPATIBLE
AZZURRO 5000PRO	COMPATIBLE	COMPATIBLE	COMPATIBLE WITH SPECIAL KIT ZSP-CAB-RJ45-PRO/S	NOT COMPATIBLE
AZZURRO 5000S	COMPATIBLE WITH SPECIAL KIT ZSP-CAB-RJ45-PRO/S	COMPATIBLE WITH SPECIAL KIT ZSP-CAB-RJ45-PRO/S	COMPATIBLE	NOT COMPATIBLE
AZZURRO 5120	NOT COMPATIBLE	NOT COMPATIBLE	NOT COMPATIBLE	COMPATIBLE

Battery compatibility table AZZURRO

If there are multiple batteries:

a. Check that the batteries have the same voltage level by switching them off, disconnecting them and switching them on one at a time, measuring the + and - terminals with a tester. Make sure that the difference between the voltages of all the batteries is less than 2 Volt. The power cables are located inside the appropriate KIT (not included with the battery).

b. Connect the communication cable from the COM port of the inverter to the CAN/Link In port of the master battery. The master battery must be connected via the communication cable found inside the appropriate KIT (not included with the battery) starting from the LINK OUT port and arriving at the CAN/ Link In communication port of the slave 1 battery.

Figure 96 – Communication cable between AZZURRO 5000S batteries

c. In the case of additional batteries, the communication cable should be connected as shown above for connecting the master battery to slave 1 battery.

d. The last battery will only have the **CAN/Link In** port connected.

As for the power connections, all batteries must be connected in parallel using the power cables supplied in the KIT (not included with the battery), taking care that the cable does not exceed a length of 2.0 metres.
The "**NEGATIVE**" power cable exiting the inverter must be connected to the **MASTER** battery on **NEGATIVE** terminal, while the **"POSITIVE"** cable must be connected to the last **SLAVE N** battery on the **POSITIVE** terminal.

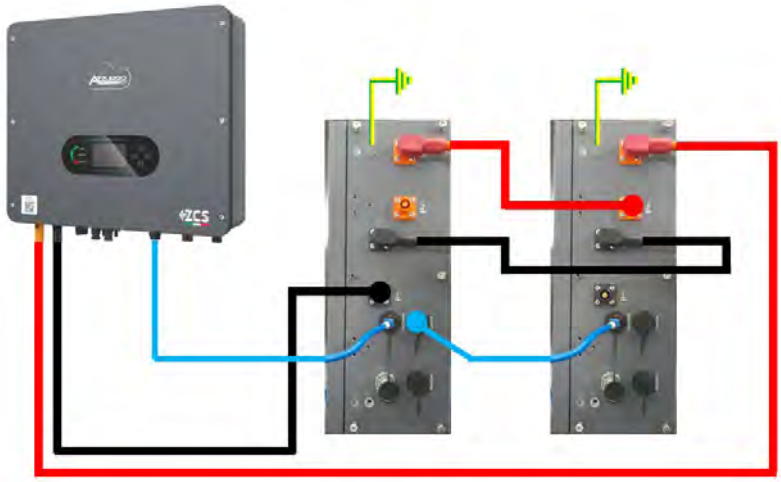


Figure 97 – Connecting two AZZURRO 5000S batteries in parallel

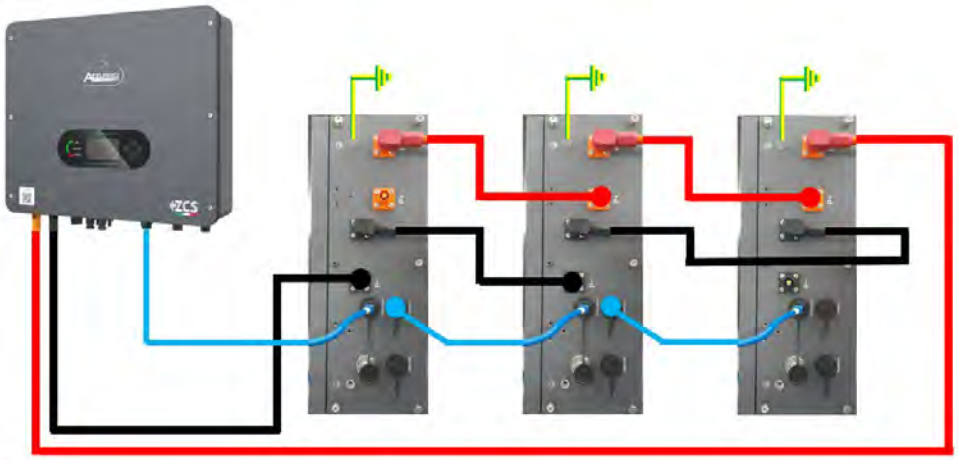


Figure 98 – Connecting three AZZURRO 5000S batteries in parallel

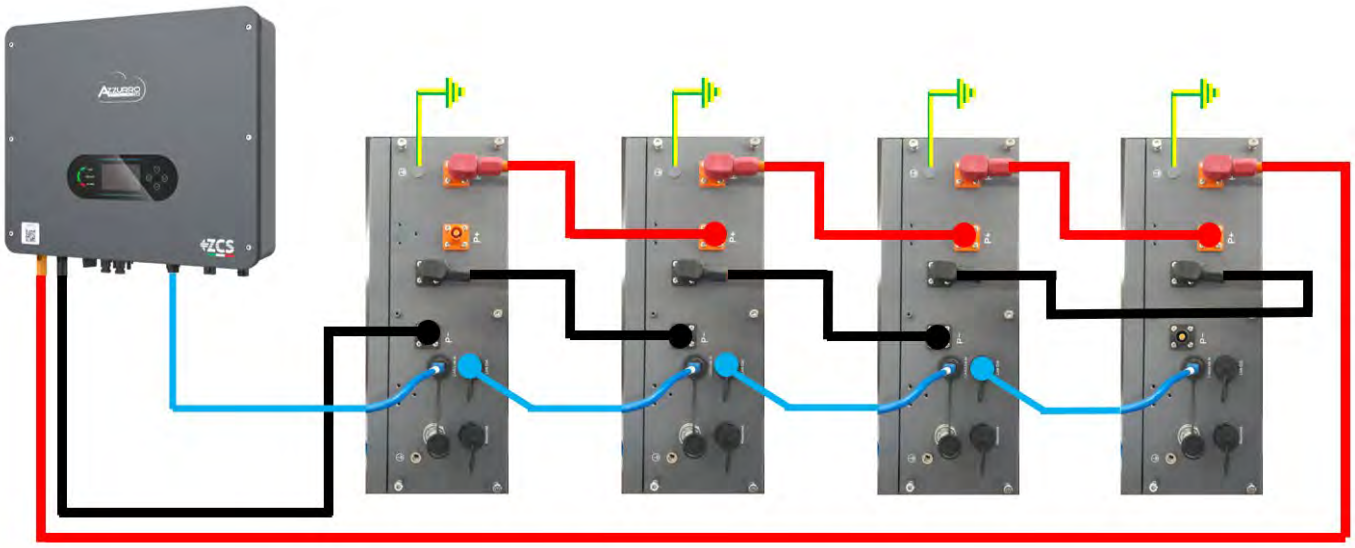


Figure 99 – Connecting four AZZURRO 5000S batteries in parallel

Battery and inverter upgrade:

Update the inverter to the latest firmware version at www.zcsazzurro.com:

1. **PRODUCTS** section;
2. **STORAGE INVERTER**;
3. **HYD 3000-ZSS HP/HYD 6000-ZSS HP** - Single Phase Hybrid;
4. Refer to the **FIRMWARE** section and verify that the inverter is updated to the latest version otherwise upgrade it.

Update the 5000S battery(s) to the latest firmware version at www.zcsazzurro.com:

1. **PRODUCTS** section;
2. **LV BATTERIES**;
3. Azzurro **ZSX LV**;
4. Refer to **FIRMWARE ZSX 5000S** section and verify that the batteries are updated to the latest version otherwise update them.

4.19.3. AZZURRO 5000S configuration

To correctly configure the battery parameters:

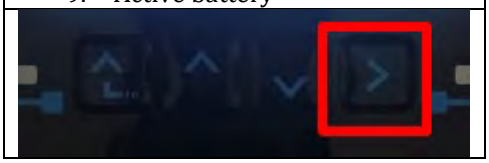
1. Press the first button on the left of the display:

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

1. Basic settings
2. Advanced settings
3. Production statistics
4. System Info
5. Event list
6. SW Update

3. Now press the last arrow on the right to access the battery parameters

1. Battery parameters
2. Zero feed-in mode
3. IV Curve Scan
4. Logic interface
5. Factory reset

6. Parallel settings
7. Reset Bluetooth
8. CT Calibration
9. Active battery


4. Check that the parameters are set correctly:

1.Battery type	Azzurro
4.Depth of Discharge	80%
6.Save	

4.19.4. AZZURRO 5000S battery and AZZURRO 5000/5000 PRO batteries in parallel

As mentioned in section 4.19.2:

- **In case of new installation**, it is strongly recommended to avoid pairing with previous models (AZZURRO 5000 and/or AZZURRO 5000PRO).
- **In case of expansion of the existing installation** with **AZZURRO 5000** and/or **5000PRO** batteries or replacement of a battery with the **AZZURRO 5000S** model, it is necessary to consult with Zucchetti Centro Sistemi Spa, as a specific kit is required to ensure proper integration (kit code ZSP-CAB-RJ45-PRO/S) and connect the batteries as in the figure:

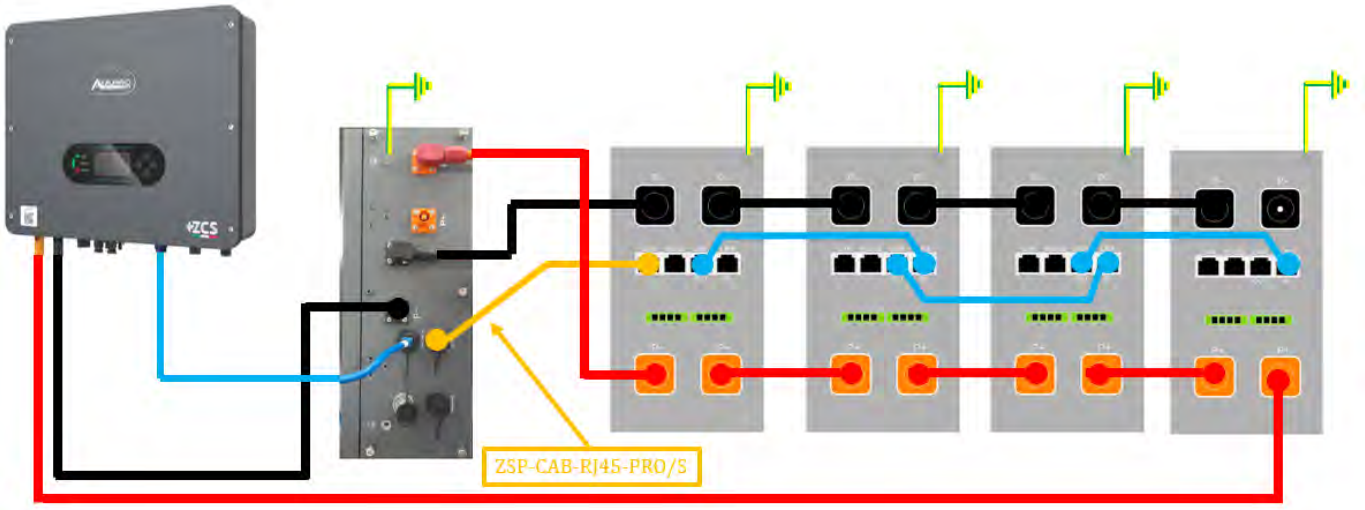


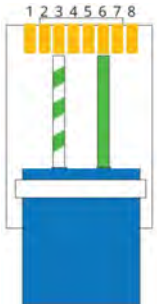
Figure 100 – Parallel connection of AZZURRO 5000S and AZZURRO 5000/AZZURRO 5000PRO battery

Communication connections between batteries and inverter:
Batteries are connected IN PARALLEL to each other:

f. **CAN/Link In** of the master battery (**5000S**) → **COM** port of the inverter

g. **Link Out** of the master battery (**5000S**) → **CAN** of the slave battery 1 (**5000/5000 PRO**) this connection must be made with appropriate cable **ZSP-CAB-RJ45-PRO/S** in detail:

   a. **Link Out** of the master battery (**5000S**)



   b. **CAN** of slave battery 1 (**5000/5000 PRO**)

h. **Link Out** of slave battery 1 (**5000/5000 PRO**) → **Link In** of slave battery 2 (**5000/5000 PRO**)

i. ...

j. **Link Out** of slave battery N-1 (penultimate **5000/5000 PRO**) → **Link In** of slave battery N (last **5000/5000 PRO**)

<u>Power connections between batteries and inverter:</u>
Batteries should be connected in a "ring" fashion.

a. Negative (-) input of master battery connected to negative (-) input of inverter.

b. Negative (-) input of master battery connected to negative (-) of slave battery 1.

c. Positive (+) input of master battery connected to positive (+) input of slave battery 1.

d. .....

e. Negative (-) input of slave battery N-1 (penultimate) connected with the negative (-) of slave battery N (last).

f. Positive (+) input of the N-1 (penultimate) slave battery connected with the positive (+) of the N (last) slave battery.

g. Positive (+) input of the slave battery N (last) connected with the positive (+) of the inverter.

Update batteries and inverter:

Update the inverter to the latest firmware version on www.zcsazzurro.com:

1. **PRODUCTS** section;
2. **STORAGE INVERTER**;
3. **HYD 3000-ZSS HP/HYD 6000-ZSS HP** - Single Phase Hybrid;
4. Refer to the **FIRMWARE** section and verify that the inverter is updated to the latest version otherwise upgrade it.

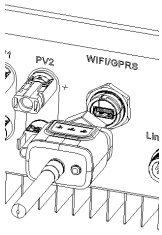
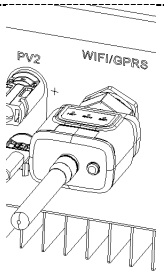
Update the 5000S battery(s) to the latest firmware version at www.zcsazzurro.com:

1. **PRODUCTS** section;
2. **LV BATTERIES**;
3. Azzurro **ZSX LV**;
4. Refer to **FIRMWARE ZSX 5000S** section and verify that the batteries are updated to the latest version otherwise update them.

5. External communication interface

5.1. USB/WIFI communication interface

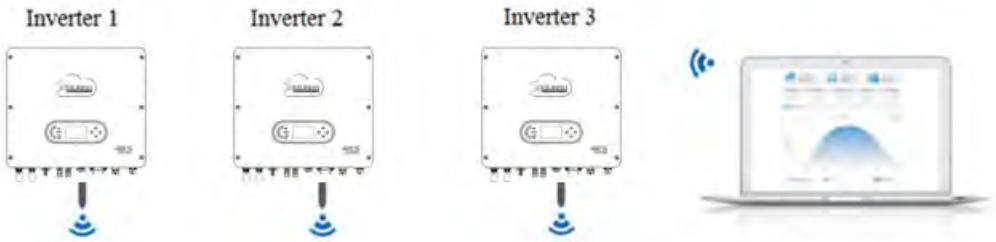
USB/ WIFI communication interface.

		
Step 1	Step 2	Step 3

Interface description.

PIN	Definition	Function	Note
1	GND.S	USB power supply -	USB power supply is 5 V/1 A; cannot be used to charge external devices
2	DP	Data USB +	
3	DM	Data USB -	
4	VBUS	USB power supply +	

Refer to the figure shown below.

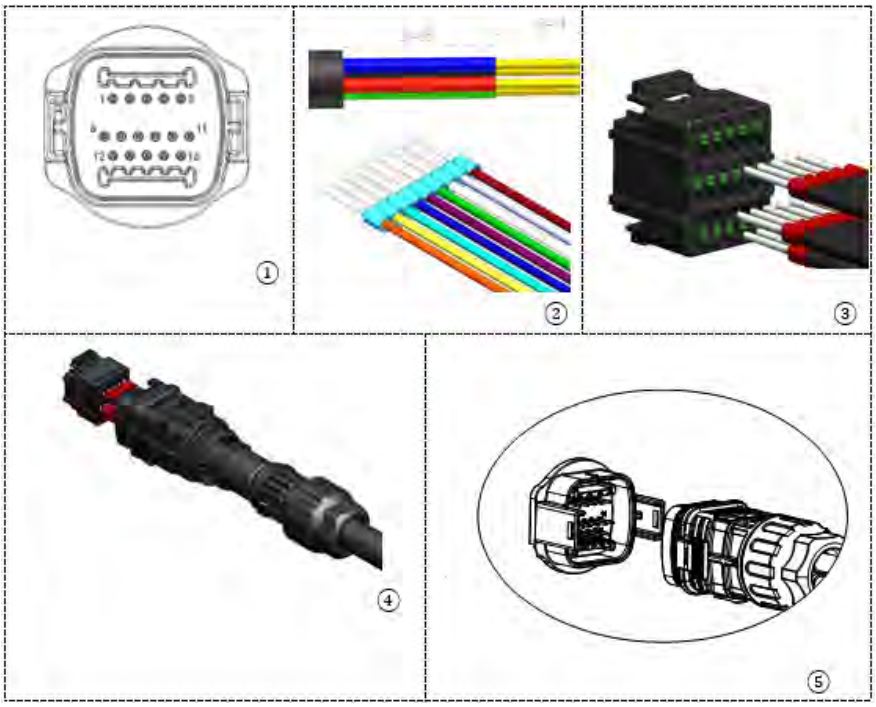


Operating information (energy generated, alerts, operating status) of the inverter can be transferred to a PC or uploaded to the server via Wi-Fi/GPRS/Ethernet. Users can choose to use the web portal or app for monitoring and displaying as required.

5.1.1. Multifunction communication interface (COM)

Interface description.

PIN	Definition	Function	Note
1	CAN	CAN data transmission	For communication between the inverter and the lithium battery management system (BMS), it is essential that the battery used is of the Zucchetti brand. This enables CAN communication and RS485 communication.
2	CAN	CAN data transmission	
3	485-2TX+	RS485+ differential signal	
4	485-2TX-	RS485- differential signal	
5	485-1TX+	RS485+ differential signal	Wired or cascade monitoring of the inverter
6	485-1TX-	RS485- differential signal	
7	GND-S	The logic interfaces (DRMS) apply to the following safety standards: Australia (AS4777), Europe (50549), Germany (4105)	Logic interface connections
8	DRMS1/5		
9	DRMS2/6		
10	DRMS3/7		
11	DRMS4/8		
12	DRMS0		
13	CT-	Current sensor emits a negative electrode	Current sensor connection (CT)
14	CT+	Current sensor emits a positive electrode	
15	RS485-B	RS485+ differential signal	Communication with the meter
16	RS485-A	RS485- differential signal	



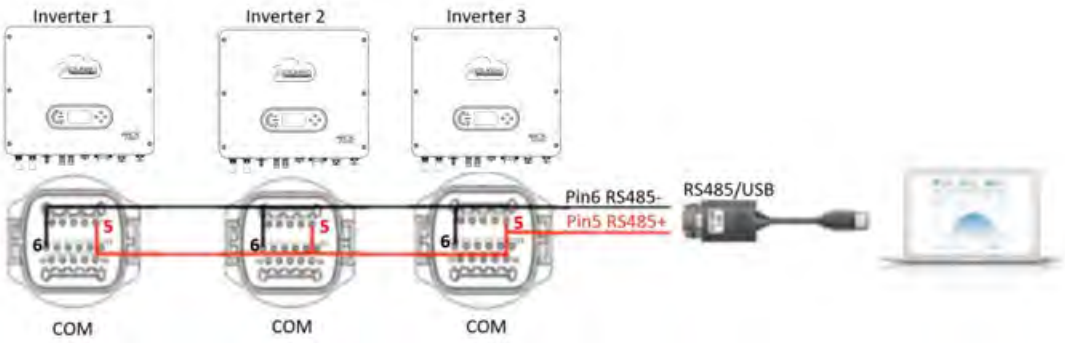
1. **CAN (port 1 and 2)**

Connection for BMS communication

2. **RS485 (wired or cascade monitoring of the inverter port 5 and 6)**

Refer to the figure below; connect RS485+ and RS485- of the inverter to TX+ and TX- of the RS485 → USB adapter and connect the USB port of the adapter to the computer.
(NOTE: The RS485 communication cable must not be longer than 1000 m).

The RS485 cables are connected in parallel between inverters.
(NOTE: when multiple inverters are connected via RS485 cables, set the communication address to differentiate the inverters).



3. **Logic interface (ports 7, 8, 9, 10, 11 and 12)**

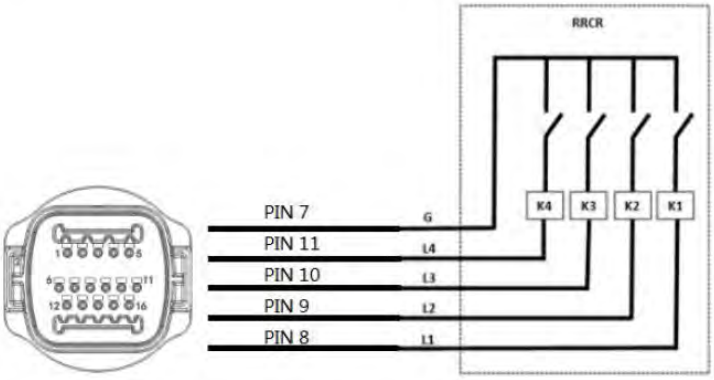
This function must be disabled unless the inverter is installed in countries where this function must be enabled. The definitions of the logic interface pins and circuit connections are as follows:

Logic interface pins are defined according to different standard requirements Logic interface for AS/ NZS 4777.2:2015, also known as inverter demand response mode (DRM).

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

Pin NO.	Function
8	DRM1/5
9	DRM2/6
10	DRM3/7
11	DRM4/8
12	DRM0
7	GND-S

Logic interface for VDE-AR-N 4105:2018-11, is to control and/or limit the output power of the inverter. The inverter can be connected to a Radio Ripple Control Receiver (RRCR) in order to dynamically limit the output power of all inverters in the installation.



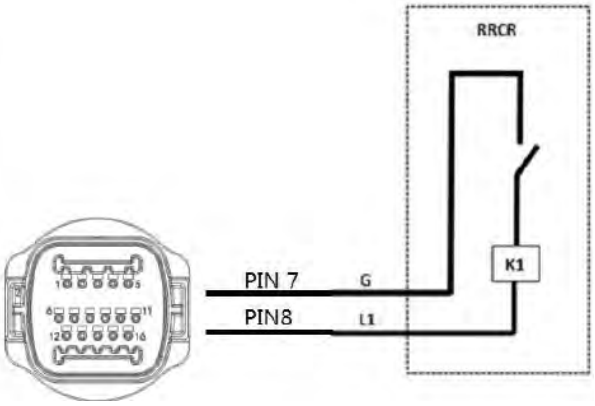
Pin NO.	Pin name	Description	Connected to (RRCR)
8	L1	Relay contact 1 input	K1 - Relay 1 output
9	L2	Relay contact 2 input	K2 - Relay 2 output
10	L3	Relay contact 3 input	K3 - Relay 3 output
11	L4	Relay contact 4 input	K4 - Relay 4 output
7	G	GND	Relays common node

The inverter is pre-configured to the following RRCR power levels, 1 is closed, 0 is open.

L1	L2	L3	L4	Active Power	Cos(φ)
1	0	0	0	0%	1
0	1	0	0	30%	1
0	0	1	0	60%	1
0	0	0	1	100%	1

Logic interface for EN50549-1:2019 is to cease active power within five sections following an instruction being received at the interface input.

Inverter - RRCR connection:



Pin NO.	Pin name	Description	Connected to (RRCR)
8	L1	Relay contact 1 input	K1 - Relay 1 output
7	G	GND	K1 - Relay 1 output

The inverter is pre-configured to the following RRCR power levels, 1 is closed, 0 is open.

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

4. **CT (ports 13 and 14)**

When using the CT to read the exchange, connect it to PIN13 and PIN14 of the COM port.

There are two ways to obtain information on the grid current:

- CT
- Meter

For the feed-in limit function can be used to limit the power fed back into the grid. In order to achieve this function, power measurement devices (meter or CT) must be installed according to the system.

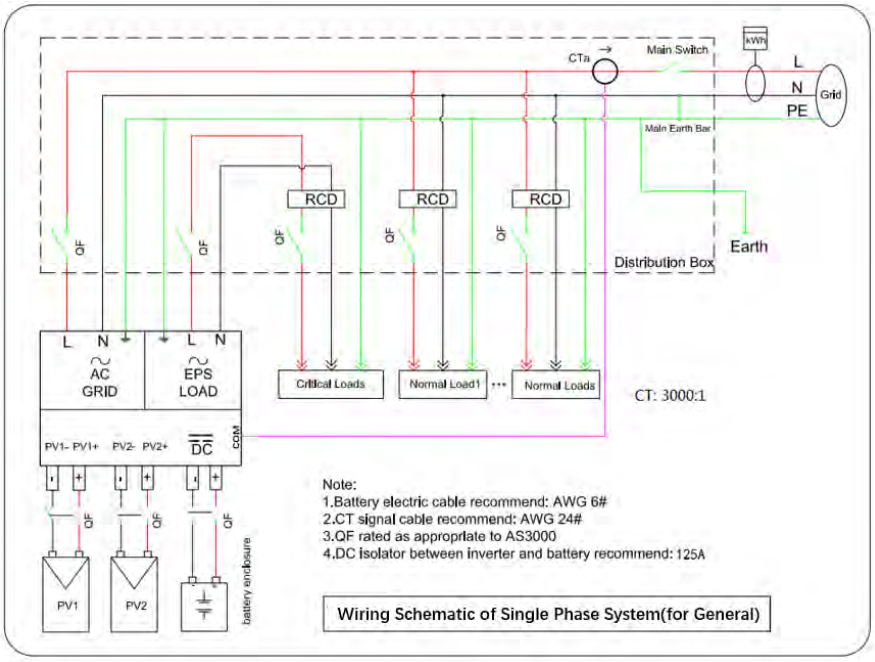


Figure 92 Electrical connections (CT)

5. **Meter single-phase DDSU (ports 15 and 16)**

PIN15 and PIN16 are used for communication with the meter; the meter is shown in “Figure 1”, PIN15 and PIN16 on the inverter COM port correspond to points 25 and 24 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

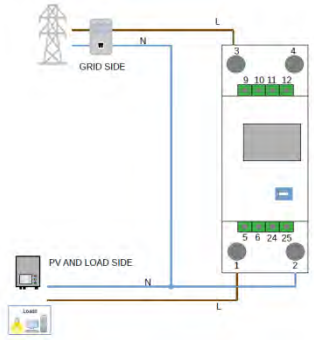


Figure 2

PIN INVERTER	PIN METER	Nota
16	24	Comunicazione del Meter di Scambio
15	25	

Figure 3

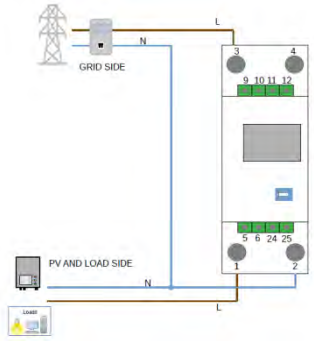


Figure 4

6. **Meter three-phase DTSU (ports 15 and 16)**

PIN15 and PIN16 are used for communication with the meter; the meter is shown in “Figure 1”, PIN15 and PIN16 on the inverter COM port correspond to points 25 and 24 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

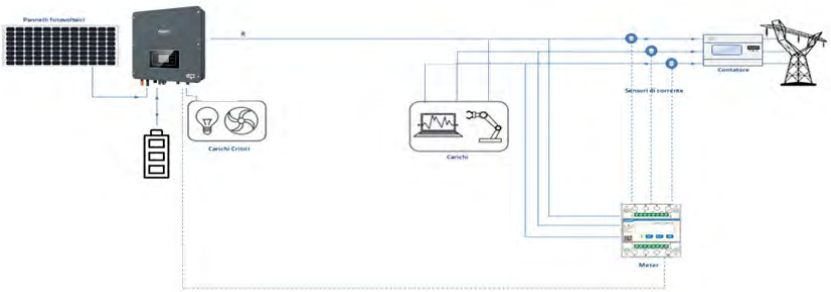


Figure 2

PIN INVERTER	PIN METER	Nota
16	24	Comunicazione del Meter di Scambio
15	25	

Figure 3

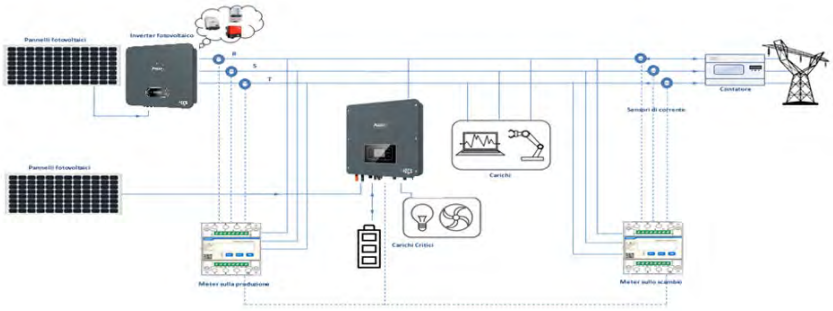
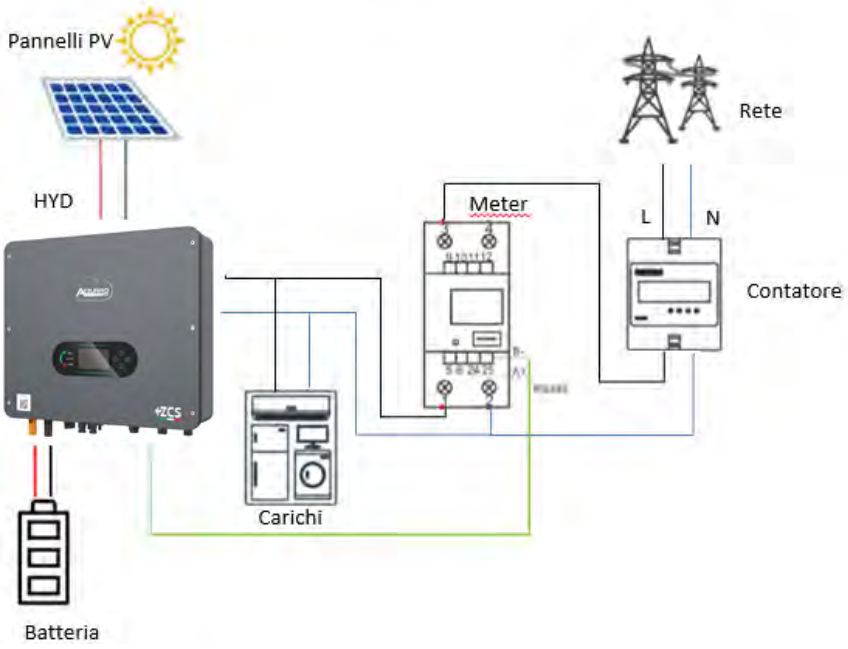


Figure 4

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

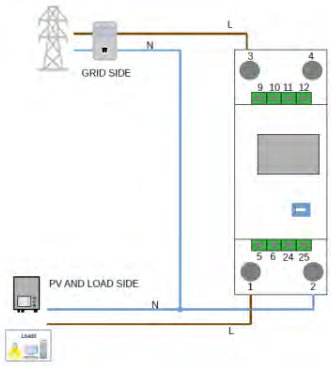
In order to be able to read the exchange via the meter, it is necessary to purchase a CHINT DDSU single-phase direct connect meter.

PIN INVERTER	PIN METER	Nota
16	24	Comunicazione del Meter di Scambio
15	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 16 and 15.
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 oe 120 Ohm resistor along the 485 daisy chain directly to the Meter (PINs 24 and 25).

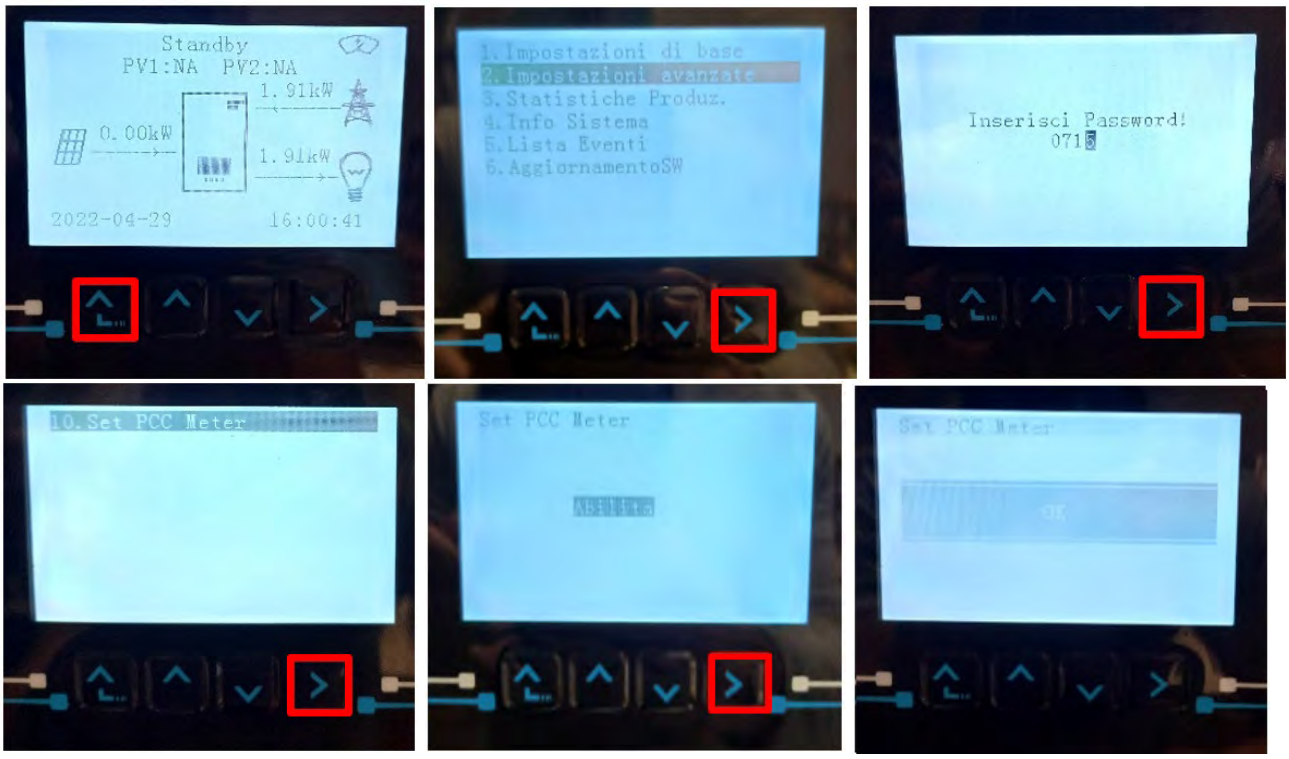
Setting Meter on exchange

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

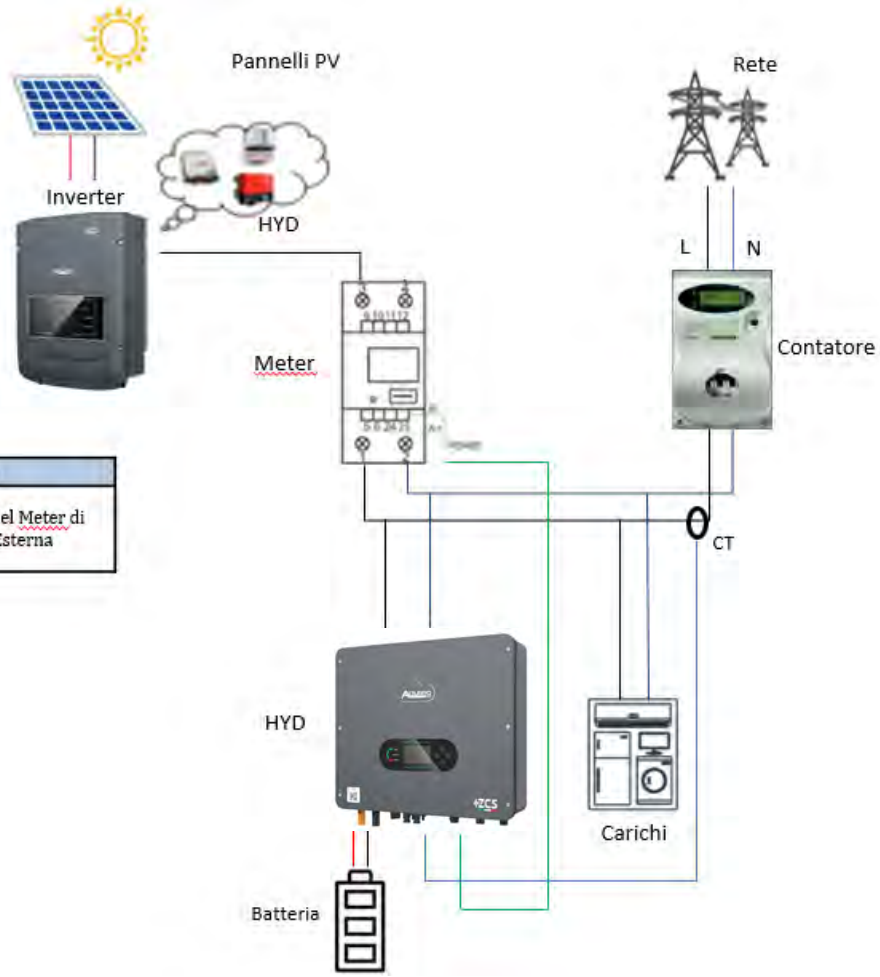

Indirizzo | Corrente | Potenza | Tensione | Power factor

2. To configure the Meter reading on the inverter, access the inverter display (as shown in the figure):
   - ✓ First button on the left of the inverter;
   - ✓ Advanced settings;
   - ✓ Enter password “0715”;
   - ✓ 10. Set PCC Meter;
   - ✓ Enable;
   - ✓ Ok.



5.1.3. 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.

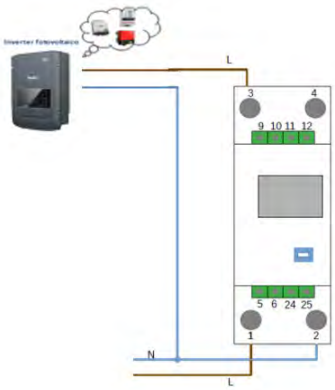


PIN INVERTER	PIN METER	Nota
16	24	Comunicazione del Meter di Produzione Esterna
15	25	

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 16 and 15 (as shown in the table).

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 one 120 Ohm resistor along the 485 daisy chain directly to the Meter (PINs 24 and 25).

Setting Meter on external production

3. 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.


Protocol


Indirizzo


Corrente


Potenza

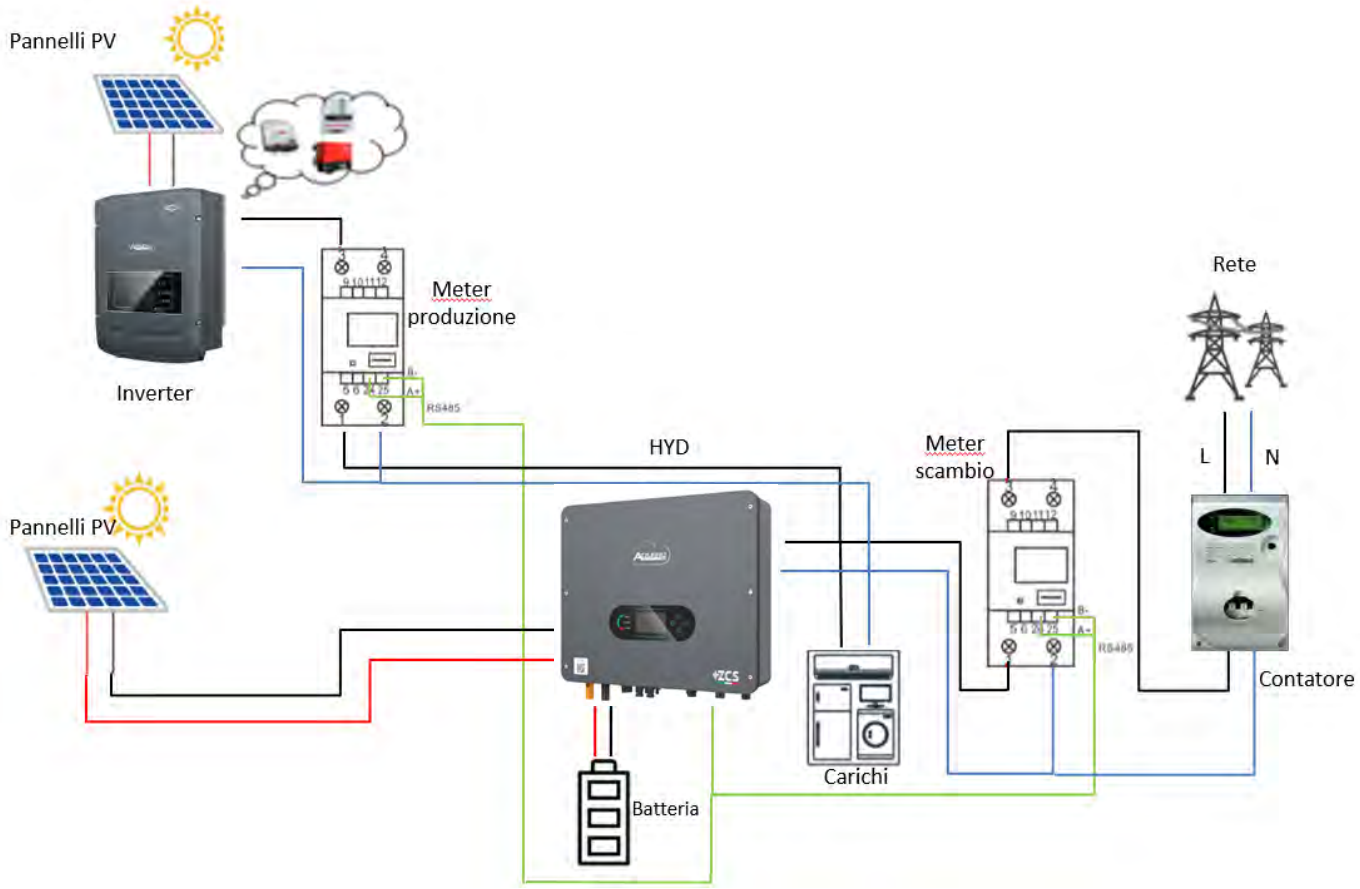

Tensione


Power factor

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

5.1.4. 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.



5.1.5. 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.

5.1.6. 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.

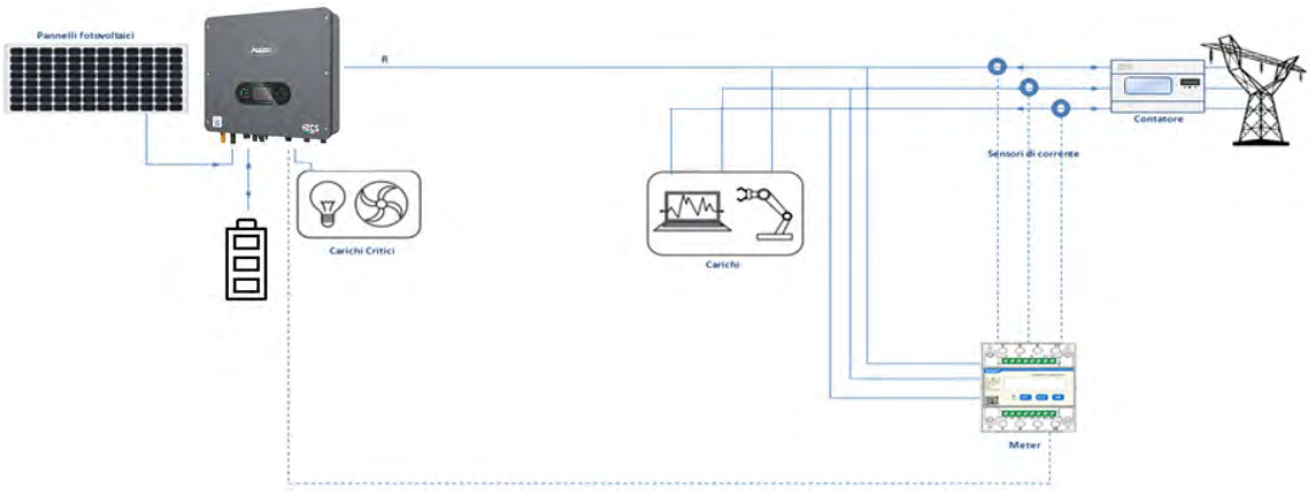


Figure 101 - Hybrid installation scheme with meter on the exchange

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).

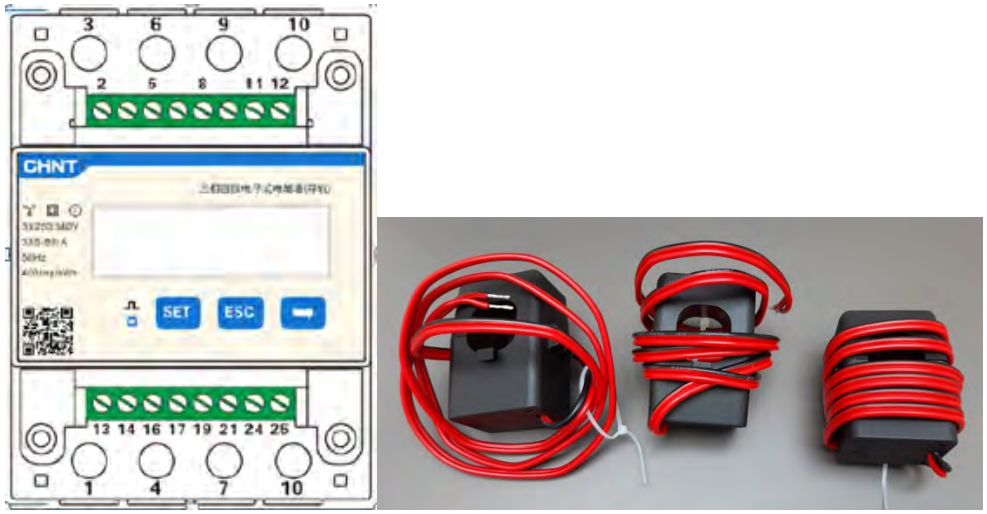


Figure 102 - Meter (left), CT sensors (right)

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.

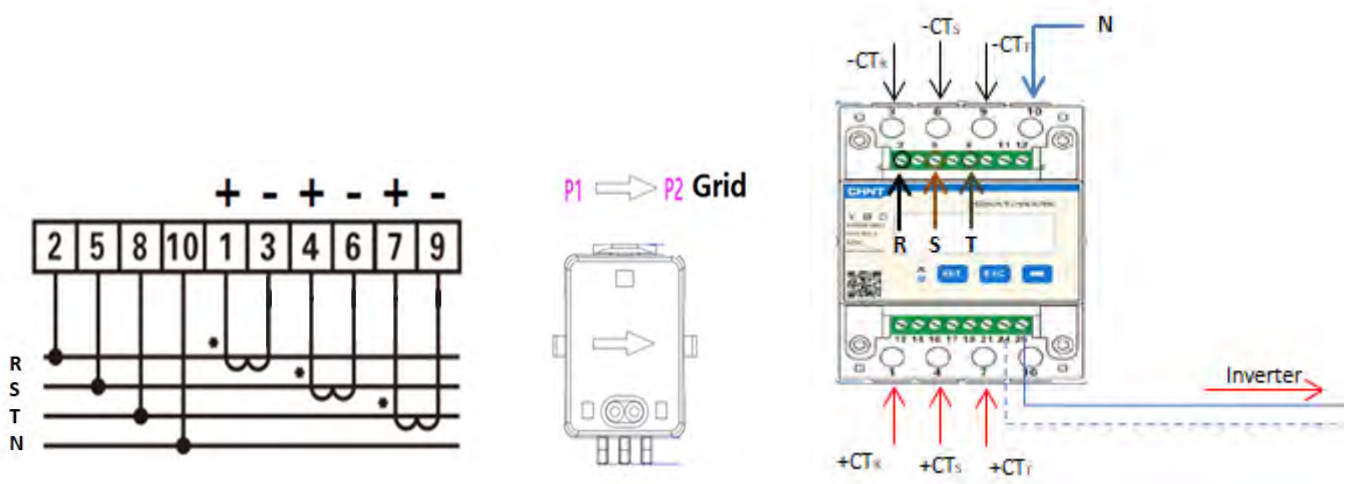
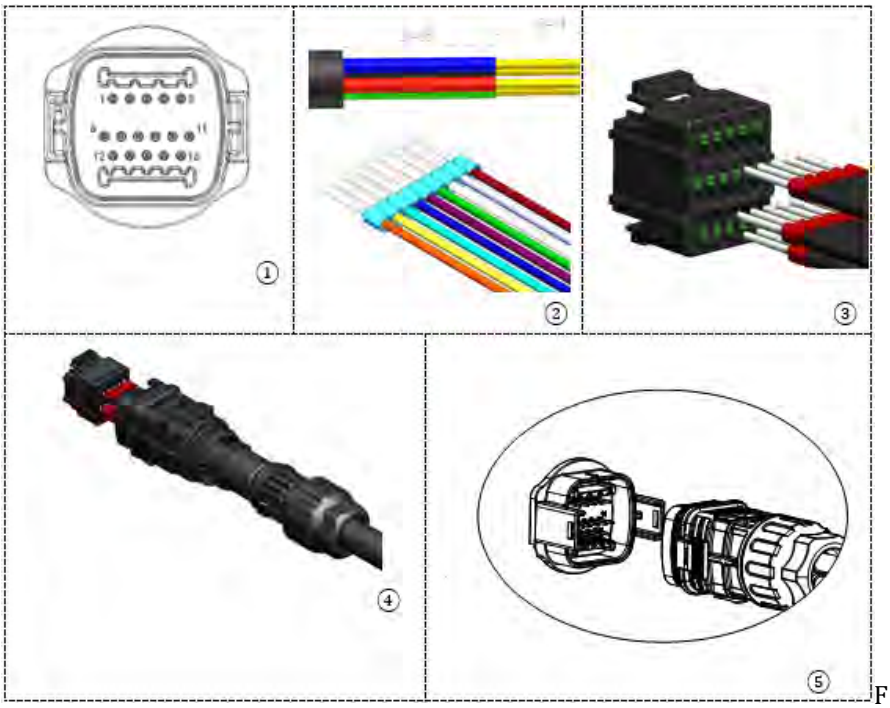


Figure 103 – Meter connection and sensors CT

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 16 and 15 as indicated in the figures and tables below.



F

Figure 104 – COM interface

PIN Inverter	Definizione	PIN Meter	Note
16	RS485 differential signal +	24	Meter communication
15	RS485 differential signal -	25	

Table 2 - Interface descriptions

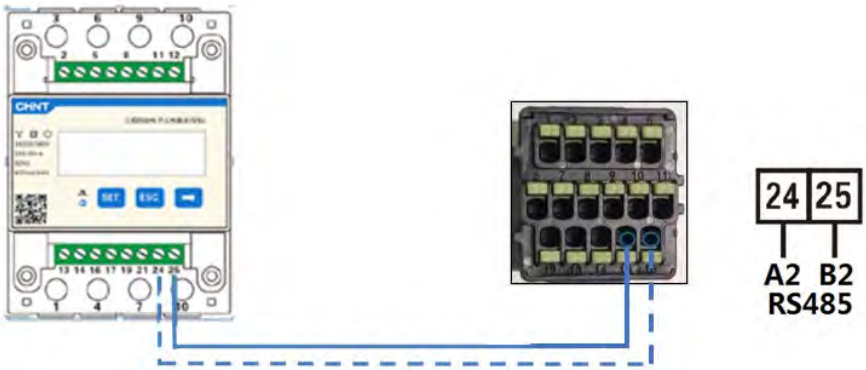
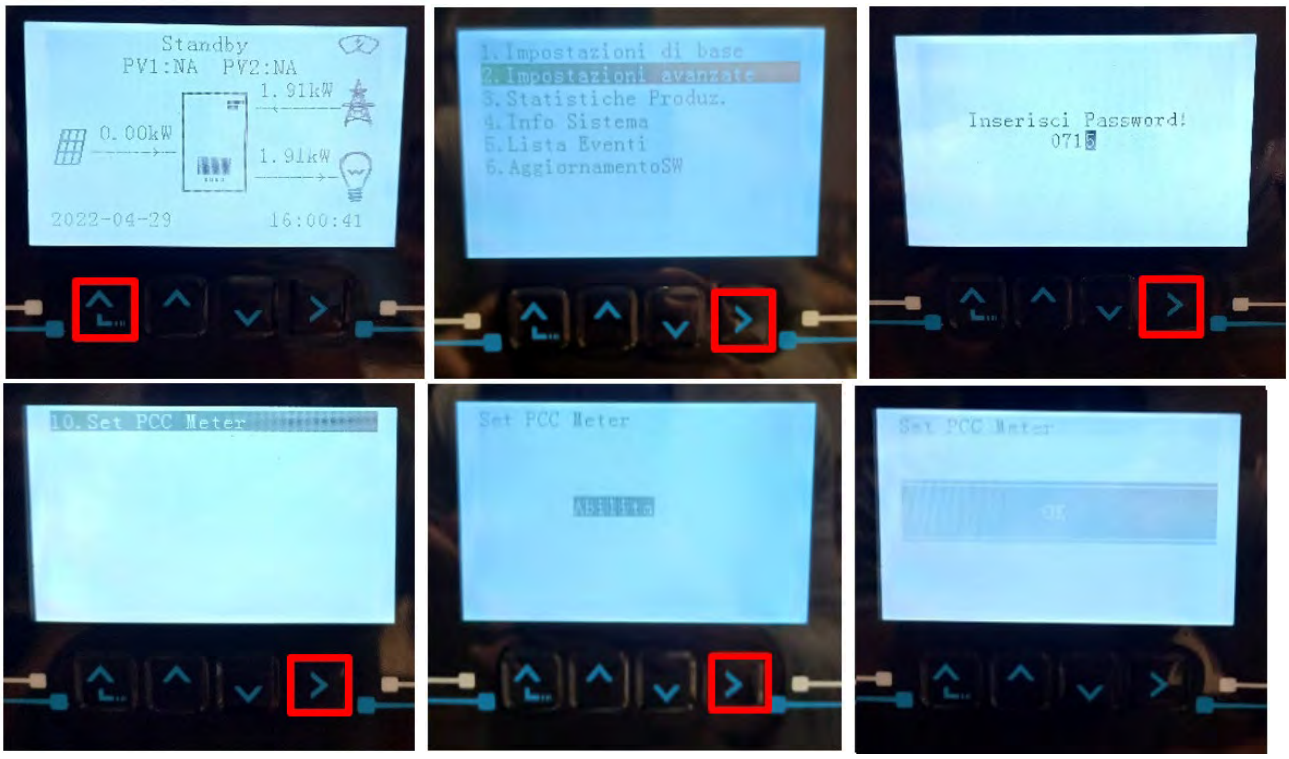


Figure 105 - Serial port connection Meter

NOTE: For distances between meter and hybrid inverter over 100 meters it is recommended to connect along the 485 dasy chain two 120 Ohm resistors, the first to the inverter (between PIN 15 and 16 of the interface), the second directly to the Meter (PIN 24 and 25).
To see the meter reading at the exchange on the inverter, access the inverter display (as shown in the figures):

- ✓ First left button of the inverter;
- ✓ Advanced settings;
- ✓ Enter password «0715»;
- ✓ 10. Set PCC Meter;
- ✓ Enable;
- ✓ Ok.



5.1.7. 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 15 and 16 of the COM port)

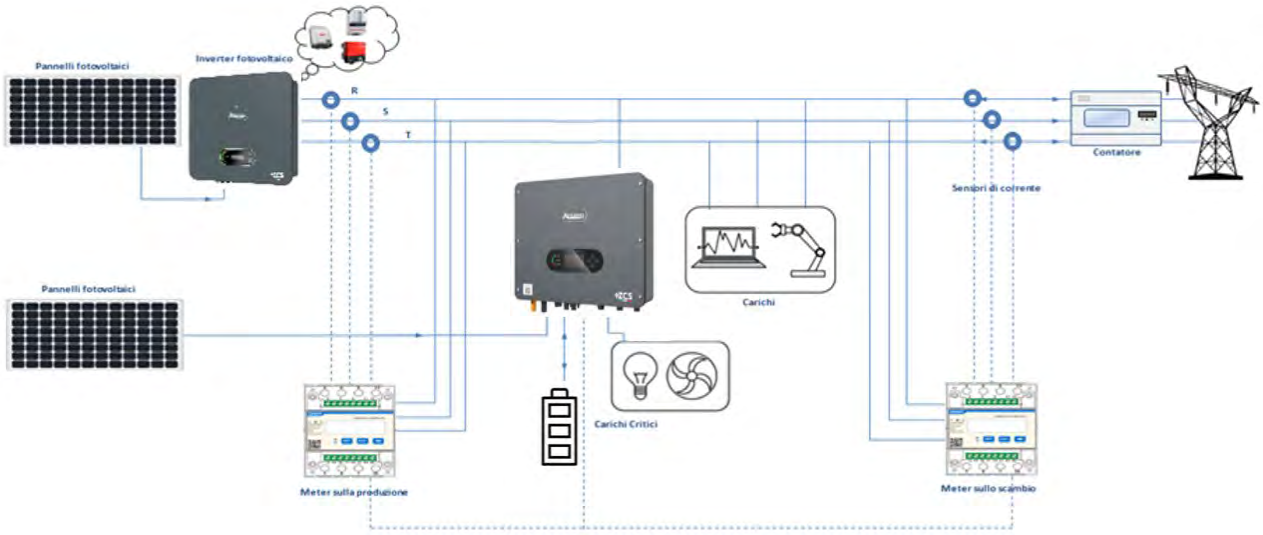


Figure 106 - Hybrid installation scheme with three-phase DTSU Meter on exchange and production

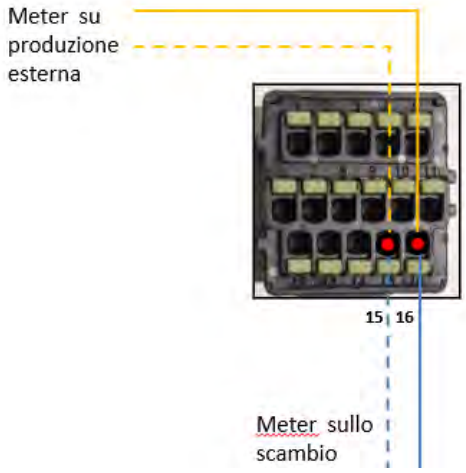


Figure 107 - COM serial port connection with more than one DTSU Meter

5.1.8. Three-phase DTSU Meter parameter configuration

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

1. Press to:
   - "Confirm"
   - "Move the cursor"

   (for entering values)
2. Presso to "go back"
3. Press to "slide"

Figure 108 – Meter legend

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.

5.1.9. Correct installation verification DTSU three-phase meter

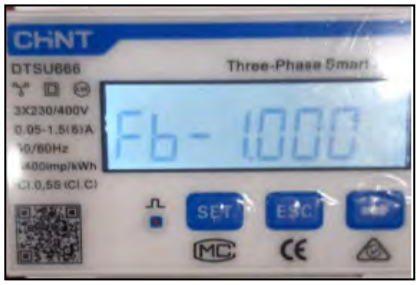
Three-phase DTSU meter verification at exchange

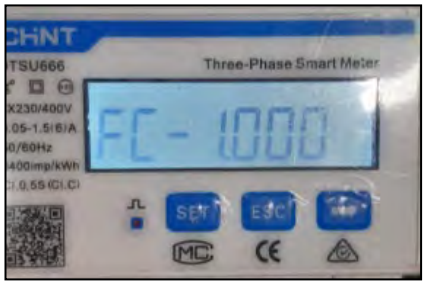
To carry out such verification it is necessary:

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

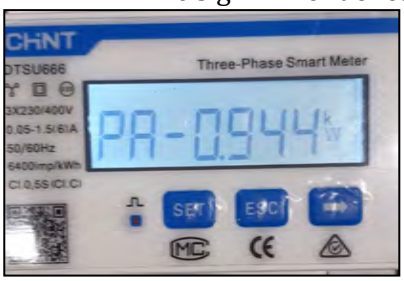
Bring yourself in front of the Meter and using the keys " " to scroll between the entries and "ESC" to go back, it must be verified that:

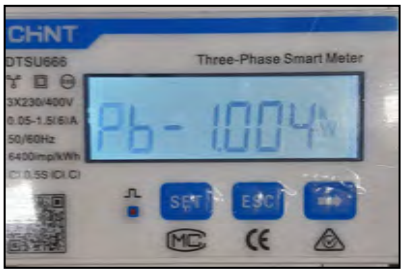
1. The Power Factor values for each phase Fa, Fb, and Fc (voltage to current offset), are between 0.8-1.0. In case of a lower value, the sensor must be moved in one of the other two phases until that value is between 0.8-1.0.

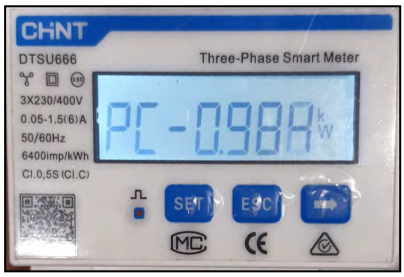




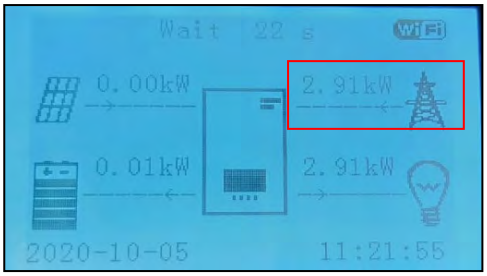
2. The Power Pa, Pb and Pc must be:
    - Greater than 1 kW.
    - In line with household consumption.
    - The sign in front of each negative value (-).







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

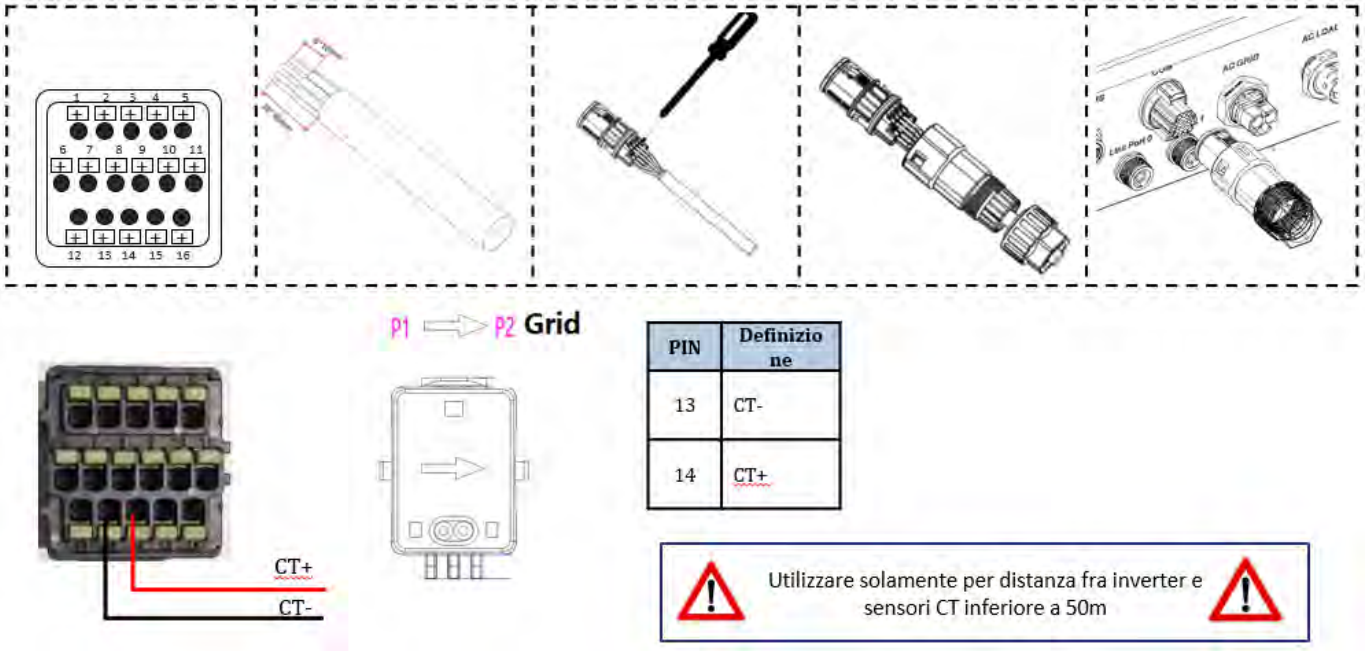


Three-phase DTSU Meter Verification on Production

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

1. Switch off the hybrid inverter and leave on only the pure photovoltaic;
2. Making pure photovoltaic go into production;
3. Power factor verification as described in the previous case;
4. The power sign Pa, Pb, and Pc must be in agreement;
5. Turn on Hybrid Inverter, verify that the total power value Pt photovoltaic is in line with the value shown on the inverter display.

5.1.10. Measuring exchange via current sensor

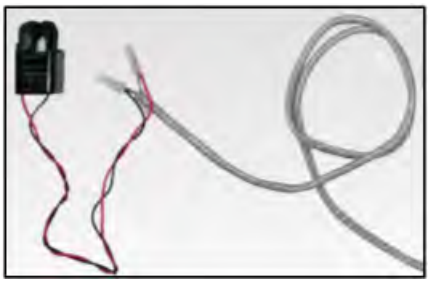


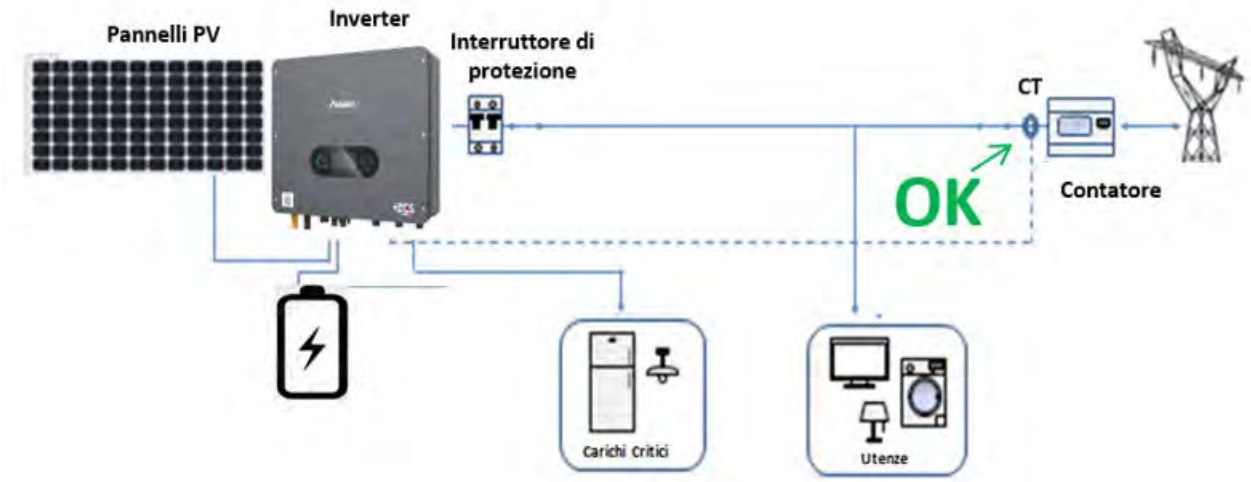
Connect the negative of the sensor to input 13 of the COM connector
Connect the positive of the sensor to input 14 of the COM connector

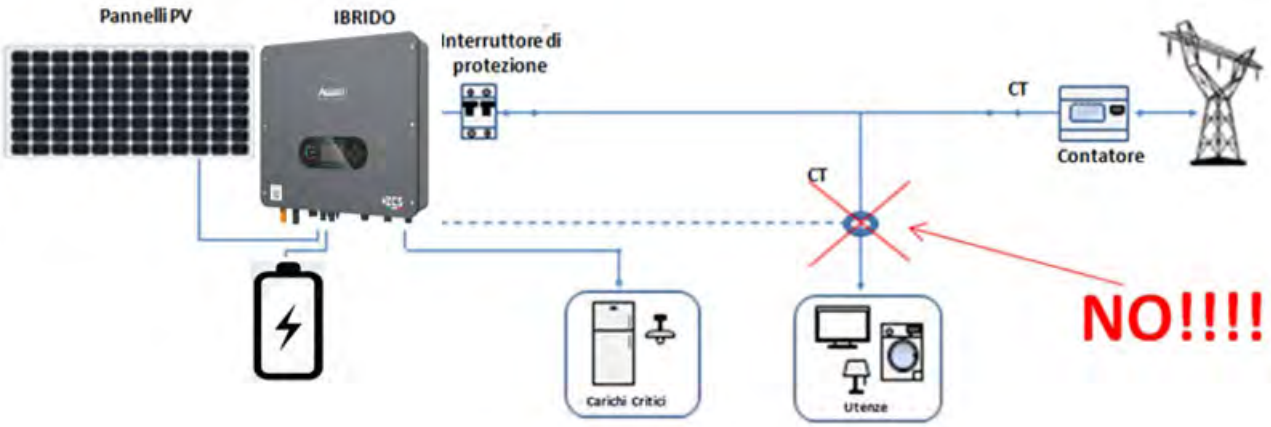
Correctly position the current sensor, in detail:

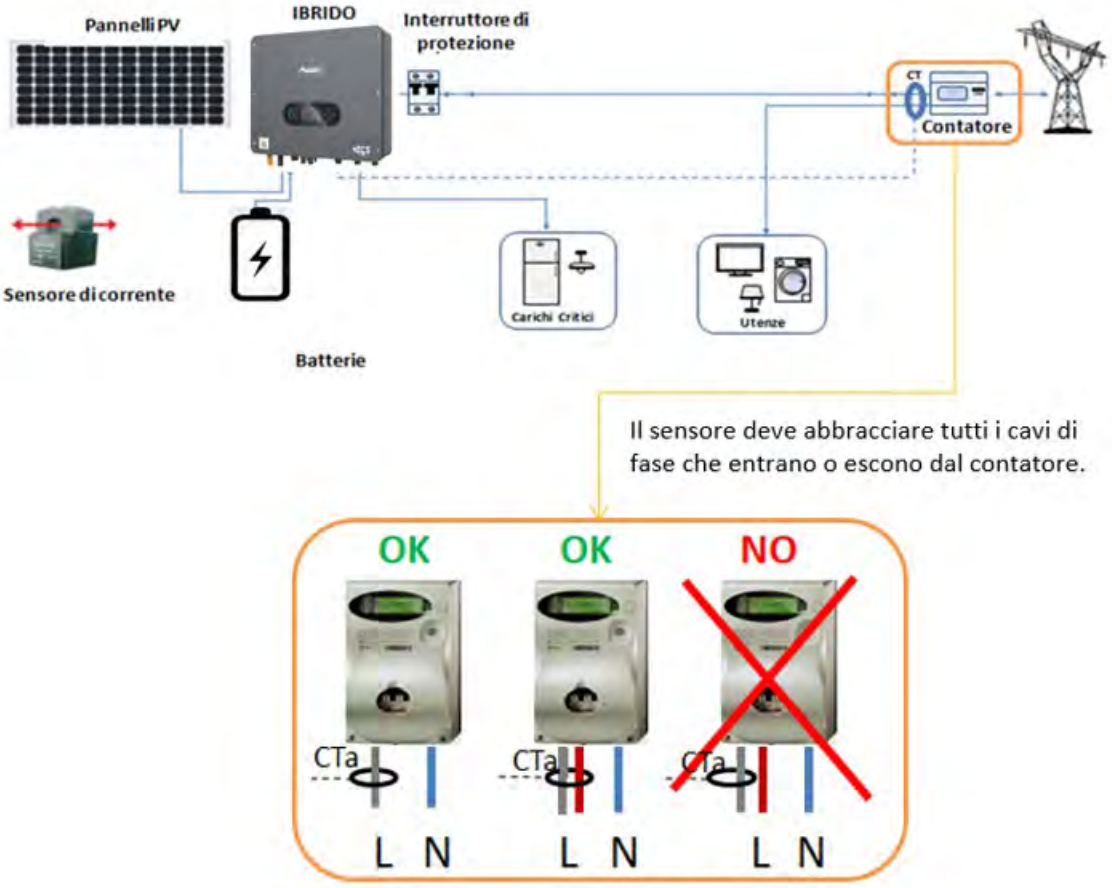
- ✓ CT (measures the current exchanged with the grid). Positioned at the output of the exchange meter so that all incoming and outgoing power flows can be read, it must include all phase cables entering or leaving the exchange meter.
- ✓ The direction of the CT is independent of the installation, and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

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.

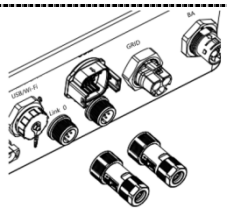
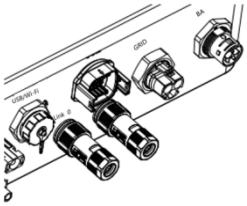



Pannelli PV
Inverter
Interruttore di protezione
CT
OK
Contatore
Carichi Critici
Utenze


Pannelli PV
IBRIDO
Interruttore di protezione
CT
Contatore
CT
NO!!!!
Carichi Critici
Utenze


Pannelli PV
IBRIDO
Interruttore di protezione
CT
Contatore
Sensore di corrente
Batterie
Carichi Critici
Utenze
Il sensore deve abbracciare tutti i cavi di fase che entrano o escono dal contatore.
OK
OK
NO
CTa
CTa
CTa
L N
L N
L N

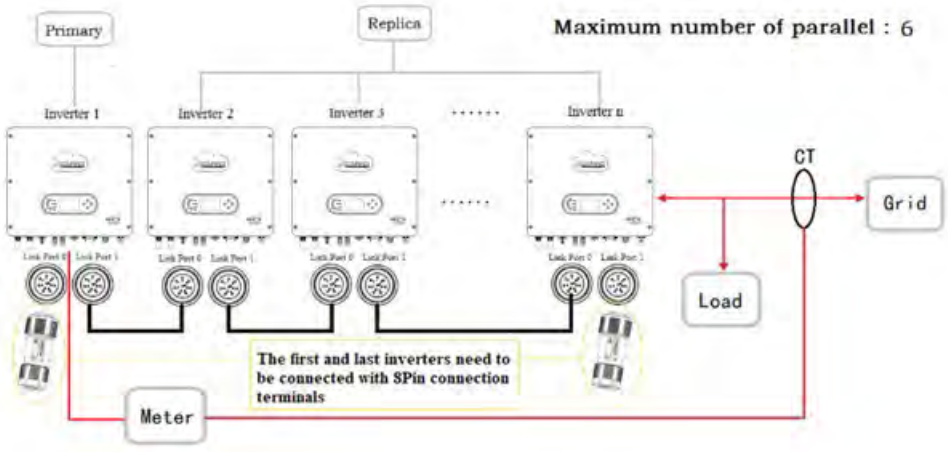
5.1.11. Connection port 0 and 1-Cascade communication interface

		
Step 1	Step 2	Step 3

If there is more than one hybrid inverter in a system, they must be connected in parallel (Master-Slave mode). For maximum performance of the system and to have future imbalances between batteries, the hybrid inverters must be the same as each other (i.e. same size, number and models of batteries). When using the parallel system, refer to the "Parallel Configuration" section of this manual for inverter settings and notes.

Note (AC LOAD is also parallel for parallel machines):

1. The first and last inverters must be connected with 8-pin connection terminals.
2. The cable length of the AC LOAD terminal connected from the LOAD terminal to each machine must be consistent with the cable length specification in order to ensure that the impedance of the circuit is consistent and that the LOAD current diverted to each machine is identical.
3. When the total AC LOAD power is greater than 110% of the machine's rated power (e.g. an AC LOAD inverter has a maximum allowed power of 5.5 kVA and six parallel AC LOAD machines have a maximum allowed power of 33 kVA), the load must not be connected to AC LOAD but to the AC GRID.
4. When inverters are in parallel, the entire AC Grid must be shared with a circuit breaker; the same should be the case for AC LOAD.



6. Buttons and indicator lights

Figure 109 – Buttons and indicator lights

Figure 102– Buttons and indicator lights

6.1. Buttons:

- Press “Back” to go back to the previous screen or to enter the main interface.
- Press “Up” to enter the upper menu or to increase the value by 1.
- Press “Down” to enter the lower menu or to decrease the value by 1.
- Press “OK” to select the option of the current menu or to move to the next number.

6.2. Indicator lights and operating status

Status	Grid active Green light	Off-Grid Green light	Alarm Red light
Grid active	Active		
Standby (grid active)	Intermittent		
Off-Grid		Active	
Standby (off-grid)		Intermittent	
Alarm			Active

7. Function

7.1. Preliminary checks

Before starting up the system, check that:

1. The 1PH HYD3000-HYD6000-ZSS-HP inverter is securely attached to the mounting bracket
2. The PV+/PV- cables are connected securely and the polarity and voltage are correct
3. The BAT+/BAT- cables are connected securely and the polarity and voltage are correct
4. The GRID/LOAD cables are connected securely/correctly
5. An AC switch is correctly connected between the GRID port of the 1PH HYD3000-HYD6000-ZSS-HP 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-ZSS-HP inverter and the critical load and the switch is off
7. The communication cable for the lithium batteries is correctly connected.

7.2. First start-up of the inverter

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

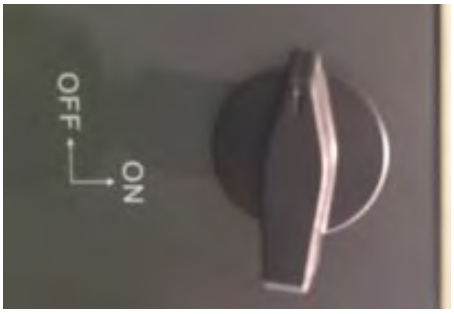


Figure 110 - Photovoltaic disconnecting switch

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

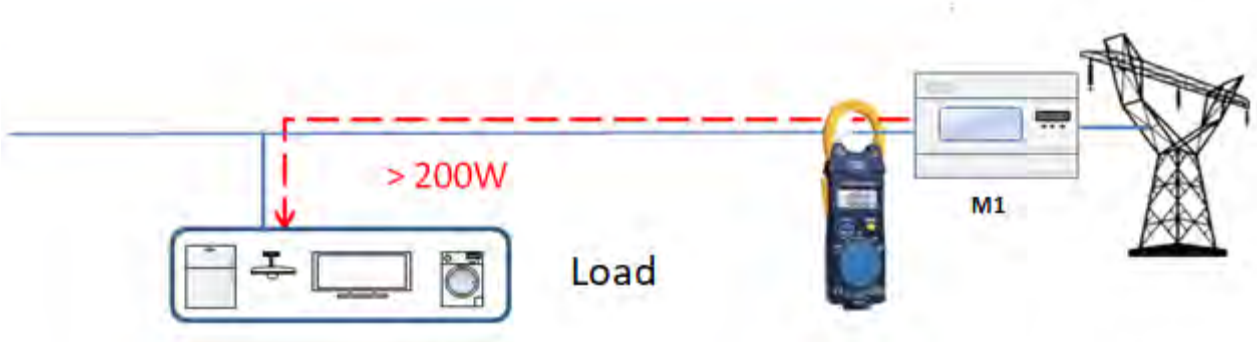


Figure 111 – Checking that the power consumption is higher than 200 W

4. Supply DC power to the inverter by correctly switching on the batteries:
In the case of Pylontech batteries, set the POWER switch of the battery, or (in the case of multiple units) of all the batteries, to I (ON position), then press the red SW button of the master battery for about one second; at this point, the LEDs of all the batteries will automatically switch on in sequence, and after a few seconds will switch off, except for the RUN LED. After which, wait for the display to turn on.

Figure 112 – Battery status after setting the POWER switch to ON and pressing the SW button

In the case of WeCo (4k4, 4k4PRO and 5K3) and AZZURRO (AZZURRO, AZZURRO PRO and AZZURRO S) batteries, press the RUN button for about one second. After releasing it, wait for the sound inside the battery indicated that the relay has closed. Repeat the operation for all the subsequent batteries in the system.

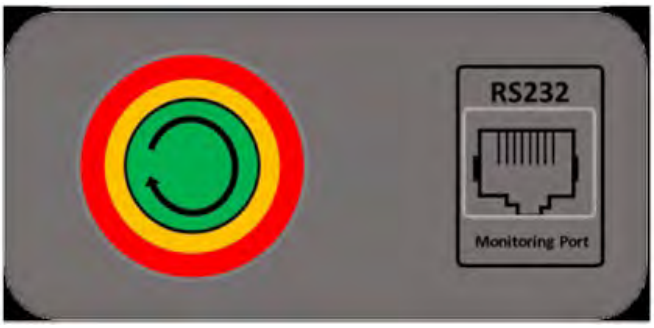


Figure 113 - View of WeCo battery power button

In the case of WeCo (4k4-LT and 5K3XP) and batteries, in order to carry out the correct switch-on procedure, ensure that the batteries are all switched off (side switch on 0);

Set all batteries via the side switch to 1 without switching them on (do not press the round metal button), switch on the master battery ONLY by pressing the button until the LED lights up. The batteries will automatically switch on in succession (each module will turn on independently and the side switch will flash for 3 seconds; then a steady GREEN light will confirm that each module is powered on).

In the case of AZZURRO ZSX5120 batteries, in order to carry out the correct switch-on procedure, ensure that the batteries are all switched off (side switch on 0). Press the switch and turn it to the ON position, then press the SW button on the battery to switch it on.

5. Supply AC power via the dedicated circuit breaker of the storage inverter. If the inverter has more than one circuit breaker (e.g. an automatic breaker and a residual current circuit breaker), they must all be set to ON to allow the inverter to be connected to the grid.

Figure 114 – Example of AC switch protecting the inverter

The following parameters must be configured before putting the 1PH HYD3000-HYD6000-ZSS-HP inverter into operation.

Parameter	Note
1. OSD language option	The default setting is English.
2. Setting and confirming system time	If the inverter is connected to the host computer as the App of the collector or for mobile devices, the time should have been calibrated to local time.
*3. Importing safety parameters	Refer to the country code table below and select country and code. Find the safety parameters file (named after the corresponding country of security) on the website, download it onto the USB flash drive and import it.
*4. Setting battery parameters	Default values can be displayed depending on the input channel configuration.
5. Configuration is complete	

2) Setting the system time

The time format of the system is “Year-Month-Day-Hour-Minutes-Seconds,” press “Up” or “Down” to change the first number, press "OK" to move to the next number, press "OK" to complete the settings. Once the time has been set, the “Set Country” menu will be displayed.

3) Safety parameter

Code		Region	Grid Code	Code		Region	Grid Code
000	000	Germany	VDE4105	018	000	EU	EU-EN50438
	001		BDEW		001		EU-EN50549
	002		VDE0126		002		EU-EN50549-HV
	003		VDE4105-HV		003		EU-EN50549-2
	004		BDEW-HV	019	000	IEC	IECEN61727
	005		VDE4110	020	000	Korea	Korea
	006		VDE4120		001		Korea-DASS
001	000	Italy	CEI-021In.	021	000	Sweden	Sweden
	001		CEI-016	022	000	Europe General	EU General
	002		CEI-021Ex.		001		EU General-MV
	003		CEI-021Ar.		002		EU General-HV
	004		CEI-021In.-HV	024	000	Cyprus	Cyprus
	005		CEI-016-HV		001		CY-LV-RES
	006		CEI-016-MV		002		CY-LN/MV-COM
002	000	Australia	Australia-A		003		CY-LV/MV-UT
	008		Australia-B	025	000	India	India
	009		Australia-C		001		India-MV
003	000	Spain	ESP-RD1699		002		India-HV
	001		RD1699-HV		003		India-CEA
	002		NTS		004		India-LV
	003		UNE217002+RD647		005		India-Kerala
	004		Spain island	026	000	Philippines	PHI
	005		RD1699-LV		001		PHI-MV
004	000	Turkey	Turkey		002		PHI-LV
005	000	Denmark	Denmark	027	000	New Zealand	New Zealand
	001		DK-TR322		001		NewZealand-MV
	002		Western Denmark		002		NewZealand-HV
	003		Eastern Denmark	028	000	Brazil	Brazil
006	000	Greece	GR-Cont.		001		Brazil- LV
	001		GR-Island		002		Brazil-230
007	000	Netherlands	Netherland		003		Brazil-254
	001		Netherland-MV		004		Brazil-288
	002		Netherland-HV	029	000	Slovakia	SK-VSD
008	000	Belgium	Belgium		001		SK-SSE
	001		Belgium-HV		002		SK-ZSD
	002		Belgium-LV	030	000	Ukraine	Czechia
009	000	UK	UK-G99		001		Czechia-MV
	001		UK-G98		002		Czech EG.D
	002		UK-G99-HV		003		Czech EG.D
010	000	China	China-B		004		Czech PPDS 2023
	001		China Taiwan	031	000	Slovenia	SIST EN 50549-1
	002		TrinaHome	033	000	Ukraine	Ukraine
	003		China HongKong	034	000	Norway	Norway
	004		SKYWORTH		001		Norway-LV
	005		CSISolar	035	000	Mexico	Mexico-LV
	006		CHINT	038	000	60Hz	Wide-Range-60Hz
	007		China-MV	039	000	Ireland	EN50549-1
	008		China-HV		001		EN50549-1
	009		China-A		002		Nor Ireland G99
	010		China JOLYWOOD		003		Nor Ireland G98
	011		RISEN	040	000	Thailand	Thai-PEA
	012		China-wide		001		Thai-MEA
011	000	France	France	042	000	50Hz	LV-50Hz
	001		FRArrete23	044	000	South Africa	South Africa
	002		FR VDE0126-HV		001		SA-HV
	003		VFR 2019		002		SA RPPS of C
	004		VDE0126 Enedis	046	000	Dubai	Dubai DEWG
	005		VDE0126-HV Enedis		001		DEWG-MV
	006		VFR2019 Enedis	107	000	Croatia	Croatia
	007		EN50549-1	108	000	Lithuania	Lithuania

	008		EN50549-2	109	000	Estonia	Estonia
012	000	Poland	Poland	111	000	Columbia	Columbia
	001		Poland-MV		001		Columbia-LV
	002		Poland-HV	112	000	Chile	Chile
	003		Poland-ABCD	121	000	Saudi Arabia	Saudi Arabia
013	000	Austria	AustriaTor Erzeuger	122	000	Latvia	Latvia
014	000	Japan	Japan-50Hz	123	000	Romania	Romania
	001		Japan-60Hz	124	000	Tunisia	Tunisia
015	000	Switzerland	Type-A	125	000	Finland	Finland
	001		Type-B				

Caution

Make sure to select the correct country code according to the requirements of the local authorities.

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

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

4) Select battery type

Battery type

Band communication protocol type
1.Battery address
2. Battery charge current limit
3. Battery discharge current limit
4. Battery DOD (EOD)

Lead acid or no protocol type
1.Battery capacity
2. Battery rated voltage
3. Type of battery cell
4. Battery charge current limit
5. Battery discharge current limit
6. Battery DOD (EOD)

Press “Up” or “Down” to select the battery type, press "OK" to complete the selection.

7.3. Commissioning

Main interface:

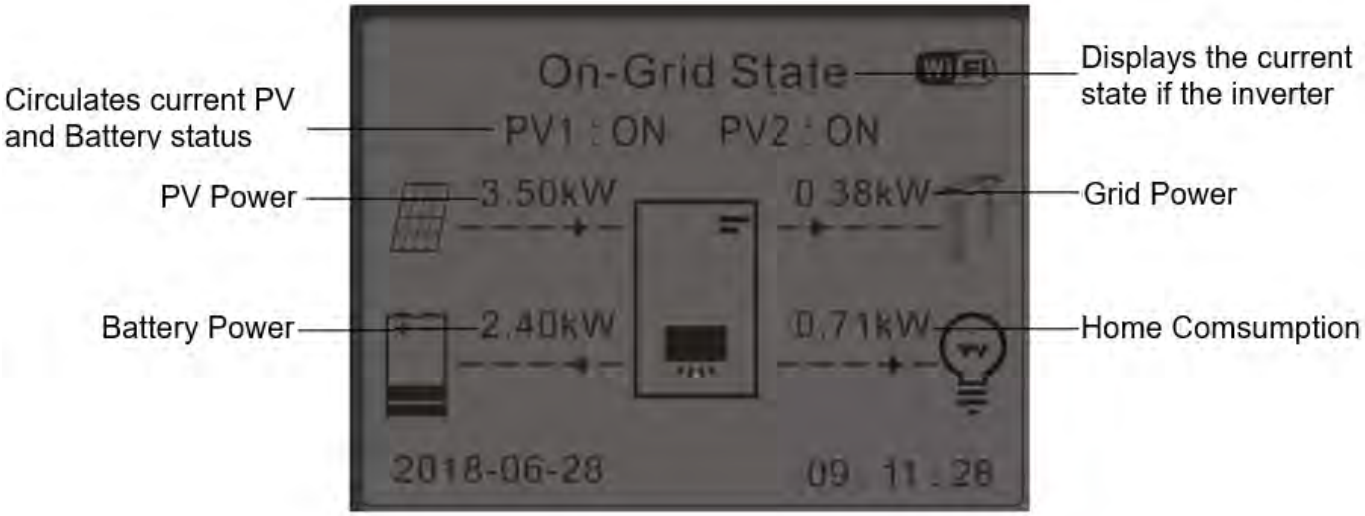


Figure 63 – Main interface

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

- If “Photovoltaic Production” > “Household Consumption”

  If the battery is not charged, the 1PH HYD3000-HYD6000-ZSS-HP inverter will charge the battery.

- If “Photovoltaic Production” > “Household Consumption”

  If the battery is not discharged, the 1PH HYD3000-HYD6000-ZSS-HP inverter will discharge the battery and supply power to the domestic load.

7.4. Main menu

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

Main interface	Press “Down”
	Grid Information
	1. Grid (V)
	2. Power (A)
	3. Frequency
	Battery Information
	1. Battery (V)

2. Charge current
3. Discharge current
4.Battery (P)
2.Battery temperature
6. Charge status
10. Battery cycles

In the main interface, press the “Up" button to enter the page with the settings of the PV system:

Main interface	Press “OK”
	PV information
	1. PV1 Voltage
	2. PV1 Current
	3. PV1 Power
	4. PV2 Voltage
	5. PV2 Current
	6. PV2 Power
	7. Inverter temp.

In the main interface, press “Back" to enter the main menu. The main menu contains the following six options:

Main interface	Press “Back”
	1. Basic settings
	2. Advanced settings
“Up” ↑	3. Production statistics
	4. System Info
“Down” ↓	5. Event list
	6. SW Update

7.4.1. Basic settings

1. Settings	Press “OK”
	1. Language
	2. Date and time
“Up” ↑	3. Safety param.
	4. Working mode
“Down” ↓	5.PV input mode (not present for inverter LCD version)
	6. Self-test (Italy only)
	7. EPS Mode
	8. Communication address

1. Language settings

To set the menu language

1. Language settings	OK	1.中文	OK
		2.English	
		3.Italiano	
		4.	
		.....	

2. Date and time setting

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

2.Time	OK	Time 2020-05-13 17:07:00

3. Safety parameters

The user can change the machine's safety parameters via the USB flash drive and copy the information on the parameters to be changed to the USB flash drive in advance.

Before loading the safety file onto the USB drive make sure that it is the one that relates to the software version of the inverter.

For more information and/or clarification, please contact Zucchetti Centro Sistemi S.p.A.

3.Safety Param.	OK	1.Select safety regulations	OK
		2.Select USB file	OK

4. Energy storage mode

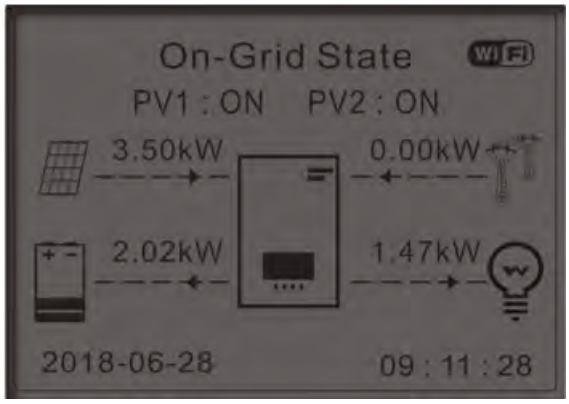
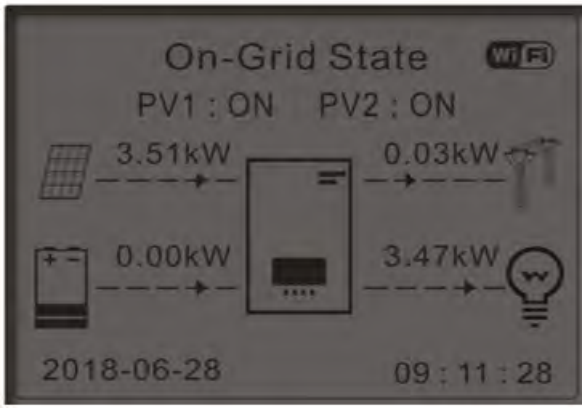
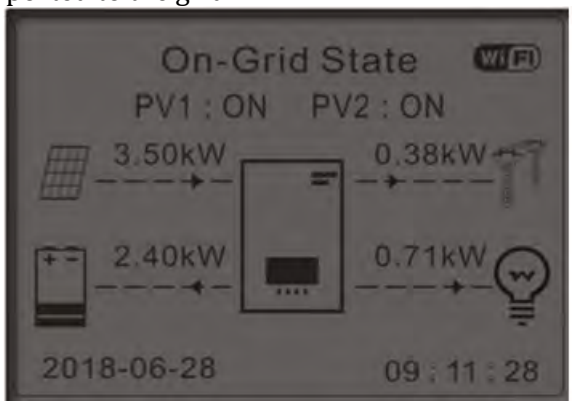
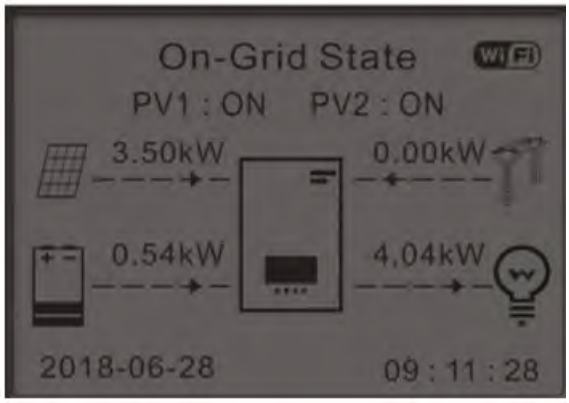
Select “4. Energy storage mode” and press “OK” to access the interface for setting the energy storage mode.

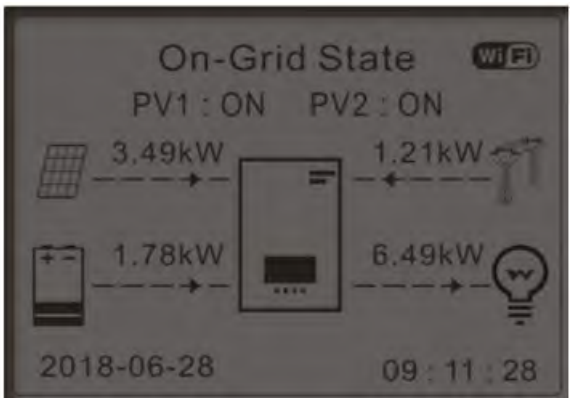
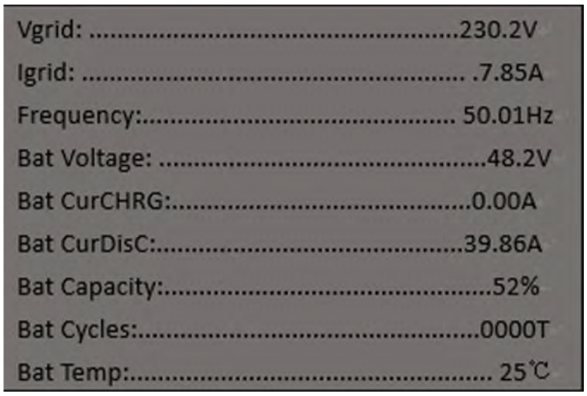
4. Energy Storage Mode	OK	1. Automatic mode	OK
		2. % charge mode	
		3. Hourly mode	
		4. Passive mode	OK
		5.Peak shaving mode	

1) Select automatic mode

Select “1. Self-use Mode" then press "OK"

In self-use mode, the inverter will automatically charge and discharge the battery.

<table>
<tr>
<td>1) If PV production = LOAD consumption (ΔP < 100 W), the 1PH HYD3000-HYD6000-ZSS-HP inverter will not charge or discharge the battery.
 
</td>
<td>2) If PV production > LOAD consumption, the surplus power will be stored in the battery.
 
</td>
</tr>
<tr>
<td>3) If the battery is fully charged (or already at max charge power), the surplus energy will be exported to the grid.
 
</td>
<td>4) If PV production < LOAD consumption, then it will discharge the battery to supply power to the load.
 
</td>
</tr>
</table>

5) If PV production + battery consumption < LOAD, 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-use-Mode

Dates, days and times can be set in which to force charge the batteries up to the set SOC %.

2.Time-of-use-Mode	OK

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

3) Timing Mode
The time range in which to charge and discharge the battery can be set manually.

3. Timing Mode	OK

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 00 m
Discharge End	16 h 00 m
Discharge Power	02500 W

Changing the value of a rule allows multiple rules to be set for the timer.

3. Timing mode	OK

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 00 m
Discharge end	16 h 00 m
Discharge power	02500 W

4) Passive mode

Passive mode allows the inverter to see the batteries but not to charge or discharge them. This setting is useful for the initial testing of the inverter. For more detailed information on passive operation, please contact Zucchetti Centro Sistemi S.p.A.

5) Peak shaving mode

5. Peak Shaving Mode	OK	Peak Shaving Mode
		Priority Buy Power 0100W

5. PV input mode (not present for inverter LCD version)
Select the input mode according to the photovoltaic array, in detail:

- ✓ Independent mode (default): If the strings are different (e.g. installed on two separate pitches or consisting of a different number of panels), the input model must be set to "independent mode."
- ✓ Parallel mode: If the strings are connected in parallel, the input mode must be set to "parallel mode."

6. Self-test

5. Self-test	OK	1. Fast self-test
		2. STD Self-test

1) Fast self-test

1. Fast self-test	OK	Start self-test	Press "OK" to start
		Test 59.S1...	
		↓	Wait
		Test 59.S1 OK!	
		↓	Wait
		Test 59.S2...	
		↓	Wait
		Test 59.S2 OK!	
		↓	Wait
		Test 27.S1...	
		↓	Wait
		Test 27.S1 OK!	
		↓	Wait
		Test 27.S2...	
		↓	Wait
		Test 27.S2 OK!	
		↓	Wait

Test 81>S1...	
↓	Wait
Test 81>S1 OK!	
↓	Wait
Test 81>S2...	
↓	Wait
Test 81>S2 OK!	
↓	Wait
Test 81<S1...	
↓	Wait
Test 81<S1 OK!	
↓	Wait
Test 81<S2...	
↓	Wait
Test 81<S2 OK!	
↓	Press “OK”
Automatic test OK!	
↓	Press “Down”
Threshold 59.S1 253 V 900ms	
↓	Press “Down”
59.S1: 228V 902ms	
↓	Press “Down”
Threshold 59.S2 264.5 V 200ms	
↓	Press “Down”
59.S2: 229V 204ms	
↓	Press “Down”
Threshold 27.S1 195.5 V 1500ms	
↓	Press “Down”
27.S1: 228V 1500ms	
↓	Press “Down”
Threshold 27.S2 34.5 V 200ms	
↓	Press “Down”
27.S2: 227V 205ms	
↓	Press “Down”
Threshold 81>.S1 50.5 Hz 100ms	
↓	Press “Down”
81>.S1 49.9Hz 103ms	
↓	Press “Down”
Threshold 81>.S2 51.5 Hz 100ms	
↓	Press “Down”
81>.S2 49.9Hz 107ms	
↓	Press “Down”
Threshold 81<.S1 49.5 Hz 100ms	
↓	Press “Down”
81<.S1 50.0Hz 105ms	
↓	Press “Down”
Threshold 81<.S2 47.5 Hz 100ms	
↓	Press “Down”
81<.S2 50.1Hz 107ms	

2) STD self-test

2. STD Self-test	Press “OK” to start

The test procedure is the same as the Fast Self-Test, but takes much longer.

- PF time settings

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

Set: *. *** s

Press "Up" or "Down" to change the first number, press "OK" to move to the next number. After changing all the numbers, press “OK.”

- QV time setting

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

Set: ** s

Press "Up" or "Down" to change the first number, press "OK" to move to the next number. After changing all the numbers, press “OK.”

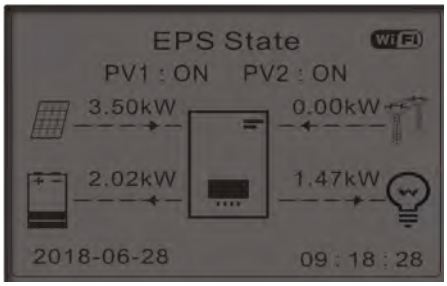
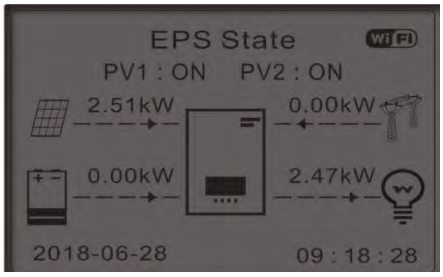
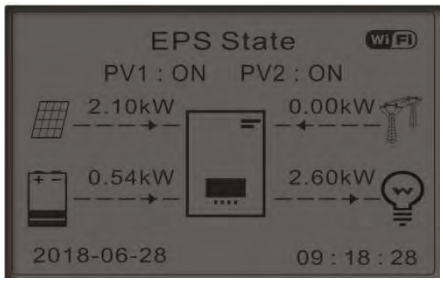
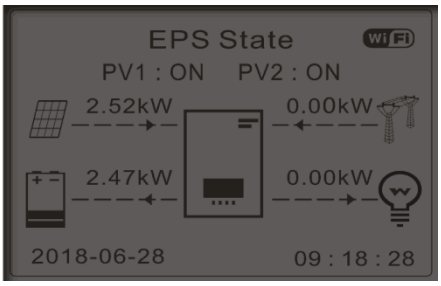
- Control 81.S1

Select “Control 81.S1” and press “OK.” Press “Up” or “Down” to “Enable 81.S1” or “Disable 81.S1,” then press “OK.”

7. EPS Mode

The EPS mode enables the EPS output for critical loads.

6. EPS Mode	OK	1.Control EPS Mode	OK	1.Enable EPS Mode	OK
				1.Disable EPS Mode	

1) If PV production > LOAD consumption (ΔP > 100 W) the inverter will charge the battery. 	2) If PV production = LOAD consumption, the inverter will not charge or discharge the battery. 
3) If PV production < LOAD consumption (ΔP＞100 W), the inverter will discharge the battery. 	4) If PV production is normal, but the LOAD consumption = 0, the surplus power will be stored in the battery. 

8. Communication address

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

7. Communication address	OK	1. Communication address	OK
		2. Transmission speed	OK

7.4.2. Advanced settings

2. Advanced settings	OK	**Password 0715**

1. Battery parameters
2. Zero grid feed-in mode
3. IV Curve Scan
4. Logic interface
5. Factory reset
6. Parallel settings
7. Bluetooth reset
8. CT Calibration
9. Active battery
10. Set PCC Meter
11. NeutralPointGrounding

Select “Advanced Settings” and press “OK.” “Enter password” appears. Enter the password “0715”, press “Up” or “Down” to change the first number, press “OK” to move to the next number. When “0715” appears on the screen, press “OK” to enter the “Advanced Settings” interface.

If “Wrong, please try again” appears on the screen, press “Back” and enter the password again.

1) Battery parameters

1. Battery parameters	OK	1. Battery type	5. Max charge (A)	
		2. Battery capacity	6. Max discharge (A)	
		3. Rated batt. voltage	7.*Depth of discharge	
		4. Type of battery cell	8.Save	OK

- Depth of discharge

For example, if Depth of Discharge(DOD) = 50% and off_grid DOD = 80%,

while the grid is connected: the inverter will not discharge the battery as long as the SOC is less than 50%.

In case of a blackout: the inverter will work in EPS mode (if EPS mode is enabled) and keep discharge the battery until the battery SOC is below 20%.

7. Depth of discharge	OK	On_grid DOD 50% Off_grid DOD 80% Off grid recovery discharge buffer 20%

2) Set Feed-in Limit

Depending on the software version of the inverter, this function may be called **Anti-Reflux** or **Feed-in.**

"Zero feed-in" mode can be enabled to limit the maximum power exported to the grid. The set in-feed power corresponds to the desired maximum export power to the grid.

2. Set Feed-in Limit	OK	1. Zero feed-in mode	OK	Enabled
				Disabled
		2. Input power	OK	***KW
		2. Hard limit Control		Enable
				Disable

4.PCC Limit Scheme Config	OK	1. PCC Limit bit	OK	Enable
				Disable
		2. Device type	OK	domestic
				non-domestic
		3. Current limit percent	OK	***%
		4.Lock enable bit	OK	lock
				no lock

5.Reset flag bit	OK	reset not reset
6.Lock flag bit cleared	OK	Input password! (5170)
7.status query	OK	Normal state Resetable number:3

PCC Limit bit: The PCC Limit Scheme Config function can be enabled by configuring it.
Device type: Sets whether the device type is a domestic or a non-domestic.
Domestic can be reset by "Reset flag bit", and the non-
domestic into the state 4 (Fault state) cannot be reset within 4 hours.)
Current limit percent: Set the current limit for the current flowing to the GIRD.
Lock enable bit: When the machine detects that the PCC point current exceeds the set current limit percentage and continues for a certain period of time, it will enter the low-power state. When the machine is set to the lock state, it needs to be manually reset to restore the anti-counter-current state of the machine.
(The Reset function is disabled after the Reset flag bit is used for four times.)When the machine is set to the no lock state, the CLS returns to the normal state by itself as long as the machine detects that the PCC point current is below the current limit percentage for 1 minute.

Reset flag bit: Reset the flag bit. When the status query is displayed as the fault state (you need to see the English display on the LCD), you can reset the flag bit to make the status become Normal state.

3) IV Curve Scan

The IV curve scan (MPPT scan) can be enabled to find the maximum overall power by adjusting the value during operation in order to obtain maximum output from the panels even in suboptimal conditions.

A scan period can be set or an instant scan can be performed.

3. IV Curve Scan	OK	1. Scan control	OK	Enabled Disabled
		2. Scan period	OK	***min
		3. Force scan	OK	

4) Logic interface control

To enable or disable logic interfaces, refer to the COM port chapter on connections between logic interfaces.

<u>This setting must always be disabled for systems installed in Italy.</u>

4. Logic interface control	OK	Enabled	OK
		Disabled	OK

5) Factory reset

5. Factory reset	OK	1. Delete energy data	OK
		2. Clear Events	OK

Delete total energy generation of the inverter.

1. Delete energy data	OK	Enter password	OK	**Password 0715**

Delete historical events recorded in the inverter.

2. Clear Events	OK	Clear events?	OK

6) Parallel settings

This setting is to be enabled for systems that have multiple hybrid inverters connected in parallel (Master – Slave).

6. Parallel configuration	OK	1. Parallel control
		2. Parallel-Primary-Replica
		3. Parallel address
		4. Save

- Parallel control: enable or disable parallel functions. Both the master and the slave must enable this function.
- Parallel Primary-Replica: Set up the primary and replica. Select one inverter as primary and set the others to replica.
- Parallel address: set the parallel address. Each inverter must set a parallel address, and the parallel address in a parallel system cannot be repeated. (NOTE: the parallel address is different from the communication address used for monitoring).
- Save: save after the setup is complete.

7) Bluetooth reset

7. Bluetooth reset	OK	Confirm!	OK	Successful

8) CT Calibration

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 ≤ 20%)
- The loads in the system are switched off
- Photovoltaic production is switched off
- Any other external production sources are switched off

In this way, the system will automatically set the direction internally in line with the system's current flows.

ATTENTION!!!!: CT calibration may take several minutes, do not switch off the inverter while it is performing this operation
We recommend that you consult with ZCS technicians before enabling this function.

8. CT Calibration	OK	Calibration	Successful/Failed

9) Active battery

This function must always be enabled.

10) Set PCC Meter

This function must be enabled when the **CHINT DDSU or DTSU meter** is used to read the exchange, and not the CT sensor.

11) NeutralPointGrounding

This function enables the dry contact management to use an external contactor to connect the neutral to the earth in EPS mode. It is not available for all models, please contact Zucchetti Centro Sistemi for more information.

7.4.3. Production statistics

3. Production statistics	OK	Today
		PV .....***KWH
		Charge .....***KWH
		Exported .....***KWH
		Imported .....***KWH
		Charge .....***KWH
		Discharge .....***KWH
	Down ↓	Month
		PV .....***KWH
		Charge .....***KWH
		Exported .....***KWH
		Imported .....***KWH
		Charge .....***KWH
		Discharge .....***KWH
	Down ↓	Year
		PV .....***KWH
		Charge .....***KWH
		Exported .....***KWH
		Imported .....***KWH
		Charge .....***KWH
		Discharge .....***KWH
	Down ↓	Totals
		PV .....***KWH
		Charge .....***KWH
		Exported .....***KWH
		Imported .....***KWH
		Charge .....***KWH
		Discharge .....***KWH

7.4.4. System information

The system information allows you to check the settings that have been assigned to the inverter and batteries. After installation, it is recommended to check that all the settings have been set correctly.

4. System information	OK	1. Inverter information
		2. Battery information
		3. Safety parameters

1. Inverter information	OK	Inverter information (1)
		Product serial number
		Hardware version
		Power level
		Firmware version
	Down ↓	Inverter information (2)
		Software version Press send (password 0715)
		Country
		Country Code version
	Down ↓	Inverter information (3)
		PV input mode
		Working mode
		RS485 address
		EPS Mode
	Down ↓	Inverter information (4)
		IV Curve Scan
		Logic interface control
	Down ↓	Inverter information (5)
		Power factor
		Zero feed-in mode
		Insulation resistance

2. Battery information	OK	Battery info 1/2 (1)
		Battery type
		Battery capacity
		Depth of discharge
	Down ↓	Inverter info 1/2 (2)
		Max charge current (A)
		Max charge threshold (V)
		Max discharge current (A)
		Min discharge voltage (V)

3. Safety param.	OK	Safety param. (1)
		OVP 1
		OVP 2
		UVP 1
		UVP 2
	Down ↓	Safety param. (2)
		OFP 1
		OFP 2
		UFP 1
		UFP 2
	Down ↓	Safety param. (3)
		OVP 10 min.

7.4.5. Event list

Event list is used to display the record of events in real time, including the total number of events and each specific ID number and time of the event. The user can access the interface of the event list through the main interface to check details of the records of events in real time. The event will be listed according to the time it occurs and recent events will be listed at the top.

1. List of current events	OK	1. List of current events	OK	ID042 IsoFault
		2. List of historical events		
2. List of historical events	OK	1.ID001 2020-4-3 14:11:45	OK	1.ID001 GridOVP
		2.ID005 2020-4-3 11:26:38		2.ID005 GFCI

7.4.6. 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).

Do not update the inverter if its firmware version is the same or higher than the one found in the ZCS Azzurro website

ATTENTION!!! Downgrading the firmware version of the inverter could lead to a malfunction.

1PH HYD3000-HYD6000-ZSS-HP inverters must be updated using an 8 GB USB stick

The folder name containing the update file is firmwareHYD-EP. The update files are named HYD-EP_ARM.bin, HYD-EP_DSPM.bin, and HYD-EP_DSPS.bin.

1. Insert the USB stick into the computer
2. Download the firmware of your inverter from the products section (storage inverters) of the www.zcsazzurro.com website, selecting the inverter model you own
3. Save only the firmware folder containing the .bin files on the USB stick.
4. Safely remove the USB stick from the computer
5. Make sure the inverter is switched off
6. Insert the USB stick in the appropriate USB port of the inverter

7. Switch on the inverter by turning the inverter's DC rotary switch to ON

8.

6. Software Update	OK	Enter password	OK **Password 0715**
			Start update
			DSP1 Update
			DSP2 Update
			ARM Update

9. If the following errors occur, please perform the update again. If the problem persists, contact technical support for assistance.

USB error	MDSP file error	SDSP file error
ARM file error	DSP1 update error	DSP2 update error
ARM update error		

10. **Step 7:** After the update is completed, turn of the DC switch, wait for the LCD screen to turn off, then restore the Wi-Fi connection and turn on the DC switch and AC switch again. The inverter will start operating. The user can check the current software version under System Information >>Inverter Info >> Input Password 0715 >> Software version.

8. Verification of proper operation

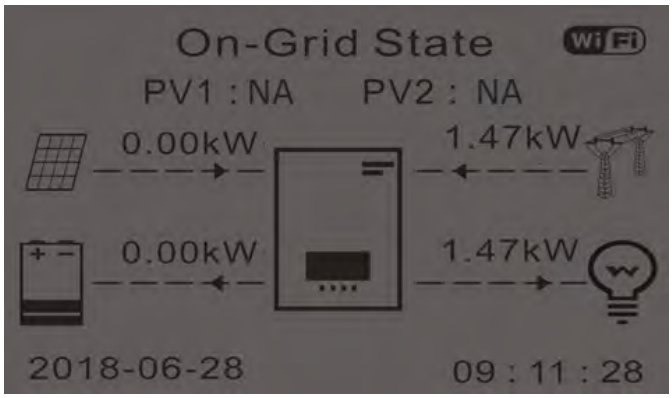
To check the proper operation of the inverter, follow these steps:

1. Switch off any source of photovoltaic generation by turning the switch to the OFF position.

2. Lower the circuit breaker of the 1PH HYD3000-HYD6000-ZSS-HP inverter. The inverter will remain switched on, but will go into error due to the lack of AC power (if the EPS function is enabled it will power the priority loads).

3. Switch on the inverter by raising the AC switch.

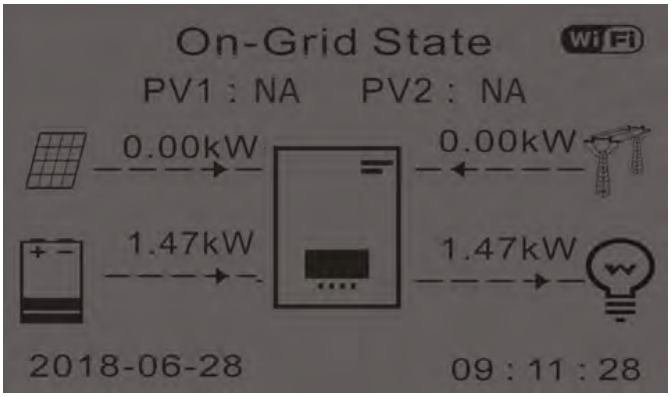
4. After raising the AC switch, the countdown will start according to the country code set (for CEI021-Internal, it will be 300 s.) for reconnecting itself to the grid. During this period, check that the household loads are only powered by the grid and that there is no other power flow, either from the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



5. Once the countdown is over, the batteries will start to deliver energy to the load according to the availability, trying to reset the consumption from the grid. During this period, check that the

   a. value of the consumption remains constant* as the energy delivered by the battery increases during discharge.

   b. The energy drawn from the grid should decrease by an amount equal to the energy delivered by the battery.



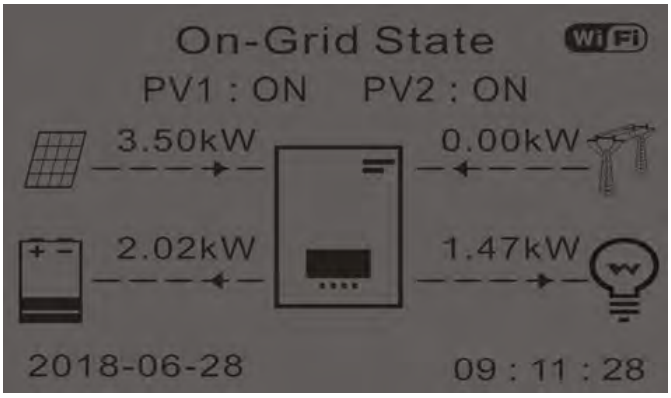
6. Switch on the photovoltaic system by turning the switch to the ON position.

7. Once the photovoltaic system is switched on, check that:

    a. The consumption value displayed on the screen remains constant as the photovoltaic power increases

    b. Depending on the photovoltaic production, the system operates according to the respective operating mode.

    c. The PV production value shown on the display is in line with the actual PV production visible on the photovoltaic inverter



8. If the above is not verified, check the CT positioning and direction by consulting the correct installation and commissioning procedures.

8.1. Checking the settings

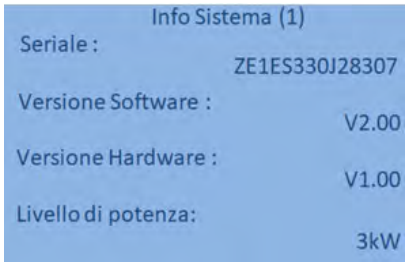
1. Below is a summary of all the device settings, available in the system information menu. In particular, it is necessary to check that the parameters circled in red are correct. To access this menu, from the main screen:

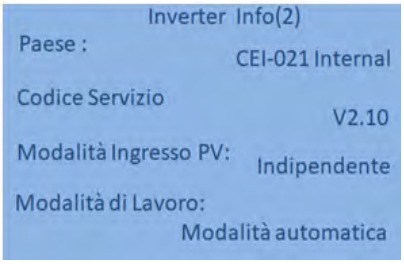
   1.1. Press the first key from the left;

   1.2. Press the third ↓ key twice;

   1.3. Enter the "System information" menu by pressing the fourth key;

   1.4. Press the third ↓ key to scroll through the images.

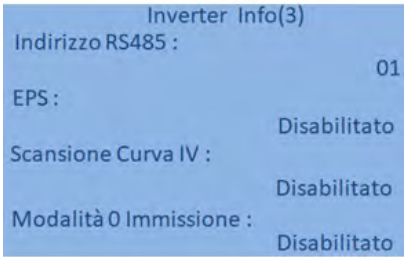


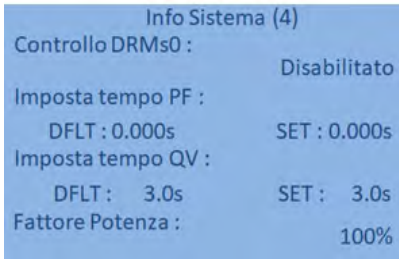


Country: check that the country code is correct for the regulation in force.

PV input mode: check that the correct setting has been set according to the system configuration.

Operating mode: in order to minimise exchanges with the grid, the correct mode will be "Automatic Mode."





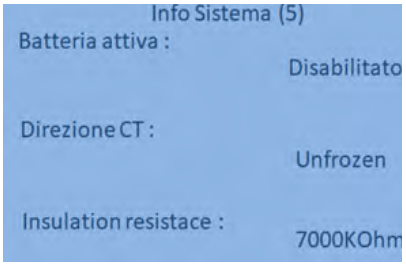
RS485 address: check that value 01 is set so that systems can be monitored via the App or Website.

EPS: check that the setting is enabled when using EPS mode.

IV Curve Scan: to be enabled in case of constant shading on the panels.

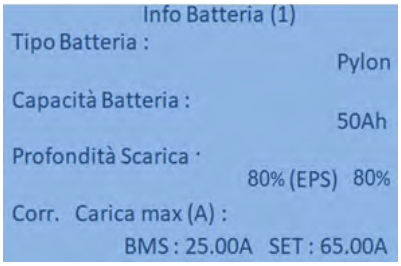
Zero feed-in mode: to be enabled to avoid feeding into the grid.

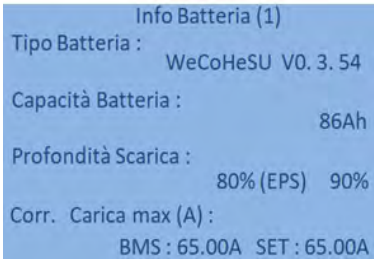
DRMs0 Control (or logic interface): must be disabled in Italy.



CT direction: check the CT blocking status.

Insulation resistance: check that the insulation resistance value is higher than the limits imposed by the standards.





Battery type: check whether the battery model on the display is consistent with the installed batteries.
Battery capacity: the system will display the total capacity of the batteries:

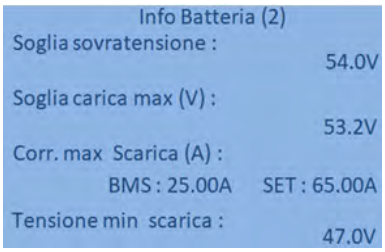
- 1 Pylontech → 50 Ah
- Pylontech 2 → 100Ah
- Pylontech n → n x 50Ah

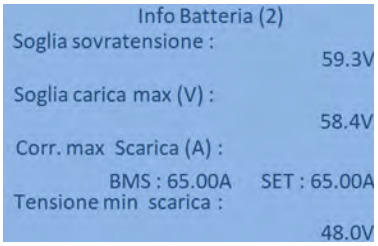
- 1 WeCo 4k4 → 86 Ah
- 2 WeCo 4k4 → 172 Ah
- n WeCo 4k4 → n x 86 Ah

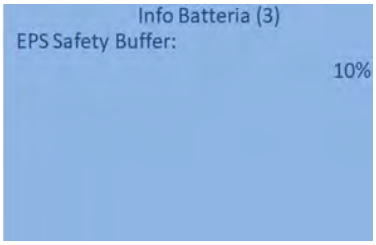
- 1 WeCo 5k3 → 100 Ah
- 2 WeCo 5k3 → 200 Ah
- n WeCo 5k3 → n x 100 Ah

- 1 AZZURRO → 100 Ah
- 2 AZZURRO → 200 Ah
- n AZZURRO → n x 100 Ah

Depth of discharge: check the depth of discharge values set in grid and EPS mode.







9. Data Sheet

9.1. Model with keys

DATI TECNICI	1PH HYD 3000 ZSS HP	1PH HYD 3600 ZSS HP	1PH HYD 4000 ZSS HP	1PH HYD 4600 ZSS HP	1PH HYD 5000 ZSS HP	1PH HYD 6000 ZSS HP
Dati tecnici ingresso DC (fotovoltaico)						
Potenza DC Tipica*	4500W	5400W	6000W	6900	7500W	9000W
Massima Potenza DC per ogni MPPT	3500W (270V-520V)				3750W (300V-520V)	
N. di MPPT indipendenti/ N. stringhe per MPPT	2/1					
Tensione massima di ingresso	600V					
Tensione di attivazione	100V					
Tensione nominale di ingresso	360V					
Intervallo MPPT di tensione DC	90V-550V					
Intervallo di tensione DC a pieno carico	160V-500V	180V-500V	200V-500V	230V-500V	250V-500V	300V-500V
Massima corrente in ingresso per ogni MPPT	13A/13A					
Massima corrente assoluta per ogni MPPT	18A/18A					
Dati tecnici collegamento batterie						
Tipo di batteria compatibile	Ioni di litio (fornite da Zucchetti)					
Tensione nominale	48V					
Intervallo di tensione ammessa	42V-58V					
Massima potenza di carica/scarica**	3750W	4000W	4250W		5000W	
Range di temperatura ammesso***	-10°C/+50°C					
Massima corrente di carica	75A (programmabile)	80A (programmabile)	85A (programmabile)		100A (programmabile)	
Massima corrente di scarica	75A (programmabile)	80A (programmabile)	85A (programmabile)		100A (programmabile)	
Curva di carica	Gestita da BMS di batteria					
Profondità di scarica (DoD)	0%-90% (programmabile)					
Uscita AC (lato rete)						
Potenza nominale	3000W	3680W	4000W	4600W	5000W	6000W
Potenza massima	3300VA	3680VA	4400VA	4600VA	5500VA	6000VA
Massima corrente	15A	16A	20A	20.9A	25 A	27.3A
Tipologia connessione/Tensione nominale	Monofase L/N/PE 220,230,240V					
Intervallo di tensione AC	180V-276V (in accordo con gli standard locali)					
Frequenza nominale	50Hz/60Hz					
Intervallo di frequenza AC	44Hz-55Hz / 54Hz-66Hz (in accordo con gli standard locali)					
Distorsione armonica totale	< 3%					
Fattore di potenza	1 default (programmabile +/- 0.8)					
Limitazione immissione in rete	Programmabile da display					
Uscita EPS (Emergency Power Supply)						
Massima potenza erogata in EPS****	3000VA (3600VA per 60s)	3680VA (4400VA per 60s)	4000VA (4800VA per 60s)	4600VA (5520VA per 60s)	5000VA (6000VA per 60s)	
Tensione e frequenza uscita EPS	Monofase 230V 50Hz/60Hz					
Corrente erogabile in EPS	13.6A	16A	18.2A	20.9A	22.7A	
Distorsione armonica totale	< 3%					
Switch time	< 10ms					
Efficienza						
Efficienza massima	97.6%			97.8%	98.0%	
Efficienza pesata (EURO)	97.2%			97.3%	97.5%	
Efficienza MPPT	>99.9%					
Massima efficienza di carica/scarica delle batterie	94.6%					
Consumo in stand-by	< 10W					
Protezioni						
Protezione di interfaccia interna	Si					
Protezioni di sicurezza	Anti islanding, RCMU, Ground Fault Monitoring					
Protezione da inversione di polarità DC	Si					
Sezionatore DC	Integrato					
Protezione da surriscaldamento	Si					
Categoria Sovratensione/Tipo di protezione	Categoria sovratensione III / Classe protezione I					
Scaricatori integrati	AC/DC MOV: Tipo 3 standard					
Soft Start Batteria	Si					
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					
Standard di connessione alla rete	Certificati e standard di connessione disponibili su www.zcsazzurro.com					
Comunicazione						
Interfacce di comunicazione	Wi-Fi/4G/Ethernet (opzionali), RS485 (protocollo proprietario), USB, CAN 2.0 (per collegamento con batterie), Bluetooth					
Ulteriori ingressi o connessioni	Ingresso per connessione sensore di corrente o meter					
Informazioni Generali						
Intervallo di temperatura ambiente ammesso	-30°C...+60°C (limitazione di potenza sopra i 45°C)					
Topologia	Trasformerless / Uscita batterie isolata ad alta frequenza					
Grado di protezione ambientale	IP65					
Intervallo di umidità relativa ammesso	0%....95% senza condensazione					
Massima altitudine operativa	4000m					
Rumorosità	< 25dB @ 1mt					
Peso	21.5 kg					
Raffreddamento	Convezione naturale					
Dimensioni (A*L*P)	482mm*503mm*183mm					
Monitoraggio dati	Display LCD + APP					
Garanzia	10 anni (NB: è necessaria una registrazione alla pagina ESTENSIONE GARANZIA del sito zcsazzurro.com per ottenere l'estensione della garanzia)					

* La potenza DC tipica non rappresenta un limite massimo di potenza applicabile. Il configuratore online disponibile sul sito www.zcsazzurro.com fornirà le possibili configurazioni applicabili
**Riferita al solo canale batteria
*** Valore standard per batterie al litio; massima operatività tra +10°C/+40°C
**** La potenza erogata in EPS dipende dal numero e dal tipo di batterie nonché dallo stato del sistema (capacità residua, temperatura)

9.2. Model with display touch

TECHNICAL DATA	1PH HYD 3000 ZSS HP	1PH HYD 3600 ZSS HP	1PH HYD 4000 ZSS HP	1PH HYD 4600 ZSS HP	1PH HYD 5000 ZSS HP	1PH HYD 6000 ZSS HP
DC input data (photovoltaic)						
Typical DC power*	4500W	5400W	6000W	6900	7500W	9000W
Maximum DC power for each MPPT	3500W (270V-520V)				3750W (300V-520V)	
No. of independent MPPTs / No. of strings per MPPT	2/1					
Maximum input voltage	600V					
Start-up voltage	100V					
Rated input voltage	360V					
MPPT DC voltage range	90V-550V					
DC voltage range at full load	160V-500V	180V-500V	200V-500V	230V-500V	250V-500V	300V-500V
Maximum input current for each MPPT	13A/13A					
Maximum absolute current for each MPPT	18A/18A					
Battery connection data						
Type of compatible battery	Lithium-ion (supplied by Zucchetti)					
Rated voltage	48V					
Allowable voltage range	42V-58V					
Maximum charge/discharge power**	3750W	4000W	4250W		5000W	
Allowable temperature range***	-10°C/+50°C					
Maximum charge current	75A (programmable)	80A (programmable)	85A (programmable)		100A (programmable)	
Maximum discharge current	75A (programmable)	80A (programmable)	85A (programmable)		100A (programmable)	
Charge curve	Managed by the BMS					
Depth of Discharge (DoD)	0%-90% (programmable)					
AC output (grid side)						
Rated power	3000W	3680W	4000W	4600W	5000W	6000W
Maximum Power	3300VA	3680VA	4400VA	4600VA	5500VA	6000VA
Maximum current	15A	16A	20A	20.9A	25 A	27.3A
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 (3600VA per 60s)	3680VA (4400VA per 60s)	4000VA (4800VA per 60s)	4600VA (5520VA per 60s)	5000VA (6000VA per 60s)	
EPS output voltage and frequency	Single-phase 230V 50Hz/60Hz					
Current supplied in EPS mode	13.6A	16A	18.2A	20.9A	22.7A	
Total harmonic distortion	< 3%					
Switch time	< 10ms					
Efficiency						
Maximum efficiency		97.6%			97.8%	98.0%
Weighted efficiency (EURO)		97.2%			97.3%	97.5%
MPPT efficiency	>99.9%					
Maximum battery charge/discharge efficiency	94.6%					
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 at www.zcsazzurro.com					
Communication						
Communication interfaces	Wi-Fi/4G/Ethernet (optional), RS485 (proprietary protocol), USB, CAN 2.0 (for battery connection), Bluetooth					
Additional inputs or connections	Input for current sensor connection or meter					
General data						
Allowable ambient temperature range	-30°C...+60°C (power limit above 45°C)					
Topology	Trasformerless / High-frequency isolation battery output					
Environmental protection class	IP65					
Allowable relative humidity range	0%....95% non-condensing					
Maximum operating altitude	4000m					
Noise level	< 25dB @ 1mt					
Weight	21.5kg					
Cooling	Natural convection					
Dimensions (H x L x D)	482mmx503mmx183mm					
Data monitoring	LCD Display + APP					
Warranty	5 or 10 years (NB: the extended warranty can be obtained by registering on th EXTENDED WARRANTY section of the zcsazzurro.com website)					

*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.
**Only referred to the drum channel
*** 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 (e.g. residual capacity, temperature)

10. Troubleshooting

Code	Name	Description	Solution
ID001	GridOVP	The grid voltage is too high.	If the alarm occurs occasionally, the probable cause is that the electric grid has occasional faults. The inverter will automatically return to normal operating state when the electric grid returns to normal operation. If the alarm occurs frequently, check whether the grid voltage/frequency is within the acceptable range. If so, check the circuit AC circuit breaker and AC wiring of the inverter. If the grid voltage/frequency is NOT within the acceptable range and the AC wiring is correct, but the alarm occurs repeatedly, contact technical support to change the grid over-voltage, under-voltage, over-frequency and under-frequency protection points, after obtaining approval from the local grid operator.
ID002	GridUVP	The grid voltage is too low	
ID003	GridOFP	The grid frequency is too high	
ID004	GridUFP	The grid frequency is too low	
ID005	GFCI	Charge leakage fault	Internal inverter errors. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support
ID006	OVRT error	The OVRT function is faulty	

ID007	LVRT error	The LVRT function is faulty	
ID008	IslandFault	Isolation protection error	
ID009	GridOVPInstant1	Transient over-voltage of grid voltage 1	
ID010	GridOVPInstant2	Transient over-voltage of grid voltage 2	
ID011	VGridLineFault	Power grid line voltage error	
ID012	InvOVP	Inverter over-voltage	
ID013	--	--	Hardreflux function enabled. Disable via advanced settings, zero feed-in mode - Hardreflux

ID017	HwADFaultIGrid	Power grid current sampling error	Check whether the PE connection is correct. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support
ID018	HwADFaultDCI	Sampling error of the DC grid component	
ID019	HwADFaultVGrid(DC)	Sampling error of the grid voltage (DC)	
ID020	HwADFaultVGrid(AC)	Sampling error of the grid voltage (AC)	Inverter measurement error. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support
ID021	GFCIDeviceFault(DC)	Sampling error of leakage current (DC)	Internal inverter errors. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support
ID022	GFCIDeviceFault(AC)	Sampling error of leakage current (AC)	
ID023	HwADFaultDCV	Sampling error of load voltage components (DC)	

ID024	HwADFaultIdc	Sampling error of the DC input current	Check that the polarity on the photovoltaic side has not been inverted. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support
ID029	ConsistentFault_GFCI	Leakage current consistency error	Internal inverter errors. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support
ID030	ConsistentFault_Vgrid	Grid voltage consistency error	
ID033	SpiCommFault(DC)	SPI communication error (DC)	
ID034	SpiCommFault(AC)	SPI communication error (AC)	
ID035	SChip_Fault	Chip error (DC)	
ID036	MChip_Fault	Chip error (AC)	

ID037	HwAuxPowerFault	Auxiliary power supply error	
ID041	RelayFail	Relay detection fault	
ID042	IsoFault	Low insulation impedance	Check the insulation resistance between the photovoltaic array and ground; if there is a short circuit, the fault should be repaired immediately.
ID043	PEConnectFault	Faulty ground	Check AC output PE wire for grounding.
ID044	PvConfigError	Error when setting input mode	Check the PV input mode settings (parallel/independent mode) for the inverter. If necessary, change the PV input mode.
ID045	CTDisconnect	CT error	Check whether the CT wiring is correct.
ID047	Parallel fault	Parallel fault	Check that parallel control has not been enabled incorrectly. To disable it, go to advanced settings, parallel control - Disable.

ID048	FanFault	Fan error	Check whether fan 1 of the inverter is working properly.
ID049	TempFault_Bat	Battery temperature protection	Make sure the inverter is installed away from direct sunlight. Make sure the inverter is installed in a cool, well-ventilated place. Make sure the inverter is installed vertically and that the ambient temperature is below the inverter temperature limit.
ID050	TempFault_HeatSink1	Radiator temperature protection 1	
ID051	TempFault_HeatSink2	Radiator temperature protection 2	
ID052	TempFault_HeatSin3	Radiator temperature protection 3	
ID053	TempFault_HeatSink4	Radiator temperature protection 4	
ID054	TempFault_HeatSin5	Radiator temperature protection 5	

ID055	TempFault_HeatSin6	Radiator temperature protection 6	
ID057	TempFault_Env1	Ambient temperature protection 1	
ID058	TempFault_Env2	Ambient temperature protection 2	
ID059	TempFault_Inv1	Module temperature protection 1	
ID060	TempFault_Inv2	Module temperature protection 2	
ID061	TempFault_Inv3	Module temperature protection 3	
ID065	VbusRmsUnbalance	Unbalanced RMS bus voltage	Inverter measurement error. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support

ID066	VbusInstantUnbalance	The transient value of the bus voltage is unbalanced	
ID067	BusUVP	Bus undervoltage during grid connection	
ID068	BusZVP	Bus voltage is low	
ID069	PVOVP	PV overvoltage	Check whether the PV array voltage (Voc) is higher than the inverter's maximum input voltage. If so, adjust the number of PV modules connected in series and reduce the PV array voltage to match the input voltage range of the inverter. After the correction, the inverter will automatically return to normal state.
ID070	BatOVP	Battery overvoltage	Check whether the battery overvoltage setting is inconsistent with the battery specifications. Check that the batteries are not installed in series.
ID071	LLCBusOVP	BUS LLC overvoltage protection	Inverter measurement error. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support
ID072	SwBusRmsOVP	Inverter bus RMS software overvoltage	

ID073	SwBusInstantOVP	Inverter bus voltage instantaneous value software overvoltage	Deactivate zero feed-in or increase grid feed-in, if permitted. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support
ID081	SwBatOCP	Battery overcurrent software protection	Internal inverter errors. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support
ID082	DciOCP	DCI overcurrent protection	Check whether the inverter is updated to the latest version found on www.zcsazzurro.com and set the correct safety standard, otherwise update to the latest version. If the errors still occur, contact technical support
ID083	SwOCPInstant	Instantaneous output current protection	Internal inverter errors. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support
ID084	SwBuckBoostOCP	BuckBoost software flow	
ID085	SwAcRmsOCP	Actual output value current protection	
ID086	SwPvOCPInstant	PV overcurrent software protection	

ID087	IpvUnbalance	Parallel PV flows not even	Check that the strings have been paralleled correctly.
ID088	IacUnbalance	Output current not balanced	Internal inverter errors. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support
ID097	HwLLCBusOVP	LLC bus hardware overvoltage	
ID098	HwBusOVP	Inverter bus hardware overvoltage	
ID099	HwBuckBoostOCP	BuckBoost hardware overflows	
ID100	HwBatOCP	Battery hardware overflows	
ID102	HwPVOCP	PV hardware overflows	Check that the polarity on the string side has not been reversed and that the MC4 connectors are crimped correctly.

ID103	HwACOCP	AC output hardware overflows	Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support
ID110	Overload1	Overload protection 1	Check whether the inverter is operating under overload.
ID111	Overload2	Overload protection 2	
ID112	Overload3	Overload protection 3	
ID113	OverTempDerating	Internal temperature is too high	Make sure the inverter is installed away from direct sunlight. Make sure the inverter is installed in a cool, well-ventilated place. Make sure the inverter is installed vertically and that the ambient temperature is below the inverter temperature limit.
ID114	FreqDerating	AC frequency is too high	Make sure that the grid frequency and voltage are within the acceptable range.
ID115	FreqLoading	AC frequency is too low	

ID116	VoltDerating	AC voltage is too high	
ID117	VoltLoading	AC voltage is too low	
ID124	BatLow	Battery low voltage protection	Check whether the battery voltage of the inverter is too low.
ID125	BatDchgProhibit	battery discharge prohibition	
ID129	unrecoverHwAcOCP	Permanent output hardware overcurrent error	Internal inverter errors. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support
ID130	unrecoverBusOVP	Permanent bus overvoltage error	
ID131	unrecoverHwBusOVP	Permanent bus hardware overvoltage error	

ID132	unrecoverIpvUnbalance	Permanent PV uneven flow error	
ID133	unrecoverEPSBatOCP	Permanent battery overcurrent error in EPS mode	
ID134	unrecoverAcOCPInstant	Permanent output transient overcurrent error	
ID135	unrecoverIacUnbalance	Permanent unbalanced output current error	
ID137	unrecoverPvConfigError	Permanent input mode setting error	Check the PV input mode settings (parallel/independent mode) for the inverter. If necessary, change the PV input mode.
ID138	unrecoverPVOCPInstant	Permanent input overcurrent error	
ID139	unrecoverHwPVOCP	Permanent input hardware overcurrent error	Internal inverter errors. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support

ID140	unrecoverRelayFail	Permanent relay error	
ID141	unrecoverVbusUnbalance	Permanent unbalanced bus voltage fault	
ID145	USBFault	Faulty USB	Check the USB port of the inverter. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support
ID146	WifiFault	Wi-Fi error	Check the Wi-Fi port. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support
ID147	BluetoothFault	Bluetooth error	Check the Bluetooth connection of the inverter. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support
ID148	RTCFault	RTC clock failure	Internal inverter errors. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support
ID149	CommEEPROMFault	Communication board EEPROM error	

ID150	FlashFault	Communication board FLASH error	
ID152	Safety fault	Error safety version not consistent with the firmware version of the inverter.	Check that the safety code has not been changed without updating the inverter. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version and upload the relative safety version.
ID153	SciCommLose (DC)	SCI communication error (DC)	Internal inverter errors. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support
ID154	SciCommLose(AC)	SCI communication error (AC)	
ID155	SciCommLose(Fuse)	SCI communication error (fuse)	
ID156	SoftVerError	Inconsistent software versions	
ID157	BMSCommunicatonFault	Lithium battery communication error	Make sure that the battery is compatible with the inverter. Check that the inverter channels are configured correctly, that the correct battery parameters have been set, and that both the power and communication cables have been connected correctly.

ID161	ForceShutdown	Forced shutdown	The inverter performs a forced shutdown
ID162	RemoteShutdown	Remote shutdown	The inverter performs a remote shutdown.
ID163	Drms0Shutdown	Drms0 shutdown	The inverter performs a Drms0 shutdown.
ID165	RemoteDerating	Remote derating	The inverter performs a remote load reduction.
ID166	LogicInterfaceDerating	Logic interface derating	The inverter is loaded from the logic interface.
ID167	AlarmAntiRefluxing	Anti- reflux derating	The inverter is implemented to prevent the drop of the meter's current load.
ID169	FanFault 1	Fan failure	Internal inverter errors. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support

ID175	FanFault 1	Fan failure	Internal inverter errors. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support
ID177	BMS OVP	BMS overvoltage alarm	Internal lithium battery failure. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support.
ID178	BMS UVP	BMS undervoltage alarm	Low battery temperature warning. Lithium batteries under 10° have an operating derating when both charging and discharging. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version.
ID179	BMS OTP	BMS high temperature warning	Internal lithium battery failure. Check whether the inverter is updated to the latest version found on www.zcsazzurro.com. If it isn't, update to the latest version. If the errors still occur, contact technical support.
ID180	BMS UTP	BMS low temperature alarm	
ID181	BMS OCP	BMS overload warning when charging and discharging	
ID182	BMS Short	BMS short-circuit alarm	

11. Maintenance

Inverters generally do not require daily or ordinary maintenance. In any case, for proper long-term operation of the inverter, make sure that the heat sink 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

Use a compressor, a soft dry cloth or a soft bristle brush to clean the inverter. Do not clean the inverter with water, corrosive chemicals or aggressive detergents. Disconnect the AC and DC power supply to the inverter before cleaning.

Cleaning the heat sink

Use a compressor, a soft dry cloth or a soft bristle brush to clean the heat sink. Do not clean the heat sink with water, corrosive chemicals or aggressive detergents. Disconnect the AC and DC power supply to the inverter before cleaning.

12. Uninstalling

12.1. Installation 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, the current sensors and the NTC temperature probe.
- Remove the AC terminals.
- Unscrew the fixing bolt of the bracket and remove the inverter from the wall.

12.2. Packaging

If possible, pack the inverter in its original packaging.

12.3. Storage

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

12.4. Disposal

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

The symbol of the crossed-out bin indicates that the product, at the end of its life, must not be disposed of with domestic waste.

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

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

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

By cooperating in the proper disposal of this product, you contribute to the reuse, recycling and recovery of this product, and to the protection of our environment.

13. Monitoring system

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		✓	✓	⊘

13.1. External Wi-Fi adapter

13.1.1. 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 115 - Slot for external Wi-Fi adapter

3) Insert the Wi-Fi adapter into the appropriate port, taking care to follow the direction of the connection and ensure correct contact between the two parts.

(a)

(b)

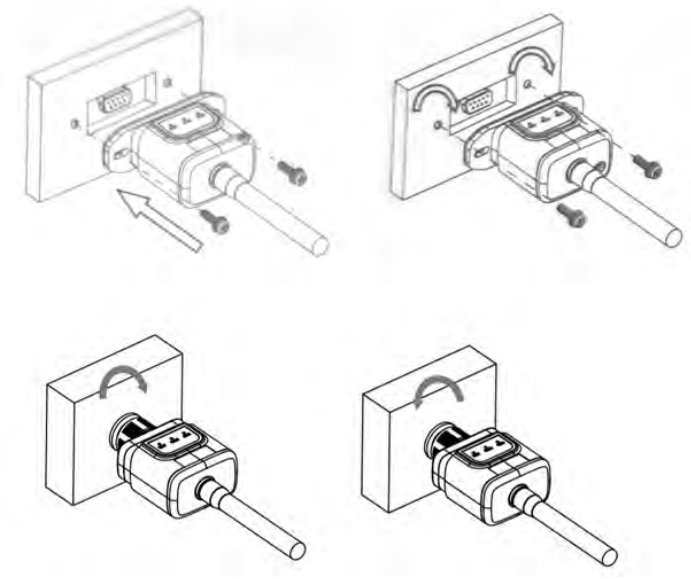


Figure 116 – Inserting and securing the external Wi-Fi adapter

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

13.1.2. 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 Wi-Fi networks on your phone or PC in order to display all the networks visible from your device.

Figure 117 – 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 118 – 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.

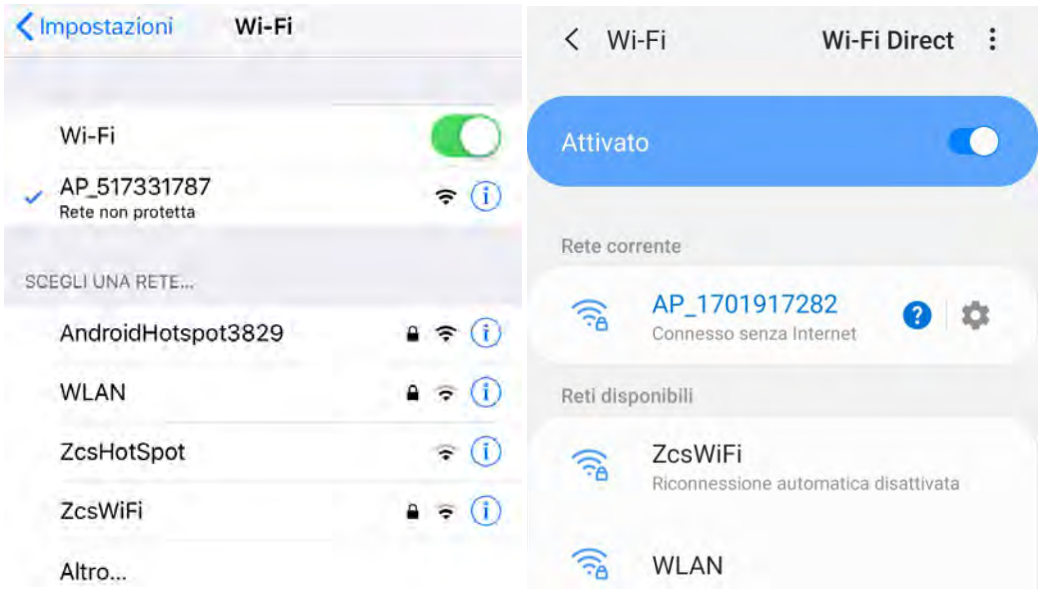


Figure 119 – Connection to Access Point of the Wi-Fi adapter on iOS smartphone (left) and Android smartphone (right)

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 120 – 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.

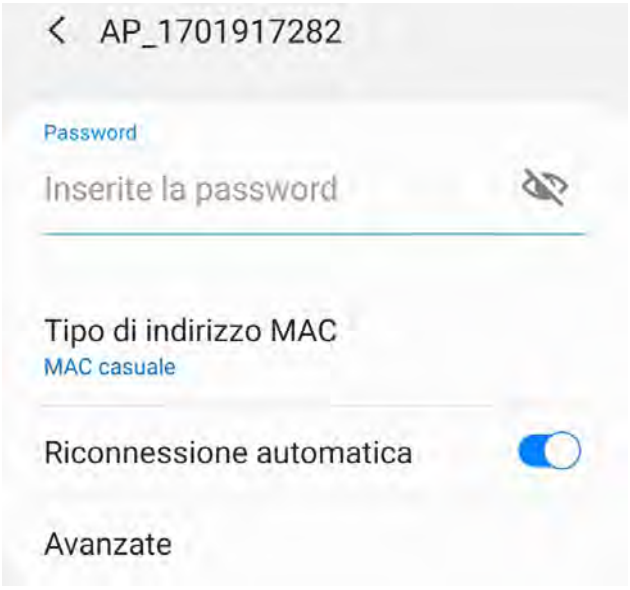


Figure 121 – Password entry prompt

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 122 – Screen showing 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 Username and Password.

Figure 123 – 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.

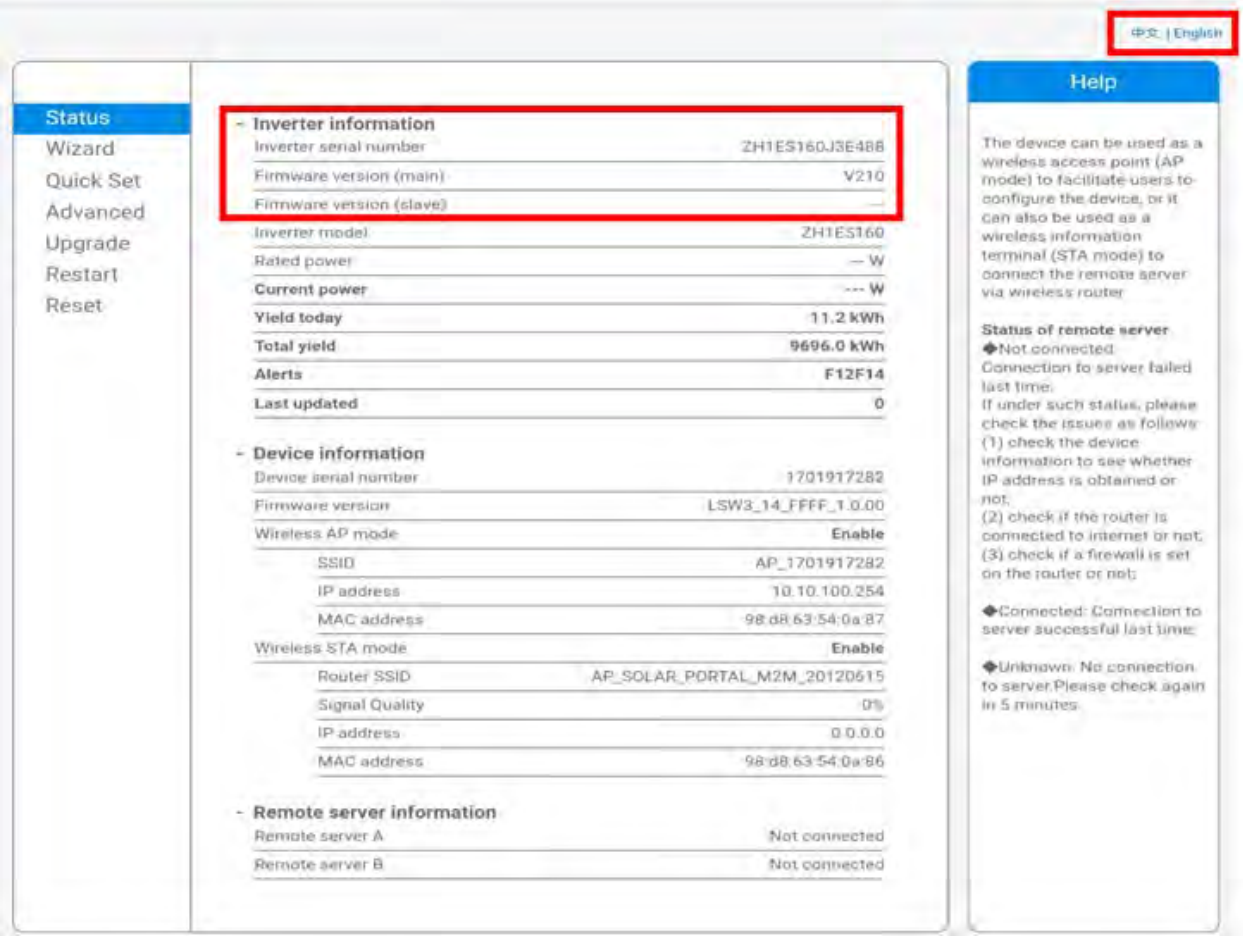


Figure 124 – Status Screen

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.

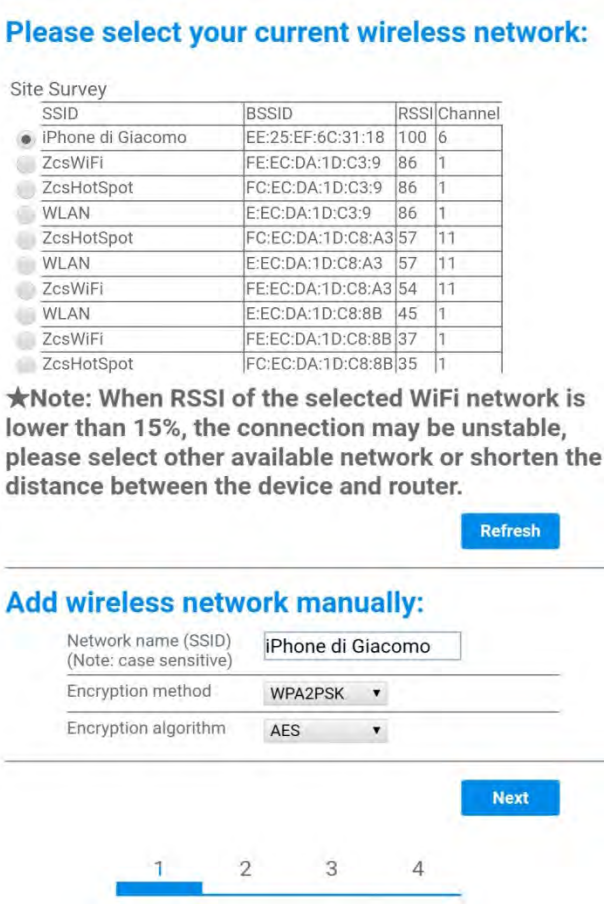


Figure 125 – Screen for selecting the available wireless network (1)

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, make sure you enter the correct password.
Also check that the box below the password is set to Enable.

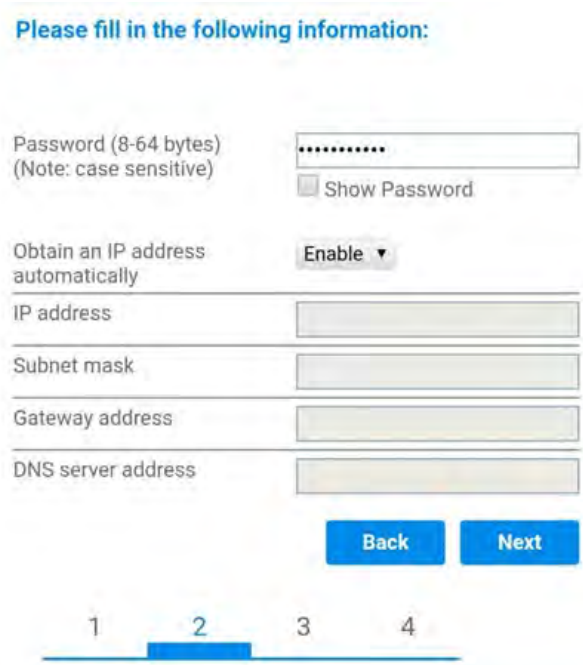


Figure 126 - Screen for entering the password of the wireless network (2)

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

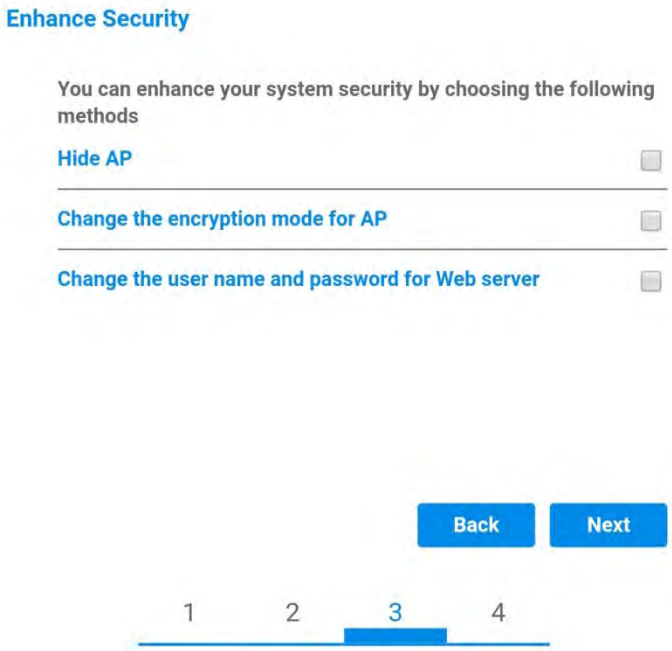


Figure 127 - Screen for setting the security options (3)

10) Click “OK.”

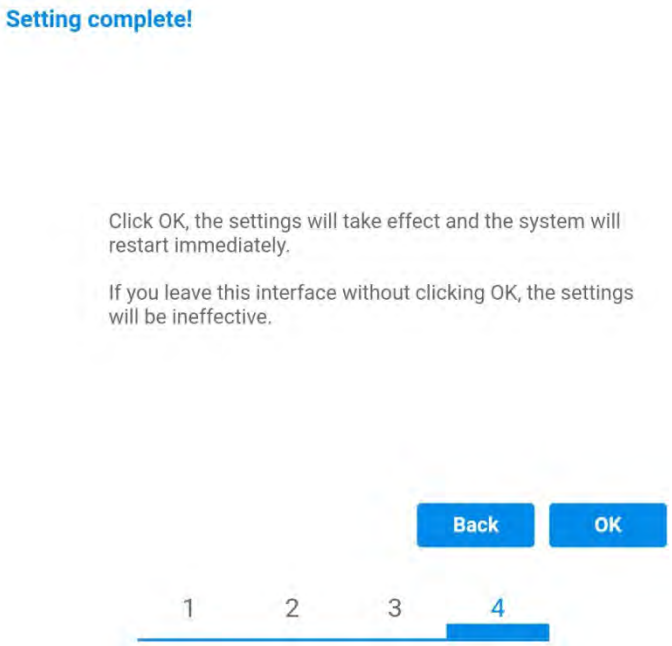


Figure 128 - Final configuration screen (4)

11) At this point, if the adapter configuration was 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.

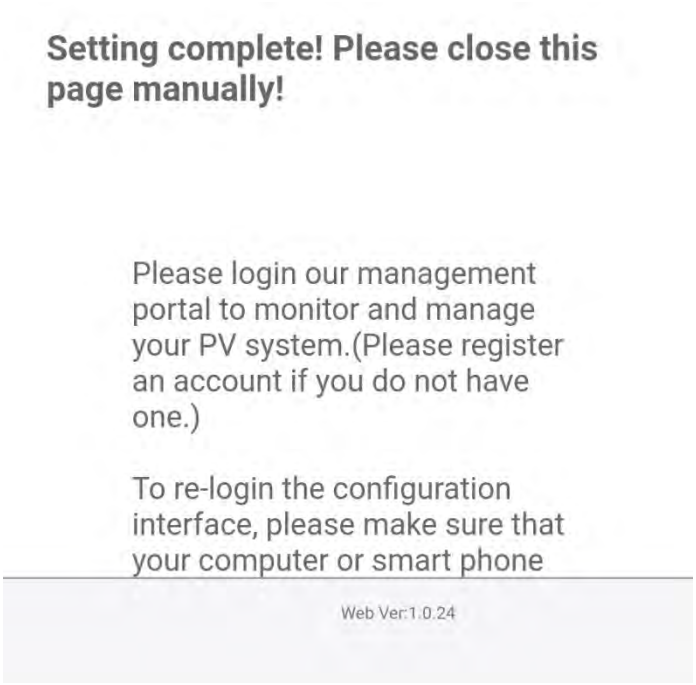


Figure 129 - Successful configuration screen

13.1.3. Check

To check that the network has been configured correctly, connect to it again and enter 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. Check 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 130 – 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 131 – Initial status of LEDs

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

Figure 132 - 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 133 – Reset button on the Wi-Fi adapter

13.1.4. 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 134 - 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 135 – 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 losing 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 136 – 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; use a PC or smartphone to check that it is possible to 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**

a) 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.

b) 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.

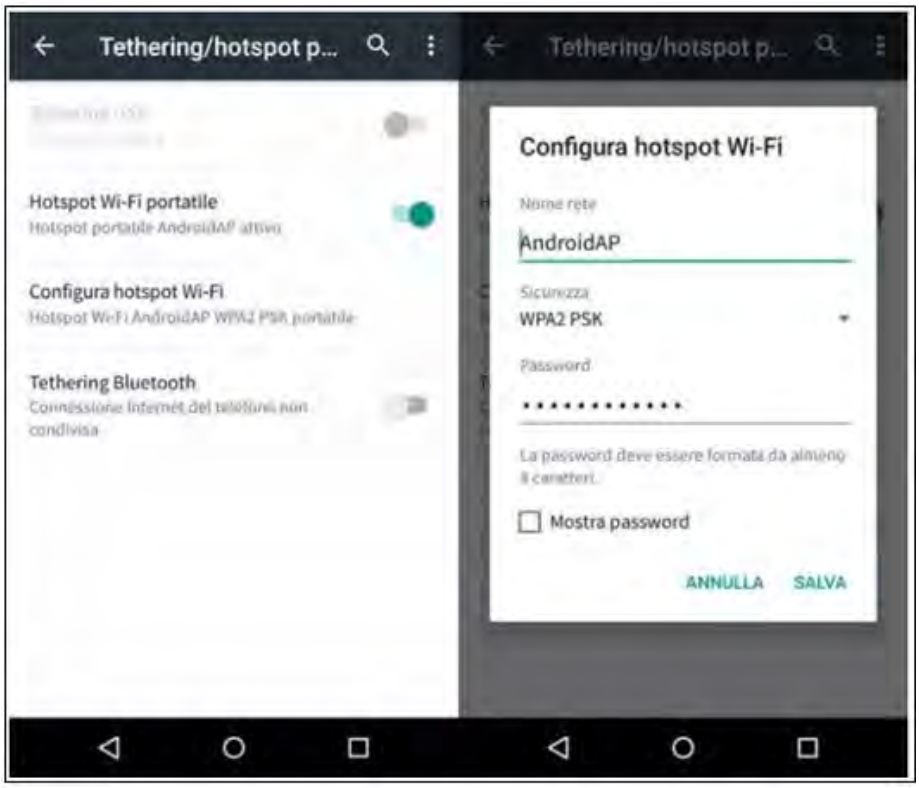


Figure 137 – Configuration of an Android smartphone as a hotspot router

- **Using an iPhone as a modem**

a) In order to share the iPhone connection, check 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.

b) 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.

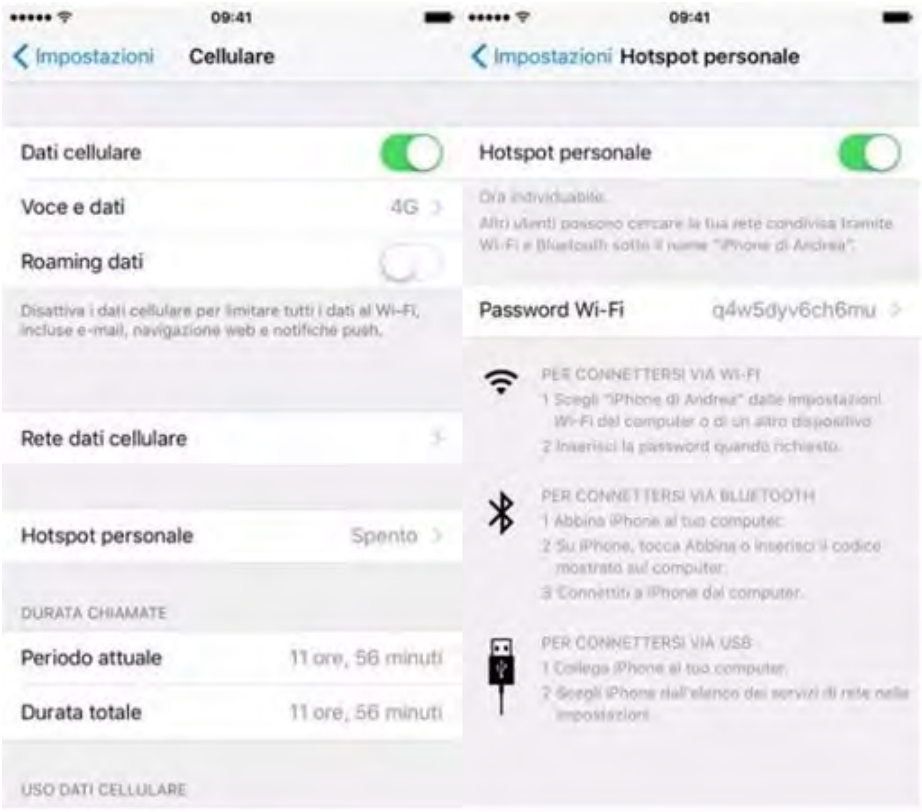


Figure 138 - Configuration of an iOS smartphone as a hotspot router

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 the word “Connected” appears next to “Remote Server A” at the end of configuration, then the problem is with the home router.

It is therefore advisable to check the brand and model of the home router that 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).

13.2. Ethernet adapter

13.2.1. Installation

All inverters compatible with the adapter must be installed. However, the procedure is quicker and easier as there is no need to open the front cover of the inverter.
Correct operation of the device requires a modem to be correctly connected to the network and operational 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.

(a)

(b)

Figure 139 - Slot for 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 slot inside the card and tighten the ring nut and cable gland to ensure a stable connection.

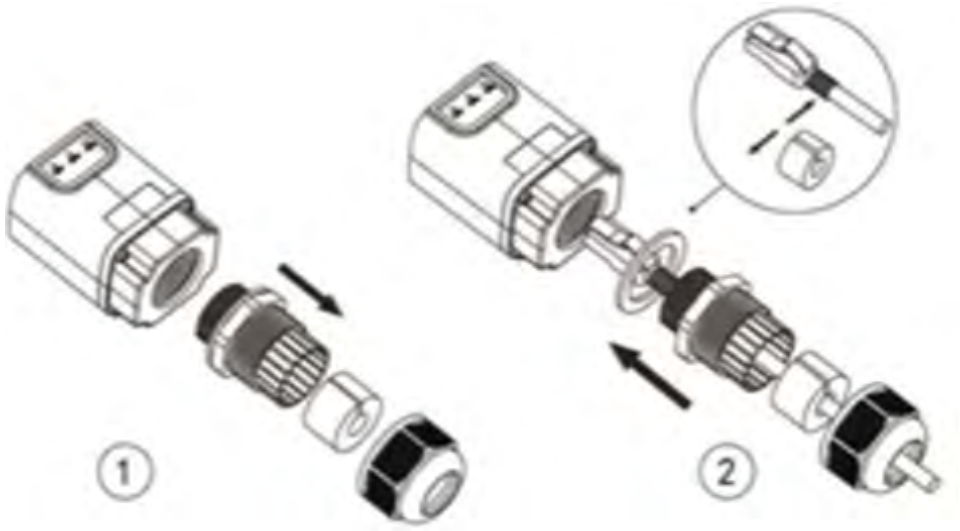


Figure 140 – Inserting the network cable inside the device

4) Insert the Ethernet adapter into the appropriate slot, taking care to follow the direction of the insertion and ensure correct contact between the two parts.

(a)

(b)

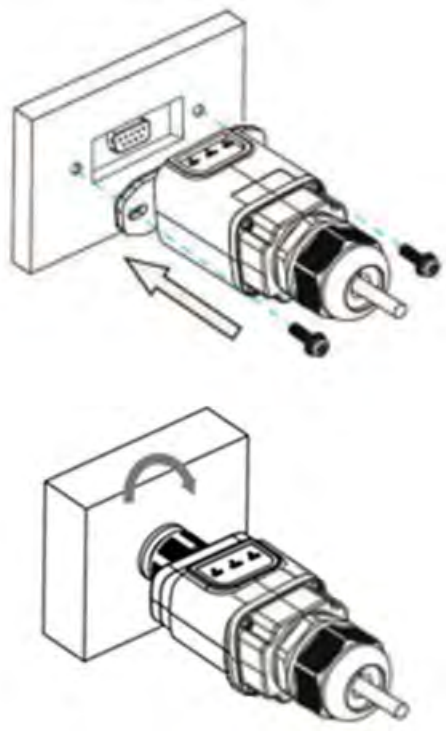


Figure 141 – Inserting and securing the Ethernet adapter

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

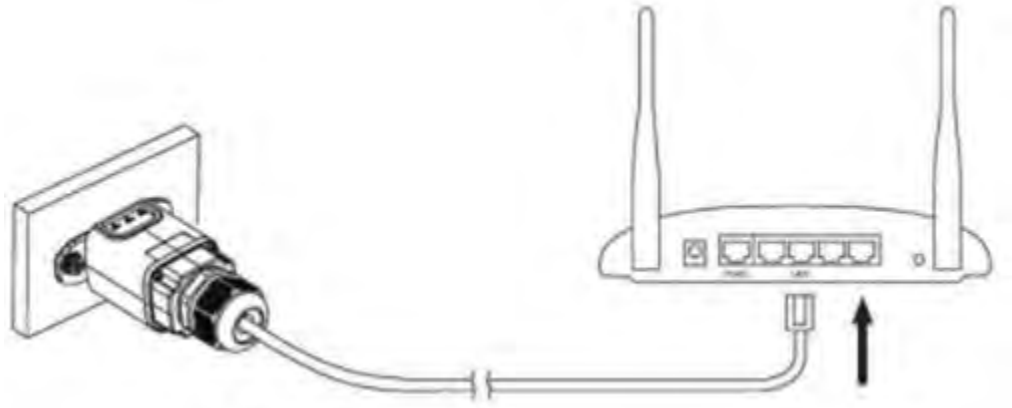


Figure 142 – Connecting the network cable to the modem

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

13.2.2. Check

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 143 – Initial status of LEDs

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

Figure 144 - Final status of LEDs

13.2.3. 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 145 - 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 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 146 – Irregular communication status between adapter and remote server

- Check that the router has access to the network and that the connection is stable; use a PC to check that it is possible to 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).

13.2.4. 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.

13.2.5. Installation

All inverters compatible with the adapter must be installed. 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

1) Switch off the inverter following the procedure described in this manual.
2) 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.

(a)

(b)

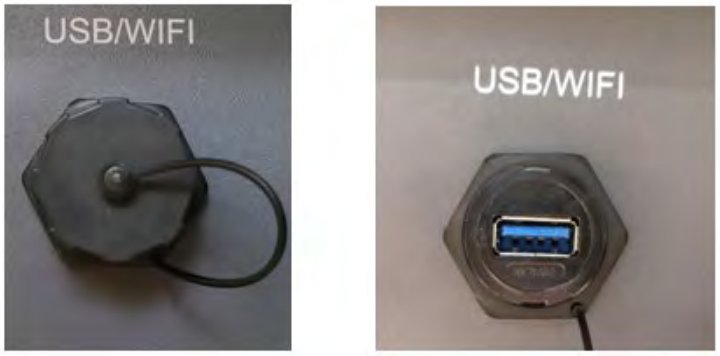


Figure 147 - Slot for the 4G adapter

3) Insert the 4G adapter into the appropriate slot, taking care to follow the direction of the insertion and ensure correct contact between the two parts. Secure the 4G adapter by tightening the two screws inside the package.

(a)

(b)

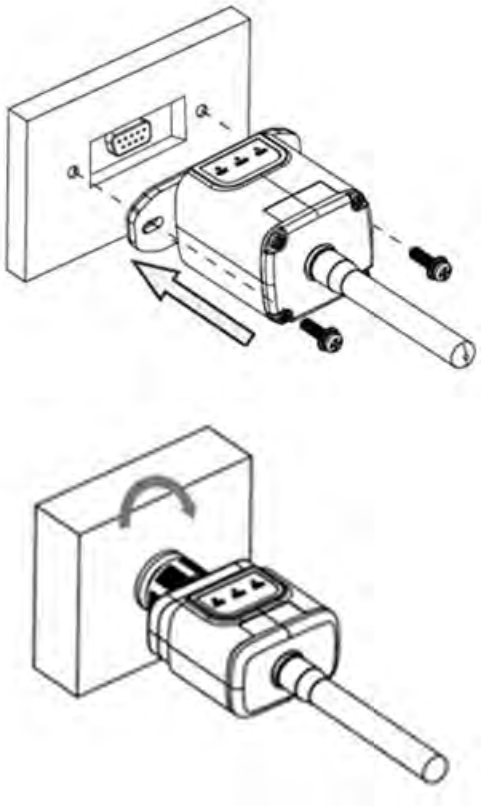


Figure 148 – Inserting and securing the 4G adapter

4) Switch on the inverter by following the procedure described in the manual.
5) Unlike Wi-Fi monitoring cards, the 4G device does not need to be configured and starts transmitting data shortly after the inverter has been switched on.

13.2.6. Check

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 149 – 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 150 - 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 151 - 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 152 – Irregular communication status between 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.

13.3. Datalogger

13.3.1. Preliminary notes on how to configure the datalogger

ZCS Azzurro 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 153 – 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 154 – Diagram for the functioning 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 via the “Azzurro System” app or the “www.zcsazzurroportal.com” website.

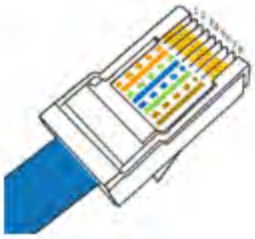
All the Azzurro ZCS inverters can be monitored using the datalogger; different models or families of inverters can also be monitored.

13.3.2. 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 Cat. 5 or Cat. 6 network cable, or a classic RS485 2x0.5mm^2 cable.

1) In the case of three-phase inverters, a suitably crimped network cable with a RJ45 connector may 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.



RJ 45	Colore	Monofase	Trifase
4	Blu	TX +	485 A
5	Bianco-Blu	TX -	485 B

Figure 155 – Pin out for connecting the RJ45 connector

2) 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 156 - Tightening the network cable to the RS485 terminal block

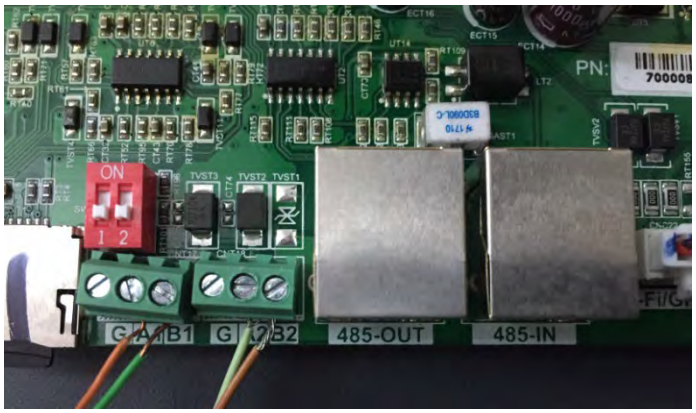


Figure 157 – Connecting the serial line via the RS485 terminal block and via the RJ45 plug

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

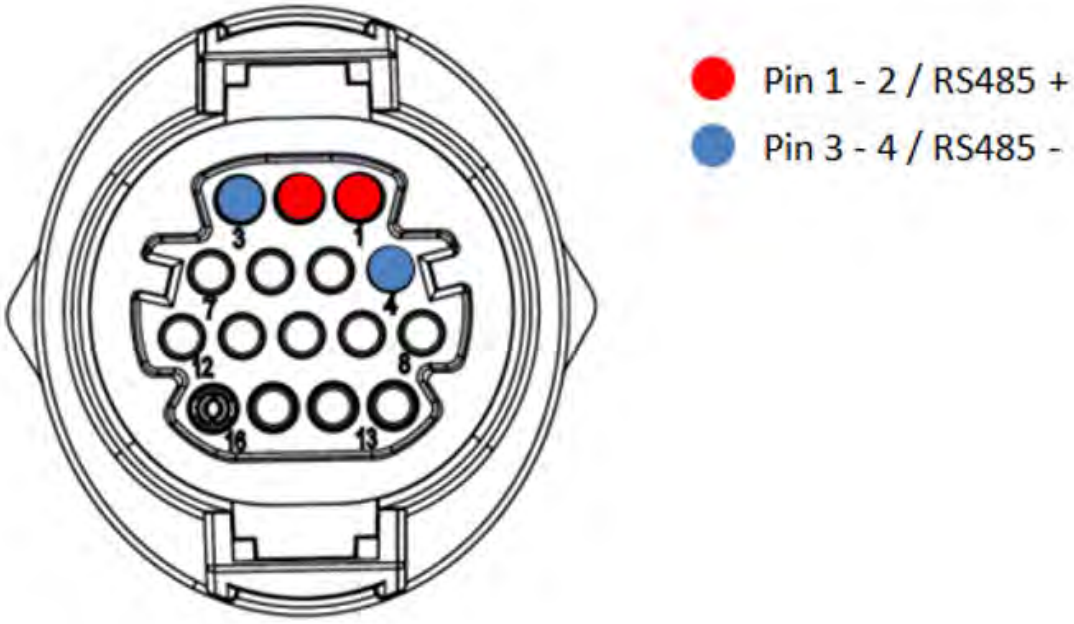


Figure 158 – Connecting the serial line via the communication connector for 3PH HYD5000-HYD20000-ZSS inverters

For 3000-6000 TLM-V3 photovoltaic inverters and HYD 3PH 5000-20000 ZSS three-phase hybrid inverters, use only one positive and one negative of those shown in the figure below.

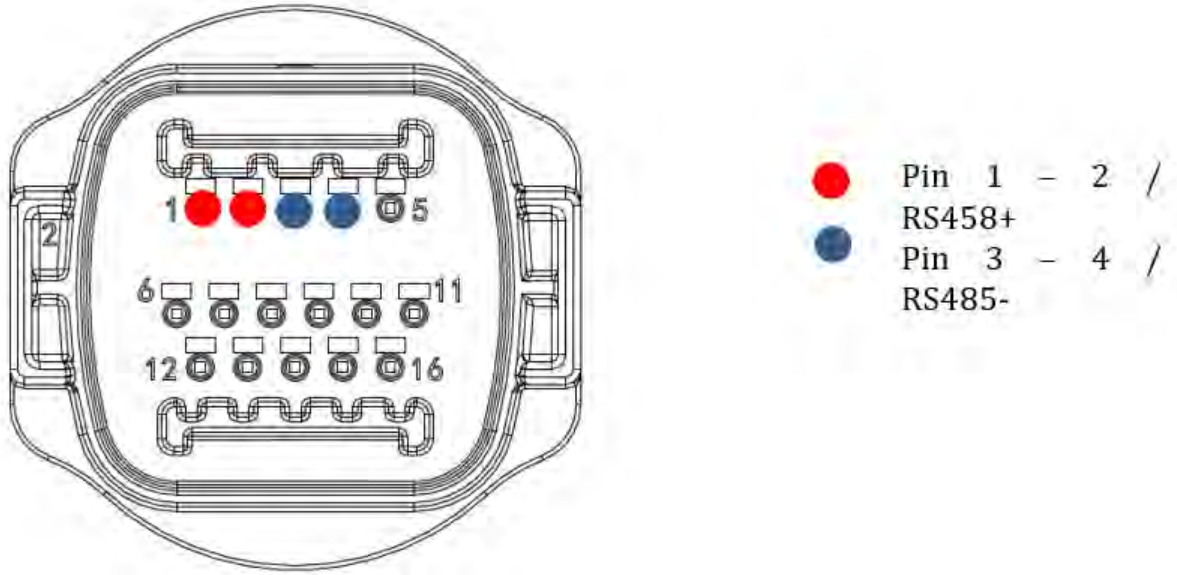


Figure 159 – Connecting the serial line via the communication connector for 1PH 3000- 6000 TLM-V3 inverters

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

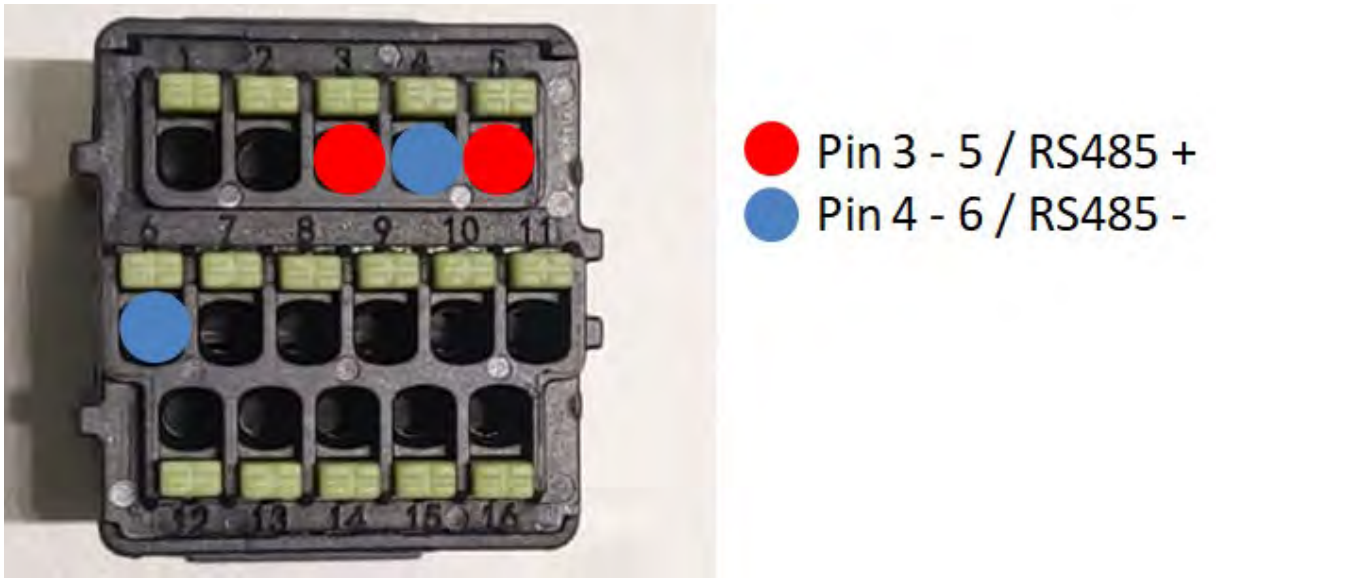


Figure 160 – Connecting the serial line via the communication connector for 3PH HYD5000-HYD20000-ZSS inverters

a. Position the dip switches of the last inverter in the daisy chain connection as shown in the figure below to activate the 120 Ohm resistor and close the communication chain. If there are no switches, physically connect a 120 Ohm resistor to terminate the bus.

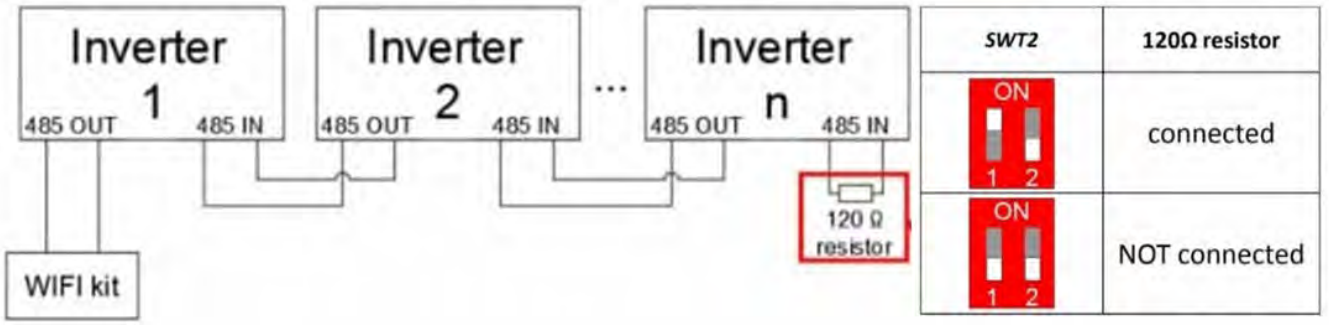


Figure 161 – Positioning the dip switches to connect the isolation resistor

3) Check that the RS485 icon is shown on the display of all the inverters, which 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.

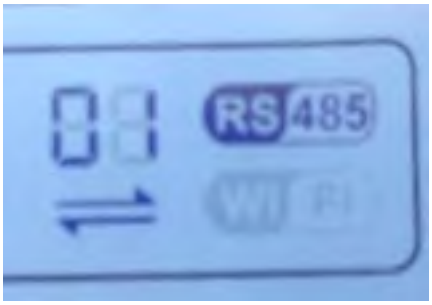


Figure 162 – RS485 symbol on the inverter display

4) 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.

13.3.3. 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

13.3.4. 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.

13.3.5. Ethernet configuration

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

Figure 163 – 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.

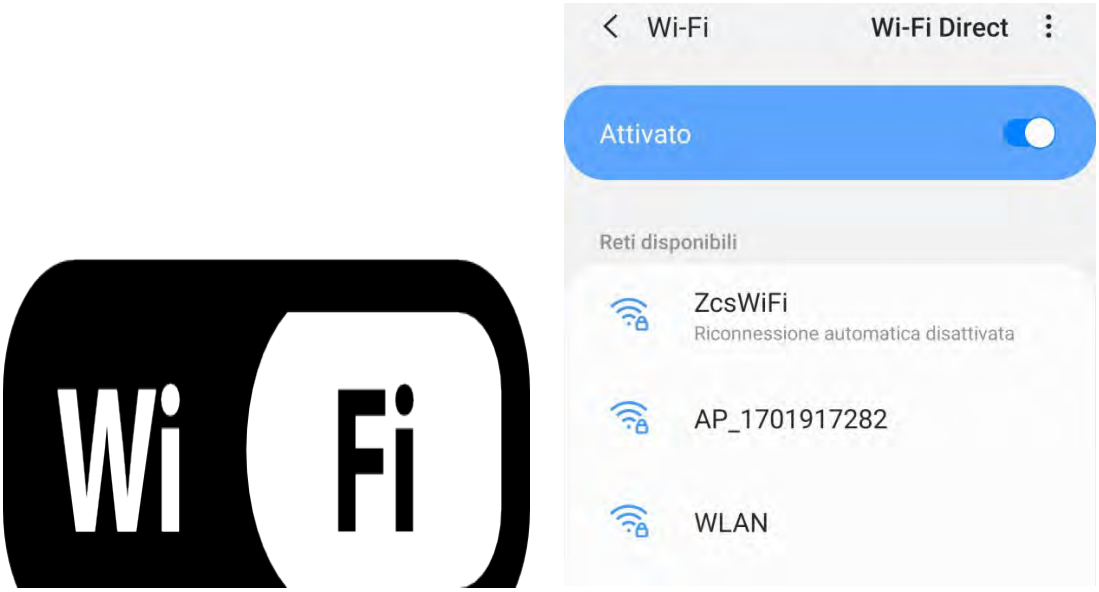


Figure 164 - Wi-Fi network search on iOS (left) and Android (right) smartphone

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

Figure 165 - 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.

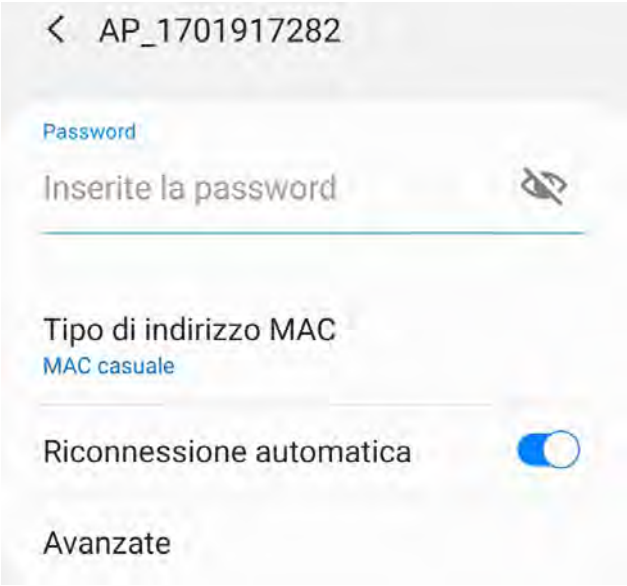


Figure 166 - Password entry prompt

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 167 - 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 168 - Screen for accessing 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.

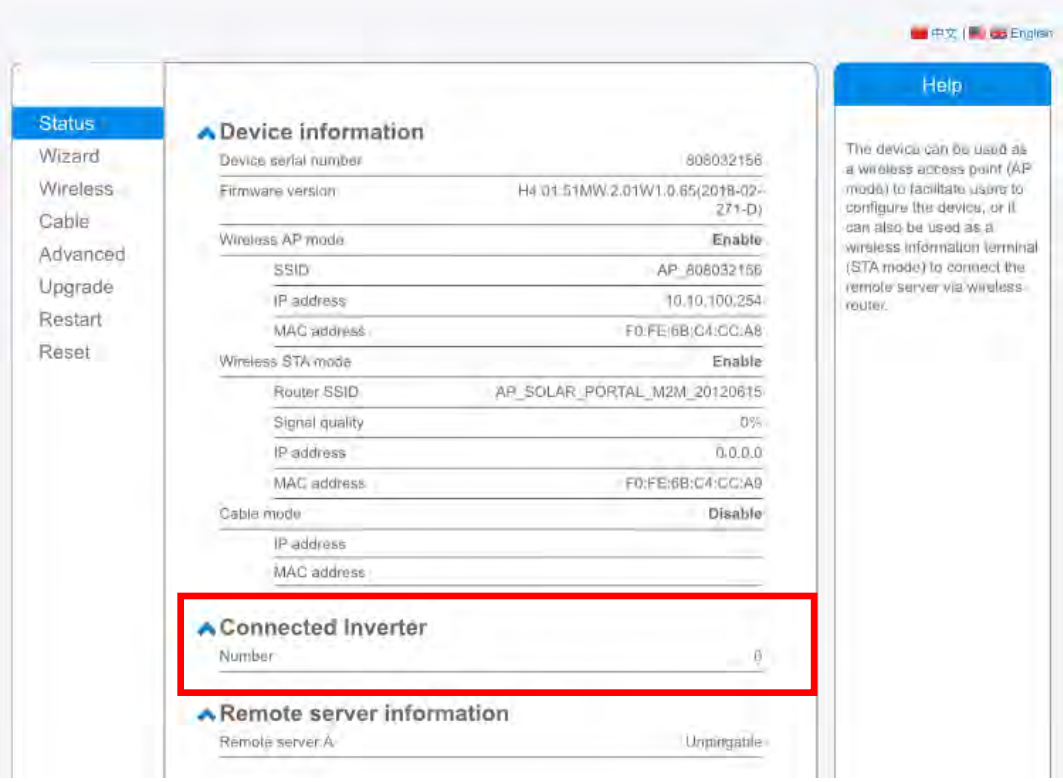


Figure 169 – Status Screen

8) Click on the Wizard setup button in the left-hand column.

9) Now click on the Start button to start the configuration wizard.

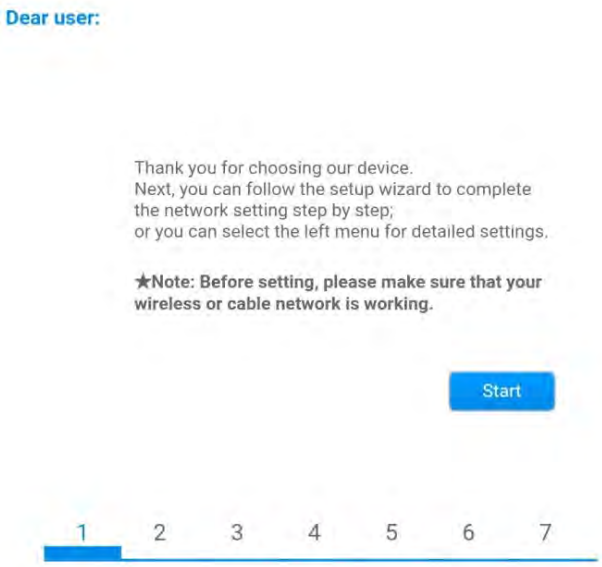


Figure 170 – Screen for starting (1) the Setup Wizard

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

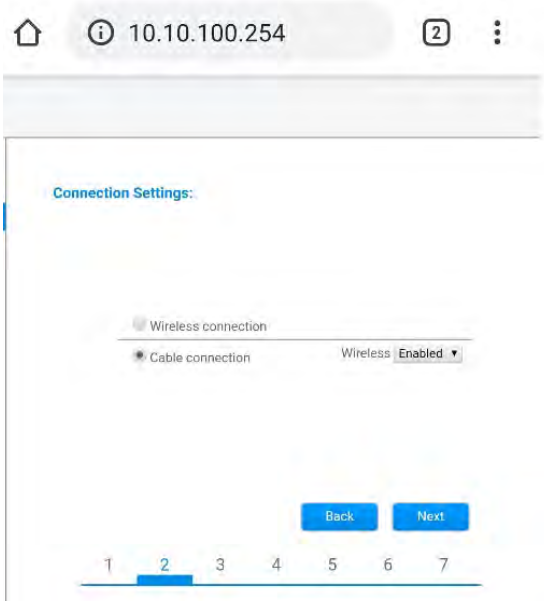


Figure 171 - Screen for selecting connection via network cable

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

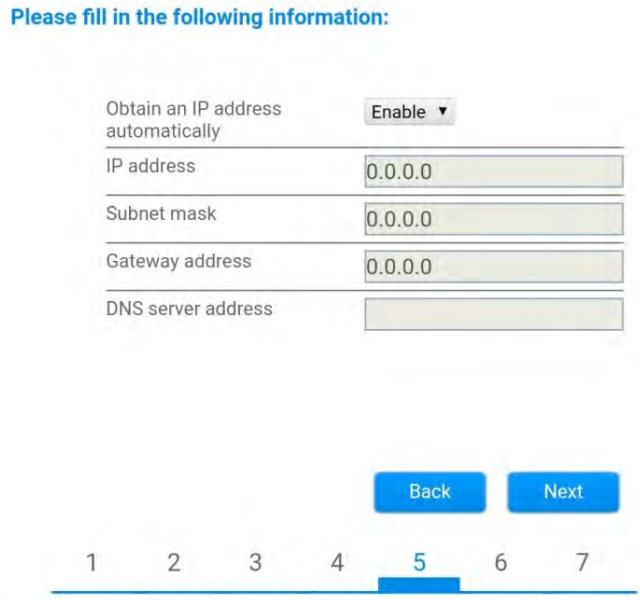


Figure 172 – Screen for automatically obtaining the IP address (5)

12) Click on Next without making any changes.

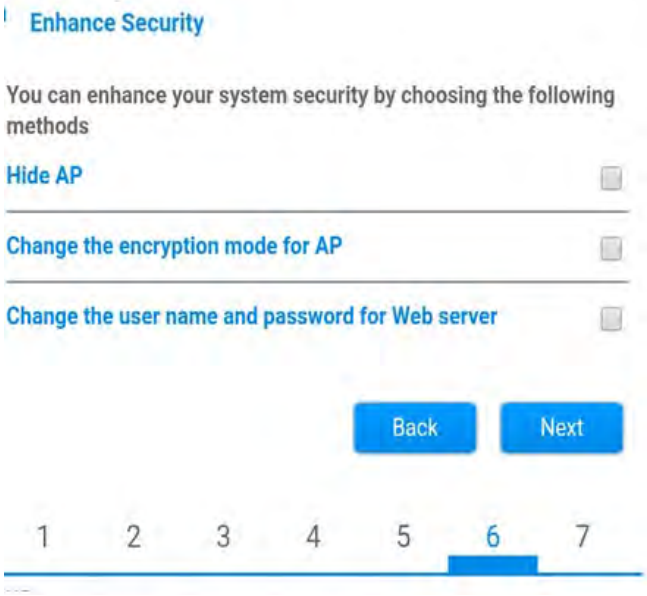


Figure 173 - Screen for setting the security options (6)

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

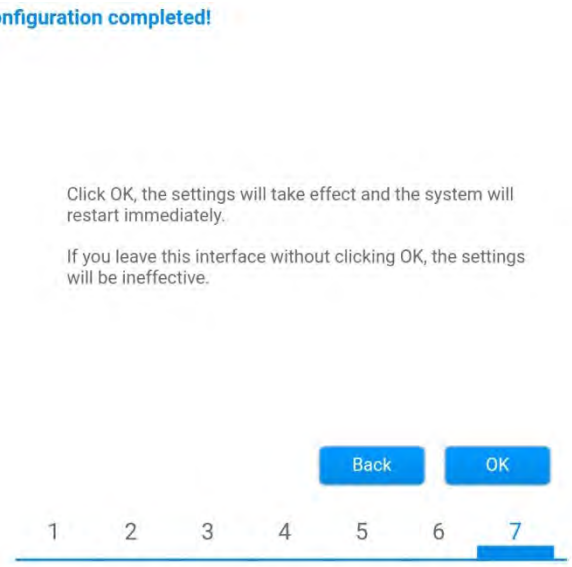


Figure 174 – Final configuration screen (7)

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.

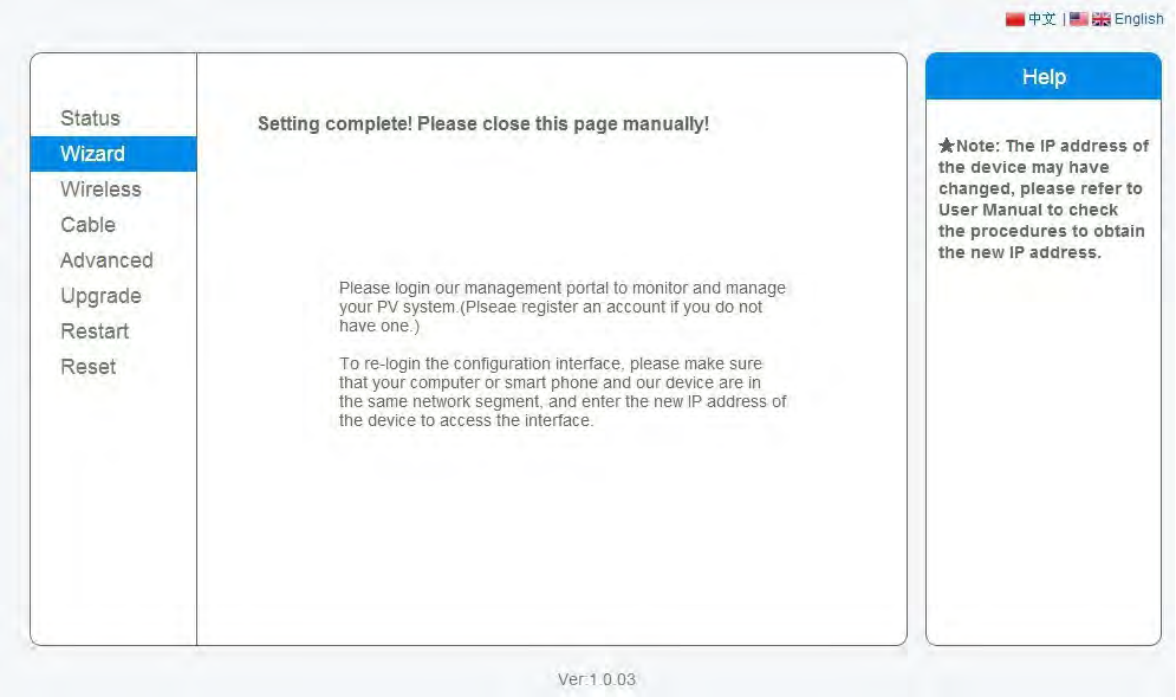


Figure 175 – Successful configuration screen

13.3.6. 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 176 – 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 again, 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

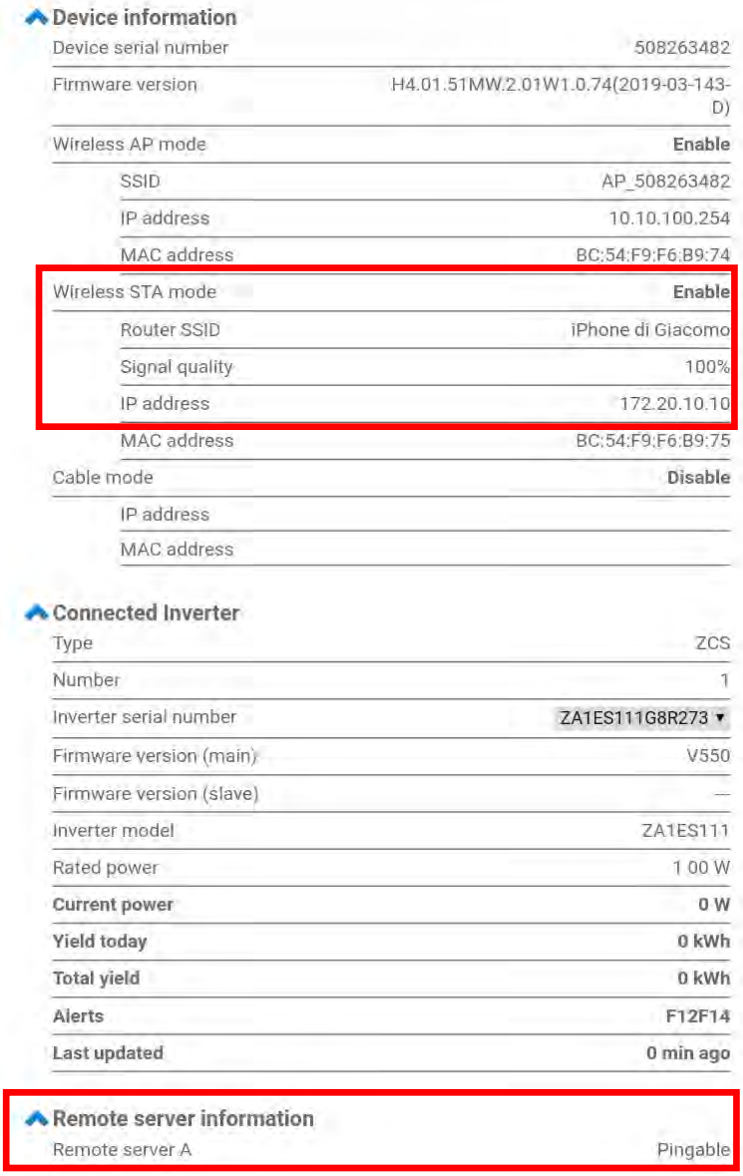


Figure 177 – Main screen of status and checking of correct configuration

Figure 178 - Main screen of status 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.

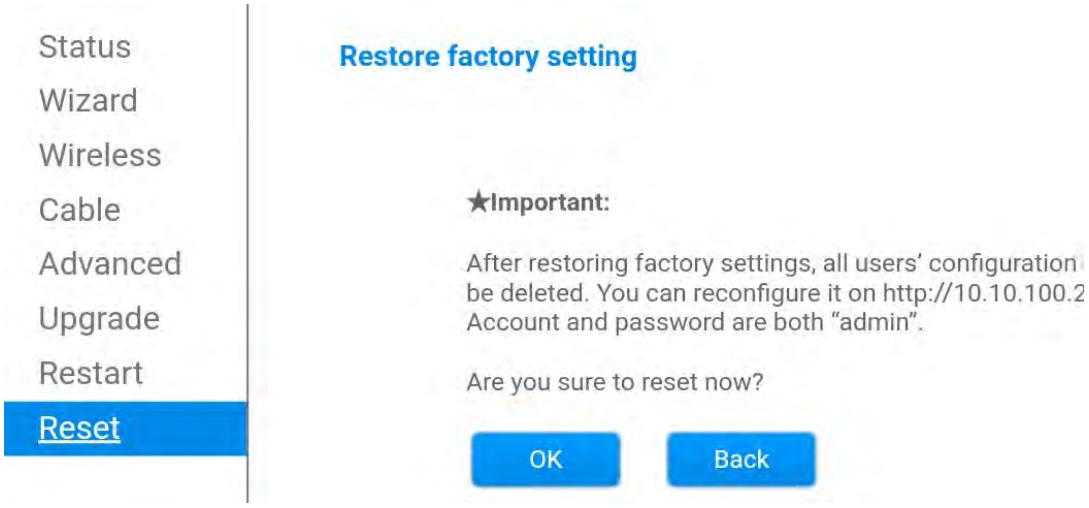


Figure 179 – Reset screen

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

13.4.1. Mechanical description and Datalogger interface

Mechanical Dimensions: 127mm x 134 x 52 mm
Protection rating: IP20

The usable ports are indicated below.

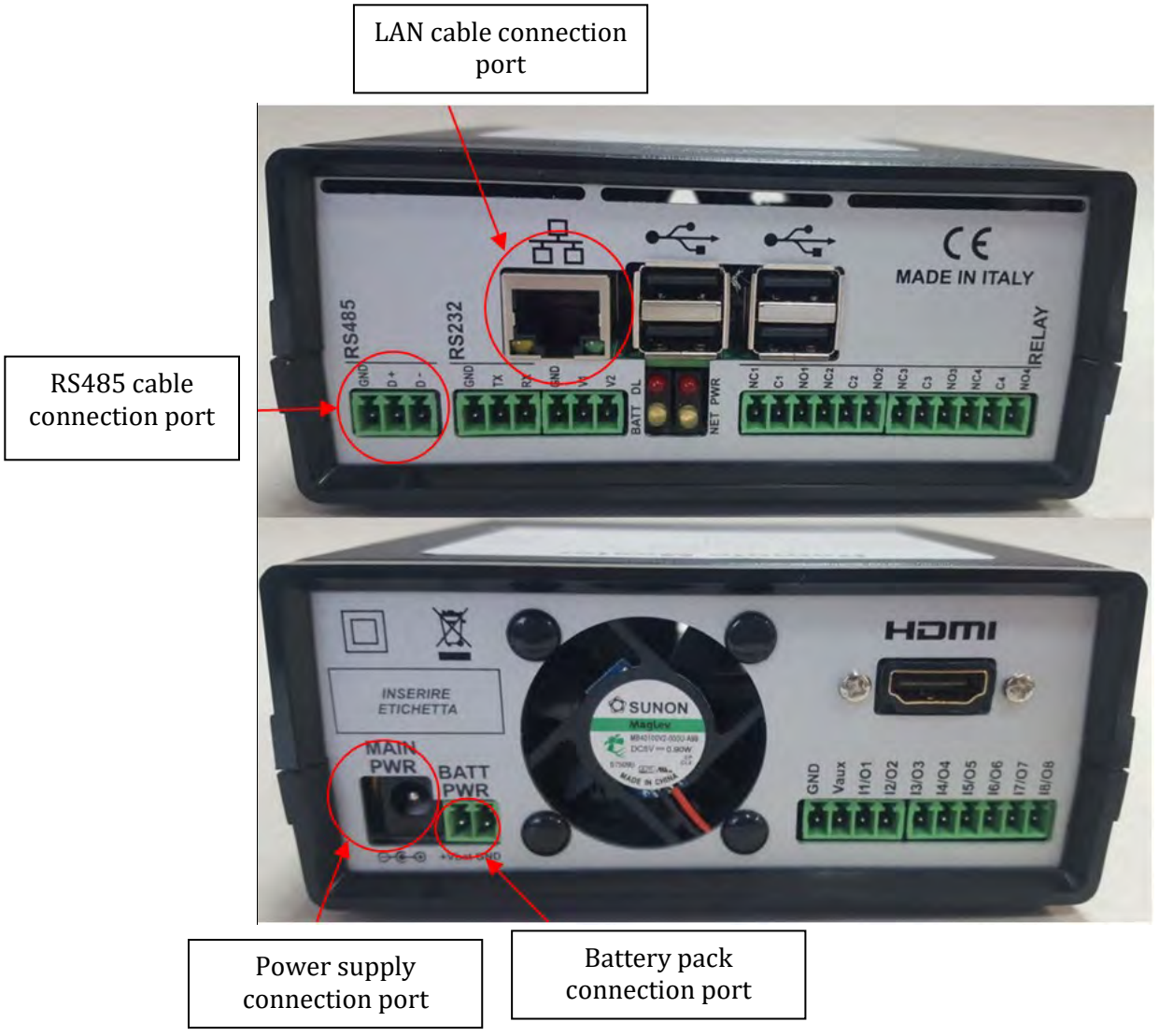


Figure 180: Back of Datalogger

13.4.2. 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
Terminal ***D+***	+	Terminal RS485***+/B***	Terminal ***+Tx***
Terminal ***D–***	-	Terminal RS485***-/A***	Terminal ***-Tx***

Table 3: Connecting the Datalogger to the inverters

13.4.3. 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 there is no need 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.

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

Once the RS485 Half Duplex cable has been connected, the Datalogger must be powered 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.

13.4.5. Connecting the LM2-485 PRO cell irradiation and temperature sensor to the datalogger

For proper installation, both the sensor signal and power cables must be connected.

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
Terminal ***D+***	+	Terminal RS485***+/B***	Terminal ***+Tx***
Terminal ***D–***	-	Terminal RS485***-/A***	Terminal ***-Tx***

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
Terminal ***V1*** (12Vdc output voltage)	Terminal **RED +12V**
Terminal ***GND*** (GND/RTN)	Terminal **BLACK 0V**
Terminal ***V2*** (12Vdc driveable voltage)	

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

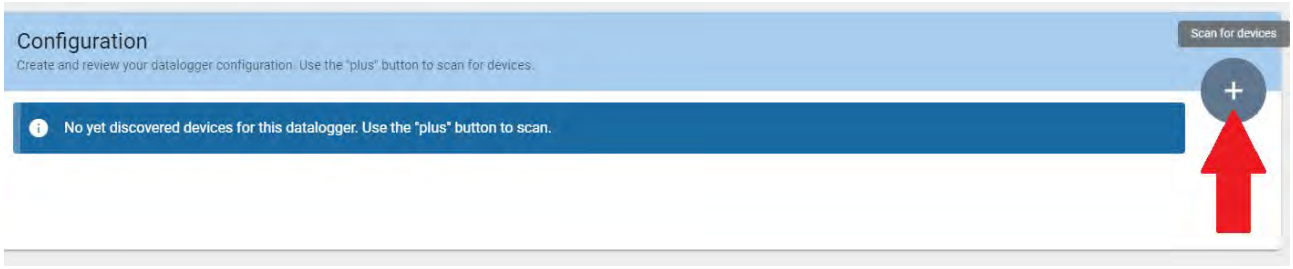
A stable communication in terms of signal and power supply, up to 200m, is guaranteed by using the RS485 cable, type Te.Co. 15166 (2x2x0,22+1x0,22)st/pu.
For longer distances, a connection to the signal side of the datalogger is recommended, and a connection to the +12V power supply via an external power supply unit.

13.4.6. Configuring the Datalogger

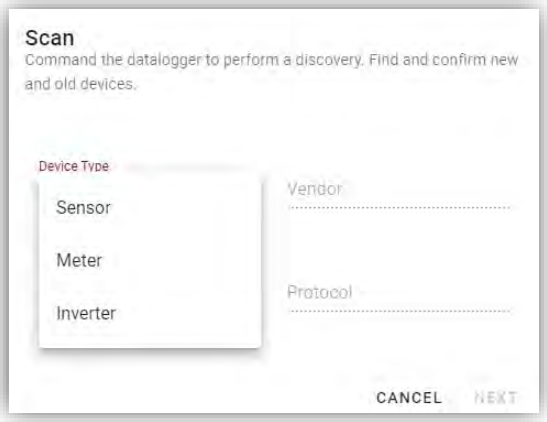
Connect to the website dlconfig.it and login by entering the temporary credentials: Username = admin and Password = admin.

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

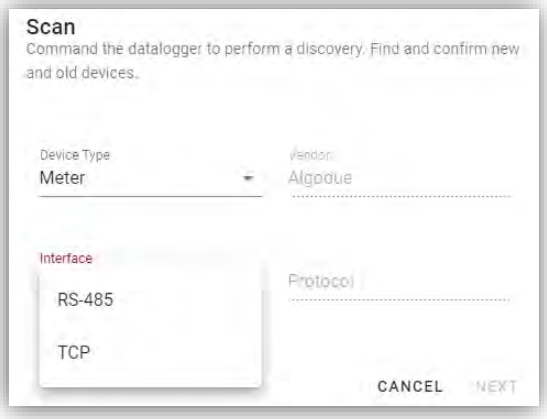
In the configuration page, you can search for any devices connected to the datalogger (inverter, meter or sensors) by clicking the + button, as shown in the figure.

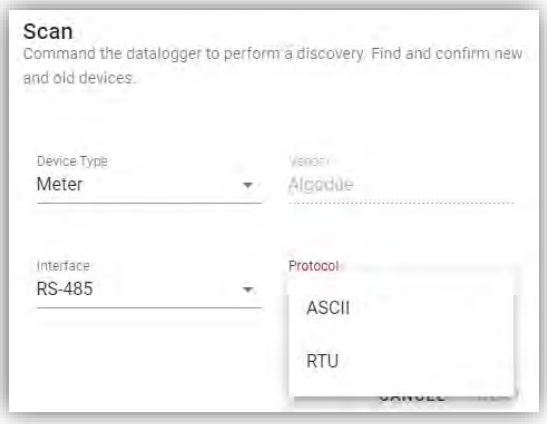


A window will open where you can search for each type of device connected to the Datalogger, after indicating the range of addresses associated with the relative devices.

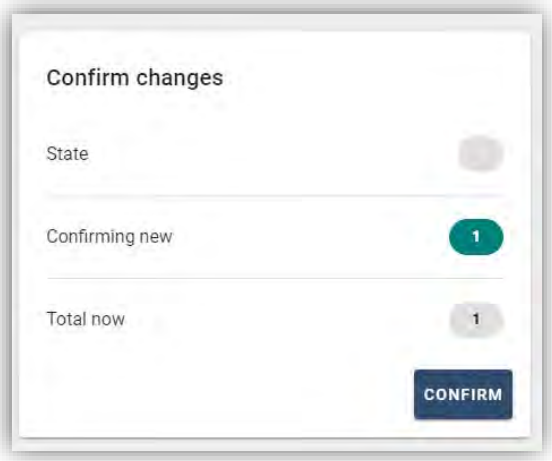


If a meter is one of the devices connected to the Datalogger, select the type of Meter/Datalogger communication interface and the relative communication protocol.

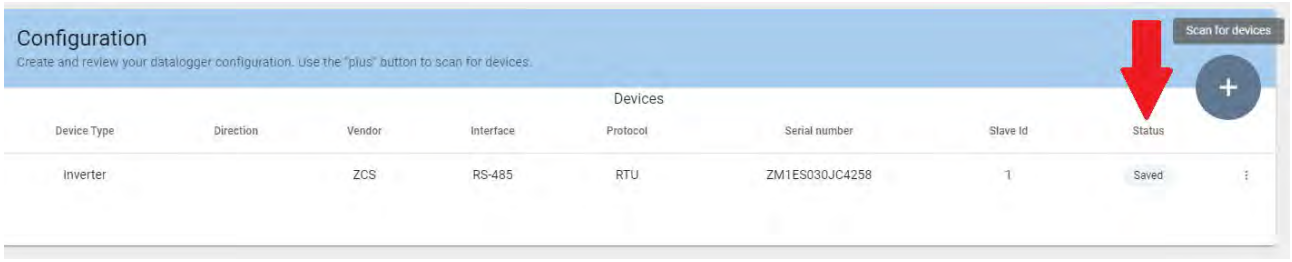




Once this operation has been completed, update the new configuration by clicking “Confirm,” which will allow you to register the devices associated with the datalogger.

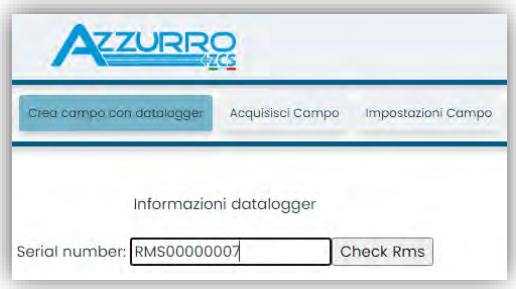


From this moment, the datalogger is correctly configured (all devices must be in the "saved" status) and therefore a new installation can be created on the ZCS Azzurro portal for associating the datalogger and the devices connected to it.

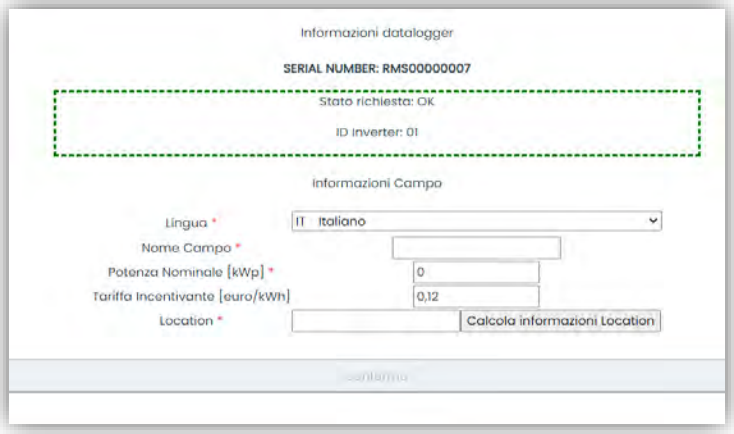


13.4.7. Configuring the Datalogger on the ZCS Azzurro portal

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.

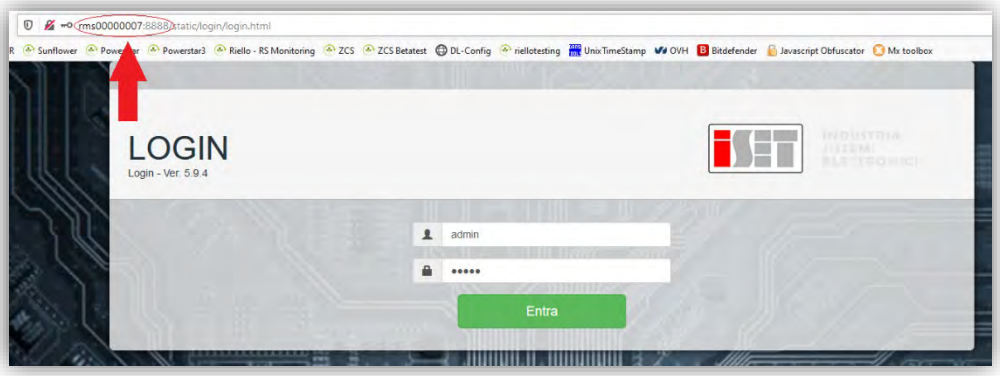


Once the "location" of the field has been entered, click "Calculate Location Information" to allow the system to obtain the latitude, longitude and timezone of the installation. Click "Confirm" to complete the configuration of the field. You only need to wait a few minutes to view the data flow on the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

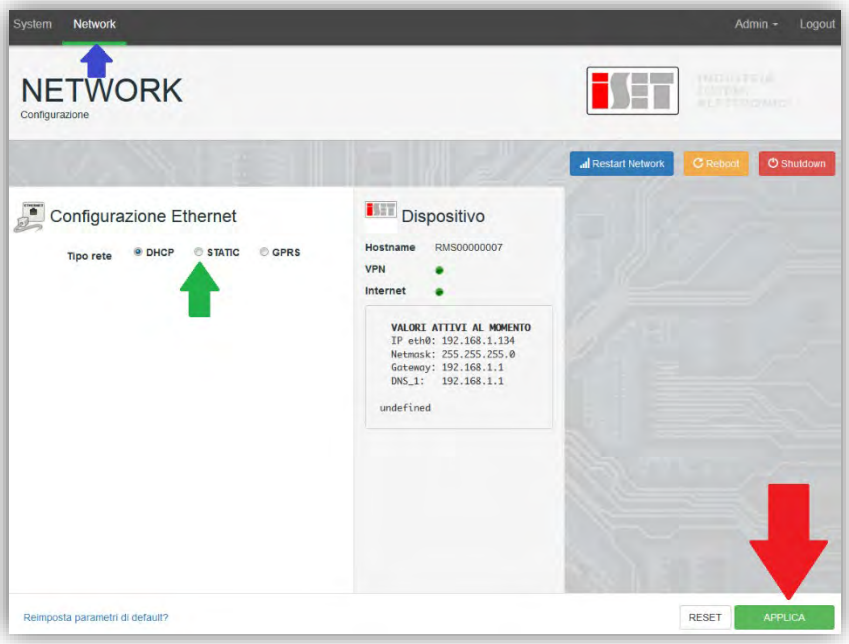
CAUTION: The location data is essential for the correct operation of the datalogger in the ZCS system. It is important to define it very carefully.

13.4.8. 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 RMSxxxxxxxx: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).

13.4.9. 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.

13.4.10. 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 the 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.

13.4.11. 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, CO_2 gains and savings.

Below is an example of a local monitoring page.

Figure 181: Example of local monitoring page

14. 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.

AZZURRO ZCS

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