SCAN ME
FOR INSTALLATION
TUTORIALS & DOCUMENTATION

QUICK INSTALLATION GUIDE HYBRID INVERTER 3-6-ZSS

TABLE OF CONTENTS

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
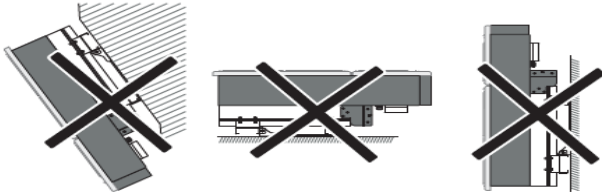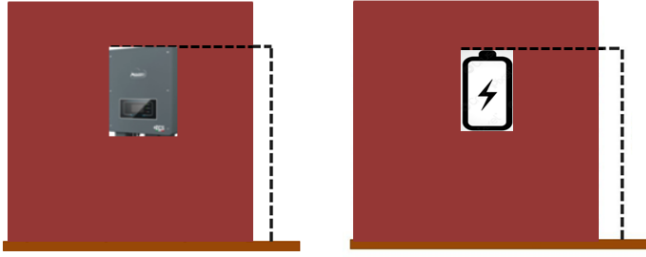
Correct installation in vertical position

Maximum inclination permitted: 15°

max 15°

NO

OK   NO
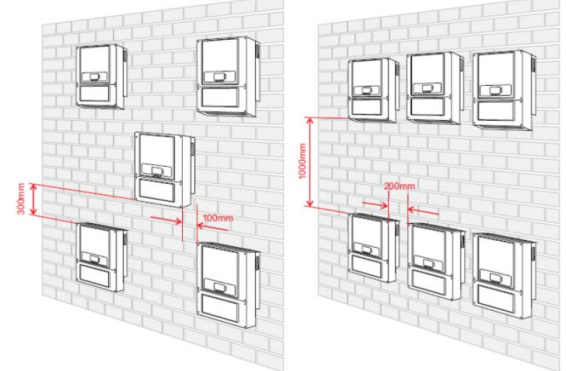
Distances for the installation of a single inverter

80 cm

20 cm   20 cm

50 cm
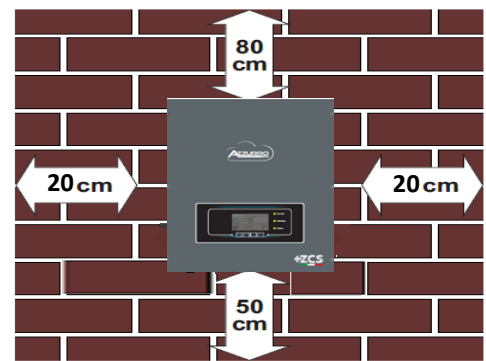
2. WIRING DIAGRAM FOR HYBRID STORAGE INVERTER
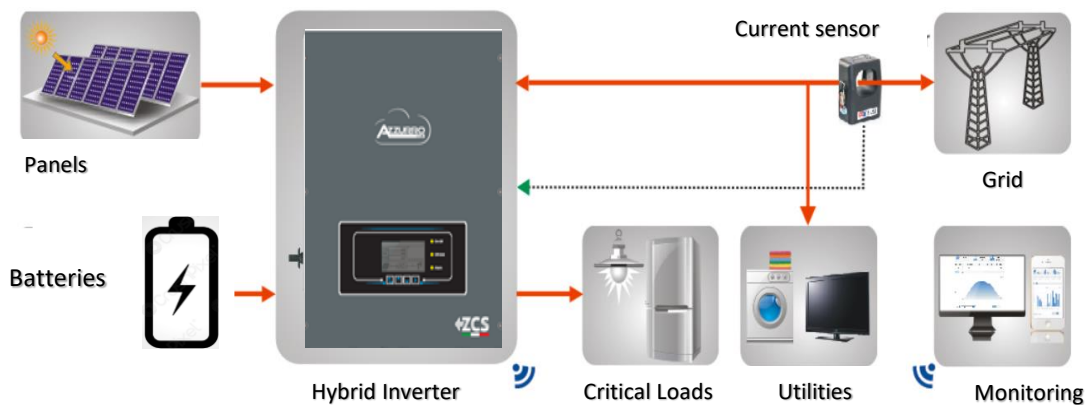
Current sensor

Panels

Grid

Batteries

Hybrid Inverter   Critical Loads   Utilities   Monitoring

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

5	Discharging	
6	Charging	
7	Alarm	

Buttons: 1 2 3 4

1. Menu/Back	8. System status
2. Up	9. PV production
3. Down	10. Grid power
4. Enter/Forward	11. Home consumption
5. Discharge status	12. Battery power
6. Charge status	13. Date and time
7. Alarm status	14. Wi-Fi signal
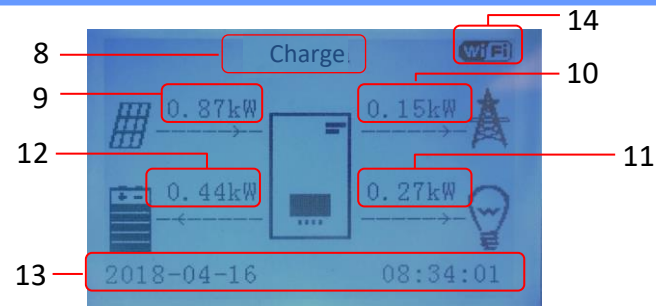
Status of the HYD-ES inverter	On Grid — Green light	Off-Grid — Green light	Alarm — Red light
On-grid	On		
Standby (On-Grid)	Intermittent		
Off-Grid		On	
Standby (Off-Grid)		Intermittent	
Alarm			On

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

1. Language
2. Date and Time
3. Working mode
4. PV input mode
5. EPS Mode
6. Select.Commun.Address
7. Self-test

2. Advanced settings   PWD: 0715

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

1. List of current events
2. List of historical events

4. System Info

1. Inverter Info
2. Battery Info
3. Safety parameters

5. SW Update   PWD: 0715

Start Update ...

6.Energy Statistics

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

4

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℃
```

```
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℃
```

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
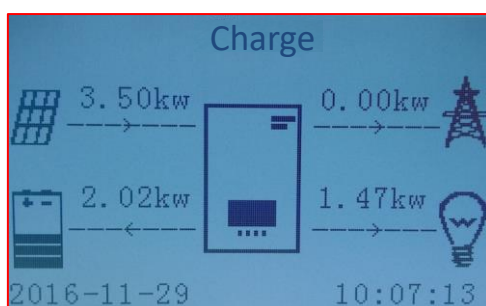
When the power produced from the photovoltaic system is greater than the energy required by the loads, the Inverter inverter will charge the battery with the excess energy.
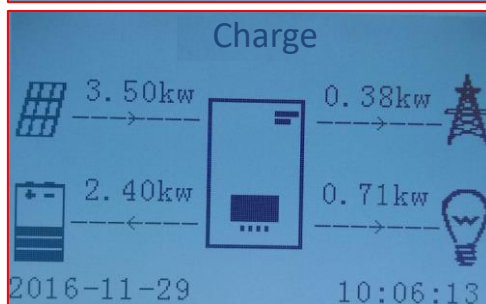
When the battery is fully charged, or when the charging power is limited (to preserve the integrity of the battery), the excess energy will be exported to the grid.

Discharge
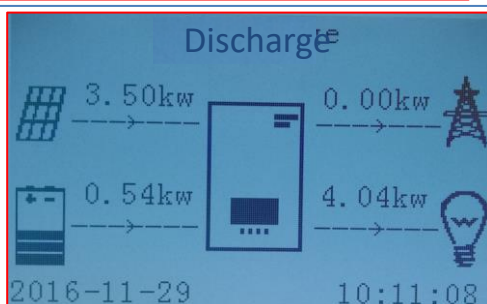
When the power of the photovoltaic system is once again less than the power required by the loads, the system will use the energy stored in the battery to power the domestic utilities.
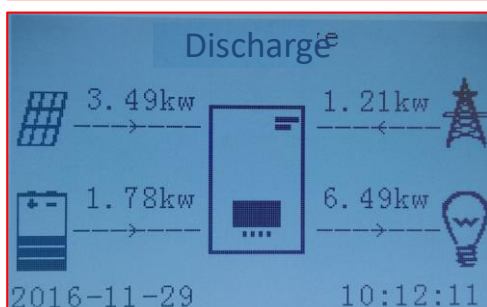
When the sum of the power produced by the photovoltaic system and supplied by the battery is less than that required by the loads, the missing energy will be taken from the grid.

Standby
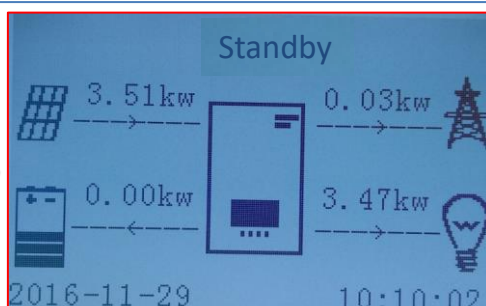
The Inverter will remain in Standby until:
•the difference between the PV production and the power required by the loads is less than 100W
•the battery is fully charged and the PV production is higher than the consumption (with tolerance of 100W)
•the battery is flat and the PV production is lower than 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.
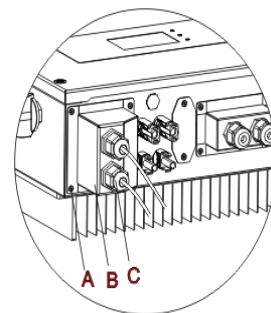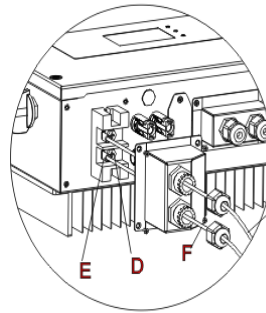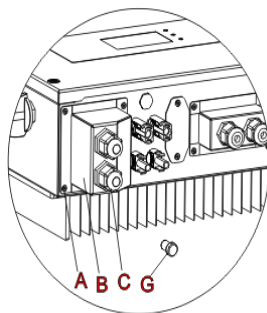
CONNECTING THE COMMUNICATION CABLES:

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.

Maximum DoD programmable 80%

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

Communication cable pinout between Pylontech battery and Inverter, from left to right	
Inverter	PIN 1: **White – Orange wire** PIN 2: **Orange wire** PIN 3: **White – Blue wire** PIN 4: **Blue wire**
Pylontech	PIN 1: **Not use** PIN 2: **Not use** PIN 3: **Not use** PIN 4: **White – Orange wire** PIN 5: **Orange wire** PIN 6: **Not use** PIN 7: **White – Blue wire** PIN 8: **Blue wire**

Communication connections between batteries and inverter:

• CAN of **Master Battery** → CAN Port of **inverter**

Inverter negative

Inverter positive

Note: DIP switches must be set as per the factory settings, all in the OFF position (00000)

POWER CONNECTION - In case of a single battery, two power cables (positive and negative) and one communication cable will be connected, as shown above.

↓ OFF ↓

NOTE: For a parallel connection, use the appropriate cables (power and communication) supplied in the kit.

Master

Slave 1

⋮

Slave n

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

- CAN of **Master Battery** → CAN Port of **inverter**
- Link port 1 of **master battery** → Link Port 0 of **Slave 1 battery**
- Link port 1 of **Slave 1 battery** → Link Port 0 of **Slave 2 battery**
- …
- Link Port 1 of **slave N-1 battery** (second last) → Link Port 0 of **slave N battery** (last)

Inverter negative

Inverter positive

Power connections between batteries and inverter:

Batteries must be connected in a "loop."
- Positive input (+) of **master battery** connected to positive input (+) of **inverter**.
- Positive input (+) of **master battery** connected to positive input (+) of **slave 1 battery**.
- Negative input (-) of **master battery** connected to negative input (-) of **slave 1 battery**.
- …..
- Positive input (+) of **slave N-1 battery** (second-last) connected to positive input (+) of **slave N battery** (last).
- Negative input (-) of **slave N-1 battery** (second-last) connected to negative input (-) of **slave N battery** (last).
- Negative input (-) of **slave N battery** (second-last) connected to negative input (-) of **inverter**.

Set the battery channels in the inverter.

*To set the **battery parameters**:*
Advanced settings → 0715 → Battery parameters:

- o   Type: Pylon; Depth of discharge: 80%.

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

Note: Maximum DoD programmable **80%**

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

Communication cable pinout between Pylontech battery and Inverter, from left to right	
Inverter	PIN 1: **White – Orange wire** PIN 2: **Orange wire** PIN 3: **White – Blue wire** PIN 4: **Blue wire**
Pylontech	PIN 1: **Not use** PIN 2: **Not use** PIN 3: **Not use** PIN 4: **White – Orange wire** PIN 5: **Orange wire** PIN 6: **Not use** PIN 7: **White – Blue wire** PIN 8: **Blue wire**

Communication connections between batteries and inverter:

- CAN of **Master Battery** → CAN Port of **inverter**

↓ OFF ↓

Note: DIP switches must be set as per the factory settings, all in the OFF position (00000)

Inverter negative

Inverter positive

POWER CONNECTION - In case of a single battery, two power cables (positive and negative) and one communication cable will be connected, as shown above.
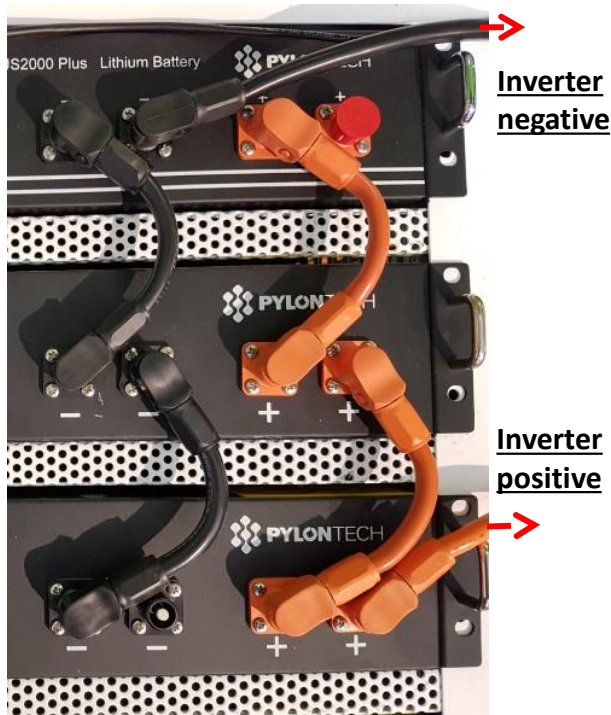
NOTE: For a parallel connection, use the appropriate cables (power and communication) supplied in the kit.

Master

Slave 1

...

Slave n

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

•CAN of **Master Battery** → CAN Port of **inverter**
•Link port 1 of **master battery** →Link Port 0 of **Slave 1 battery**
•Link port 1 of **Slave 1 battery** →Link Port 0 of **Slave 2 battery**
•…
•Link Port 1 of **slave N-1 battery** (second last) →Link Port 0 of **slave N battery** (last)

Inverter negative

→

Inverter positive

→

Power connections between batteries and inverter:

Batteries must be connected in a "loop."
•Positive input (+) of **master battery** connected to positive input (+) of **inverter**.
•Positive input (+) of **master battery** connected to positive input (+) of **slave 1 battery**.
•Negative input (-) of **master battery** connected to negative input (-) of **slave 1 battery**.
•…..
•Positive input (+) of **slave N-1 battery** (second-last) connected to positive input (+) of **slave N battery** (last).
•Negative input (-) of **slave N-1 battery** (second-last) connected to negative input (-) of **slave N battery** (last).
•Negative input (-) of **slave N battery** (second-last) connected to negative input (-) of **inverter**.

Set the battery channels in the inverter.

*To set the **battery parameters***:
Advanced settings → 0715 → Battery parameters:

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    o   Type: Pylon; Depth of discharge: 80%.

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

Maximum DoD programmable 90%

⚠️ **OFF** DO NOT CHANGE DIP SWITCH POSITION WITH THE BATTERY ON!!

POWER   RUN   LOW BATTERY   FAULT

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

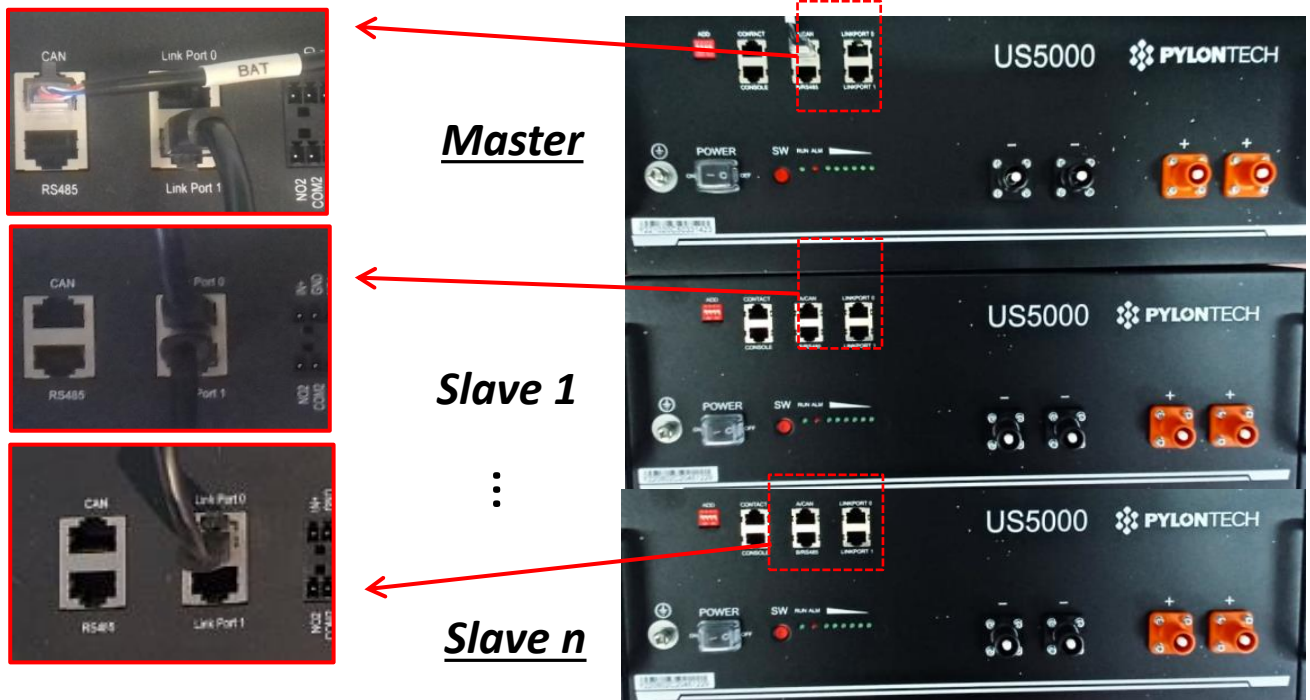| Communication cable pinout between WeCo battery and Inverter, from left to right	
Inverter	1 ... 4
	PIN 1: **White – Orange wire** PIN 2: **Orange wire** PIN 3: **White – Green wire** PIN 4: **Not use**
WeCo	1 ... 8
	PIN 1: **White – Orange wire** PIN 2: **Orange wire** PIN 3: **Not use** PIN 4: **White - Green** PIN 5: **Not use** PIN 6: **Not use** PIN 7: **Not use** PIN 8: **Not use**
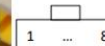
Communication connections between batteries and inverter:

• BMS-CAN of **Master Battery** → CAN Port of **inverter**

In case of a SINGLE BATTERY:
1. Connect the **BMS-CAN** input

2. Set the **DIP Switches**

3. Make the power connections by connecting the appropriate B+ and B- wires to the corresponding input (as shown in the figure).
4. Connect the ground cable to the battery

COM

POWER +/-

GND

INPUT/OUTPUT   BMS-CAN   ADDRESS   RS485-A   RS485-B   RS232

PARALLEL PORTS

B+   B+   B-   B-
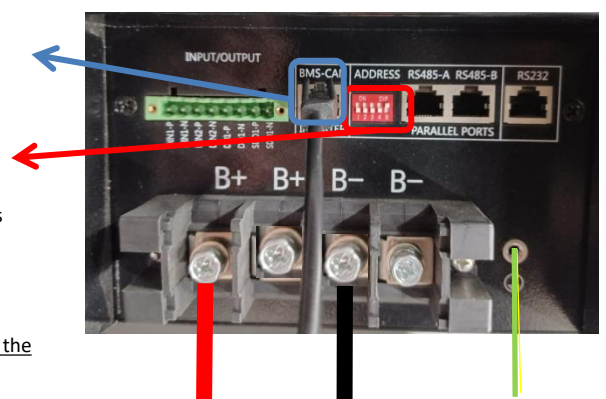
In case of <u>MULTIPLE BATTERIES</u>, connect the communication cable from the **CAN** port of the inverter to the **BMS-CAN** port of the MASTER battery, after having defined the correct positioning of the <u>DIP Switches</u> (see following pages).

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

•<u>BMS-CAN</u> of **master battery** → <u>CAN</u> Port of **inverter**
•<u>RS485-B</u> of **master battery** → <u>RS485-A</u> of **slave 1 battery**
•<u>RS485-B</u> of **slave 1 battery** → <u>RS485-A</u> of **slave 2 battery**
•**…**
•<u>RS485-B</u> of **slave N-1 battery** (second last) → <u>RS485-A</u> of **slave N battery** (last)

Power connections between batteries and inverter:

Batteries must be connected in a "loop."
•Positive input (+) of **master battery** connected to positive input (+) of **inverter**.
•Positive input (+) of **master battery** connected to positive input (+) of **slave 1 battery**.
•Negative input (-) of **master battery** connected to negative input (-) of **slave 1 battery**.
•…..
•Positive input (+) of **slave N-1 battery** (second-last) connected to positive input (+) of **slave N battery** (last).
•Negative input (-) of **slave N-1 battery** (second-last) connected to negative input (-) of **slave N battery** (last).
•Negative input (-) of **slave N battery** (second-last) connected to negative input (-) of **inverter**.

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

Connecting 2 batteries

Connecting 3 batteries

Connecting 4 batteries

Connecting 5 batteries

Set the battery channels in the inverter.

*To set the **battery parameters**:*
__Advanced settings__ → *__0715__* → *__Battery parameters:__*
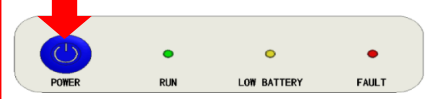
- o   Type: WeCo; Depth of discharge: 80%.

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

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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, from left to right	
Inverter 1 … 4	PIN 1: **White – Orange wire** PIN 2: **Orange wire** PIN 3: **White – Green wire** PIN 4: **Not use**
WeCo 1 … 8	PIN 1: **White – Orange wire** PIN 2: **Orange wire** PIN 3: **Not use** PIN 4: **White - Green** PIN 5: **Not use** PIN 6: **Not use** PIN 7: **Not use** PIN 8: **Not use**

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

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

In case of <u>MULTIPLE BATTERIES</u>, 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:
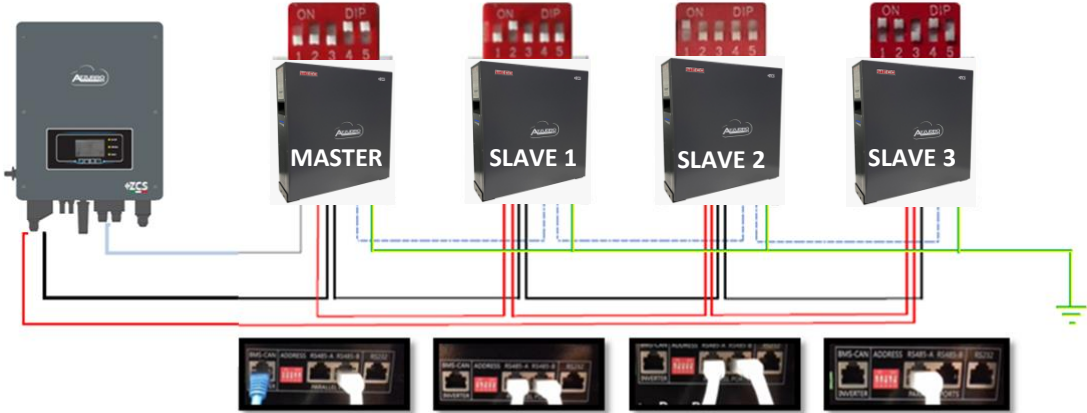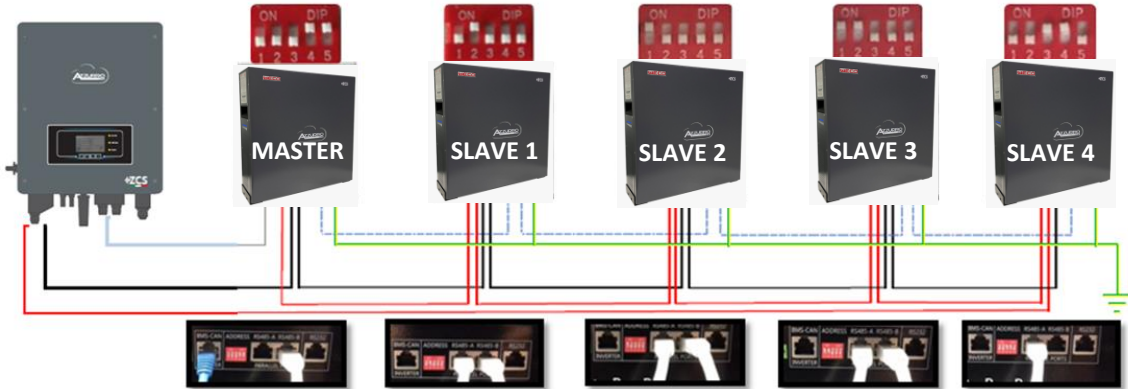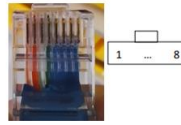

The MASTER battery must be connected to the communication cable inside the battery box starting from the **RS485-B** port and arriving at the **RS485-A** communication port of the Slave 1 battery.
(Attention: do not connect the RS485-A port to the Master battery).
In case of additional batteries, connect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

INCORRECT CONNECTION

CORRECT CONNECTION

Connecting 2 batteries

MASTER SLAVE 1

CAN-A CAN-B ADDRESS RS485-A RS485- PARALLEL PORTS
CAN-A CAN-B ADDRESS RS485-A RS485-B PARALLEL PORTS

Connecting 3 batteries

MASTER SLAVE 1 SLAVE 2

CAN-A CAN-B ADDRESS RS485-A RS485- PARALLEL PORTS
CAN-A CAN-B ADDRESS S485-A RS485 PARALLEL PORTS
CAN-A CAN-B ADDRESS RS485-A RS485-B PARALLEL PORTS

Connecting 4 batteries

MASTER SLAVE 1 SLAVE 2 SLAVE 3

CAN-A CAN-B ADDRESS RS485-A RS485- PARALLEL PORTS
CAN-A CAN-B ADDRESS S485-A RS485 PARALLEL PORTS
CAN-A CAN-B ADDRESS 485-A RS485 PARALLEL PORTS
CAN-A CAN-B ADDRESS S485-A RS485-B PARALLEL PORTS

Connecting 5 batteries

MASTER SLAVE 1 SLAVE 2 SLAVE 3 SLAVE 4

CAN-A CAN-B ADDRESS RS485-A RS485 PARALLEL PORTS
CAN-A CAN-B ADDRESS S485-A RS485 PARALLEL PORTS
CAN-A CAN-B ADDRESS 485-A RS48 PARALLEL PORTS
CAN-A CAN-B ADDRESS S485-A RS485 PARALLEL PORTS
CAN-A CAN-B ADDRESS 485-A RS485 PARALLEL PORTS

Set the battery channels in the inverter.

*To set the **battery parameters**:*
Advanced settings → 0715 → Battery parameters:

- o   Type: WeCo; Depth of discharge: 80%.

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

Maximum DoD programmable **90%**

DO NOT CHANGE DIP SWITCH POSITION WITH THE BATTERY ON!!

OFF

POWER   RUN   LOW BATTERY   FAULT

The communication cable is located inside the kit in the battery box.

Communication cable pinout between WeCo battery and Inverter, from left to right	
Inverter	1 ... 4
	PIN 1: **White – Orange wire** PIN 2: **Orange wire** PIN 3: **White – Green wire** PIN 4: **Not use**
WeCo	1 ... 8
	PIN 1: **White – Orange wire** PIN 2: **Orange wire** PIN 3: **Not use** PIN 4: **White - Green** PIN 5: **Not use** PIN 6: **Not use** PIN 7: **Not use** PIN 8: **Not use**

Communication connections between batteries and inverter:

• <u>CAN-A</u> of **Master Battery** → <u>CAN</u> Port of **inverter**

In case of a <u>SINGLE BATTERY</u>:
1. Connect the **CAN-A** input

2. Set the DIP Switches

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

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In the event of <u>MULTIPLE BATTERIES</u>, connect the communication cable from the **CAN** port of the inverter to the **CAN-A** port of the MASTER battery, after having defined the correct positioning of the <u>DIP Switches</u> (see following pages).
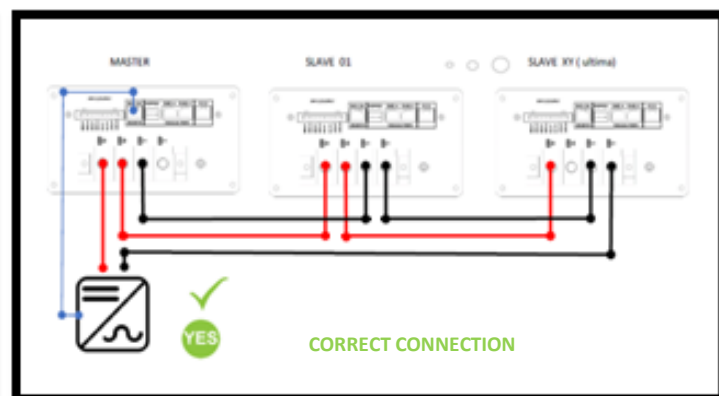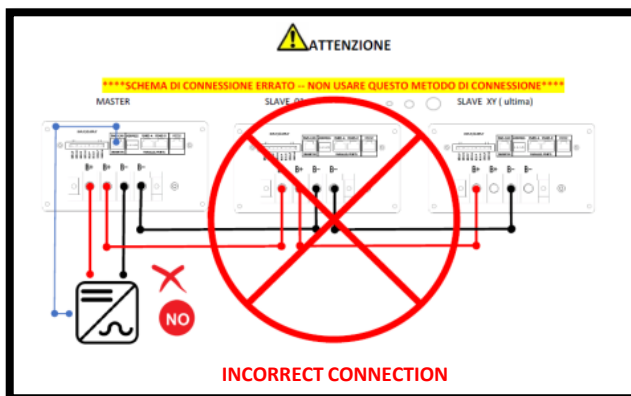
Communication connections between batteries and inverter:
Batteries <u>are connected **IN PARALLEL** to each other.</u>

- <u>CAN-A</u> of **master battery** → <u>CAN</u> Port of **inverter**
- <u>RS485-B</u> of **master battery** → <u>RS485-A</u> of **slave 1 battery**
- <u>RS485-B</u> of **slave 1 battery** → <u>RS485-A</u> of **slave 2 battery**
- **…**
- <u>RS485-B</u> of **slave N-1 battery** (second last) → <u>RS485-A</u> of **slave N battery** (last)

Power connections between batteries and inverter:
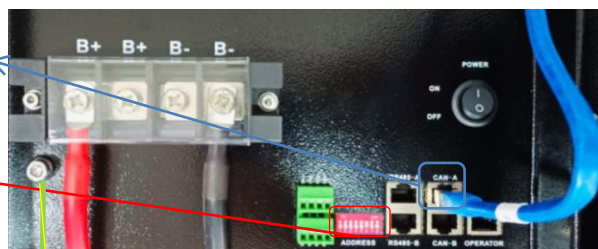
Batteries must be connected in a "loop."
- Positive input (+) of **master battery** connected to positive input (+) of **inverter**.
- Positive input (+) of **master battery** connected to positive input (+) of **slave 1 battery**.
- Negative input (-) of **master battery** connected to negative input (-) of **slave 1 battery**.
- …..
- Positive input (+) of **slave N-1 battery** (second-last) connected to positive input (+) of **slave N battery** (last).
- Negative input (-) of **slave N-1 battery** (second-last) connected to negative input (-) of **slave N battery** (last).
- Negative input (-) of **slave N battery** (second-last) connected to negative input (-) of **inverter**.

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

Connecting 2 batteries

MASTER   SLAVE 1

CAN-A CAN-B ADDRESS RS485-A RS485   CAN-A CAN-B ADDRESS RS485-A RS485-B
PARALLEL PORTS   PARALLEL PORTS

Connecting 3 batteries

MASTER   SLAVE 1   SLAVE 2

CAN-A CAN-B ADDRESS RS485-A RS485   CAN-A CAN-B ADDRESS RS485-A RS485   CAN-A CAN-B ADDRESS RS485-A RS485-B
PARALLEL PORTS   PARALLEL PORTS   PARALLEL PORTS

Connecting 4 batteries

MASTER   SLAVE 1   SLAVE 2   SLAVE 3

CAN-A CAN-B ADDRESS RS485-A RS485   CAN-A CAN-B ADDRESS RS485-A RS485   CAN-A CAN-B ADDRESS RS485-A RS485   CAN-A CAN-B ADDRESS RS485-A RS485-B
PARALLEL PORTS   PARALLEL PORTS   PARALLEL PORTS   PARALLEL PORTS

Connecting 5 batteries

MASTER   SLAVE 1   SLAVE 2   SLAVE 3   SLAVE 4

CAN-A CAN-B ADDRESS RS485-A RS485   CAN-A CAN-B ADDRESS RS485-A RS485   CAN-A CAN-B ADDRESS RS485-A RS485   CAN-A CAN-B ADDRESS RS485-A RS485   CAN-A CAN-B ADDRESS RS485-A RS485
PARALLEL PORTS   PARALLEL PORTS   PARALLEL PORTS   PARALLEL PORTS   PARALLEL PORTS

In order to carry out the correct start-up procedure:

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

2. Inverter DC rotary switch set to OFF;

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

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

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

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

Set the battery channels in the inverter.
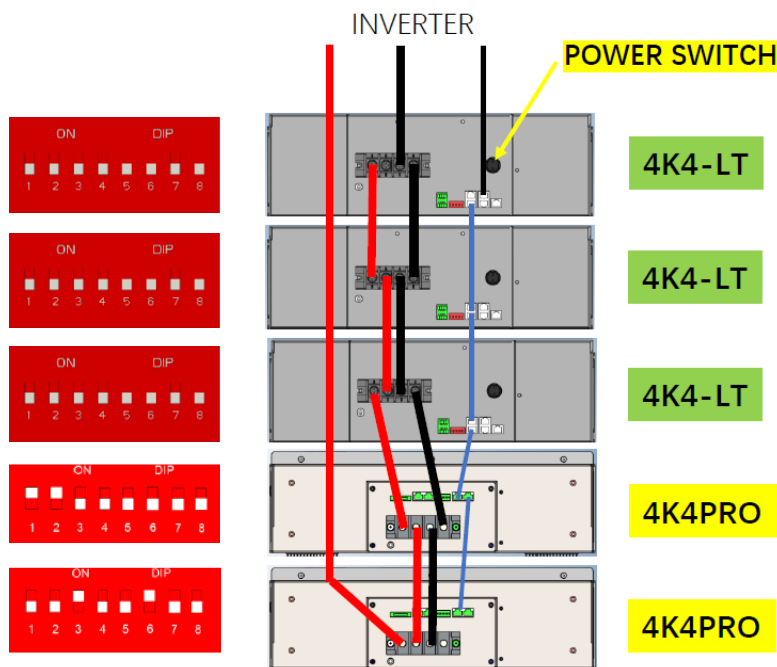
*To set the **battery parameters**:*
Advanced settings → 0715 → Battery parameters:

- o   Type: WeCo; Depth of discharge: 80%.

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

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

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

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

- CAN-A of **master battery** → CAN Port of **inverter**
- RS485-B of **master battery** → RS485-A of **slave 1 battery**
- RS485-B of **slave 1 battery** → RS485-A of **slave 2 battery**
- …
- RS485-B of **slave N-1 battery** (second last) → RS485-A of **slave N battery** (last)

Power connections between batteries and inverter:

Batteries must be connected in a "loop."
- Positive input (+) of **master battery** connected to positive input (+) of **inverter**.
- Positive input (+) of **master battery** connected to positive input (+) of **slave 1 battery**.
- Negative input (-) of **master battery** connected to negative input (-) of **slave 1 battery**.
- …..
- Positive input (+) of **slave N-1 battery** (second-last) connected to positive input (+) of **slave N battery** (last).
- Negative input (-) of **slave N-1 battery** (second-last) connected to negative input (-) of **slave N battery** (last).
- Negative input (-) of **slave N battery** (second-last) connected to negative input (-) of **inverter**.

NOTE: When switched on for the first time, the WeCo batteries receive a command from the inverter to start regular operation only when all of them have collectively reached a state of full charge (i.e. a SOC level of 100%).
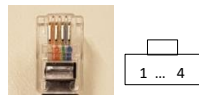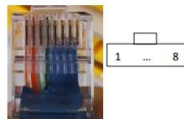
Note: Maximum DoD programmable 90%

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, from left to right	
Inverter	PIN 1: **White – Orange wire** PIN 2: **Orange wire** PIN 3: **White – Green wire** PIN 4: **Not use**
WeCo	PIN 1: **White – Orange wire** PIN 2: **Orange wire** PIN 3: **Not use** PIN 4: **White - Green** PIN 5: **Not use** PIN 6: **Not use** PIN 7: **Not use** PIN 8: **Not use**

Low voltage connection (LV)

High voltage connection (HV)

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 <u>SINGLE BATTERY</u>:
1. Connect the **CAN-A** input
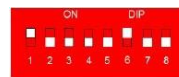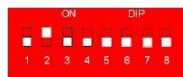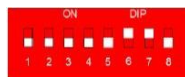2. Set the DIP switches as shown in the figure

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

Inv-Batt communication cable
Positive power cable
Negative power cable
Ground cable (PE)
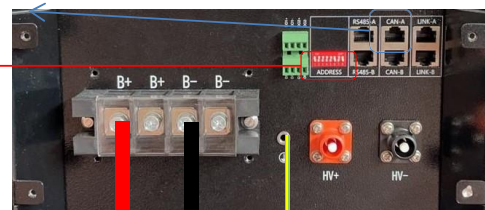
8.7.2 WECO 5K3 BATTERIES IN PARALLEL

In case of <u>MULTIPLE BATTERIES</u>, 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.
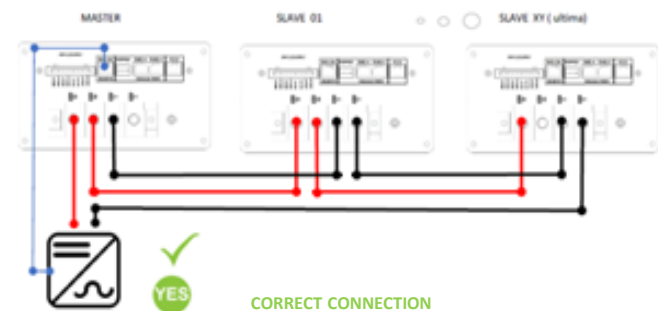The **"NEGATIVE"** power cable coming from inverter must be connected to the **MASTER** battery on the **NEGATIVE** terminal, while the **"POSITIVE"** power cable must be connected to the last **SLAVE N** battery on the **POSITIVE** terminal.

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

MASTER   SLAVE 01   SLAVE XY (ultima)

NO

INCORRECT CONNECTION

MASTER   SLAVE 01   SLAVE XY (ultima)

YES

CORRECT CONNECTION

Connecting 2 batteries

MASTER   SLAVE 1

Connecting 3 batteries

MASTER   SLAVE 1   SLAVE 2

Connecting 4 batteries

MASTER   SLAVE 1   SLAVE 2   SLAVE 3

Connecting 5 batteries

MASTER   SLAVE 1   SLAVE 2   SLAVE 3   SLAVE 4

27

Set the battery channels in the inverter.

*To set the **battery parameters**:*
Advanced settings → 0715 → Battery parameters:

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- o   Type: WeCo; Depth of discharge: 80%.

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

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

Communication cable pinout between WeCo battery and Inverter, from left to right	
Inverter 1 ... 4	PIN 1: **White – Orange wire** PIN 2: **Orange wire** PIN 3: **White – Green wire** PIN 4: **Not use**
WeCo 1 ... 8	PIN 1: **White – Orange wire** PIN 2: **Orange wire** PIN 3: **Not use** PIN 4: **White - Green** PIN 5: **Not use** PIN 6: **Not use** PIN 7: **Not use** PIN 8: **Not use**

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

Inv-Batt communication cable

Positive power cable

Negative power cable

Ground cable (PE)

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****

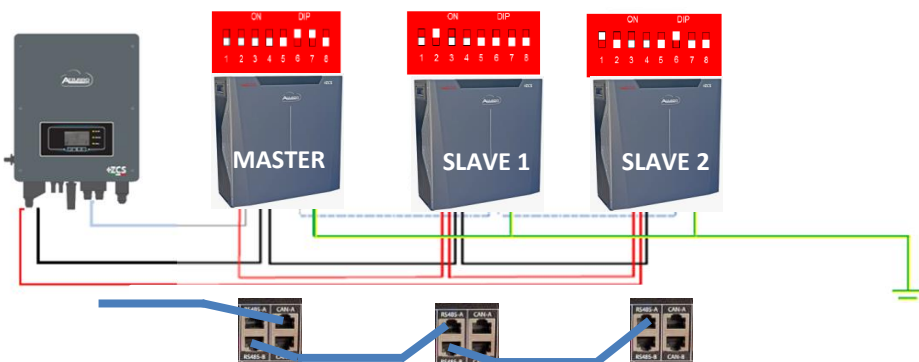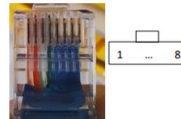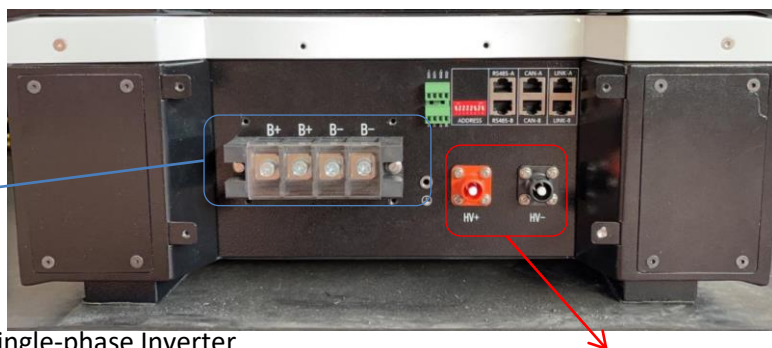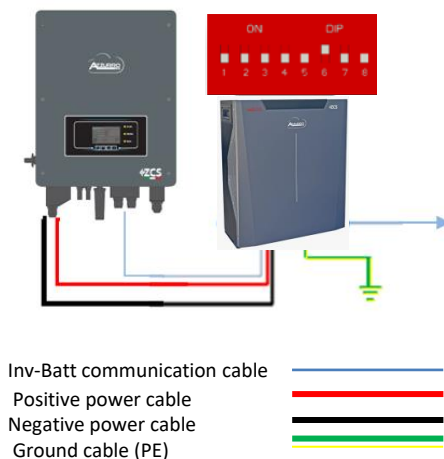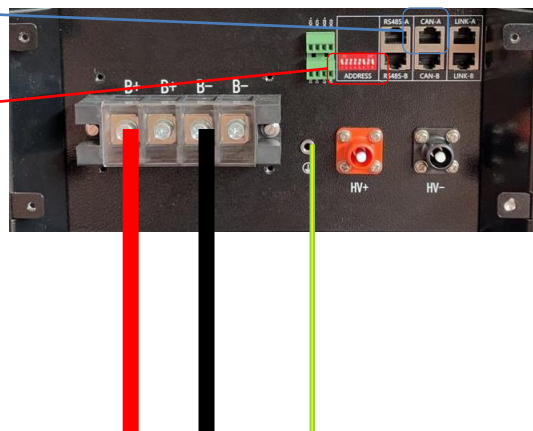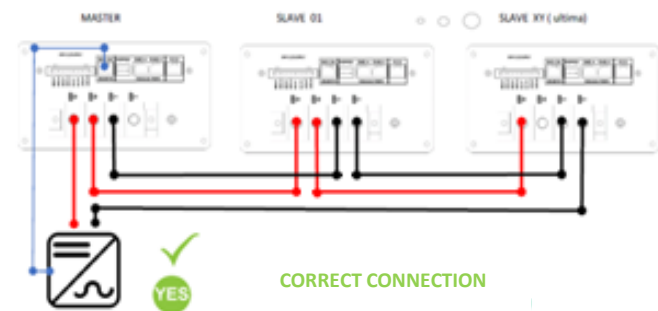MASTER   SLAVE 01   SLAVE XY (ultima)

❌ NO

INCORRECT CONNECTION

MASTER   SLAVE 01   SLAVE XY (ultima)

✓ YES

CORRECT CONNECTION

Connecting 2 batteries

MASTER   SLAVE 1

Connecting 3 batteries

MASTER   SLAVE 1   SLAVE 2

Connecting 4 batteries

MASTER   SLAVE 1   SLAVE 2   SLAVE 3

Connecting 5 batteries

MASTER   SLAVE 1   SLAVE 2   SLAVE 3   SLAVE 4

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Set the battery channels in the inverter.

To set the **battery parameters***:*
Advanced settings → 0715 → Battery parameters:

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- o   Type: WeCo; Depth of discharge: 80%.

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

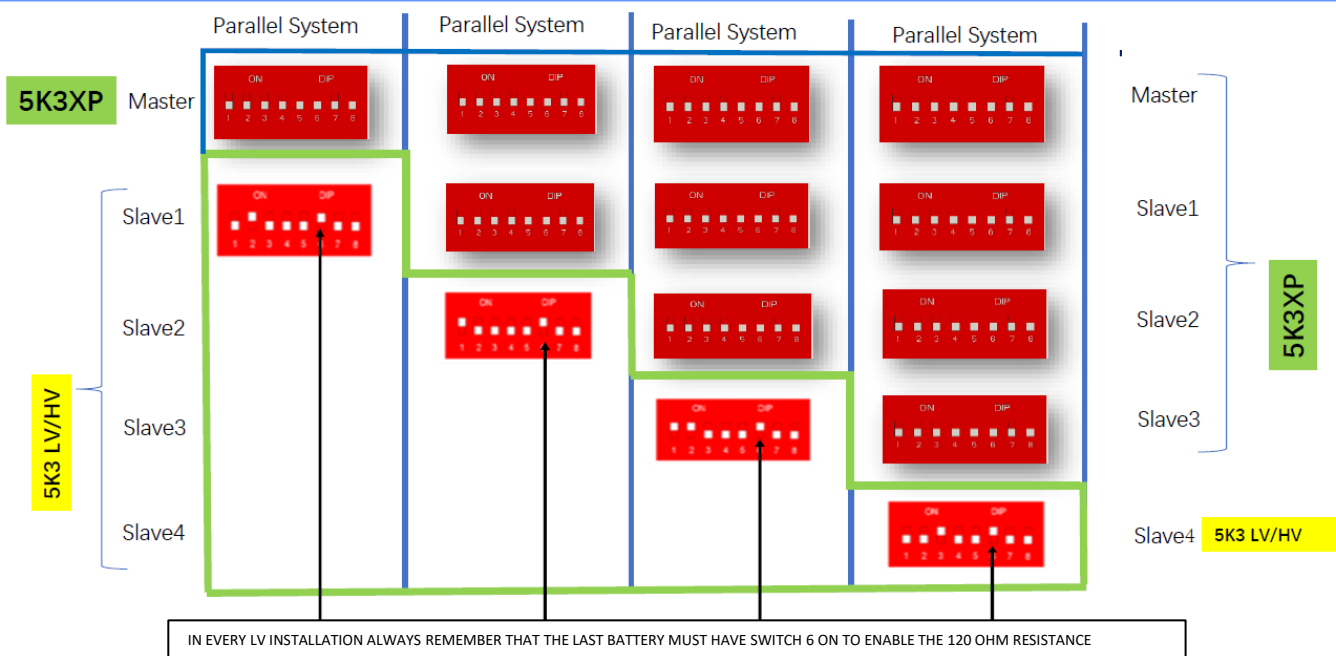Parallel System   Parallel System   Parallel System   Parallel System

IN EVERY LV INSTALLATION ALWAYS REMEMBER THAT THE LAST BATTERY MUST HAVE SWITCH 6 ON TO ENABLE THE 120 OHM RESISTANCE
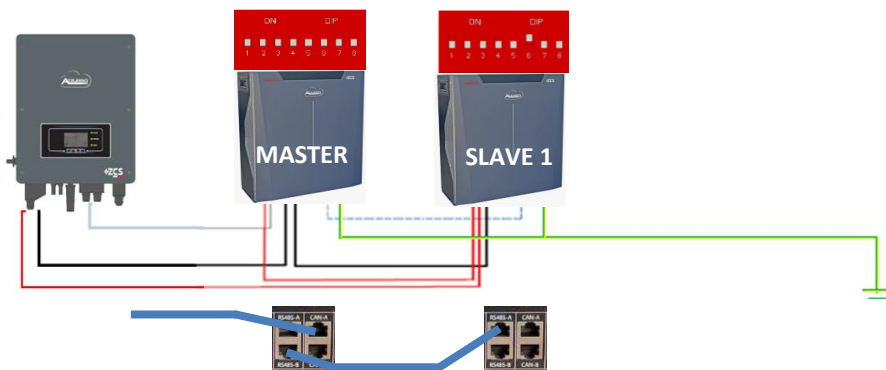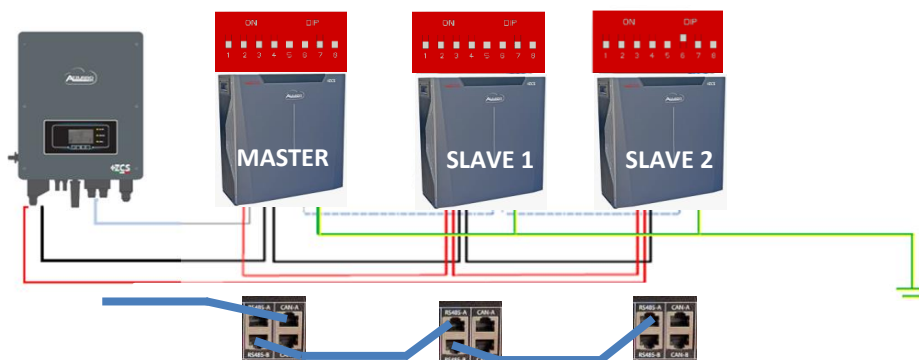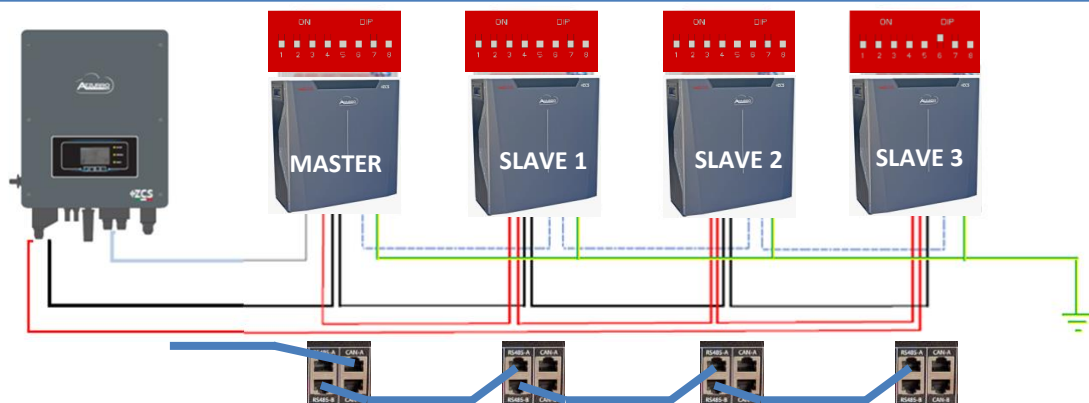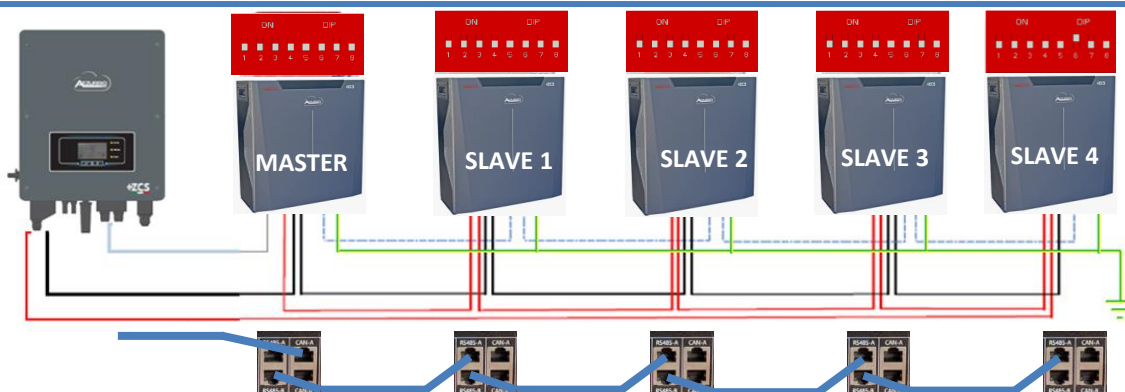
In case of 5K3XP and 5K3 in parallel:

✓ **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 setting of the DIP switches of the last 5K3 battery must be set based on the number of additional Slaves with DIP 6 in ON as indicated in the example table.**

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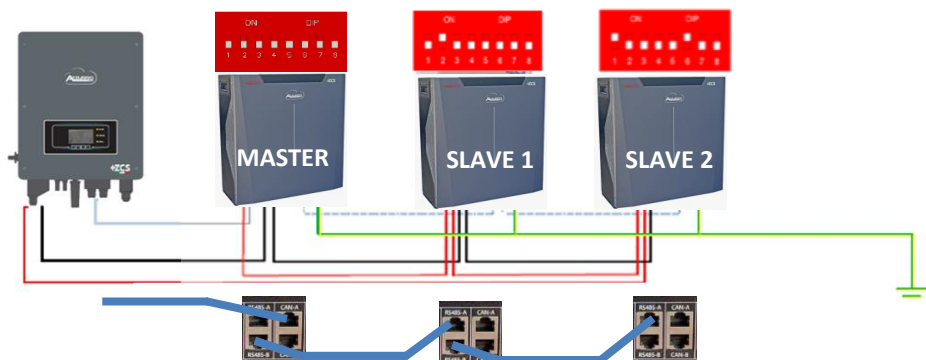
Connecting 4 batteries:
Master 5K3XP
Slave 1 5K3
Slave 2 5K3
Slave 3 5K3
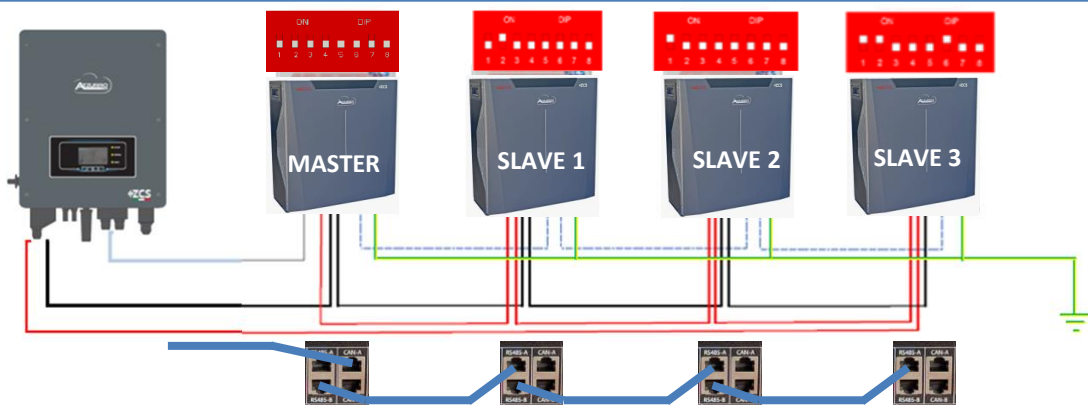
Connecting 5 batteries:
Master 5K3XP
Slave 1 5K3
Slave 2 5K3
Slave 3 5K3
Slave 4 5K3

32
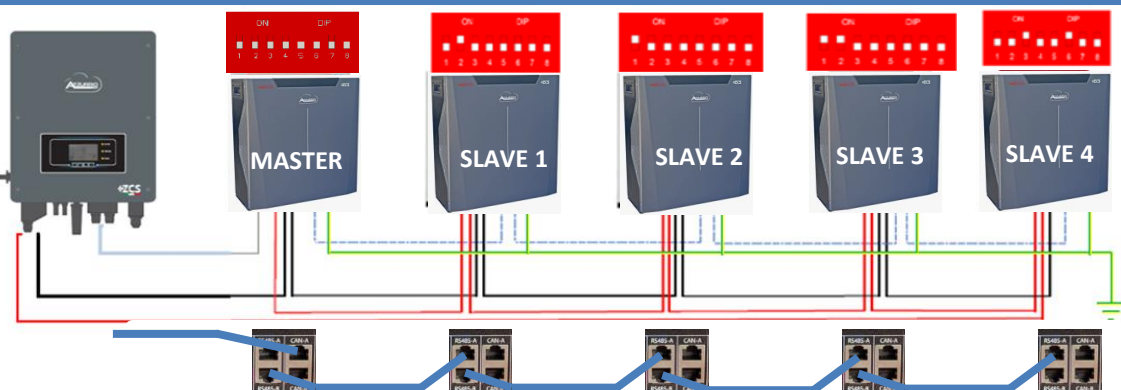
8.10.1 SINGLE AZZURRO 5000 BATTERY

**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 battery and Inverter inverter. From left to right		
Inverter	1 … 4	PIN 1: **White – Orange** PIN 2: **Orange** PIN 3: **White – Blue** PIN 4: **Blue wire**
Azzurro	1 … 8	PIN 1: **Not use** PIN 2: **Not use** PIN 3: **Not use** PIN 4: **White – Orange** PIN 5: **Orange wire** PIN 6: **Not use** PIN 7: **White – Blue** PIN 8: **Blue wire**
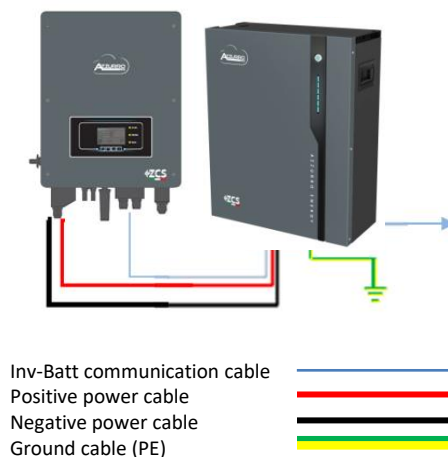
In case of a SINGLE BATTERY:

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.

Inv-Batt communication cable
Positive power cable
Negative power cable
Ground cable (PE)
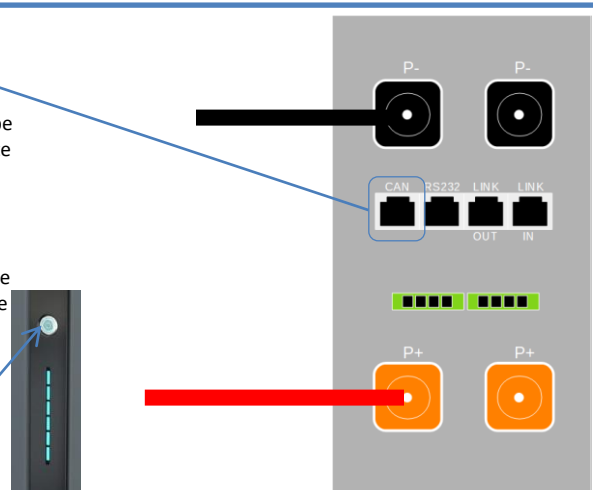
## 8.10.2 AZZURRO 5000 BATTERIES IN PARALLEL

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
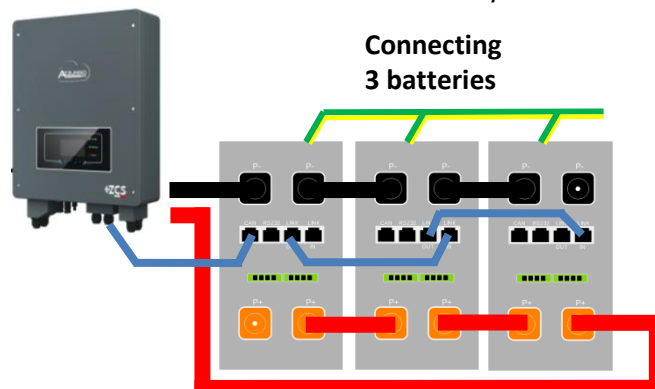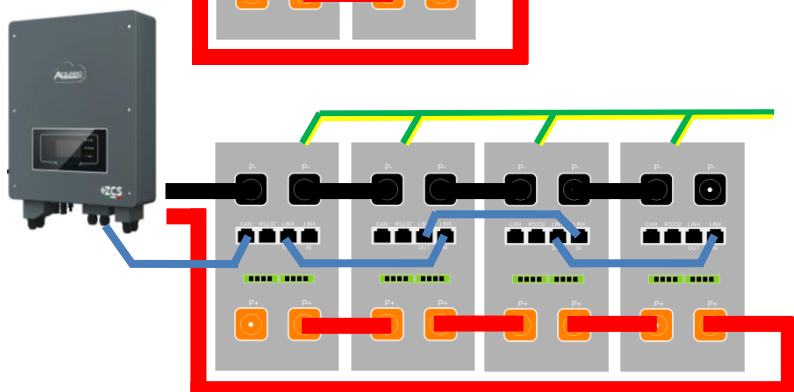
Connecting 3 batteries

Connecting 4 batteries

Set the battery channels in the inverter.

*To set the **battery parameters**:*
Advanced settings → 0715 → Battery parameters:

- o Type: Azzurro; Depth of discharge: 80%.

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

34

Maximum DoD programmable 90%

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

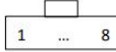| Communication cable pinout between Azzurro battery and Inverter, from left to right		
Inverter		PIN 1: **White – Orange wire** PIN 2: **Orange wire** PIN 3: **White – Blue wire** PIN 4: **Blue wire**
1 … 4		
Azzurro		PIN 1: **Not use** PIN 2: **Not use** PIN 3: **Not use** PIN 4: **White – Orange wire** PIN 5: **Orange wire** PIN 6: **Not use** PIN 7: **White – Blue wire** PIN 8: **Blue wire**
1 … 8		

Communication connections between batteries and inverter:

- CAN of **Master Battery** → CAN Port of **inverter**

In case of multiple batteries connected in parallel or when adding new batteries to a system with batteries already installed, *make sure that the difference between the voltages of all the batteries is less than 0.5 Volt*. Each battery must be measured individually, so make sure the batteries are not connected to each other. Contact technical support if the voltage between the batteries is not aligned.

COM

GND

POWER +/-

In case of a SINGLE BATTERY:
1. Connect the **CAN** input

2. Make the power connections by connecting the appropriate P+ and P- connectors to the corresponding input (as shown in the figure).

3. Connect the ground cable to the battery

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

NOTE: Both AZZURRO 5000 and AZZURRO 5000 PRO batteries can be connected to the same inverter. AZZURRO 5000 batteries and AZZURRO 5000 PRO batteries **CANNOT** be connected to **AZZURRO ZSX 5120** batteries.

In case of <u>MULTIPLE BATTERIES</u>, connect the communication cable from the **CAN** port of the inverter to the **CAN-A** port of the MASTER battery.

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

- <u>CAN-A</u> of **master battery** → <u>CAN</u> Port of **inverter**
- <u>LINK OUT</u> of **master battery** → <u>LINK IN</u> of **slave 1 battery**
- <u>LINK OUT</u> of **slave 1 battery** → <u>LINK IN</u> of **slave 2 battery**
- …
- <u>LINK OUT</u> of **slave N-1 battery** (second last) → <u>LINK IN</u> of **slave N battery** (last)

Power connections between batteries and inverter:

Batteries must be connected in a "loop."
- Positive input (+) of **master battery** connected to positive input (+) of **inverter**.
- Positive input (+) of **master battery** connected to positive input (+) of **slave 1 battery**.
- Negative input (-) of **master battery** connected to negative input (-) of **slave 1 battery**.
- …..
- Positive input (+) of **slave N-1 battery** (second-last) connected to positive input (+) of **slave N battery** (last).
- Negative input (-) of **slave N-1 battery** (second-last) connected to negative input (-) of **slave N battery** (last).
- Negative input (-) of **slave N battery** (second-last) connected to negative input (-) of **inverter**.

Connecting 2 batteries

Connecting 3 batteries

Connecting 4 batteries

Set the battery channels in the inverter.

*To set the **battery parameters**:*
<u>**Advanced settings → 0715 → Battery parameters:**</u>

- o   Type: WeCo; Depth of discharge: 80%.

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

37

Maximum DoD programmable 90%

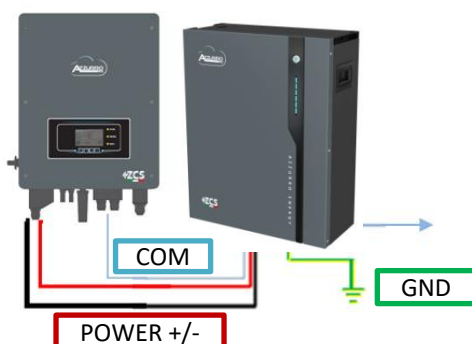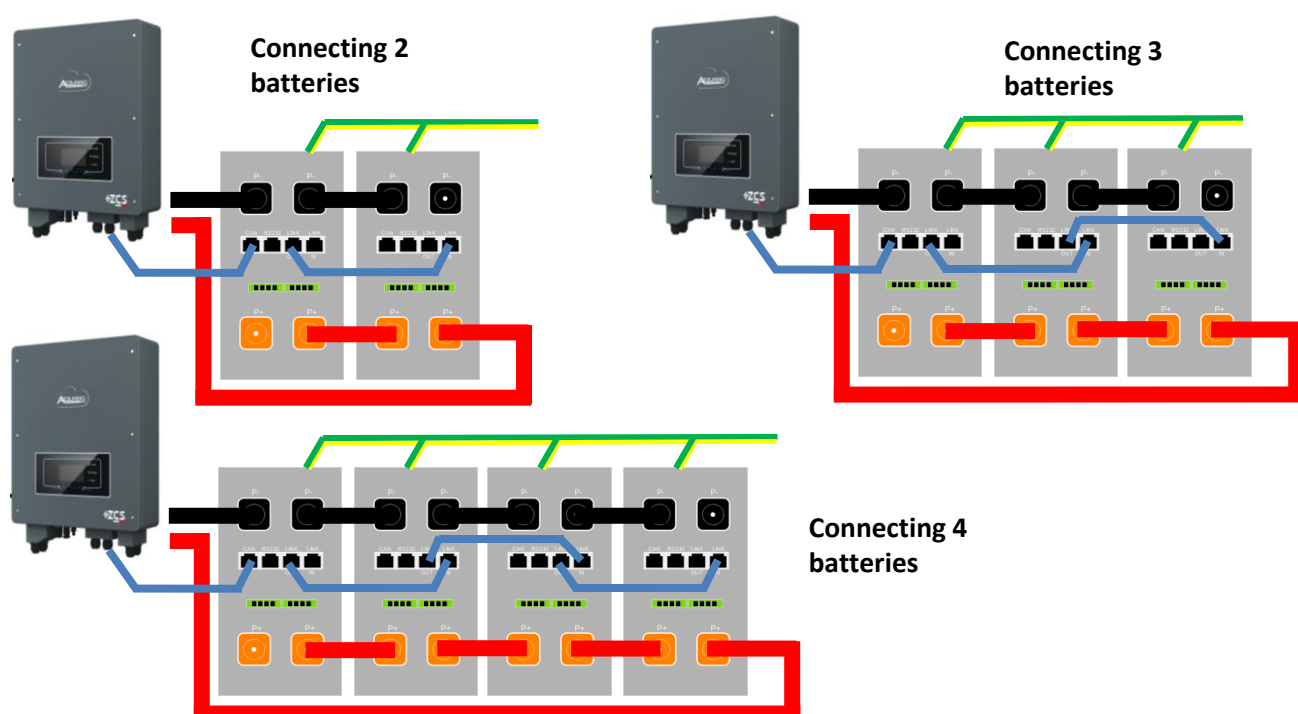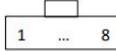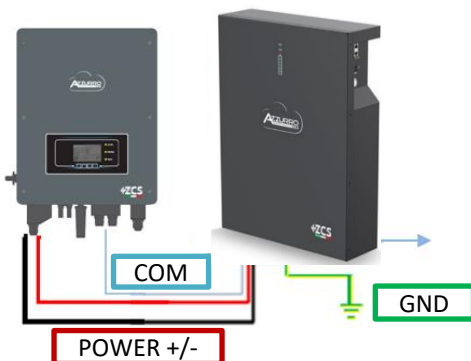The communication cable is located inside the kit in the inverter box.

Communication cable pinout between Azzurro battery and Inverter, from left to right		
Inverter		PIN 1: **White – Orange wire** PIN 2: **Orange wire** PIN 3: **White – Blue wire** PIN 4: **Blue wire**
	1 ... 4	
Azzurro		PIN 1: **Not use** PIN 2: **Not use** PIN 3: **Not use** PIN 4: **White – Orange wire** PIN 5: **Orange wire** PIN 6: **Not use** PIN 7: **White – Blue wire** PIN 8: **Blue wire**
	1 ... 8	

Communication connections between batteries and inverter:

- CAN of **Master Battery** → CAN Port of **inverter**

In case of multiple batteries connected in parallel or when adding new batteries to a system with batteries already installed, *make sure that the difference between the voltages of all the batteries is less than 0.5 Volt*. Each battery must be measured individually, so make sure the batteries are not connected to each other. Contact technical support if the voltage between the batteries is not aligned.
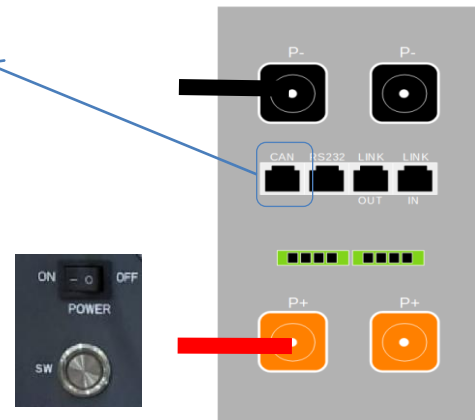
COM

GND

POWER +/-

In case of a SINGLE BATTERY:
1. Connect the **CAN** input

2. Make the power connections by connecting the appropriate P+ and P- connectors to the corresponding input (as shown in the figure).

3. Connect the ground cable to the battery

4. Switch on the battery by flipping the switch on 1 and pressing the battery's button.

NOTE: Both AZZURRO 5000 and AZZURRO 5000 PRO batteries can be connected to the same inverter.
AZZURRO 5000 batteries and AZZURRO 5000 PRO batteries **CANNOT** be connected to **AZZURRO ZSX 5120** batteries.

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.

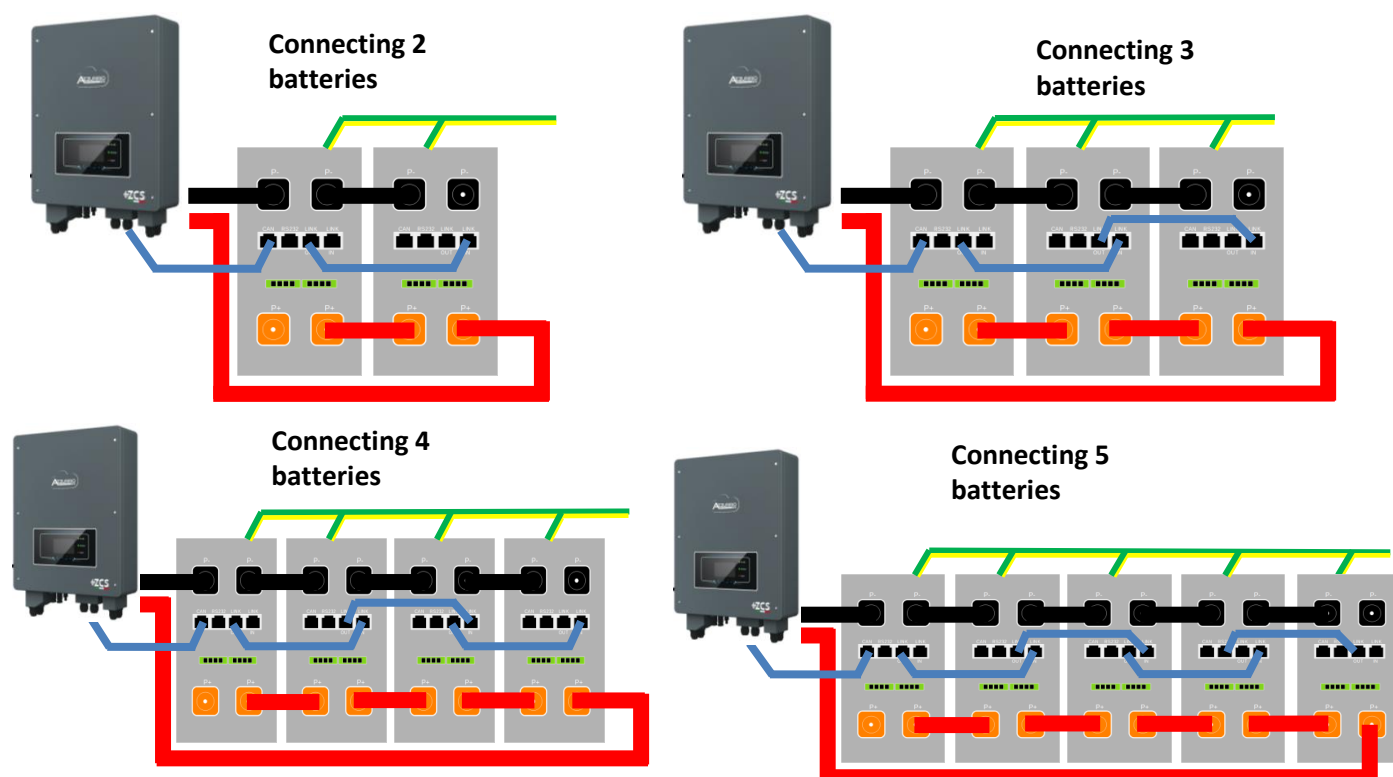**Communication connections between batteries and inverter:**
Batteries are connected **IN PARALLEL** to each other.

- CAN-A of **master battery** → CAN Port of **inverter**
- LINK OUT of **master battery** → LINK IN of **slave 1 battery**
- LINK OUT of **slave 1 battery** → LINK IN of **slave 2 battery**
- ...
- LINK OUT of **slave N-1 battery** (second last) → LINK IN of **slave N battery** (last)

Power connections between batteries and inverter:

Batteries must be connected in a "loop."
- Positive input (+) of **master battery** connected to positive input (+) of **inverter**.
- Positive input (+) of **master battery** connected to positive input (+) of **slave 1 battery**.
- Negative input (-) of **master battery** connected to negative input (-) of **slave 1 battery**.
- .....
- Positive input (+) of **slave N-1 battery** (second-last) connected to positive input (+) of **slave N battery** (last).
- Negative input (-) of **slave N-1 battery** (second-last) connected to negative input (-) of **slave N battery** (last).
- Negative input (-) of **slave N battery** (second-last) connected to negative input (-) of **inverter**.

Connecting 2 batteries

Connecting 3 batteries

Connecting 4 batteries

Connecting 5 batteries

Set the battery channels in the inverter.

*To set the **battery parameters**:*
<u>*Advanced settings*</u> → <u>*0715*</u> → <u>*Battery parameters:*</u>

- o   Type: WeCo; Depth of discharge: 80%.

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

For the extension cable, it is recommended to use a category five 8-pole mains cable, or a 2x0.5 mm² cable. In the first case, four conductors will be connected to one pole of the sensor and the other four will be connected to 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.

OK

NO!!!!

PV panels   **HYBRID**   **Protection switch**

CT

Meter

Current sensor

Critical Loads

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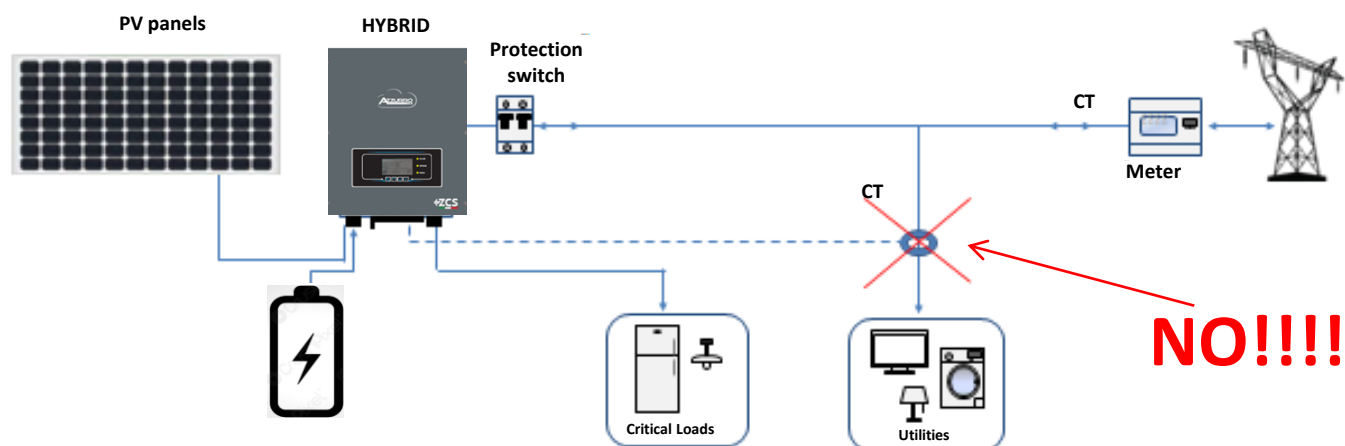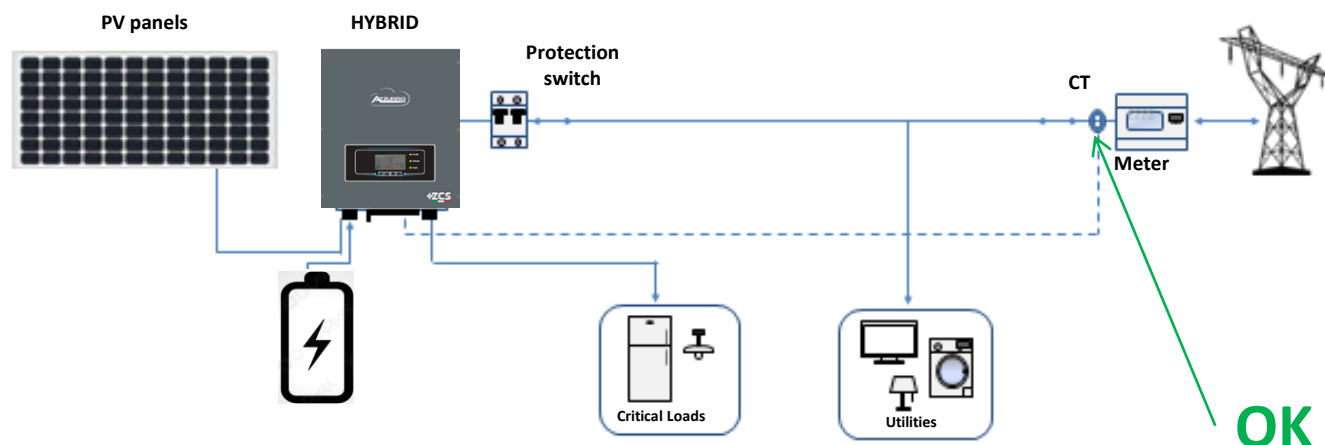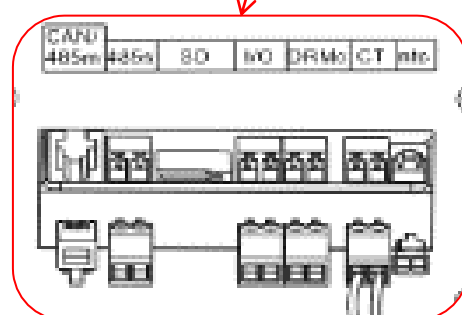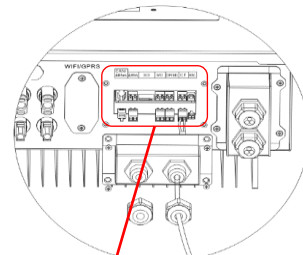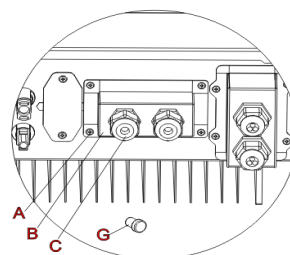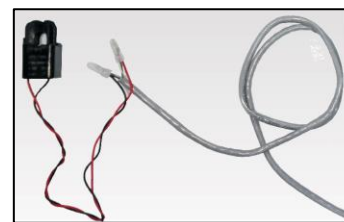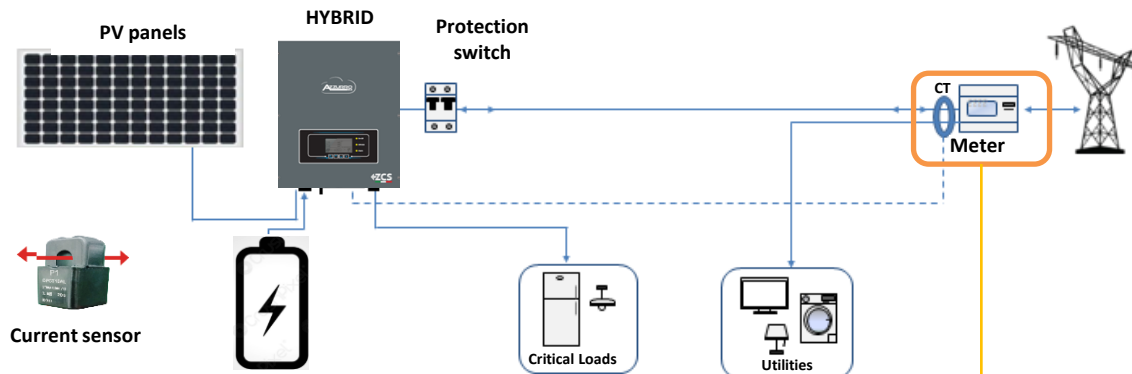
The sensor must include all phase cables entering or leaving the meter.

OK   **OK**   **NO**

CTa   CTa   CTa

L N   L N   L N
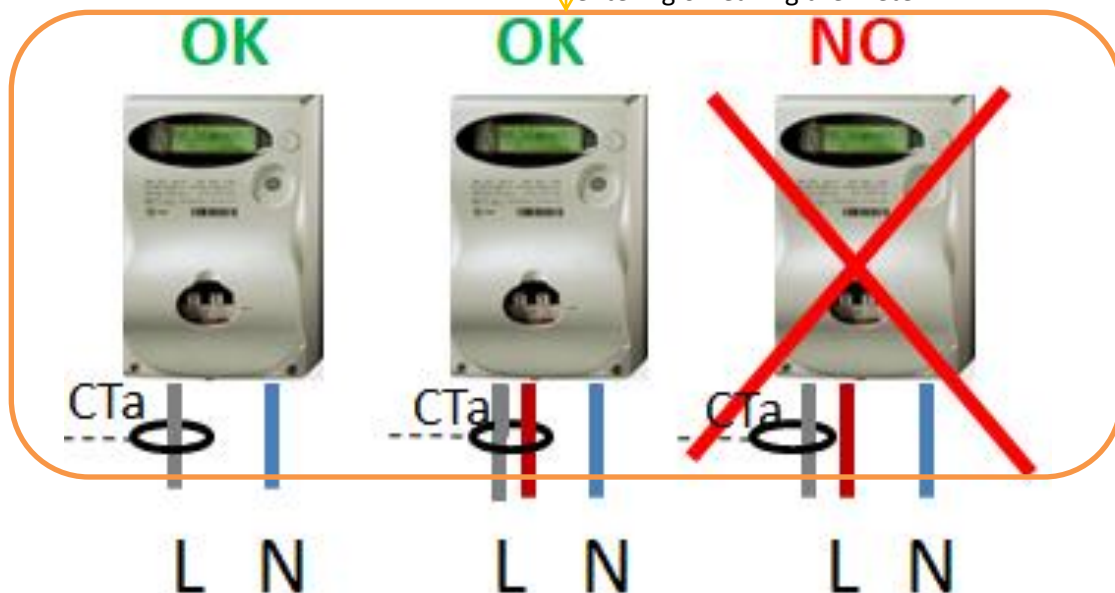
9.2 MEASUREMENT OF THE EXCHANGE POWER THROUGH METER

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

PV Panels

Grid

HYD

Meter

L   N

Exchange meter

Load

Battery
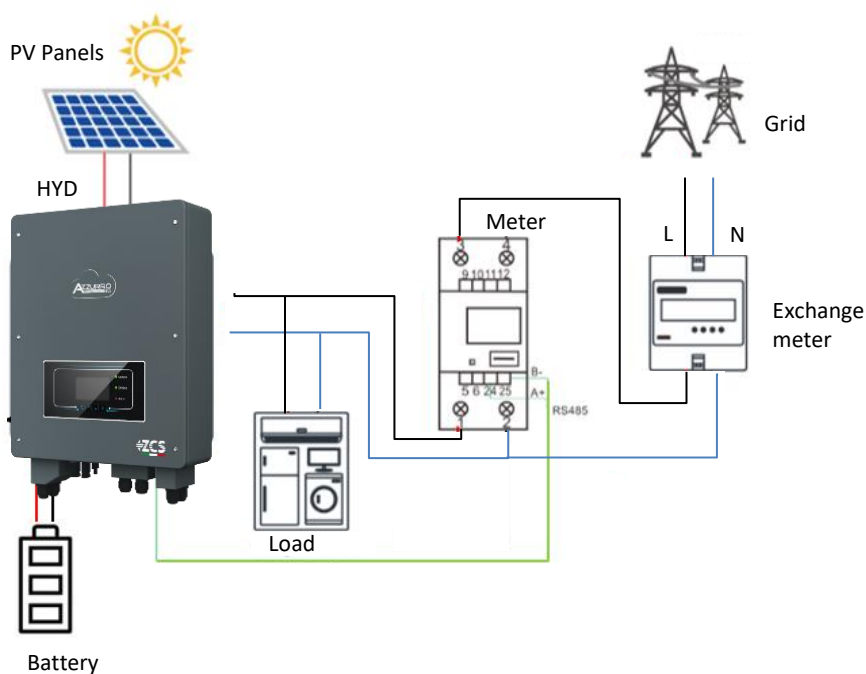
Meter Connection

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

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

RS485-   RS485+   Meter for exchange
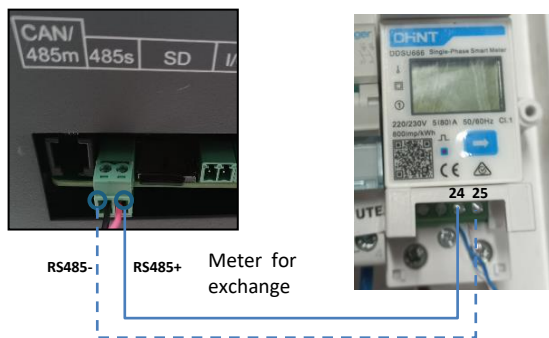
3. Meter side connect 120 Ohm resistor from **PIN 24 and 25.**

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

RS485-   RS485+   Meter for exchange
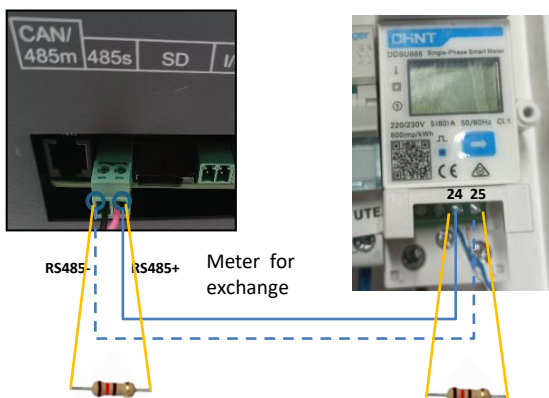
1.   Connect the Meter as shown in the picture:

✓ 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.

GRID SIDE

PV AND LOAD SIDE
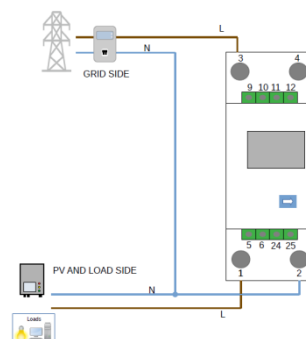
9.3 METER SETTING ON EXCHANGE AND INVERTER

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.
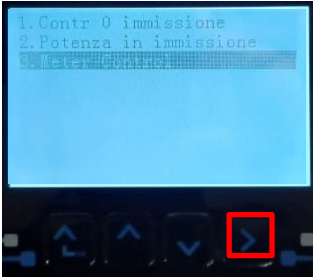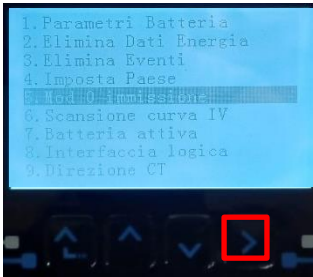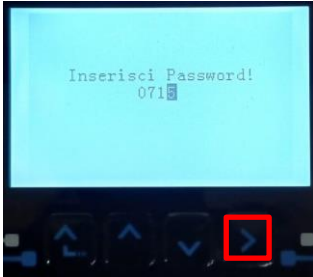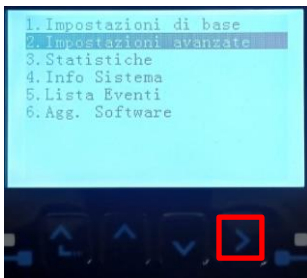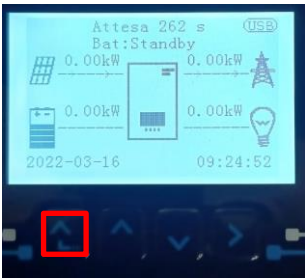
9. 4 METER READING VERIFICATION

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 carcases 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.
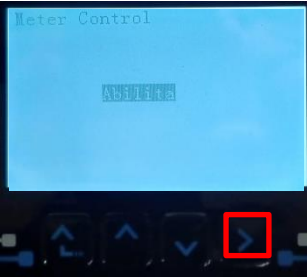✓ The sign in front of each negative value (-).

10. CONNECTING TO THE GRID
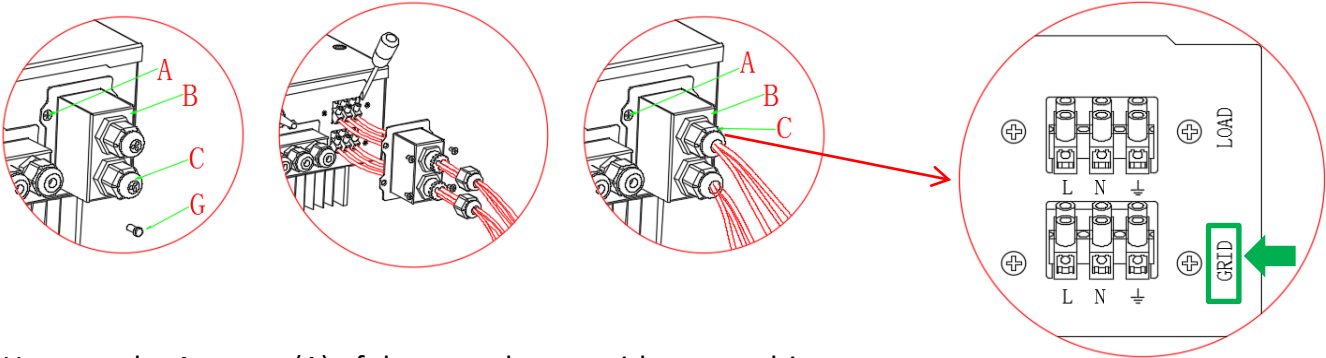
1) Unscrew the 4 screws (A) of the central cover with a screwdriver.

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..

Recommended specifications for DC input cables

Cross-sectional area (mm²)		Outer diameter of cable (mm²)
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**
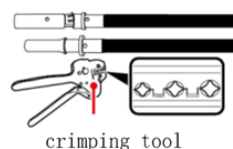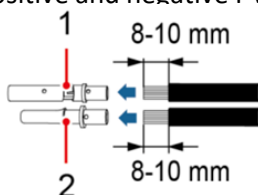
Insert the crimped positive and negative cables into the corresponding photovoltaic connectors.

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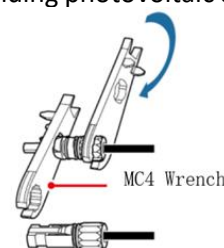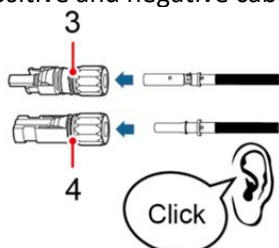
Make sure that all the DC string parameters are acceptable to the inverter in accordance with the technical specifications given in the datasheet and in the Azzurro ZCS configurator.

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."
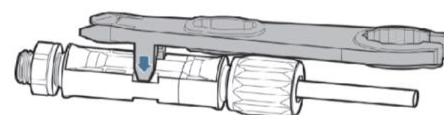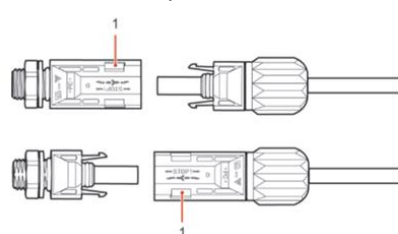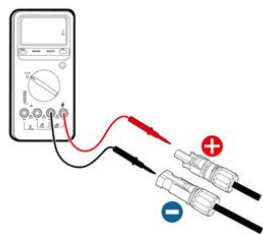
Use a MC4 wrench to disconnect the photovoltaic connectors

> **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.

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.

HYD 3-6

GRID

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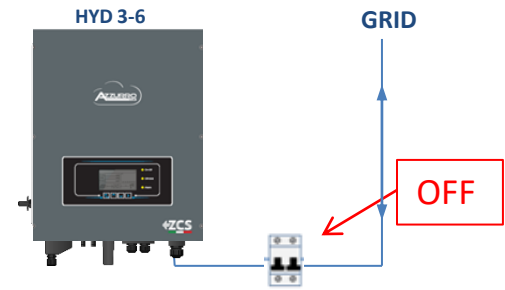
Check that the DC circuit breaker of the inverter is in the OFF position.

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

Current flow

Import/Export meter

> 200W

Loads
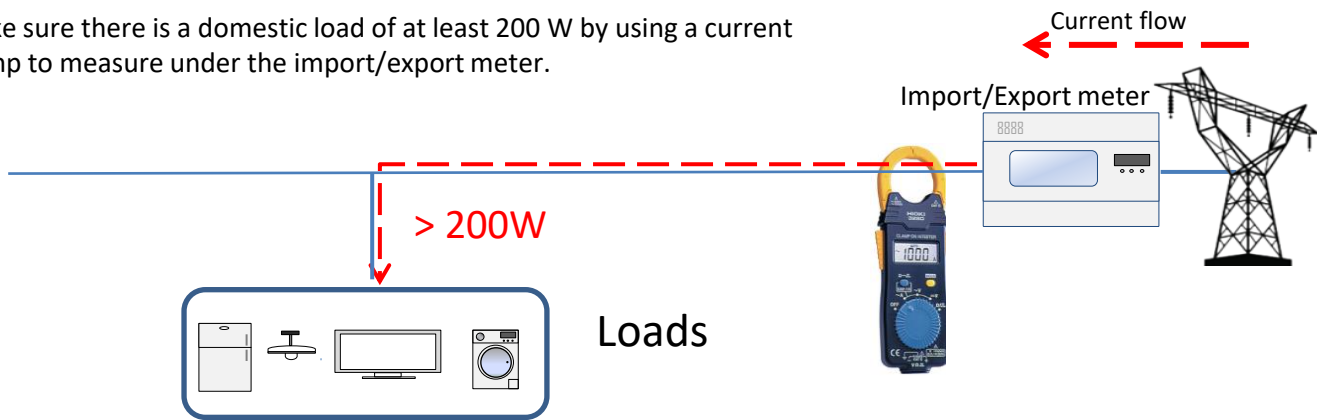
Turn on the batteries:

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.

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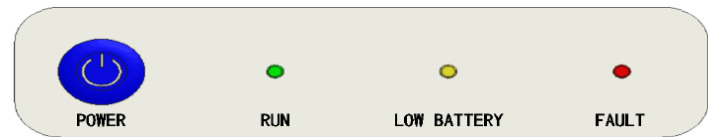
In case of **WeCo** batteries, press the POWER button of each battery for 1 second, the RUN LED will turn on and the internal contactor will close automatically.

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

Hybrid Inverter

GRID

ON

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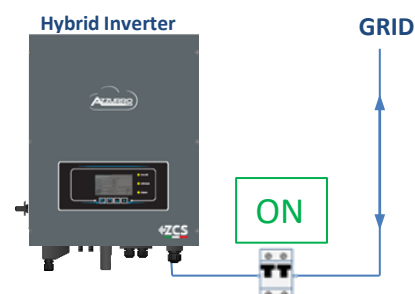
The procedure for blocking the current sensors is available from version 2.00 of the Service Code onwards; in the event of lower Service Codes, contact technical support.

To perform the freezing operation, follow the instructions below:

1.Advanced settings   "Password 0001" → **NOTE**: info for writing the password

9.CT Direction

Enter Pwd!
0001

Back   Forward or confirm

Decrease number   Increase number

Power read by CT

CT info

CT Direction
CT   1.85kW   IMPORT
PF   99%

FREEZE

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 x I) = cosφ

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

1.Advanced settings "Password 0001"

→ **1.PYLON (PYLONTECH)**

→ **4.GENERAL LITHIUM (WECO)**

1.Battery parameters

1. Battery type
2. Depth of Discharge
3. Save *

Depth of discharge
50%

EPS depth of discharge
80%

Safety Buffer
10%

* After setting the parameters, confirm by moving the cursor to "Save and press
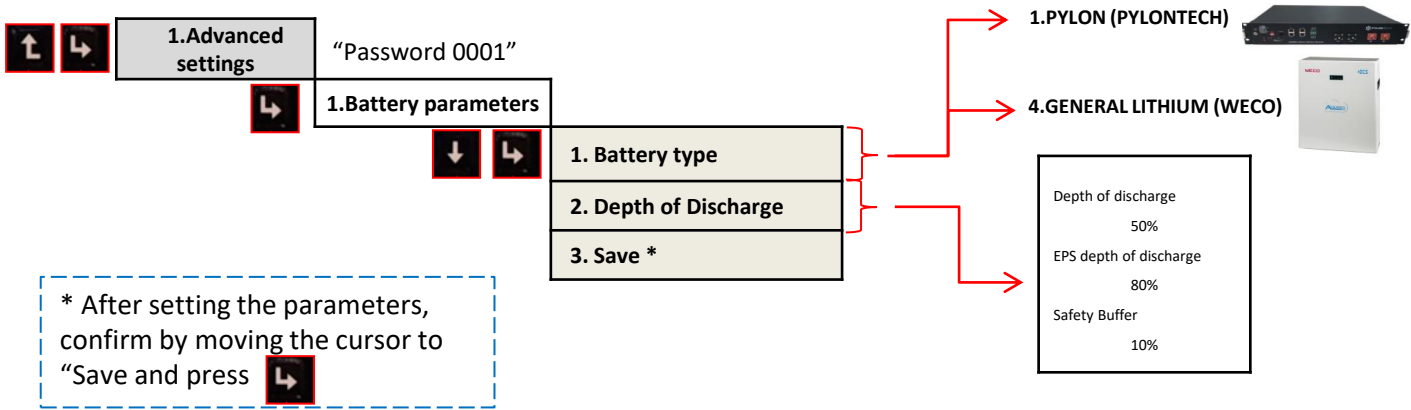
14. INITIAL SETTINGS - COUNTRY CODE

1.Advanced settings "Password 0715"

| 4.Set Country | 1.Country |
| | 2.Enable Country Change* |
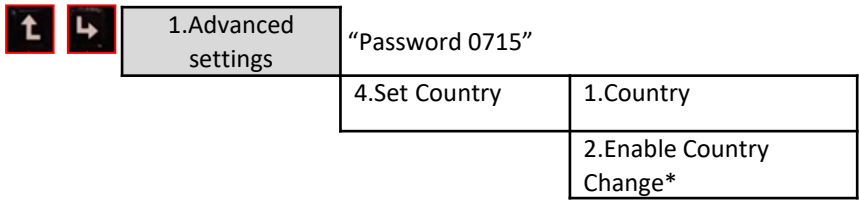
Select the code corresponding to the national standard (see table below) which can be set using the "Up" and "Down" keys, press "OK" to move to the next character and confirm.

* 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	CEI0-21 In Areti

15. INITIAL SETTINGS - DATE AND TIME

1.Settings
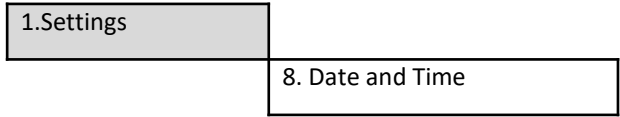
8. Date and Time

To enter the correct date and time:

Back

Decrease number

Increase number

Forward or confirm

Date and Time

2019-01-02 09:23:07
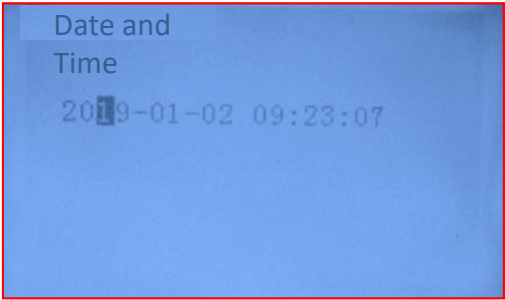
1) Turn the PV circuit breaker to the OFF position and disconnect the inverter from the grid

Hybrid Inverter

1 | OFF

GRID

OFF

2

Battery | ON

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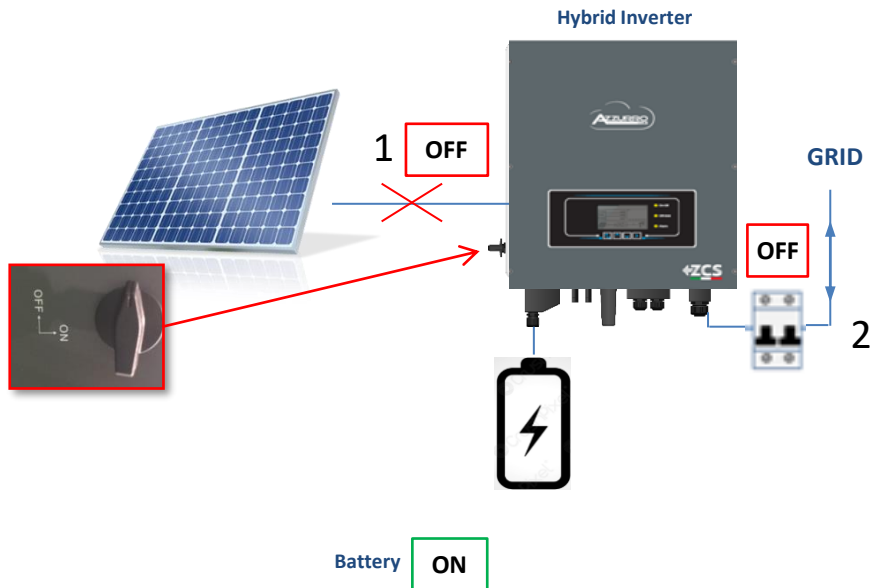
2) Restore AC voltage by flicking the dedicated switch upwards:

Hybrid Inverter

OFF

GRID

ON

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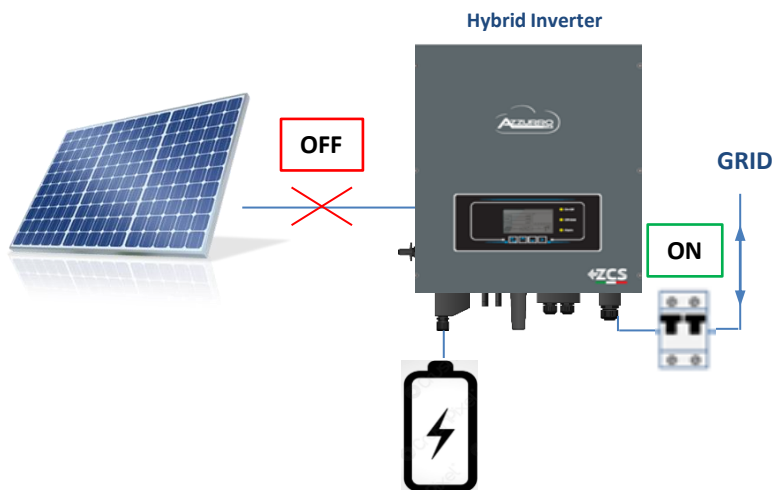
3) Check that the power value taken from the grid display is approximately equal to the power consumption shown on the meter, or to the value obtained by using a current meter to measure under the import/export meter.

On-Grid State   WiFi

PV1 : NA   PV2 : NA

0.00kW   1.47kW

0.00kW   1.47kW

2018-06-28   09 : 11 : 28
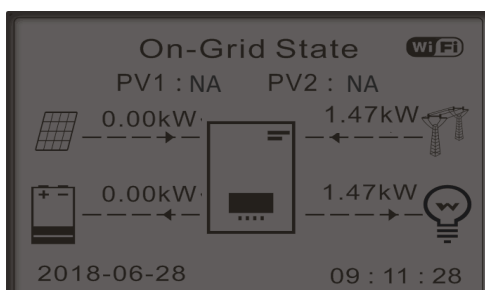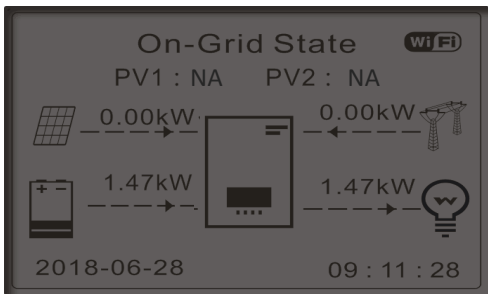
Once the countdown is over, the batteries will start to deliver power to the utility according to availability, and will attempt to reset the consumption from the grid.

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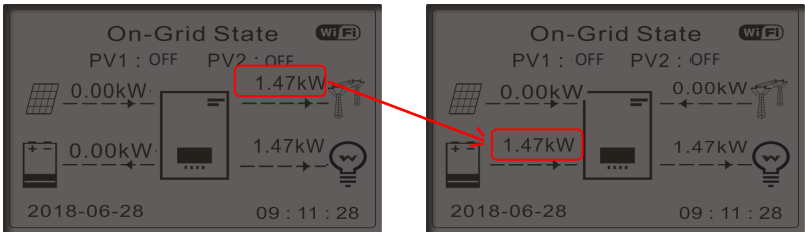
Switch the photovoltaic system back on by turning the DC switch to the ON position

Hybrid Inverter

ON

GRID

ON

ON
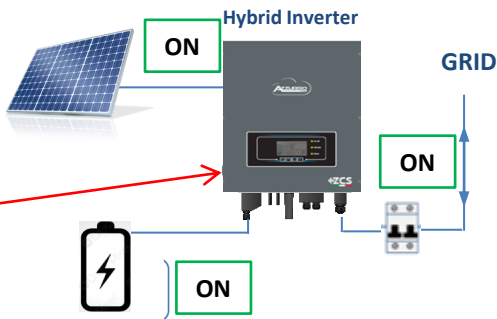
Once the photovoltaic system has been activated, check that:
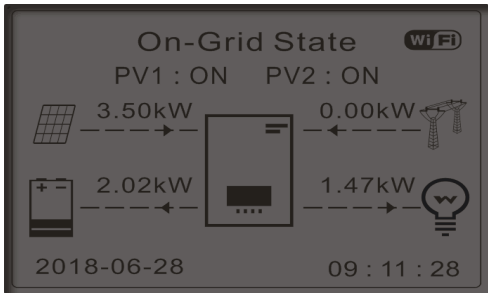
The value of consumption remains constant as the photovoltaic power increases.

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 ➤ *Serial number of the machine*
Software version:
V2.00 ➤ *Software version installed*
Hardware version:
V1.00 ➤ *Hardware version*
Power level :
3kW ➤ *Max inverter power*

Inverter Info (4)
DRMs0 Control:
Disabled ➤ *Information on DRMs0 mode (to enabled only for Australia)*
Set PF time:
DFLT: 0.000s   SET : 0.000s ➤ *Response delay in frequency*
Set QV time:
DFLT: 3.0s   SET :   3.0s ➤ *Response delay in voltage*
Power Factor :
100% ➤ *Power factor value*

Inverter Info (2)
Country:
CEI-021 Internal ➤ *Country code for legislation*
Service Code :
V2.10 ➤ *Service Code Version*
PV Input Mode :
Independent ➤ *Photovoltaic input mode (Independent / Parallel)*
Working mode :
Automatic mode ➤ *Information on operating mode (must be automatic)*

Inverter Info (5)
Battery active :
Disabled ➤ *Function not enabled*
CT Direction :
Unfrozen ➤ *Sensor status*
Resistance insulation :
7000KOhm ➤ *Measured value of the insulation resistance*

Inverter Info (3)
RS485 address :
01 ➤ *Communication address (value must be different from 00)*
EPS :
Disabled ➤ *Information on EPS mode*
IV Curve Scan :
Disabled ➤ *Information on MPPT scan mode*
Zero grid feed-in mode :
Disabled ➤ *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 : 25.00 A SET : 65.00 A
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 : 65.00 A
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 : 65.00 A
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 %

Batterie-Info (3)
EPS Safety Buffer:
20 %

Batterie-Info (3)
EPS Safety Buffer:
20 %

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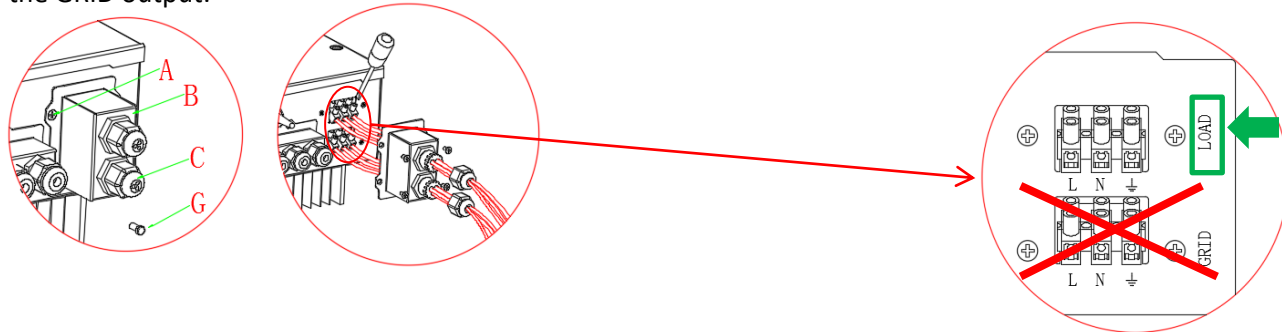
1) Unscrew the 4 screws (A) of the central cover with a screwdriver.
2) Remove the waterproof cover (B), loosen the cable gland (C), and then remove the stopper (G).
3) Pass the cable with the phases through the cable gland (C), connecting it to the appropriate terminals on the **LOAD** side.

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.
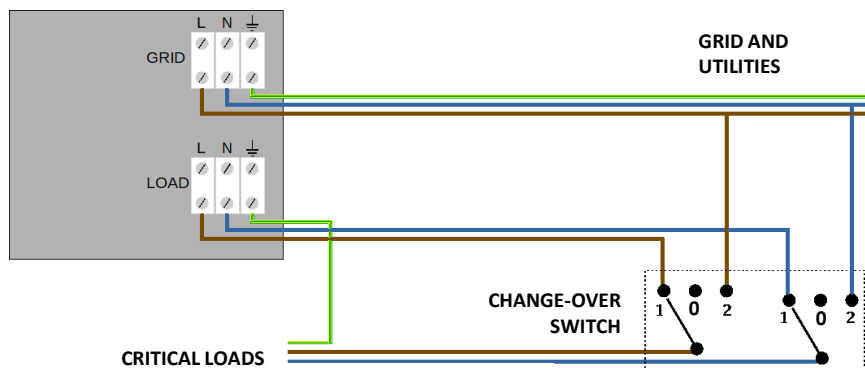

Position 1→ Priority loads connected and powered by the inverter's LOAD line

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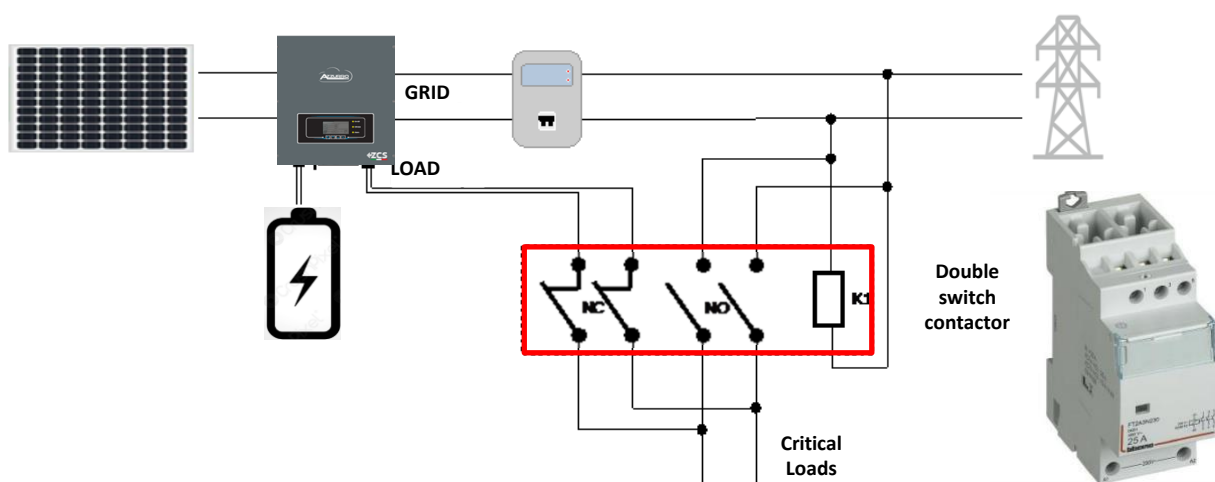
NOTE: For the conditions described above, in the event of a power failure, the part of the system powered by the inverter's LOAD port behaves like an IT system

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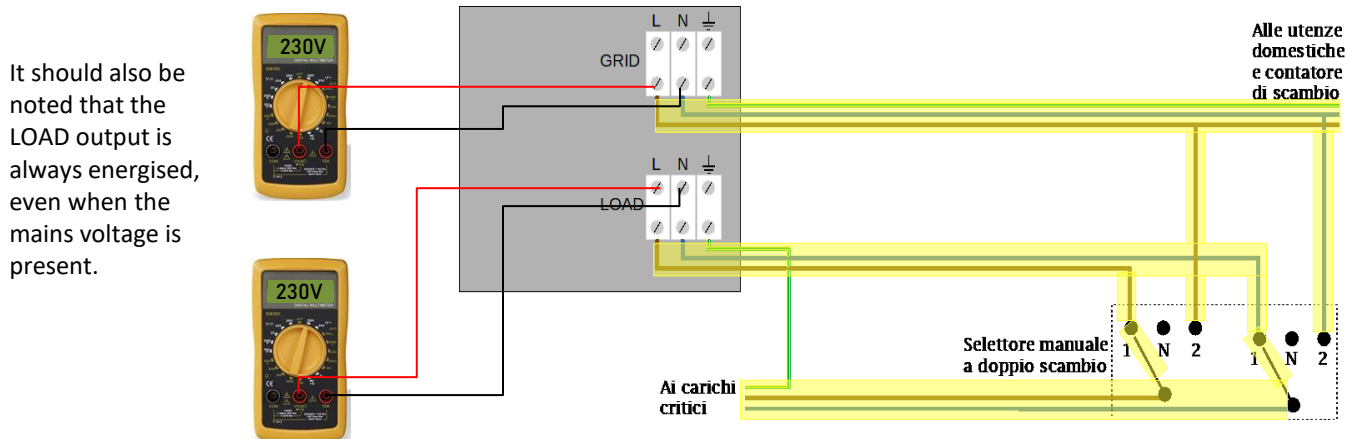
In the event of a **blackout**, the alternating voltage supplied by the grid will be lost; this condition will cause the internal contacts of the hybrid inverter to switch over which, once the set activation time has expired, will continue to supply an alternating voltage of 230V to the LOAD output,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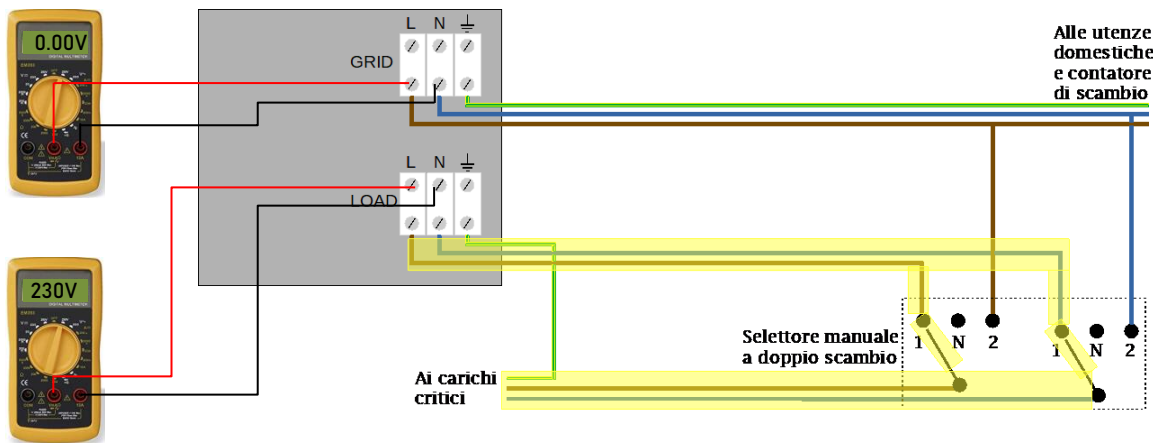
NOTE: with this configuration, the system becomes an IT system during a blackout.

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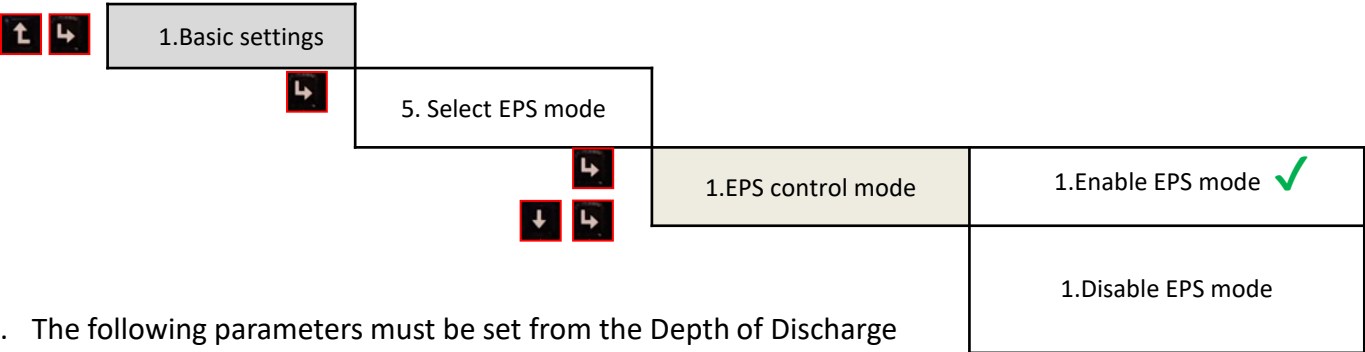
2. The following parameters must be set from the Depth of Discharge menu.

Depth of Discharge

80%

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

EPS Depth of Discharge

85%

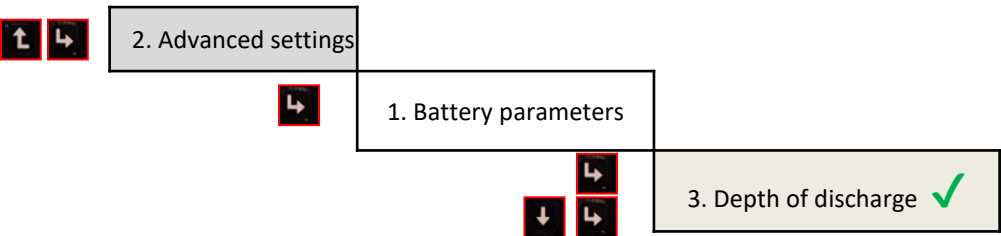2. Depth of Discharge in EPS (or OFF-Grid) mode, beyond which the inverter stops supplying power to the connected loads.

SOC% < (100 - Depth of Discharge in EPS)

e.g. Max charge value = 100%
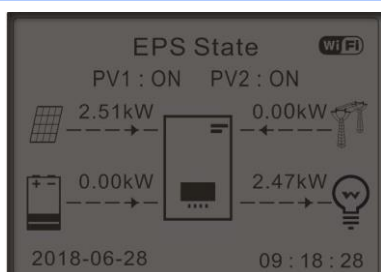   *Min discharge value = 15%*

EPS Safety Buffer

10%

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)

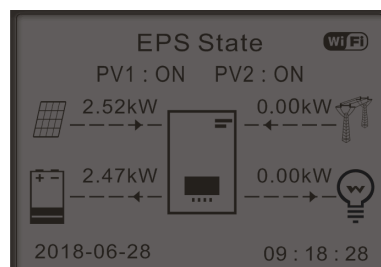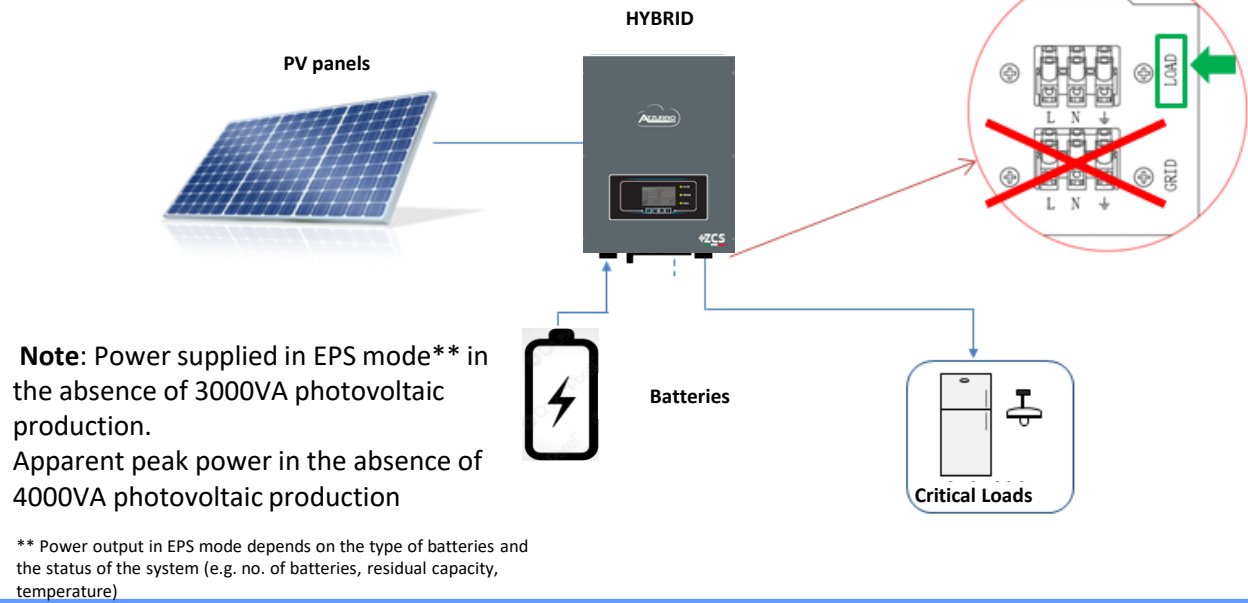|		
Standby		If PV production = LOAD consumption, the HYD-ES inverter will not charge or discharge the battery.
Discharge		If PV production < LOAD consumption (ΔP ＞ 100W) the HYD-ES inverter will discharge the battery.
Charge		If PV production > LOAD consumption (ΔP > 100W) the HYD-ES inverter will charge 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.
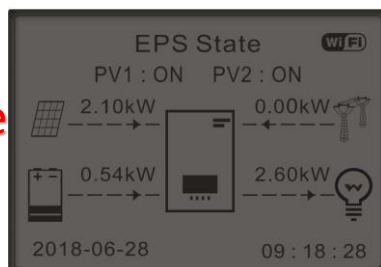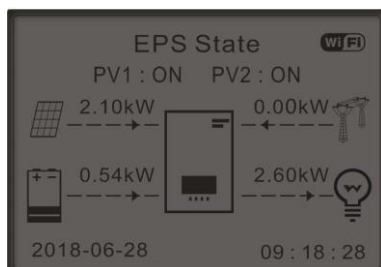
By switching on the HYD-ES inverter when there is no grid, it will be able to supply the energy coming from the PV system and stored in the batteries to the pre-defined critical loads. To do this, it is necessary to activate the EPS (Emergency Power Supply) mode.

HYBRID

PV panels

Batteries

Critical Loads

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.
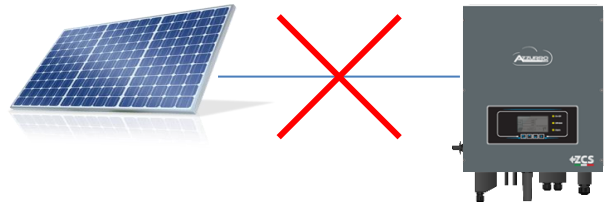
2) Turn on the batteries:
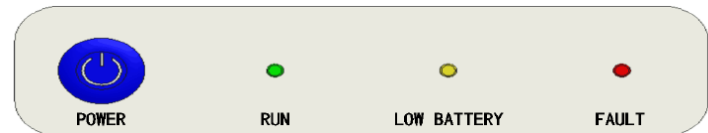
| POWER | RUN | LOW BATTERY | FAULT |

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.

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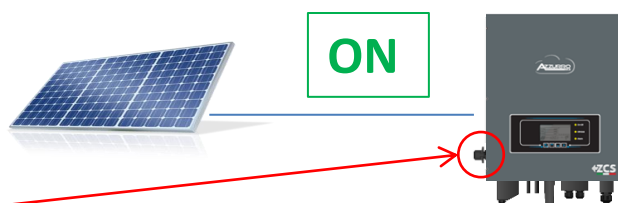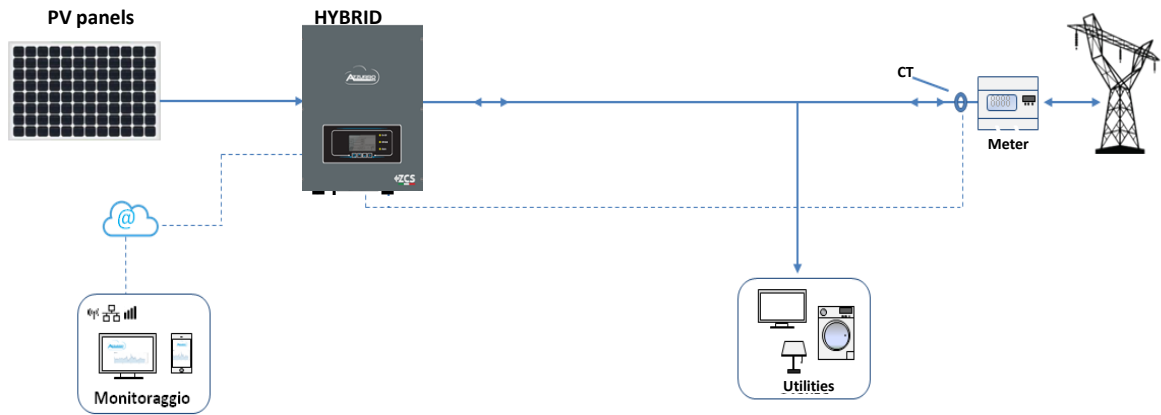
The system can also work as a photovoltaic inverter only, and therefore without batteries.

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
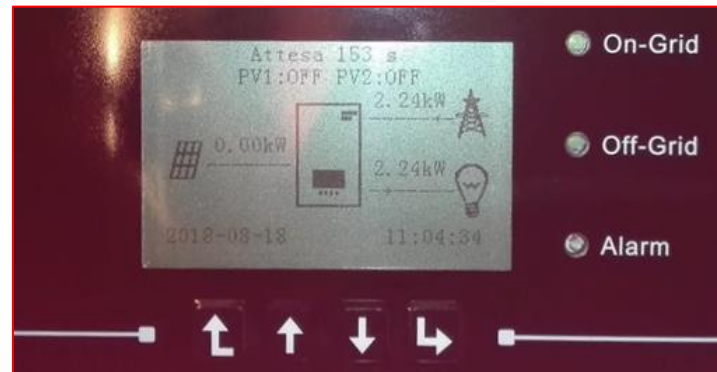
22. SELF-TEST

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

1.Settings

11.Self-test

1. Fast self-test

2. STD self-test

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).

Here below the inverter <u>logic interface connection</u>.

PIN 1: **White – Orange wire**
PIN 2: **Orange wire**
PIN 3: **White – Green wire**
PIN 4: **Blue wire**
PIN 5: **White – Blue wire**
PIN 6: **Green wire**
PIN 7: **White – Brown wire**
PIN 8: **Brown wire**

1 White and orange
2 Orange
3 White and green
4 Blue
5 White and blue
6 Green
7 White and brown
8 Brown

a) Logic interface for AS/NZS 4777.2:2015, also known as inverter demand response modes (DRMs).
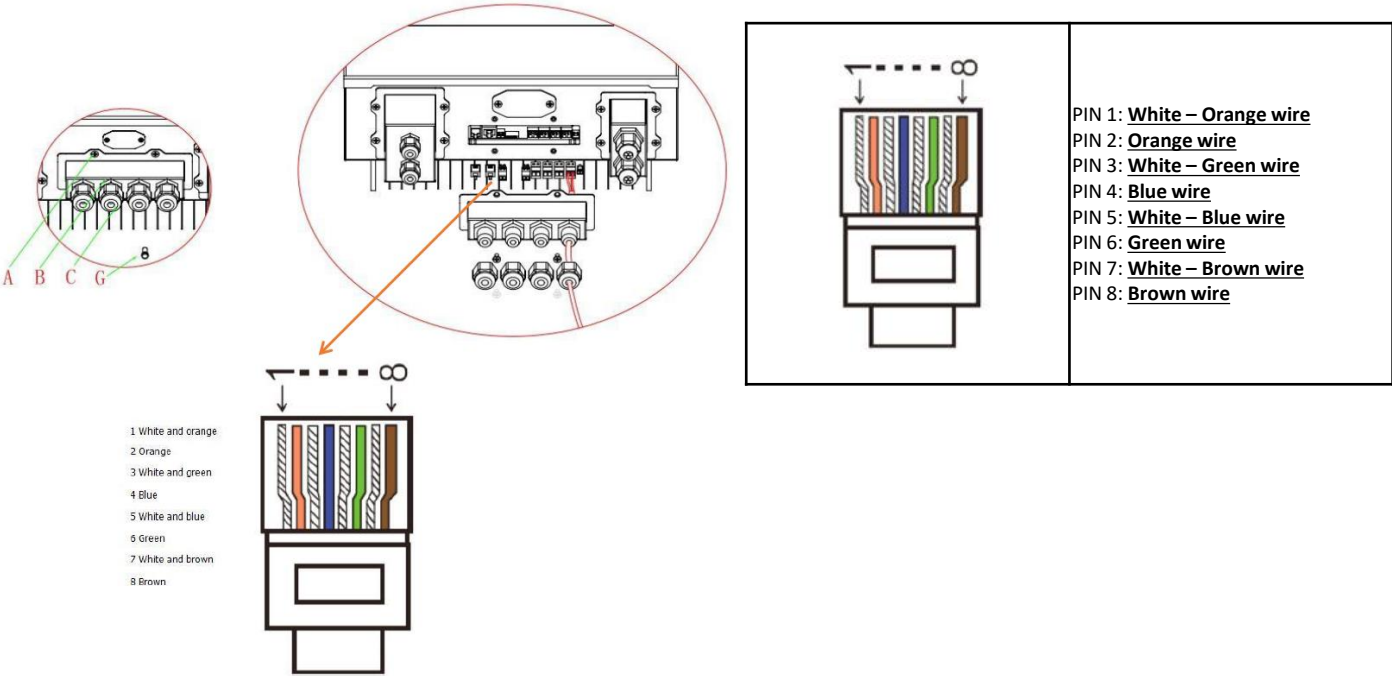The inverter will detect and initiate a response to all supported demand response commands within 2s.
The inverter will continue to respond while the mode remains asserted.

Below the **function description of the DRMs terminal**.

Pin NO.	Color	Function
1	White and orange	DRM1/5
2	Orange	DRM2/6
3	White and green	DRM3/7
4	Blue	DRM4/8
5	White and blue	DRM0
6	Green	RefGen
7	White and brown	Pin 7 and Pin 8 short internal
8	Brown	Pin 7 and Pin 8 short internal

b) Logic interface for VDE-AR-N 4105:2018-11, is in order to control and/or limit the inverter's output power.

The inverter can be connected to a **RRCR (Radio Ripple Control Receiver)** in order to dynamically limit the output power of all the inverters in the installation.
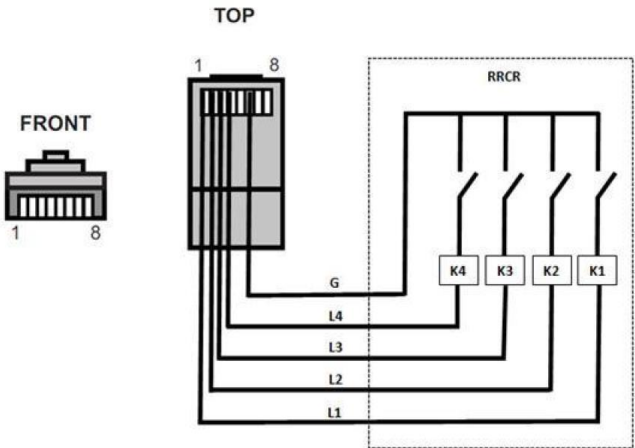
Here below the <u>function description of the terminal</u>.

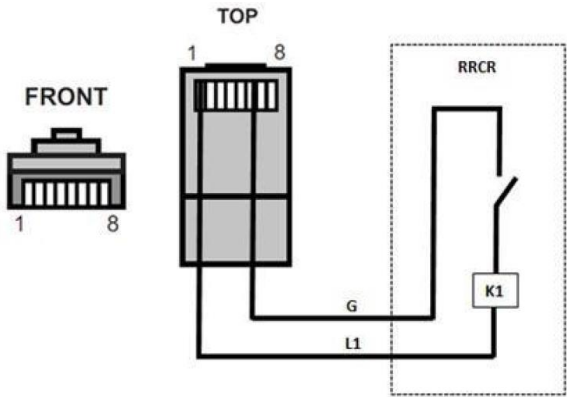| Pin NO.	Pin name	Description	Function
1	L1	Relay contact 1 input	K1 – Relay 1 output
2	L2	Relay contact 2 input	K2 – Relay 2 output
3	L3	Relay contact 3 input	K3 – Relay 3 output
4	L4	Relay contact 4 input	K4 – Relay 4 output
5	NC	Not connected	Not connected
6	G	GND	Relays common node
7	NC	Not connected	Not connected
8	NC	Not connected	Not connected

The inverter is preconfigured to the following RRCR power levels.
Relay status: close is 1, open is 0.

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

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

Here below <u>the Inverter – RRCR Connection.</u>

Here below the <u>function description of the terminal</u>.
Relay status: close is 1, open is 0.

Pin NO.	Pin name	Description	Function
1	L1	Relay contact 1 input	K1 – Relay 1 output
2	NC	Not connected	Not connected
3	NC	Not connected	Not connected
4	NC	Not connected	Not connected
5	NC	Not connected	Not connected
6	G	GND	K1 – Relay 1 output
7	NC	Not connected	Not connected
8			

The inverter is preconfigured to the following RRCR power levels.

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