

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



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### **General instructions**

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

### **Please keep these instructions!**

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

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### **Technical support**

ZCS offers a support and technical consultancy service accessible by sending a request directly from the website <https://www.zcsazzurro.com/it/support>.

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

## **Preface**

### **General information**

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

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

### **Scope**

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

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

### **Recipients**

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

## 1. Introduction

The 1PH HYD3000-HYD6000-ZSS hybrid inverter is used in photovoltaic systems with battery storage. The system can be combined with 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 inverter can operate in automatic mode and in time-of-use charge, charge/discharge mode. In automatic mode, when the energy produced by the PV field is greater than that required by the utilities, the 1PH HYD3000-HYD6000-ZSS inverter charges the battery using the photovoltaic energy in excess, and when the photovoltaic energy is lower than that required, the inverter uses the energy stored in the battery to supply current to the local load.

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



Figure 1 - Diagram of a system on which a 1PH HYD3000-HYD6000-ZSS hybrid 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 inverter strictly complies with the safety, design and testing regulations provided for by the national standards.

During installation, operation and maintenance, operators must carefully observe the local safety standards. Improper use may result in electrical shock and harm and damage to persons, the equipment and its components.

Contact the nearest authorised service centre for any repairs or maintenance. Contact your distributor for information on the nearest authorised service centre. **DO NOT** carry out repairs yourself, as this may result in injury or damage.

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

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

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

### 2.1. Safety Notes

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

- The 1PH HYD3000-HYD6000-ZSS inverter may reach high temperatures and have rotating parts inside during operation. Switch off the 1PH HYD3000-HYD6000-ZSS 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 inverter.
- Do not open the front cover of the 1PH HYD3000-HYD6000-ZSS inverter. Opening the front cover will void the product warranty.
- Damage caused by improper installation/operation is NOT covered by the product warranty.

## 2.2. Assembly and maintenance diagram







- The battery must be protected against short circuits during transport and installation.
- The inverter 1PH HYD3000-HYD6000-ZSS/batteries must be located in well-ventilated areas. Do not place the 1PH HYD3000-HYD6000-ZSS inverter/batteries in a cabinet or in an airtight or poorly ventilated location. This could be extremely hazardous to the performance and life of the system.
- Keep the 1PH HYD3000-HYD6000-ZSS inverter and batteries away from direct sunlight. Do not bring the 1PH HYD3000-HYD6000-ZSS inverter and batteries near ovens, flames or other heat sources as the battery may catch fire and cause an explosion.
- The current capacity of the DC power cables (from the battery to the inverter) must be at least 90A. Use short DC power cables to prevent voltage drops and power losses.
- Use a multimeter to check the battery polarity and voltage before turning on the power. Make sure that the connections are made according to the instructions in this manual.
- Use the multimeter to check the PV voltage and polarity before closing the PV switch. Make sure that the connections are made according to the instructions in this manual.
- If you want to store the batteries without using them, disconnect them from the 1PH HYD3000-HYD6000-ZSS inverter and store them in a cool, dry and well-ventilated area.
- Battery maintenance workers must have the skills and knowledge required to carry out this activity.
- All the batteries connected in parallel must be of the same model and have the same firmware version. This problem must be taken into consideration by the designer/installer, especially when replacing the batteries or when modifying the existing storage system.
- The 1PH HYD3000-HYD6000-ZSS inverter does not have an isolation transformer so the positive and negative polarities of the PV string do NOT have to be grounded, otherwise the inverter may be damaged. All non-current-carrying metal parts (such as the PV module frame, PV rack, housing of the combiner box, and housing of the inverter) in the photovoltaic power system must be connected to the ground.
- Attention: Do not disassemble or break the battery. The electrolytes in the battery may be toxic and cause damage to skin and eyes.







- Attention: during installation and maintenance of the battery, please follow the rules below.
  - a) Remove watches, rings and other metal objects.
  - b) Only use tools with insulated handles.
  - c) Wear rubber gloves and shoes.
  - d) Do not place tools or metal objects on top of the battery.
  - e) Turn off the 1PH HYD3000-HYD6000-ZSS inverter and batteries before connecting/disconnecting the battery terminals.
  - f) Both the positive and negative polarities must be isolated from the ground.

### 2.3. Symbols on the inverter

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

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




	Read this manual before installing the 1PH HYD3000-HYD6000-ZSS inverter.
	This indicates the degree of protection of the equipment in accordance with the IEC 70-1 (EN 60529 June 1997) standard.
	Positive polarity and negative polarity of the DC voltage (Photovoltaic and Battery).
	This side up. The 1PH HYD3000-HYD6000-ZSS 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 inverter is subjected to strict controls and inspection before packaging and delivery. Do not turn the 1PH HYD3000-HYD6000-ZSS inverter upside down during delivery.

	<p>Carefully check the packaging and product fittings before installation.</p>
<p><b>Caution</b></p>	

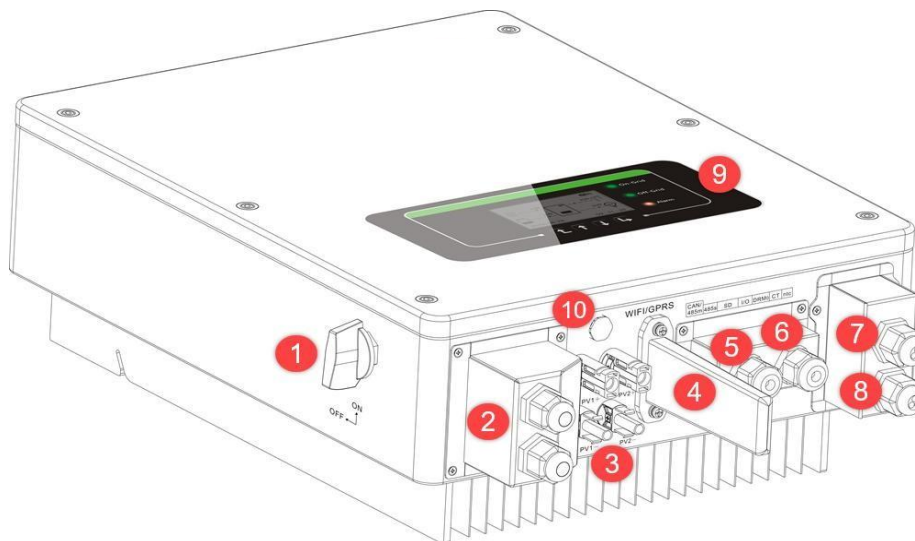


Figure 2 - Diagram of a system on which an 1PH HYD3000-HYD6000-ZSS hybrid is installed

1	DC switch	6	Current transformer port
2	Battery input terminals	7	Critical load connection port
3	PV input terminals	8	Grid connection port
4	Wi-Fi/GPRS adaptor	9	LCD
5	BMS communication interface	10	Vent valve

#### 3.2. Contents of the packaging

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

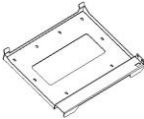






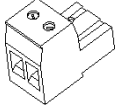
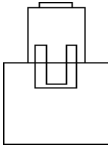



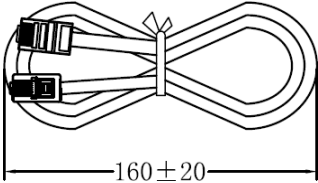


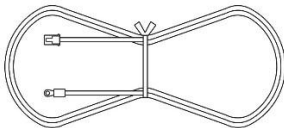
 1 mounting bracket	 6 AC terminals	 2 M5 screws	 2 battery terminals
 8 M6 flat washers	 8 expansion plugs	 4 terminal caps	 2 CT terminals
 1 current transformer	 1 user manual	 1 warranty	 1 quality certificate
 1 Pylontech battery communication cable	 2 PV + input terminals	 2 PV - input terminals	 1 NTC (3M long)





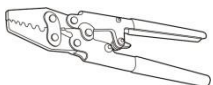
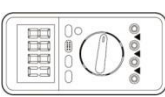
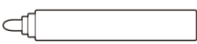

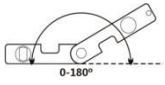
Figure 3 – Components and accessories inside in the packaging

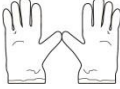

### 3.3. Installation environment

- Choose a dry, clean and orderly place, suitable for installation.
- Ambient temperature range: -25°C ~ 60°C.
- Relative humidity: 0 ~ 100% (non-condensing).
- The 1PH HYD3000-HYD6000-ZSS inverter must be installed in a well-ventilated area.
- Do not place flammable or explosive materials near the 1PH HYD3000-HYD6000-ZSS inverter.
- The AC overvoltage of the 1PH HYD3000-HYD6000-ZSS inverter belongs to Category III.
- Maximum altitude: 2000 m.

### 3.4. Installation tools

Prepare the following tools before installation:

Number	Tool	Model	Function
1		Percussion drill Recommended diameter: 6 mm	Used to make holes in the wall
2		Screwdriver	Used for the wiring
3		Cable stripper	Used for stripping the wires
4		4mm Allen key	Used for tightening the screws to connect the rear panel to the inverter
5		Crimping tools	Used for crimping the power cables
6		Multi-meter	Used for checking the grounding connection
7		Marker	Used for marking
8		Tape measure	Used for measuring distances
9		Level	Used for making sure that the rear panel is installed correctly

10		ESD gloves	Must be worn by operators
11		Safety goggles	Must be worn by operators
12		Dust mask	Must be worn by operators

### 3.5. Wall installation position

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

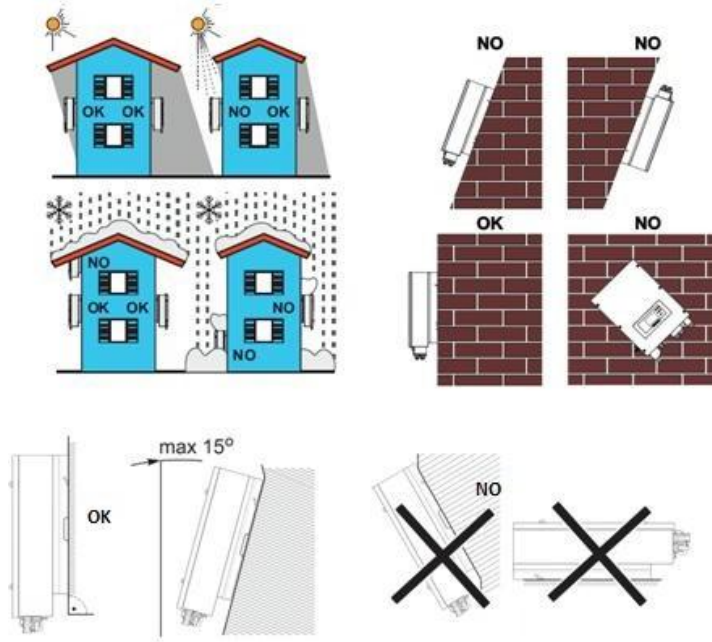


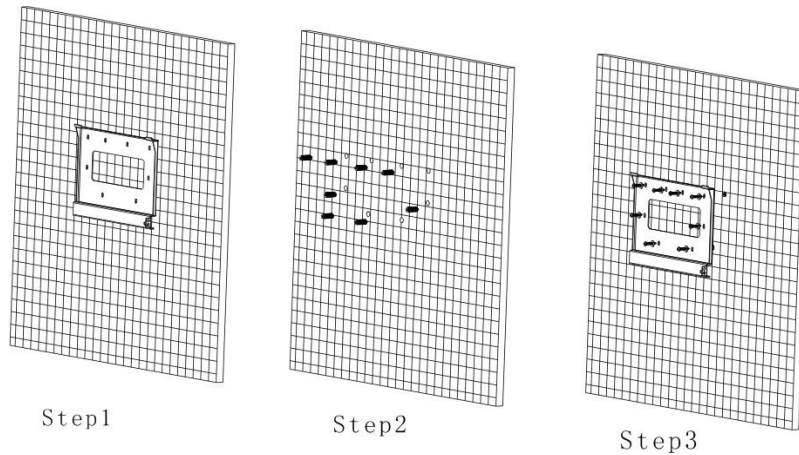
Figure 4 - Installation position of the 1PH HYD3000-HYD6000-ZSS inverter

### 3.6. Assembly instructions

**Step 1:** Position the mounting bracket on the wall, mark the 8 fixing points using the marker. Drill 8 holes (6 mm drill bit) in the wall.

**Step 2:** Insert the expansion screws vertically into the hole, make sure that the insertion depth is neither too shallow nor too deep.

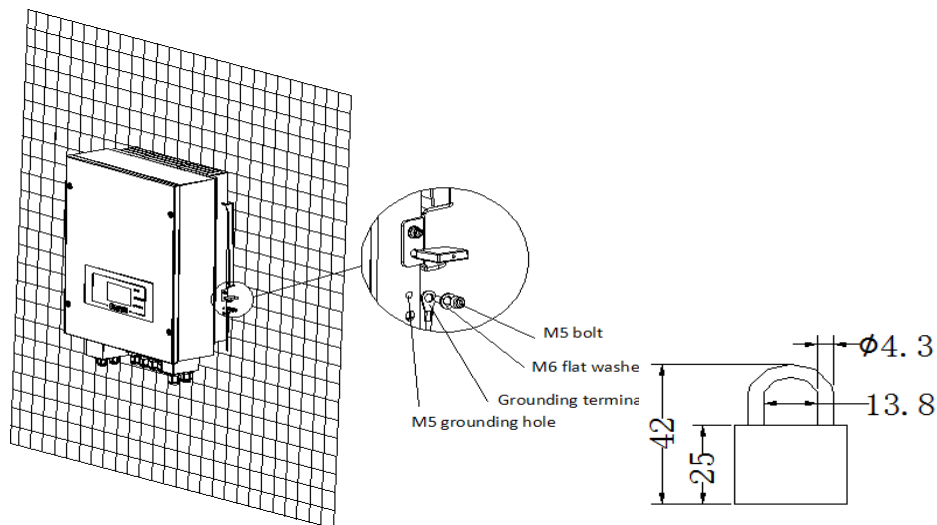
**Step 3:** Fix the mounting bracket to the wall using dowels and flat washers.



**Step 4:** Place the 1PH HYD3000-HYD6000-ZSS inverter on the mounting bracket.

**Step 5:** Use the grounding hole of the heatsink to ground the 1PH HYD3000-HYD6000-ZSS inverter.

**Step 6:** OPTIONAL: the 1PH HYD3000-HYD6000-ZSS inverter can be fixed to the mounting bracket.



**Note:** For safety reasons, ZCS Spa and/or its partners may not carry out any technical repairs or maintenance work, or move the inverter or battery packs from and to the ground if they are installed at a height of more than 180 cm from the ground.

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

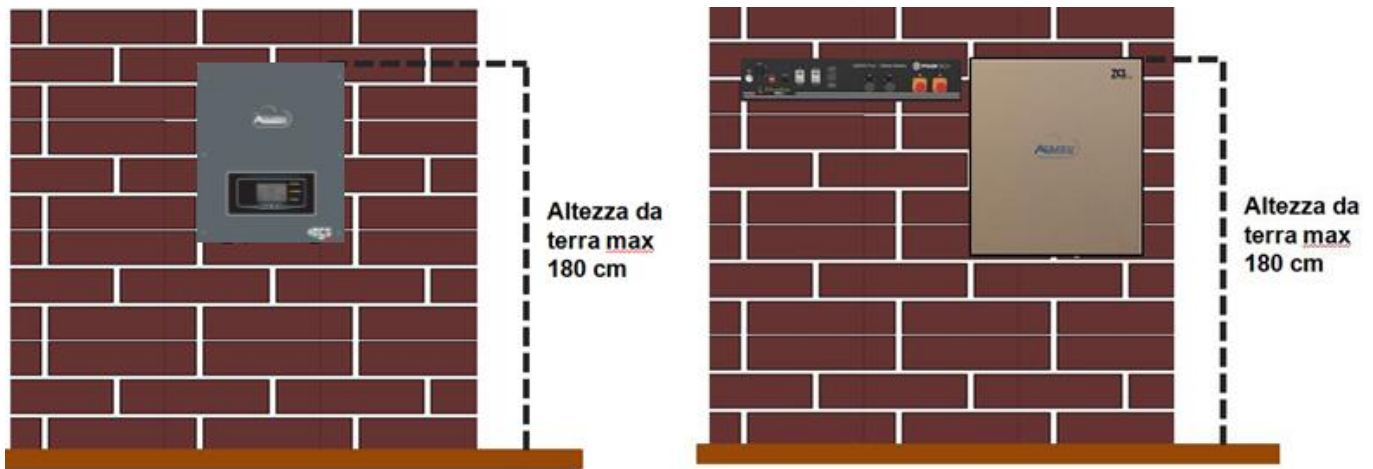


Figure 5 - Instructions for installing the storage inverter and battery pack



## 4. Electrical connections

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

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

Note: the Pylontech batteries, as well as the WeCo batteries do not require a disconnecting device for connecting to the storage inverter. The Cable kit, which includes crimped power cables for connecting the Pylontech batteries to the 1PH HYD3000-HYD6000-ZSS storage inverter, is supplied separately. Make sure your storage kit is equipped with this accessory. In the case of WeCo batteries, the connection kit is already inside the package.

- A 25A AC disconnecting device (circuit breaker) must be installed between the 1PH HYD3000-HYD6000-ZSS 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 inverter and power grid.
- For safety and proper functioning of the system, it is important to use a cable of the appropriate type and size for the electrical connections.
  - Battery connection: DC cable with cross-section of AWG8 or AWG6 (supplied).
  - Grid or load connection: AC cable with cross-section of AWG12.

### !!!PLEASE NOTE!!!

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

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

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

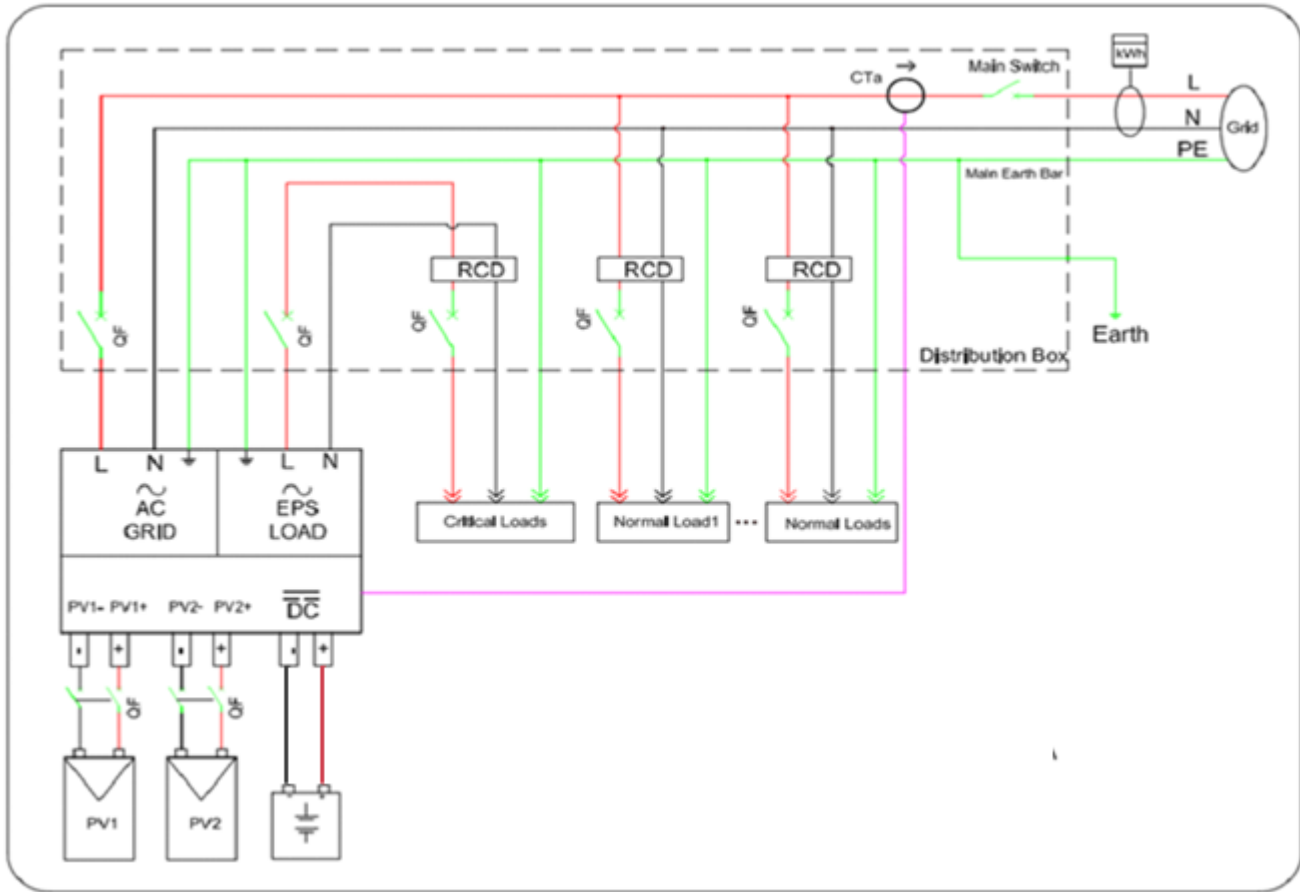


Figure 6 - Electrical Connections

#### 4.1. Connecting the battery

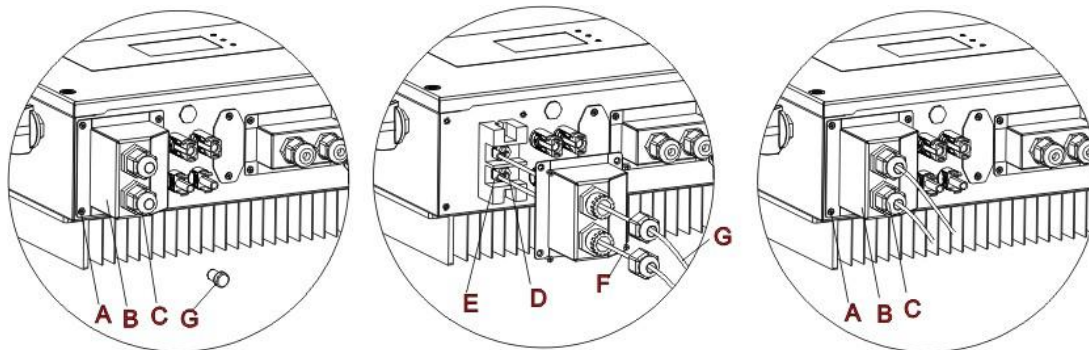


Figure 7 - Connecting the battery (measure polarity/voltage of the battery cables before connection)

**Step 1:** Unscrew the 4 screws (A) using a screwdriver (Fig. 6).

**Step 2:** Remove the waterproof cover (B), loosen the cable gland (C), and then remove the cap (G).

**Step 3:** Pass the battery cables (F) through the cable gland, then connect the battery wires using the OT terminal (E).

**Step 4:** Fasten the waterproof cover using the 4 screws.

## 4.2. Connecting a Pylontech battery

### 4.2.1. Connecting a single battery

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 plug into the BMS CAN port of the single battery.



Figure 8 - Pylontech communication cable to be inserted into the battery communication input

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

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



Figure 9 - Connecting the communication cable to the Pylontech battery

### 4.2.2. Connecting multiple batteries in parallel

If multiple batteries are present, check the parallel connections between one battery and another.

- a. In the case of Pylontech batteries, connect one of the two power cables (e.g. the positive, orange one) to the master battery, inserting the fast contact into the appropriate terminal; then connect the other cable (e.g. the negative, black one) to the last battery of the pack, as shown in the figure below. Finally, run the batteries in parallel using the short jumpers (supplied with the battery) or those with a length of 0.6 m or 1.5 m (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 10 - Connecting three Pylontech batteries in parallel

The communication cables must be connected starting from the master battery and inserting the short jumper (supplied with the battery) or a jumper with a length of 0.6 m or 1.5 m (available on request, codes ZST-CABLE-0.6M and ZST-CABLE-1.5M) in the LINK connection PORT; insert this cable in LINK CONNECTION PORT 0 of the second battery, which will be called Slave 1. If additional batteries are present, a new jumper must be inserted into LINK CONNECTION PORT 1 of the Slave 1 battery; insert the free end of this cable into the third battery, called Slave 2. This procedure will be repeated for all the elements of the battery pack. In 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).

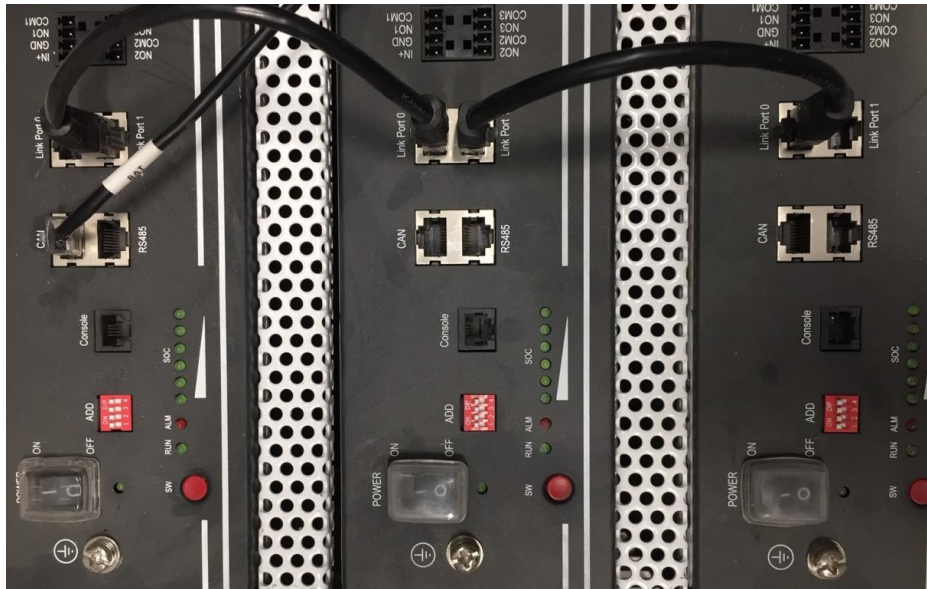


Figure 11 - Connecting the communication cable between three Pylontech batteries

**NOTE:** the position of the DIP switches (white on a red background, as shown in the figure below) should not be changed. If it is changed by accident, 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>.

## 4.3. Connecting a WeCo battery

### 4.3.1. Connecting a single battery

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

- In the case of WeCo batteries, insert the plug into the BMS CAN port of the single battery.



Figure 12 - Communication cable between the inverter and WeCo battery

- Make sure that the DIP switches are set as shown in the figure.
- Connect the ground cable to the battery through the threaded hole.

**NOTE:** To connect the WECO batteries, use the blue or grey communication cable contained in the battery kit.

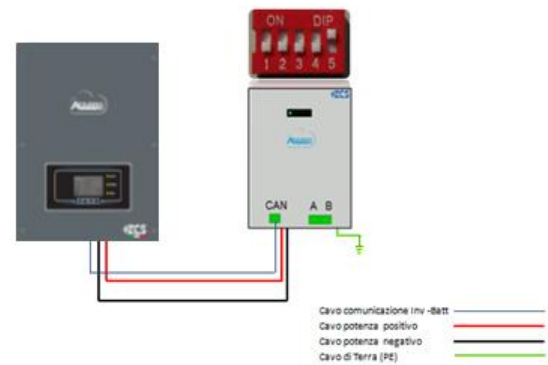
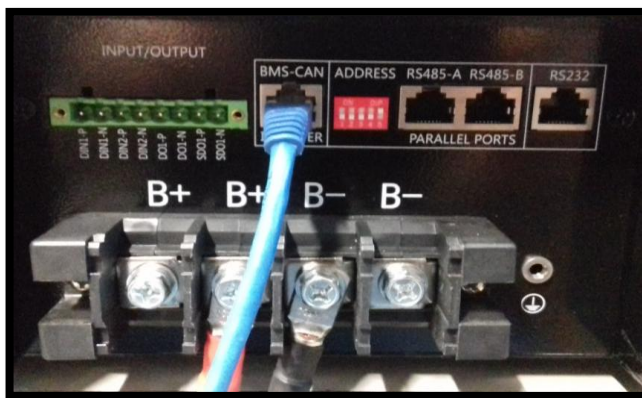


Figure 13 - Connecting the communication cable to the WeCo battery

### 4.3.2. Connecting multiple batteries in parallel

If multiple batteries are present:

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

- b. Set the DIP switches correctly according to the number of batteries connected, as shown in the figure (warning: only make changes when the battery is switched off).
- c. Connect the communication cable inserted in the CAN port of the inverter to the CAN-BUS port of one of the batteries, this will now become the MASTER battery.
- d. The MASTER must be connected to the communication cable inside the battery box starting from the **RS485-B** port and arriving at the **RS485-A** communication port of the Slave 1 battery. (**Attention: do not connect the RS485-A port to the Master battery**).

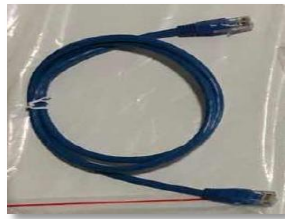


Figure 14 – Communication cable between the batteries

- e. In case of additional batteries, the communication cable will be connected as indicated above for the connection of the MASTER battery to SLAVE 1.
- f. The last battery will only have the **RS485-A** port connected.

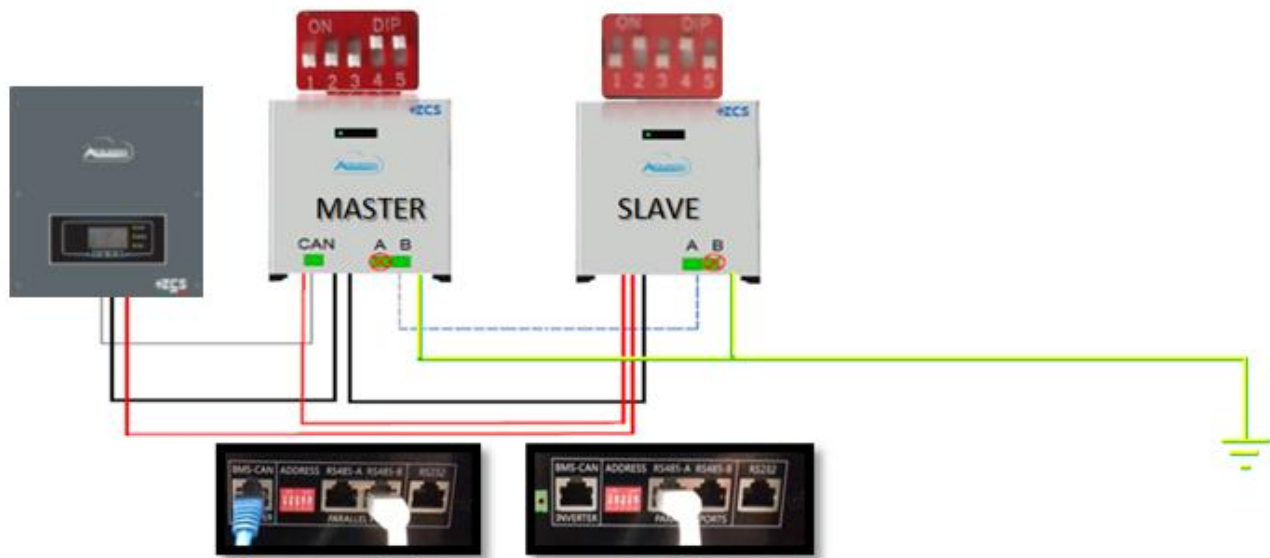


Figure 15 – Parallel connection of two WeCo batteries

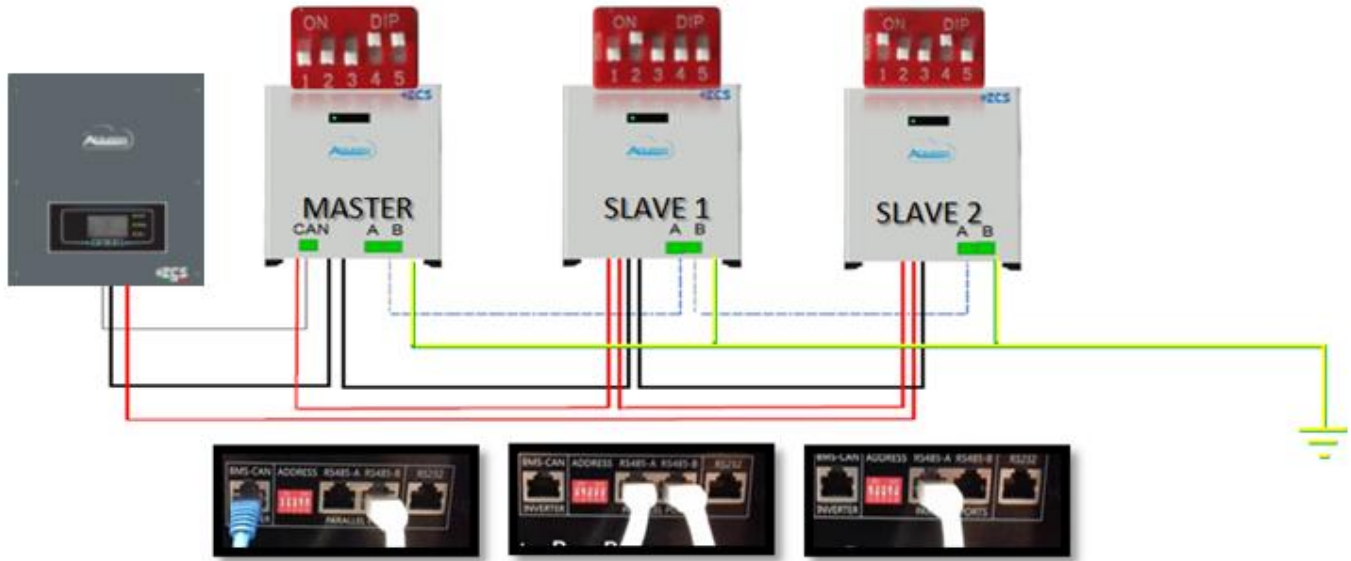


Figure 16 - Parallel connection of three WeCo batteries

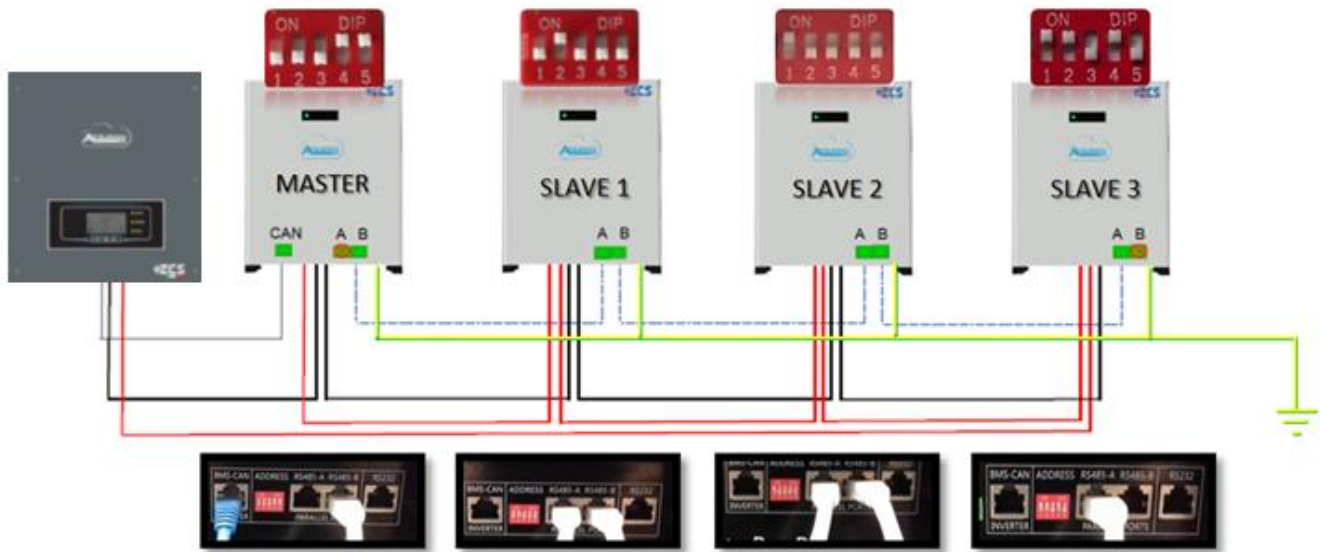


Figure 17 - Parallel connection of four WeCo batteries





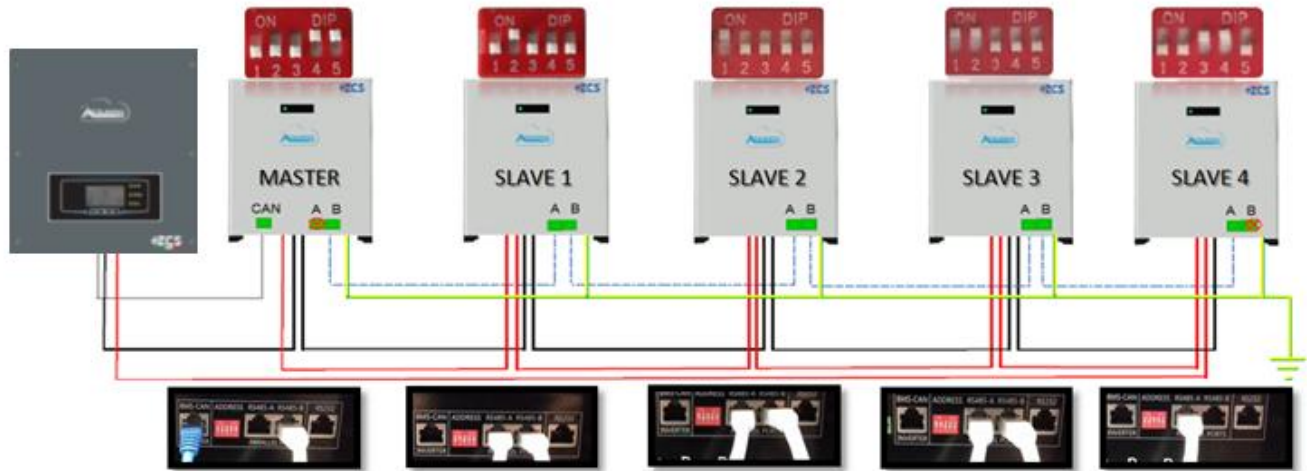


Figure 18 - Parallel connection of five WeCo batteries

#### 4.4. Photovoltaic connection

Recommended specifications for DC input cables

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

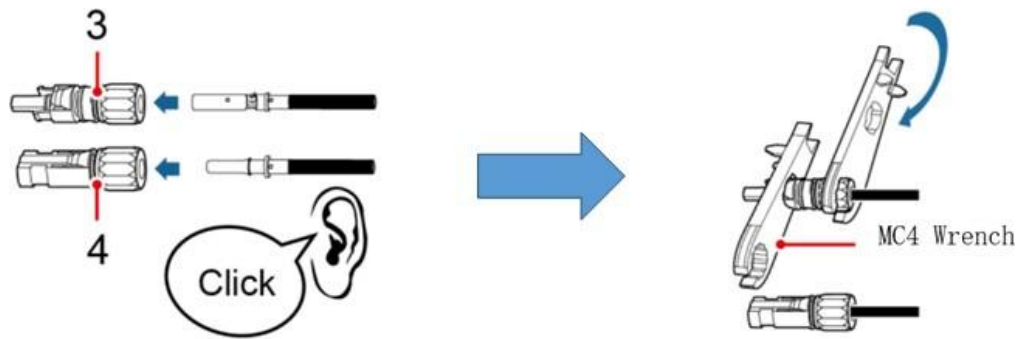
#### Procedure:

**Step 1:** Prepare the positive and negative photovoltaic cables.



Figure 19 - Preparing the positive and negative photovoltaic cables

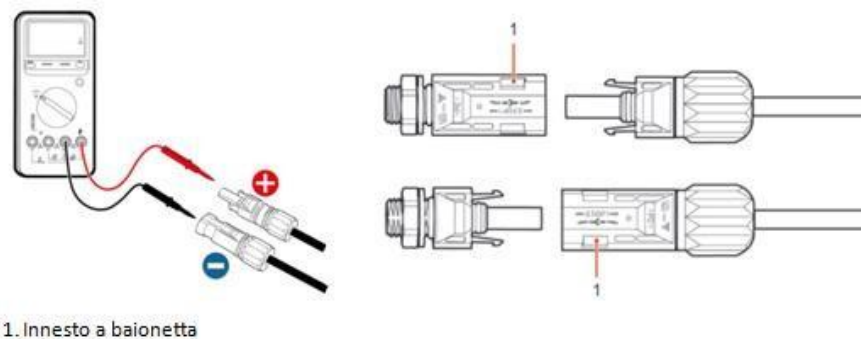
**Step 2:** Insert the crimped positive and negative cables into the corresponding photovoltaic connectors.



3. Connettore positivo 4. Connettore negativo

Figure 20 - Preparing the positive and negative photovoltaic connectors

**Step 3:** Make sure that the DC voltage of each photovoltaic string is less than 600V DC and that the polarities of the photovoltaic cables are correct. Insert the positive and negative connectors in the 1PH HYD3000-HYD6000-ZSS inverter until you hear a “click” sound, as show in Fig. 9.



1. Innesto a baionetta

Figure 21 - Connecting the photovoltaic connectors



**Caution**

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

## Removal procedure

Use a MC4 wrench to disconnect the photovoltaic connectors, as shown in figure 11.

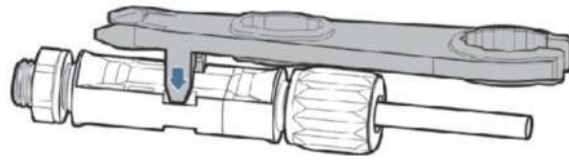


Figure 22 - Disconnecting the photovoltaic connectors

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

### Independent mode (default):

If the strings are different (e.g. installed on two separate flaps 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 cable must be suitable for photovoltaic applications.

### Note:

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



Figure 23 - Y-branch connection cable for solar panels

### 4.5. CT / Battery Communication / RS485 Connections

The CTa (current transformer) can measure the value and direction of the AC current. Refer to Figure 12 for the correct connection of the CTa.

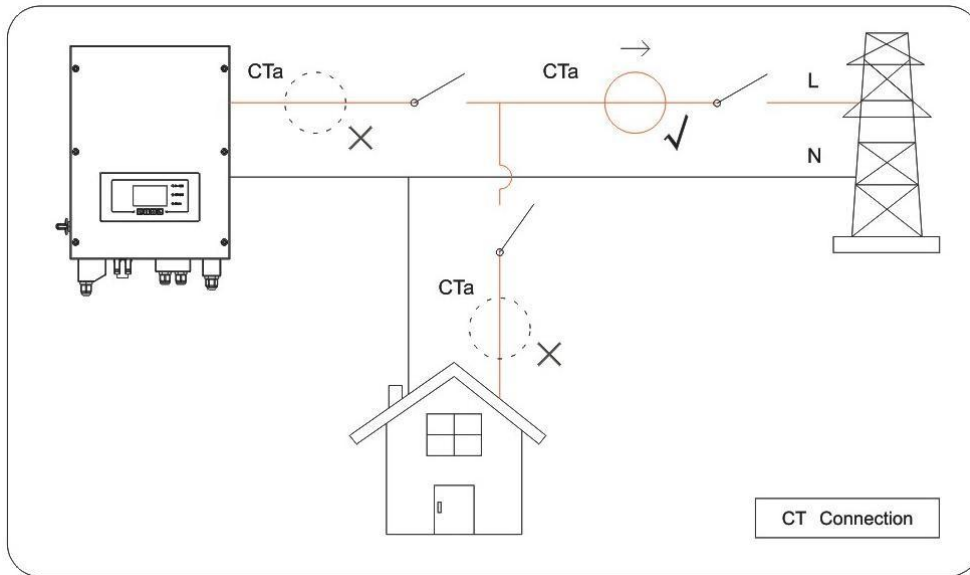


Figure 24 - CT connections

**Step 1:** Refer to figure 12 for the correct position of the CTa. Wrap the CTa around the L wire of the mains power supply.

**Step 2:** If necessary, network cables and terminal caps can be used to extend the CTa wires; the maximum length of the cables is 200m.

TC Wire	Extension (network cable)	HYD3000-HYD6000
Red	Orange / white orange / brown / white brown	CT+
Black	Green / white green / blue / white blue	CT-

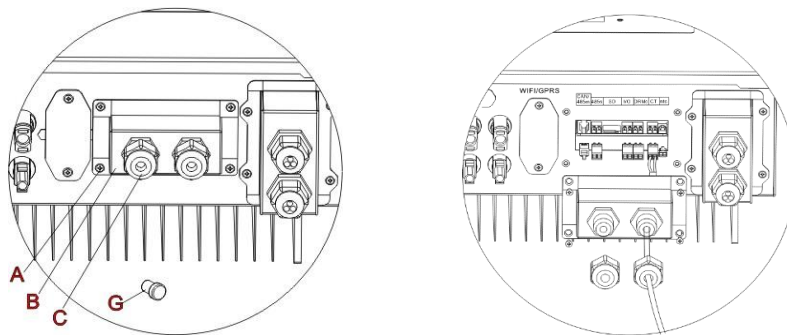


Figure 25 - CT / CAN / RS485 / NTS connections

**Step 3:** Loosen the 4 screws (part A) using a screwdriver (Fig. 13)

**Step 4:** Remove the waterproof cover (B), loosen the cable gland (C), and then remove the cap (G).

**Step 5:** Route the CT cable through the cable gland to the right of the cover, connect the cable to the CT terminal supplied, then insert the CT terminals into the corresponding ports (CTa for the exchange sensor and CTpv for the production sensor).

**Step 6:** If using Pylontech batteries, the communication cable between the inverter and batteries is supplied as an accessory inside the transparent bag in the inverter’s packaging. For WeCo batteries, the cable is found inside the battery packaging.

Connect one terminal to the battery (BAT), and the other to the inverter (inverter).

Route the communication cable (inverter side) through the cable gland on the left side of the cover, then insert the connector into the CAN port. Insert the battery-side connector (BAT end) into the CAN port of the PYLONTECH or WeCo battery.

NOTE: for correct connection between the inverter and batteries, please refer to the relevant procedure or manual.



Communication cable between the battery and the 1PH HYD3000-HYD6000-ZSS inverter	CAN communication	
	<b>1PH HYD3000-HYD6000-ZSS</b>	
	CAN port	CANH→pin1 CANL→pin2 GND→pin3
	<b>WeCo</b>	
	CAN port	CANH→pin1 CANL→pin2 GND→pin3

Figure 26 – End of WeCo communication cable with inverter-side terminal in the CAN input





Communication cable between the battery and the 1PH HYD3000-HYD6000-ZSS inverter	CAN communication	
	<b>1PH HYD3000-HYD6000-ZSS</b>	
	CAN port	CANH → pin1      CANL → pin2
	RS485 port	485A → pin3      485B → pin4
	<b>PYLONTECH</b>	
	CAN port	CANH → pin4      CANL → pin5
	RS485 port	485A → pin1 & pin8 485A → pin2 & pin7

Figure 27 – End of Pylontech communication cable with inverter-side terminal in the CAN input

**Step 7:** Replace the waterproof cover and secure it with the 4 screws; tighten the cable gland.

**Step 8:** Below are some simplified diagrams showing the correct and incorrect installation of the current sensors.

As shown in the figure, the CTa current sensor must be positioned on the phase wire coming from the import/export meter so that all the incoming and outgoing power flows can be read.



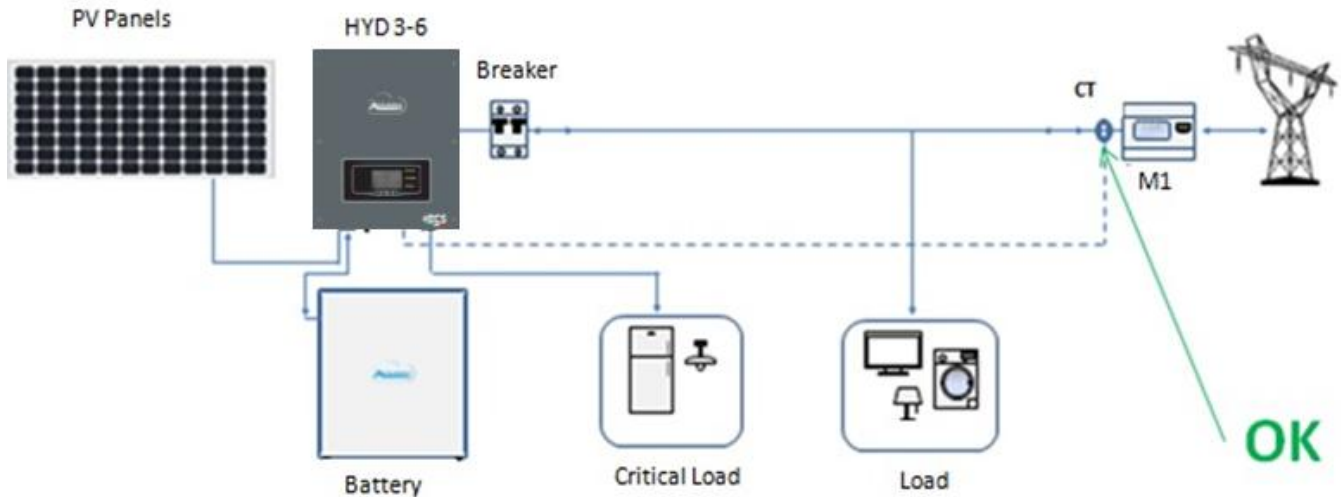


Figure 28 – Correct positioning of the current sensors

The figure below shows an incorrect positioning of the CTa sensor (consumption reading)

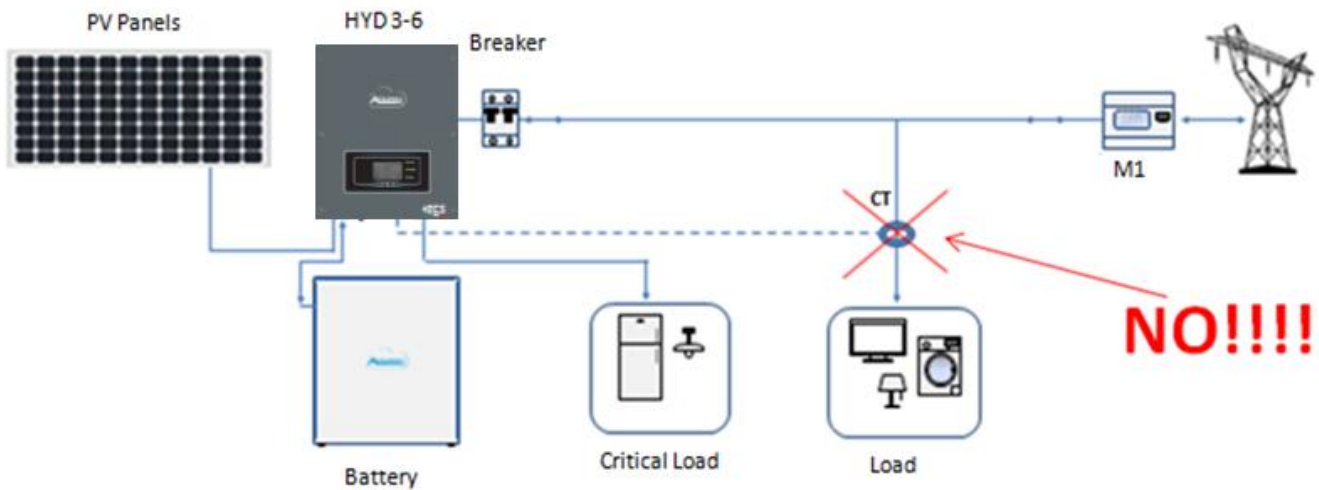


Figure 29 – Incorrect positioning of the current sensors (CTa reading of the utilities only)

In case of multiple phase cables connected in parallel directly under the import/export meter, make sure all the phase cables pass through the CTa sensor, as shown in the figure.

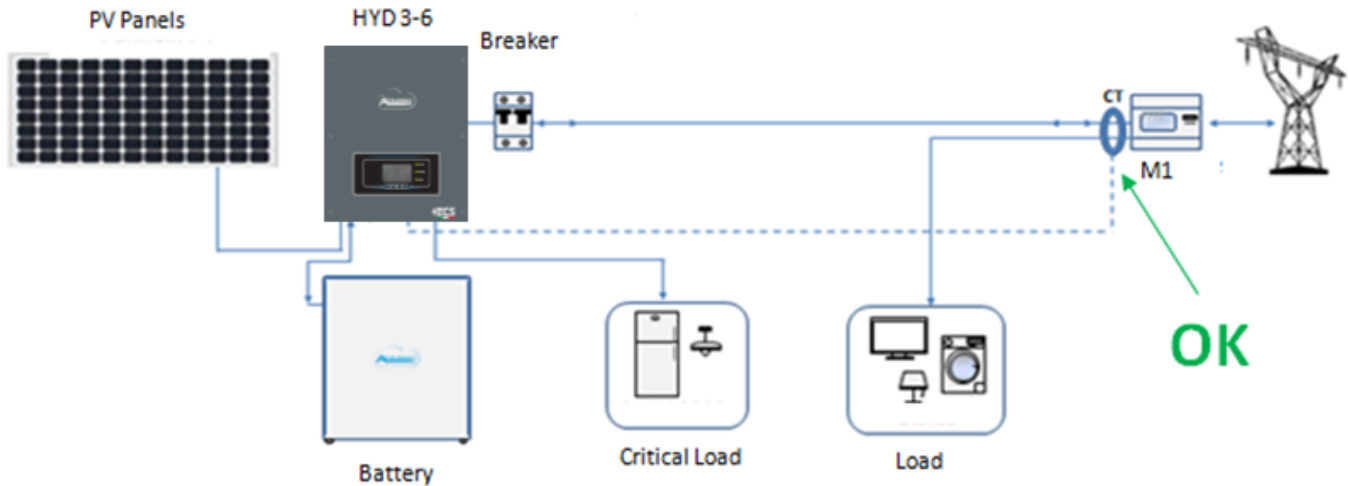


Figure 30 – Correct positioning of the current sensors for a system with two separate lines

## 4.6. Grid connection

**Step 1:** Loosen the 4 screws (part A) using a screwdriver (fig. 15).

**Step 2:** Remove the waterproof cover (part B), loosen the cable gland (part C), and then remove the cap (part G).

**Step 3:** Route a three-pole cable through the GRID cable gland, then connect the three wires to the corresponding terminal blocks. (BROWN - L, BLUE - N, YELLOW / GREEN - PE).

**Step 4:** Fasten the waterproof cover using the 4 screws.

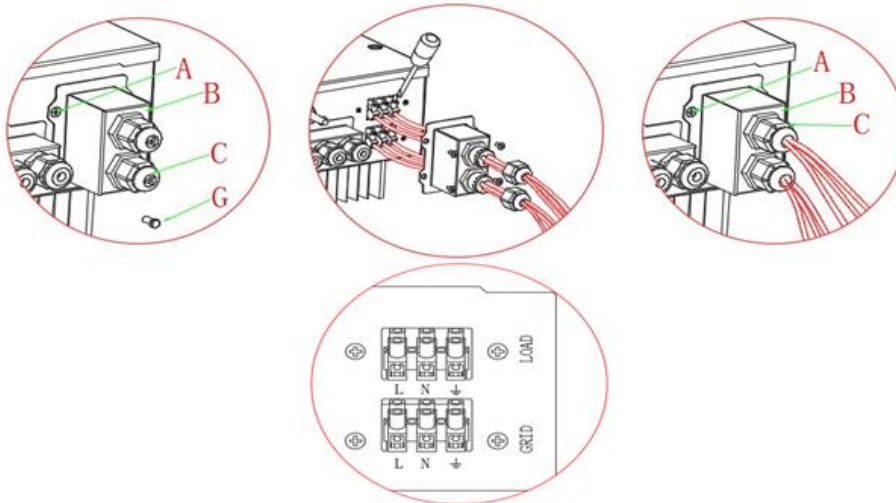


Figure 31 – Connecting the grid and critical loads



#### 4.7. Connecting a Critical Load (EPS function)


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

The LOAD connection port is only for connecting critical loads. The power of critical loads must not exceed 3000VA.

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

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

#### Change-over positions

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

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

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

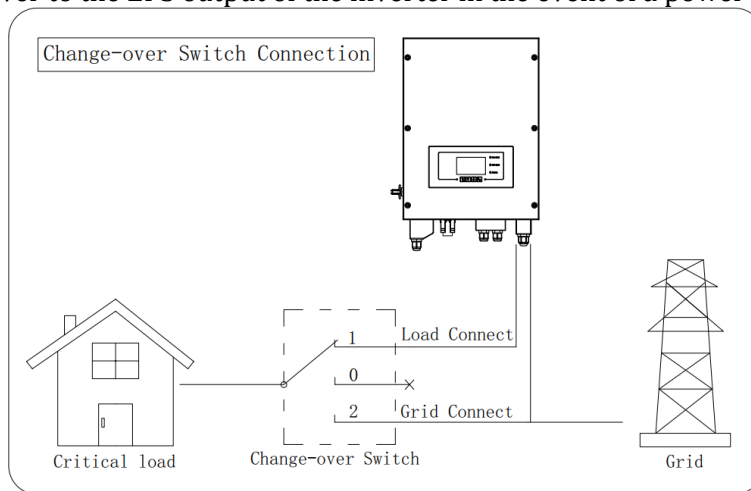


Figure 32 – Connecting the change-over switch

## 5. Buttons and indicator lights

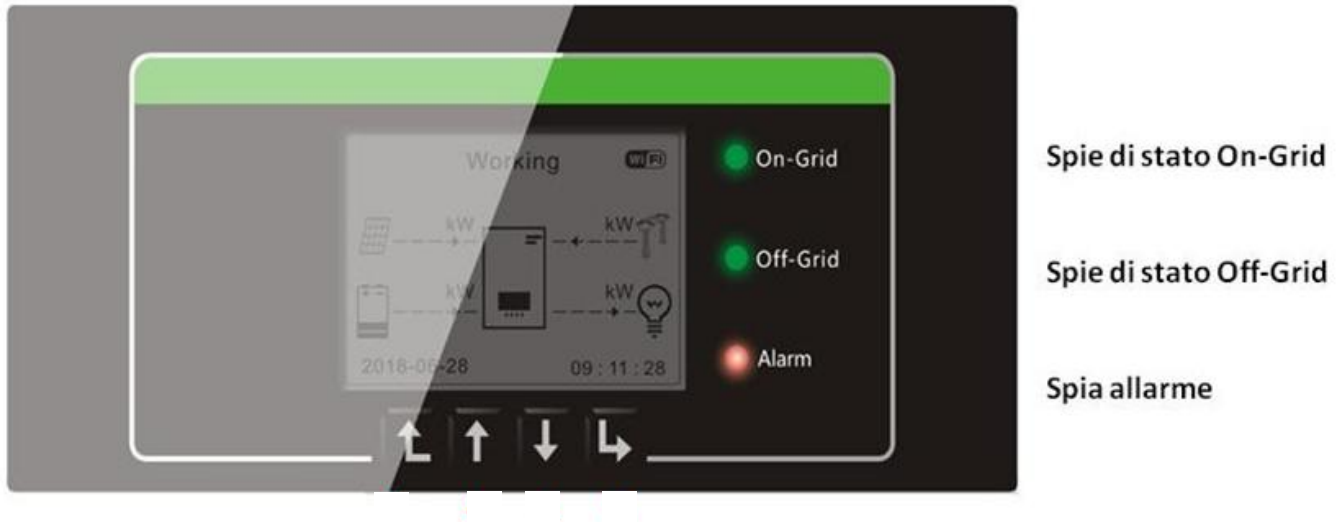


Figure 33 – Buttons and indicator lights

### 5.1. 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.

### 5.2. Indicator lights and operating status

Status of the 1PH HYD3000-HYD6000-ZSS inverter	On Grid Green light	Off-Grid Green light	Alarm Red light
On-grid	On		
Standby (On-Grid)	Intermittent		
Off-Grid		On	
Standby (Off-Grid)		Intermittent	
Alarm			On

## 6. Operation

### 6.1. Preliminary checks

Before starting the system, please check that:

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

### 6.2. 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 34 - 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 ( $800W < P < 1600W$ ), electric heaters ( $1000W < P < 2000W$ ) and ovens ( $P > 1500W$ ). Other types of loads, such as washing machines or heat pumps, although characterised by high energy consumption, may take some time to reach this level of absorption after starting.

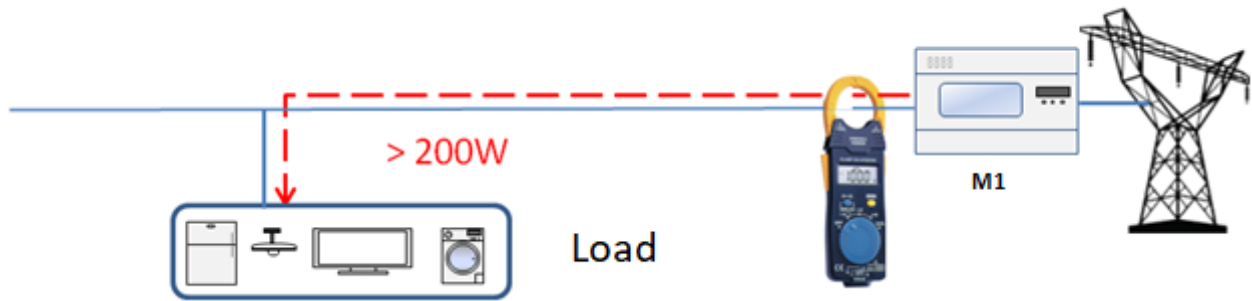


Figure 35 - Checking that the power consumption is above 200W

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 light up in sequence, and after a few seconds will turn off, except for the RUN indicating LED. After this, wait for the display to turn on.



Figure 36 - Battery status after setting the POWER switch to ON and pressing the SW button

In the case of WeCo batteries, press the RUN button for about one second; after releasing it, wait for the sound inside the battery indicating the closure of the relay. Repeat the operation for all the subsequent batteries in the system.



Figure 37 - View of WeCo battery ON button

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



Figure 38 – Example of AC switch protecting the inverter

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

1) Set the system time	8)* Set the minimum discharge voltage
2) Set the country	9)* Set the maximum discharge voltage
3) Select the type of battery	10)* Set the minimum voltage protection
4)* Set the battery capacity	11)* Set the depth of discharge
5)* Set the maximum charge voltage	12)* Set the no-load discharge voltage
6)* Set the maximum charge current	13)* Set the full charge voltage
7)* Set the maximum protection voltage	

Note: Settings 4)\* to 13)\* do not have to be configured.

#### 1) Setting of system time

The system time format 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 setting. Once the time has been set, the “Set Country” menu will pop up.

## 2) Set Country

Press “Up” or “Down” to select the country, press “OK” to complete the setting of the country. Once the country has been set, the “Select battery type” menu will pop up.

Code	Country
00	Germany VDE4105
01	CEI-021 Internal
02	Australia
03	SpainRD1699
04	Turkey
05	Denmark
06	Greece-Mainland
07	Netherlands
08	Belgium
09	UK G59
10	China

Code	Country
11	France
12	Poland
13	Germany BDEW
14	Germany VDE0126
15	CEI-016 Italy
16	UK G83
17	Greece-Islands
18	EU EN50438
19	IEC EN61727
20	Korea
21	Sweden

Code	Country
22	General Europe
23	CEI-021 External
24	Cyprus
25	India
26	Philippines
27	New Zealand
28	Brazil
29	Slovakia
30	Slovakia SSE
31	Slovakia ZSD
32	CEI0-21 In Areti



### Caution

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

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

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

## 3) Select type of battery

MENU	Compatible batteries
1.PYLON	PYLONTECH
2.(WeCo) GENERAL LITHIUM	WeCo

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

### 6.3. Commissioning

Main interface:

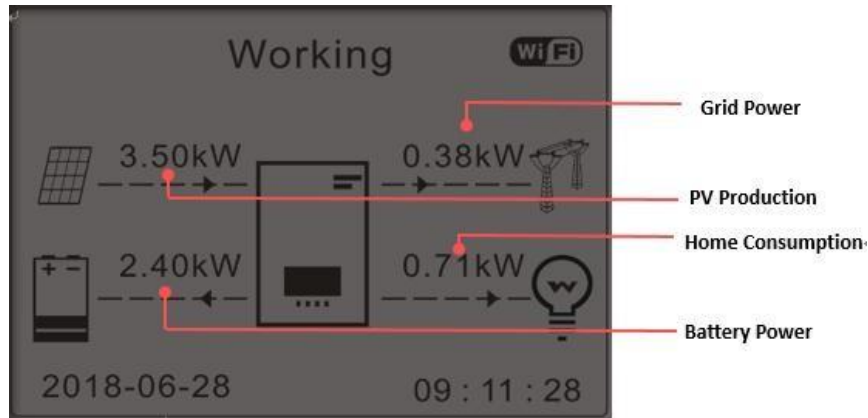


Figure 39 – Main interface

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

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

### 6.4. Main menu

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

Main interface	Press “Down”
	1. Grid(V)
	2. Grid(A)
	3. Frequency
	4. Battery(V)
	5. Charge current
	6. Discharge current
	7. Charge level
	8. Battery cycles
	9. Battery time



In the main interface, press the “Up” button to enter the page with the photovoltaic settings:

Main interface	Press “OK”
	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 has the following five options:

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

### 6.4.1. Basic settings

1. Settings	Press “OK”
	1. Language
	2. Date and Time
“Up”↑	3. Working Mode
	4. PV input mode
“Down” ↓	5. EPS mode
	6. Communication address
	7. Self-test



### 1. Set language

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

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

### 2. Set Time

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

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

### 3. Energy Storage Mode

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

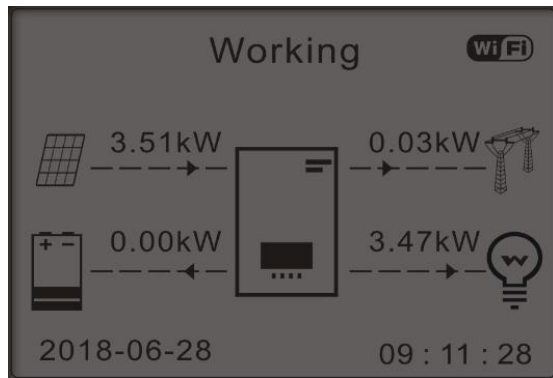
3. Energy Storage Mode	
	1. Select automatic mode
“Up” ↑	2. Select charge mode
“Down” ↓	3. Select Time Zone mode
	4. Select Passive Mode

#### 1) Select automatic mode

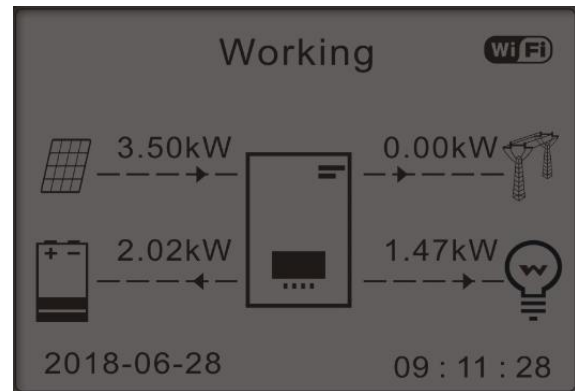
Select “1. Select automatic mode,” then press “OK.”

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

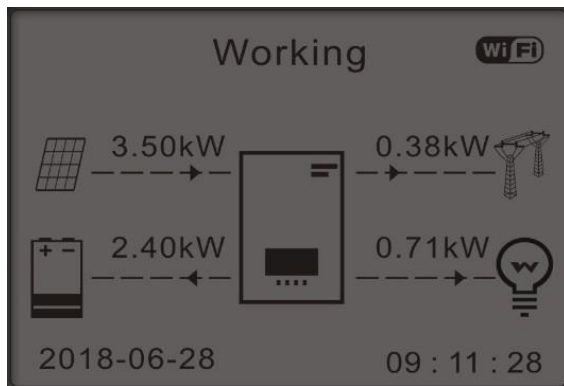
1) If PV production = LOAD consumption ( $\Delta P < 100W$ ) the 1PH HYD3000-HYD6000-ZSS inverter will not charge or discharge the battery.



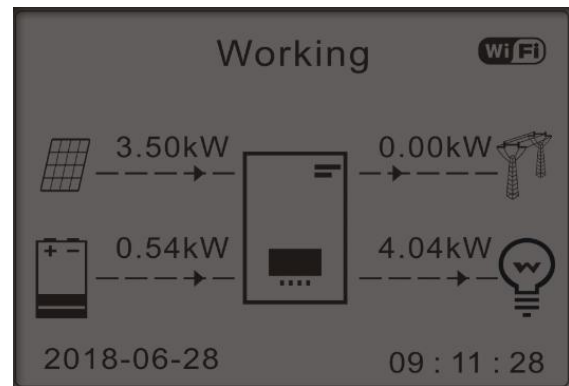
2) If PV production > LOAD consumption, the surplus power will be stored in the battery.



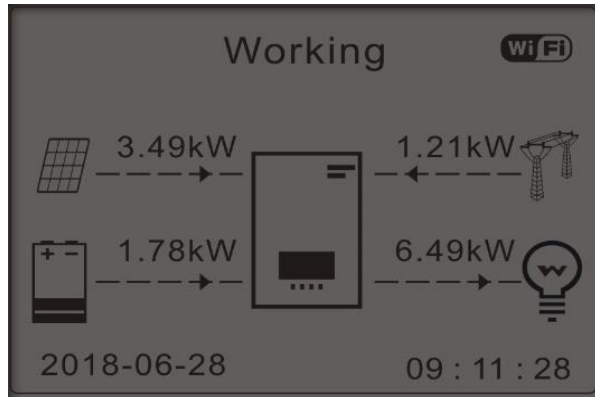
3) If the battery is fully charged (or already at max charge power), the surplus energy will be exported to the grid.



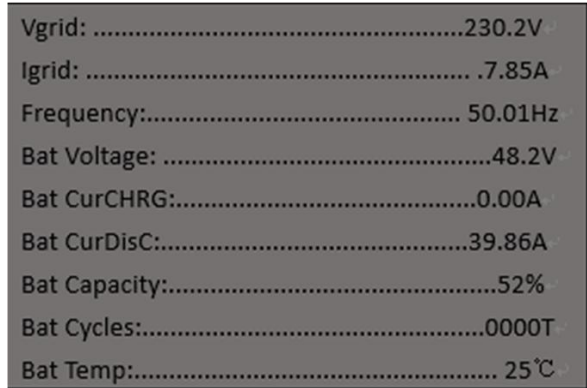
4) If PV production < LOAD consumption, then it will discharge the battery to supply power to the load.



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



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



#### 4. Photovoltaic Input Mode

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

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

#### 5. EPS Mode

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

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

#### 6. Communication address

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

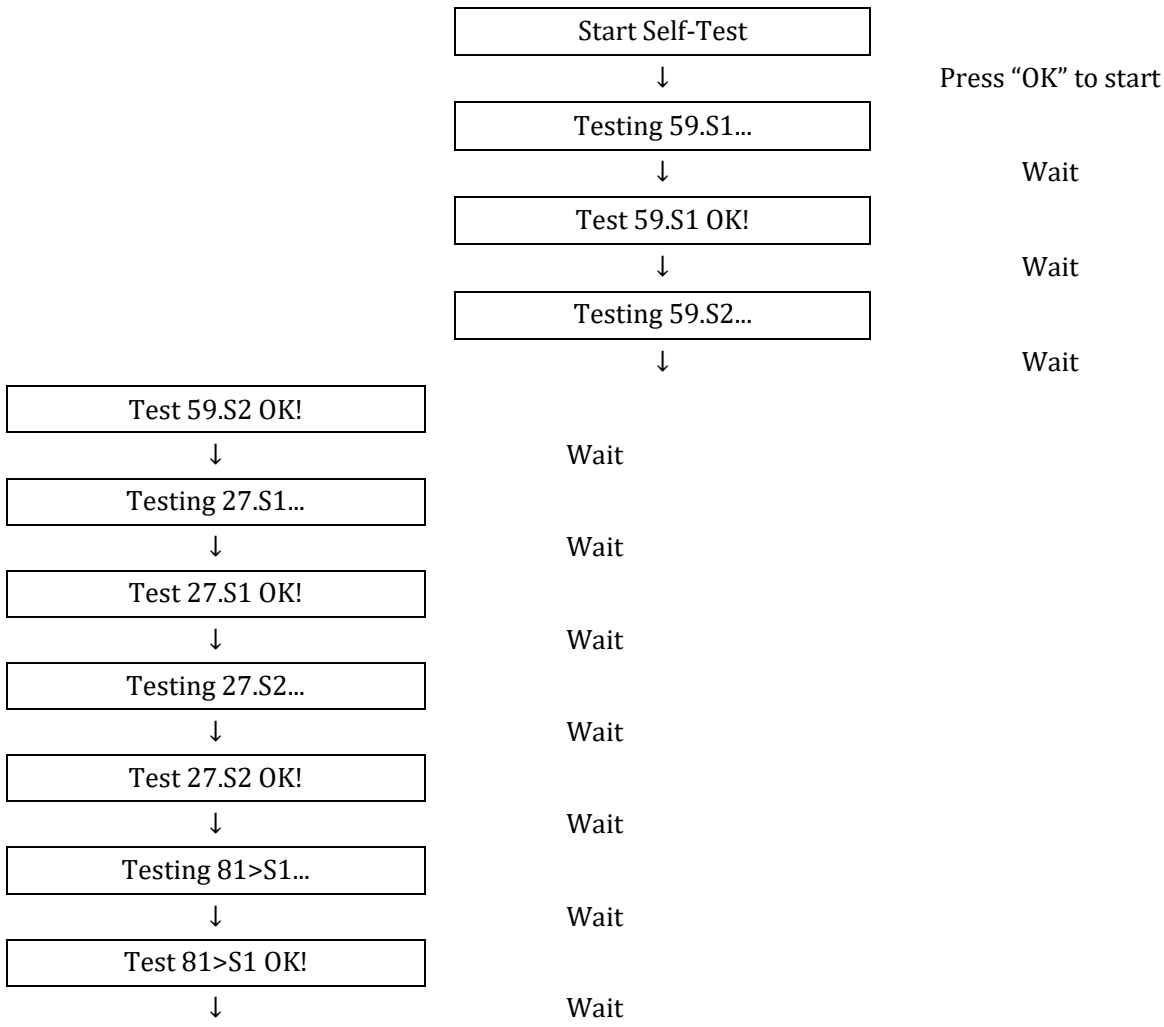
## 7. Self-test

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

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

### 1) Fast self-test

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



Testing 81>S2...	Wait
↓	
Test 81>S2 OK!	Wait
↓	
Testing 81<S1...	Wait
↓	
Test 81<S1 OK!	Wait
↓	
Testing 81<S2...	Wait
↓	
Test 81<S2 OK!	Press "OK"
↓	
OK self-test!	Press "Down"
↓	
59.S1 threshold 253V 900ms	Press "Down"
↓	
59.S1: 228V 902ms	Press "Down"
↓	
59.S2 threshold 264.5V 200ms	Press "Down"
↓	
59.S2: 229V 204ms	Press "Down"
↓	
27.S1 threshold 195.5V 400ms	

## 2) STD self-test

Select "2. STD self-test," then press "OK" to start the STD self-test. The test procedure is the same as the Fast Self-Test, but much longer.

## 3) PF Time Setting

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

Set: \*.\*\*\* s

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

#### 4) QV Time Setting

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

Set: \*\* s

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

#### 5) Control 81.S1

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

### 6.4.2. Advanced settings

2. Advanced settings	<b>Enter password: 0715</b>
	1. Battery Parameters
	2. Delete Energy Data
	3. Clear events
“Up”↑	4. Set Country
	5. Anti Reflux
“Down”↓	6. IV Curve Scan
	7. Battery Active
	8. DRMs0 Control
	9. Set Safety parameters

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

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

### 1) Battery parameters

1.Battery Parameters		
"Up" ↑	1)Battery type	7)Maximum discharge (A)
	2)*Battery Capacity	8)*Low (V) Protection
"Down" ↓	3)*Depth of discharge	9)*Minimum discharge
	4)Maximum charge (A)	10)No-load discharge (V)
	5)*Over (V) Protection	11)*Full Charge (V)
	6)*Maximum charge (V)	12) Save

Note: the 2)\*, 5)\*, 6)\*, 8)\*, 9)\*, 10)\* and 11)\* parameters do not have to be changed.

### 2) Reset Energy Data

Select "2. Reset Energy", then press "OK" to reset the energy data.

### 3) Clear events

Select "3. Clear Events," then press "OK" to clear all the events.

### 4) Country (refer to Set Country )

Select "4. Country", press "OK", the settings of the current country appear. Press "Up" or "Down" to change the first digit, press "OK" to move to the next digit. Enter the new country code and press "OK."

### 5) Anti Reflux

5.Anti Reflux control		
"Up" ↑	1.Anti Reflux control	Enable
		Disable
"Down" ↓	2.Reflux Power	***KW

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

## 6) IV Curve Scan

6.IV Curve Scan	
	1.Scan Control
“Up” ↑	Enable
“Down” ↓	Disabled
	2.Scan Period
	***min
	3.Force Scan

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

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

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

Contact ZCS Technical Support for more information.

### 6.4.3. Event list

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

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

#### 1) List of current events

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

#### 2) List of historical events

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



#### 6.4.4. System interface information

4. System information			
	Inverter information		
		Inverter Information (1)	SN Product
			Software version
			Hardware version
			Energy Level
		Inverter Information (2)	Country
			Photovoltaic Input Mode
			Energy Storage Mode
		Inverter Information (3)	RS485 address
			EPS Mode
			IV Curve Scan
			Anti Reflux
		Inverter Information (4)	DRMs0 Control
			PF Time Setting
			QV Time Setting
			Power factor
	Battery Info		
		Battery Info (0)	Battery type
			*Battery capacity
			Depth of discharge
			Maximum charge (A)
		Battery Info (1)	Over (V) Protection
			Maximum charge (V)
			Maximum discharge (A)
			Minimum discharge (V)



3.Safety Parameters

Safety parameters (0)	OVP 1
	OVP 2
	UVP 1
	UVP 2
Safety parameters (1)	OFP 1
	OFP 2
	UFP 1
	UFP 2
Safety parameters (2)	OVP 10mins

### 6.4.5. Energy statistics

5.Energy Statistics

1.Daily/Weekly

Photovoltaic ***KWH
Charge ***KWH
Export ***KWH
Import ***KWH
Charge ***KWH
Discharge ***KWH

2.Year/Duration

Photovoltaic ***KWH
Charge ***KWH
Export ***KWH
Import ***KWH
Charge



***KWH
Discharge
***KWH

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

### 6.4.6. Software Update

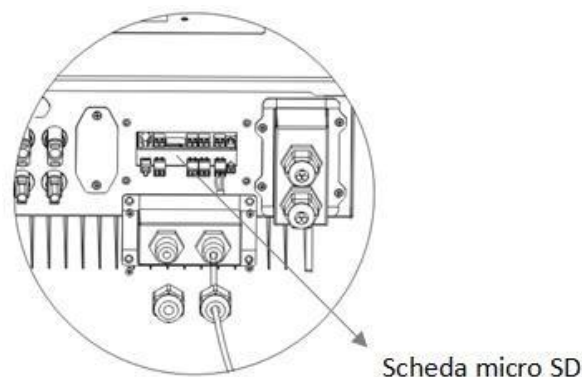
If a software update is required, ask ZCS to send you the latest version of the available firmware.

Copy the firmware folder to the main directory of the SD Card.

Select “6. Software Update” and press “OK”; “Enter Password” appears on the screen. Enter the password “0715”, press “Up” or “Down” to change the first digit, press “OK” to move to the next digit, when “0715” appears on the screen press “OK”. The 1PH HYD3000-HYD6000-ZSS inverter will automatically start the software update.

#### Detailed Procedure for Firmware Update:

**Step 1:** Turn off the AC switch (grid and load), then turn off the batteries and the photovoltaic switch. Remove the waterproof communication cover. If the communication cables (CAN/RS485/NTC/CT) have been connected, loosen the cable glands before removing the cover.



**Step 2:** Press the SD card and extract it. Insert the SD card into the micro-SD reader, then enter it into the PC; (Please note: the micro-SD reader and the PC are not supplied by ZCS).

**Step 3:** Format the SD card. Copy the “firmware” folder to the SD card.

**Step 4:** Insert the SD card into the SD card slot.

**Step 5:** Turn on the AC switch (grid), press “Back” to enter the main interface. Press “Down” to select “6. Software Update”, then press “OK.”

**Step 6:** “Enter password” appears. Enter the password “0715”, press “Up” or “Down” to change the first digit, press “OK” to move to the next digit, when “0715” appears on the screen press “OK” to start the firmware update.

**Step 7:** When the firmware update is complete, turn off the AC (mains) switch, close the waterproof communication cover with the four screws, then turn on the AC (mains) switch again. Turn on the battery switch, turn on the photovoltaic switch, the 1PH HYD3000-HYD6000-ZSS inverter will automatically resume operation.

NOTE: If “DSP Communication error,” “DSP1 update error” or “DSP2 update error” appear on the screen the firmware update has failed. In this case, turn off the AC (mains) switch, wait 5 minutes and start again from “**Step 5**”.

## 7. Verification of proper functioning

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

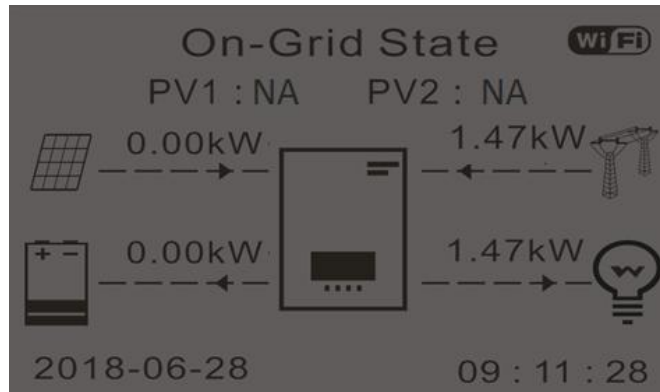
1. Switch off any source of photovoltaic generation by turning the circuit breaker to the OFF position.
2. Lower the protection switch of the 1PH HYD3000-HYD6000-ZSS inverter. The inverter will remain switched on but will go into error due to a lack of AC power (if the EPS function is enabled, it will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



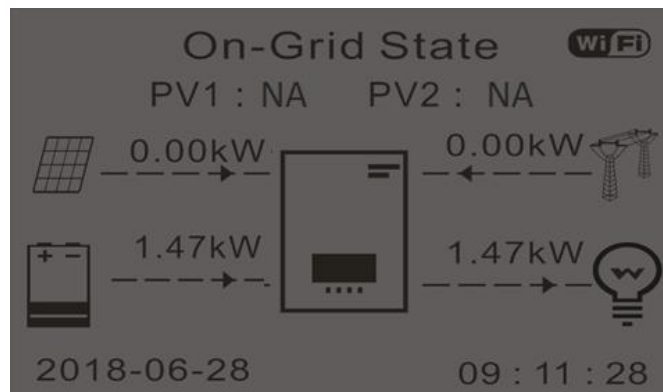
3. Power up the inverter by pulling up the AC switch.



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



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

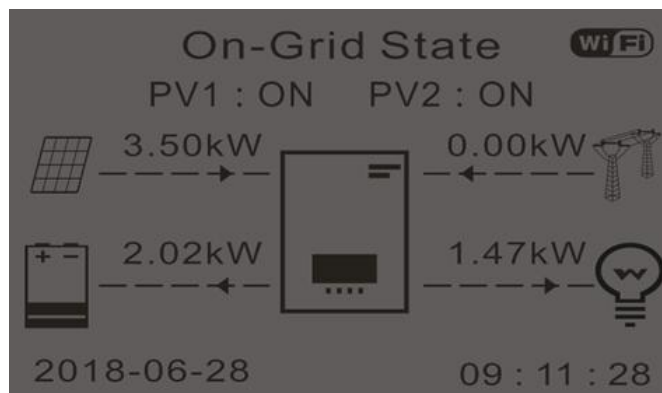


6. Switch on the photovoltaic system by turning the switch to the ON position.



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

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



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

## 7.1. Checking the settings

1. Below is a summary of all the settings on the device, which you can find in the system info 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 Info” menu by pressing the fourth key;

1.4. To scroll through the images, press the third ↓ key.

Info Sistema (1)		Inverter Info(2)	
Seriale :	ZE1ES330J28307	Paese :	CEI-021 Internal
Versione Software :	V2.00	Codice Servizio	V2.10
Versione Hardware :	V1.00	Modalità Ingresso PV:	Indipendente
Livello di potenza:	3kW	Modalità di Lavoro:	Modalità automatica

**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.

**Working mode:** in order to minimise exchanges with the grid, the correct mode will be “Automatic Mode.”

Inverter Info(3)		Info Sistema (4)	
Indirizzo RS485 :	01	Controllo DRMs0 :	Disabilitato
EPS :	Disabilitato	Imposta tempo PF :	DFLT : 0.000s SET : 0.000s
Scansione Curva IV :	Disabilitato	Imposta tempo QV :	DFLT : 3.0s SET : 3.0s
Modalità 0 Immissione :	Disabilitato	Fattore Potenza :	100%

**RS485 Address:** check that it has a value of 01 so that you can monitor your systems via the app or website.

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

**IV Curve Scan:** to be enabled if there is constant shading on the panels.

**0 In-feed Mode:** to be enabled if you want to avoid feeding into the grid.

**DRMs0 Control (or Logical Interface):** it must be disabled.



Info Sistema (5)	
Batteria attiva :	Disabilitato
Direzione CT :	Unfrozen
Insulation resistance :	7000KOhm

**CT Direction:** check the blocking status of the CTs.

**Insulation resistance:** check that the value of the insulation resistance is higher than the limits imposed by the standard.

Info Batteria (1)		Info Batteria (1)	
Tipo Batteria :	Pylon	Tipo Batteria :	WeCoHeSU V0. 3. 54
Capacità Batteria :	50Ah	Capacità Batteria :	86Ah
Profondità Scarica :	80% (EPS) 80%	Profondità Scarica :	80% (EPS) 90%
Corr. Carica max (A) :	BMS : 25.00A SET : 65.00A	Corr. Carica max (A) :	BMS : 65.00A SET : 65.00A

**Battery type:** check if the battery model on the display is consistent with the batteries installed.

**Battery capacity:** the system will show the total capacity of the batteries:

- 1 Pylontech → 50 Ah;
- 2 Pylontech → 100Ah
- n Pylontech → n x 50Ah
- 1 WeCo → 86 Ah;
- 2 WeCo → 172Ah
- n WeCo → n x 86Ah

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

Info Batteria (2)		Info Batteria (2)		Info Batteria (3)	
Soglia sovratensione :	54.0V	Soglia sovratensione :	59.3V	EPS Safety Buffer:	10%
Soglia carica max (V) :	53.2V	Soglia carica max (V) :	58.4V		
Corr. max Scarica (A) :	BMS : 25.00A SET : 65.00A	Corr. max Scarica (A) :	BMS : 65.00A SET : 65.00A		
Tensione min scarica :	47.0V	Tensione min scarica :	48.0V		



## 8. Technical specifications

TECHNICAL DATA	HYD3000	HYD3600	HYD4000	HYD4600	HYD5000	HYD6000
<b>DC input data (photovoltaic)</b>						
Maximum DC Power	3500W	4000W	4400W	5100W	5500W	6600W
Maximum DC power for each MPPT	2000W (160V-520V)	2400W (180V-520V)	2600W (200V-520V)	3000W (250V-520V)	3000W (250V-520V)	3500W (300V-520V)
No. of independent MPPTs / No. of strings per MPPT	2/1					
Maximum input voltage	600V					
Start-up voltage	120V					
Rated input voltage	360V					
MPPT DC voltage range	90V-580V					
DC voltage range at full load	160V-520V	180V-520V	200V-520V	190V-520V	250V-520V	300V-520V
Maximum input current for each MPPT	12A/12A					
<b>Battery connection data</b>						
Type of compatible battery	Lithium-ion (supplied by Zucchetti)					
Rated voltage	48V					
Allowable voltage range	42V-58V					
Recommended battery capacity	50Ah- 200Ah					
Maximum charge/discharge power	3000W					
Allowable temperature range*	-10°C-50°C					
Maximum charge current	65A (programmable)					
Maximum discharge current	65A (programmable)					
Charge curve	Managed by the battery's BMS					
Depth of Discharge (DoD)	Lithium-ion: 0%-90% (programmable)					
<b>AC output (grid side)</b>						
Rated power	3000W	3680W	4000W	4600W	5000W	6000W
Maximum Power	3000VA	3680VA	4000VA	4600VA	5000VA	6000VA
Maximum current	13.7A	16A	18.2A	21.3A	22.8A	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 limit	Programmable from display					
<b>EPS Output (Emergency Power Supply)</b>						
Power supplied in EPS mode** in the absence of photovoltaic production	3000VA					
EPS output voltage and frequency	Single-phase 230V 50Hz/60Hz					
Current supplied in EPS mode	13A					
Apparent peak power in the absence of photovoltaic production	4000VA for 10s					
Total harmonic distortion	< 3%					
Switch time	< 25ms					
<b>Efficiency</b>						
Maximum efficiency	97.6%	97.8%	98.0%	97.8%	97.8%	98.0%
Weighted efficiency (EURO)	97.2%	97.3%	97.5%	97.3%	97.3%	97.5%
MPPT efficiency	>99.9%					
Maximum battery charge/discharge efficiency	94.6%					
Consumption in stand-by	< 5W					
<b>Protections</b>						
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/Protective class	Overvoltage Category III / Protective class I					
Integrated dischargers	AC/DC MOV: Type 3 Standard					
Battery soft start	Yes					
<b>Standard</b>						
EMC	EN 61000-6-1/2/3/4,					
Safety standard	IEC 62116, IEC 61727, IEC 61683, IEC 60068-1/2/14/30, IEC 62109-1/2					
Grid connection standard	CEI 0-21, NB/T32004-2013, AS4777, VDE 0126-1, G83/2, G59/3, EN50438, VDE-AR-N4105					
<b>Communication</b>						
Communication interfaces	Wi-Fi, GPRS, Ethernet (Optional), RS485 (proprietary protocol), SD card, CAN 2.0 (for battery connection)					
Additional inputs or connections	Input for current sensor connection					
Data storage on SD	25 years					
<b>General information</b>						
Allowable ambient temperature range	-30°C...+60°C (power limit above 45°C)					
Topology	Transformerless / High-frequency isolation battery output					
Environmental protection class	IP65					
Allowable relative humidity range	0%.....95% non-condensing					
Maximum operating altitude	2000m					
Noise level	< 25dB @ 1mt					
Weight	20.5Kg					
Cooling	Natural convection					
Dimensions (H x L x D)	566mm x 394mm x 173mm					
Display	LCD					
Warranty	10 years					

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

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

## 9. Troubleshooting

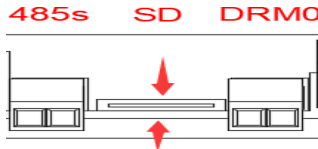
Code	Name	Description	Solution
ID01	GridOVP	The grid voltage is too high.	<p>If the alarms occurs occasionally, the probable cause is that the electric grid is in an abnormal state.</p> <p>The 1PH HYD3000-HYD6000-ZSS inverter will automatically return to its normal operating state when the electrical grid is restored to its normal state.</p> <p>If the alarm occurs frequently, check whether the grid voltage/frequency is within the correct range. If so, check the AC switch and the AC wiring of the 1PH HYD3000-HYD6000-ZSS inverter.</p> <p>If the grid voltage/frequency is NOT within the acceptable range and the AC wiring is correct but the alarm occurs repeatedly, contact ZCS Technical Support to change the grid overvoltage, undervoltage, overfrequency and underfrequency protection points after obtaining approval from the local grid operator.</p>
ID02	GridUVP	The grid voltage is too low.	
ID03	GridOFP	The grid frequency is too high.	
ID04	GridUFP	The grid frequency is too low.	
ID05	BatOVP	The battery voltage is too high	<p>If the alarm occurs occasionally, wait a few moments to see if the problem has been resolved.</p> <p>If the alarm occurs frequently, check that the battery overvoltage setting is compatible with the battery specifications.</p>
ID06	Vlvrtlow	LVRT function error	Contact ZCS Technical Support
ID07	Vovrthigh	OVRT function error	

<b>ID08</b>	PVOVP	The photovoltaic voltage is too high	Check whether too many photovoltaic modules have been connected in series in a PV string and therefore the voltage (Voc) of the PV string is higher than the maximum input voltage of the inverter. In this case, reduce the voltage of the PV string by adjusting the number of photovoltaic modules so that it adapts to the voltage range of the inverter. Once the necessary changes have been made, the inverter returns to its normal operating state.
<b>ID09</b>	HW_LLCCBus_OVP	The LLCBus voltage is too high and has triggered the hardware protection.	<p>ID09 - ID12 are internal faults of the inverter; switch it off, wait 5 minutes and then switch it back on again. Check if the problem has been resolved.</p> <p>If not, contact ZCS Technical Support.</p>
<b>ID10</b>	HW_Boost_OVP	The voltage increase is too high and has triggered the hardware protection	
<b>ID11</b>	HwBuckBoostOCP	The BuckBoost current is too high and has triggered the hardware protection	
<b>ID12</b>	HwBatOCP	The battery current is too high and has triggered the hardware protection	
<b>ID13</b>	GFCI OCP	The GFCI sampling value between the master DSP and slave DSP is not suitable.	
<b>ID14</b>	HWPVOC	The photovoltaic current is too high and has triggered the hardware protection	<p>ID14-ID15 are internal faults of the 1PH HYD3000-HYD6000-ZSS inverter; switch it off, wait 5 minutes and then switch it back on again. Check if the problem has been resolved. If not, contact ZCS Technical Support.</p>
<b>ID15</b>	HwAcOCP	The grid current is too high and has triggered the hardware protection	
<b>ID16</b>	IpvUnbalance	The input current is not balanced.	Check the settings of the <a href="#">photovoltaic Input mode</a> (parallel/independent mode) of the inverter. If this is not correct, change the <a href="#">input mode</a> .

<b>ID17</b>	HwADFaultIGrid	Sampling error of the grid current.	ID17-ID26 are internal faults of the 1PH HYD3000-HYD6000-ZSS inverter; switch it off, wait 5 minutes and then switch it back on again. Check if the problem has been resolved. If not, contact ZCS Technical Support.
<b>ID18</b>	HwADFaultDCI	DCI sampling error.	
<b>ID19</b>	HwADFaultVGrid	Sampling error of the grid voltage.	
<b>ID20</b>	GFCIDeviceFault	GFCI sampling error.	
<b>ID21</b>	MChip_Fault	Master chip fault	
<b>ID22</b>	HwAuxPowerFault	Auxiliary voltage error	
<b>ID25</b>	LLCBusOVP	The LLCBus voltage is too high.	
<b>ID26</b>	SwBusOVP	The Bus voltage is too high and has triggered the hardware protection.	
<b>ID27</b>	BatOCP	Battery current is too high.	If the fault occurs frequently, contact ZCS Technical Support.
<b>ID28</b>	DciOCP	The DCI is too high.	ID28-ID31 are internal faults of the 1PH HYD3000-HYD6000-ZSS inverter; switch it off, wait 5 minutes and then switch it back on again. Check if the problem has been resolved. If not, contact ZCS Technical Support.
<b>ID29</b>	SwOCPInstant	The grid current is too high.	
<b>ID30</b>	BuckOCP	The buck current is too high.	
<b>ID31</b>	AcRmsOCP	The output current is too high	
<b>ID32</b>	SwBOCPInstant	The input current is too high.	Check whether the input current is higher than the maximum input current of the 1PH HYD3000-HYD6000-ZSS inverter, then check the input wiring; if both are correct, contact Technical Support.
<b>ID33</b>	PvConfigSetWrong	Incorrect input mode	Check the settings of the photovoltaic input mode (parallel/independent mode) of the 1PH HYD3000-HYD6000-ZSS inverter. If this is not correct, change the photovoltaic input mode.
<b>ID34</b>	Overload	Overload	Adjust the load power in the correct range.

<b>ID35</b>	CT Fault	The CT is faulty	Check whether the CT is stable and has been directed correctly.
<b>ID48</b>	Fault-ConsistentFault	The GFCI sampling value between the master DSP and slave DSP is not suitable.	ID48-ID51 are internal faults of the 1PH HYD3000-HYD6000-ZSS inverter; switch it off, wait 5 minutes and then switch it back on again. Check if the problem has been resolved. If not, contact ZCS Technical Support.
<b>ID49</b>	ConsistentFault_VGrid	The grid voltage sampling value between the master DSP and slave DSP is not suitable.	
<b>ID50</b>	ConsistentFault_FGrid	The grid frequency sampling value between the master DSP and slave DSP is not suitable.	
<b>ID51</b>	ConsistentFault_DCI	The Dci sampling value between the master DSP and slave DSP is not consistent	
<b>ID52</b>	BatCommunication Flag	HYD3000-HYD6000-ZSS inverter can't communicate with Lithium battery BMS correctly.	
<b>ID53</b>	SpiCommLose	SPI communication is fault	ID53-ID55 are internal faults of HYD3000-HYD6000-ZSS inverter, switch OFF HYD3000-HYD6000-ZSS inverter, wait for 5 minutes, then switch ON HYD3000-HYD6000-ZSS inverter. Check whether the problem is solved. If no, please contact ZCS Technical Support.
<b>ID54</b>	SciCommLose	SCI communication is fault	
<b>ID55</b>	RecoverRelayFail	The relays fault	
<b>ID56</b>	PvIsoFault	The insulation resistance is too low	Check the insulation resistance between the PV array and earth(ground), if a short circuit occurs, rectify the fault.
<b>ID57</b>	OverTempFault_BAT	The battery temperature is too high	Make sure that the 1PH HYD3000-HYD6000-ZSS inverter is installed away from direct sunlight. Make sure that the 1PH HYD3000-HYD6000-ZSS inverter is installed in a cool, well-ventilated place. Make sure that the inverter is installed vertically and that the ambient temperature is below the limits tolerated by the 1PH HYD3000-HYD6000-ZSS inverter.
<b>ID58</b>	OverTempFault_HeatSink	The heatsink temperature is too high.	
<b>ID59</b>	OverTempFault_Env	The ambient temperature is too high.	
<b>ID60</b>	PE connectFault		Check the grounding of the AC output of the PE cable.

<b>ID65</b>	UnrecoverHwAcOCP	The grid current is too high and has caused an irreparable hardware failure.	ID65-ID67 are internal faults of the inverter; switch it off, wait 5 minutes and then switch it back on again. Check if the problem has been resolved. If not, contact ZCS Technical Support.
<b>ID66</b>	UnrecoverBusOVP	The bus voltage is too high and has caused an irreparable fault.	
<b>ID67</b>	BitEPSunrecover BatOCP	Unrecoverable battery overcurrent fault in EPS mode	
<b>ID68</b>	UnrecoverIpv Unbalance	The input current is not balanced and has caused an unrecoverable fault.	Check the settings of the photovoltaic input mode (parallel/independent mode) of the 1PH HYD3000-HYD6000-ZSS inverter. If this is not correct, change the photovoltaic input mode.
<b>ID70</b>	UnrecoverOCPIstant	The grid current is too high and has caused an irreparable fault.	ID70-ID73 are internal faults of the inverter; switch it off, wait 5 minutes and then switch it back on again. Check if the problem has been resolved. If not, contact ZCS Technical Support.
<b>ID73</b>	UnrecoverIPVInstant	The input current is too high and has caused an unrecoverable fault.	
<b>ID74</b>	UnrecoverPvConfigSetWrong	Incorrect input mode	Check the settings of the photovoltaic input mode (parallel/independent mode) of the 1PH HYD3000-HYD6000-ZSS inverter. If this is not correct, change the photovoltaic input mode.
<b>ID75</b>	unrecoverEEPROM_W	Unrecoverable EEPROM writing	ID75-ID77 are internal faults of the inverter; switch it off, wait 5 minutes and then switch it back on again. Check if the problem has been resolved. If not, contact ZCS Technical Support.
<b>ID76</b>	unrecoverEEPROM_R	Unrecoverable EEPROM reading	
<b>ID77</b>	unrecoverRelayFail	The relay has generated a permanent fault.	
<b>ID81</b>	Over-temperature	The internal temperature is too high.	Make sure that the 1PH HYD3000-HYD6000-ZSS inverter is installed away from direct sunlight. Make sure that the 1PH HYD3000-HYD6000-ZSS inverter is installed in a cool, well-ventilated place. Make sure that the inverter is installed vertically and that the ambient temperature is below the limits tolerated by the 1PH HYD3000-HYD6000-ZSS inverter.
<b>ID82</b>	Over-frequency	The AC frequency is too high.	

<b>ID83</b>	Remote power derating	Derating of remote power	The 1PH HYD3000-HYD6000-ZSS inverter receives a remote signal to decrease its power.
<b>ID84</b>	Remote off	Remote shutdown of HYD inverters	The 1PH HYD3000-HYD6000-ZSS inverter receives a remote signal to shutdown.
<b>ID85</b>	SOC <= 1 -DOD or The battery voltage is low	Battery voltage is lower than the DOD	For example, if the DOD is set at 30%, when the DOD is below 70%, ID85 will appear in the event list. The 1PH HYD3000-HYD6000-ZSS inverter will not discharge the battery when ID85 is present. Or, it could indicate that the battery voltage is too low. In this case, the 1PH HYD3000-HYD6000-ZSS inverter will not discharge the battery to ensure a longer battery life.
<b>ID86</b>	Force charge failure	Force charge failure	Check whether the photovoltaic and grid conditions meet the charging conditions.
<b>ID94</b>	Software version is not consistent	The firmware version installed is not suitable for the type of inverter.	Contact Technical Support to update the software.
<b>ID95</b>	CommEEPROMFault	The EEPROM communication board is faulty.	ID95-ID96 are internal faults of the 1PH HYD3000-HYD6000-ZSS inverter; switch it off, wait 5 minutes and then switch it back on again. Check if the problem has been resolved.  If not, contact ZCS Technical Support.
<b>ID96</b>	RTCFault	The RTC clock chip is faulty.	
<b>ID98</b>	SDfault	The SD card is faulty.	ID98 is generally caused by a loose SD card support. Click and pull out the SD card, press the support and reinsert the card. This should fix the problem.  
<b>ID99</b>	Wi-Fi fault	The Wi-Fi is in error	Contact Technical Support
<b>ID100</b>	BatOCD	Battery discharge overcurrent protection	ID100-ID103 are battery errors. If the alarm occurs occasionally, wait a few moments to see if the problem has been resolved.
<b>ID101</b>	BatSCD	Short-circuit discharge protection	



<b>ID102</b>	BatOV	Battery overvoltage protection	Technical Support.
<b>ID103</b>	BatUV	Battery undervoltage protection	
<b>ID104</b>	BatOTD	Battery overtemperature protection while discharging	<p>Make sure that the battery is in a well-ventilated place.</p> <p>Try to decrease the maximum discharge (A) and/or maximum charge (A) to see if the problem is fixed.</p>
<b>ID105</b>	BatOTC	Battery overtemperature protection while charging	
<b>ID106</b>	BatUTD	Battery low temperature protection while discharging	<p>Try to increase the ambient temperature in the battery location.</p>
<b>ID107</b>	BatUTC	Battery low temperature protection while discharging	

## 9.1. Maintenance

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

### Cleaning the inverter

Use an air compressor, a soft dry cloth or a soft-bristled brush to clean the inverter. Do not use water, corrosive chemicals or aggressive detergents to clean the inverter. Disconnect the AC and DC power to the inverter before performing any cleaning operations.

### Cleaning the heatsink

Use an air compressor, a soft dry cloth or soft-bristled brush to clean the heatsink. Do not use water, corrosive chemical substances or aggressive detergents to clean the heatsink. Disconnect the AC and DC power to the inverter before performing any cleaning operations.

## 10. Uninstalling

### 10.1. Uninstallation steps

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

### 10.2. Packaging

If possible, pack the inverter in its original packaging.

### 10.3. Storage

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

### 10.4. Disposal

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



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

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

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

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

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

## 11. Monitoring systems

### 11.1. External Wi-Fi adapter

#### 11.1.1. 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.



Figure 40 – Port for external Wi-Fi adapter

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

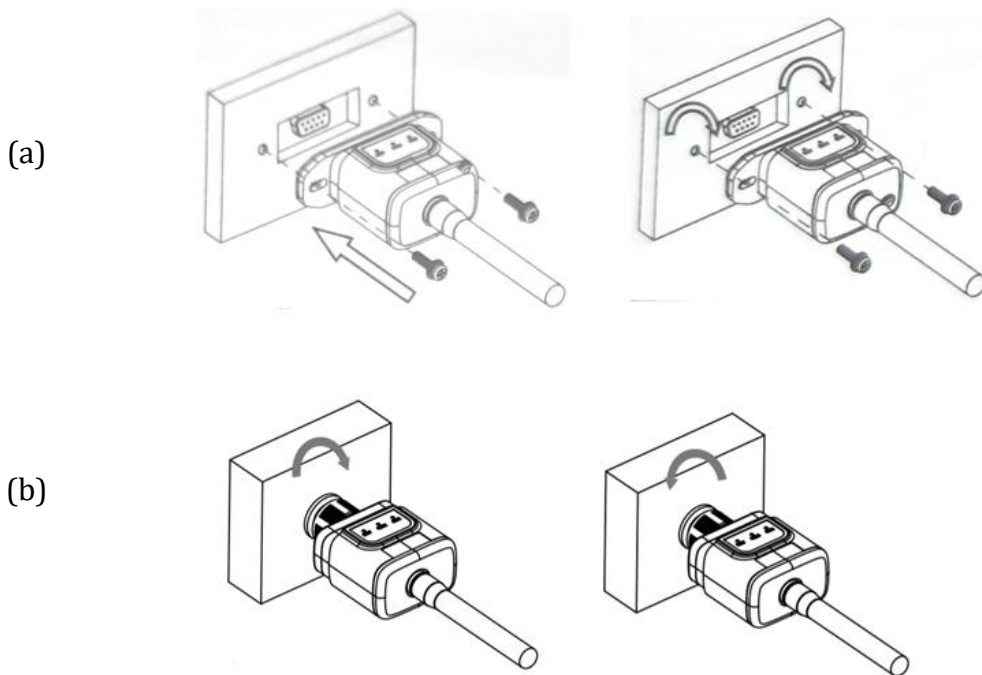


Figure 41 – Inserting and securing the external Wi-Fi adapter

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

### 11.1.2. Configuration

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

**Tools required for configuration:**

- Smartphone, PC or tablet

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

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

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

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

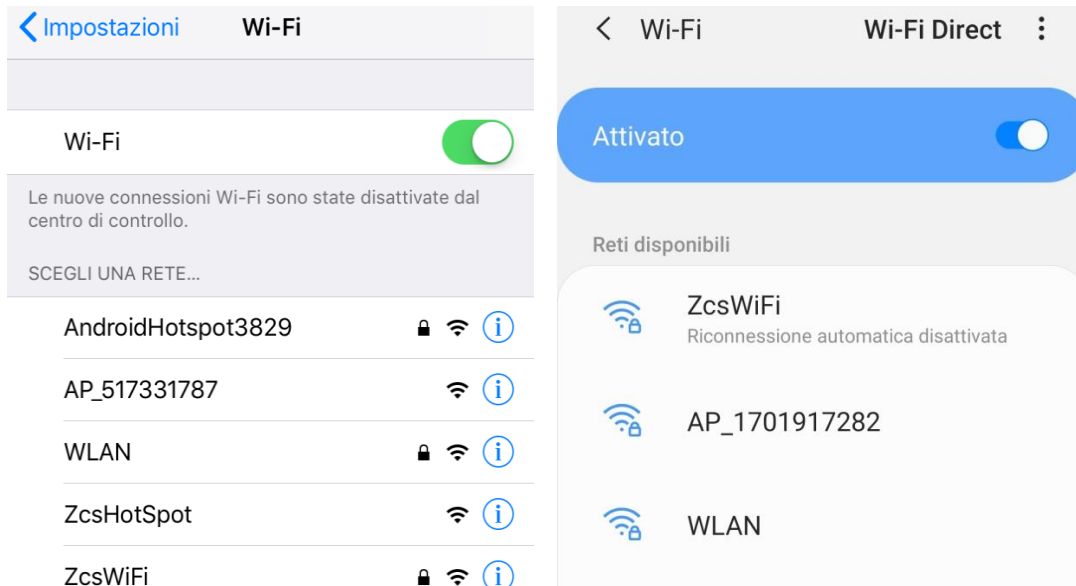


Figure 42 - Search for Wi-Fi networks on iOS smartphone (left) and Android smartphone (right)

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



Figure 43 - 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.

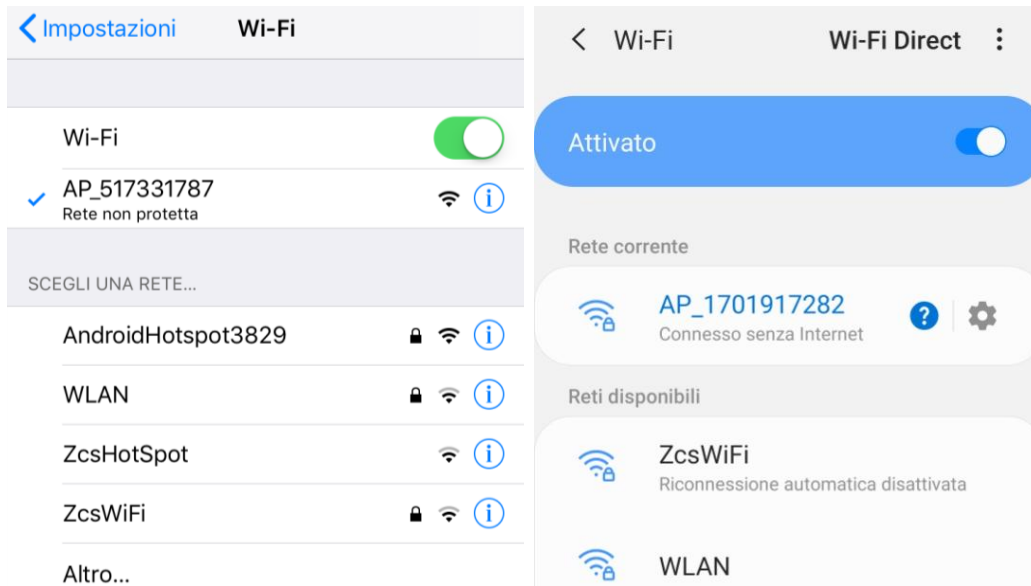


Figure 44 - Connection to Access Point for Wi-Fi adapter on iOS smartphone (left) and Android smartphone (right)

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



Figure 45 - 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.

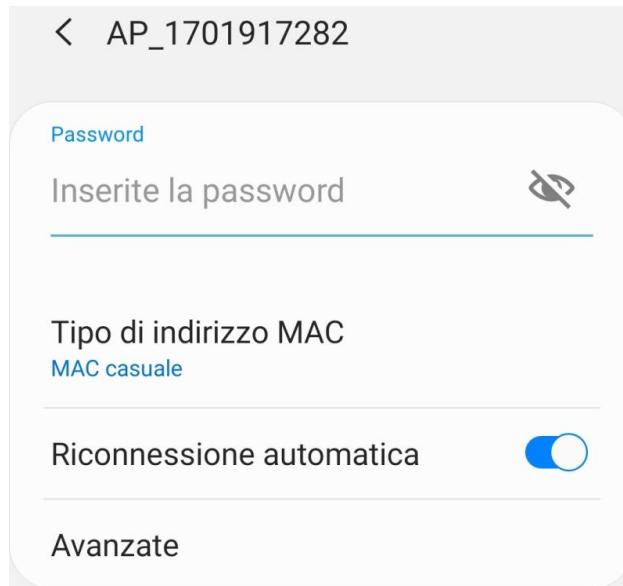


Figure 46 – Password entry prompt

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

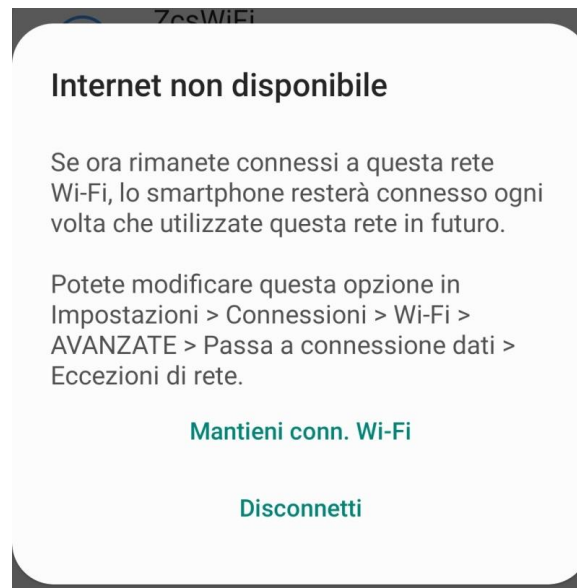


Figure 47 – Screen indicating that the Internet cannot be accessed

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

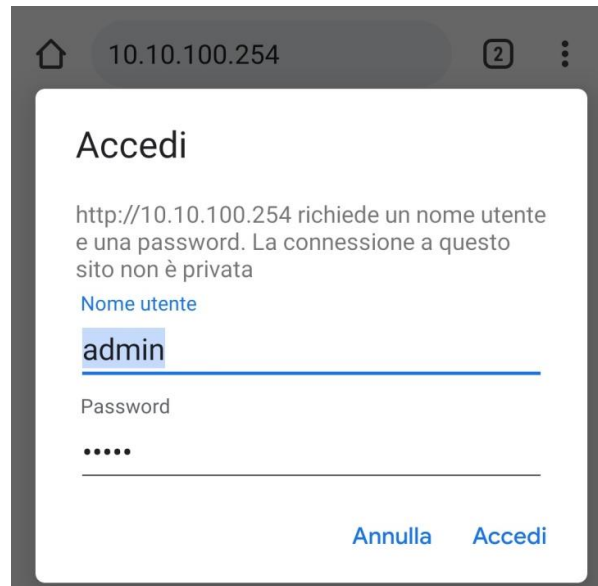


Figure 48 – Screen for accessing the web server to configure the Wi-Fi adapter

- 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.



中文 | English

<b>Status</b>																								
Wizard	<div style="border: 2px solid red; padding: 5px;"> <p><b>- Inverter information</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>Inverter serial number</td><td style="text-align: right;">ZH1ES160J3E488</td></tr> <tr><td>Firmware version (main)</td><td style="text-align: right;">V210</td></tr> <tr><td>Firmware version (slave)</td><td style="text-align: right;">---</td></tr> </table> </div>	Inverter serial number	ZH1ES160J3E488	Firmware version (main)	V210	Firmware version (slave)	---	<div style="background-color: #0070C0; color: white; text-align: center; padding: 5px;"><b>Help</b></div> <p>The device can be used as a wireless access point (AP mode) to facilitate users to configure the device, or it can also be used as a wireless information terminal (STA mode) to connect the remote server via wireless router.</p> <p><b>Status of remote server</b></p> <p>◆Not connected: Connection to server failed last time. If under such status, please check the issues as follows: (1) check the device information to see whether IP address is obtained or not; (2) check if the router is connected to internet or not; (3) check if a firewall is set on the router or not;</p> <p>◆Connected: Connection to server successful last time;</p> <p>◆Unknown: No connection to server. Please check again in 5 minutes.</p>																
Inverter serial number	ZH1ES160J3E488																							
Firmware version (main)	V210																							
Firmware version (slave)	---																							
Quick Set	<p>Inverter model</p> <hr/> <p>Rated power</p> <hr/> <p><b>Current power</b></p> <hr/> <p>Yield today</p> <hr/> <p>Total yield</p> <hr/> <p><b>Alerts</b></p> <hr/> <p>Last updated</p> <hr/>																							
Advanced	<p><b>- Device information</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>Device serial number</td><td style="text-align: right;">1701917282</td></tr> <tr><td>Firmware version</td><td style="text-align: right;">LSW3_14_FFFF_1.0.00</td></tr> <tr><td>Wireless AP mode</td><td style="text-align: right;"><b>Enable</b></td></tr> <tr><td>  SSID</td><td style="text-align: right;">AP_1701917282</td></tr> <tr><td>  IP address</td><td style="text-align: right;">10.10.100.254</td></tr> <tr><td>  MAC address</td><td style="text-align: right;">98:d8:63:54:0a:87</td></tr> <tr><td>Wireless STA mode</td><td style="text-align: right;"><b>Enable</b></td></tr> <tr><td>  Router SSID</td><td style="text-align: right;">AP_SOLAR_PORTAL_M2M_20120615</td></tr> <tr><td>  Signal Quality</td><td style="text-align: right;">0%</td></tr> <tr><td>  IP address</td><td style="text-align: right;">0.0.0.0</td></tr> <tr><td>  MAC address</td><td style="text-align: right;">98:d8:63:54:0a:86</td></tr> </table>	Device serial number	1701917282	Firmware version	LSW3_14_FFFF_1.0.00	Wireless AP mode	<b>Enable</b>		SSID	AP_1701917282	IP address	10.10.100.254	MAC address	98:d8:63:54:0a:87	Wireless STA mode	<b>Enable</b>	Router SSID	AP_SOLAR_PORTAL_M2M_20120615	Signal Quality	0%	IP address	0.0.0.0	MAC address	98:d8:63:54:0a:86
Device serial number	1701917282																							
Firmware version	LSW3_14_FFFF_1.0.00																							
Wireless AP mode	<b>Enable</b>																							
SSID	AP_1701917282																							
IP address	10.10.100.254																							
MAC address	98:d8:63:54:0a:87																							
Wireless STA mode	<b>Enable</b>																							
Router SSID	AP_SOLAR_PORTAL_M2M_20120615																							
Signal Quality	0%																							
IP address	0.0.0.0																							
MAC address	98:d8:63:54:0a:86																							
Upgrade	<p><b>- Remote server information</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>Remote server A</td><td style="text-align: right;">Not connected</td></tr> <tr><td>Remote server B</td><td style="text-align: right;">Not connected</td></tr> </table>	Remote server A	Not connected	Remote server B	Not connected																			
Remote server A	Not connected																							
Remote server B	Not connected																							
Restart																								
Reset																								

Figure 49 – Status screen

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

Please select your current wireless network:

Site Survey

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

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

Refresh

Add wireless network manually:

Network name (SSID)  
(Note: case sensitive)

Encryption method

Encryption algorithm

Next

1 2 3 4

Figure 50 – Screen for selecting the available wireless network (1)

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

Please fill in the following information:

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

Obtain an IP address  
automatically **Enable** ▼

IP address

Subnet mask

Gateway address

DNS server address

**Back** **Next**



Figure 51 - Screen for entering the password of the wireless network (2)

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

### Enhance Security

You can enhance your system security by choosing the following methods

- Hide AP**

---

- Change the encryption mode for AP**

---

- Change the user name and password for Web server**

**Back** **Next**



Figure 52 - Screen for setting the security options (3)



10) Click “OK”.

**Setting complete!**

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

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



**Figure 53 – Final configuration screen (4)**

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

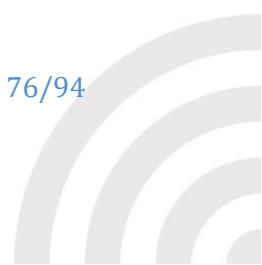
**Setting complete! Please close this page manually!**

Please login our management portal to monitor and manage your PV system.(Please register an account if you do not have one.)

To re-login the configuration interface, please make sure that your computer or smart phone

Web Ver:1.0.24

**Figure 54 - Successful configuration screen**



### 11.1.3. Verification

Wait two minutes after configuring the adapter and then go back to the Wi-Fi network selection screen to verify that the AP\_\*\*\*\*\* network is no longer present. The absence of the Wi-Fi network in the list will confirm the successful configuration of the Wi-Fi adapter.



Figure 55 - Wi-Fi network search on Smartphone (iOS and Android); Access point of the Wi-Fi adapter is no longer visible

If the Wi-Fi network is still present in the list, 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. 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
<b>Remote server information</b>	
Remote server A	Not connected

Figure 56 – Status screen

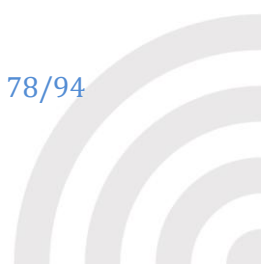
### Status of LEDs present on the adapter

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



Figure 57 - Initial status of LEDs

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





**Figure 58 - 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 59 – Reset button on the Wi-Fi adapter**

## 11.1.4. 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 60 - 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 61 – Icons on the display of LITE single-phase inverters (left) and three-phase or hybrid inverters (right)



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

2) Irregular communication with remote server

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

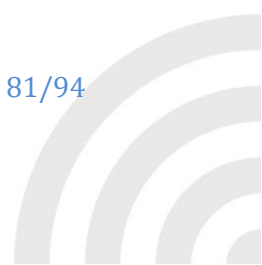


Figure 62 - Irregular communication status between Wi-Fi and remote server

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

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

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



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

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

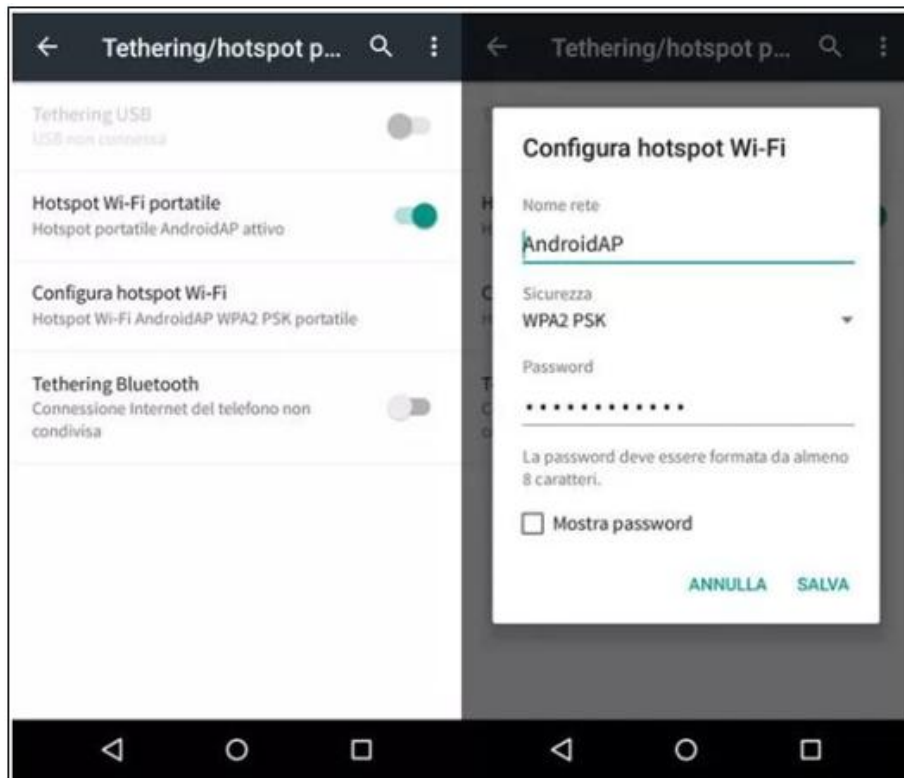


Figure 63 – Configuration of an Android smartphone as a hotspot router

- **Using an iPhone as a modem**

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



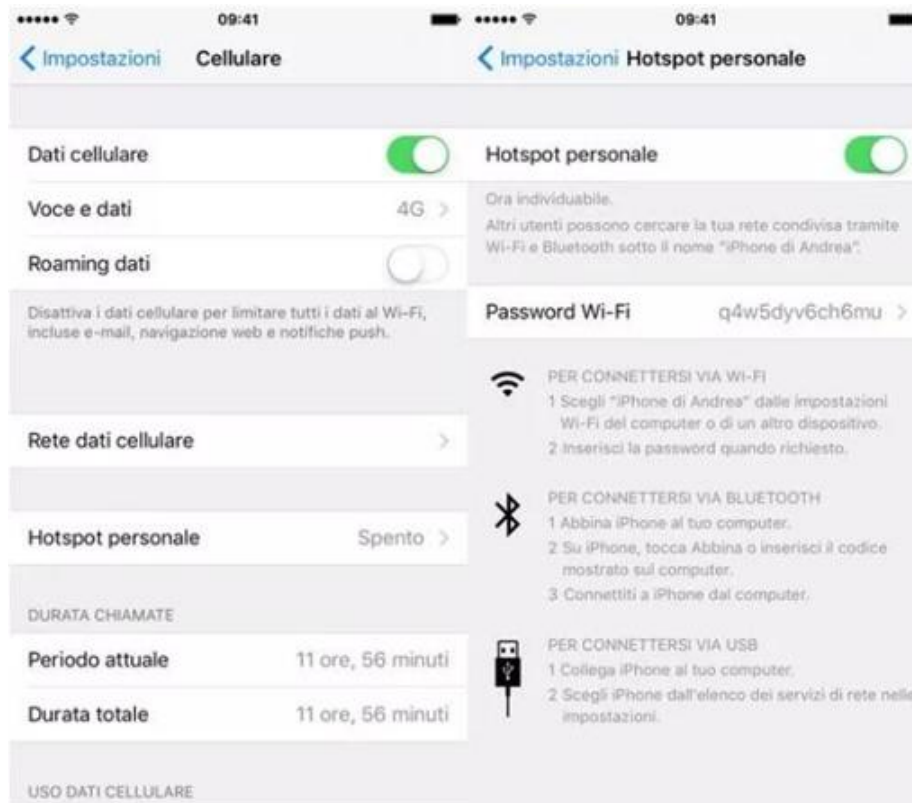


Figure 64 - Configuration of an iOS smartphone as a hotspot router

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

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

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

## 11.2. Ethernet adapter

### 11.2.1. Installation

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

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

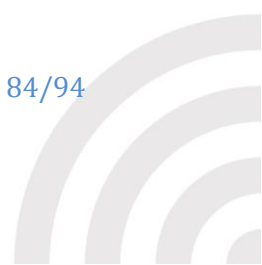
#### Installation tools:

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

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



Figure 65 – Port of the Ethernet adapter



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

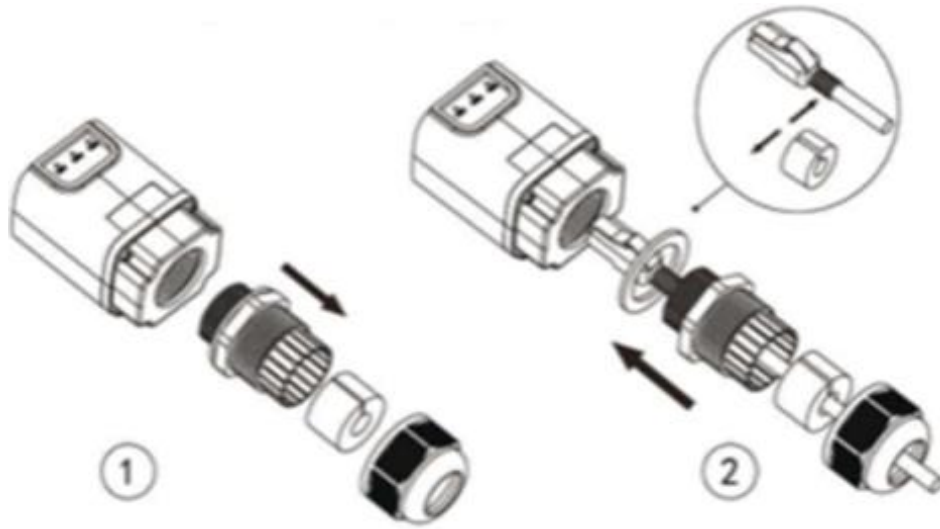


Figure 66 – Inserting the network cable inside the device

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

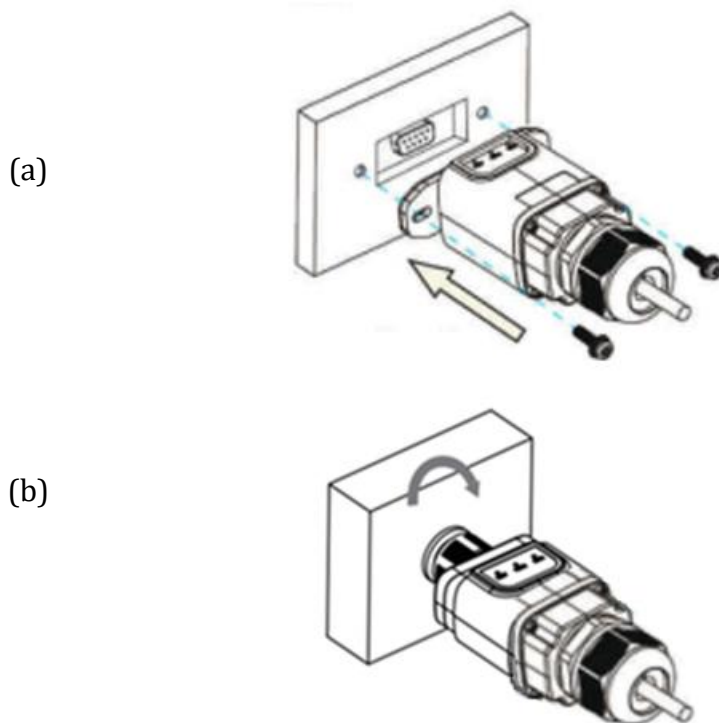
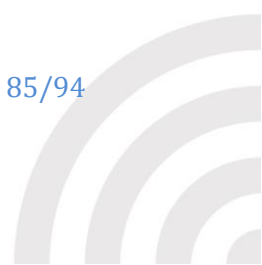


Figure 67 – Inserting and securing the ethernet adapter



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

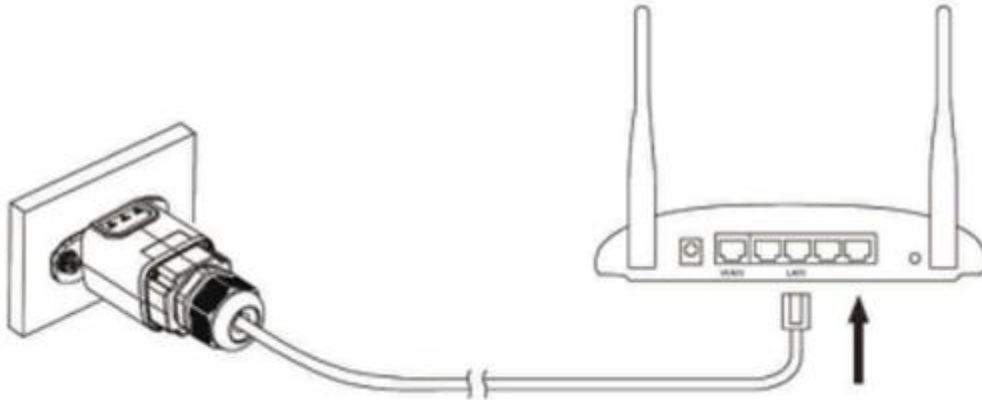


Figure 68 - Connecting the network cable to the modem

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

### 11.2.2. Verification

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

#### Status of LEDs present on the adapter

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



Figure 69 - Initial status of LEDs

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



Figure 70 - Final status of LEDs

### 11.2.3. 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 71 - Irregular communication status between the inverter and adapter

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

2) Irregular communication with remote server

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



Figure 72 - Irregular communication status between the adapter and remote server



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

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

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

### 11.3. 4G adapter

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

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

#### 11.3.1. Installation

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

##### Installation tools:

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



Figure 73 – Port of the 4G adapter

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

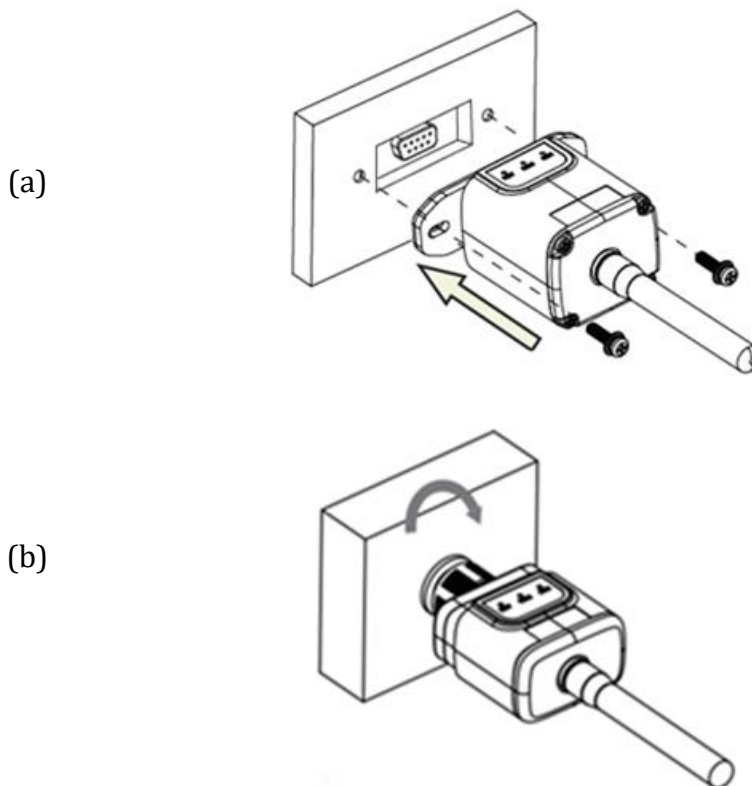


Figure 74 – Inserting and securing the 4G adapter

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

### 11.3.2. Verification

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

#### Status of LEDs present on the adapter

1) Initial status:

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



Figure 75 - 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 76 - 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 77 - 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 78 - Irregular communication status between the adapter and remote server

- Check that the 4G signal is present in the installation location (the adapter uses the Vodafone network for 4G transmission; if this network is not present or the signal is weak, the SIM will use a different network or will limit the data transmission speed). Ensure that the installation location is suitable for 4G signal transmission and that there are no obstacles that could affect data transmission.
- Check the status of the 4G adapter and that there are no external signs of wear or damage.

## 12. 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](http://www.zcsazzurro.com).