



QUICK INSTALLATION GUIDE (v1.8.1)

UNE ZHERO S6

ZHERO SINGLE-PHASE STANDARD – RETROFIT – HYBRID



Carefully follow all the steps indicated in the ZHERO quick installation guide; once the installation is completed, fill in the check boxes. The document must be handed over to the customer, signed, at the end of all the procedures described.

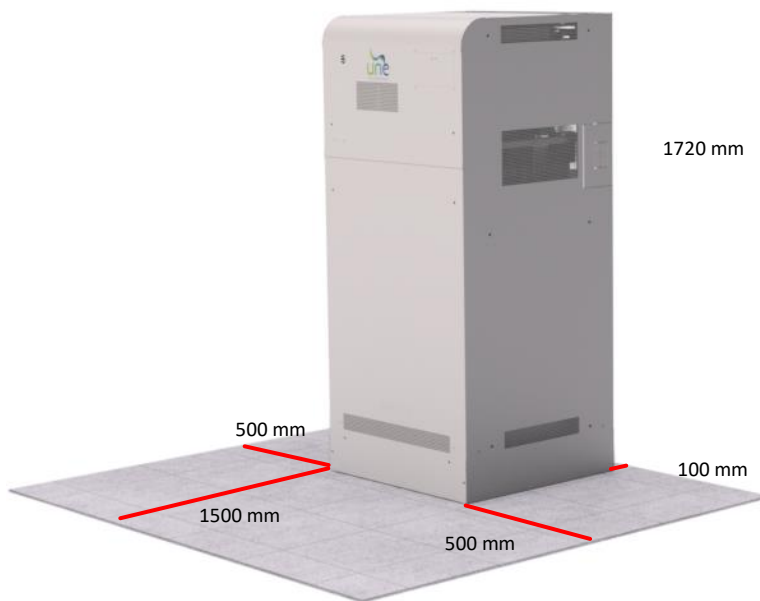
For more information, please refer to the updated version of the UNE ZHERO installation manual, downloadable from the website www.unesrl.com.

1. POSITIONING OF UNE ZHERO

- On a flat floor;
- In easily accessible places;
- In places with air recirculation; no other regulatory provisions are prescribed;

WARNING: It is essential to assess the suitability of the floor on which UNE ZHERO is placed in order to determine its suitability to withstand the weight of the system (approximately 250–350 kg) according to the number of batteries.

WARNING: UNE ZHERO S6 must be anchored to the floor by means of the holes provided in the base plate in order to avoid possible overturning.



To guarantee the necessary aeration and the installation, maintenance and inspection operations, the following distances must be respected:

MINIMUM DISTANCES	BOX ZHERO
Front distance	1500 mm
Rear distance	100 mm
Left side distance	500 mm
Right side distance	500 mm
Upper distance	500 mm

2. GENERAL CONNECTION DIAGRAM OF THE MACHINE

Before proceeding, **it is necessary to identify and follow the general diagram** of the machine according to the type of application and the type of grid to which the UNE ZHERO system will be connected.

Warning: refer to the detailed connection diagram shown in Chap. 3.13 of the UNE ZHERO manual, which can be downloaded free of charge from the website: <https://www.unesrl.com> in the “DOWNLOAD” section.



3. CONNECTION BETWEEN UNE ZHERO AND THE PHOTOVOLTAIC GENERATOR

WARNING: the MPPT controllers are present only in the ZHERO Single-Phase Standard, Off-Grid and Hybrid systems; the Retrofit system is not equipped with any.



It is necessary to remove the plate by unscrewing the appropriate screws of the plate. Once the plate has been reinstalled and the cables have been brought inside the system, these can be connected to the regulators via MC4 photovoltaic connector.

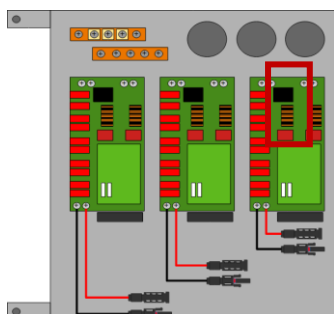
To connect the photovoltaic strings, it is necessary to connect the positive and negative MC4 of the cables coming from the photovoltaic system to the pairs of MC4 at the output of the terminal.

Carefully check that you **have not inverted the poles of the strings**, otherwise a fault will occur



NETWORK CONNECTION (FROM LEFT TO RIGHT)

MC4 female	→	PV Input: Negative - ;
MC4 male	→	PV Output: Positive + .



According to the type of controller installed, check that the string voltage is between 100–180 V or 120–308 V. Before applying open-circuit string voltage, check on the ZHERO label the accepted voltage range.

Pay attention to:

- Not connecting to the same controller strings with different numbers of panels.
- Not connecting different panels to the same controller.
- To the same controller, photovoltaic modules that are located on the same roof slope must be connected.
- Connect the photovoltaic string to the MPPT controllers according to the order indicated in the figure;
- Pay attention not to connect the string under voltage;
- Anchor the cables to the base using a cable tie to prevent movement of the wires;
- Pay attention not to obstruct the ventilation of the controller.

WARNING: Use exclusively MC4 connectors that support a string current up to **59 A** nominal and **6 or 10 mm²** double-insulated photovoltaic cables.

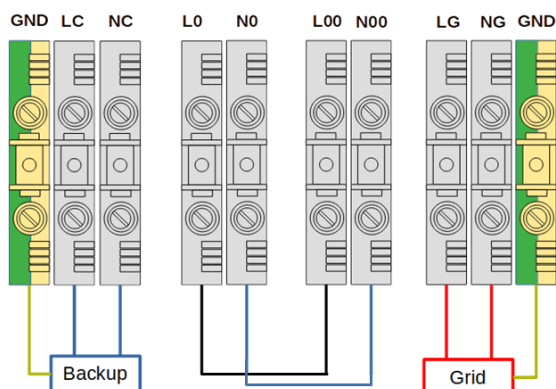
WARNING: It is necessary to install a surge protection device (SPD) for the photovoltaic system, external to the machine, with rating **Up ≤ 2.5 kV**, for each MPPT present.

WARNING: The **parallel configuration increases the current**, the series configuration increases the voltage! **Choose suitable fuse holders and fuses.**



AC ZERO CONNECTION TO DISTRIBUTOR GRID/GENERATOR SET and "BACKUP"

ON-GRID, RETROFIT AND HYBRID INSTALLATION WITHOUT PRODUCTION METER



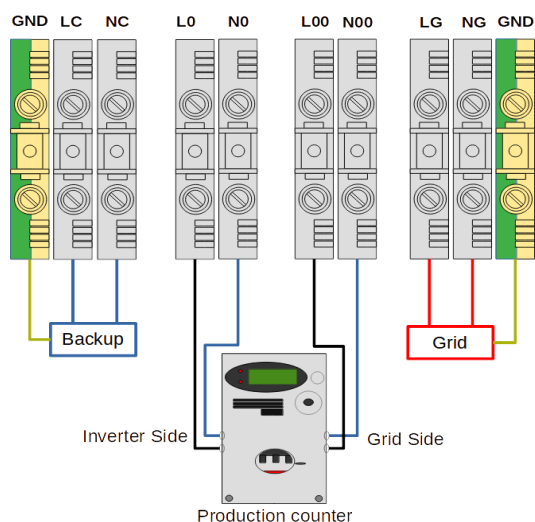
Connection of the distributor grid/generator set input to the system (not production meter):

- **LG:** Phase DISTRIBUTOR/GENERATOR 230 VAC;
- **NG:** Neutral DISTRIBUTOR/GENERATOR 230 VAC;
- **Yellow/Green terminal:** earth connection.

Connection of the "backup" line (optional):

- **LC:** Backup Phase 230 VAC;
- **NC:** Backup Neutral 230 VAC;
- **Yellow/Green terminal:** earth connection.

ON-GRID INSTALLATION WITH PRODUCTION METER



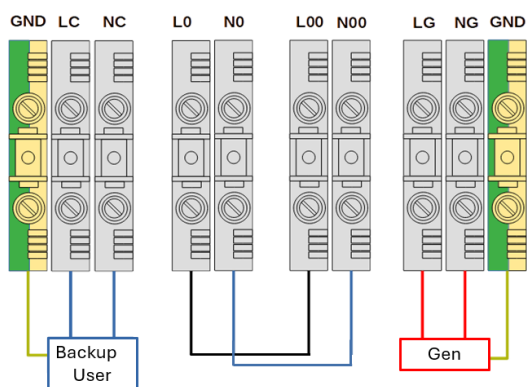
Connection of the production meter (if present):

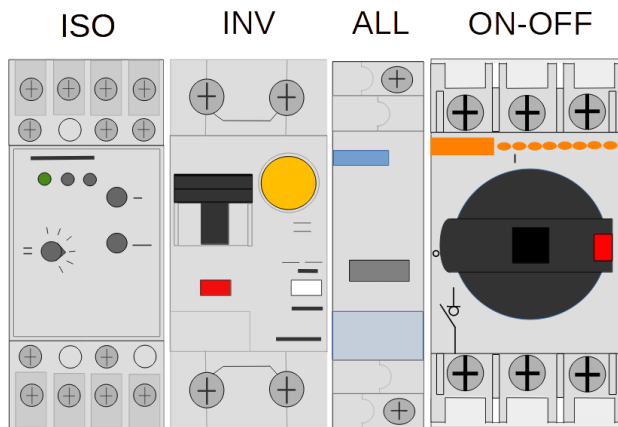
- **L0:** phase at the input of the production meter on the inverter side;
- **N0:** neutral at the input of the production meter on the inverter side;
- **L00:** phase at the output of the production meter on the grid side;
- **N00:** neutral at the output of the production meter on the grid side.

OFF GRID INSTALLATION

In the case of Off-Grid application, the jumper between L00 and L0 and between N00 and N0 must simply be left in place.

No meter must be installed.

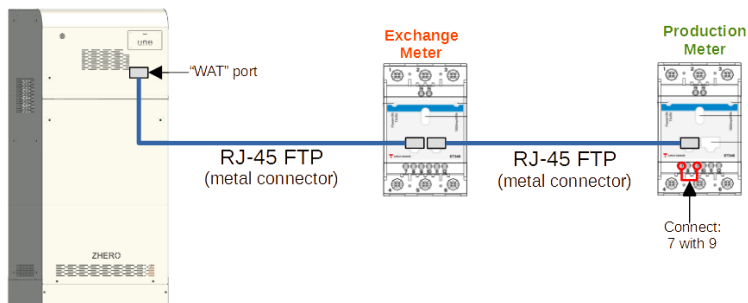




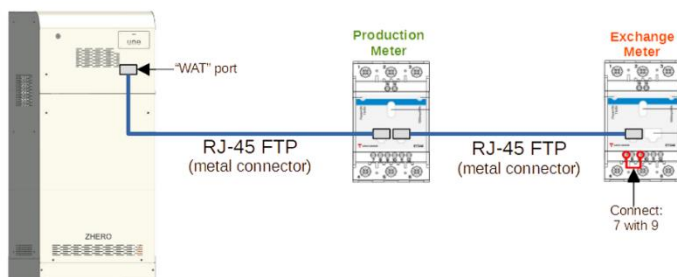
LEGEND	
ISOL:	Insulation control.
INV:	Differential magnetothermal circuit breaker at the inverter output; it does not cause the interruption of the load but the blocking of the supply from the battery + photovoltaic source.
ALL:	Alarm button, allows resetting a system alarm that is indicated by the switching on of the red alarm lamp..
ON-OFF:	Disconnecter, allows switching the system on or off.

WARNING: For the communication connection (RJ-45) **the order of the Meters is irrelevant** (the first Meter can be either the exchange meter or the production meter) **but pay attention not to invert the Meters in the electrical installation.**

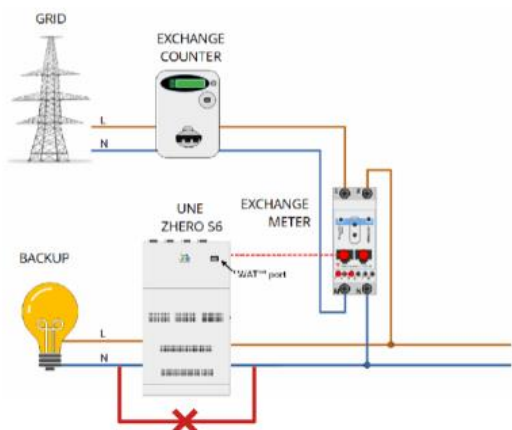
The diagram below shows an example of a three-phase meter connection for different configurations, regardless of the order of the meters. This diagram is also valid for single-phase systems, using the correct terminals indicated in the following section.



Activate the terminator (always on the most distant one). Connection to the terminals:
For the **three-phase** connection the terminals are 7 - 9.
For the **single-phase** connection the terminals are 3 - 5.



Activate the terminator (always on the most distant one). Connection to the terminals:
For the **three-phase** connection the terminals are 7 - 9.
For the **single-phase** connection the terminals are 3 - 5.



WARNING: The neutral at the output of the backup line (NC) must never be reconnected to the neutral coming from the meter.
In fact, a common connection between the input neutral and the backup output neutral can cause undesired tripping of the differential circuit breakers and, under certain conditions, can lead to irreversible damage to the system.



CONNECTION OF THE METER AND LOADS

The meter connection cable to the system must not be longer than 50 m.

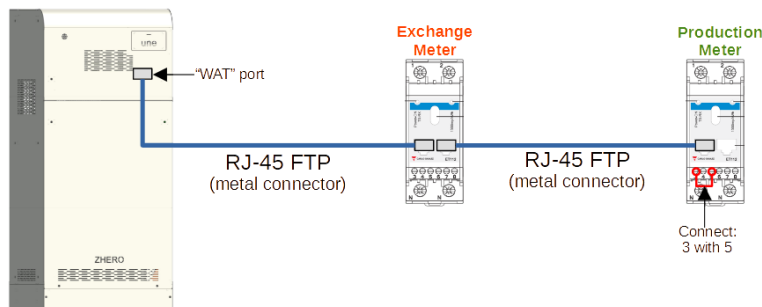
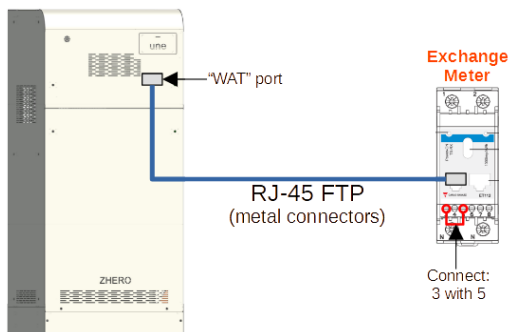
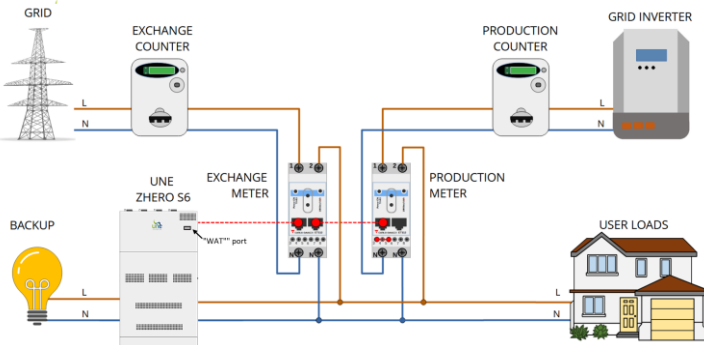
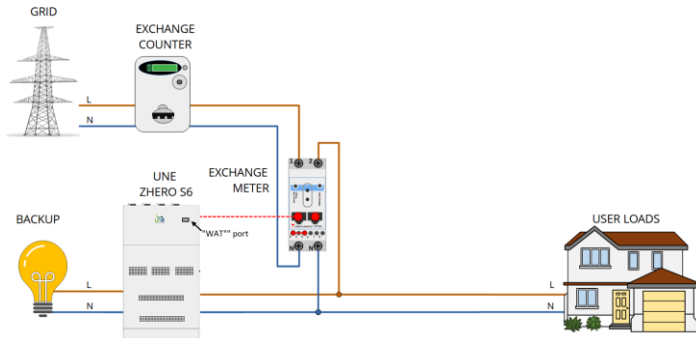
To remain within 1% losses, the following distances are recommended for electrical connections:

1. 6 mmq (3,11 Ohm/km) up to 15 m in length
2. 10 mmq (1,84 Ohm/km) up to 25 m in length

WARNING: check the maximum current supported by your meter.

WARNING: in the case of systems with more than one ZHERO, each ZHERO system must **have its own meters**.

WARNING: use **twisted** cables, do not use cross cables for the RJ-45 cable.



AC connection to the **single-phase exchange meter** (for ZHERO single-phase **STANDARD** configuration)

- At the input of the exchange meter (terminal 1 and N) connect the exchange meter. Phase L to terminal 1 and neutral to the terminal N below.
- At the output of the exchange meter (terminal 2 and N) connect both the line directly to ZHERO and the loads. Phase L to terminal 2 and neutral to the terminal N below.

AC connection to the exchange and production meters (for ZHERO single-phase **RETROFIT** and **HYBRID** configuration)

- At the input of the exchange meter (terminal 1 and N) connect the exchange meter. Phase L to terminal 1 and neutral to the terminal N below.
- At the input of the production meter (terminal 1 and N) connect the production meter. Phase L to terminal 1 and neutral to the terminal N below.
- At the output of the exchange and production meters (terminal 2 and N) connect both the line directly to ZHERO and the loads. Phase L to terminal 2 and neutral to the terminal N below.

Connection of the 485 communication Meter-ZHERO (ZHERO single-phase **STANDARD**)

- Connect the RJ-45 cable to the left input (RJ-45) on the exchange meter;
- Connect the other end of the cable to the RJ-45 port on the "WAT" panel of ZHERO;
- Make a jumper between terminal 3 and 5 of the exchange meter.

Connection of the 485 communication Meter-ZHERO (ZHERO single-phase **RETROFIT** and **HYBRID**)

- Connect the RJ-45 cable to the left input (RJ-45) on the exchange meter; connect the other end of the cable to the RJ-45 port on the "WAT" panel of ZHERO;
- Connect an RJ-45 cable to the right input of the exchange meter and the other end to the left input of the production meter.
- Make a jumper between terminal 3 and 5 of the last meter in the series.



The meter connection cable to the system must not be longer than 50 m.

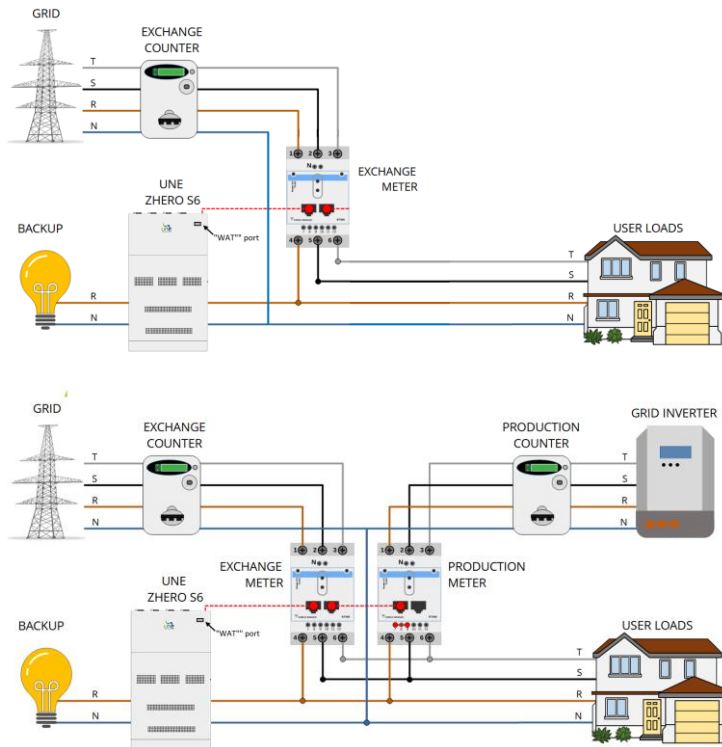
To remain within 1% losses, the following distances are recommended for electrical connections:

1. 6 mmq (3,11 Ohm/km) up to 15 m in length
2. 10 mmq (1,84 Ohm/km) up to 25 m in length

WARNING: check the maximum current supported by your meter.

WARNING: in the case of systems with more than one ZHERO, each ZHERO system must have its own meters.

WARNING: use twisted cables, do not use cross cables for the RJ-45 cable.

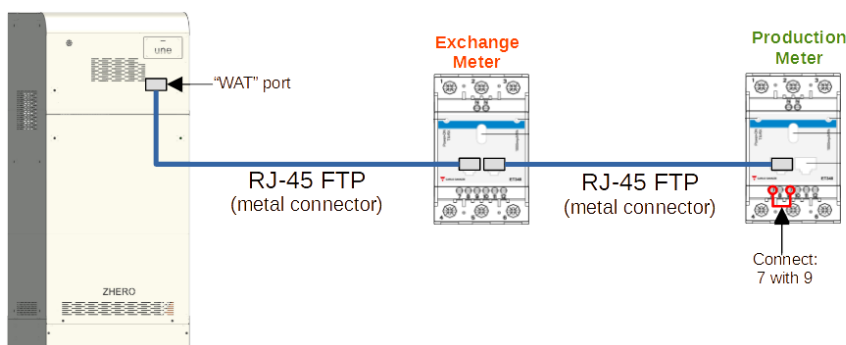
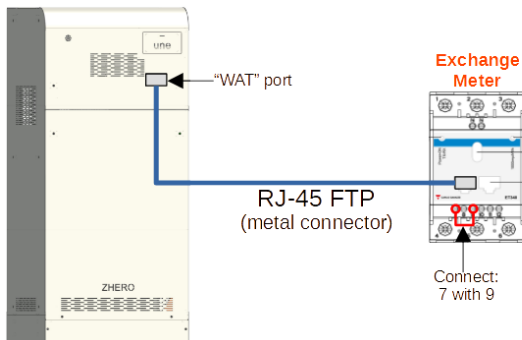


AC connection to the THREE-PHASE Meter (ZHERO single-phase STANDARD).

- Dal From the distributor meter, connect the three phases to 1 – 2 – 3, the neutral is not connected;
- Connect the line directly to ZHERO on terminals 4 or 5 or 6 depending on the chosen phase;
- Connect the loads at the Meter output from terminals 4 – 5 – 6;
- Neutral and GND are not connected to the Me

Connection of the production Meter (ZHERO single-phase RETROFIT and HYBRID)

- Connect the phases from the production meter to 1 – 2 – 3;
- Connect the user system to terminals 4 – 5 – 6.
- The neutral must not pass through the meter.



Connection of the 485 communication Meter-ZHERO STANDARD

- Connect the RJ-45 cable to the left RJ-45 input on the device as shown in the figure;
- Connect the other end of the cable to the RJ-45 port on the "WAT" panel of ZHERO;
- Make a jumper between terminal 7 and 9 if three-phase.

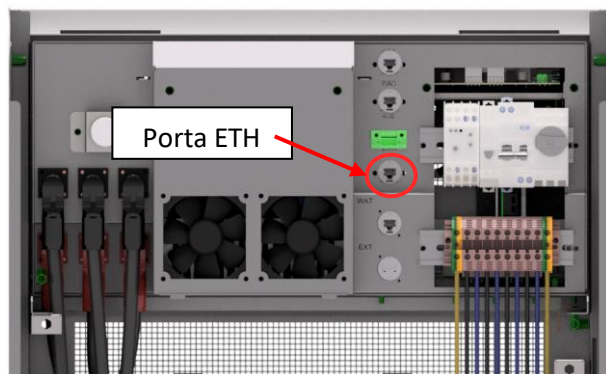
Connection of the 485 communication Meter-ZHERO Retrofit and Hybrid

- Connect the RJ-45 cable to the left RJ-45 input on the device as shown in the figure; connect the other end of the cable to the RJ-45 port on the "WAT" panel of ZHERO;
- Connect an RJ-45 cable to the right input of the exchange meter and the other end to the left input of the production meter.
- Make a jumper between terminal 7 and 9 of the last meter in the series.



4. INTERNET CONNECTION

WARNING: The system, both for warranty, monitoring and assistance purposes, must be connected to the internet; the ETH port on UNE ZHERO S6 is located where indicated in the figure below.



The ethernet cable exiting the system must be brought directly to the router or to a network switch connected to it, as shown in the schematics below.

Always use **shielded RJ-45 FTP cables of category 5e or higher** with a metallic connector head.

ATTENZIONE: The RJ-45 cable must not exceed a length of 50 m.

a) Direct connection with RJ-45 cable

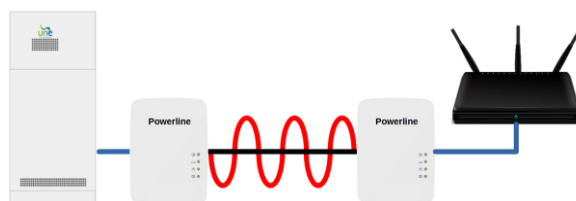


b) Connection with a range extender



If such a connection is not possible, it will be necessary to use a WIFI REPEATER with ethernet port, configured as a range extender of your network.

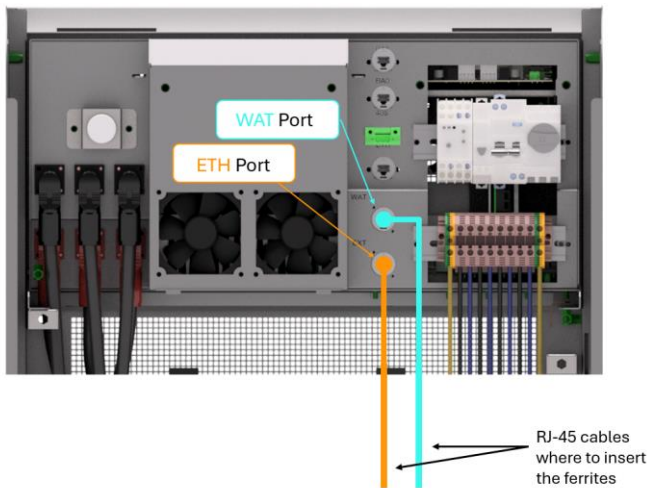
c) Connection with a Powerline



Note: For further details and possible solutions to connection issues, please refer to the ethernet communication manual available online for download. Please note that the support provided is indicative in nature and does not replace the intervention of a qualified technician.



5. POSITIONING OF FERRITES



The ferrites supplied in the kit with the product must be installed as indicated below.

On the side, the two ETH and WAT ports are shown as represented in the ferrite insertion diagram described in detail below in **Error! Reference source not found.** and Figure 2.

WARNING: Always use **shielded RJ-45 FTP cables of category 5e** or higher with metallic connector head. In case of non-compliance, a stable ETH connection is not guaranteed.

II The section of RJ-45 cable exiting from the **ETH port** of the UNE ZHERO system, before entering the router, range extender or powerline, must be wound inside 2 ferrite **rings 742-722-22 or equivalent**, strictly following the indications schematized in **Error! Reference source not found.**

The RJ-45 cable must be **passed 3 times** inside each single ferrite, which must be located at about 50 cm from each other; these windings must be made **outside** the ZHERO casing.

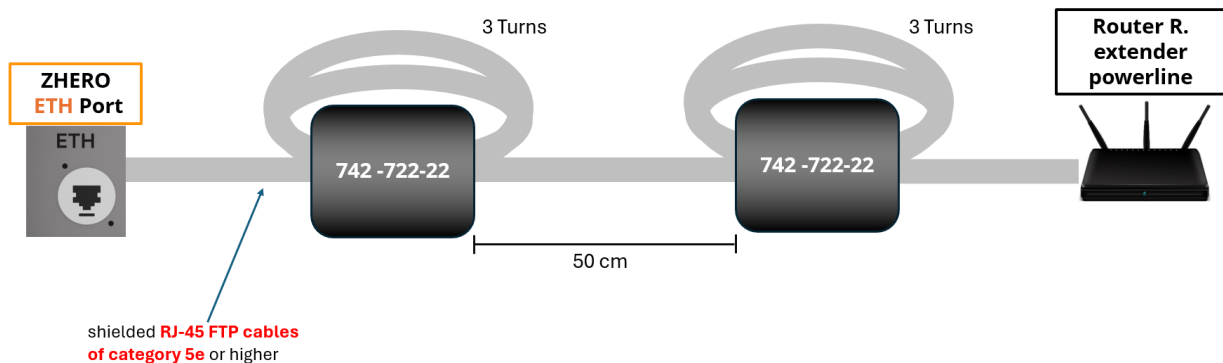


Figure 1 - Positioning of the ferrites along the ETH connection line.

Similarly, in the section of RJ-45 cable exiting from the **WAT port**, before entering the meter, 2 ferrite rings **742-722-22 or equivalent** must be inserted and the cable must be passed **3 times** inside each single ferrite, which must be at a distance of about **50 cm** from the other; these windings must be made **outside** the ZHERO casing. See Figure 2.

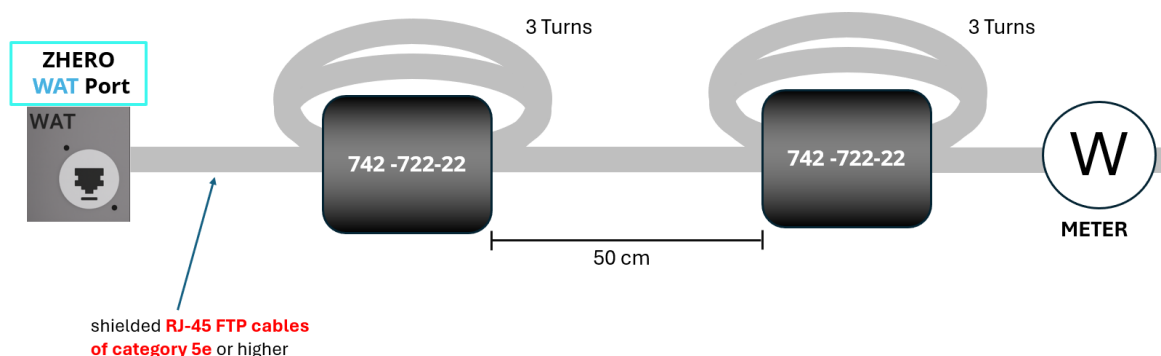
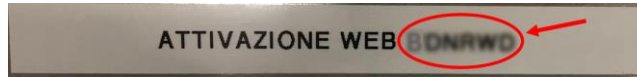


Figure 2 - Positioning of the ferrites along the wattmeter communication line.

6. ZHERO ASSOCIATION TO WEBSERVER

- The installer and the user shall independently register on the website: <https://portal.zherosystem.com>.
Once registration has been completed, a code will be generated as follows:
 - For the user: "xxxxxx"
 - For the installer: "DEALxxxxx"
- Proceed with the association by entering the code generated by the above registration and the code "WEB ACTIVATION: XXXXXX" shown on a label located on the right side of the system:



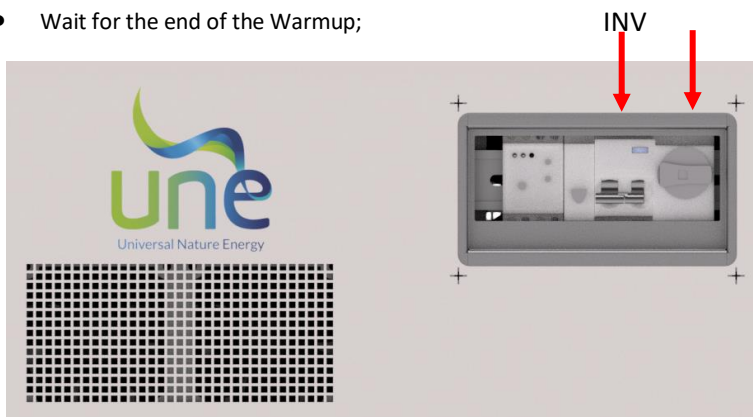
- The use of the webserver is dealt with in depth in the Online course of the portal: UNE CAMPUS, upon registration to the portal, by clicking on the following link: <https://unecampus.thinkific.com/courses/corso-webserver-une>

7. VERIFICATION OF CONNECTIONS

- Check the connection of the electrical grid;
- Check the connection of the electrical grid;
- Check that the exchange and production meters are enabled;
- Check that the power cables of the Meter are correctly connected;
- Check that the 485 terminator of the meters is only on the last meter in the series;
- Check that any 485/CAN data lines are correctly connected (optional);
- Check the connection of the Internet cable to the "ETH" port;
- Check the tightening of the screws of the possible backup line;
- Check that the photovoltaic system is enabled at the input to the system;
- Check that the grid inverter is enabled (if present).

8. SYSTEM START-UP

- Enable the "INV" residual current circuit breaker;
- Enable all loads downstream and upstream of the system (external to the system);
- Enable the "ON-OFF" switch to ON, the left side indicator light must turn GREEN;
- Wait for the end of the Warmup;



WARNING: The system will perform the **Warmup** of the battery until it reaches the operating temperature (about 260°C) and it **may last up to 14 hours**.

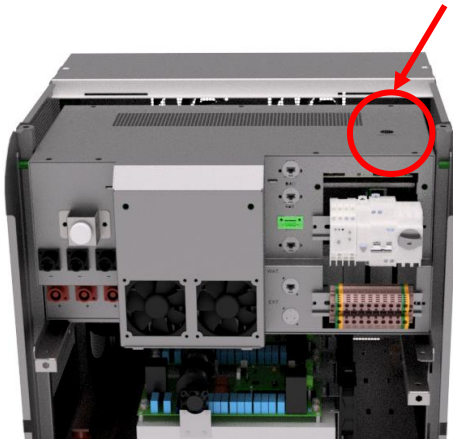
If the indicator appears **RED**, refer to Chap. 11 of the manual for possible solutions.



9. VERIFICATION OF OPERATION

MONITORING SOFTWARE

Following the first start-up, it is necessary to verify the correct installation via the **ZHERO Installer TOOL** software. The Warmup status will remain active until the completion of the Warmup, at which point the system will start normal operation.



The software can be downloaded free of charge from the official UNE website in the download section, with an UPDATED WINDOWS 10 or higher PC. Always check that you are in possession of the latest version of the software.

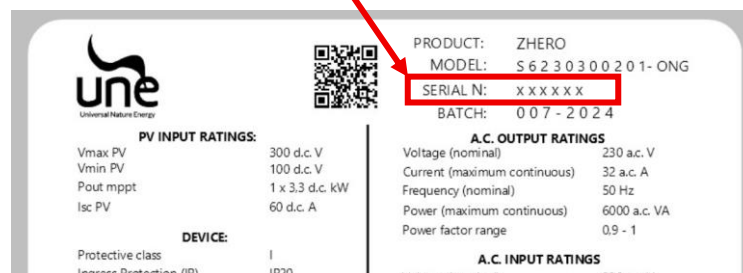
The USB type B port for the monitoring of ZHERO is located on the upper right part, under the upper cover (see figure on the side).

For monitoring, use a USB Type A–Type B cable with a length **not greater than 1 meter**, **with ferrites applied at both ends** of the cable as shown in the figure. It is recommended to keep the PC connected to the power socket.

10. ASSISTANCE

Technical assistance for the UNE ZHERO storage system is provided by contacting UNE at the address assistenza@unesrl.com, indicating the problem and obligatorily providing the following data:

- **Serial number** SN: XXXXXX (indicated by red arrow in the label shown below as an example);
- **Email and telephone** reference;
- Indicative **date and time** of the event detected;
- Description as complete and detailed as possible of the event/problem.



Once the email has been sent, UNE will receive the assistance request and an operator will take care of replying in the shortest possible time.

WARNING: The assistance department is intended to provide support to professionals in the sector and to installers. The private customer must necessarily refer to their UNE authorized installer, who will contact the assistance service according to the methods indicated above.

WARNING: UNE technical assistance is reserved exclusively for the UNE Zhero Single-phase product. Any issues attributable to elements external to the system, such as

- electrical connections on the plant side,
- network configurations or Ethernet connections,

do not fall within the scope of technical assistance nor within the warranty conditions provided by UNE s.r.l. It is therefore recommended to entrust such activities to qualified personnel, following what is indicated in the installation manual.



Apply installer label with phone number for customer support

Date:	Place:	Stamp and signature of the operator:

Thank you for choosing UNE srl products and for having carefully followed all the steps necessary for the correct installation.

Document to be kept by the customer

NOTE:

For more detailed and complete information, please refer to the official product manual, available for download on the website www.unesrl.com. The manual constitutes the only complete technical reference for the installation, configuration and correct use of the system.





U N I V E R S A L N A T U R E  E N E R G Y

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