SCAN GUIDA VIRTUALE ZP1

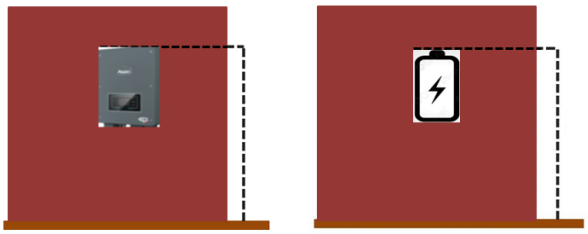
QUICK GUIDE
5-20-ZSS HYBRID INVERTER

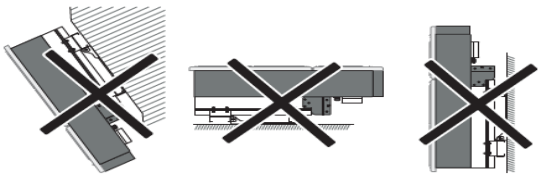
TABLE OF CONTENTS

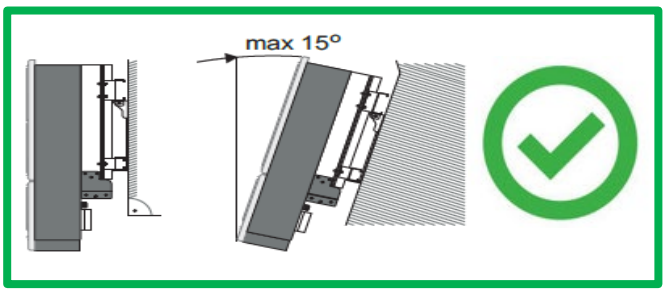
1. INSTALLATION AND DISTANCES

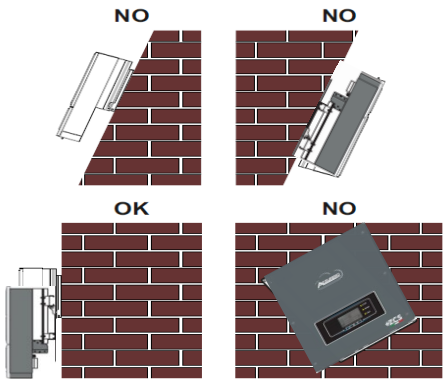
Always wear protective clothing and/or personal protective equipment	Always consult the manual	General notice - Important Safety Instructions

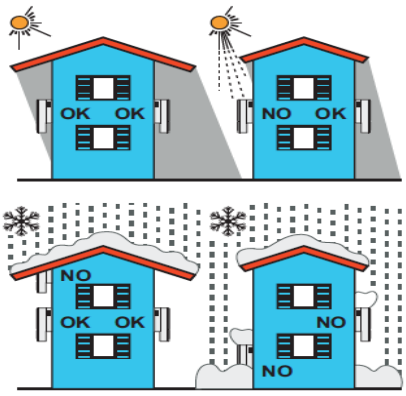
Maximum height from ground permitted: 180 cm



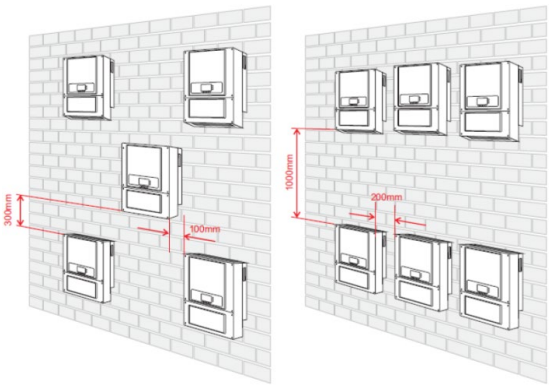




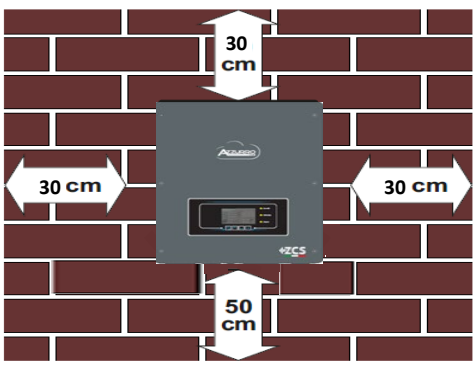




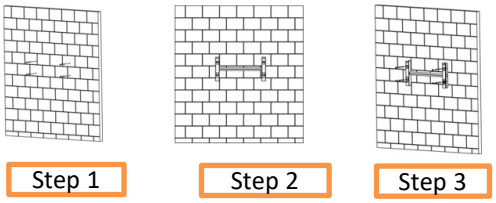
Distances for installation of multiple inverters

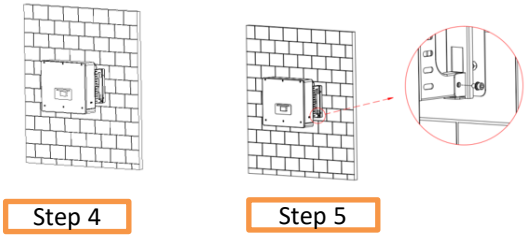


Distances for installation of a single inverter



2. WALL INSTALLATION





Step 1: Position the mounting bracket on the wall, mark the fixing points.

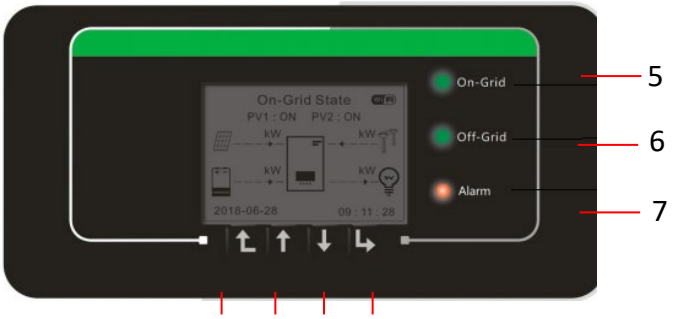
Step 2: Insert the expansion bolts vertically into the hole, make sure that the insertion depth is neither too shallow nor too deep.

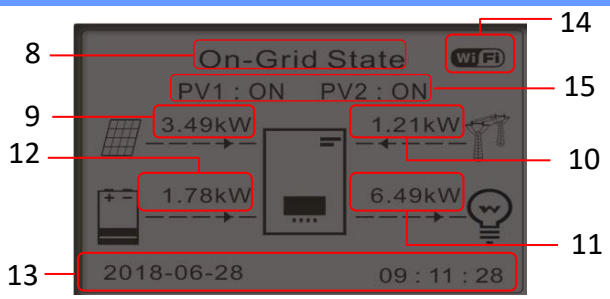
Step 3: Fix the mounting bracket to the wall using the expansion bolts with nuts.

Step 4: Position the 3PH HYD5000-HYD20000-ZSS inverter on the mounting bracket.

Step 5: Use the grounding hole to electrically ground the inverter

3. LIGHTS AND BUTTONS





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

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.

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

1. Language
2. Date and Time
3. Safety parameters
4. Working mode
5. Self-test
6. Config. input Channels
7. EPS Mode
8. Commun. Address. Select.

PWD: 0715

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

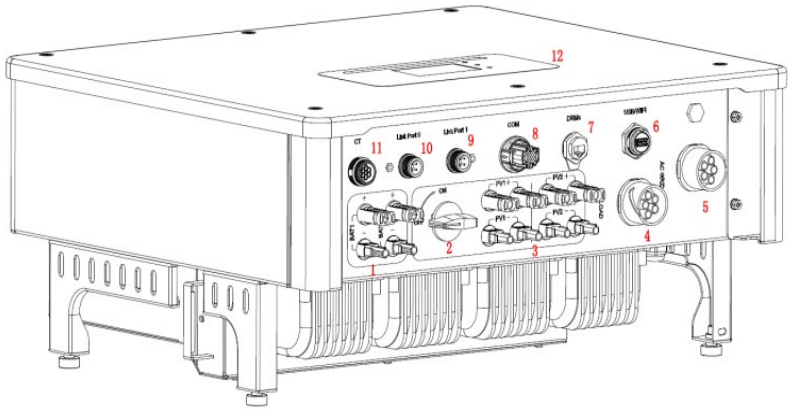
1. List of current events
2. List of historical events

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

PWD: 0715 | Start Update ...

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
Import	Import	Import	Import	Import

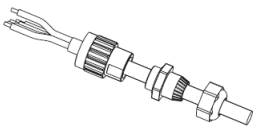
5. QUICK INFO ON SYSTEM STATUS



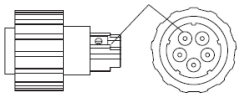
1	Battery input terminals	7	DRMs
2	DC Switch	8	COM
3	PV input terminals	9	Port 1 for parallel connection
4	Privileged load connection port	10	Port 0 for parallel connection
5	Grid connection port	11	CT (current sensors)
6	USB/Wi-Fi	12	LCD

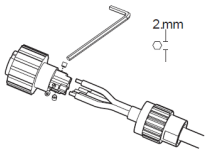
6. CONNECTING TO THE GRID

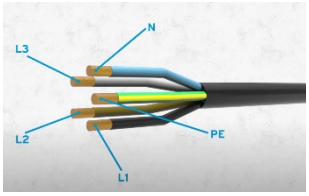
Step 1: Select the appropriate cable type and specifications. Then pass the cables through the terminal.

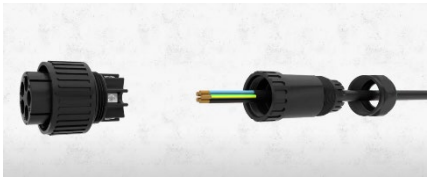


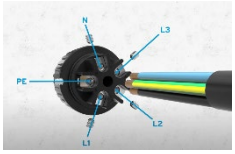
Step 2: Lock the cables into the holes on the terminal and tighten them with the Allen key.



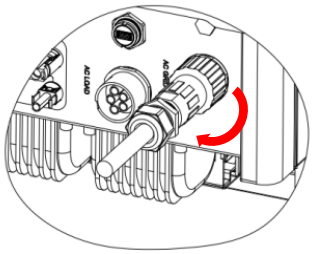


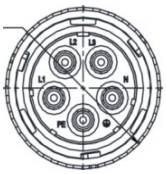
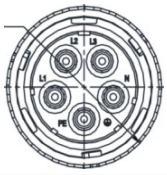






Step 3: Connect the terminal to the machine port and turn the clamp in a clockwise direction



Component	Description		Recommended cable type	Recommended cable specification
	LOAD	L1/L2/L3	Multi-core copper cable for outdoor use	Cross-section area of the conductor: 6~10 mm²
		N		
		PE		
	AC	L1/L2/L3	Multi-core copper cable for outdoor use	Cross-section area of the conductor: 10~16 mm²
		N		
		PE		

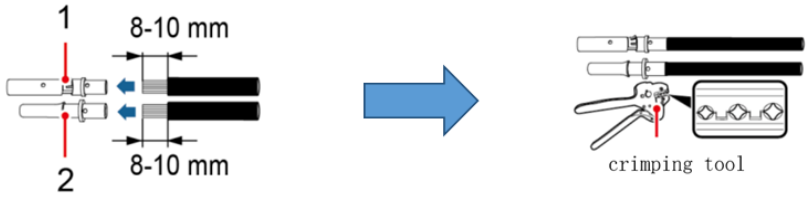
Recommended specifications for DC input cables

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

Procedure:

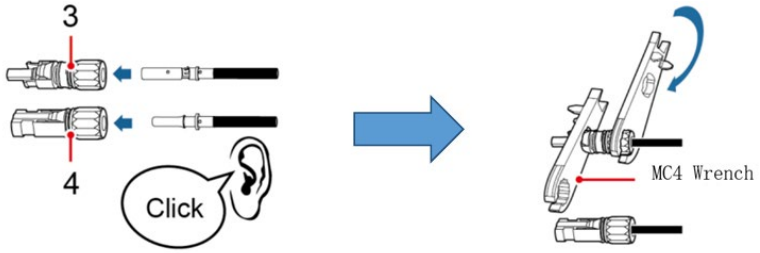
1) Prepare the positive and negative photovoltaic cables.

1. Positive contact
2. Negative contact

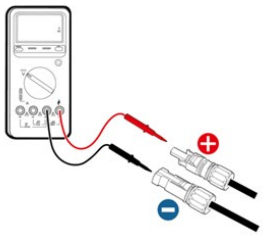


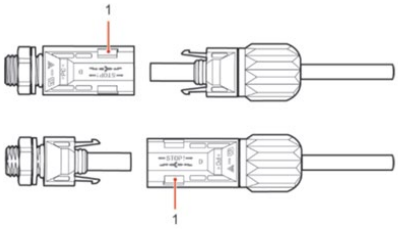
Insert the crimped positive and negative cables into the corresponding photovoltaic connectors.

3. Positive connector
4. Negative connector

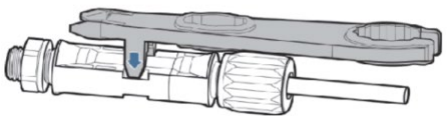


Make sure that all the DC string parameters are acceptable to the inverter according to the technical specifications given in the datasheet and in the Azzurro ZCS configurator. **In addition, check that the polarities of the photovoltaic cables are correct.** Insert the positive and negative connectors into the inverter until you hear a "click" sound.





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



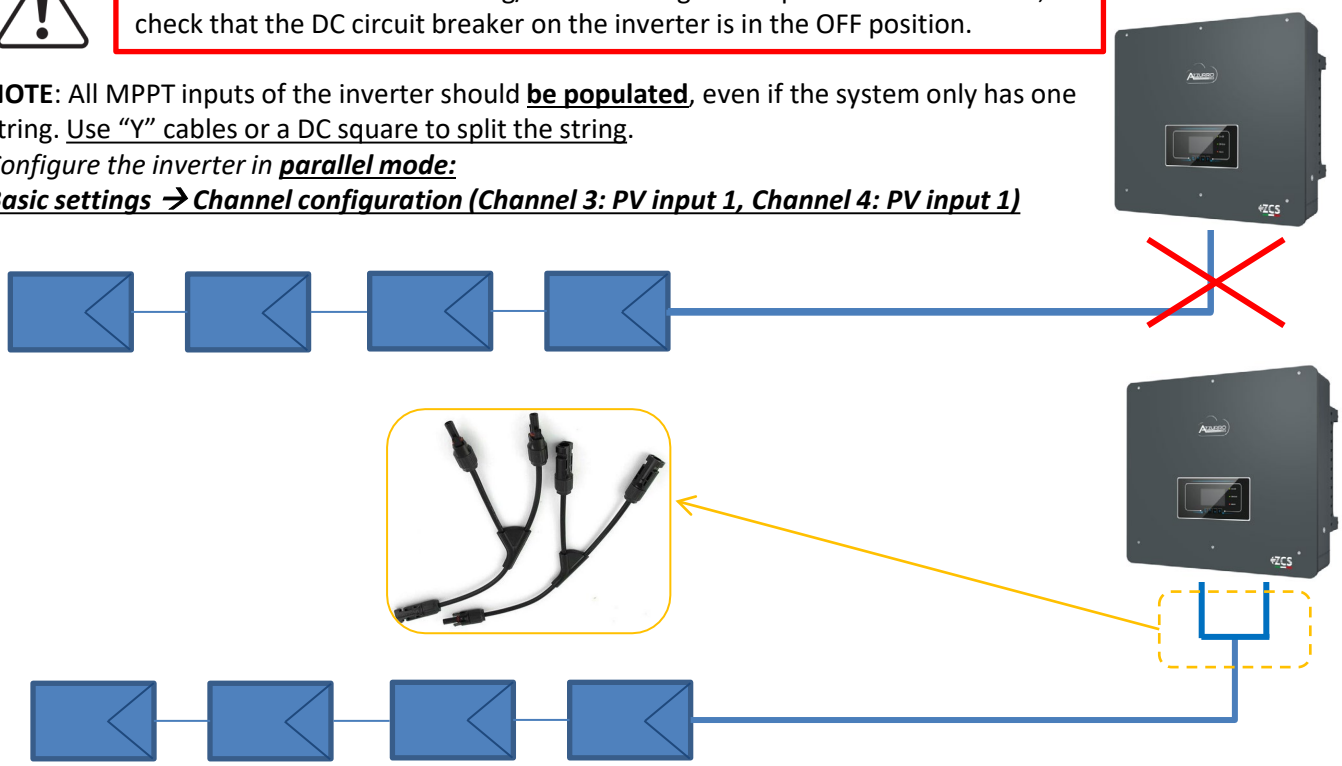
Use a MC4 wrench to disconnect the photovoltaic connectors

ATTENTION Before connecting/disconnecting the PV panels to the inverter, check that the DC circuit breaker on the inverter is in the OFF position.

NOTE: All MPPT inputs of the inverter should **be populated**, even if the system only has one string. Use "Y" cables or a DC square to split the string.

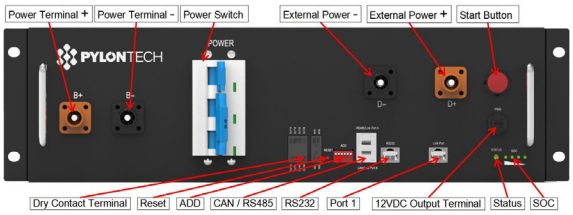
Configure the inverter in ***parallel mode:***

Basic settings → Channel configuration (Channel 3: PV input 1, Channel 4: PV input 1)

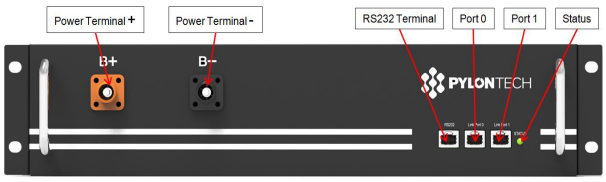


Power and communication connections between batteries and BMS

BMS



Battery

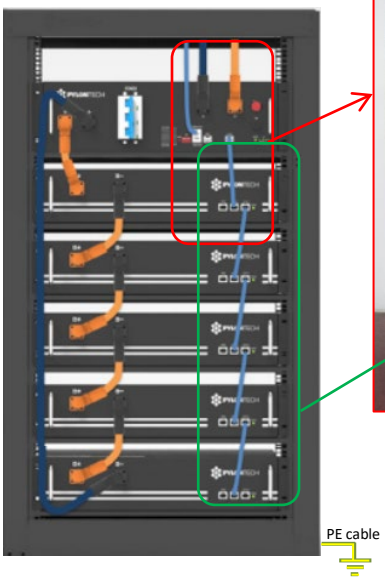


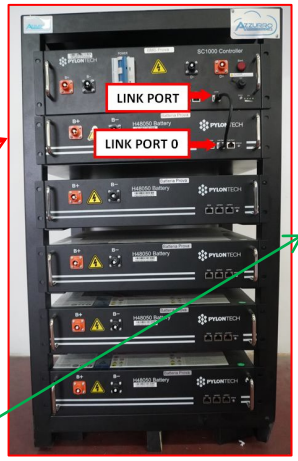
Power connections between batteries and BMS:

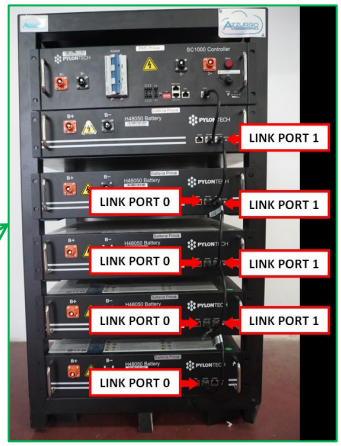
Batteries are connected **IN SERIES** to each other:
- Negative input (-) of **battery 1** connected to positive input (+) of **battery 2**.
- Negative input (-) of **battery 2** connected to positive input (+) of **battery 3**.
- .....
- Negative input (-) of **battery N-1** (second-last) connected to positive input (+) of **battery N** (last).

Connect each battery to the metal rack and connect accordingly to the ground system.

The **BMS** is connected in parallel to the series consisting of the **batteries**:
- Negative input (-) of the **BMS** connected to the negative input (-) of **battery N** (last) in the series.
- Positive input (+) of the **BMS** connected to positive input (+) of **battery 1**.





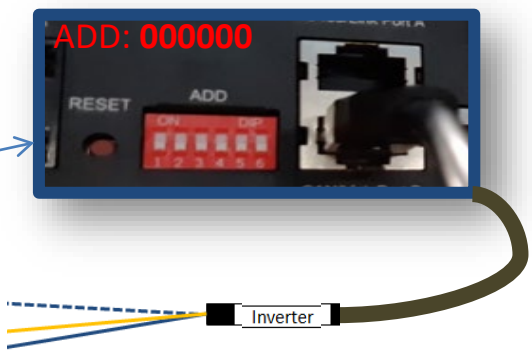


Communication connections between batteries and BMS:

- Link port of the **BMS** to link port 0 of **battery 1**.
- Link port 1 of **battery 1** must be connected to link port 0 of **battery 2**.
- ...
- Link port 1 of **battery N-1** (second-last) must be connected to link port 0 of **battery N** (last).

Power and communication connections between BMS and inverter

Communication connections between BMS and inverter:



SC500 & SC1000 BMS

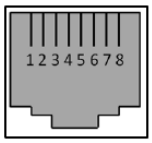
Wi-Fi/USB SC500 & Wi-Fi/USB SC1000 BMS

SC500 & SC1000 BMS communication:
•ADD communication address: **000000**
•Cable connected to **BMS** on CAN/Link port B

Wi-Fi/USB SC500 & Wi-Fi/USB SC1000 BMS communication:
•ADD communication address: **000000**
•Cable connected to **BMS** on CAN port

Definition of RJ45 Port Pin

No.	CAN	RS485	RS232 Pin
1	---	---	---
2	GND	---	---
3	---	---	TX
4	CANH	---	---
5	CANL	---	---
6	---	GND	RX
7	---	RS485A	---
8	---	RS485B	GND



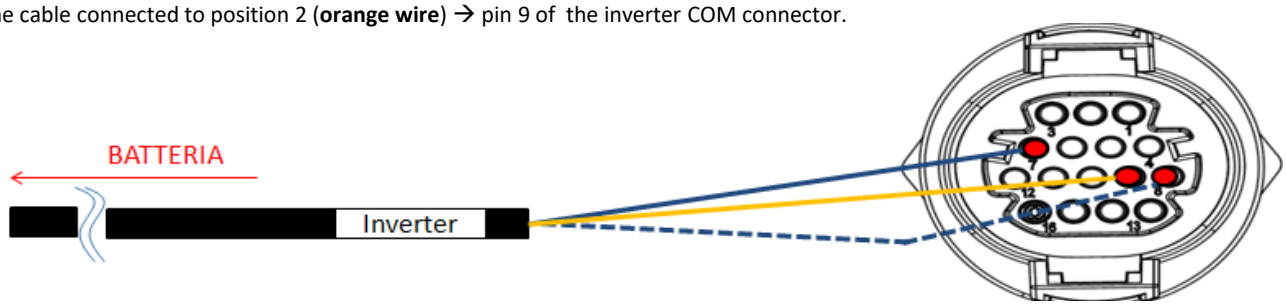
RJ45 Port

RJ45 Plug

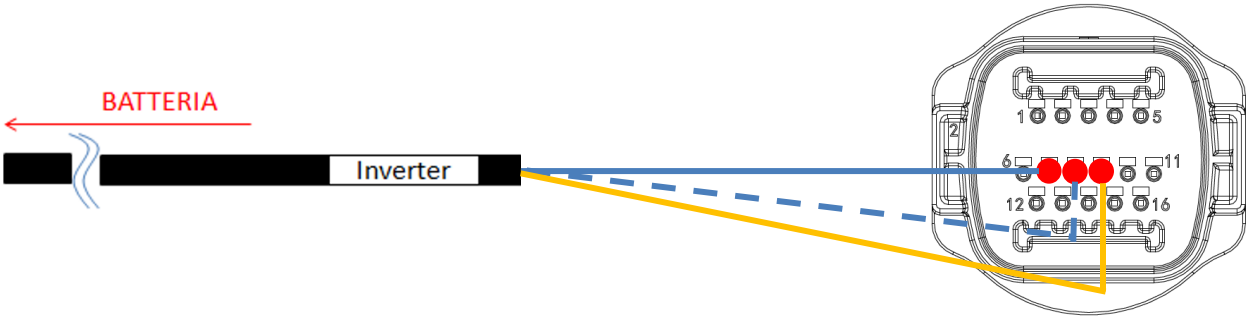
The end labelled **inverter** must be cut leaving only the wires connected to pins 2 (orange wire), 4 (blue wire) and 5 (white-blue wire).

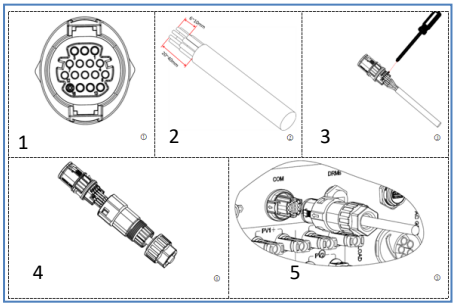
Connect the cable connected to position 4 (**blue wire**) → pin 7 of the inverter COM connector.
Connect the cable connected to position 5 **(white-blue wire**) → pin 8 of the inverter COM connector.
Connect the cable connected to position 2 (**orange wire**) → pin 9 of the inverter COM connector.

Screw-in COM port

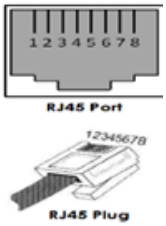


Snap-in COM port

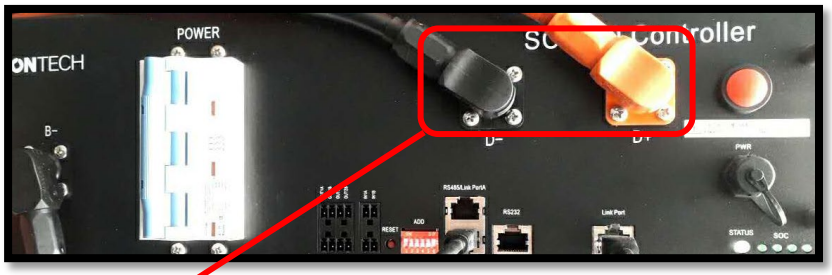




COM port PIN (inverter)	Battery communication	Notes
7	CAN H (blue wire)	Communication with the BMS of the lithium battery, the CAN of the inverter adapts to the BMS of the lithium battery.
8	CAN L (white-blue wire)	
9	GND.S (orange wire)	



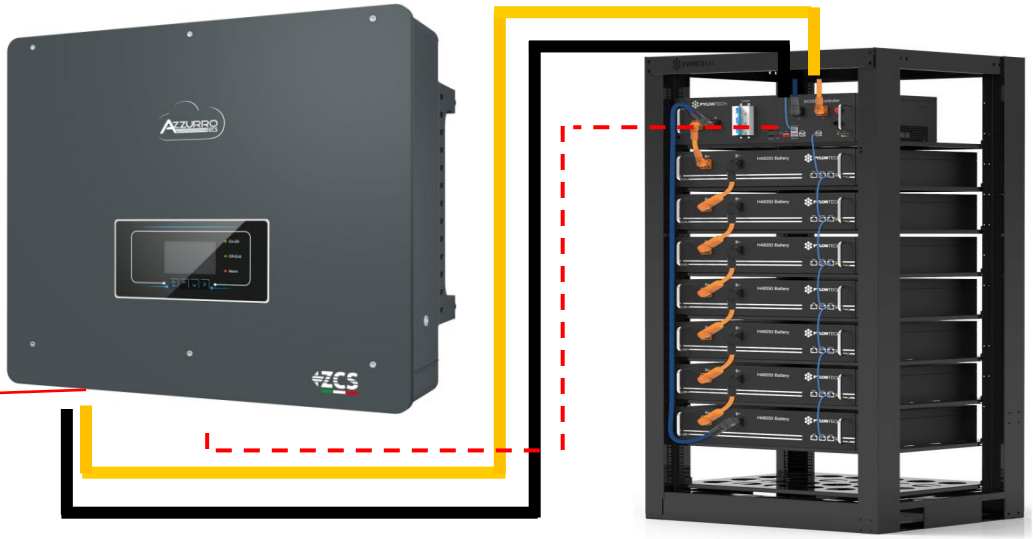
Power connections between BMS and inverter:



Cable ends with fast connectors to connect to the **BMS**

Power cables supplied

Power cable ends with connectors to connect to the BAT1 channel of the **inverter**.



8.1.2 PYLONTECH BATTERY SETTINGS ON INVERTER - 1 BATTERY TOWER

Set the battery channels in the inverter according to the configuration of the battery towers.

*Configure the **inverter channels:***
Basic settings → Channel configuration:

When connecting **1 Pylontech tower**:
- Input channel 1 – BAT input 1;
- Input channel 2 – Not used.

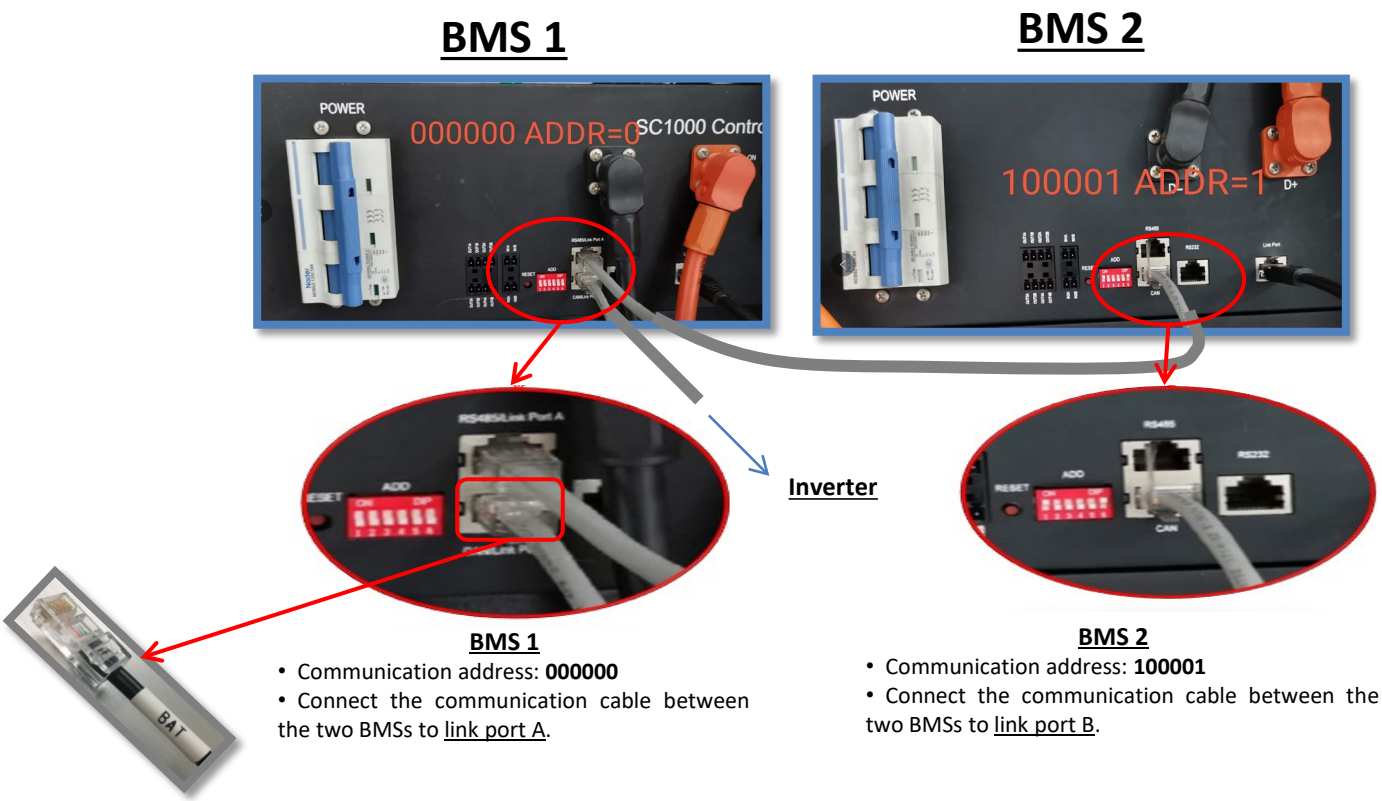
*To set the **battery parameters**:*
Advanced settings → 0715 → Battery parameters:

When connecting **1 Pylontech tower**:
- Battery 1:
  - Type: Pylon ; Address: 00; Maximum charge/discharge current: 25 A; Depth of discharge: 80%.

BATTERY 1	
1.Battery type	Pylon
2.Battery address	00
3.Maximum charge (A)	25.00 A
4.Maximum discharge (A)	25.00 A
5.Depth of Discharge	80%
6.Save	

8.2.1 PYLONTECH BATTERY CONNECTION – 2 SC500 & SC1000 BATTERY TOWERS

Communication connections between the two SC500 & SC1000 Battery Management Systems



BMS 1
- Communication address: **000000**
- Connect the communication cable between the two BMSs to link port A.

BMS 2
- Communication address: **100001**
- Connect the communication cable between the two BMSs to link port B.

Power connections between SC500 & SC1000 BMS and inverter

BMS 1

BMS 2

Each **BMS** will be connected via power cables (+ and -) to the two inputs of the inverter, in particular make sure to connect:

BMS 1 → Channel BAT1 of the inverter

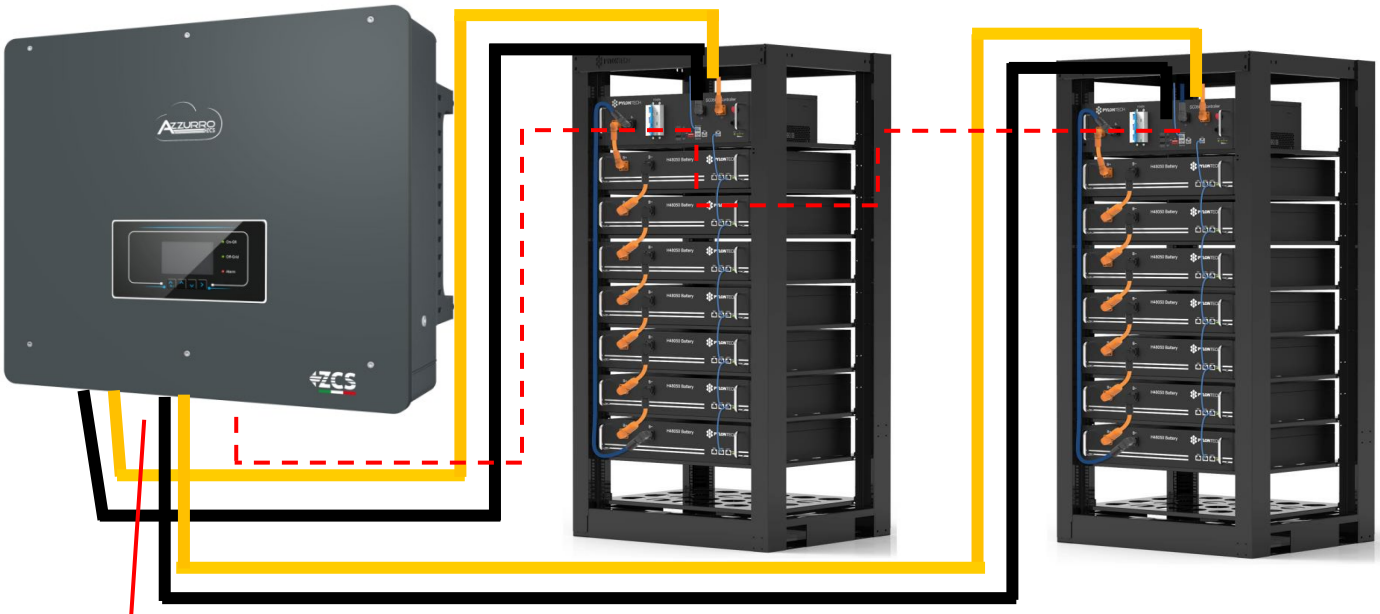
BMS 2 → Channel BAT2 of the inverter

+	-	+	-
BAT1 INPUT		BAT2 INPUT	

INVERTER

BATTERY TOWER 1

BATTERY TOWER 2



Note: Refer to the previous chapter for the communication and power connections of each tower.

8.2.2 PYLONTECH BATTERY SETTINGS ON INVERTER - 2 SC500 & SC1000 BATTERY TOWERS

Set the battery channels in the inverter according to the configuration of the battery towers.

*Configure the **inverter channels:***
Basic settings → Channel configuration:

When connecting **2 Pylontech towers**:
- Input channel 1 – BAT input 1;
- Input channel 2 – BAT input 2.

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

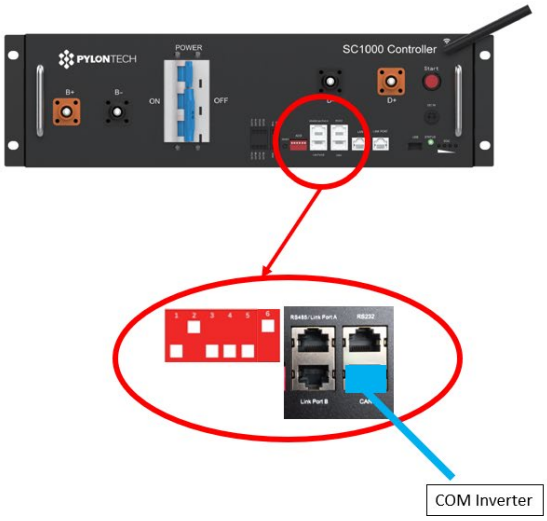
When connecting **2 Pylontech towers**:
- Battery 1:
  - Type: Pylon ; Address: 00; Maximum charge/discharge current: 25 A; Depth of discharge: 80%.
- Battery 2:
  - Type: Pylon ; Address: 01; Maximum charge/discharge current: 25 A; Depth of discharge: 80%.

BATTERY 1	
1.Battery type	Pylon
2.Battery address	00
3.Maximum charge (A)	25.00A
4.Maximum discharge (A)	25.00A
5.Depth of Discharge	80%
6.Save	

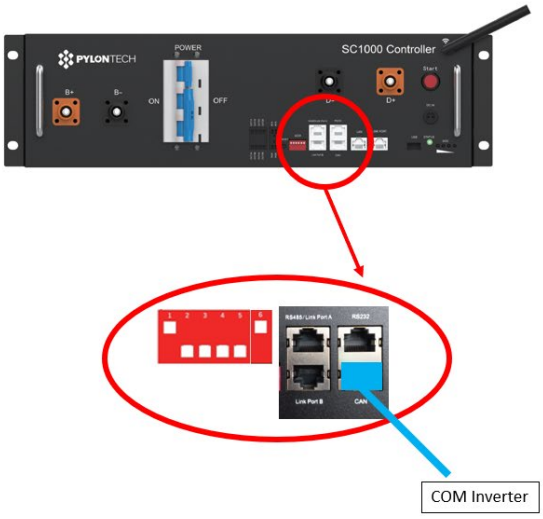
BATTERY 2	
1.Battery type	Pylon
2.Battery address	01
3.Maximum charge (A)	25.00A
4.Maximum discharge (A)	25.00A
5.Depth of Discharge	80%
6.Save	

Communication connections between the two Wi-Fi/USB SC500 & SC1000 BMSs

BMS 2



BMS 1



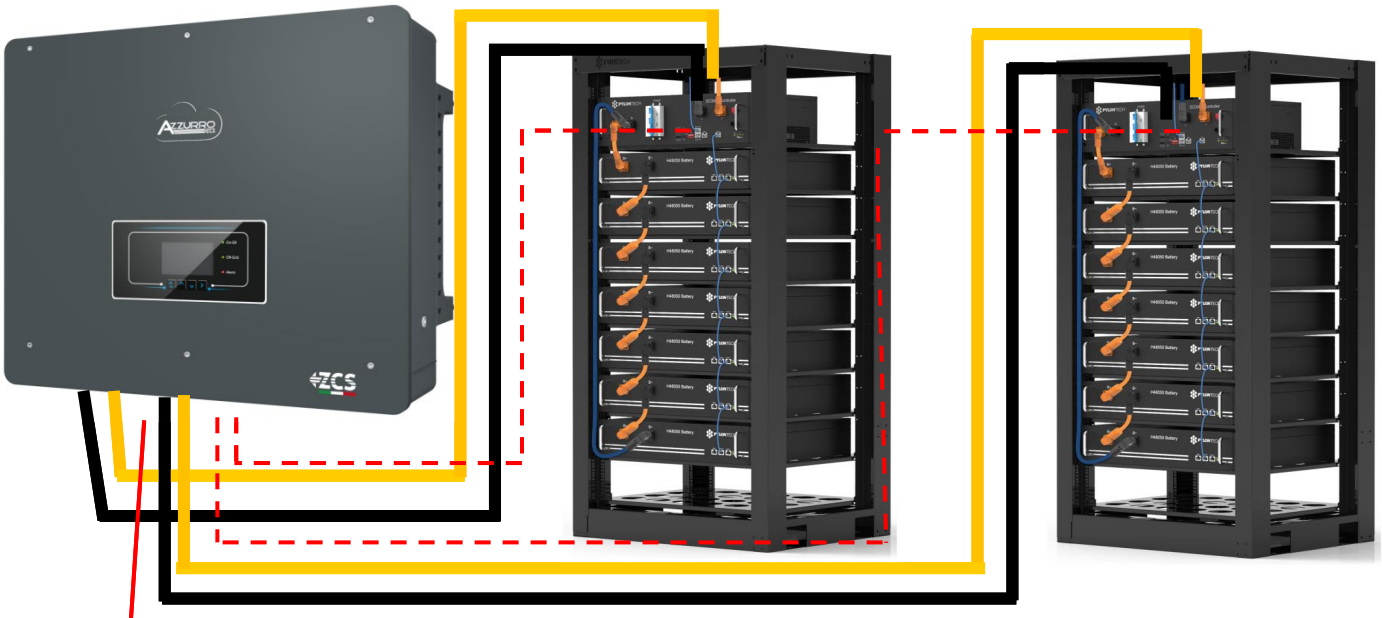
BMS 2

- Communication address: **010001**
- CAN port of **BMS 2** → COM port of the **inverter**

BMS 1

- Communication address: **100001**
- CAN port of **BMS 1** → COM port of the **inverter**

BATTERY TOWER 1 **BATTERY TOWER 2**



Note: Refer to the previous chapter for the communication and power connections of each tower.

8.3.2 PYLONTECH BATTERY SETTINGS ON INVERTER - 2 Wi-Fi/USB SC500 & SC1000 BATTERY TOWERS

Set the battery channels in the inverter according to the configuration of the battery towers.

*Configure the **inverter channels:***
Basic settings → Channel configuration:

When connecting **2 Pylontech towers**:
- Input channel 1 – BAT input 1;
- Input channel 2 – BAT input 2.

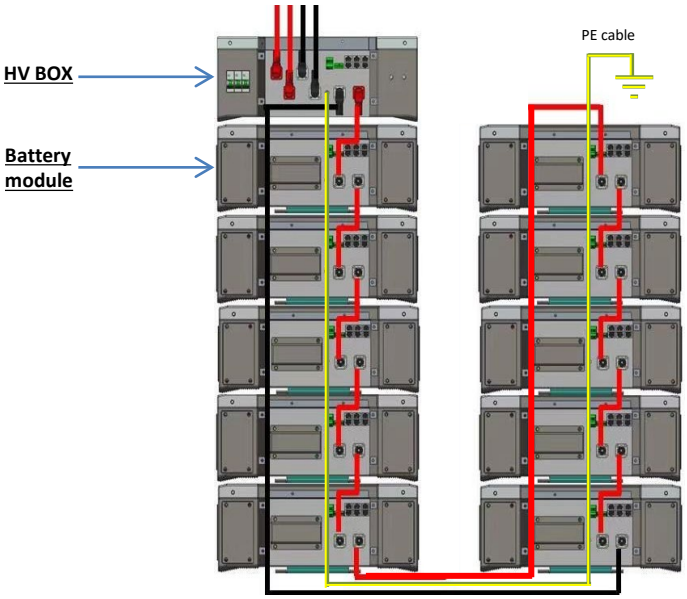
*To set the **battery parameters**:*
Advanced settings → 0715 → Battery parameters:

When connecting **2 Pylontech towers**:
- Battery 1:
  - Type: Pylon ; Address: 01; Maximum charge/discharge current: 25 A; Depth of discharge: 80%.
- Battery 2:
  - Type: Pylon ; Address: 02; Maximum charge/discharge current: 25 A; Depth of discharge: 80%.

BATTERY 1	
1.Battery type	Pylon
2.Battery address	01
3.Maximum charge (A)	25.00A
4.Maximum discharge (A)	25.00A
5.Depth of Discharge	80%
6.Save	

BATTERY 2	
1.Battery type	Pylon
2.Battery address	02
3.Maximum charge (A)	25.00A
4.Maximum discharge (A)	25.00A
5.Depth of Discharge	80%
6.Save	

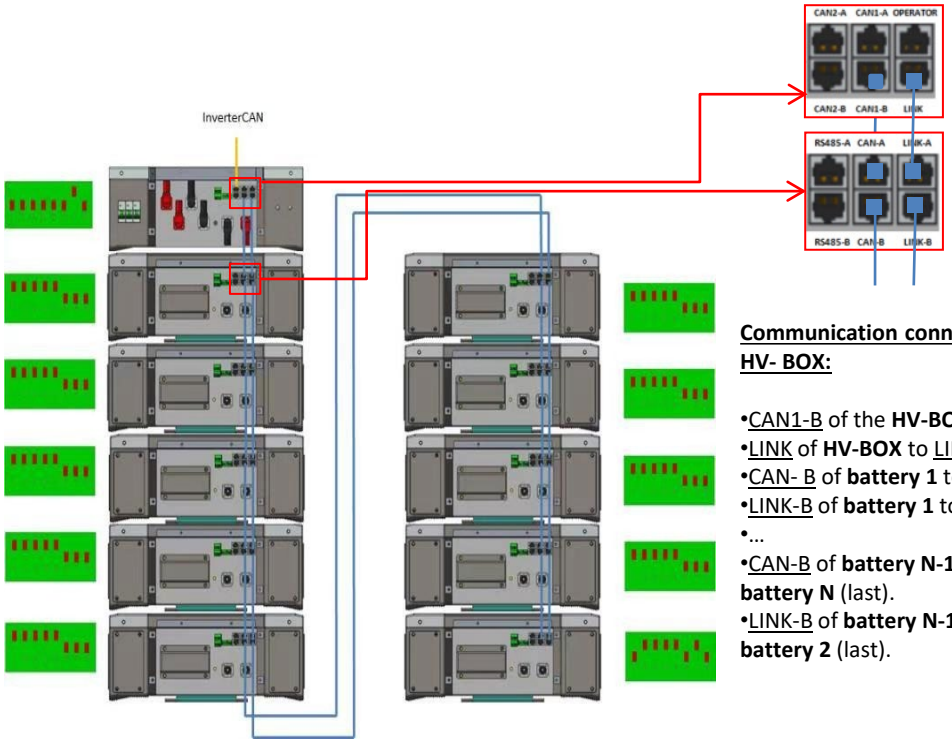
Power and communication connections between batteries and HV-BOX



Batteries are connected **IN SERIES** to each other:
•Negative input (-) of **battery 1** connected to positive input (+) of **battery 2**.
•Negative input (-) of **battery 2** connected to positive input (+) of **battery 3**.
•.....
•Negative input (-) of **battery N-1** (second-last) connected to positive input (+) of **battery N** (last).

The **HV-BOX** is connected in parallel to the series consisting of the **batteries**:
•Negative input (-) of the **HV-BOX** connected to negative input (-) of **battery N** (last) in the series.
•Positive input (+) of the **HV-BOX** connected to positive input (+) of **battery 1**.

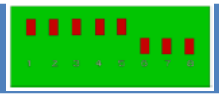
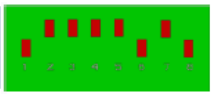
Connect each device to the ground system.



Communication connections between batteries and HV- BOX:

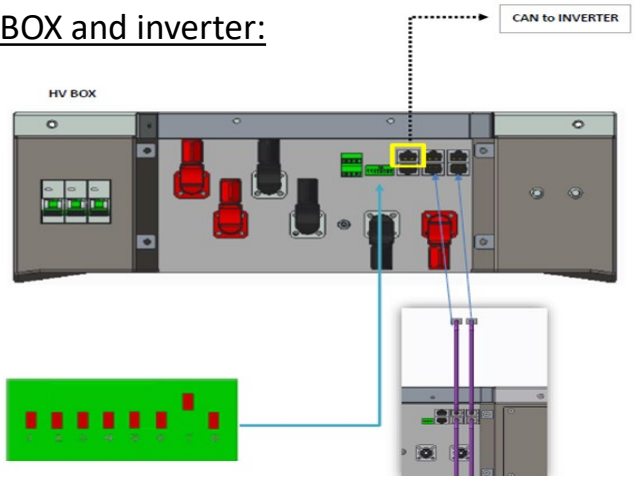
•CAN1-B of the **HV-BOX** to CAN-A of **battery 1**.
•LINK of **HV-BOX** to LINK-A of **battery 1**.
•CAN- B of **battery 1** to CAN-A of **battery 2**.
•LINK-B of **battery 1** to LINK-A of **battery 2.**
•...
•CAN-B of **battery N-1** (second-last) to CAN-A of **battery N** (last).
•LINK-B of **battery N-1** (second-last) to LINK-A of **battery 2** (last).

The Dip switches of the battery modules must be set:

Switch **from battery 1 to battery N-1** (second-last)	
Switch to **battery N** (last)	

Power and communication connections between HV-BOX and inverter

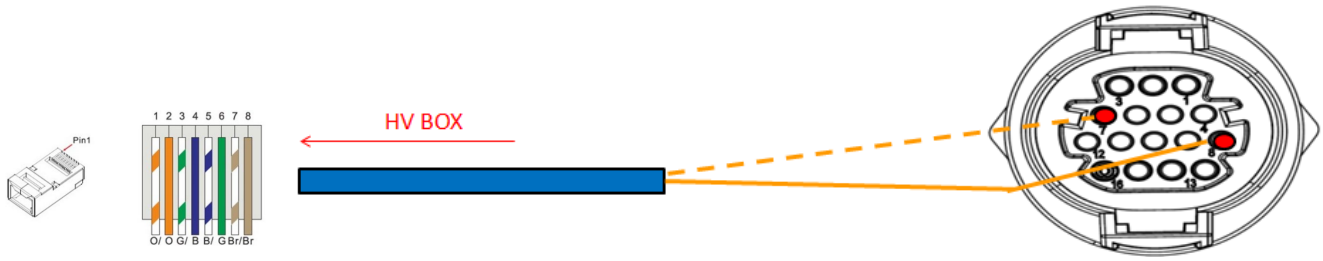
Communication connections between HV-BOX and inverter:



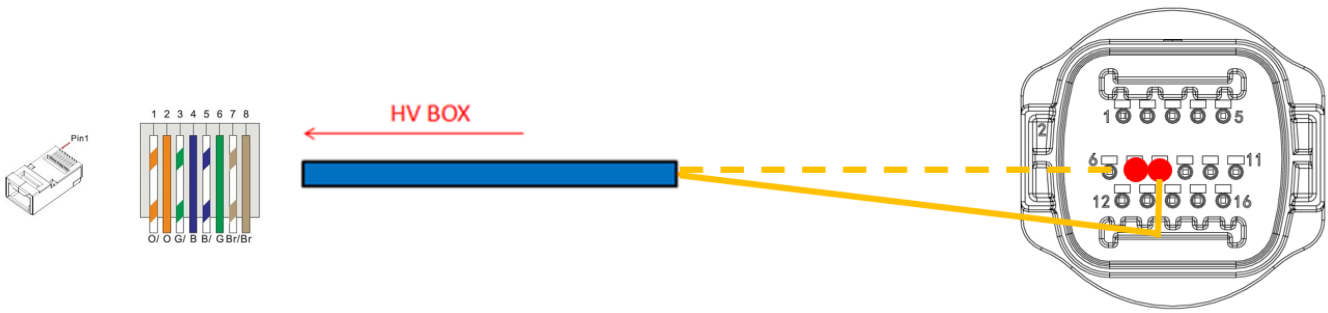
HV-BOX communication:
•**ADD** communication address: **00000010**
•Communication cable connections between **HV-BOX** and inverter:
CAN2-A **HV-BOX** → COM port **inverter**

- Connect cable CAN H **(White-Orange wire)** → pin 7 of the **inverter** COMM connector.
- Connect cable CAN L **(Orange wire)** → pin 8 of **inverter** COM connector.

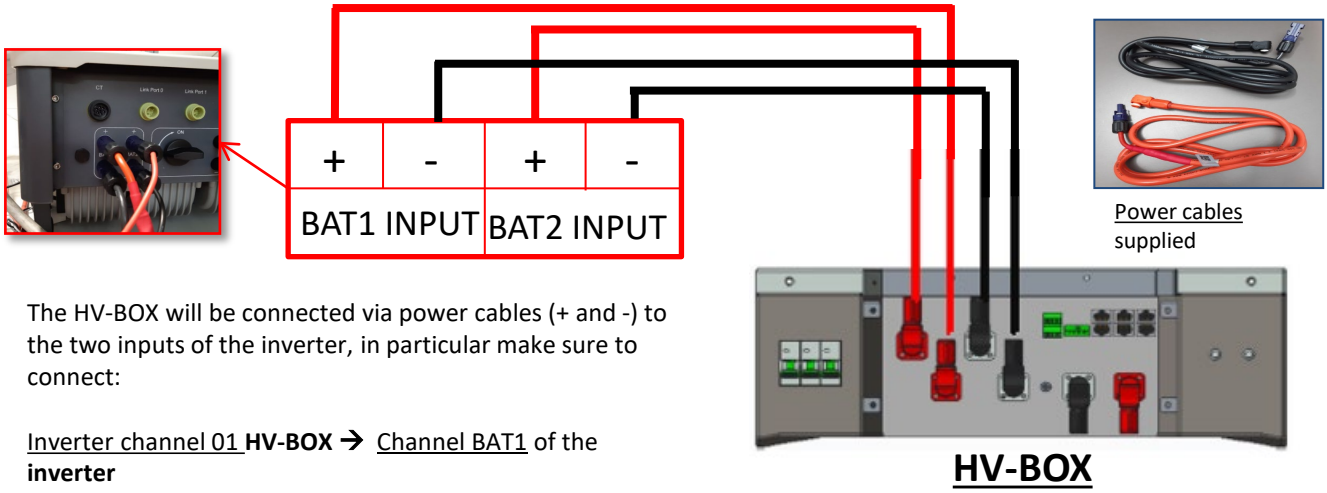
Screw-in COM port



Snap-in COM port

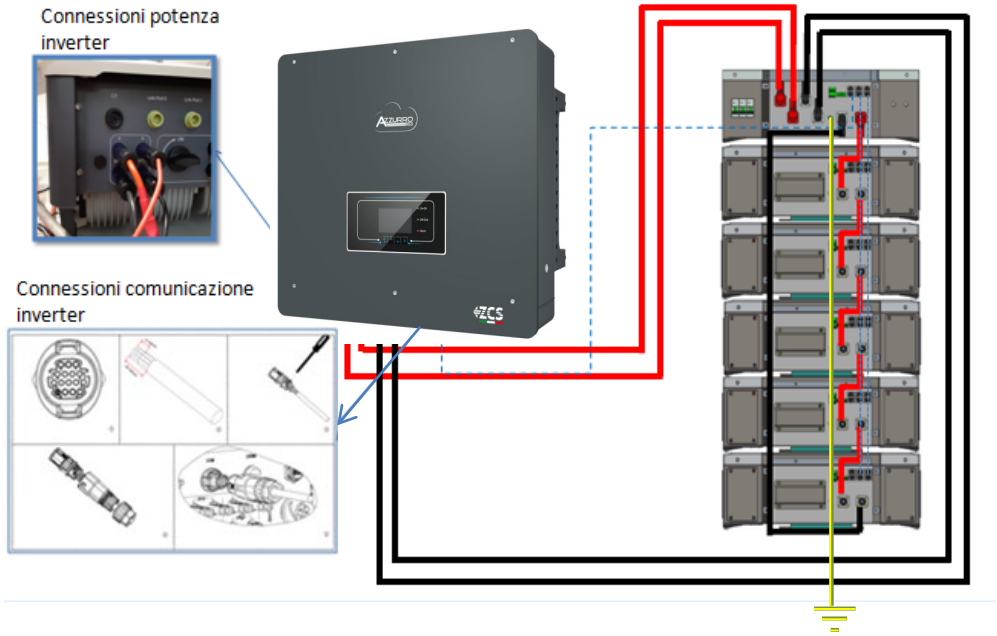


Power connections between HV-BOX and inverter:



The HV-BOX will be connected via power cables (+ and -) to the two inputs of the inverter, in particular make sure to connect:

Inverter channel 01 **HV-BOX** → Channel BAT1 of the **inverter**
Inverter channel 02 **HV-BOX** → Channel BAT2 of the **inverter**



9.1.2 5K3 WECO BATTERY SETTINGS ON INVERTER - 1 BATTERY TOWER

Set the battery channels in the inverter according to the configuration of the battery towers.

*Configure the **inverter channels:***
Basic settings → Channel configuration:

When connecting **1 5k3 WeCo tower**:
- Input channel 1 – BAT input 1;
- Input channel 2 – BAT input 1.

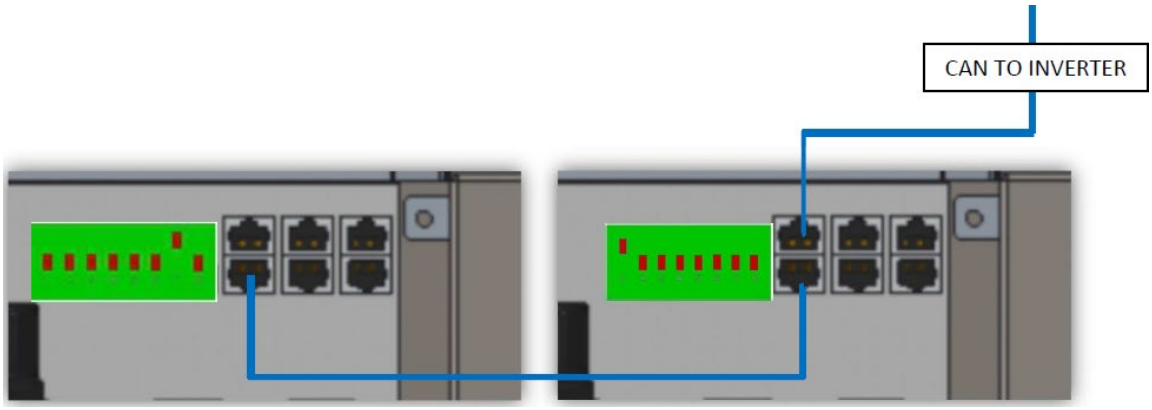
*To set the **battery parameters**:*
Advanced settings → 0715 → Battery parameters:

When connecting **1 5k3 WeCo tower**:
- Battery 1:
  - Type: WeCo ; Address: 00; Maximum charge/discharge current: 25 A (for inverter HYD 3PH 5000-8000 ZSS) or 50 A (for inverter HYD 3PH 10000-20000 ZSS) ; Depth of discharge: 80%.

HYD 5000 ZSS/HYD 8000 ZSS	
BATTERY 1	
1.Battery type	WeCo
2.Battery address	00
3.Maximum charge (A)	25.00A
4.Maximum discharge (A)	25.00A
5.Depth of Discharge	80%

HYD 10000 ZSS/HYD 20000 ZSS	
BATTERY 1	
1.Battery type	WeCo
2.Battery address	00
3.Maximum charge (A)	50.00A
4.Maximum discharge (A)	50.00A
5.Depth of Discharge	80%

Communication connections between the two HV-BOXES



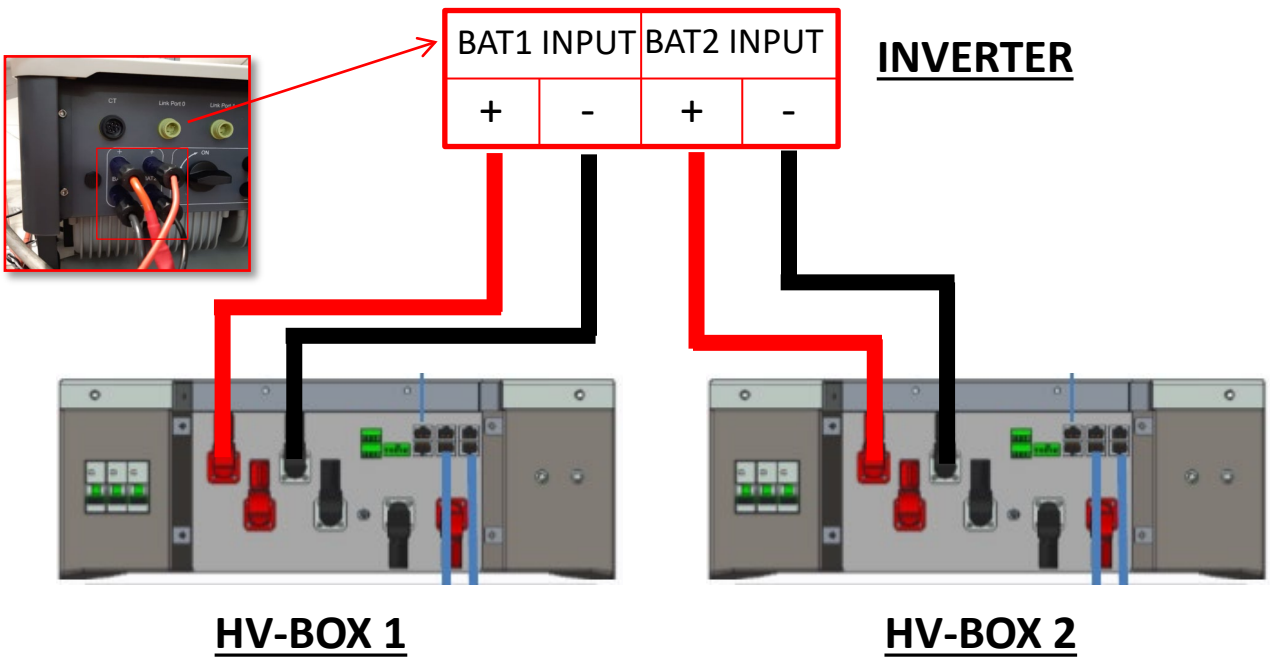
HV-BOX 1

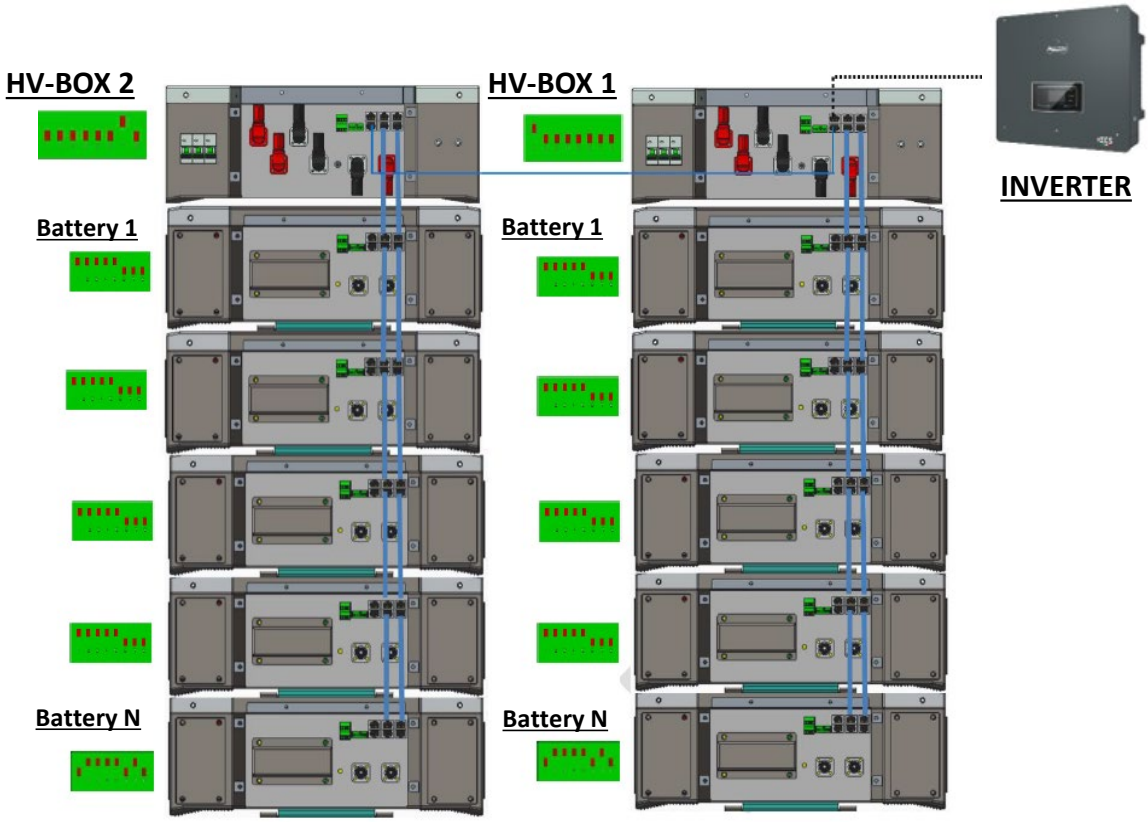
- Communication address: **00000010**
- Connect the communication cable between the two **HV-BOXES** to CAN2-B port.

HV-BOX 2

- Communication address: **10000000**
- Connect the communication cable between the two **HV-BOXES** to CAN2-B port.

Power connections between the two HV-BOXES and inverter





Note: Refer to the previous chapter for the communication and power connections of each tower.

9.2.2 5K3 WECO BATTERY SETTINGS ON INVERTER - 2 BATTERY TOWERS

Set the battery channels in the inverter according to the configuration of the battery towers.

*Configure the **inverter channels:***
Basic settings → Channel configuration:

When connecting **2 5k3 WeCo towers**:
- Input channel 1 – BAT input 1;
- Input channel 2 – BAT input 2.

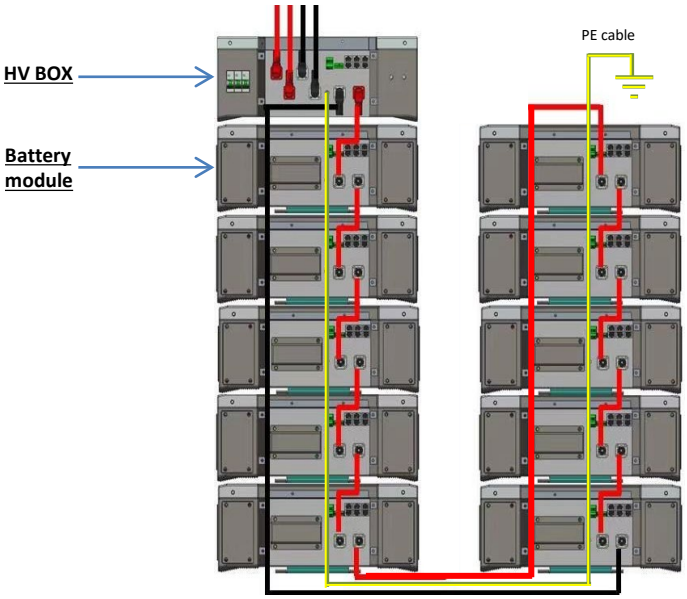
*To set the **battery parameters**:*
Advanced settings → 0715 → Battery parameters:

When connecting **2 5k3 WeCo towers**:
- Battery 1:
  - Type: WeCo ; Address: 00; Maximum charge/discharge current: 25 A; Depth of discharge: 80%.
- Battery 2:
  - Type: WeCo ; Address: 01; Maximum charge/discharge current: 25 A; Depth of discharge: 80%.

BATTERY 1	
1.Battery type	WeCo
2.Battery address	00
3.Maximum charge (A)	25.00A
4.Maximum discharge (A)	25.00A
5.Depth of Discharge	80%
6.Save	

BATTERY 2	
1.Battery type	WeCo
2.Battery address	01
3.Maximum charge (A)	25.00A
4.Maximum discharge (A)	25.00A
5.Depth of Discharge	80%
6.Save	

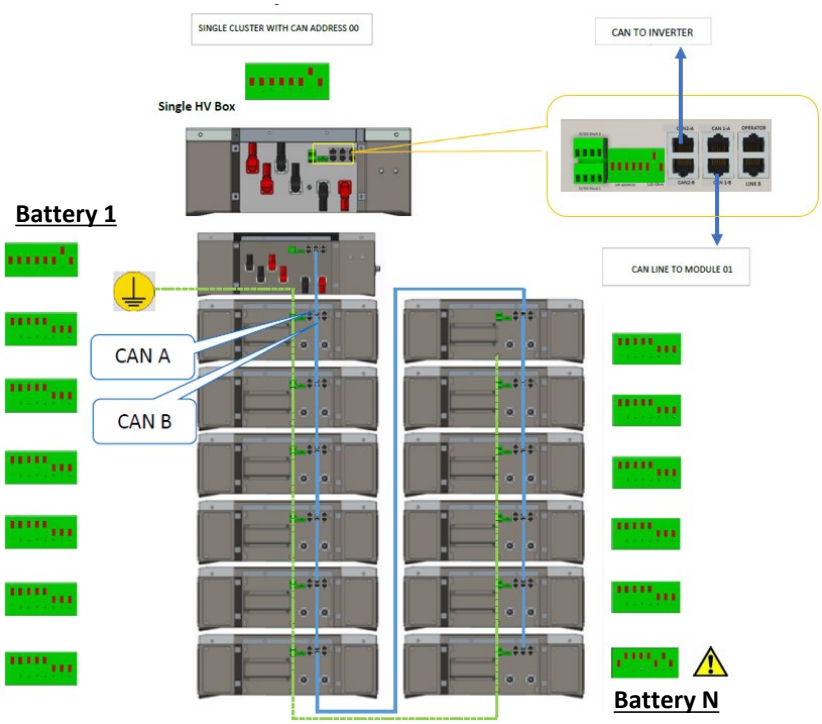
Power and communication connections between batteries and HV-BOX



Batteries are connected **IN SERIES** to each other:
•Negative input (-) of **battery 1** connected to positive input (+) of **battery 2**.
•Negative input (-) of **battery 2** connected to positive input (+) of **battery 3**.
•.....
•Negative input (-) of **battery N-1** (second-last) connected to positive input (+) of **battery N** (last).

The **HV-BOX** is connected in parallel to the series consisting of the **batteries**:
•Negative input (-) of the **HV-BOX** connected to negative input (-) of **battery N** (last) in the series.
•Positive input (+) of the **HV-BOX** connected to positive input (+) of **battery 1**.

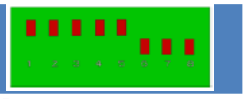
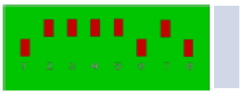
Connect each device to the ground system.



Communication connections between batteries and HV- BOX:

•CAN1-B of the **HV-BOX** to CAN-A of **battery 1**.
•CAN- B of **battery 1** to CAN-A of **battery 2**.
•...
•CAN-B of **battery N-1** (second-last) to CAN-A of **battery N** (last).

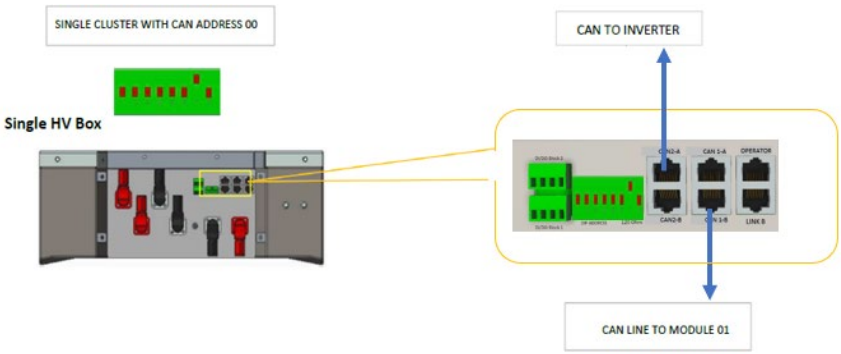
The Dip switches of the battery modules must be set:

Switch **from battery 1 to battery N-1** (second-last)	
Switch to **battery N** (last)	

Power and communication connections between HV-BOX and inverter

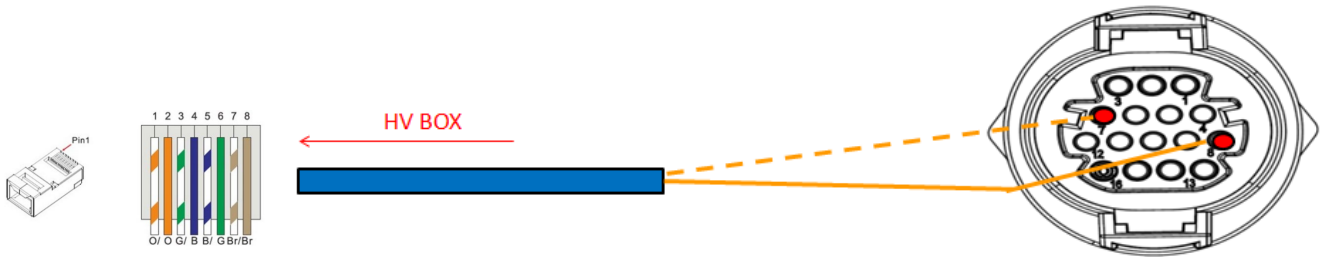
Communication connections between HV-BOX and inverter:

HV-BOX communication:
•**ADD** communication address: **00000010**
•Communication cable connections between **HV-BO** and inverter:
CAN2-A **HV-BOX** → COM port **inverter**

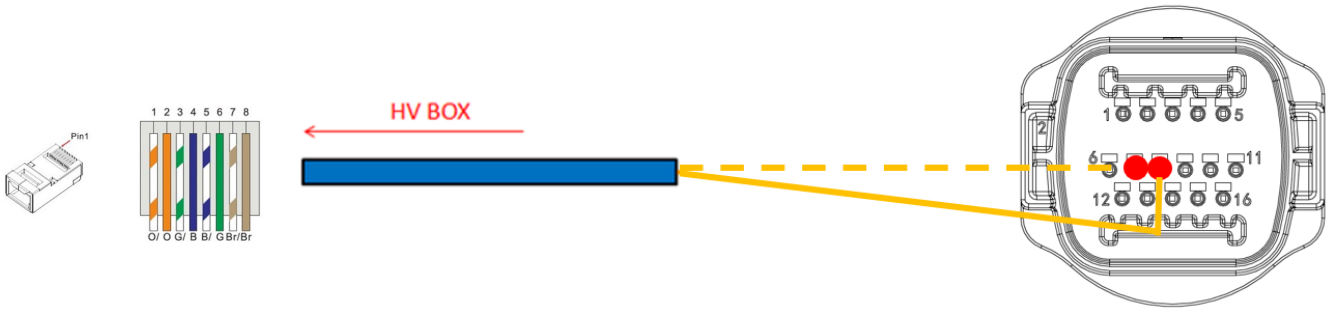


- Connect cable CAN H **(White-Orange wire)** → pin 7 of the **inverter** COMM connector.
- Connect cable CAN L **(Orange wire)** → pin 8 of **inverter** COM connector.

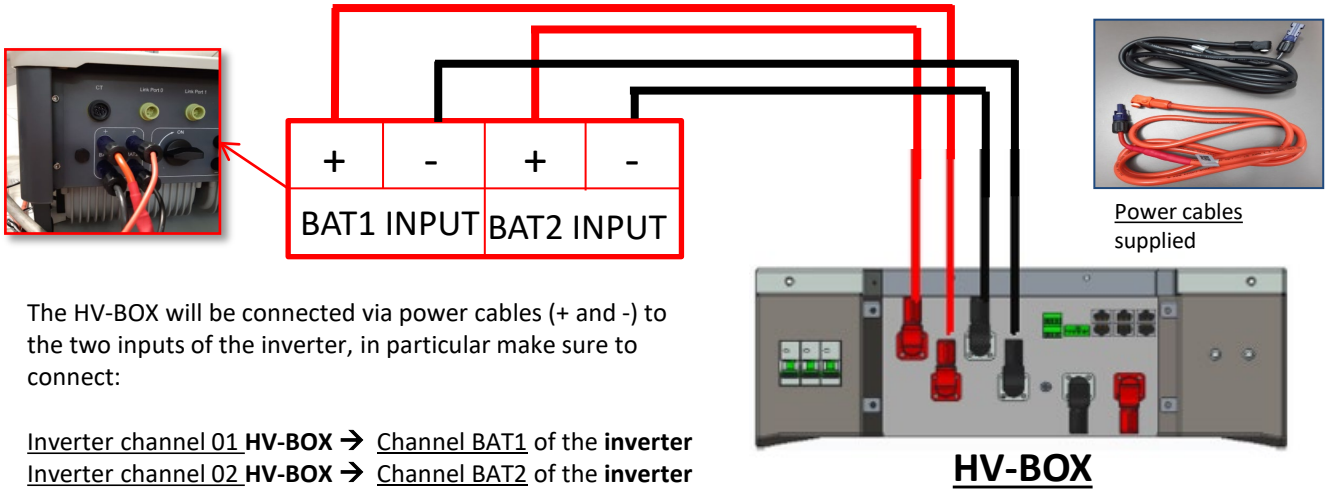
Screw-in COM port



Snap-in COM port

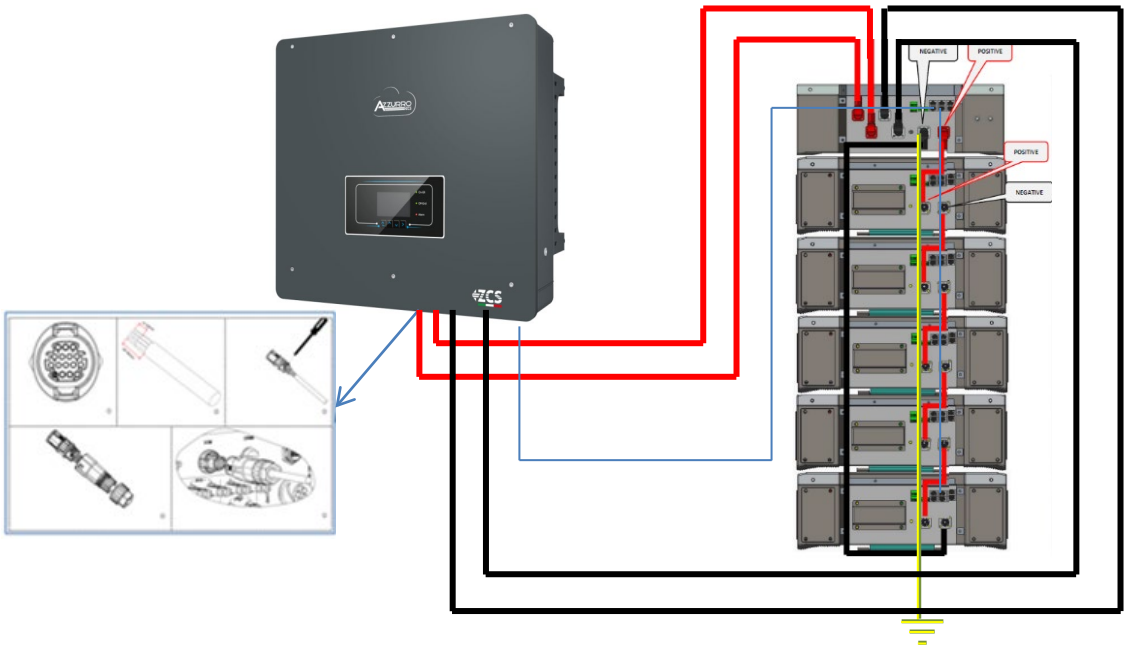


Power connections between HV-BOX and inverter:



The HV-BOX will be connected via power cables (+ and -) to the two inputs of the inverter, in particular make sure to connect:

Inverter channel 01 **HV-BOX** → Channel BAT1 of the **inverter**
Inverter channel 02 **HV-BOX** → Channel BAT2 of the **inverter**



9.3.2 5K3 XP WECO BATTERY SETTINGS ON INVERTER - 1 BATTERY TOWER

Set the battery channels in the inverter according to the configuration of the battery towers.

Configure the ***inverter channels:***
Basic settings → Channel configuration:

When connecting **1 5k3 XP WeCo tower**:
- Input channel 1 – BAT input 1;
- Input channel 2 – BAT input 1.

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

When connecting **1 5k3 XP WeCo tower**:
- Battery 1:
  - Type: WeCo ; Address: 00; Maximum charge/discharge current: 25 A (for inverter HYD 3PH 5000-8000 ZSS) or 50 A (for inverter HYD 3PH 10000-20000 ZSS) ; Depth of discharge: 80%.

HYD 5000 ZSS/HYD 8000 ZSS	
BATTERY 1	
1.Battery type	WeCo
2.Battery address	00
3.Maximum charge (A)	25.00A
4.Maximum discharge (A)	25.00A
5.Depth of Discharge	80%

HYD 10000 ZSS/HYD 20000 ZSS	
BATTERY 1	
1.Battery type	WeCo
2.Battery address	00
3.Maximum charge (A)	50.00A
4.Maximum discharge (A)	50.00A
5.Depth of Discharge	80%

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

1. The HV-BOX must be switched off;

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

3. Inverter DC rotary switch set to OFF;

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

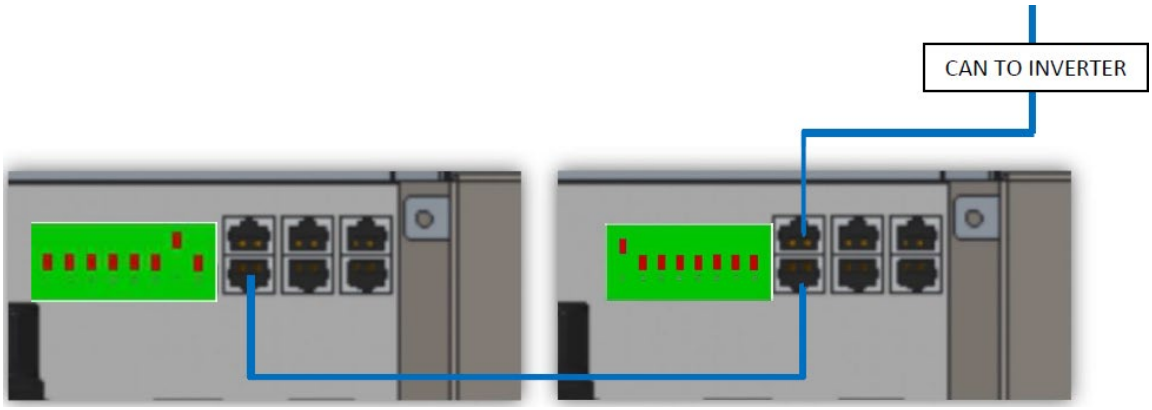
5. Switch on the HV BOX via its switch;

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

7. The HV BOX will end the start-up procedure within 90 seconds by closing the input circuit (the RED and GREEN lights will turn on to confirm its operation);

NOTE: If communication between the inverter and the HV BOX is lost for more than 60 seconds during or after the start-up phase, the HV BOX will enable the safety procedure by opening the POWER CONTACTOR. During the commissioning phase, the installer must ensure that the communication between the HV BOX and the inverter is connected properly. Do not leave the system powered when there is no communication between the HV BOX and the inverter, as prolonged standby of the system could cause an imbalance due to natural self-discharge.

Communication connections between the two HV-BOXES



HV-BOX 1

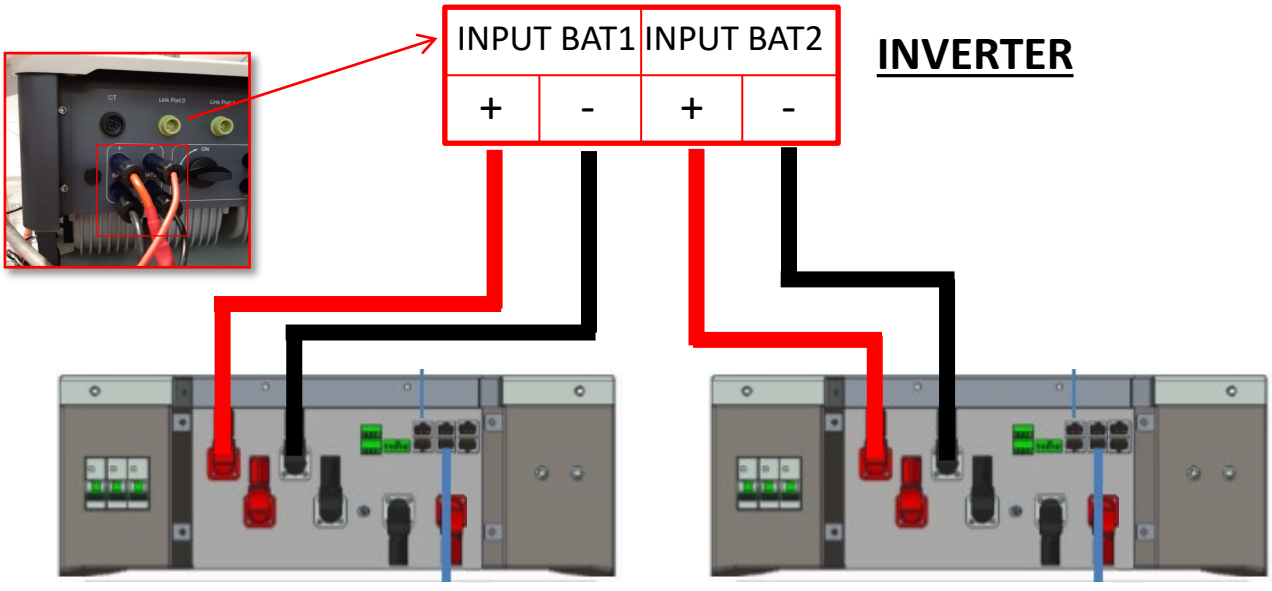
- Communication address: **00000010**
- Connect the communication cable between the two **HV-BOXES** to CAN2-B port.

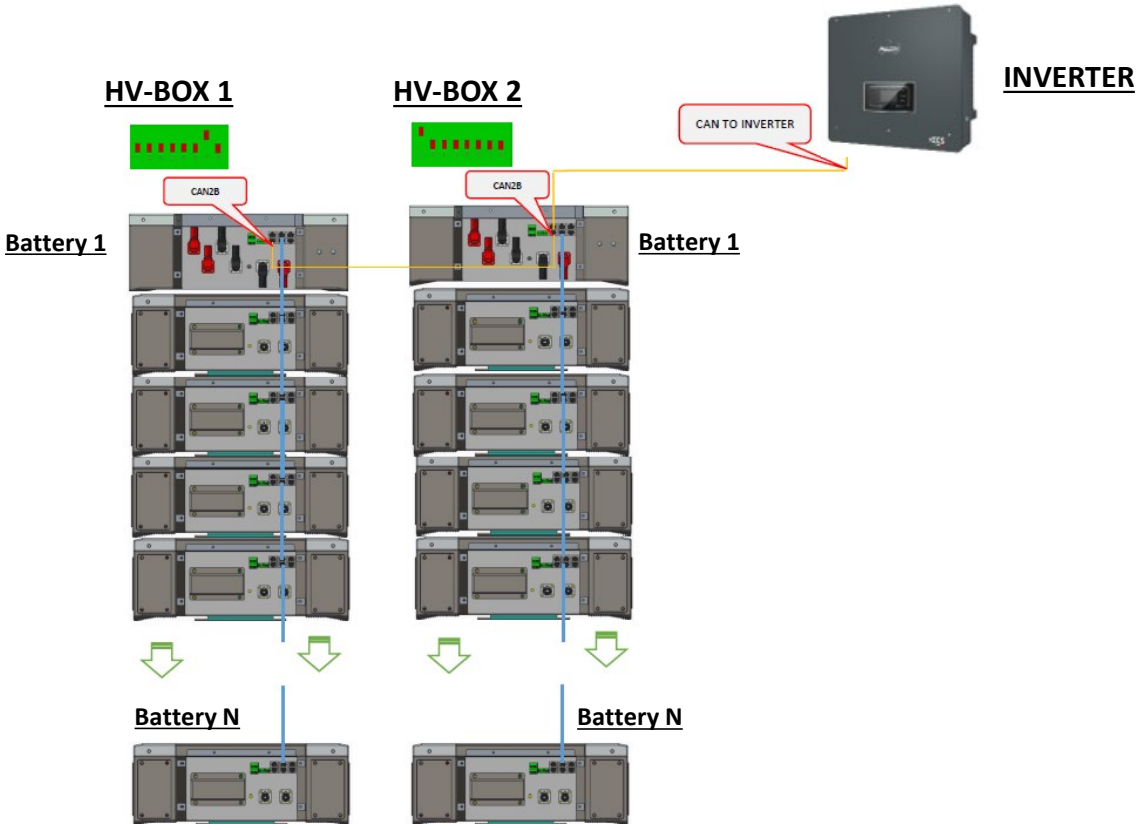
HV-BOX 2

- Communication address: **10000000**
- Connect the communication cable between the two **HV-BOXES** to CAN2-B port.

CAN2-B HV-BOX 2 **CAN2-B HV-BOX 1**

Power connections between the two HV-BOXES and inverter





Note: Refer to the previous chapter for the communication and power connections of each tower.

9.4.2 5K3 XP WECO BATTERY SETTINGS ON INVERTER - 2 BATTERY TOWERS

Set the battery channels in the inverter according to the configuration of the battery towers.

*Configure the **inverter channels:***
Basic settings → Channel configuration:

When connecting **2 5k3 XP WeCo towers**:
- Input channel 1 – BAT input 1;
- Input channel 2 – BAT input 2.

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

When connecting **2 5k3 XP WeCo towers**:
- Battery 1:
  - Type: WeCo ; Address: 00; Maximum charge/discharge current: 25 A; Depth of discharge: 80%.
- Battery 2:
  - Type: WeCo ; Address: 01; Maximum charge/discharge current: 25 A; Depth of discharge: 80%.

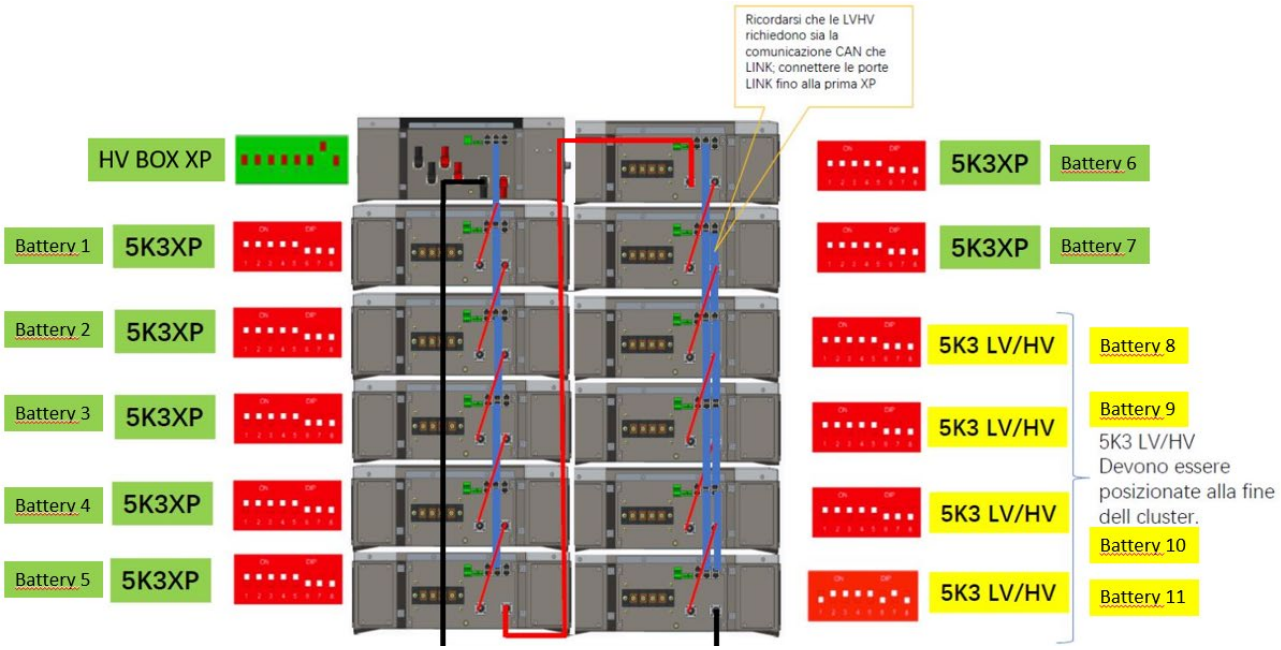
BATTERY 1	
1.Battery type	WeCo
2.Battery address	00
3.Maximum charge (A)	25.00A
4.Maximum discharge (A)	25.00A
5.Depth of Discharge	80%
6.Save	

BATTERY 2	
1.Battery type	WeCo
2.Battery address	01
3.Maximum charge (A)	25.00A
4.Maximum discharge (A)	25.00A
5.Depth of Discharge	80%
6.Save	

Power and communication connections between batteries and HV-BOX

For a new system, we do not recommend installing a mixed solution with mixed 5K3 and 5K3XP batteries.

When using 5k3 and 5k3XP batteries, it is mandatory to:
- Install an **XP HV-BOX**;
- Install **at least one 5k3XP battery** (the 5k3 XP batteries must be installed just below the XP HV BOX, while the 5k3 batteries must be inserted last).



Batteries are connected **IN SERIES** to each other:
•Negative input (-) of **battery 1** connected to positive input (+) of **battery 2**.
•Negative input (-) of **battery 2** connected to positive input (+) of **battery 3**.
•.....
•Negative input (-) of **battery N-1** (second-last) connected to positive input (+) of **battery N** (last).

The **HV-BOX** is connected in parallel to the series consisting of the **batteries**:
•Negative input (-) of the **HV-BOX** connected to negative input (-) of **battery N** (last) in the series.
•Positive input (+) of the **HV-BOX** connected to positive input (+) of **battery 1**.

Connect each device to the ground system.

Communication connections:

•CAN1-B of **XP HV-BOX** to CAN-A of **battery 1.**
•CAN-B of **battery 1 (5k3 XP)** to CAN-A of **battery 2 (5k3 XP)**.
•...
•CAN-B of **battery 6 (5k3 XP)** to CAN-A of **battery 7 (5k3 XP)**.
•CAN-B of **battery 7 (5k3 XP)** to CAN-A of **battery 8 (5k3)**.
•LINK-B of **battery 7 (5k3)** to LINK-A of **battery 8 (5k3)**.
•CAN-B of **battery 8 (5k3)** to CAN-A of **battery 9 (5k3)**.
•LINK-B of **battery 8 (5k3)** to LINK-A of **battery 9 (5k3)**.
•...
•CAN-B of **battery N-1** (second-last 5k3) to CAN-A of **battery N** (last 5k3).
•LINK-B of **battery N-1** (second-last 5k3) to LINK-A of **battery N** (last 5k3).

Channel configuration:

Configure the inverter channels according to the number of HV-BOXES connected to the inverter (see previous paragraphs).

Power and communication connections between batteries and BDU

NOTE: The Azzurro HV batteries are batteries with 400V DC output, therefore, unlike the WeCo and Pylontech batteries they must NOT be installed in series but in **PARALLEL**.

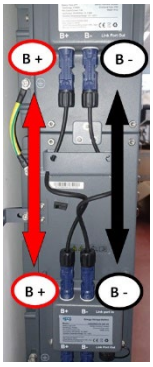
Each tower of battery modules consists of a **BDU** connected in parallel to multiple battery modules.

BDU
(ZZT-ZBT5K-BDU)

Battery module
(ZZT-BAT-ZBT5K)

Batteries are connected **IN Parallel** to each other:
•Positive input (+) of **battery 1** connected to positive input (+) of **battery 2**.
•Negative input (-) of **battery 1** connected to negative input (+) of **battery 2**.
•…..
•Positive input (+) of **battery N-1** (second-last) connected to positive input (+) of **battery N** (last).
•Negative input (-) of **battery N-1** (second-last) connected to negative input (-) of **battery N** (last).

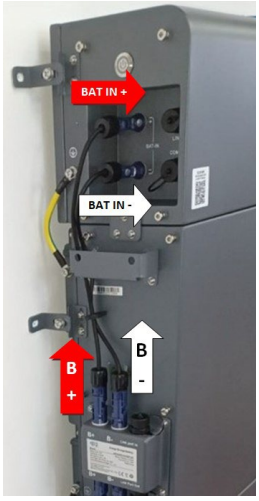
Connect each device to the ground system.



The **BDU** is connected to **battery 1**:

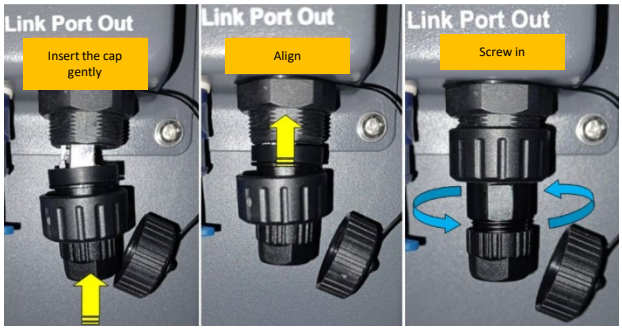
•Negative input (-) of the **BDU** connected to negative input (-) of **battery 1**.
•Positive input (+) of the **BDU** connected to positive input (+) of **battery 1**.

Connect each device to the ground system.



Communication connections between batteries and BDU:

•COM-IN of the **BDU** → LINK PORT IN of **battery 1.**
•LINK PORT OUT of **battery 1** → LINK PORT IN of **battery 2.**
•…
•LINK PORT OUT of **battery N-1** (second-last) → LINK PORT IN of **battery N** (last).
•LINK PORT OUT **of battery N** (last) → **Terminating resistor**.

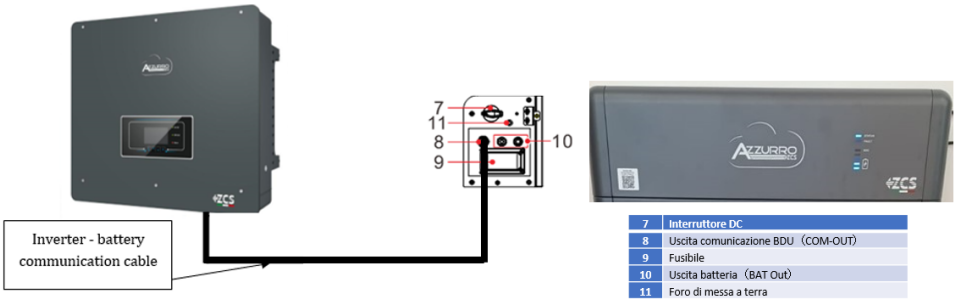


Terminating resistor

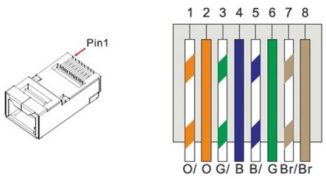
Power and communication connections between BDU and inverter

Communication connections between BDU and inverter:

BDU communication:
•Cable communication connection between **BDU** and inverter:
COM-OUT **BDU** → Port COM **inverter**

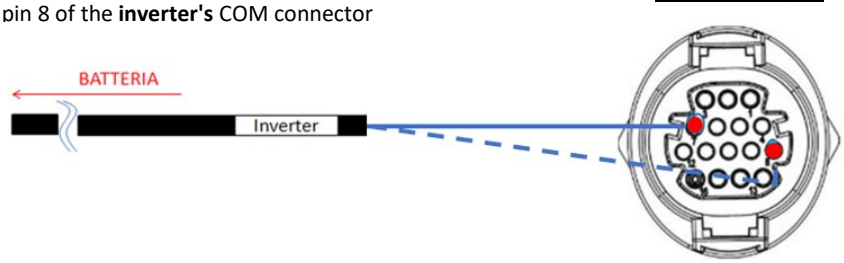


PIN	Wire colour	Definition	COM Port
PIN 1	White Orange		
PIN 2	Orange		
PIN 3	White Green		
PIN 4	Blue	CAN-H	PIN 7
PIN 5	White Blue	CAN-L	PIN 8
PIN 6	Green		
PIN 7	White Brown		
PIN 8	Brown		

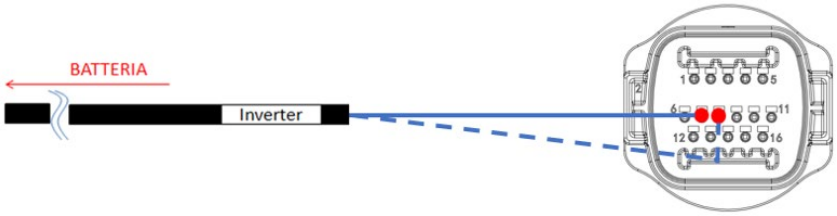


- Connect the **Blue wire** → pin 7 of the **inverter's** COM connector.
- Connect the **White-Blue wire** → pin 8 of the **inverter's** COM connector

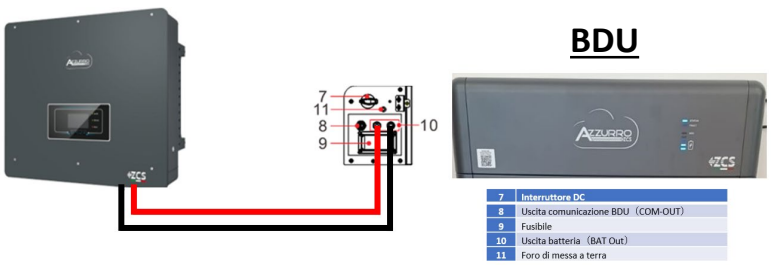
Screw-in COM port



Snap-in COM port



Power connections between BDU and inverter:



Power cables supplied

The **BDU** will be connected via power cables (+ and -) to the two inputs of the inverter, in particular make sure to connect:

BAT OUT **BDU** → Channel BAT1 of the **inverter**

10.1.2 AZZURRO HV BATTERY SETTINGS ON INVERTER - 1 BATTERY TOWER

Set the battery channels in the inverter according to the configuration of the battery towers.

*Configure the **inverter channels:***
Basic settings → Channel configuration:

When connecting **1 Azzurro HV tower**:
- Input channel 1 – BAT input 1;
- Input channel 2 – Not used.

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

When connecting **1 Azzurro HV tower**:
- Battery 1:
  - Type: HV ZBT; Depth of discharge: 80%.

- Automatic addr. cfg:
  - Check the total number of batteries in the installation. The configuration will take about 30 seconds, after which the OK message appears.

BATTERY 1	
1.Battery type	HV ZBT
5.Depth of Discharge	80%
6.Save	

Communication connections between the two BDUs

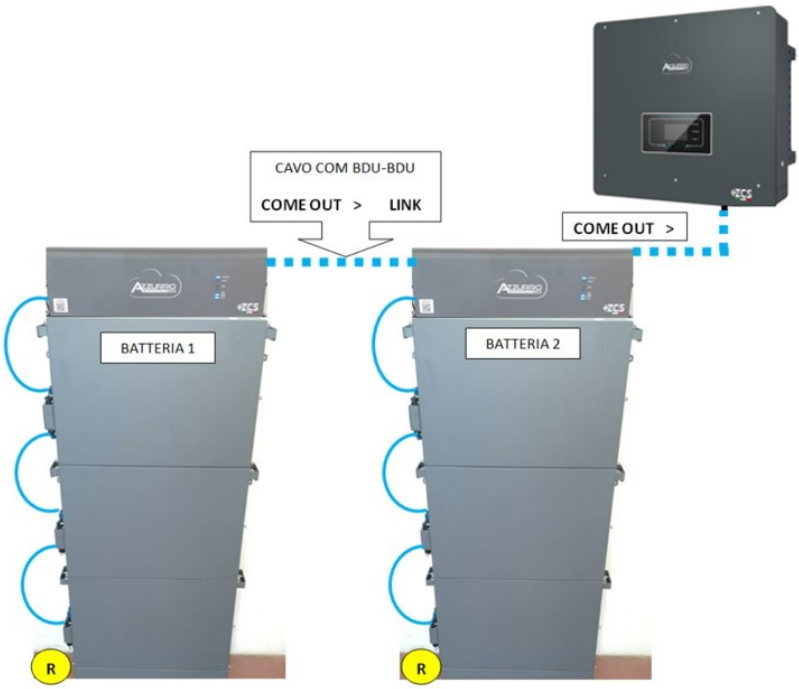
INVERTER

BDU 1 and BDU 2:

- COM-OUT **BDU 1** → LINK **BDU 2**

BDU 2 and Inverter:

- COM-OUT **BDU 2** → COM **inverter**



Note: Refer to the previous chapter for the communication and power connections of each tower.

10.2.2 AZZURRO HV BATTERY SETTINGS ON INVERTER - 2 BATTERY TOWERS

Set the battery channels in the inverter according to the configuration of the battery towers.

*Configure the **inverter channels:***
Basic settings → Channel configuration:

When connecting **2 Azzurro HV towers**:
- Input channel 1 – BAT input 1;
- Input channel 2 – BAT input 2.

BATTERY 1	
1.Battery type	HV ZBT
5.Depth of Discharge	80%
6.Save	

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

When connecting **2 Azzurro HV towers**:
- Battery 1:
  - Type: HV ZBT; Depth of discharge: 80%.

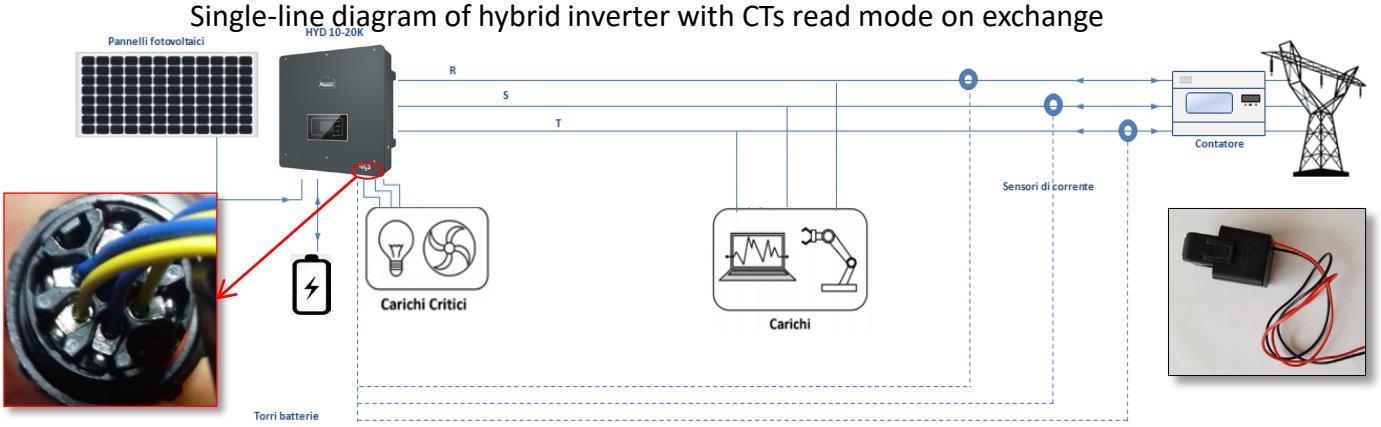
BATTERY 2	
1.Battery type	HV ZBT
5.Depth of Discharge	80%
6.Save	

- Battery 2:
  - Type: HV ZBT; Depth of discharge: 80%.

- Automatic addr. cfg:
  - Check the total number of batteries in the installation. The configuration will take about 30 seconds, after which the OK message appears.

11.1 DIRECT READING VIA CURRENT SENSORS

Single-line diagram of hybrid inverter with CTs read mode on exchange

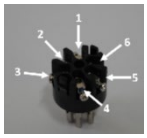


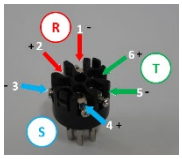
To connect each of the 3 CTs to the inverter, wire the quick connector as shown in the table.

PIN	Definition	Function	Notes
1	Ict_R-	Negative R-phase sensor (L1)	Used to connect the R-phase current sensor (L1)
2	Ict_R+	Positive R-phase sensor (L1)	
3	Ict_S-	Negative S-phase sensor (L2)	Used to connect the S-phase current sensor (L2)
4	Ict_S+	Positive S-phase sensor (L2)	
5	Ict_T-	Negative T-phase sensor (L3)	Used to connect the T-phase current sensor (L3)
6	Ict_T+	Positive T-phase sensor (L3)	

Method to be used for CT - Hybrid distances of less than 50 m

To extend the + and – cables of the CT, use a Category 6 to 8-pin STP cable and connect the shield to the ground on one of the two sides.





The connector is correctly assembled when you hear a "click." If not, rotate and reinsert.

To allow the system to correctly read the current flows of the system, use the "CT Calibration" function in the advanced settings of the device.
For the inverter to perform this operation, it is necessary that:

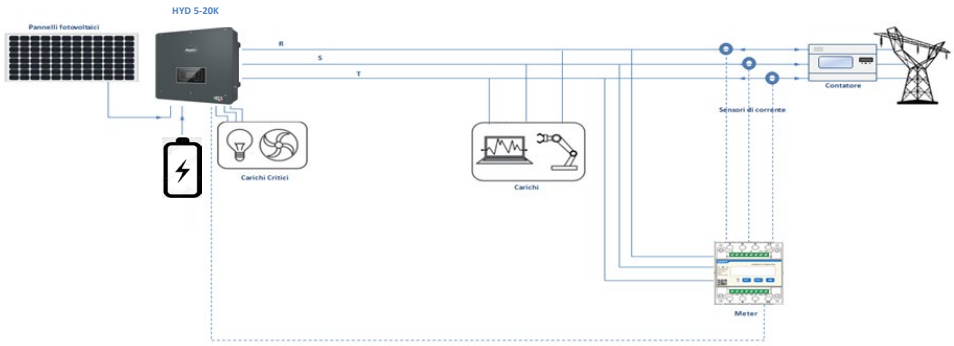
1. The system is connected to the grid
2. The batteries are present and switched on, with DOD% that allows the batteries to be charged and discharged
3. Consumption in the system is off
4. Photovoltaic production is off

2. Advanced settings	PWD 0001
	9. CT Calibration

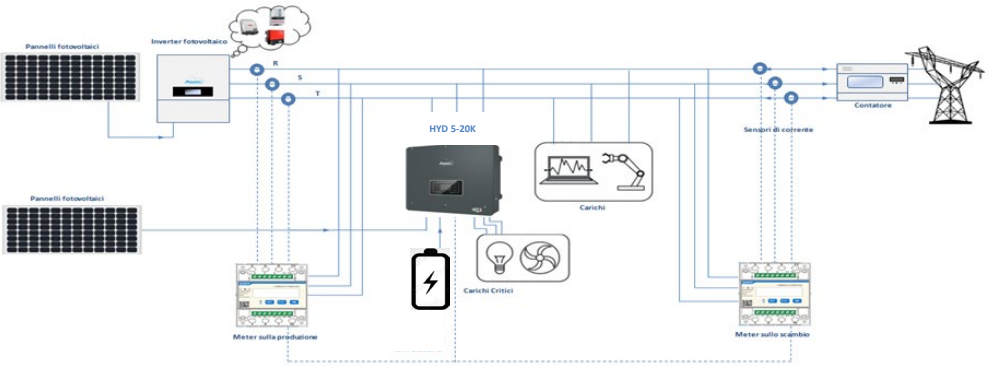
In this way, the system will automatically set the position of each sensor in the correct phase and the direction in line with the system's current flows.

11.2 METER READING

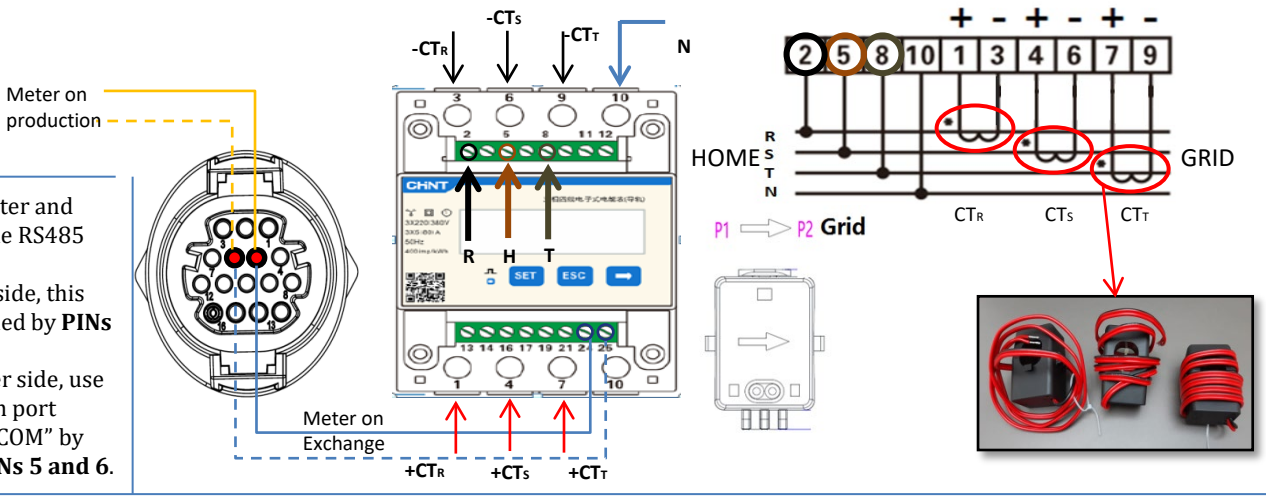
Single-line diagram of hybrid inverter with meter reading mode on exchange only



Single-line diagram of hybrid inverter with meter reading mode on exchange and external production



Meter connections – with COM port type A

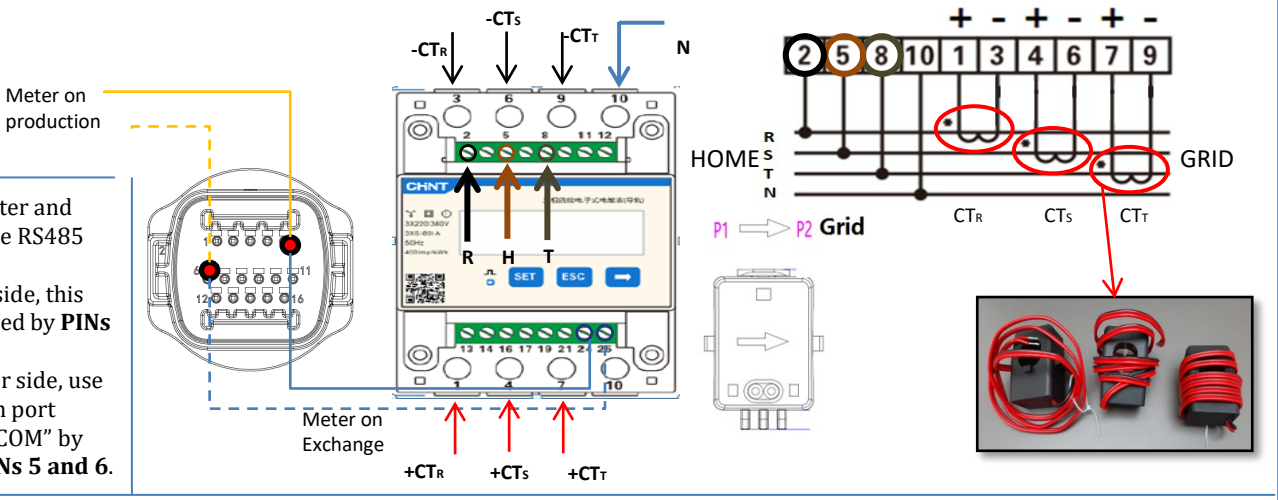


1. Connect Meter and inverter via the RS485 serial port.
On the Meter side, this port is identified by **PINs 24 and 25.**
On the inverter side, use the connection port identified as "COM" by connecting **PINs 5 and 6**.

2. Connect PIN 10 of the Meter to the neutral wire (N), connect PINs 2, 5 and 8 to phases R, S and T respectively.
CT connections, the terminals of the sensor positioned on **phase R** must be connected to **PIN 1** (red wire) and **PIN 3** (black wire).
The terminals of the sensor positioned on **phase S** must be connected to **PIN 4** (red wire) and **PIN 6** (black wire).
The terminals of the sensor positioned on **phase T** must be connected to **PIN 7** (red wire) and **PIN 9** (black wire).
Position the sensors, paying attention to the direction on the sensor itself (arrow pointing towards the grid).
ATTENTION: hook the CT sensors to the phases only after connecting them to the Meter.

NOTE: For **distances** between the meter and hybrid inverter of **more than 100 metres**, it is recommended to connect two 120 OhM resistors along the 485 daisy chain: the first to the inverter (between PIN 5 and PIN 6 of the inverter COM), the second directly to the meter (PIN 24 and PIN 25).

Meter connections – with COM port type B



1. Connect Meter and inverter via the RS485 serial port.
On the Meter side, this port is identified by **PINs 24 and 25.**
On the inverter side, use the connection port identified as "COM" by connecting **PINs 5 and 6**.

2. Connect PIN 10 of the Meter to the neutral wire (N), connect PINs 2, 5 and 8 to phases R, S and T respectively.
CT connections, the terminals of the sensor positioned on **phase R** must be connected to **PIN 1** (red wire) and **PIN 3** (black wire).
The terminals of the sensor positioned on **phase S** must be connected to **PIN 4** (red wire) and **PIN 6** (black wire).
The terminals of the sensor positioned on **phase T** must be connected to **PIN 7** (red wire) and **PIN 9** (black wire).
Position the sensors, paying attention to the direction on the sensor itself (arrow pointing towards the grid).
ATTENTION: hook the CT sensors to the phases only after connecting them to the Meter.

NOTE: For **distances** between the meter and hybrid inverter of **more than 100 metres**, it is recommended to connect two 120 OhM resistors along the 485 daisy chain: the first to the inverter (between PIN 5 and PIN 6 of the inverter COM), the second directly to the meter (PIN 24 and PIN 25).

11.3 METER SETTING

To configure the device in read mode on the exchange, enter the settings menu as shown below:
•Press **SET** and the word **CODE** will appear
•Press **SET** again

•Enter the number "701":
1. From the first screen where the number "600" will appear, press the "→" key once to write the number "601".
2. Press "**SET**" twice to move the cursor left, highlighting "601";
3. Press the "→" key once more to write the number "701"

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

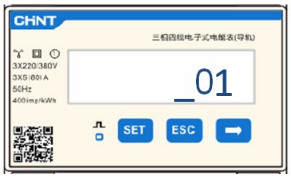
•Confirm by pressing **SET** and to enter the settings menu.
•Enter the following menus and set the parameters indicated:

1. CT:
a. Press **SET** to enter the menu
b. Write "40":
a. From the first screen where the number "1" appears, press the "→" key repeatedly until the number "10" is written.
b. Press **SET** once to move the cursor left, highlighting "10"
c. Press the "→" key repeatedly until the number "40" is written.
d. Press "ESC" to confirm and "→" to scroll to the next setting.

Note: In case of CT sensors other than those supplied, enter the correct transformation ratio.

Note: In case of error, press "SET" until the thousand digit is highlighted and then press "→" until only the number "1" is displayed; at this point, repeat the above procedure.

2. ADDRESS:
a. Press **SET** to enter the menu:
b. Leave "01" for Meter on exchange
c. Write "02" (by pressing "→" once from screen "01"). With address 02, the inverter assigns the data sent by the meter as production power. A maximum of 3 meters can be set for the production (Addresses 02, 03 and 04)



Meter on Exchange

Meter on Production

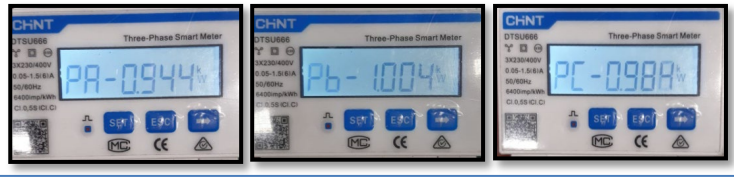
d. Press "ESC" to confirm.

11.4 CHECKING THE CORRECT READING OF THE METER

In order to verify the correct reading of the **meter on exchange**, make sure that the hybrid inverter and any other PV production sources are switched off. Switch on loads greater than 1 kW for each of the three phases of the system.
Stand in front of the meter and use the "→" keys to scroll through the items, and "ESC" to go back, checking that:

1. The Power Factor values for each phase Fa, Fb and Fc (phase shift between voltage and current) are between 0.8-1.0. If the value is lower, move the sensor to one of the other two phases until the value is between 0.8-1.0.

2. The Pa, Pb and Pc Powers are:
•Greater than 1 kW.
•In line with the home consumption.
•The sign in front of each value is negative (–).
In the case of a positive sign, reverse the direction of the toroidal winding in question.



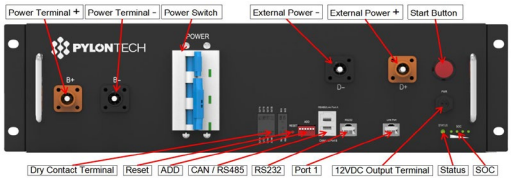
In the case of a **meter for reading the production of existing photovoltaic systems**, repeat the previous steps :
1. Check the Power Factor as described in the previous case.
2. This time the sign of the powers must be positive for Pa, Pb, and Pc
3. Switch on the Hybrid Inverter, check that the total PV power value (Pt) is in line with the value shown on the inverter's display.

IMPORTANT: Use a PC and USB in the event of update requests and country code settings different from the default settings.

1. Set the DC switch of the inverter to ON

2. Wait for the display to turn on
(you will see a normal indication of a no grid fault)

3. Turn on the **Pylontech** battery
   a) Switch on the BMS (shown in figure below):
   b) Turn on the Power Switch (DC disconnect switch)
   c) Press the red START button for one second



Turn on the **WeCo** battery
To start the HV BOX module, simply arm the GENERAL BREAKER present on the front of the HV BOX.

Turn on the **Azzurro HV** battery
   a) Turn on the Power Switch (DC disconnect switch)
   b) Press the power button.

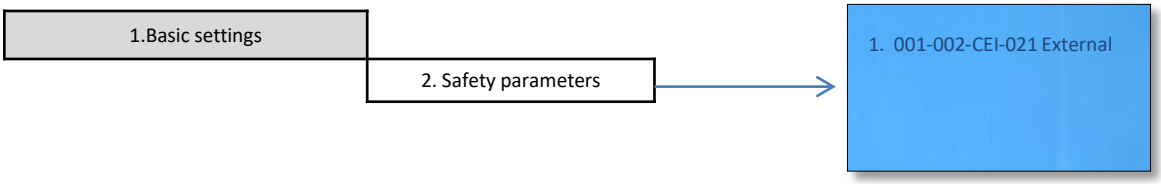
1

2

4. Supply AC voltage to the inverter via the dedicated switch

Parameters	Notes
1. OSD language options	Default English
2. Setting of date and time, confirmation	Use display keys
3. Importing safety parameters (country code)*	Select the correct country in accordance with the requirements of the local energy authorities.
4. Setting the input channel**	Default order: BAT1, BAT2, PV1, PV2
5. Setting the battery parameters***	Default values are shown according to the input channel configured
6. Set-up is complete	

*3. Importing safety parameters (country code)



Code		Region		Code		Region	
000	000	Germany	VDE4105	018	000	EU	EN50438
	001		BDEW		001		EN50549
	002		VDE0126		002		EU-EN50549-HV
				019	000	IEC EN61727	
	003		VDE4105-HV	020	000	Korea	Korea
	004		BDEW-HV		001		Korea-DASS
001	000	Italia	CEI-021 Internal	021	000	Sweden	
	001		CEI-016 Italia	022	000	Europe General	EU General
					001		EU General-MV
	002		CEI-021 External		002		EU General-HV
	003		CEI-021 In Areti	024	000	Cyprus	Cyprus
	004		CEI-021In--HV	025	000	India	India
					001		India-MV
002	000	Australia	Australia		002		India-HV
	008		Australia-B	026	000	Philippines	PHI
					001		PHI-MV
	009		Australia-C	027	000	New Zealand	New Zealand
003	000	Spain	ESP-RD1699		001		New Zealand-MV
	001		RD1699-HV		002		New Zealand-HV
	002		NTS	028	000	Brazil	Brazil
	003		UNE217002+RD647		001		Brazil-LV
	004		Spian Island		002		Brazil-230
004	000	Turkey	Turkey		003		Brazil-254
005	000	Denmark	Denmark		004		Brazil-288
	001		DK-TR322	029	000	Slovakia	SK-VDS
006	000	Greece	GR-Continent		001		SK-SSE
	001		GR-Island		002		SK-ZSD
007	000	Netherland	Netherland	030	000		
	001		Netherland-MV	031-032			
	002		Netherland-HV	033	000	Ukraine	
008	000	Belgium	Belgium	034	000	Norway	Norway
	001		Belgium-HV		001		Norway-LV
009	000	UK	G99	035	000	Mexico	Mexico-LV
	001		G98	036-037			
	002		G99-HV	038	000	60Hz	
010	000	China	China-B	039	000	Ireland EN50438	Ireland
	001		Taiwan	040	000	Thailand	Thai-PEA
	002		TrinaHome		001		Thai-MEA
	003		HongKong	041			
	004		SKYWORTH	042	000	50Hz	LV-50Hz
	005		CSISolar	043			
	006		CHINT	044	000	South Africa	SA
	007		China-MV		001		SA-HV
	008		China-HV	045			
	009		China-A	046	000	Dubai	DEWG
011	000	France	France		001		DEWG-MV
	001		FAR Arrete23	047-106			
	002		FR VDE0126-HV	107	000	Croatia	Croatia
	003		France VFR 2019	108	000	Lithuania	Lithuania
012	000	Poland	Poland	109	000		
	001		Poland-MV	110			
	002		Poland-HV	111	000	Columbia	Columbia
	003		Poland-ABCD		001		Columbia-LV
013	000	Austria	Tor Erzeuger	112-120			
014	000	Japan		121	000	Saudi Arabia	IEC62116
	001			122	000	Latvia	
015	003	Switzerlan		123	000	Romania	
16-17							

NOTE: By default, the external interface of the inverters are set to the CEI-021 country code, if a different country code is required, please contact technical support.

14. 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 : ZP1ES015L68007
SW version: V2.00
DSP1 SW version: V030010
DSP2 SW version: V030010

- *Serial number of the machine*
- *Software version installed*
- *Serial number of the machine*
- *Software version installed*

Inverter Info (1)
Working mode: Automatic mode
RS485 Modbus Address 01
EPS Mode: Disabled
IV Curve Scan Disabled

- *Information on operating mode (must be automatic)*
- *Communication address*
- *Information on EPS mode*
- *Information on MPPT scan mode*

Inverter Info (2)
HW version: V001
Power level: 10 kW
Country: 0: Italy CEI-021 Int
Service Code: V030013

- *Hardware version*
- *Max inverter power*
- *Country code for the standard*
- *Service Code Version*

Inverter Info (4)
Logic interface: Disabled
Set PF time: DFLT: 0.000s SET : 0.000s
Set QV time: DFLT: 3.0s SET : 3.0s
Power Factor : 100%

- *Information on DRMs0 mode (enable only for Australia)*
- *Response delay in frequency*
- *Response delay in voltage*
- *Power factor value*

Inverter Info (3)
Channel 1: Bat input 1
Channel 2: Bat input 1
Channel 3: PV Input 1
Channel 4: PV Input 1

- *Setting Battery 1 Channel*
- *Setting Battery 2 Channel*
- *Setting PV 1 Channel*
- *Setting PV 2 Channel*

Inverter Info (1)
0 grid feed-in mode: Disabled
Insulation resistance 404KOhm

- *Information on maximum grid in-feed mode*
- *Measured value of the insulation resistance*

15. 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

Single tower

Double tower

Single tower

Battery Info (1)
Battery type: Pylon
Bat Address: 00
Battery capacity: 50Ah
Depth of Discharge : 90% (EPS) 90%

Battery Info (2)
Max charge current (A) : BMS: 25.00A SET : 25.00A
Max charge (V) : 216V
Max. discharge current (A): BMS: 25.00A SET : 25.00A
Min. discharge voltage (V): 183V

Battery Info (3)
EPS Safety Buffer: 20%

Double tower

Battery Info (1)
Battery type: Pylon
Bat Address: 00
Battery capacity: 50Ah
Depth of Discharge : 90% (EPS) 90%

Battery Info (2)
Battery type: Pylon
Bat Address: 01
Battery capacity: 50Ah
Depth of Discharge : 90% (EPS) 90%

- *Battery model set*
- *Battery address*
- *Battery capacity in Ah*
- *Battery discharge percentage*

Battery Info (2)
Max charge current (A) : BMS: 25.00A SET : 25.00A
Max charge (V) : 216V
Max. discharge current (A): BMS: 25.00A SET : 25.00A
Min. discharge voltage (V): 183V

Battery Info (2)
Max charge current (A) : BMS: 25.00A SET : 25.00A
Max charge (V) : 216V
Max. discharge current (A): BMS: 25.00A SET : 25.00A
Min. discharge voltage (V): 183V

- *Maximum charge current in A*
- *Max voltage value depends on no. of batteries*
- *Maximum discharge current in A*
- *Min voltage value depends on no. of batteries*

Battery Info (3)
EPS Safety Buffer: 20%

Battery Info (3)
EPS Safety Buffer: 20%

- *EPS safety value*

Single tower

Double tower

Battery Info (1)
Battery type: WECO
Bat Address: 00
Battery capacity: 105Ah
Depth of Discharge : 90% (EPS) 90%

Battery Info (2)
Max charge current (A) :
BMS 50.00A SET : 50.00A
Max charge (V) : 216V
Max. discharge current (A):
BMS: 25.00A SET : 25.00A
Min. discharge voltage (V): 183V

Battery Info (3)
EPS Safety Buffer: 20%

Battery Info (1)
Battery type: WECO
Bat Address: 00
Battery capacity: 105Ah
Depth of Discharge : 90% (EPS) 90%

Battery Info (2)
Max charge current (A) :
BMS: 25.00A SET : 25.00A
Max charge (V) : 216V
Max. discharge current (A):
BMS: 25.00A SET : 25.00A
Min. discharge voltage (V): 183V

Battery Info (3)
EPS Safety Buffer: 20%

Battery Info (1)
Battery type: WECO
Bat Address: 01
Battery capacity: 105Ah
Depth of Discharge : 90% (EPS) 90%

Battery Info (2)
Max charge current (A) :
BMS: 25.00A SET : 25.00A
Max charge (V) : 216V
Max. discharge current (A):
BMS: 25.00A SET : 25.00A
Min. discharge voltage (V): 183V

Battery Info (3)
EPS Safety Buffer: 20%

- *Battery model set*
- *Battery address*
- *Battery capacity in Ah*
- *Battery discharge percentage*
- *Maximum charge current in A*
- *Max voltage value depends on no. of batteries*
- *Maximum discharge current in A*
- *Min voltage value depends on no. of batteries*
- *EPS safety value*

Single tower

Double tower

1. Impostazioni di base
2. Impostazioni avanzate
3. Statistiche Produz.
4. Info Sistema
5. Lista Eventi
6. AggiornamentoSW
7. Battery real-time Info

1. Impostazioni di base
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7. Battery real-time Info

Info BMS(BMS2)
Batteria(V) 53.3V
Batteria(A) ..... -1.00A
Corr. carica max..... 50.00A
Corr. max Scarica..... 50.00A
SOC Batt 97%
SOH Batt 100%
temp. Batt ..... 20℃
Cicli Batt 0T

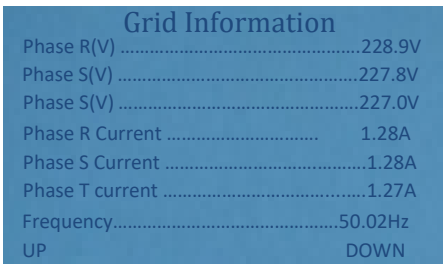
Info BMS(BMS1)
Batteria(V) 52.3V
Batteria(A) 0.00A
Corr. carica max..... 50.00A
Corr. max Scarica..... 50.00A
SOC Batt 24%
SOH Batt 100%
temp. Batt ..... 20℃
Cicli Batt 0T

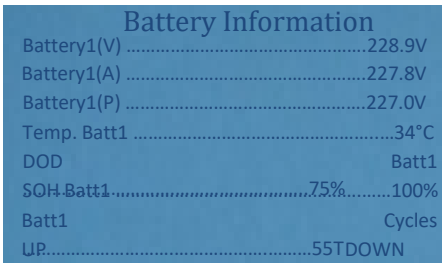
Info BMS(BMS1)
Batteria(V) 52.3V
Batteria(A) 0.00A
Corr. carica max..... 50.00A
Corr. max Scarica..... 50.00A
SOC Batt 24%
SOH Batt 100%
temp. Batt ..... 20℃
Cicli Batt 0T

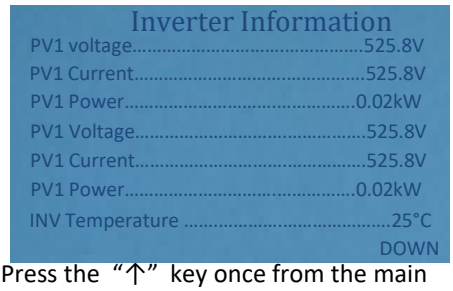
Info PCU(PCU2)
PCU a bassa tensione 53.1V
PCU ad alta tensione 400.6V
PCU a bassa potenz 0.00kW
Stato PCU ..... normale
Temp. interna..... 24℃
Temp. radiatore..... 19℃

16. QUICK INFO ON SYSTEM STATUS

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



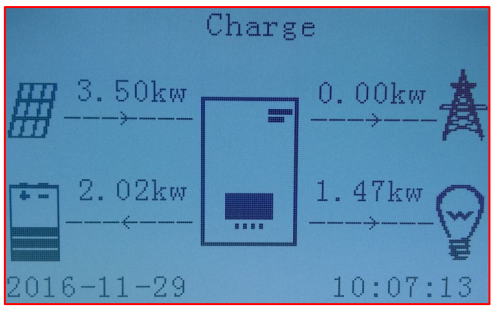




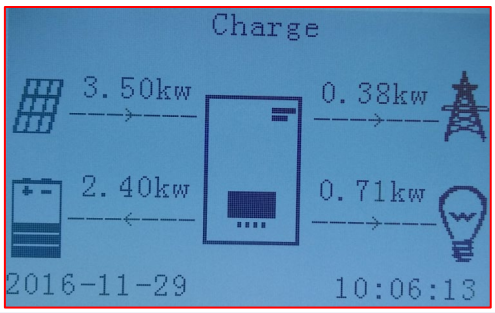
Press the "↑" key once from the main menu to access the instantaneous information on the DC side of the inverter.

17. OPERATING STATUSES IN AUTOMATIC MODE

Charge

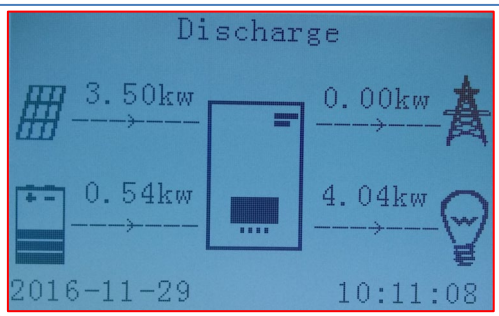


When the power produced from the photovoltaic system is greater than the energy required by the loads, the hybrid inverter will charge the battery with the excess energy.

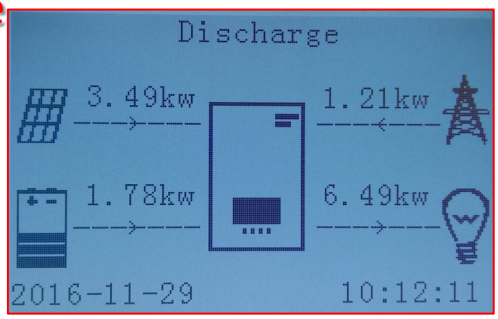


When the battery is fully charged, or when the charging power is limited (to preserve the integrity of the battery), the excess energy will be exported to the grid.

Discharge

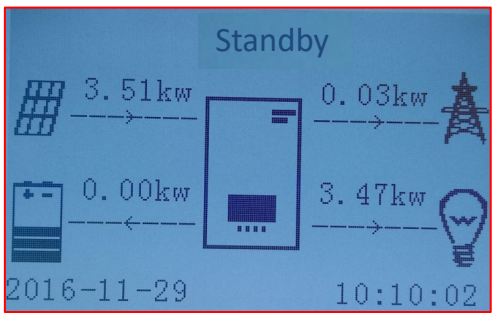


When the power of the photovoltaic system is once again less than the power required by the loads, the system will use the energy stored in the battery to power the domestic utilities.



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 hybrid inverter will remain in Standby until:
- the difference between the photovoltaic production and the power required by the loads is less than 100W
- the battery is fully charged and the photovoltaic production is higher than the consumption (with tolerance of 100W)
- the battery is flat and the photovoltaic production is lower than the consumption (with tolerance of 100W)

18.1 EPS MODE (OFF GRID)

In the event of a power failure, or start-up in OFF-Grid mode, if the EPS function is active, the inverter is able to supply energy - coming from the PV and stored in the batteries - to critical loads connected to the LOAD connection port.

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

Identify 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.

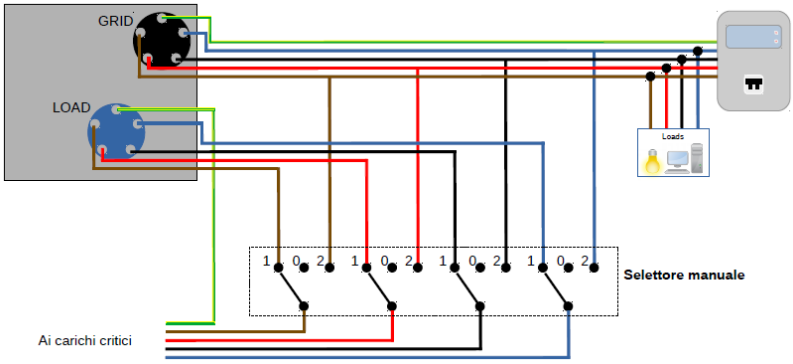
• High power loads may not be supported by the inverter in EPS mode, given the maximum power that can be delivered under these conditions.

• Loads with high inrush currents may not be supported by the inverter in EPS mode, as the inrush current, even if only for a very short period, is significantly higher than that supplied by the inverter.

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.

CHANGE-OVER SWITCH

In case of maintenance of 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.



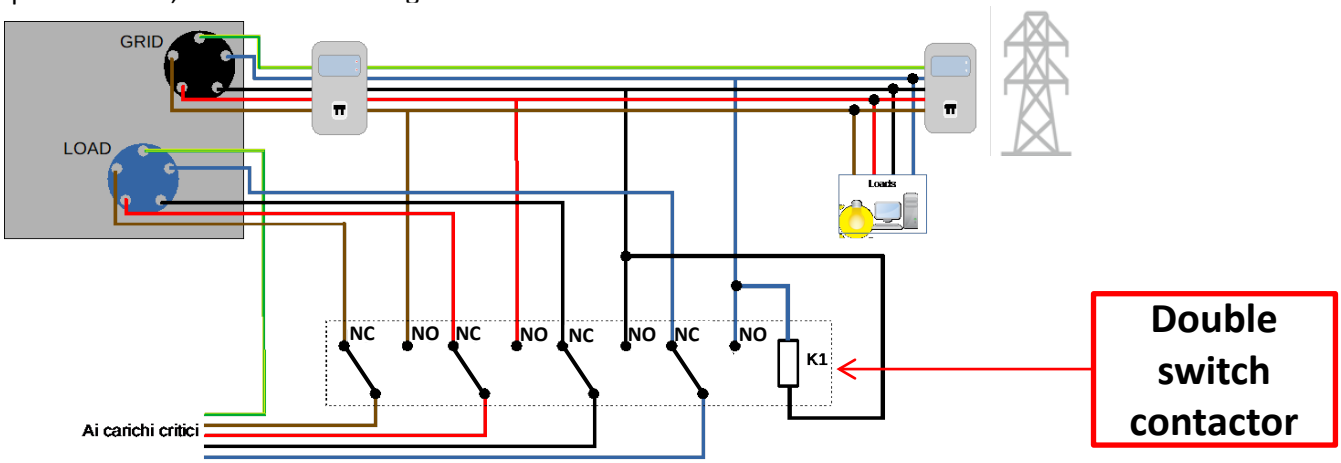
Position 1→ Priority loads connected and powered by the inverter's LOAD line

Position 0→ Priority loads not powered by either the inverter or 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.

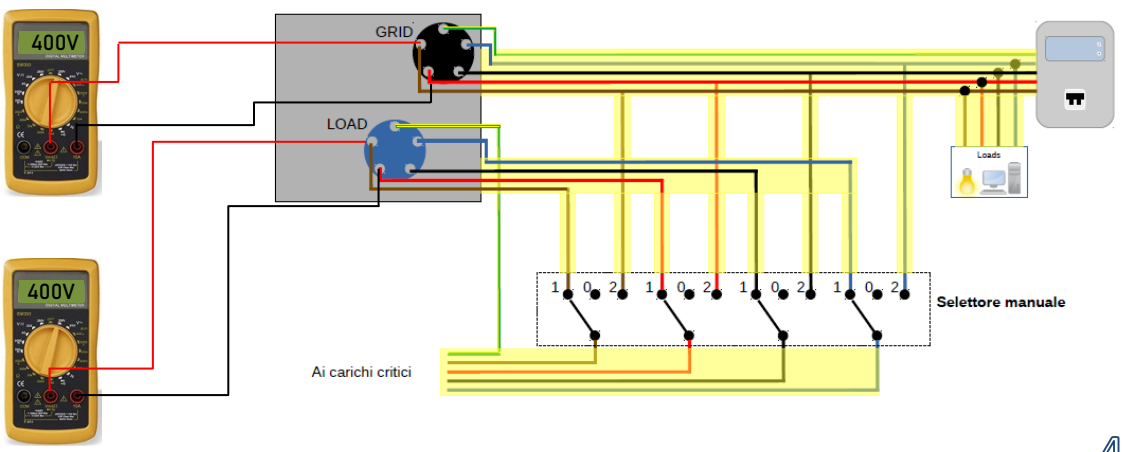


NOTE: For the conditions described above, in the event of a power failure, the part of the system powered by the inverter's LOAD port behaves like an IT system.
If the hybrid inverter is to be installed under different conditions from those shown in the diagrams above, contact technical support to check whether it is feasible.

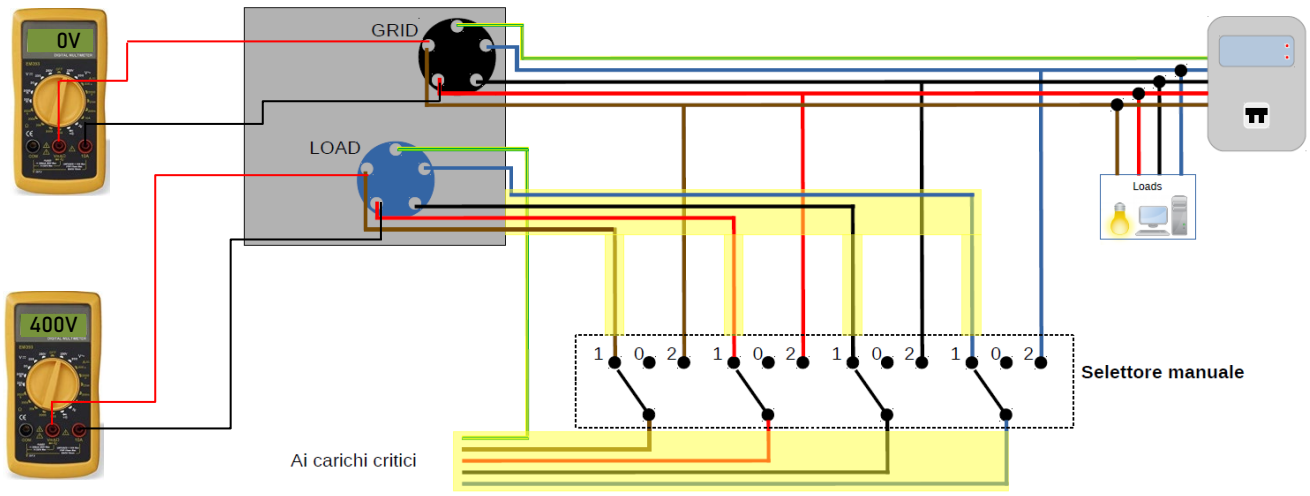
18.3 EPS MODE (OFF GRID) - OPERATION

If the alternating voltage supplied by the mains is present (normal operating condition), both the standard loads of the system and the priority or critical loads are supplied by the mains 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 power **blackout**, the alternating voltage supplied by the mains 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 400V to the LOAD output, supplying power only to the critical loads according to the availability of the batteries and PV system.

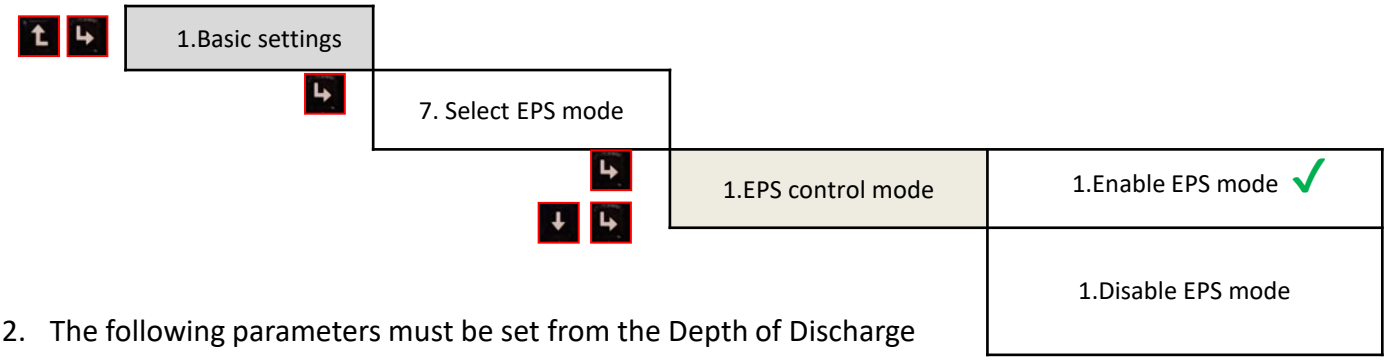


NOTE: with this configuration, the system becomes an IT system during a blackout.

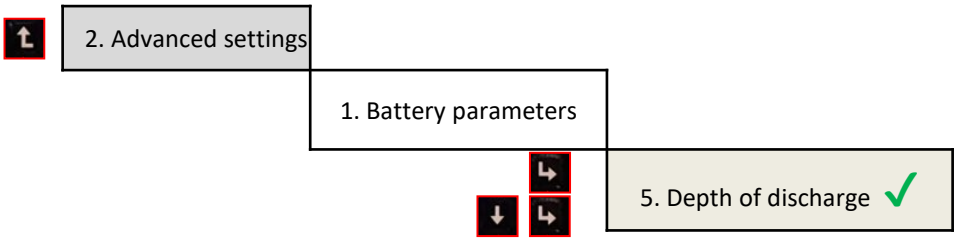
18.4 EPS MODE (OFF GRID) - MENU ENABLING

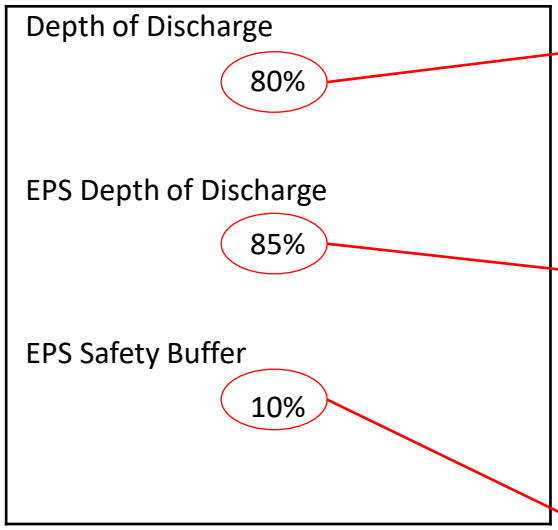
To enable the EPS (OFF-GRID) mode:

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



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





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

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

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

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

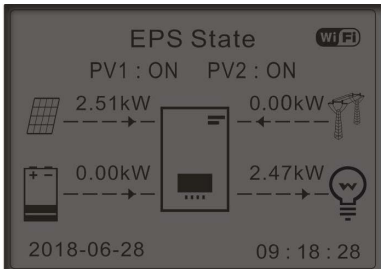
3. After reaching the minimum EPS discharge value, the inverter resumes supplying power to the loads in EPS (or OFF-Grid) mode once the set threshold has been exceeded

SOC%> 100 – Depth of Discharge in EPS+ safety buffer)

e.g. LOAD output re-supplying value = 26%

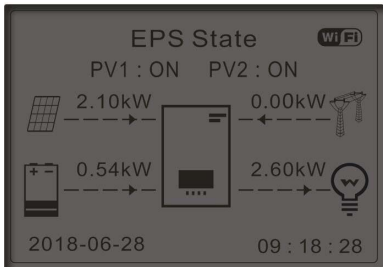
18.5 EPS OPERATING MODE (OFF GRID)

Standby



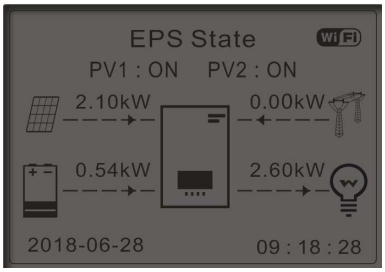
If PV production = LOAD consumption, the HYD-ES inverter will not charge or discharge the battery.

Discharge

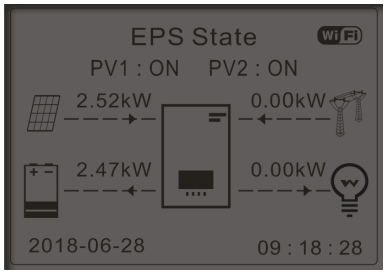


If PV production < LOAD consumption (ΔP > 300W) the HYD-ES inverter will discharge the battery.

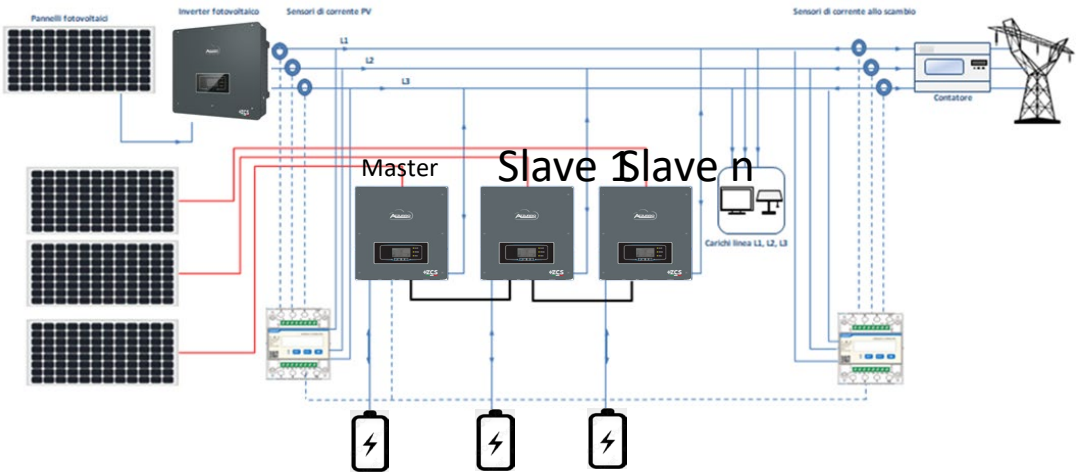
Charge



If PV production > LOAD consumption (ΔP > 300W) 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.



1.The inverters must be interconnected using the cable supplied, making sure to populate the inputs as follows:

- **Link port 0** of **Master** inverter → connected to **terminating resistor** (8-pin terminal)
- **Link port 1** of **Master** Inverter → **Link port 0** of **Slave 1** Inverter
- **Link port 1** of **Slave 1** Inverter → **Link port 0** of **Slave 2** Inverter
- **Link port 1** of **Slave 2** Inverter → **Link port 0** of **Slave 3** Inverter
- ...
- **Link port 1** of **Slave n-1** Inverter → **Link port 0** of **Slave n** Inverter
- **Link port 1** of **Slave n** inverter → connected to **terminating resistor** (8-pin terminal)

Note: The terminating resistors are supplied as standard

NOTE: the inverter parallel cable supplied is 3 metres long and cannot be extended.

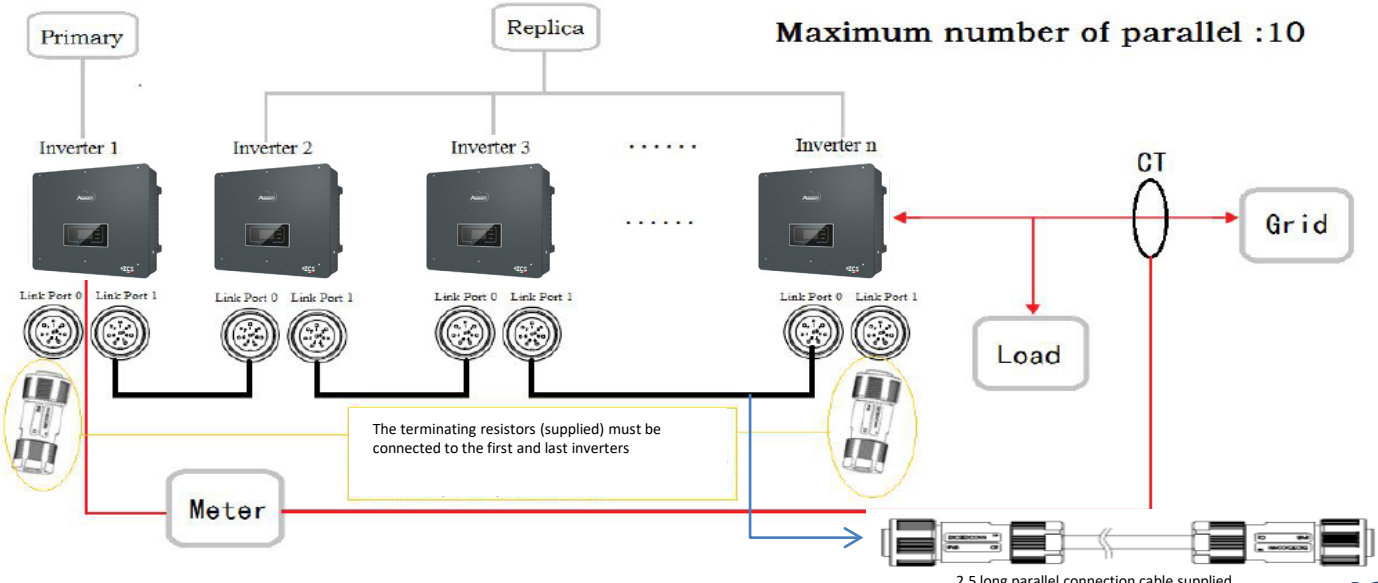
2.If the inverters connected are of the same size, the LOAD outputs can be connected in parallel in order to supply power to the same group of priority loads. To do this, a parallel switchboard must be used. It is necessary to ensure that the connections between each inverter and the parallel switchboard have:

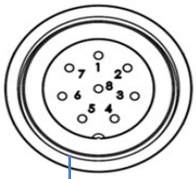
- the same length
- the same cross-section
- the lowest possible impedance.

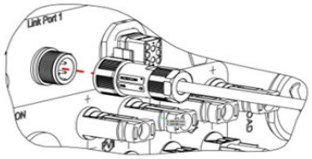
It is advisable to install suitable protection on each connection line between the inverter and the switchboard.

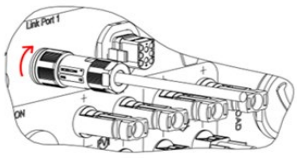
3.The total load connected to the LOAD outputs must be less than the total sum of the power outputs of the inverters in EPS mode.

4.The meters must be connected to the Master Inverter (Primary)









PIN	Definition	Function	Notes
1	IN_SYN0	Synchronizing signal0	The high level of the synchronizing signal is 12V
2	CANL	CAN low data	
3	SYN_GND0	Synchronizing signal GND0	
4	CANH	CAN high data	
5	IN_SYN1	Synchronizing signal1	
6	SYN_GND1	Synchronizing signal GND1	
7	SYN_GND2	Synchronizing signal GND2	
8	IN_SYN2	Synchronizing signal2	

19.2 PARALLEL INVERTER MODE - SETTINGS

2. Advanced settings

PWD 0001

7.Parallel settings

OK

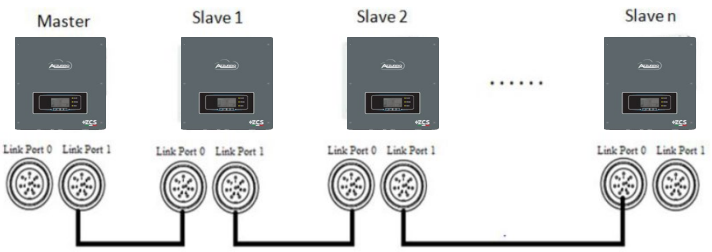
1.Parallel Control	Enable / disable
2.Parallel Master-Slave	Primary / Replica
3.Parallel Address	00 (Primary) 01 (replica 1) ... 0n (Replica n)
4.Save	ok

Enable
Primary
00
ok

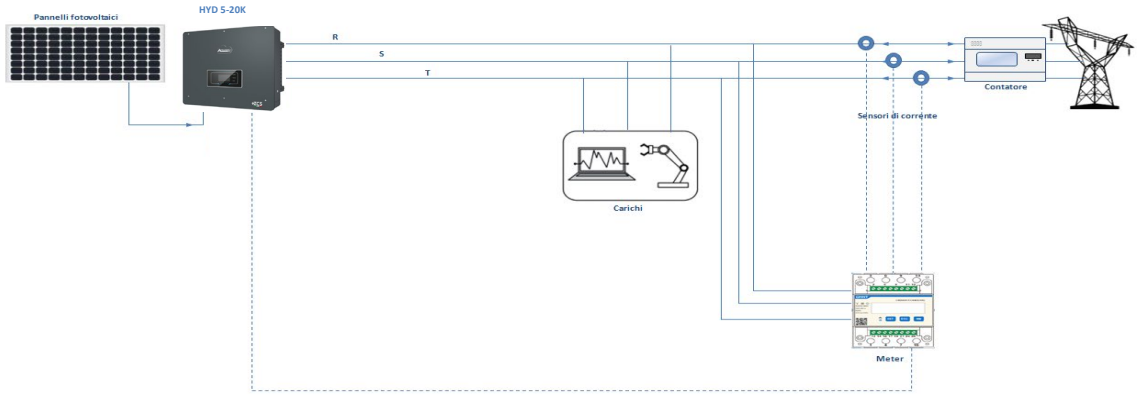
Enable
Replica
01
ok

Enable
Replica
02
ok

Enable
Replica
03
ok

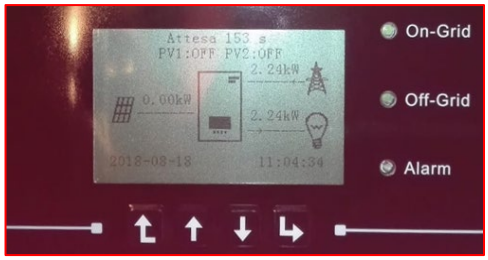


20. OPERATION OF PHOTOVOLTAIC SYSTEM ONLY



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

In this case, the display will only show the values relating to:
.Photovoltaic production
.Load consumption
.Power exchanged with the grid



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