



QUICK INSTALLATION GUIDE HYBRID INVERTER 3-6-ZSS

1. INSTALLATION AND DISTANCES



Always wear protective clothing and/or personal protective equipment

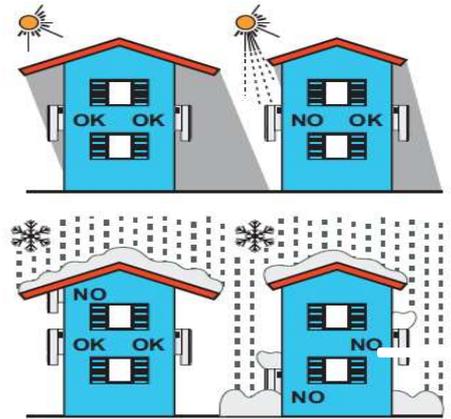
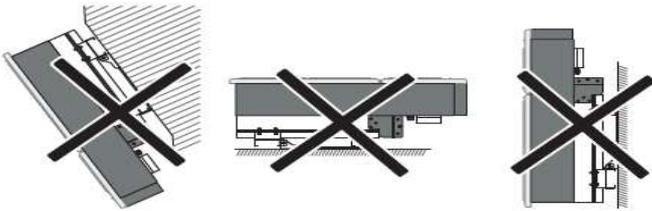
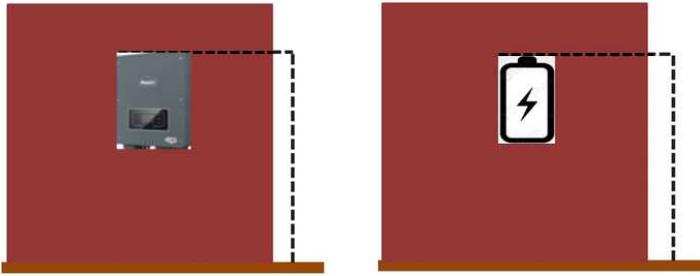


Always consult the manual

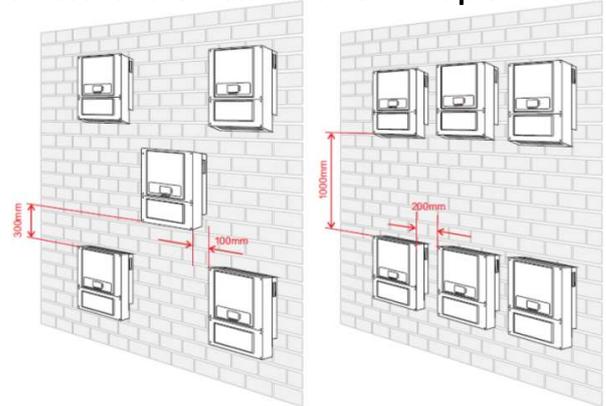


General notice - Important Safety Instructions

Maximum height from ground permitted: 180 cm

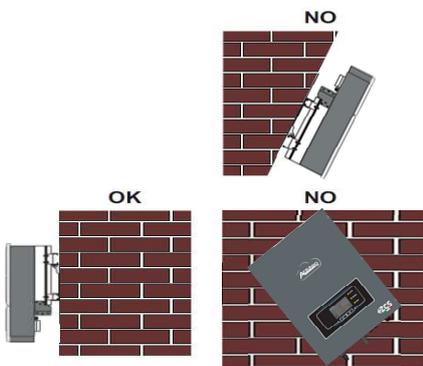
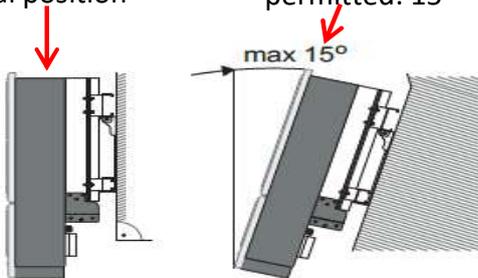


Distances for the installation of multiple inverters

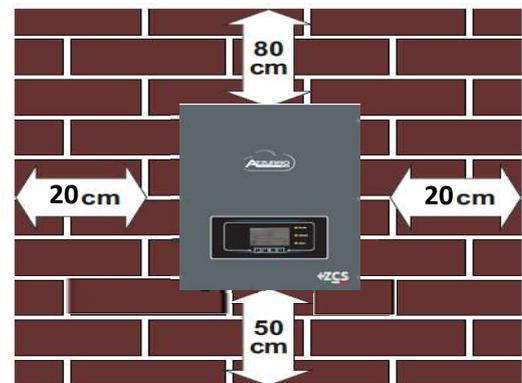


Correct installation in vertical position

Maximum inclination permitted: 15°



Distances for the installation of a single inverter

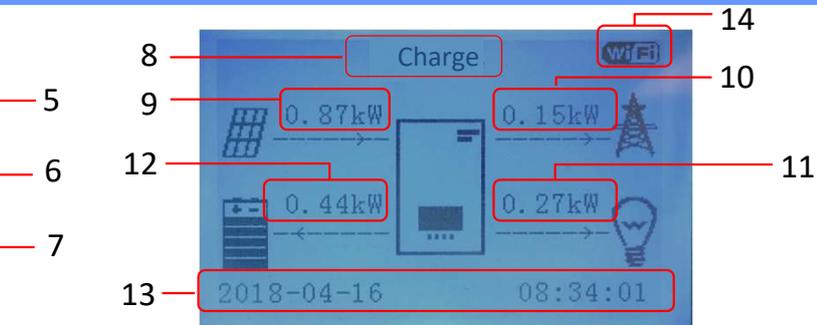


2. WIRING DIAGRAM FOR HYBRID STORAGE INVERTER



Note: If the hybrid inverter is to be installed under different conditions from those shown in the diagrams above, contact technical support to check whether it is feasible.

3. LIGHTS AND BUTTONS



- | | |
|---------------------|-------------------|
| 1. Menu/Back | 8. System status |
| 2. Up | 9. PV production |
| 3. Down | 10. Grid power |
| 4. Enter/Forward | 11. Home |
| 5. Discharge status | consumption |
| 6. Charge status | 12. Battery power |
| 7. Alarm status | 13. Date and time |
| | 14. Wi-Fi signal |

Status of the HYD-ES 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

4. MAIN MENU

From the main menu, press "Menu/Back" to enter the main menu.
The main menu contains five different sections:

Main menu
1. Basic settings
2. Advanced settings
3. Event list
4. System Info
5. Software Update
6. Energy statistics

1. Basic settings	<ul style="list-style-type: none"> 1. Language 2. Date and Time 3. Working mode 4. PV input mode 5. EPS Mode 6. Select.Communic.Address 7. Self-test
-------------------	---

2. Advanced settings	PWD: 0715
<ul style="list-style-type: none"> 1. Battery parameters 2. Clear Energy Data 3. Clear Events 4. Set Country Code 5. Zero grid feed-in mode 6. IV Curve Scan 7. Battery active 8. Logic interface 9. CT Direction 	

3. Event list	<ul style="list-style-type: none"> 1. List of current events 2. List of historical events
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4. System Info	<ul style="list-style-type: none"> 1. Inverter Info 2. Battery Info 3. Safety parameters
----------------	---

5. SW Update	PWD: 0715
Start Update ...	

6. Energy Statistics	<table border="1"> <tr> <th>Today</th> <th>Week</th> <th>Month</th> <th>Year</th> <th>Life Cycle</th> </tr> <tr> <td>PV prod.</td> <td>PV prod.</td> <td>PV prod.</td> <td>PV prod.</td> <td>PV prod.</td> </tr> <tr> <td>AutoCon</td> <td>AutoCon</td> <td>AutoCon</td> <td>AutoCon</td> <td>AutoCon</td> </tr> <tr> <td>Export</td> <td>Export</td> <td>Export</td> <td>Export</td> <td>Export</td> </tr> <tr> <td>Consumption</td> <td>Consumption</td> <td>Consumption</td> <td>Consumption</td> <td>Consumption</td> </tr> <tr> <td>AutoCon</td> <td>AutoCon</td> <td>AutoCon</td> <td>AutoCon</td> <td>AutoCon</td> </tr> <tr> <td>Amount</td> <td>Amount</td> <td>Amount</td> <td>Amount</td> <td>Amount</td> </tr> </table>	Today	Week	Month	Year	Life Cycle	PV prod.	AutoCon	AutoCon	AutoCon	AutoCon	AutoCon	Export	Export	Export	Export	Export	Consumption	Consumption	Consumption	Consumption	Consumption	AutoCon	AutoCon	AutoCon	AutoCon	AutoCon	Amount	Amount	Amount	Amount	Amount				
Today	Week	Month	Year	Life Cycle																																
PV prod.	PV prod.	PV prod.	PV prod.	PV prod.																																
AutoCon	AutoCon	AutoCon	AutoCon	AutoCon																																
Export	Export	Export	Export	Export																																
Consumption	Consumption	Consumption	Consumption	Consumption																																
AutoCon	AutoCon	AutoCon	AutoCon	AutoCon																																
Amount	Amount	Amount	Amount	Amount																																

5. QUICK INFO ON SYSTEM STATUS

Press the “↓” key once from the main menu to access the instantaneous information on the battery and AC grid.

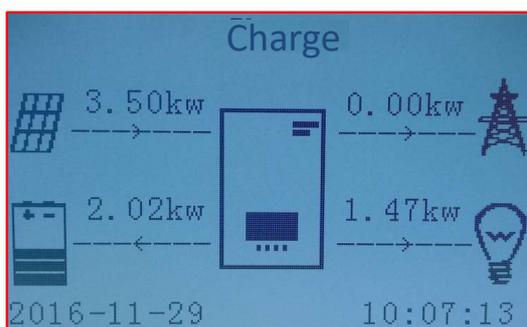
```
Vgrid:..... 230.2V
Igrid:..... 7.85A
Frequency:..... 50.01Hz
Bat Voltage:..... 48.2V
Bat CurCHRG:..... 0.00A
Bat CurDisC:..... 39.86A
Bat Capacity:..... 52%
Bat Cycles:..... 0000T
Bat Temp:..... 25°C
```

```
PV1 Voltage ..... 517.3V
PV1 Current ..... 0.00A
PV1 Power ..... 0W
PV2 Voltage ..... 7.1V
PV2 Current ..... 0.01A
PV2 Power ..... 0W
Inverter Temp. .... 21°C
```

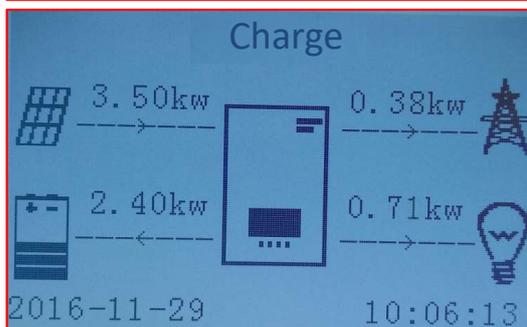
Press the “↑” key once from the main menu to access the instantaneous information on the DC side of the inverter.

6. OPERATING STATES IN AUTOMATIC MODE

Charge

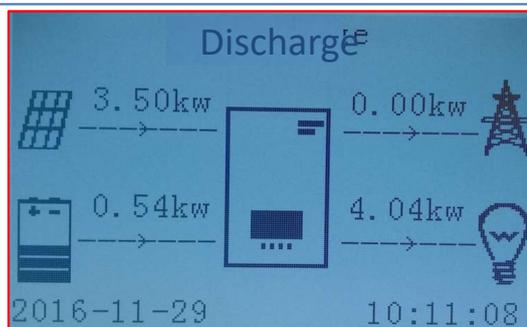


When the power produced from the photovoltaic system is greater than the energy required by the loads, the Inverter inverter will charge the battery with the excess energy.

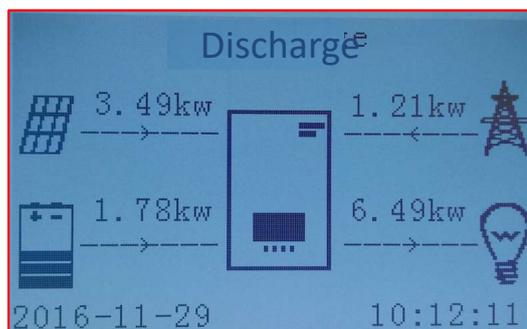


When the battery is fully charged, or when the charging power is limited (to preserve the integrity of the battery), the excess energy will be exported to the grid.

Discharge

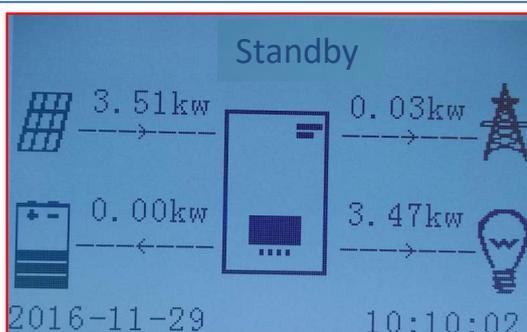


When the power of the photovoltaic system is once again less than the power required by the loads, the system will use the energy stored in the battery to power the domestic utilities.



When the sum of the power produced by the photovoltaic system and supplied by the battery is less than that required by the loads, the missing energy will be taken from the grid.

Standby



The Inverter will remain in Standby until:

- the difference between the PV production and the power required by the loads is less than 100W
- the battery is fully charged and the PV production is higher than the consumption (with tolerance of 100W)
- the battery is flat and the PV production is lower than the consumption (with tolerance of 100W)



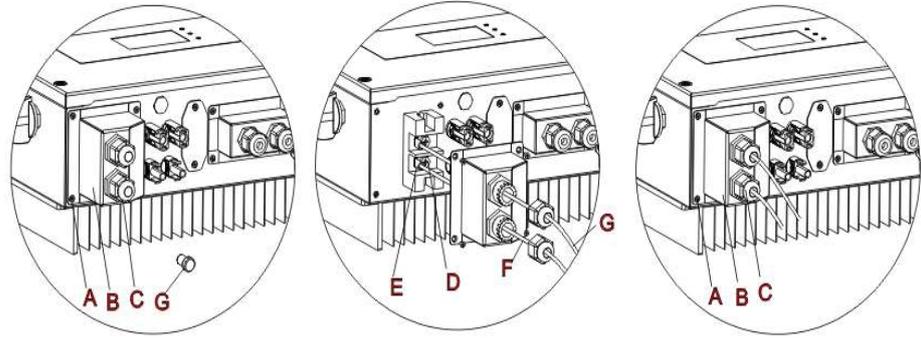
If the system has to be switched off, make sure to disconnect the AC voltage first by opening the dedicated switch.
NEVER turn off the batteries before disconnecting the AC voltage, therefore with the storage system connected to the AC grid.



7. BATTERY CONNECTION

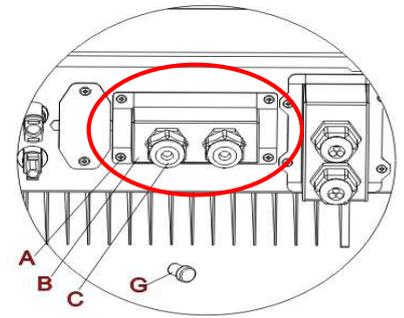
CONNECTING THE POWER CABLES:

- 1) Unscrew the 4 screws (A) with a screwdriver.
- 2) Remove the cover (B), loosen the cable gland (C), and then remove the stopper (G).
- 3) Feed the battery cables (F) through the cable gland, then connect them to the positive and negative terminals of the inverter (E).
- 4) Replace the cover on the inverter and secure it with the four screws; then tighten the cable glands.



CONNECTING THE COMMUNICATION CABLES:

- 1) Unscrew the 4 screws (A) with a screwdriver.
- 2) Remove the cover (B), loosen the cable gland (C), and then remove the stopper (G).
- 3) Feed the communication cable (inverter side) through the cable gland on the left side of the cover, then insert the connector into the **CAN** port on the inverter's communication board.
- 4) Replace the cover on the inverter and secure it with the four screws; then tighten the cable glands.



8.1 SINGLE PYLONTECH BATTERY

Note: Maximum DoD Programmable 80%



Communication cable pinout between Pylontech battery and Inverter, left to right

Communication cable pinout between Pylontech battery and Inverter, left to right	
<u>Inverter</u>	 PIN 1: White orange PIN 2: orange PIN 3: white blue PIN 4: blue
<u>Pylontech</u>	 PIN 1: not used PIN 2: not used PIN 3: not used PIN 4: White orange PIN 5: orange PIN 6: not used PIN 7: white blue PIN 8: blue

Note: The communication cable is located inside the kit in the inverter box.

In case of a single battery, two power cables (positive and negative) and a communication cable will be connected. This connection is shown in the figures below:

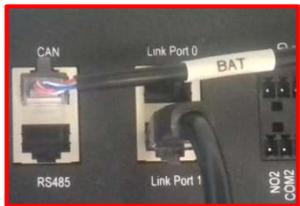
The communication cable must be connected to the battery's CAN port



Note: The DIP switch positions must be set according to the factory settings

8.2 PYLONTECH BATTERIES IN PARALLEL

Note: To connect multiple batteries in parallel, use the appropriate cables (power and connection) contained in the kit.



Master



Slave 1

⋮



Slave n



Note: The DIP switch positions must be set according to the factory settings

When connecting multiple batteries in parallel, connect the communication cable previously connected to the inverter's CAN port to the CAN port of one of the batteries. This will be referred to as the MASTER battery.

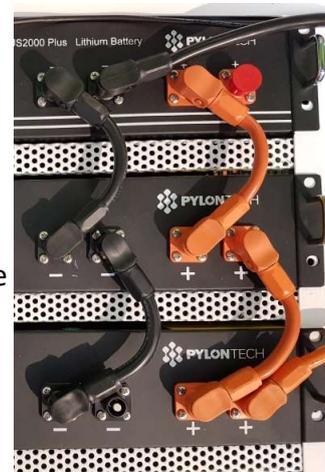
A communication cable will go from the port 1 link of the MASTER battery to the second battery called SLAVE 1, entering the port 0 link.

In case of additional batteries, the communication cable will be connected as indicated above for the connection of the MASTER battery to SLAVE 1.

The last battery will only have the port 0 link connected.

The batteries must be connected in a "loop" as shown in the side photo, and explained below:

The power cable connected to the inverter's negative pole must be connected to the MASTER battery, while the cable connected to the inverter's positive pole must be connected to the last "SLAVE N" battery.



Inverter negative

Inverter positive

8.3 SINGLE 4K4 WECO BATTERY

Note: Maximum DoD programmable 90%

Note: The communication cables are located inside the kit in the WeCo battery box



Communication cable pinout between the Weco battery and Inverter, from left to right

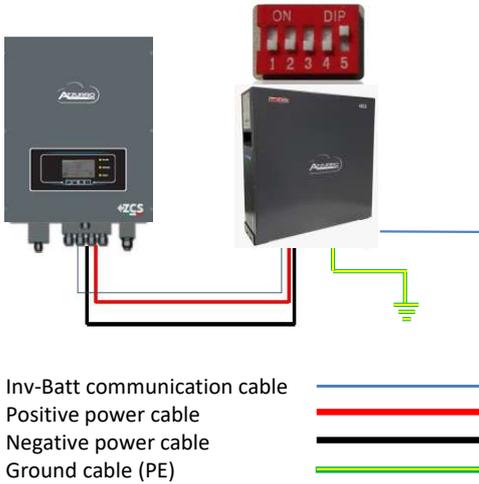
Inverter			PIN 1: White orange PIN 2: orange PIN 3: white green PIN 4: blue
Weco			PIN 1: White orange PIN 2: orange PIN 3: white green PIN 4: blue PIN 5: not used PIN 6: not used PIN 7: not used PIN 8: not used

Note: Turn off the batteries each time the position of the DIP switches changes.



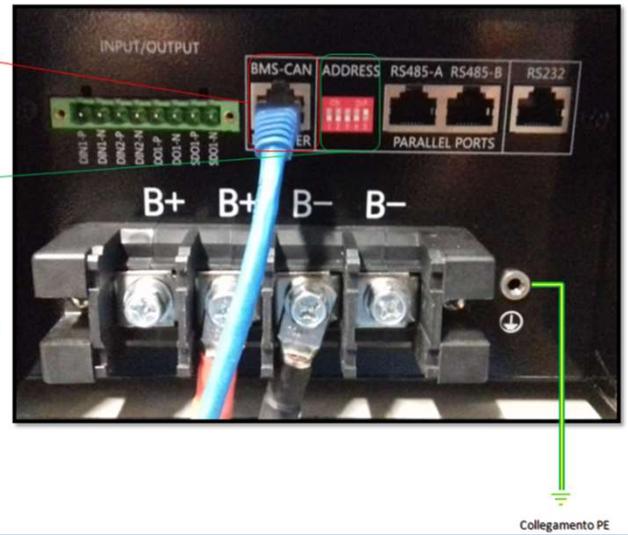
In case of multiple batteries connected in parallel or when adding new batteries to a system with batteries already installed and working, make sure that the difference between the voltages of all the batteries is less than 1.5 Volt. Each battery must be measured individually, therefore make sure the batteries are not connected to each other. (If the value is higher than 1.5 Volt, contact Technical Support)

To access the battery connection, remove the cover by unscrewing the crosshead screws.



In case of a **SINGLE BATTERY**:

1. Connect the **BMS-CAN** input
2. Set the DIP switches as shown in the photo
3. The power connections must be made by attaching the appropriate B+ and B- connectors to the corresponding input (as shown in the figure).
4. Connect the ground cable to the battery through the threaded hole



8.4 4K4 WECO BATTERIES IN PARALLEL

In the event of **MULTIPLE BATTERIES**, connect the communication cable from the CAN port of the inverter to the CAN-BMS port of the **MASTER** battery after defining the correct positioning of the DIP Switches:



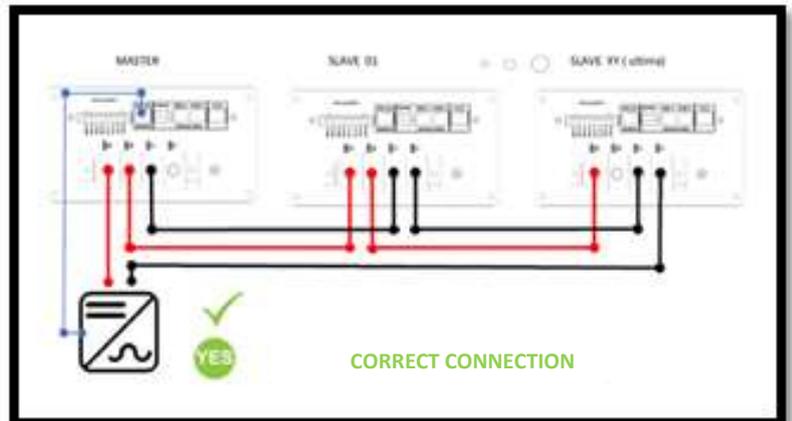
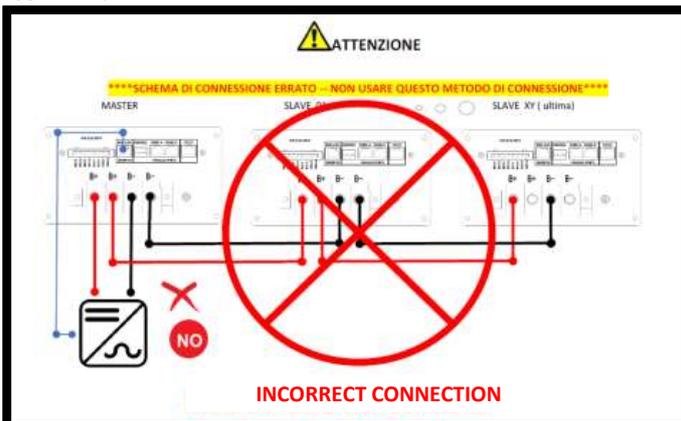
The **MASTER** battery must be connected to the communication cable inside the battery box starting from the **RS485-B** port and arriving at the **RS485-A** communication port of the Slave 1 battery. (**NOTE: do not connect the RS485-A port to the Master battery**).

In case of additional batteries, the communication cable will be connected as indicated above for the connection of the **MASTER** battery to **SLAVE 1**.

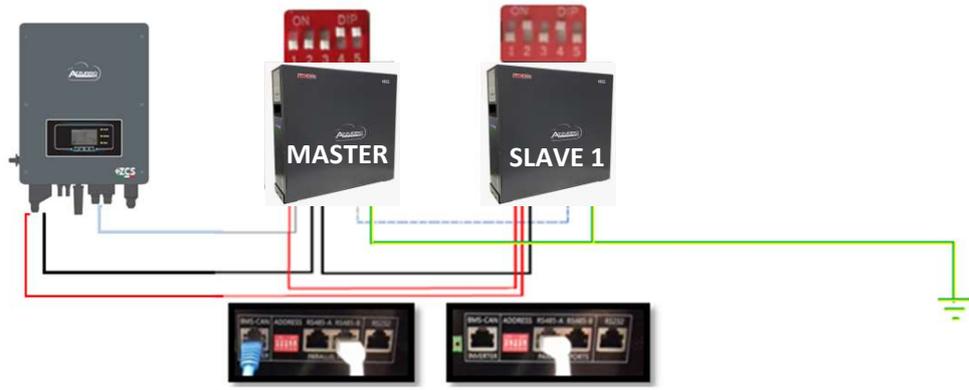
The last battery will only have the **RS485-A** port connected.

As for the power connections, all the batteries must be connected in parallel using the power cables supplied, making sure that the cable does not exceed a length of 2.5 m.

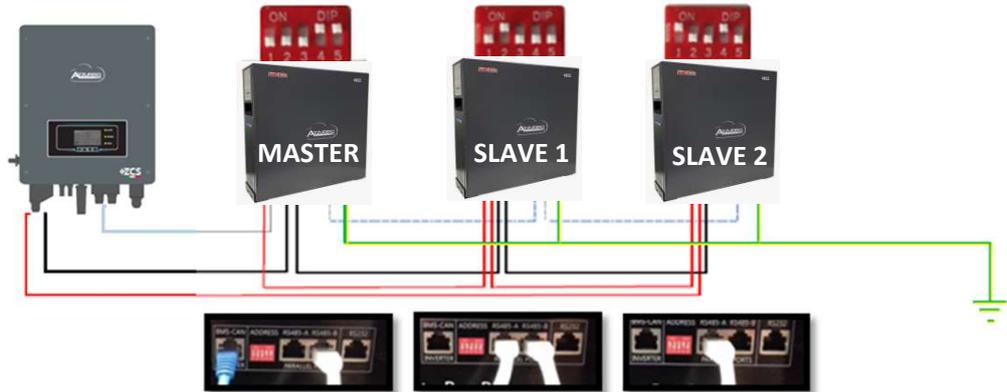
The **"NEGATIVE"** power cable coming out from the inverter must be connected to the **MASTER** battery on the **NEGATIVE** terminal, while the **"POSITIVE"** cable must be connected to the last **SLAVE N** battery on the **POSITIVE** terminal.



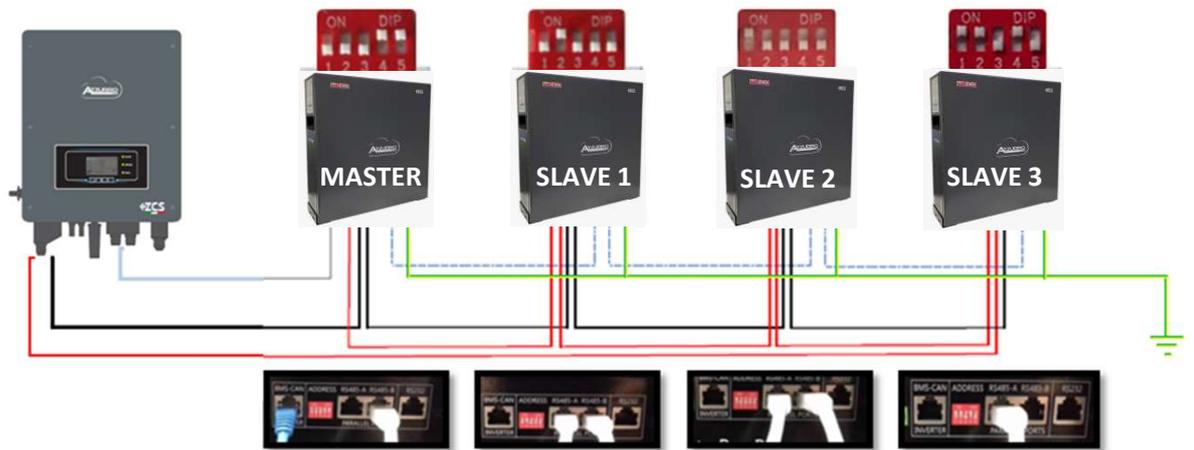
Connecting 2 batteries



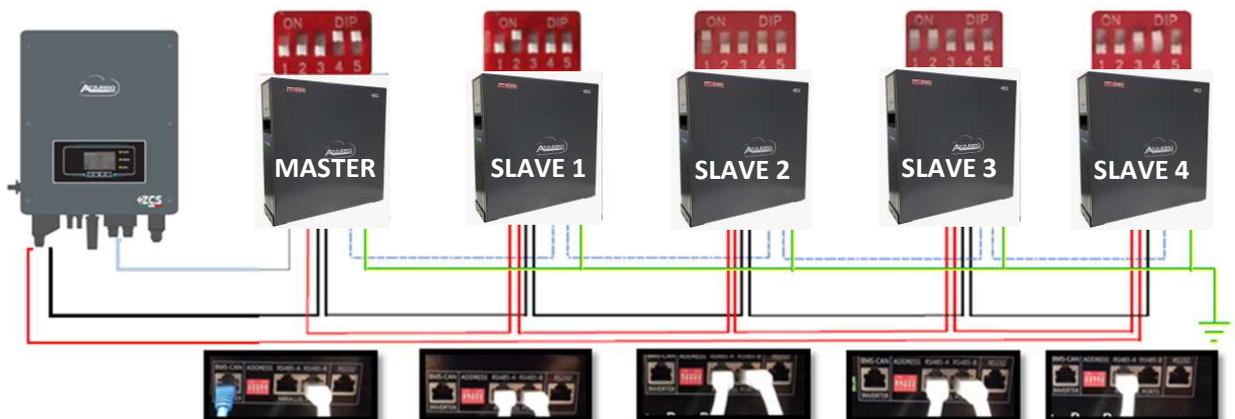
Connecting 3 batteries



Connecting 4 batteries



Connecting 5 batteries



8.5 SINGLE 4K4PRO WECO BATTERY

Note: Maximum DoD programmable 90%

Note: The communication cables are in the kit that is contained in the WeCo battery box

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

In case of multiple batteries connected in parallel or when adding new batteries to a system with batteries already installed and operating, make sure that the difference between the voltages of all the batteries is less than 1.5 volts. Each battery must be measured individually, therefore make sure the batteries are not connected to each other. (If the value is higher than 1.5 volts, contact Technical Support).

Communication cable pinout between Weco battery and Inverter inverter From left to right		
Inverter		PIN 1: White orange PIN 2: orange PIN 3: white green PIN 4: blue
Weco		PIN 1: White orange PIN 2: orange PIN 3: white green PIN 4: blue PIN 5: not used PIN 6: not used PIN 7: not used PIN 8: not used

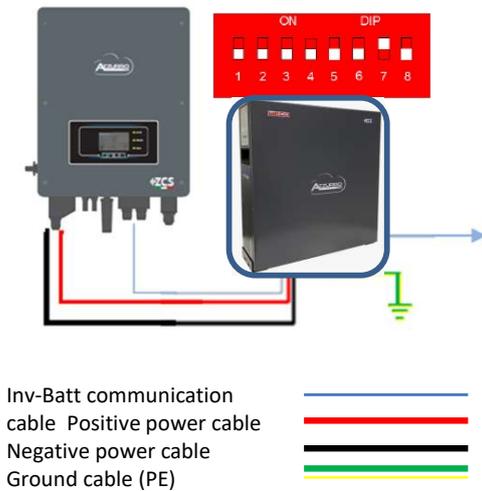
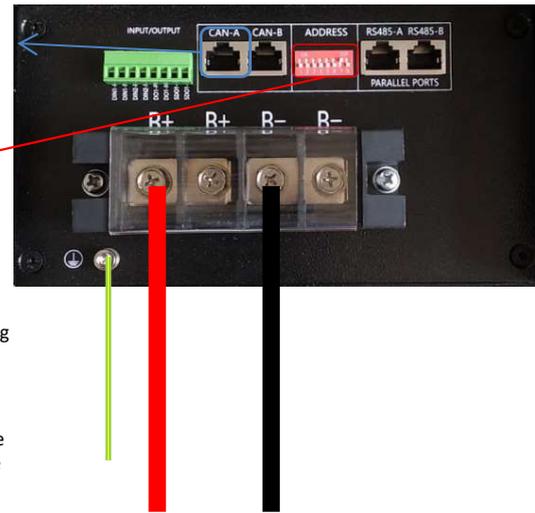
In case of SINGLE BATTERY:

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



3. Connect the power cables by attaching the appropriate B+ and B- connectors to the corresponding input (as shown in the figure).

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



8.6 WECO 4K4PRO BATTERIES IN PARALLEL

In case of **MULTIPLE BATTERIES**, connect the communication cable from the CAN port of the inverter to the CAN-A port of the MASTER battery after defining the correct positioning of the DIP switches:



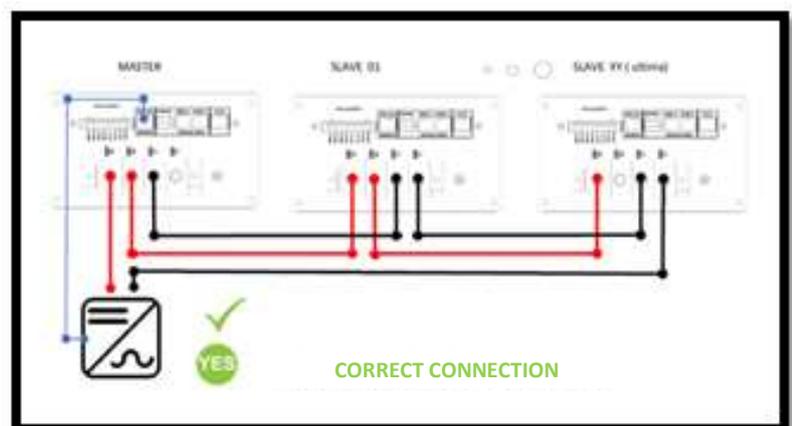
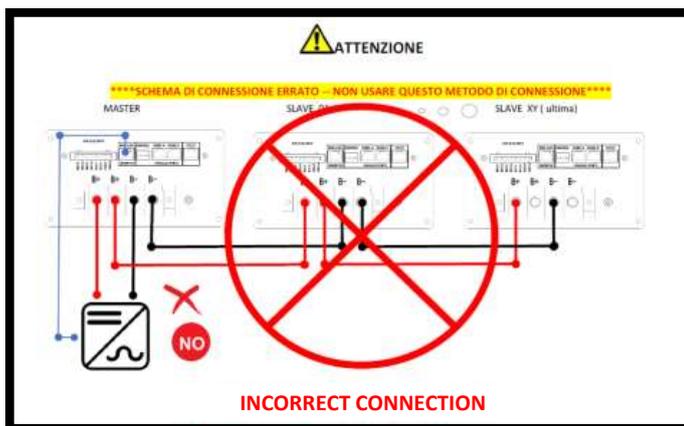
The MASTER battery must be connected to the communication cable inside the battery box starting from the **RS485-B** port and arriving at the **RS485-A** communication port of the Slave 1 battery.

(Attention: do not connect the RS485-A port to the Master battery).

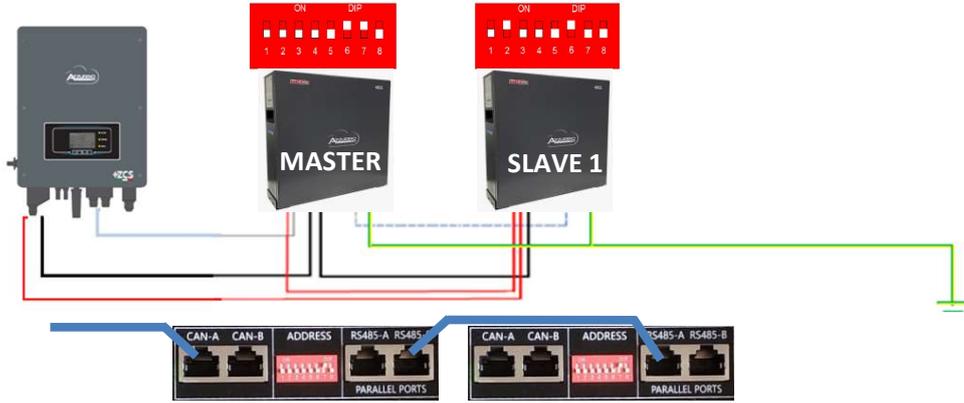
In case of additional batteries, connect the communication cable as indicated above for the connection of the MASTER battery to SLAVE 1. The last battery will only have the **RS485-A** port connected.

As for the power connections, all the batteries must be connected in parallel using the power cables supplied, making sure that the cable does not exceed a length of 2.5 m.

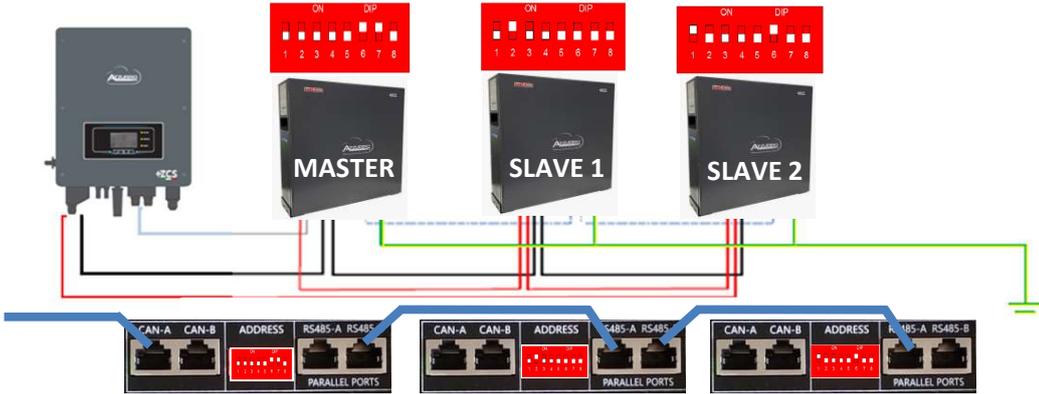
The **"NEGATIVE"** power cable coming from inverter must be connected to the **MASTER** battery on the **NEGATIVE** terminal, while the **"POSITIVE"** power cable must be connected to the last **SLAVE N** battery on the **POSITIVE** terminal.



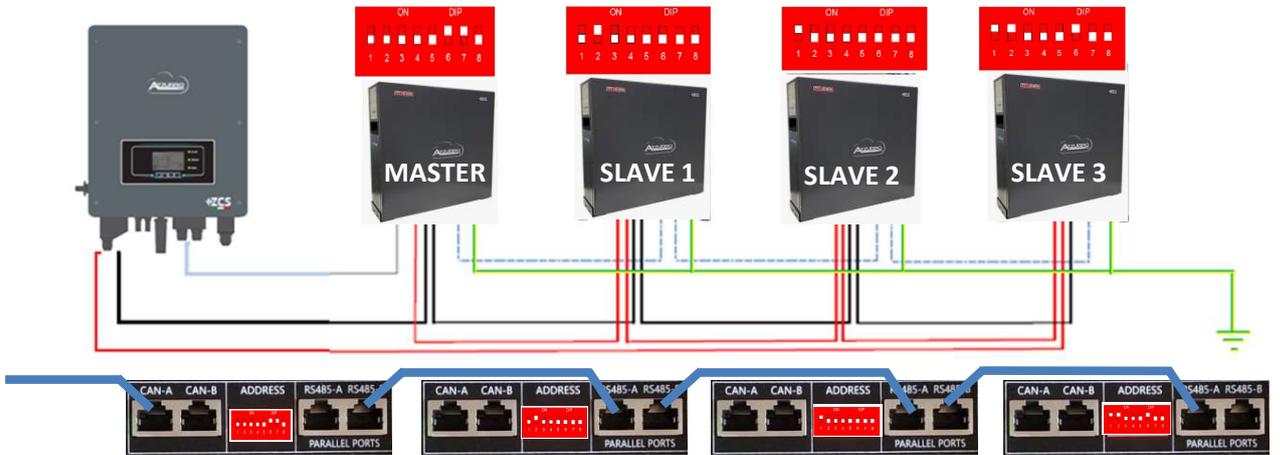
Connecting 2 batteries



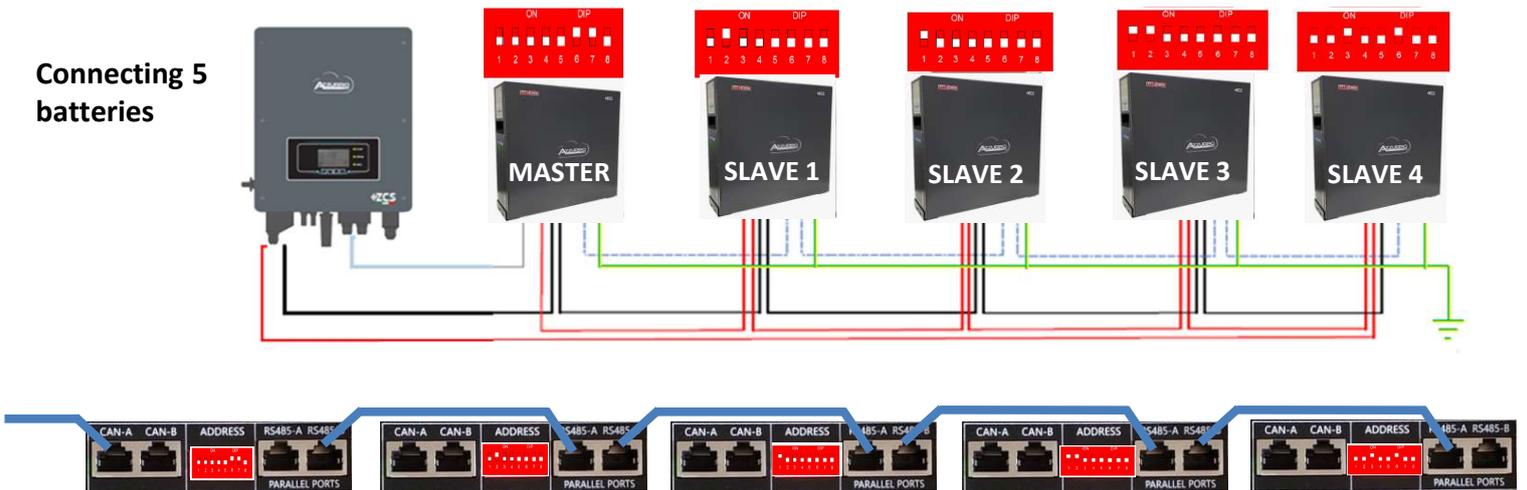
Connecting 3 batteries



Connecting 4 batteries



Connecting 5 batteries



Note: Maximum DoD programmable 90%

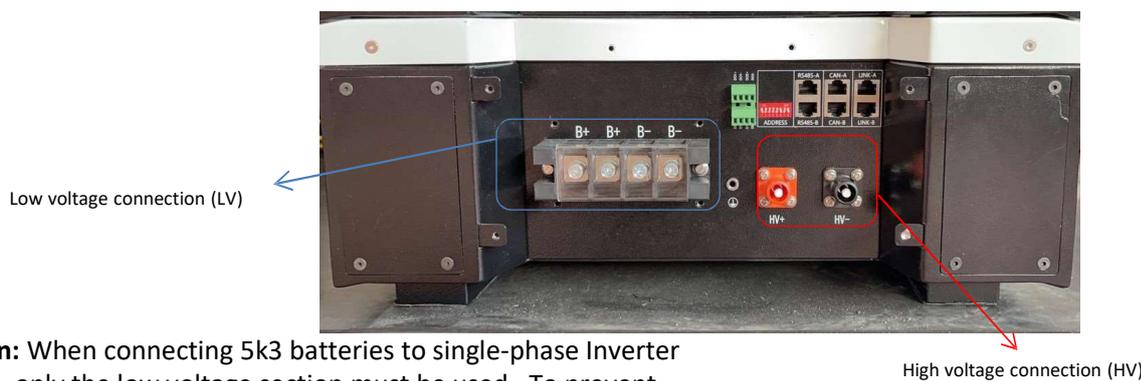
Note: The communication and power cables must be ordered separately

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

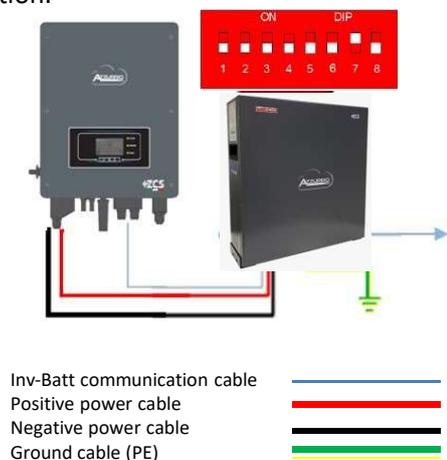
In case of multiple batteries connected in parallel or when adding new batteries to a system with batteries already installed and operating, make sure that the difference between the voltages of all the batteries is less than 1.5 volts. Each battery must be measured individually, therefore make sure the batteries are not connected to each other. (If the value is higher than 1.5 volts, contact Technical Support).

To access the battery connection, remove the cover of the LV section located on the left hand side by unscrewing the crosshead screws. See the figure to identify the LV section

Communication cable pinout between Weco battery and Inverter inverter From left to right		
Inverter		PIN 1: White orange PIN 2: orange PIN 3: white green PIN 4: blue
Weco		PIN 1: White orange PIN 2: orange PIN 3: white green PIN 4: blue PIN 5: not used PIN 6: not used PIN 7: not used PIN 8: not used

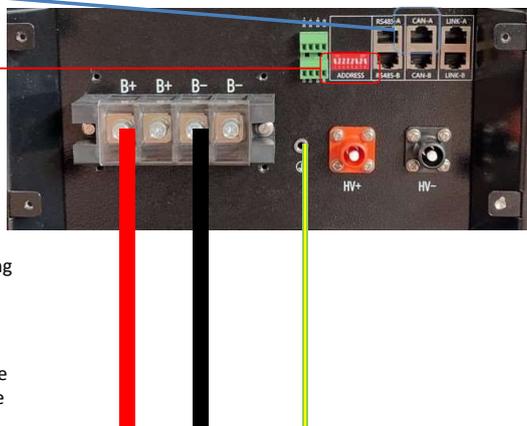


Attention: When connecting 5k3 batteries to single-phase Inverter inverters, only the low voltage section must be used. To prevent damage to the batteries or inverter, do not use the high voltage section.



In case of a SINGLE BATTERY:

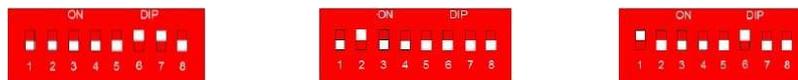
1. Connect the **CAN-A** input
2. Set the DIP switches as shown in the figure



3. Connect the power cables by attaching the appropriate B+ and B- connectors to the corresponding input (as shown in the figure).
4. Connect the ground cable to the battery through the threaded hole

8.8 WECO 5k3 BATTERIES IN PARALLEL

In case of MULTIPLE BATTERIES, connect the communication cable from the CAN port of the inverter to the CAN- A port of the MASTER battery after defining the correct positioning of the DIP switches:



The MASTER battery 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).

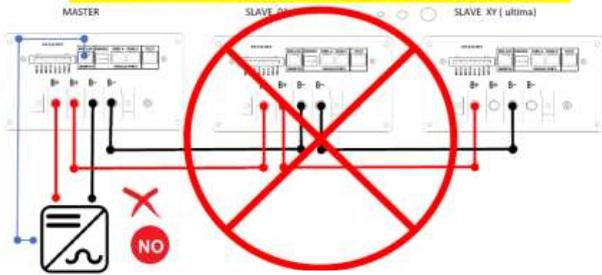
In case of additional batteries, connect the communication cable as indicated above for the connection of the MASTER battery to SLAVE 1. The last battery will only have the **RS485-A** port connected.

As for the power connections, all the batteries must be connected in parallel using the power cables supplied, making sure that the cable does not exceed a length of 2.5 m.

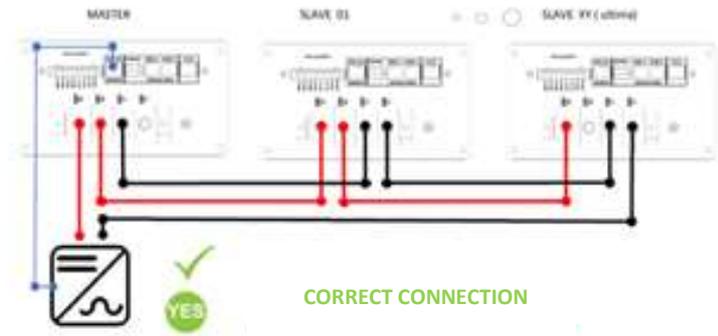
The **"NEGATIVE"** power cable coming from inverter must be connected to the **MASTER** battery on the **NEGATIVE** terminal, while the **"POSITIVE"** power cable must be connected to the last **SLAVE N** battery on the **POSITIVE** terminal.

ATTENZIONE

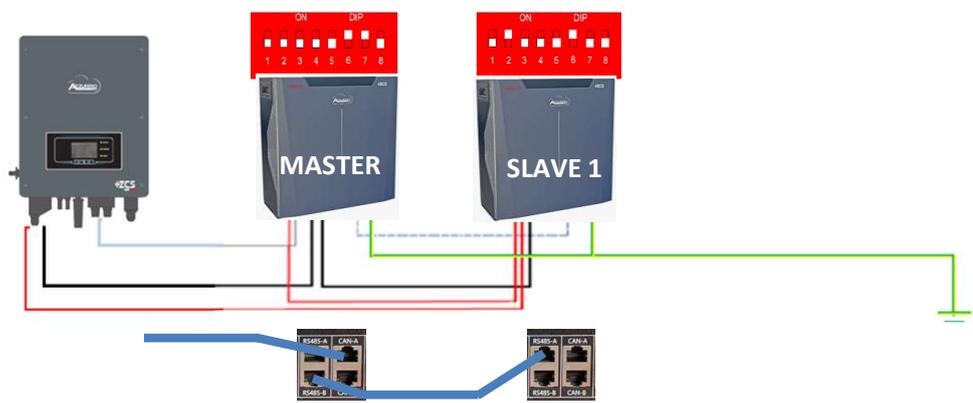
****SCHEMA DI CONNESSIONE ERRATO - NON USARE QUESTO METODO DI CONNESSIONE****



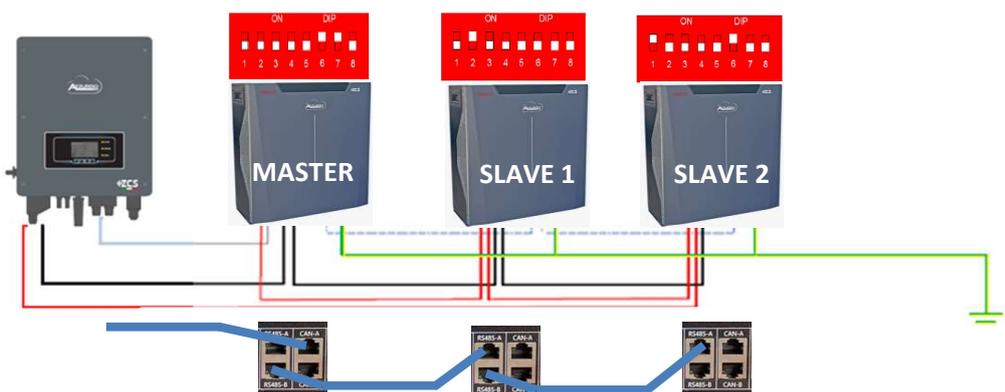
INCORRECT CONNECTION



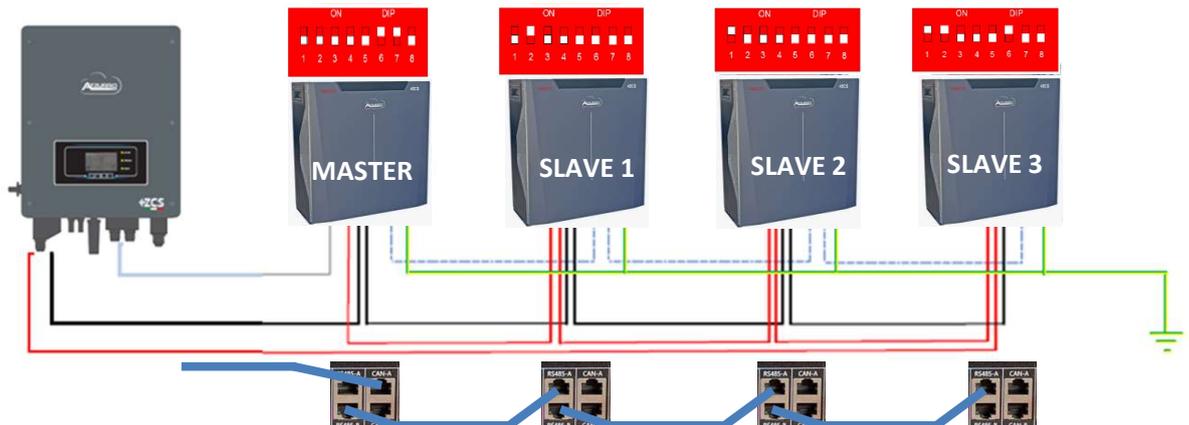
Connecting 2 batteries



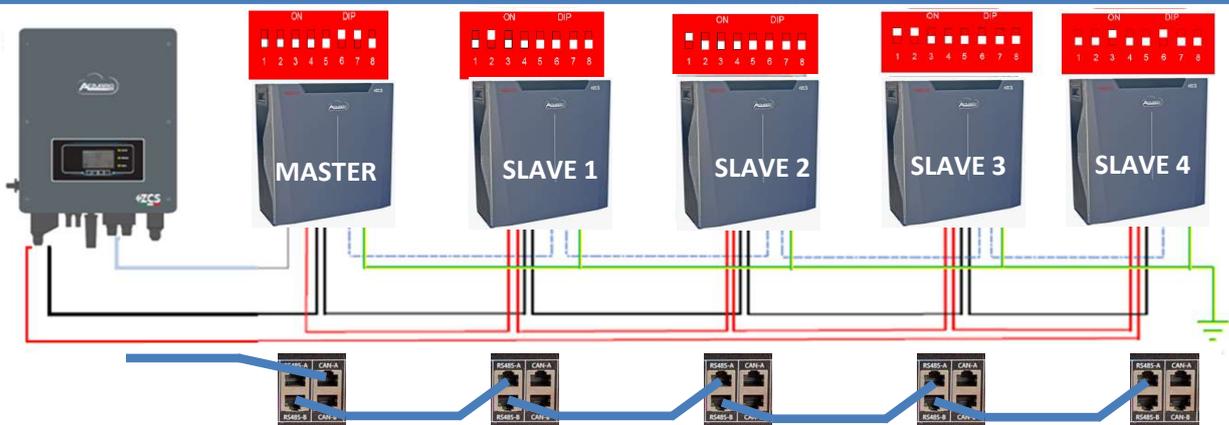
Connecting 3 batteries



Connecting 4 batteries



Connecting 5 batteries



8.9 SINGLE 5K3XP WECO BATTERY

- Note:** Maximum DoD programmable 90%
- Note:** The communication and power cables must be ordered separately
- Note:** Turn off the batteries each time of the DIP switches is position changed.

In case of multiple batteries connected in parallel or when adding new batteries to a system with batteries already installed and operating, make sure that the difference between the voltages of all the batteries is less than 1,5 volts. Each battery must be measured individually, therefore make sure the batteries are not connected to each other. (If the value is higher than 1,5 volts, contact Technical Support). To access the battery connection, remove the cover of the LV section located on the left hand side by unscrewing the crosshead screws. See the figure to identify the LV section

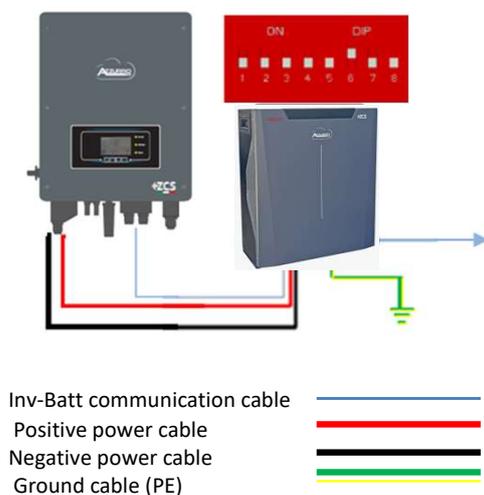
Pinout cavo di comunicazione tra batteria Weco ed Inverter			
Da sinistra verso destra			
Inverter		1 ... 4	PIN 1: Bianco arancio PIN 2: arancio PIN 3: bianco verde PIN 4: blu
Weco		1 ... 8	PIN 1: Bianco arancio PIN 2: arancio PIN 3: bianco verde PIN 4: blu PIN 5: non utilizzato PIN 6: non utilizzato PIN 7: non utilizzato PIN 8: non utilizzato

Low voltage connector (LV)



High voltage connectors (HV)

Attention: When connecting 5k3xp batteries to single-phase Inverter inverters, only the low voltage section must be used. To prevent damage to the batteries or inverter, do not use the high voltage section.



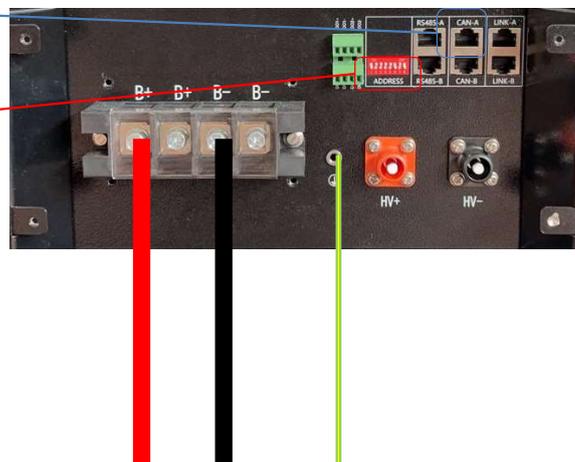
In case of a SINGLE BATTERY:

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



3. Connect the power cables by attaching the appropriate B+ and B- connectors to the corresponding input (as shown in the figure).

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



8.10 WECO 5K3XP BATTERIES IN PARALLEL

In case of MULTIPLE BATTERIES, connect the communication cable from the CAN port of the inverter to the CAN- A port of the MASTER battery after defining the correct positioning of the DIP switches:



The **RS485-B** port of the MASTER battery must be connected to the **RS485-A** port of the Slave 1 battery using the cable provided inside the battery box . (**NOTE: the RS485-A port of the Master battery will remain not connected**).

In case of additional batteries, the communication cable will be connected between the **RS485-B** port of the previous battery to the **RS485-A** port of the following battery. The last battery will only have the **RS485-A** port connected. As for the power connections, all the batteries must be connected in parallel using the power cables supplied, making sure that the cable does not exceed a length of 2.5 m.

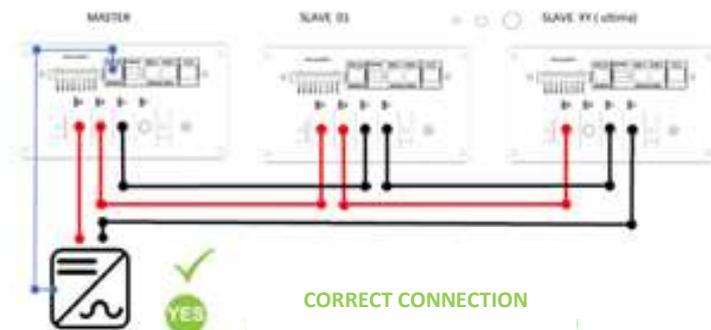
The **"NEGATIVE"** power cable coming out from the inverter must be connected to the **MASTER** battery on the **NEGATIVE** terminal, while the **"POSITIVE"** cable must be connected to the last **SLAVE N** battery on the **POSITIVE** terminal.

ATTENZIONE

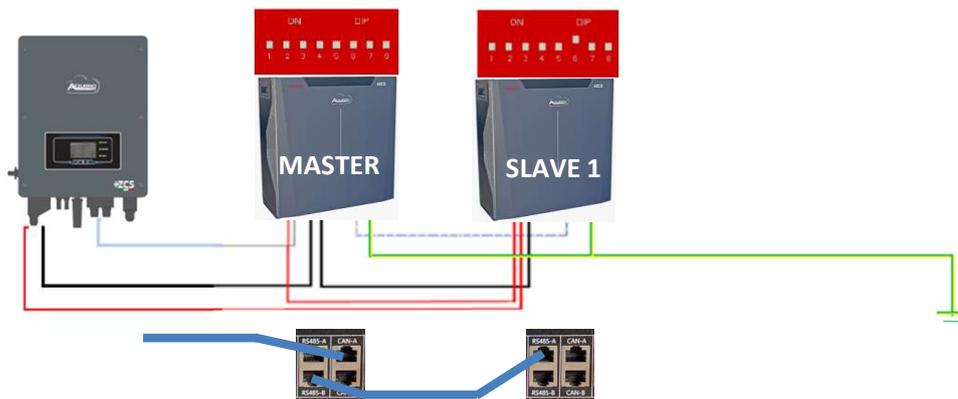
****SCHEMA DI CONNESSIONE ERRATO - NON USARE QUESTO METODO DI CONNESSIONE****



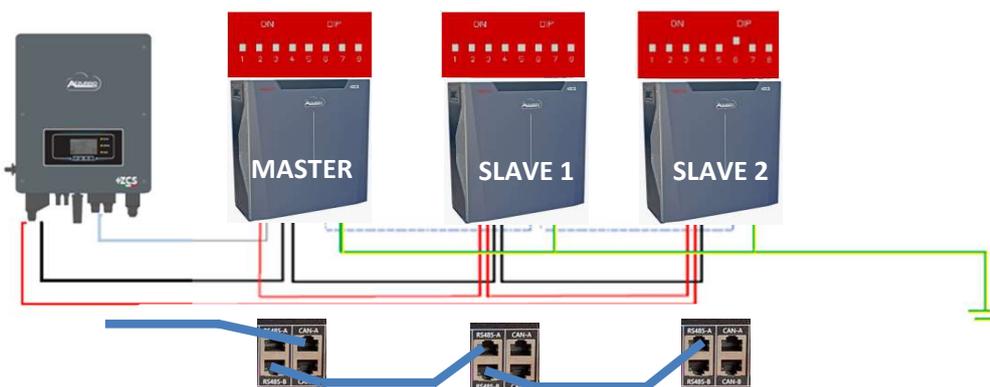
INCORRECT CONNECTION



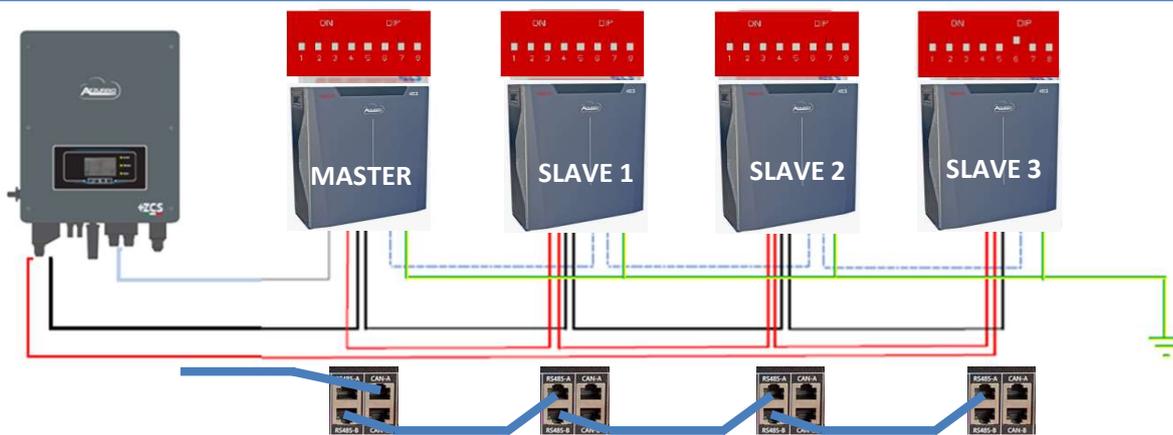
Connecting 2 batteries



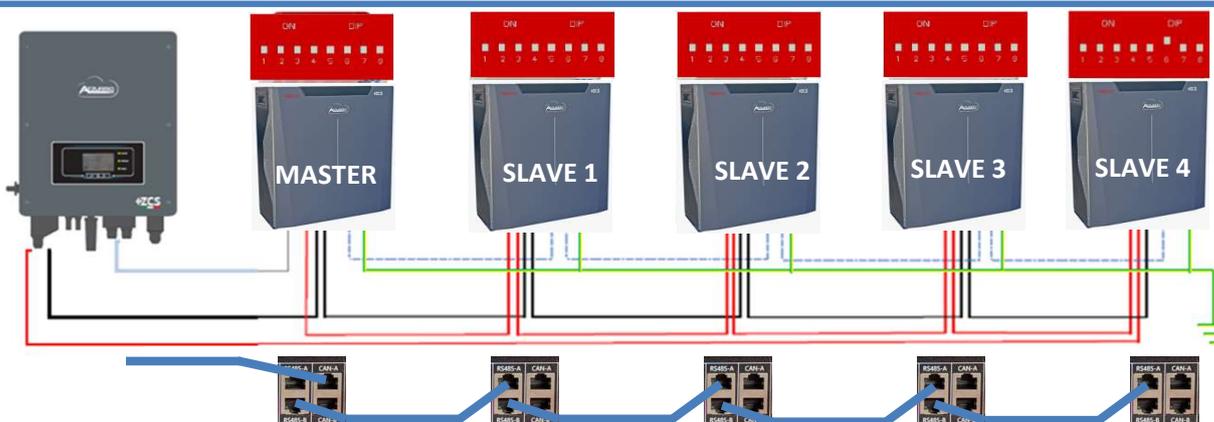
Connecting 3 batteries



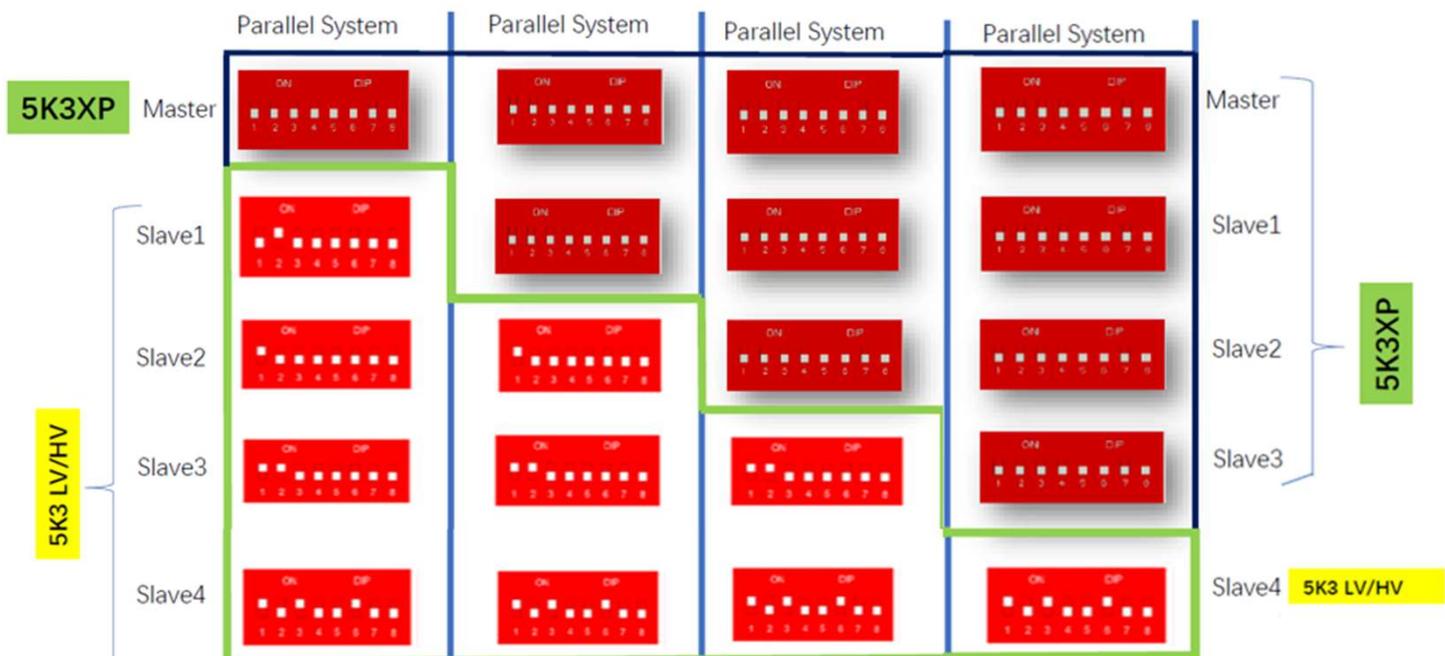
Connecting 4 batteries



Connecting 5 batteries



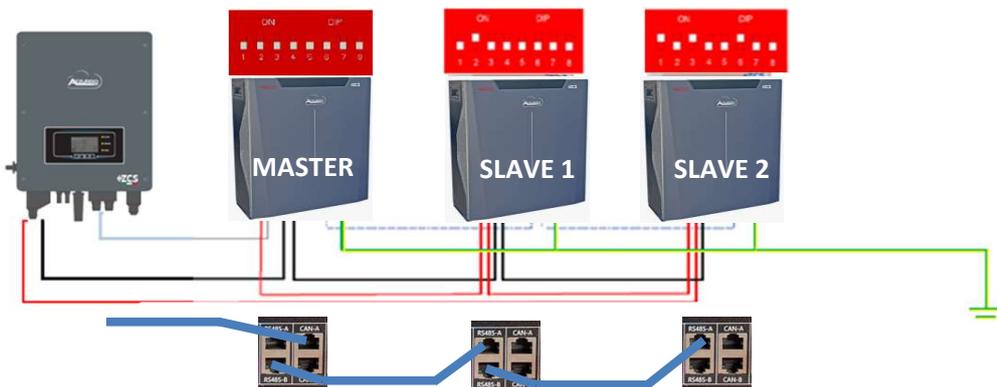
8.11 5K3XP BATTERIES AND 5K3 BATTERIES IN PARALLEL



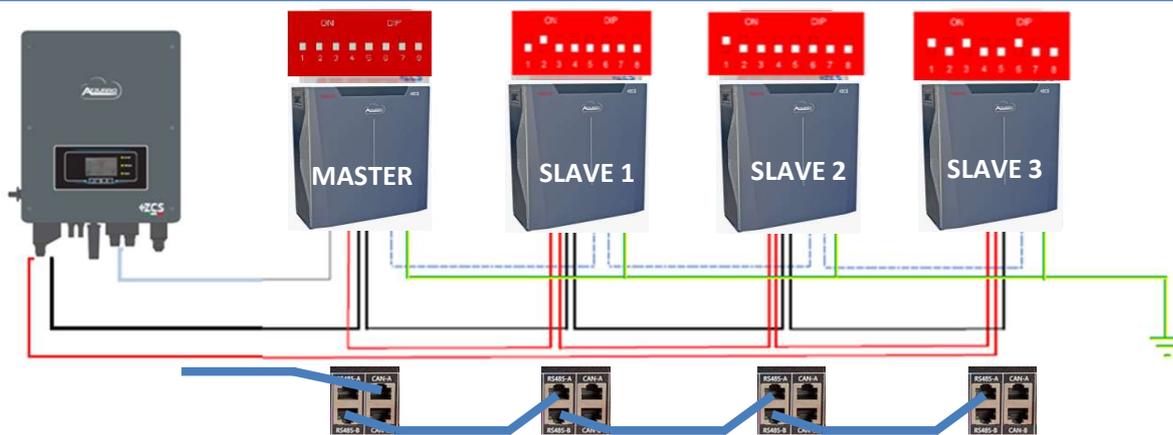
In case of 5K3XP and 5K3 in parallel:

- ✓ Always provide as master the 5K3XP battery (if they are more than one set them as first Slaves);
- ✓ The setting of the DIP switches of the last 5K3 battery must be set as indicated in the example table - Slave 4;
- ✓ The DIP switches of the 5K3 batteries must be set according to the Slave number as shown in the table above (example DIP switch: Master 5K3XP - 00000000, Slave 1 5K3XP - 00000000, Slave 2 5K3 - 10000000 and Slave 3 5K3 - 10100100).

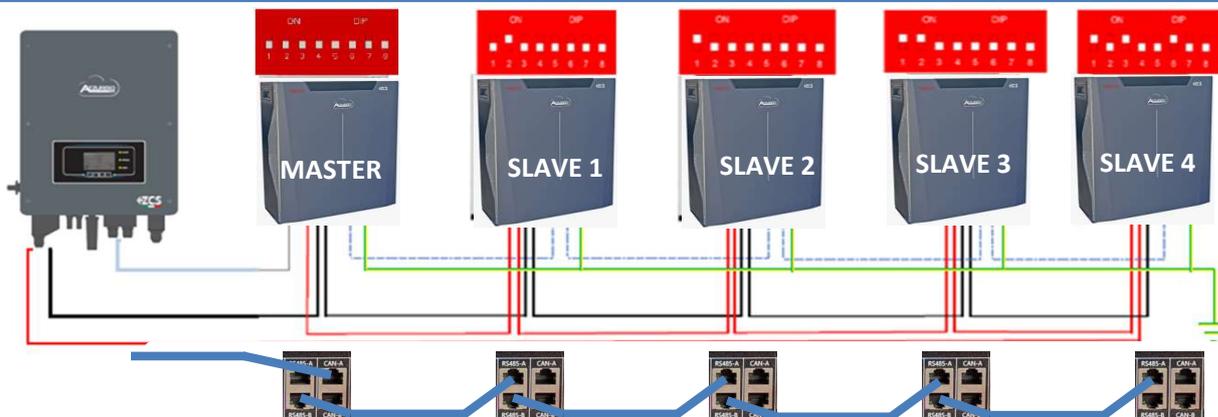
Connecting 3 batteries:
Master 5K3XP
Slave 1 5K3
Slave 2 5K3



Connecting 4 batteries:
Master 5K3XP
Slave 1 5K3
Slave 2 5K3
Slave 3 5K3



Connecting 5 batteries:
Master 5K3XP
Slave 1 5K3
Slave 2 5K3
Slave 3 5K3
Slave 4 5K3



8.12 SINGLE AZZURRO 5000 BATTERY

Note: Maximum DoD programmable 90%

Note: The communication cable is located inside the kit in the inverter box.

In case of multiple batteries connected in parallel or when adding new batteries to a system with batteries already installed and working, make sure that the difference between the voltages of all the batteries is less than 1.5 Volt. Each battery must be measured individually, so make sure the batteries are not connected to each other. (If the value is higher than 1.5 Volt, contact Technical Support)

Communication cable pinout between the Azzurro 5000 battery and Inverter inverter. From left to right

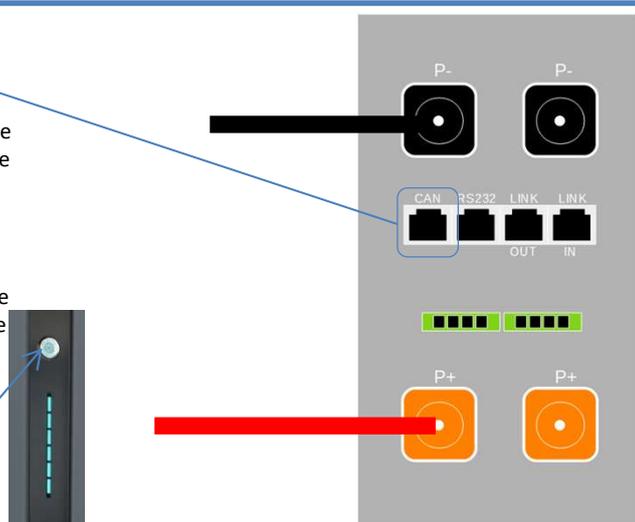
<u>Inverter</u>			PIN 1: White orange PIN 2: orange PIN 3: white green PIN 4: blue
<u>Azzurro 5000</u>			PIN 1: not used PIN 2: not used PIN 3: not used PIN 4: White orange PIN 5: orange PIN 6: not used PIN 7: white blue PIN 8: blue



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

In case of a SINGLE BATTERY:

1. Connect the **CAN** input
2. The power connections must be made by attaching the appropriate P+ and P- connectors to the corresponding input (as shown in the figure).
3. Connect the ground cable to the battery through the threaded hole indicated by the ground symbol.
4. Press the button on the front of the battery to switch it on.



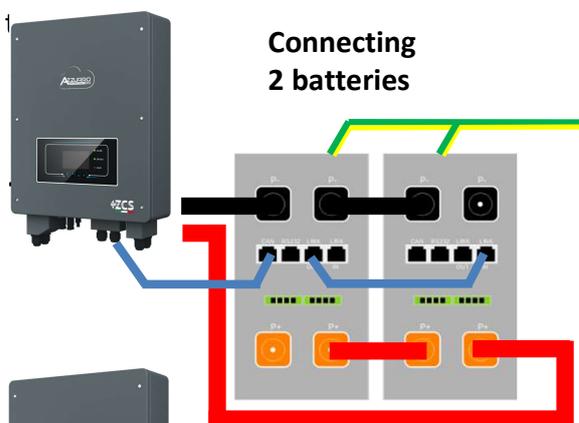
8.13 AZZURRO 5000 BATTERIES IN PARALLEL

In the event of MULTIPLE BATTERIES, connect the communication cable from the CAN port of the inverter to the CAN port of the MASTER battery. The MASTER battery must be connected to the communication cable found inside the battery box starting from the **LINK OUT** port and arriving at the **LINK IN** communication port of the Slave 1 battery. (**Attention: do not connect the LINK IN port to the Master battery**).

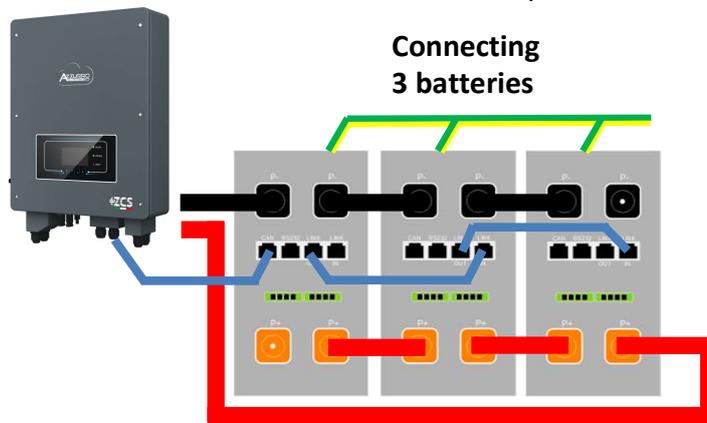
In case of additional batteries, the communication cable will be connected as indicated above for the connection of the MASTER battery to SLAVE 1. The last battery will only have the **LINK IN** port connected.

As for the power connections, all the batteries must be connected in parallel using the power cables supplied, making sure that the cable does not exceed a length of 2.0 m.

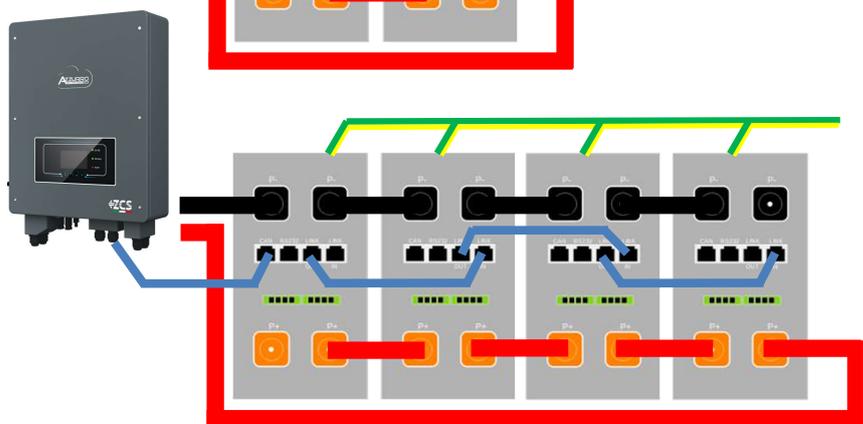
The **"NEGATIVE"** power cable coming out from the inverter must be connected to the **MASTER** battery on the **NEGATIVE** terminal, while the **"POSITIVE"** cable must be connected to the last **SLAVE N** battery on the **POSITIVE**



Connecting
2 batteries



Connecting
3 batteries



Connecting
4 batteries

9.1 CURRENT SENSOR CONNECTION

For the extension cable it is recommended to use an 8-pole category 6 STP cable, or a 2x0.5 mm² shielded bipolar alarm cable, in the first case 4 conductors will be connected on one pole of the sensor and the other 4 will be connected on the other pole.

To prevent the conductor wires from breaking, it is recommended to use a cable with flexible and non-rigid conductors.

Unscrew the 4 screws of the central cover with a screwdriver

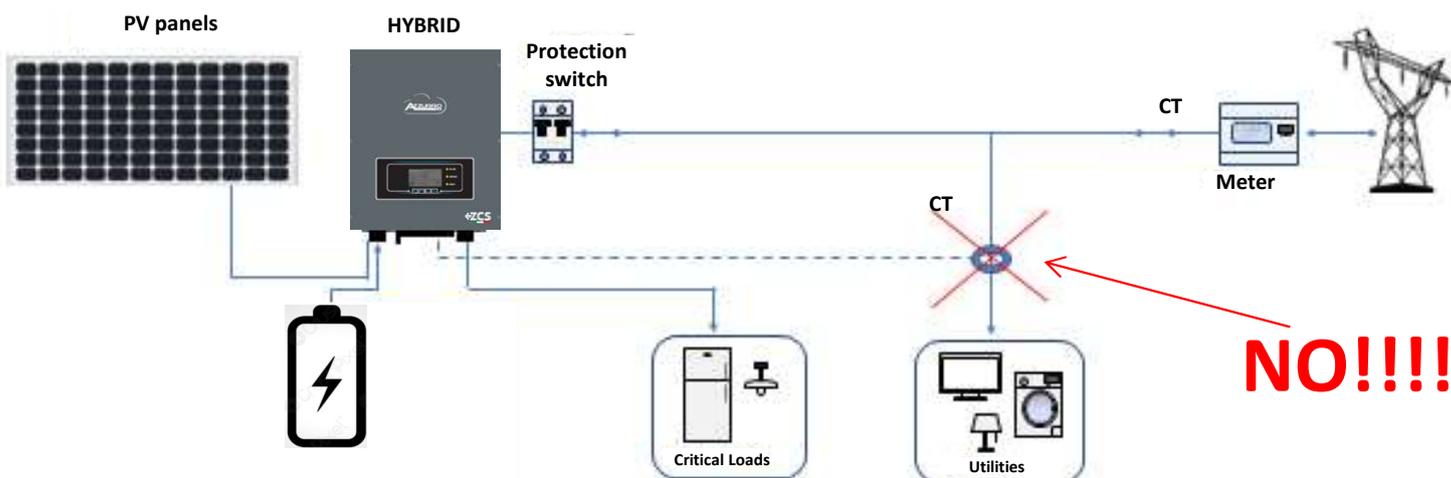
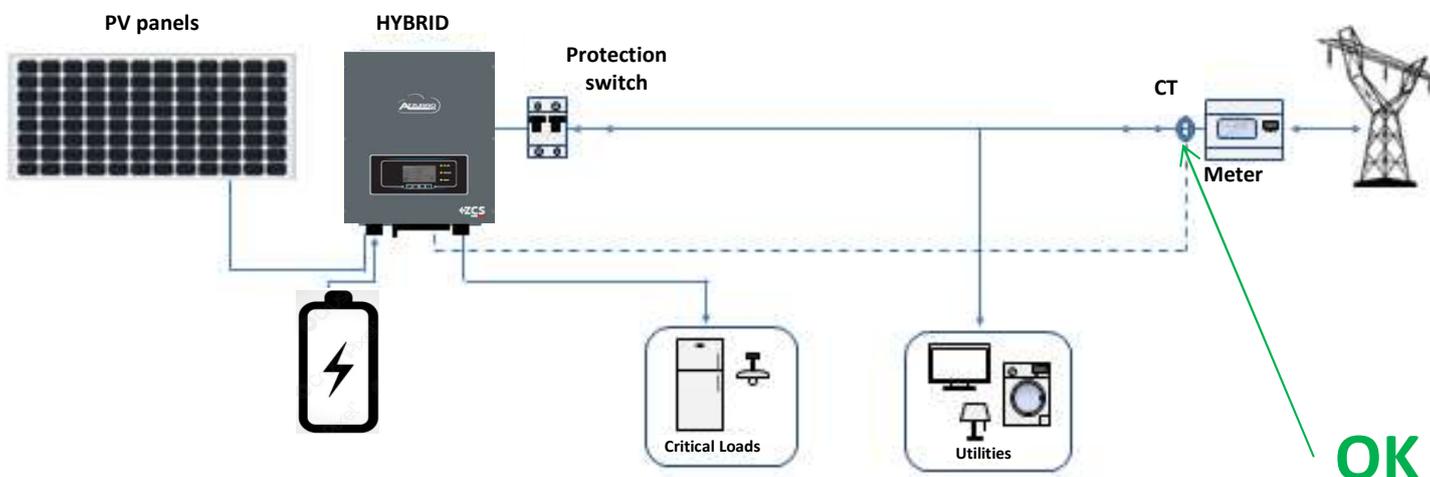
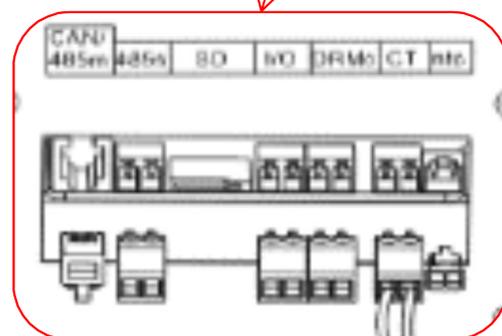
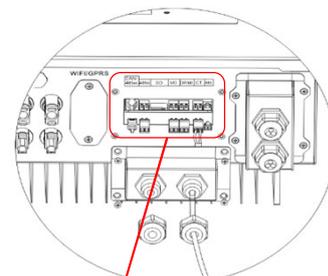
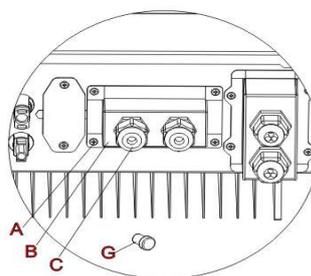
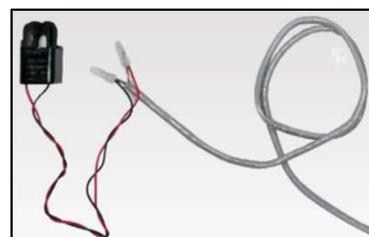
Remove the waterproof cover (B), loosen the cable gland (C), and then remove the stopper.

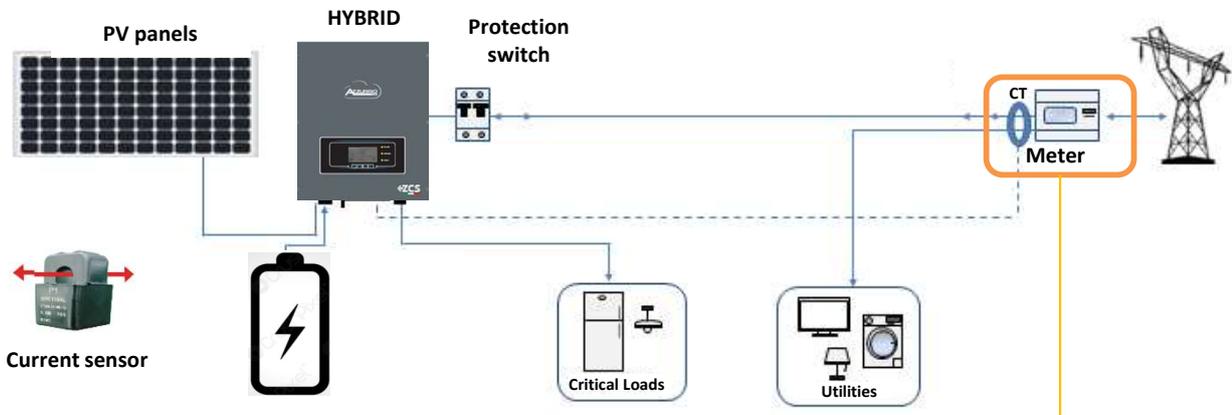
Route the CT cable through the cable glands on the right side of the cover, connect the positive and negative cables of the sensor to the counterpart contained in the inverter kit, then insert the counterpart into the corresponding port on the inverter board.

Replace the cover and secure it with the four screws; then tighten the cable glands.

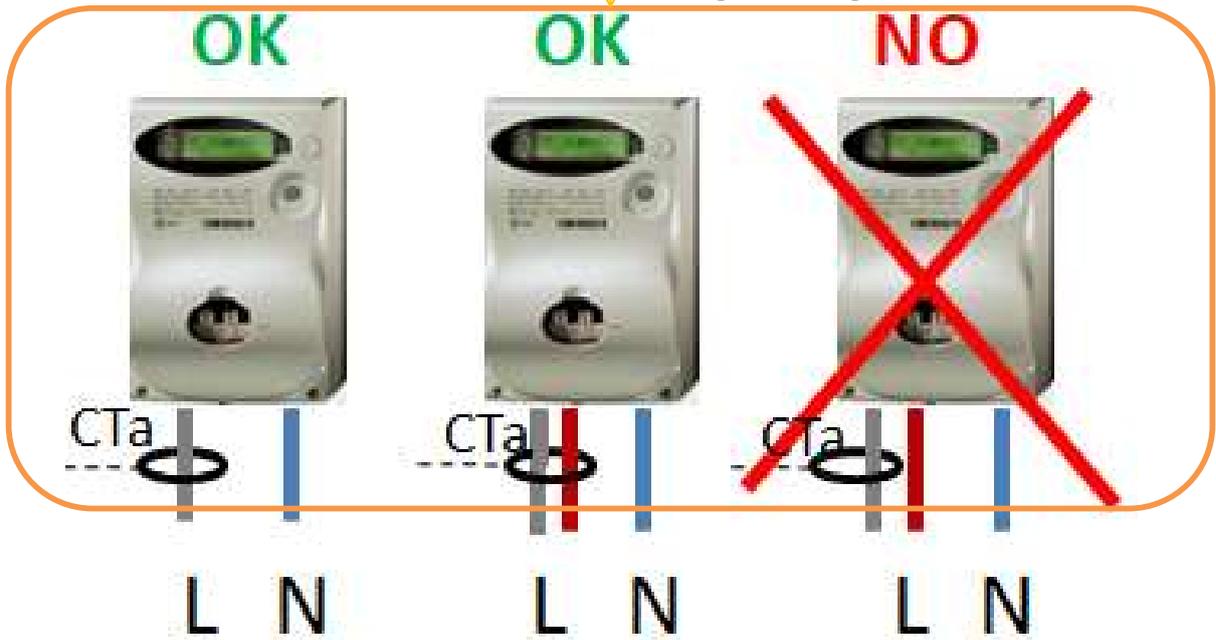
Correctly position the current sensor:

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





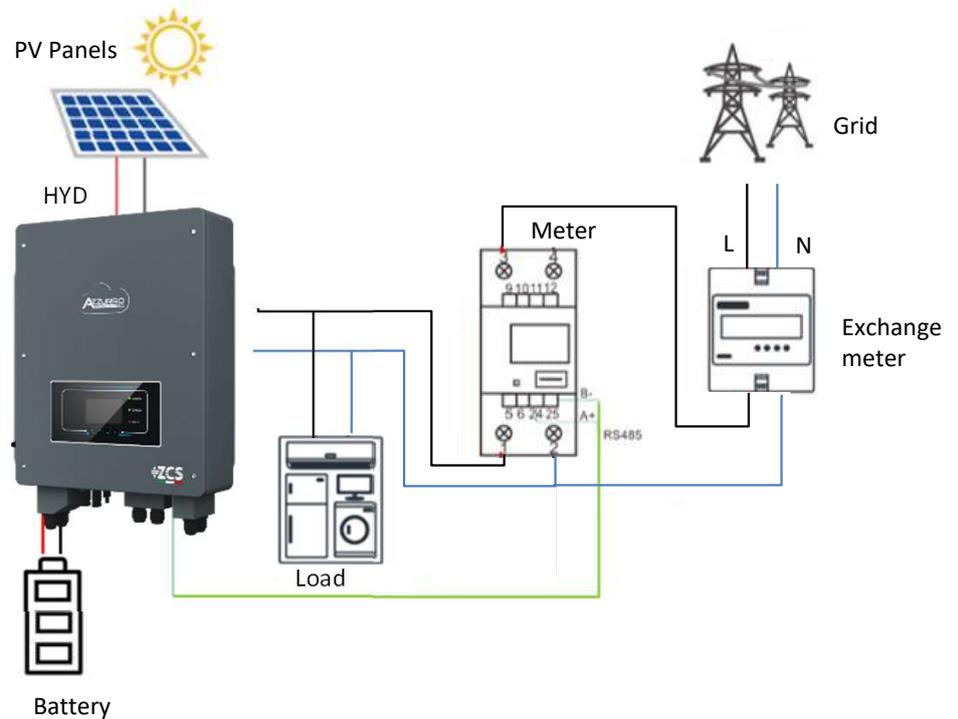
The sensor must include all phase cables entering or leaving the meter.



9.2 MEASUREMENT OF THE EXCHANGE POWER THROUGH METER



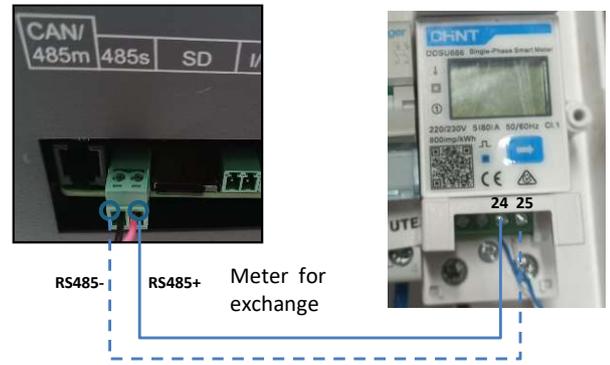
INVERTER PIN	METER PIN	Nota
RS485+	24	Exchange meter communication
RS485-	25	



Meter Connection

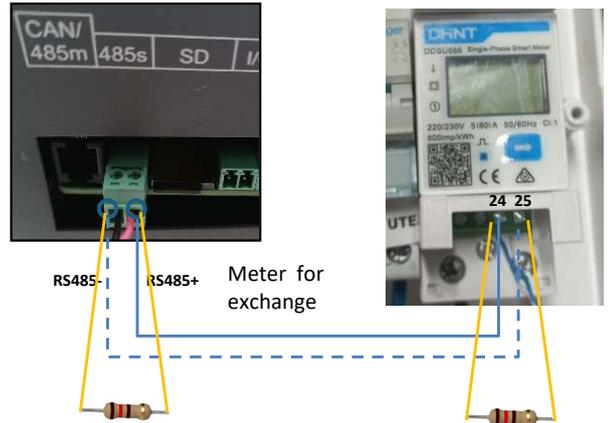
1. Connect Meter and inverter through the RS485 port. On the Meter this port is identified by **PIN 24 and 25**.

2. Connect Meter and inverter through the RS485 port. On the Meter this port is identified by **PIN RS485+ and RS485-**.



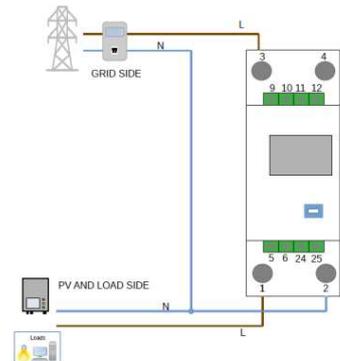
3. Meter side connect 120 Ohm resistor from **PIN 24 and 25**.

4. Inverter side connect 120 Ohm resistor from **PIN RS485+ and RS485-**



1. Connect the Meter as shown in the picture:

- ✓ Connect Neutral cable (N) to Meter's PIN 2;
- ✓ Connect phase cable (exchange meter side) to Meter's PIN 3
- ✓ Connect phase cable (Solar inverter and loads side) to Meter's PIN 1.



9.3 SETTAGGIO METER SU SCAMBIO ED INVERTER

1. Verify, using the push button  That the Meter is **001**.

In the Meter display are visible also:

- ✓ Current;
- ✓ Voltage;
- ✓ Power Factor ;
- ✓ Power.



Indirizzo



Corrente



Potenza



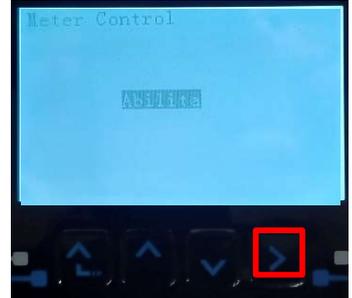
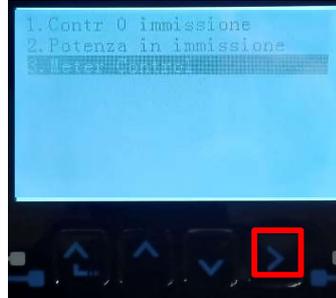
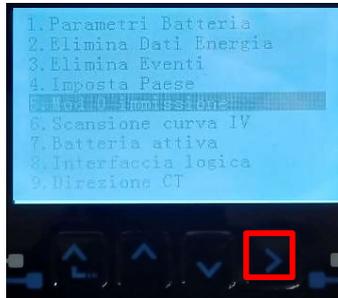
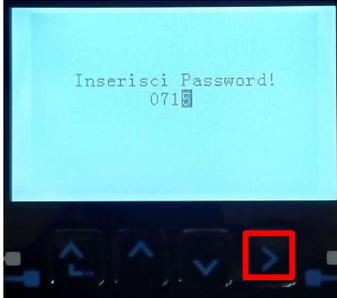
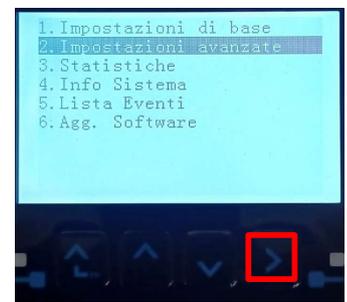
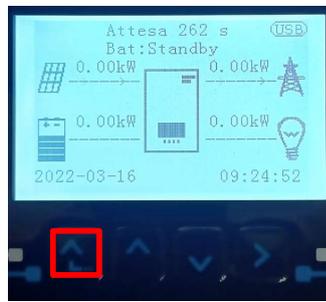
Tensione



Power factor

2. In order to configure the meter reading on the inverter is required to access the display (see picture):

1. Press the first push button on the inverter;
2. Access the advanced setting on the menu;
3. Enter the PWD «0715»;
4. 5. Anti Reflux;
5. 3. Meter Control
6. Enable;
7. Ok.



9. 4 METER READING VERIFICATION

To verify the correct meter reading on the exchange it is necessary to ensure that the hybrid inverter and any other source of photovoltaic production are turned off.

Light carcasses greater than 1kw.

Move in front of the meter and using the buttons

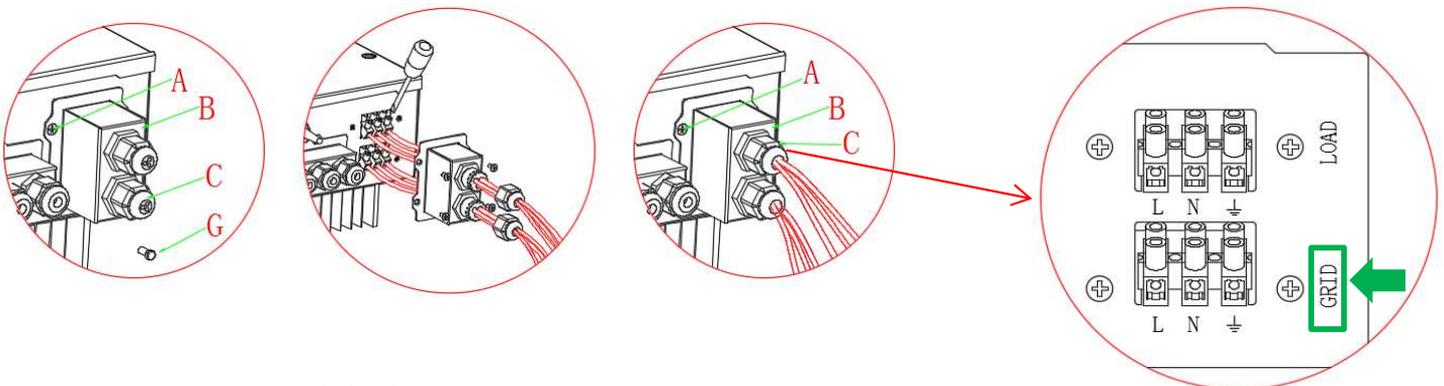
"  " to scroll between entries, it must be verified that:

The Power P is:

- ✓ Greater than 1 kW.
- ✓ In line with domestic consumption.
- ✓ The sign in front of each negative value (-).



10. CONNECTING TO THE GRID



1) Unscrew the 4 screws (A) of the central cover with a screwdriver.

2) Remove the cover (B), loosen the cable gland (C), and then remove the stopper (G).

3) Pass the AC cable through the cable gland (C), and connect the phase, neutral and ground cables to the GRID terminal block.

NOTE: The loads connected to the LOAD output will be regularly powered, even in the presence of the AC grid..

11. PV CONNECTION



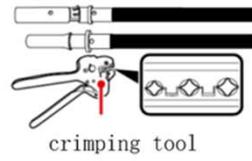
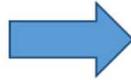
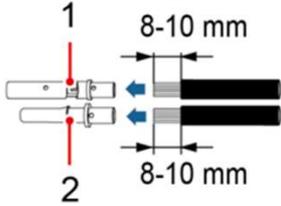
Recommended specifications for DC input cables

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

Procedure:

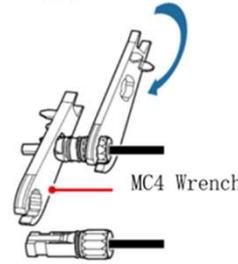
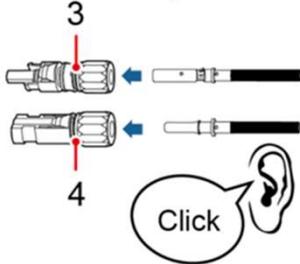
1) Prepare the positive and negative PV cables.

1. Positive contact
2. Negative contact



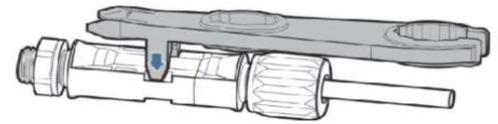
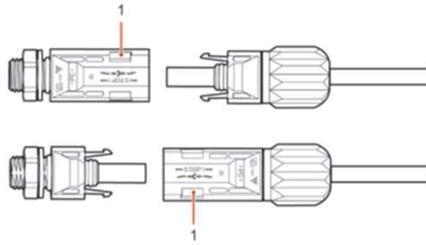
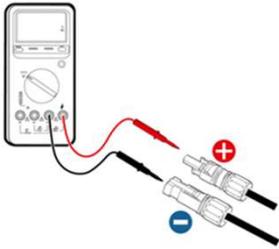
Insert the crimped positive and negative cables into the corresponding photovoltaic connectors.

3. Positive connector
4. Negative connector



Make sure that all the DC string parameters are acceptable to the inverter in accordance with the technical specifications given in the datasheet and in the Azzurro ZCS configurator.

In addition, check that the polarities of the photovoltaic cables are correct. Insert the positive and negative connectors of the HYD-ES inverter until you hear a "click."



Use a MC4 wrench to disconnect the photovoltaic connectors

PRUDENZA!

Before removing the positive and negative PV connectors, make sure that the DC rotary circuit breaker is in the OFF position.

NOTE: Before connecting/disconnecting the strings to the inverter, check that the DC circuit breaker on the side of the inverter is in the OFF position.

NOTE: Both MPPT inputs of the inverter should be populated, even if the system only has one string.

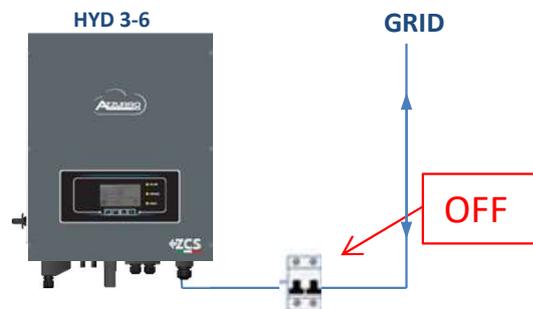
Use a "Y" cable or a square to split the string.

Configure the inverter in parallel MPPT mode directly from the display.



12.1 INITIAL SET UP PROCEDURE

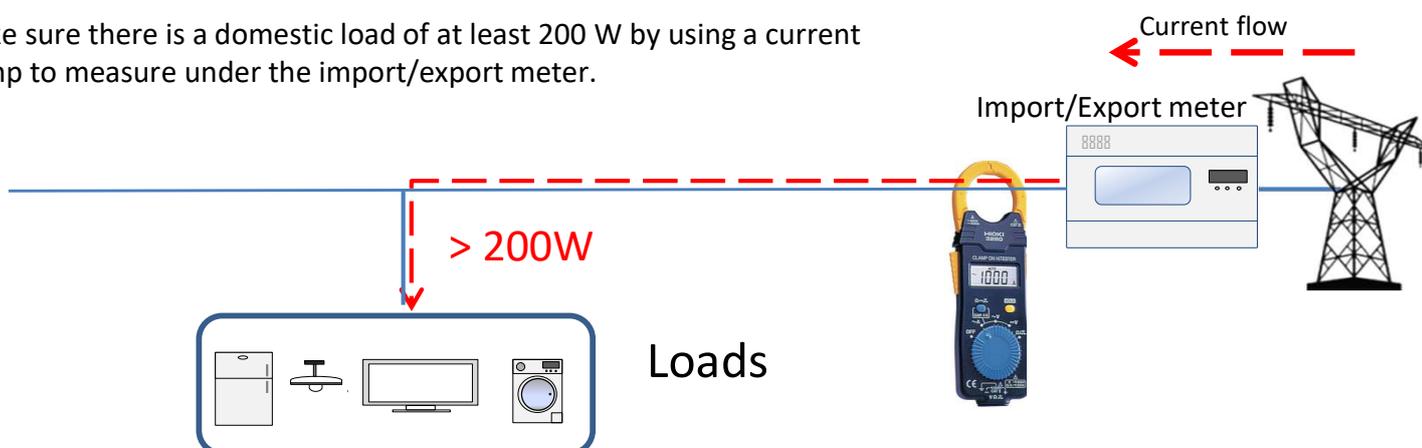
Make sure that the AC circuit breaker of the hybrid inverter is open and that no voltage is present on the inverter's terminal block.



Check that the DC circuit breaker of the inverter is in the OFF position.



Make sure there is a domestic load of at least 200 W by using a current clamp to measure under the import/export meter.



Turn on the batteries:



To turn on the **Pylontech** batteries: bring the switch on the front of **all the batteries** to the ON position.



Press the red SW button of **a single** battery for one second, the internal contactor will close automatically.



In case of **WeCo** batteries, press the POWER button of each battery for 1 second, the RUN LED will turn on and the internal contactor will close automatically.

Turn ON the AC circuit breaker located between the inverter and AC grid.





The procedure for blocking the current sensors is available from version 2.00 of the Service Code onwards; in the event of lower Service Codes, contact technical support.

To perform the freezing operation, follow the instructions below:

“Password 0001” → **NOTE:** info for writing the password

Power read by CT

CT info

Direction of power flow:
 •IMPORT → from grid to utility
 •EXPORT → from utility to grid

Phase shift between the voltage (V) and current (I) expressed as a percentage → $P / (V \times I) = \cos\phi$

Indicates the status of the current sensors:

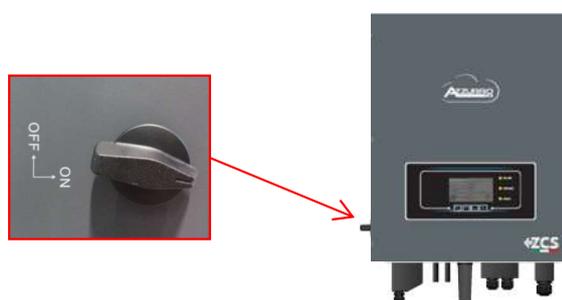
- UNFREEZE → direction not blocked (at each system start, the direction depends on the direction of the first current flow).
- FREEZE → direction blocked (sensors keep the same direction at each start up).

After checking for the presence of a power flow towards the utility, freeze the CTs by pressing the arrow so that the word **FREEZE** appears at the bottom and then confirm with the fourth button .

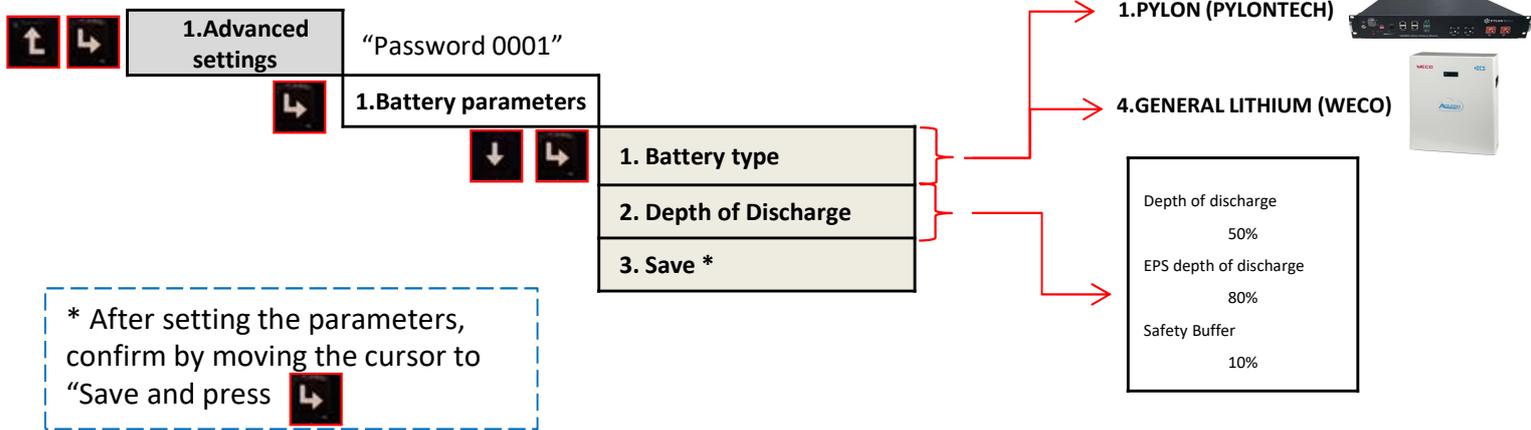
To unfreeze, press the third button to display the **UNFREEZE** message and then press the third key. Confirm. By switching the system off and on in this way, the sensor can once again be directed. .

12.3 INITIAL SET-UP PROCEDURE - PHOTOVOLTAIC START UP

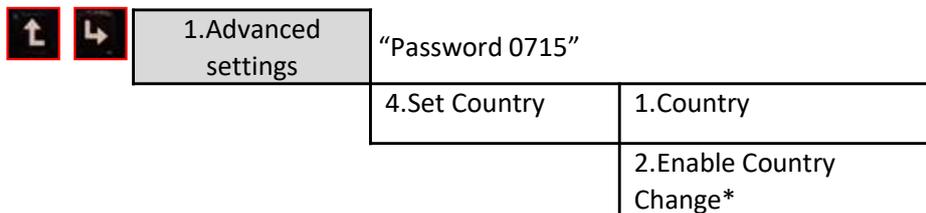
To supply DC voltage to the hybrid inverter, turn the circuit breaker to the ON position



13. INITIAL SETTINGS - BATTERY PARAMETERS



14. INITIAL SETTINGS - COUNTRY CODE



Select the code corresponding to the national standard (see table below) which can be set using the "Up" and "Down" keys, press "OK" to move to the next character and confirm.

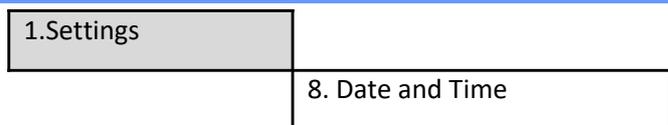
* Setting to be used only if more than 24 hours have elapsed since the inverter was first switched on or since the previous country change.

Code	Country
00	Germany VDE4105
01	CEI-021 Internal
02	Australia
03	Spain RD1699
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	UE EN50438
19	IEC EN61727
20	Korea
21	Sweden

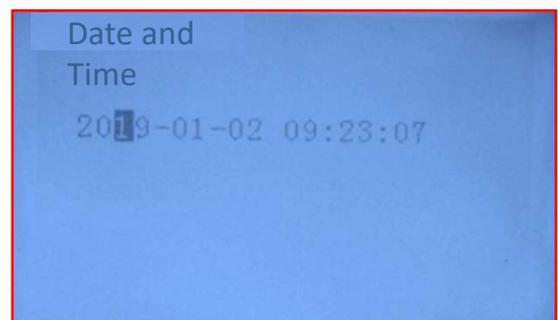
Code	Country
22	General Europe
23	CEI-021 External
24	Cyprus
25	India
26	Philippines
27	New Zealand
28	Brazil
29	Slovakia
30	Slovakia SSE
31	Slovakia ZSD
32	CEIO-21 In Areti

15. INITIAL SETTINGS - DATE AND TIME



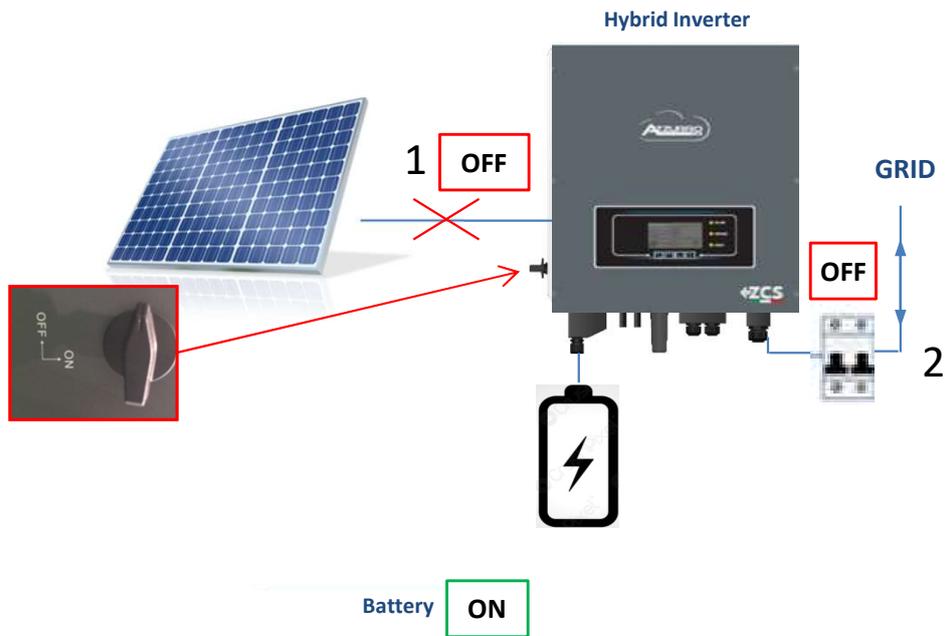
To enter the correct date and time:

- [Up Arrow] Back
- [Down Arrow] Decrease number
- [Up Arrow] Increase number
- [Down Arrow] Forward or confirm

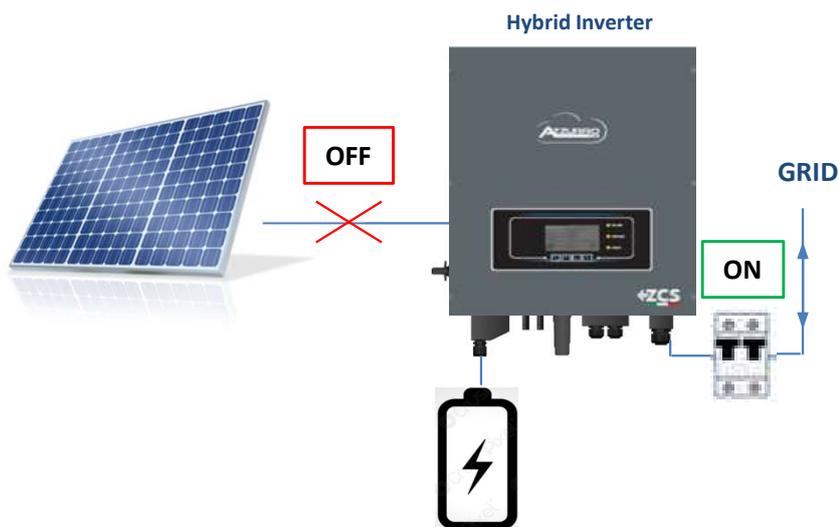


16. CHECKING FOR CORRECT OPERATION

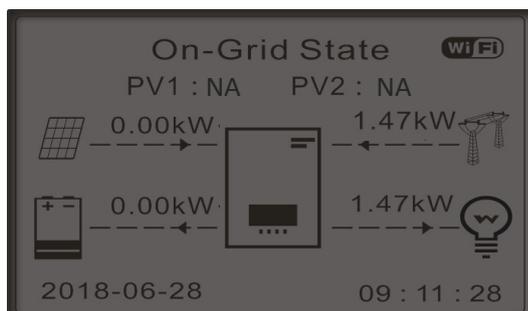
1) Turn the PV circuit breaker to the OFF position and disconnect the inverter from the grid

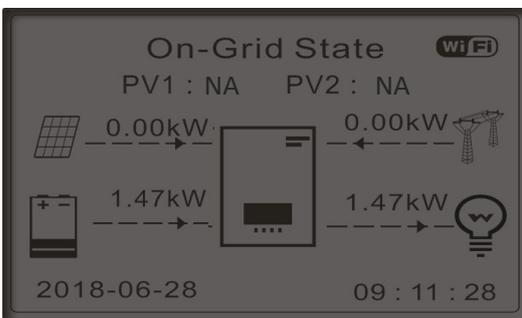


2) Restore AC voltage by flicking the dedicated switch upwards:



3) Check that the power value taken from the grid display is approximately equal to the power consumption shown on the meter, or to the value obtained by using a current meter to measure under the import/export meter.

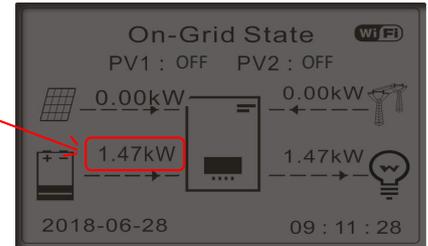
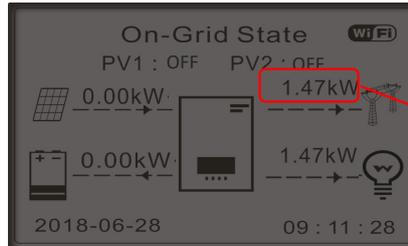




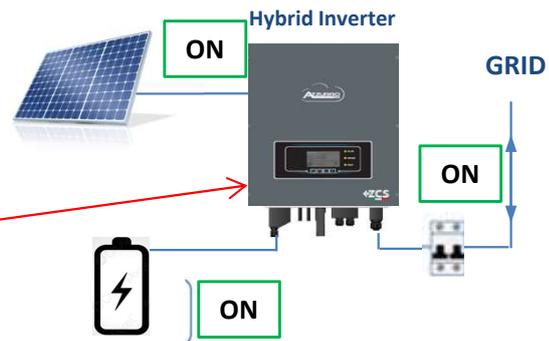
Once the countdown is over, the batteries will start to deliver power to the utility according to availability, and will attempt to reset the consumption from the grid.

Check that the value of the consumption remains constant* as the power supplied by the battery increases during discharge.

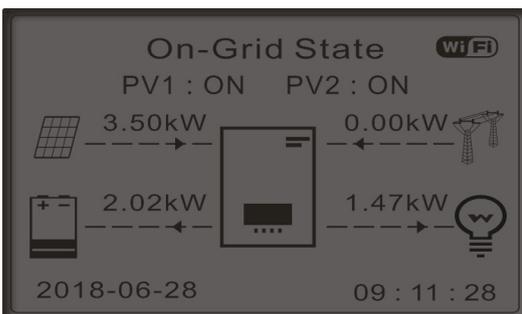
Check that the power taken from the grid decreases by an amount equal to the power supplied by the battery.



Switch the photovoltaic system back on by turning the DC switch to the ON position



Once the photovoltaic system has been activated, check that:



The value of consumption $\xrightarrow{1.47kW}$ remains constant as the photovoltaic power increases. $\xrightarrow{3.50kW}$

Depending on the photovoltaic production, the system will operate according to the mode described in chapter 6.

* Check that the power of the loads in use does not change:

- Heat pump or pump → Load variable over time
- Light or Hairdryer → Load constant over time



Note: If the conditions described above are not met:

- Unfreeze the current sensors as described in point 12.2 of this guide.
- Check the correct positioning of the current sensors and then restart the system by performing the above checks, and freeze the sensors only after making sure that everything has been installed correctly.



17. CHECKING THE INVERTER SETTINGS

To check whether the parameters set are correct, enter the display menu under “Inverter Info” and check the data, especially those highlighted:

Inverter Info (1) Serial number: ZM1ES030M28307 Software version: V2.00 Hardware version: V1.00 Power level: 3kW	➤ Serial number of the machine ➤ Software version installed ➤ Hardware version ➤ Max inverter power	Inverter Info (4) DRMs0 Control: Disabled Set PF time: DFLT: 0.000s SET: 0.000s Set QV time: DFLT: 3.0s SET: 3.0s Power Factor: 100%	➤ Information on DRMs0 mode (to enabled only for Australia) ➤ Response delay in frequency ➤ Response delay in voltage ➤ Power factor value
Inverter Info (2) Country: CEI-021 Internal Service Code: V2.10 PV Input Mode: Independent Working mode: Automatic mode	➤ Country code for legislation ➤ Service Code Version ➤ Photovoltaic input mode (Independent / Parallel) ➤ Information on operating mode (must be automatic)	Inverter Info (5) Battery active: Disabled CT Direction: Unfrozen Resistance insulation: 7000KOhm	➤ Function not enabled ➤ Sensor status ➤ Measured value of the insulation resistance
Inverter Info (3) RS485 address: 01 EPS: Disabled IV Curve Scan: Disabled Zero grid feed-in mode: Disabled	➤ Communication address (value must be different from 00) ➤ Information on EPS mode ➤ Information on MPPT scan mode ➤ Information on maximum grid in-feed mode		

18. CHECKING THE BATTERY SETTINGS

To check whether the parameters set are correct, enter the display menu under “Battery Info” and check the data, especially those highlighted



Pylontech

Weco 4K4 / 4K4PRO

Weco 5K3

Azzurro ZSX5000

Batterie-Info (1) Battery type: Pylon Battery capacity: 50 Ah Depth of Discharge: 80 % (EPS) 80 % Curr. Max charge current (A): BMS: 25.00A SET: 65.00A	Batterie-Info (1) Battery type: WeCoHeSU V0.3.54 Battery capacity: 86 Ah Depth of Discharge: 80 % (EPS) 90 % Curr. Max charge current (A): BMS: 65.00A SET: 65.00A	Batterie-Info (1) Battery type: WECO628 Battery capacity: 100 Ah Depth of Discharge: 80 % (EPS) 90 % Curr. Max charge current (A): BMS: 65.00A SET: 65.00A	Batterie-Info (1) Battery type: AZZURRO LVZSX5000 Battery capacity: 100 Ah Depth of Discharge: 80 % (EPS) 90 % Curr. Max charge current (A): BMS: 50.00A SET: 65.00A	➤ Battery model set ➤ Total battery capacity in Ah ➤ Battery discharge percentage ➤ Maximum charge current in A
Batterie-Info (2) Overvoltage threshold: 54.0 V Max. charge threshold (V): 53.2 V Max. discharge current (A): BMS: 25.00A SET: 65.00A Min. discharge voltage: 47.0 V	Batterie-Info (2) Overvoltage threshold: 59.3 V Max. charge threshold (V): 58.4 V Max. discharge current (A): BMS: 65.00A SET: 65.00A Min. discharge voltage: 48.0 V	Batterie-Info (2) Overvoltage threshold: 59.3 V Max. charge threshold (V): 58.4 V Max. discharge current (A): BMS: 65.00A SET: 65.00A Min. discharge voltage: 48.0 V	Batterie-Info (2) Overvoltage threshold: 59.3 V Max. charge threshold (V): 58.4 V Max. discharge current (A): BMS: 50.00A SET: 65.00A Min. discharge voltage: 48.0 V	➤ Max voltage value (protection) ➤ Max voltage value (charge) ➤ Maximum discharge current in A ➤ Min voltage value (discharge)
Batterie-Info (3) EPS Safety Buffer: 20%	➤ EPS safety value			

***Note:** if there is more than one battery, the sum of the total capacities will be shown on the display

19.1 EPS MODE (OFF GRID)

In the event of a power failure or operation in OFF-Grid mode, if the EPS function is enabled, the HYD-ES inverter will operate in Emergency Power Supply (EPS) mode using the PV power and energy stored in the battery to supply power to the critical load via the LOAD connection port.

19.2. EPS MODE (OFF GRID) - ACCESSORIES REQUIRED

Three-pole AC cable for connecting critical loads to the inverter



19.3 EPS MODE (OFF GRID) - WIRING PROCEDURE AND INSTALLATION TYPES

Identify the critical or priority domestic loads: it is advisable to identify the domestic loads strictly necessary during power outages, such as lights, refrigerators or freezers, emergency sockets.

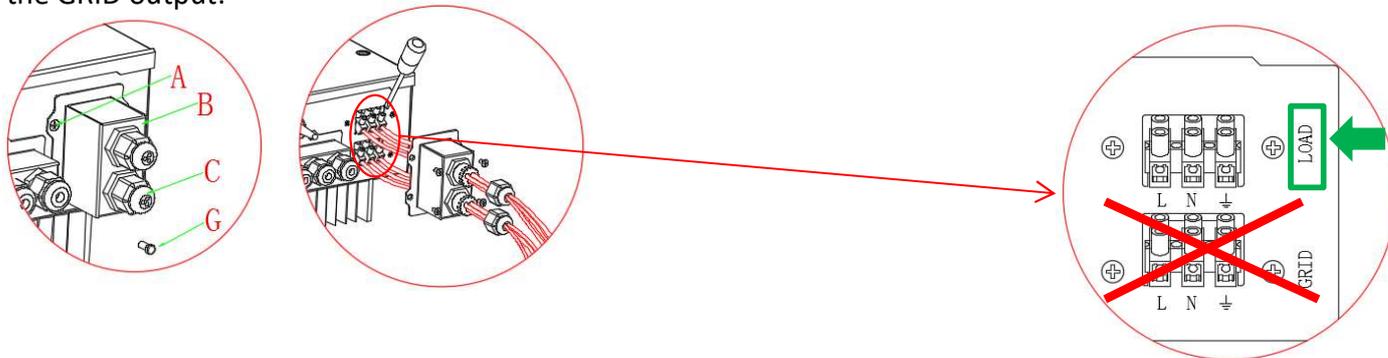


- High power loads (such as ovens, washing machines, heat pumps) may not be supported by the inverter in EPS mode, given the maximum power that can be delivered under these conditions.
- Loads with high inrush currents (such as pumps, compressors or in general devices driven by electric motors) may not be supported by the inverter in EPS mode, as the inrush current, even if only for a very short period, is considerably higher than that supplied by the inverter.
- Inductive loads (such as induction plates) may not be supported by the inverter in EPS mode, due to the waveform of these devices.

Connect the phase, neutral and ground wires to the LOAD output located on the right side of the bottom of the inverter.

NOTE: the LOAD output must only be used for connecting the critical load.

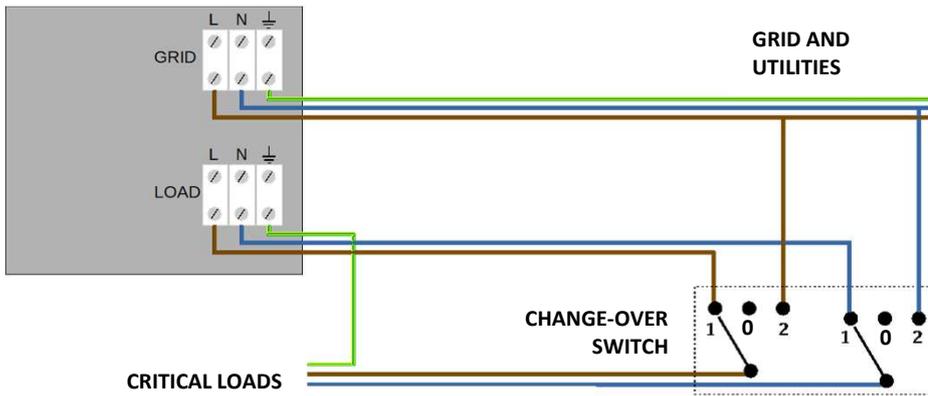
The procedure for connecting the power cables to the LOAD output is the same as that for connecting the cables to the GRID output:



- 1) Unscrew the 4 screws (A) of the central cover with a screwdriver.
- 2) Remove the waterproof cover (B), loosen the cable gland (C), and then remove the stopper (G).
- 3) Pass the cable with the phases through the cable gland (C), connecting it to the appropriate terminals on the **LOAD** side.

CHANGE-OVER SWITCH

In case of maintenance of the components of the photovoltaic system or in case of an inverter that cannot be used, it is recommended to install a change-over switch so that the loads normally connected to the inverter's load line can be fed directly from the grid.



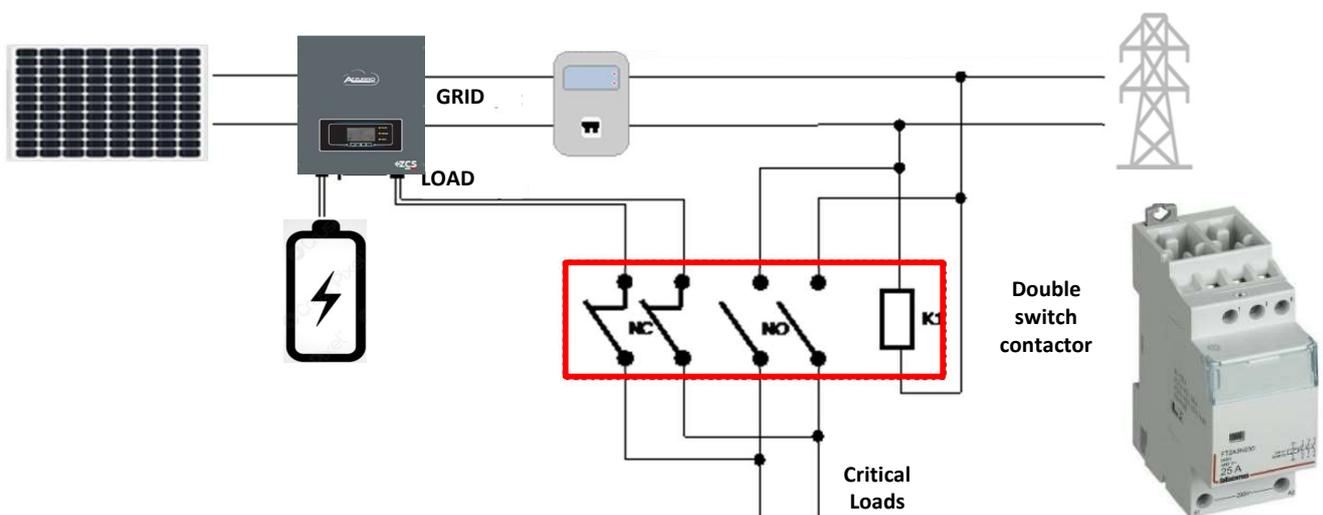
Position 1 → Priority loads connected and powered by the inverter's LOAD line

Position 0 → Priority loads not powered by the inverter or by the grid

Position 2 → Priority loads connected and powered by the grid

DOUBLE SWITCH CONTACTOR

For subsidised systems, a double switch contactor can be installed. This device will ensure that the critical loads are normally powered by the grid, they will be powered by the EPS LOAD line of the inverter only in the event of a power failure thanks to the change-over of the contactors



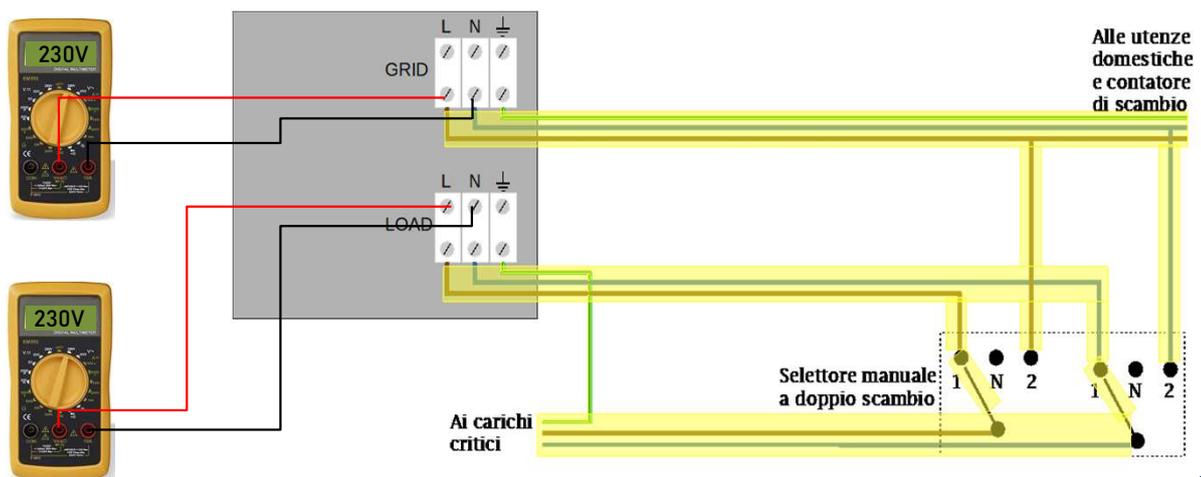
NOTE: For the conditions described above, in the event of a power failure, the part of the system powered by the inverter's LOAD port behaves like an IT system

Note: If the hybrid inverter is to be installed under different conditions from those shown in the diagrams above, contact technical support to check whether it is feasible.

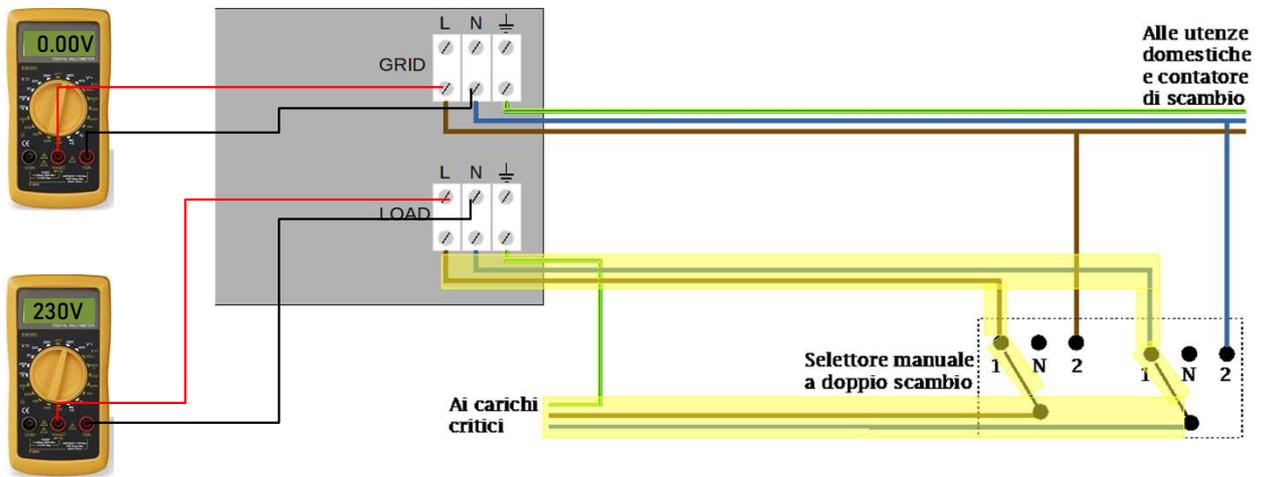
19.4 EPS MODE (OFF GRID) - OPERATION

If the alternating voltage supplied by the grid is present (normal operating condition), both the standard loads of the system and the priority or critical loads are supplied by the grid without the need to use a double switch-over contactor. This operation is shown in the figure below.

It should also be noted that the LOAD output is always energised, even when the mains voltage is present.



In the event of a **blackout**, the alternating voltage supplied by the grid will be lost; this condition will cause the internal contacts of the hybrid inverter to switch over which, once the set activation time has expired, will continue to supply an alternating voltage of 230V to the LOAD output, supplying power only to the critical loads according to the availability of the batteries and PV system.



NOTE: with this configuration, the system becomes an IT system during a blackout.

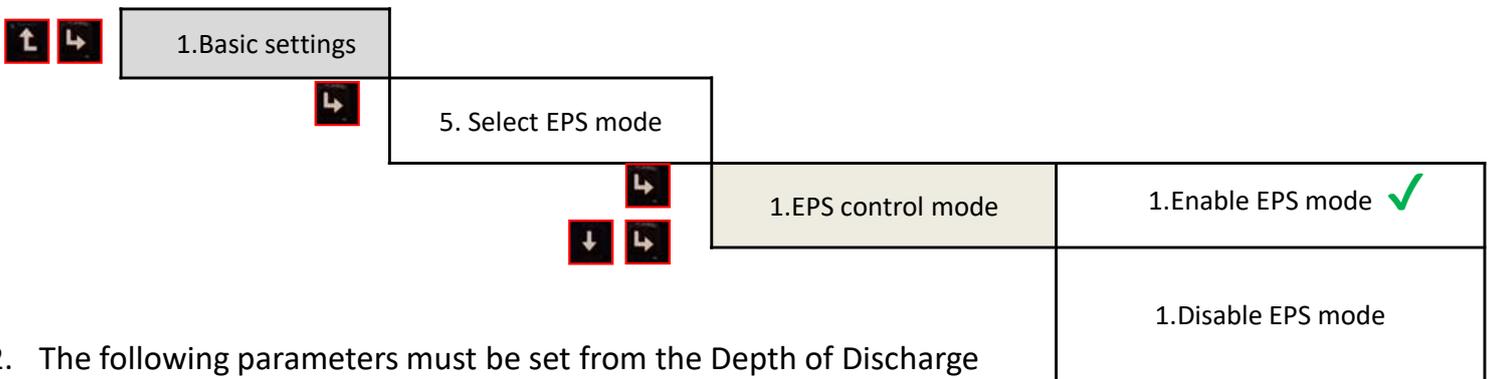
Note: During operation in EPS mode, if the batteries are sufficiently charged, the system will be able to deliver a maximum alternating current equal to:

- System with one Pylontech battery: 5 A (1,100 W)
- System with two Pylontech batteries: 10 A (2,200 W)
- System with three or more Pylontech batteries: 13 A (3,000 W)
- System with one or more WECO batteries: 13 A (3,000 W)

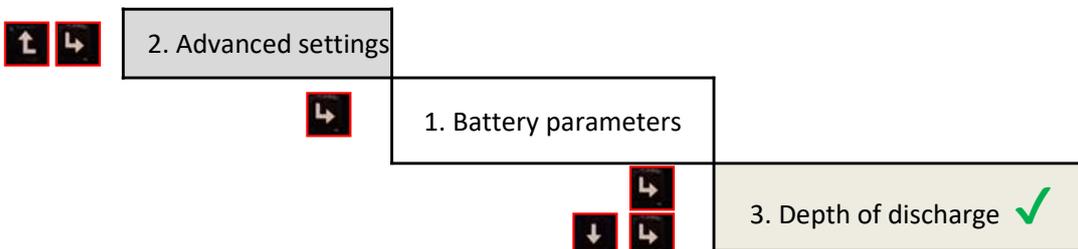
19.5 EPS MODE (OFF GRID) - MENU ENABLING

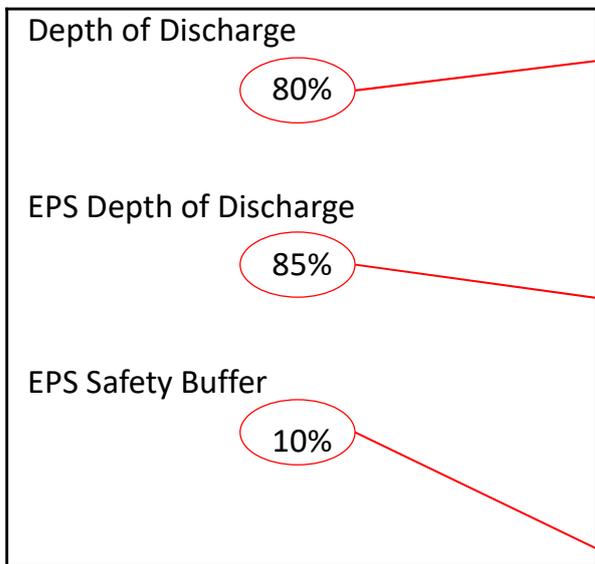
To enable the EPS (OFF-GRID) mode:

1. The EPS mode must be enabled from the display.



2. The following parameters must be set from the Depth of Discharge menu.





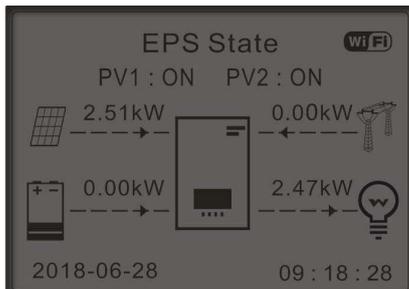
1. Depth of Discharge in ON-Grid mode
 e.g.
 Max charge value 100%
 Min discharge value 20%

2. Depth of Discharge in EPS (or OFF-Grid) mode, beyond which the inverter stops supplying power to the connected loads.
SOC% < (100 - Depth of Discharge in EPS)
 e.g. Max charge value = 100%
 Min discharge value = 15%

3. After reaching the minimum EPS discharge value, the inverter resumes supplying power to the loads in EPS (or OFF-Grid) mode once the set threshold has been exceeded
SOC% > 100 - Depth of Discharge in EPS+ safety buffer)
 e.g. LOAD output re-supplying value = 26%

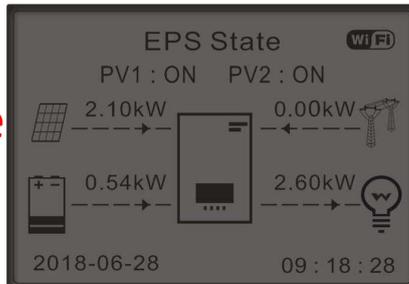
19.6 EPS OPERATING MODE (OFF GRID)

Standby



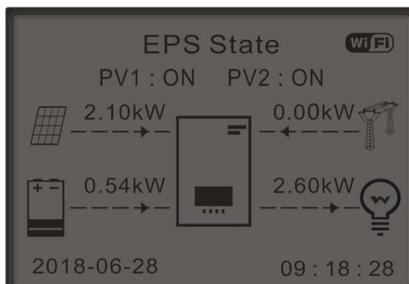
If PV production = LOAD consumption, the HYD-ES inverter will not charge or discharge the battery.

Discharge

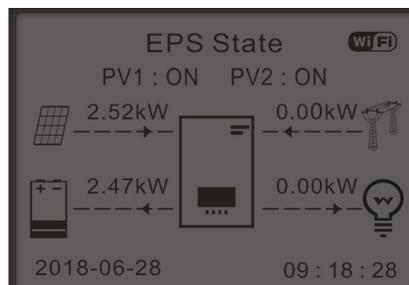


If PV production < LOAD consumption ($\Delta P > 100W$) the HYD-ES inverter will discharge the battery.

Charge



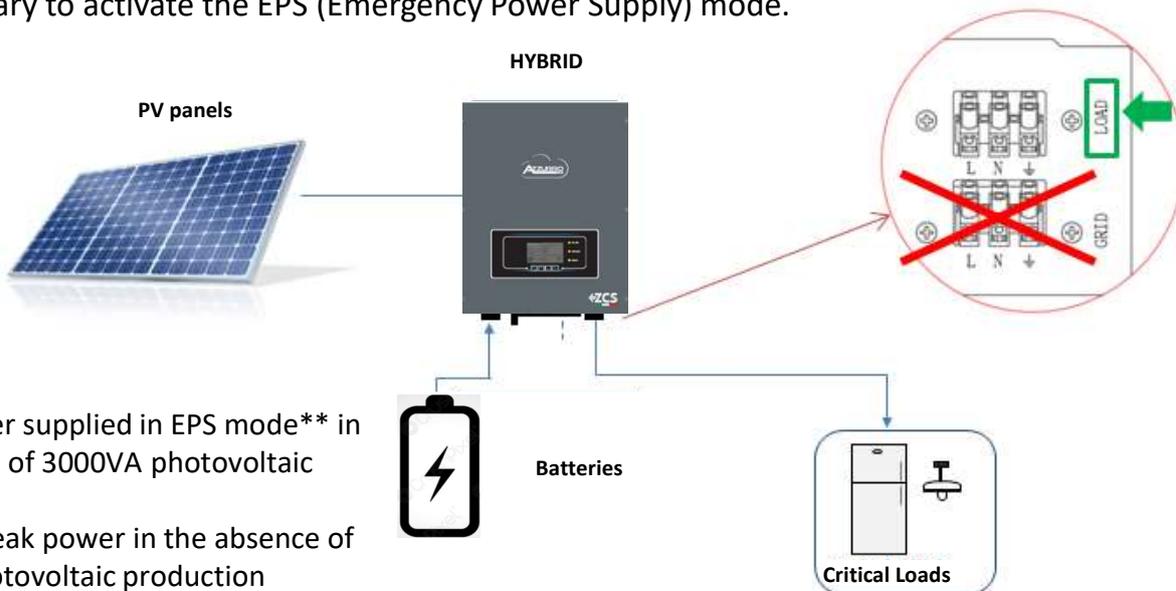
If PV production > LOAD consumption ($\Delta P > 100W$) the HYD-ES inverter will charge the battery.



If the photovoltaic production is normal, but the LOAD consumption = 0, or if the **SOC% < 100% - EPS_{DOD}** the excess energy will be stored in the battery.

20.1 OFF GRID MODE ONLY

By switching on the HYD-ES inverter when there is no grid, it will be able to supply the energy coming from the PV system and stored in the batteries to the pre-defined critical loads. To do this, it is necessary to activate the EPS (Emergency Power Supply) mode.



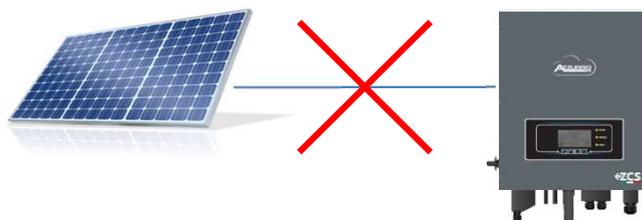
Note: Power supplied in EPS mode** in the absence of 3000VA photovoltaic production.

Apparent peak power in the absence of 4000VA photovoltaic production

** Power output in EPS mode depends on the type of batteries and the status of the system (e.g. no. of batteries, residual capacity, temperature)

20.2 OFF GRID MODE ONLY - START UP

- 1) Check that the DC circuit breaker of the inverter is in the OFF position.



- 2) Turn on the batteries:



To turn on the **Pylontech** batteries: bring the switch on the front of **all the batteries** to the ON position..

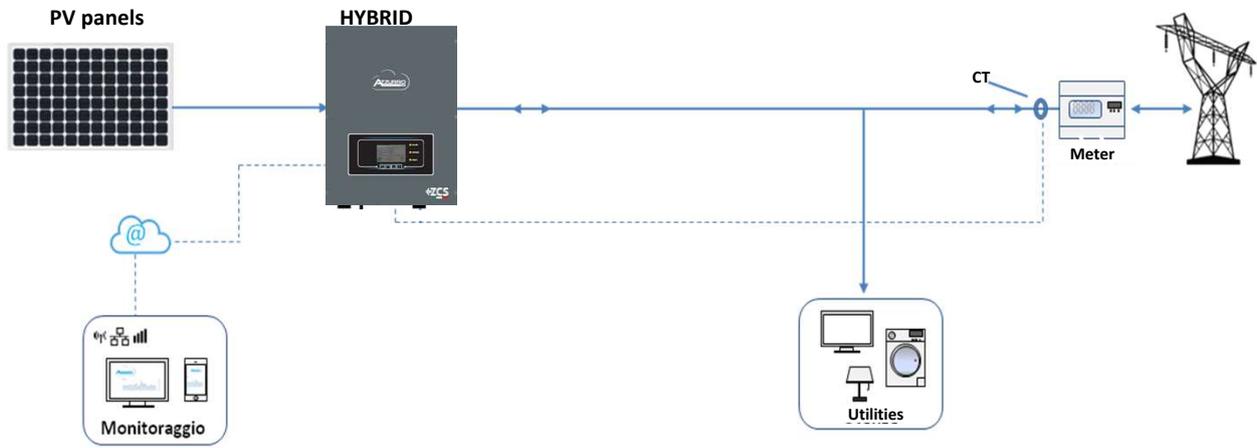
Press the red SW button of **a single** battery for one second, the internal contactor will close automatically.

In case of **WeCo** batteries, press the POWER button of each battery for 1 second, the RUN LED will turn on and the internal contactor will close automatically.

- 3) Switch on the photovoltaic system by turning the switch to the ON position.



21. OPERATION OF PHOTOVOLTAIC SYSTEM ONLY

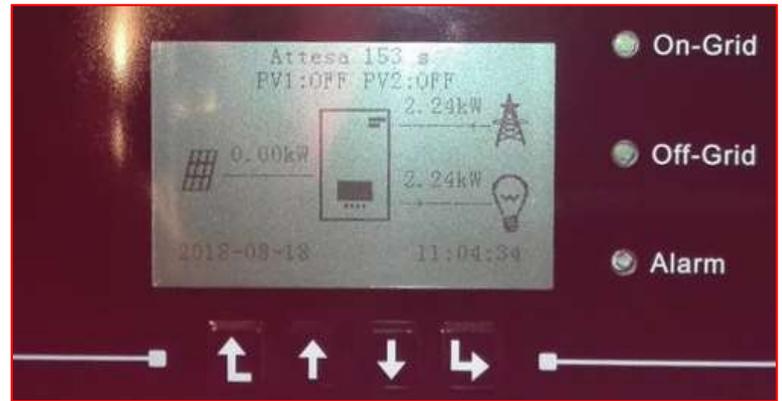


The system can also work as a photovoltaic inverter only, and therefore without batteries.

In this case, the display will only show the values relating to:

- .Photovoltaic production
- .Load consumption
- .Power exchanged with the grid

NOTE: In this case, the AC wire must be connected to the GRID port



22. SELF-TEST



Before running the self-test make sure the correct country code has been set!!!



Note: the STD self-test is the same as the Fast self-test except that the waiting times are longer (about 12 minutes for the fast self-test compared to 45 minutes for the STD self-test).

