Water Tank Module 2.0

For Enapter Systems

Installation Manual

Water Tank Module 2.0 Manual

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CONTENT

WELCOME

Thank you for choosing the Water Tank Module 2.0. Please read through this Installation Manual carefully before performing any operation.

If you have any further questions regarding the device's installation, please contact the Enapter Srl Help Centre. Quote the system serial number when contacting us; you will find the serial number on the type plate placed on the modules' rear side.

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Scope of the document

This installation Manual provides the installer with the information needed to install the Water Tank Module 2.0. The information contained in this manual will help you to install the Water Tank Module 2.0 safely and as intended.

Keep this Installation Manual in a safe place and readily available. Always follow its instructions. The operator's responsibility is to ensure that an installed Water Tank Module 2.0 is always in proper condition. Please observe any additional local requirements applicable to the installation of the Water Tank Module 2.0.

Approved use

The Water Tank Module 2.0 has been designed to pressurize low-conductivity water that can be used directly for the Enapter Electrolyzers.

According to the specifications and instructions provided in this manual, the unit must only be operated for this purpose.

Observance of this Installation Manual is part of “normal use.”

Danger of injury due to improper use!
Improper use of the product can result in serious injuries.

- Ensure that the manual is always accessible.
- Make sure you have read and understood this manual in its entirety.
- Comply with all safety instructions and warnings.
- Store the manual and other documentation safely and pass them on to future owners of the product.
- Comply with all local regulations.

PREFACE

Warnings and Hazards

The following terms and symbols are used in this manual to indicate essential text passages which must be given particular attention:

	Warns of dangers of fatal/serious injury
	Warns of danger of injury
	Warns of physical damage to the product
	Do not open or dismantle
	Keep away from sources of heat and ignition. No naked flames
	No smoking
	Minimum two persons required to handle the item
	Wear Personal Protective Equipment

General safety instructions

The following rules should always be observed:

1. **Keep the work area clean.** If the work area or surface is busy, the probability of injuries is higher.

2. **Do not use** the machine in dangerous environmental conditions. To prevent electric shock, **do not expose the device** to rain, and not use it in a damp area. Keep the work area illuminated. **Do not use the machine** near gas or flammable substances.

3. **Keep** unknown persons and children away from the machine. All unknown persons and children must keep a safe distance from the work area.

4. **Protect yourself** from electric shock. Avoid any contact with earthing surfaces.

5. **Handle** the power supply cable with care. **Do not pull** the electric cord to disconnect it from the plug. Keep the electric line away from heat, oil, and sharp edges.

6. **Use always personal protection devices:** wear protective goggles. Wear ear muffs or plugs in noisy areas. Wear gloves when handling parts with sharp edges or the conditioning solution.

7. **Disconnect** the tool from electricity if you do not use it before maintaining and changing the accessories.

8. **Use** the machine, the tools, and accessories in the way and for the purposes mentioned in this manual. Different uses and parts can cause possible risks for the operator.

9. **Get the machine repaired** by a qualified person. This electric tool complies with local safety regulations. The device must be repaired only by qualified people who use original spare parts. Otherwise, risks may arise for the operator.

10. **Never store** the unit at temperatures below 2°C with liquid inside the internal pipeline. This will cause irreversible damage to the components inside the module.

11. **Only use** demineralized water according to the specification stated in this manual

12. **Only operate** the unit in a room with sufficient ventilation

Hazards description

The owner/operator and the User of a device need to be aware of the potential dangers and know what to do in case of an accident or emergency. It must be ensured that the system is installed and operated in compliance with local regulations and standards.

Mechanical Hazards

As for the generic mechanical hazard that can occur during operations requiring hand tools, Enapter Srl recommends wearing appropriate Personal Protective Equipment (PPE) and using suitable tools.

Operators protections
Before performing any operation, the operators must wear the appropriate PPE, such as cut-resistant gloves, safety shoes, protective goggles, etc.

No special training is needed to perform the preliminary steps of the installation phase. A general training regarding how to transport heavy and bulky objects, the use of electrical equipment, and the application of general safety principles is sufficient.

There are residual risks associated with the manual handling of the packaging and of the device during installation that can generate:

- ✓ impacts due to uncontrolled movements of the load,
- ✓ entanglements,
- ✓ fallings of the load,
- ✓ loss of stability;
- ✓ overturning.

To prevent these risks, the packaging must be handled by at least two people or heavy machinery.

Installers must comply with the general safety principles during the handling phases.

In particular, before moving a load:

- ✓ Installers must allow sufficient clearance when using aisles and passageways with openings/doorways with at least 1000 mm of free space in width and height to grant the easy transit of the packaging and machine parts
- ✓ Installers must verify that there are no people on the passageways
- ✓ Installers must verify that there is sufficient visibility to grant a safe moving of materials.

Electrical hazards

The unit poses no special electrical hazards as long as the following instructions on safety measures are observed:

- ✓ Use only the supply voltage specified on the rating plate.
- ✓ Do not short-circuit inputs and outputs.
- ✓ Do not reverse the polarity of inputs and outputs.
- ✓ Equip the power supply line with proper protections
- ✓ Do not short-circuit the cables of the cabinet.
- ✓ Do not insert any mechanical parts, primarily metal parts, into the product through the ventilation slots.
- ✓ Do not use liquids near the product.
- ✓ Never use the product if any part of it has been immersed in water.

WARNING!
Other than cleaning and user maintenance, any servicing must be performed by specialist personnel and with the power supply switched off.

Environmental hazards

The device has been designed for use in standard ambient conditions, respecting stability requirements (in the absence of seismic or hydrogeological events of particular intensity).

Furthermore, the Water Tank Module 2.0 has not been designed for outdoor use. It is the User's responsibility to protect the system and all its accessories against atmospheric phenomena such as direct sunlight, rain, snow, and lightning.

TECHNICAL SPECIFICATIONS

	Water Tank Module 2.0
Dimensions:	Width: 483mm Depth: 640mm Height: 310mm
Weight:	Empty: 25 kg Full: 60 kg
Max outlet water flow rate:	3.8 liters per minute
Max outlet pressure:	4.8 bar
Operative Power Consumption:	50 W
Max power consumption	70 W
Power Supply	AC 85-264 VAC/47-63Hz
Ambient conditions	
- Temperature:	5°C – 45°C
- Relative humidity:	20-95% non-condensing
Demineralized water input (when coupled to Enapter's Electrolyzers)	
- Max conductivity at 25°C:	< 20 µS/cm (at 25° C)

Pressure values are intended as relative pressure values.

WATER TANK MODULE 2.0 OVERVIEW

Current Label On Device	Old Label On Device	Description	Label On Drawing
H2O IN	W1.5	De-ionized water, inlet port from a purification system.	H2O IN
H2O OUT	W1.2	High pressure water, outlet port towards Electrolysers.	H2O OUT
OVERFILL	W1.4	Overfill port, only used when the tank is overfilled with water.	OVERFILL
TANK DRAIN	W1.6	Water Tank Drain, only used during routine maintenance to drain the WTM2.0	TANK DRAIN
LINE DRAIN	W1.7	Waterline Drain, only used if needed to “clean” the tank for maintenance purposes.	LINE DRAIN
-	-	Water level indicator: used to indicate the level of water inside the tank.	6

Current Label On Device	Old Label On Device	Description	Label On Drawing
-	-	Red LED: Used to know the severity level of the error; if it is blinking means a major error	7
-	-	Yellow LED: Used to know the severity level of the error; if it is blinking means a minor error	8
-	-	Green LED: Used to know if the water tank is working and supplying water to the electrolyser; if it is stable means correct operation.	9
Power	Power	Supplies power to the water tank module (Ground, Live and Neutral, 200-220V AC, 50-60Hz).	10
-	-	The fuse holder is used to hold the fuses inside the electric box.	11
Breaker	-	Magnetothermic switch, Used to turn On/Off the Water Tank Module.	12

Abbreviations

WTM: Water Tank Module

INTERNAL COMPONENTS

Inside the WTM, it is possible to find, mainly:

- 1 Water tank
- 1 Water pump
- 1 Electrovalve
- 1 Check valve
- 1 Pressure switch
- 1 Electric box

WORKING PRINCIPLE

Thanks to a self-priming pump, the stored water is pumped towards the electrolysers: a check valve is installed downstream of the pump to avoid backflow towards the water tank.

A pressure switch controls the exiting fluid Pressure (from port H2O OUT): when the higher threshold is reached, 2,8 barg (when no water required by the User), the pressure switch turns off the pump; when the lower threshold is reached, (1,4 barg) the pump is turned on again.

Thanks to a circuit composed of relays, the two main components of the WTM are controlled: the pump, installed on the refilling line of the electrolyser (H2O OUT), and the solenoid valve, installed on the refilling line of the tank (H2O IN).

The solenoid valve (N/C) closes when the maximum filling level is reached and opens when the medium level is reached: thanks to three separate level switches (“low”, “medium” and “high”) the solenoid valve is closed if the maximum level has been reached, and it is open once the level drops below the medium level. During the first WTM refilling, the low-level switch is also open, and the solenoid valve guarantees the water flows inside the tank.

The pump is powered only when the water level reaches the medium level, and it is powered OFF if the tank empties up to the minimum level.

Although the pump can run between the maximum and minimum level in normal operating conditions, if the power fails at the WTM, the pump won’t work unless the medium level is reached again after restarting the system.

WATER TANK MODULE 2.0 INSTALLATION

Required tools

Water connections

	Plastic pipe cutter

Piping and tubing

Water connections:	
	8 mm Ø LLDPE pipe (6 bar pressure resistant)
	Quick male connector + pipe 10 mm Ø for water drain

Water connection

OPERATORS MUST PERFORM THE FOLLOWING ACTIONS:

INLET

- *H2O IN port:*
  Connect the 8mm Ø LLDPE pipe to the H2O IN port. This is an **inlet port**. You must connect the source of water you want to store inside the tank at the other end of the pipe.
  When using the WTM to feed Enapter's electrolysers you must provide to this port (H2O IN) de-ionized water, with a conductivity < 20 microSiemens/cm.

OUTLET

- *H2O OUT port:*
  Connect the 8mm Ø LLDPE pipe to the H2O OUT port. This is an **outlet port**. From this port, high-pressure water comes out with a maximum head of 48m. Before connecting the H2O port to the

electrolyser, make sure to fill the line by turning on the WTM and observing that the water discharges into an empty container.
When you're using the WTM to feed Enapter's electrolysers, be sure that this port is connected to the homonym port on the electrolyser's front side.

- *OVERFILL port:*
  Connect the 8mm Ø LLDPE pipe to the OVERFILL port. This is an **outlet port**. From this pipe, the water stored inside the water tank will flow out only if the high-level sensor **fails**. This is a rare condition, but please be sure this pipe is connected to the User's drainage system.
  Moreover, be sure that at any point, the pipe connected to this port does not overcome the height of the line that indicates the maximum level (on the level indicator column).

Connections working principle

Bulkhead unions: ports **H2O IN**, **H2O OUT,** and **OVERFILL** of 8 mm Ø.

1. Cut the tube square and remove sharp edges. Ensure the outside diameter is free of score marks.
2. Push the tube into the fitting to the tube stop.
3. Pull-on the tube to check it is secure. Test the system before use.

MAINTENANCE

- *TANK DRAIN port:*
  This is a **maintenance port**. You will use it in just 2 cases:

1. Manual refilling of the water tank inside the module:

If there is no water coming from the water source **(that, in case you're using the WTM to feed Enapter's electrolysers, must be a purification system)**:

1. Quick-connect your source of water to port TANK DRAIN with the provided 10 mm Ø LLDPE pipe. Water starts to flow inside the module tank. It works by gravity, so be sure that your source of water is elevated above the WTM.
2. Fill the module *at least* until the led turns back to green. This occurs at 2/3 of the WTM's level sensor indicator.
   Do not fill the tank over the maximum level black line of the level indicator.
3. Disconnect the source of water through the quick-connection.

2. General maintenance of internal components:

   You may need to discharge the water stored inside the tank to make it easier to move the WTM. So:

   1. Shut down the WTM with the external switch (label 12).
   2. Quick-connect the provided 10 mm Ø LLDPE pipe (with the white connector) to port TANK DRAIN. Water starts immediately flowing out of the line. It works by gravity, so be sure that the pipe's end does not overcome the tank's water level.
   3. Wait until the module is empty.
   4. Disconnect the pipe.
   5. Move the WTM where you need it.

- *LINE DRAIN port:*

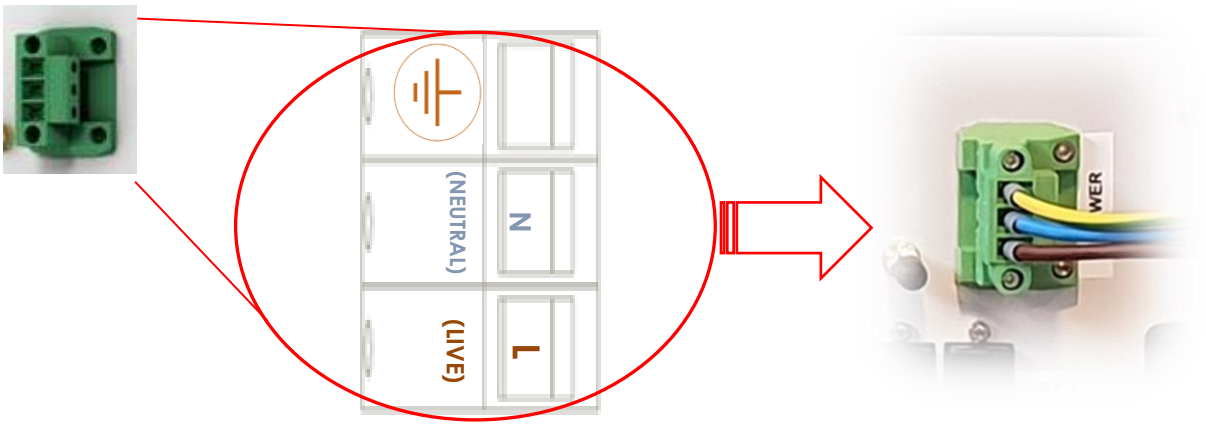
  This is a **maintenance port**. You will use it just in case you need to disconnect the pipe connected to port H2O OUT.

  Even if you shut down the module (using the external circuit breaker), this pipe will contain some water in pressure. So, each time you want to disconnect the line connected to port H2O OUT:

  1. Shut down the WTM with the external switch (label 12).
  2. Quick-connect the provided 10 mm Ø LLDPE pipe to port LINE DRAIN. A little water comes out from the quick-connected pipe, depressurizing the module.
  3. Disconnect the pipe.
  4. Now it is possible to disconnect the pipe connected to port H2O OUT.

Electric connection

Connect the WTM to the mains using the proper power supply cables - 1.5 mm2 is sufficient. Brown (live), blue (neutral) and yellow/green (ground). Ensure to use the male connector in the correct orientation.



Power ON

When the water connections and the electrical connection are performed (see possible configurations below), it is possible to activate the magnetothermic switch (12) and let the WTM work.

CONFIGURATION 1

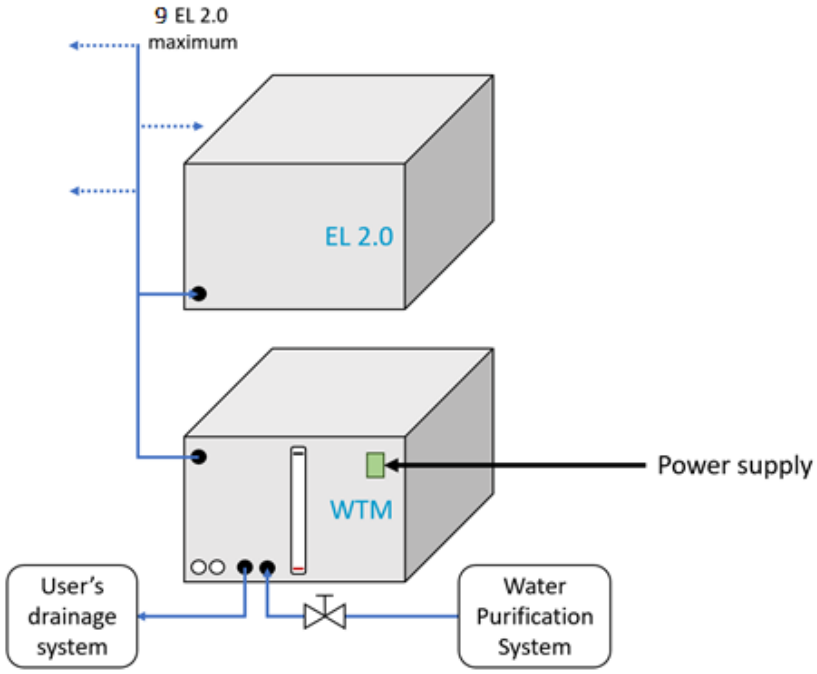


Figure 1: Connection with Enapter's electrolysers

- Turn "on" the system (label 12)
- The yellow led turns "on";
- If the manual valve between WTM and Water Purification System is open, the de-ionized water enters the tank inside the WTM, filling it;
- The green led turns "on" as soon as the level indicator shows that the water tank is filled for 2/3. This process requires some time; it depends on the adopted Water Purification System;
- If the electrolysers require water, the pump starts to work, provided that the green LED is "on" and the red LED is "off".

CONFIGURATION 2

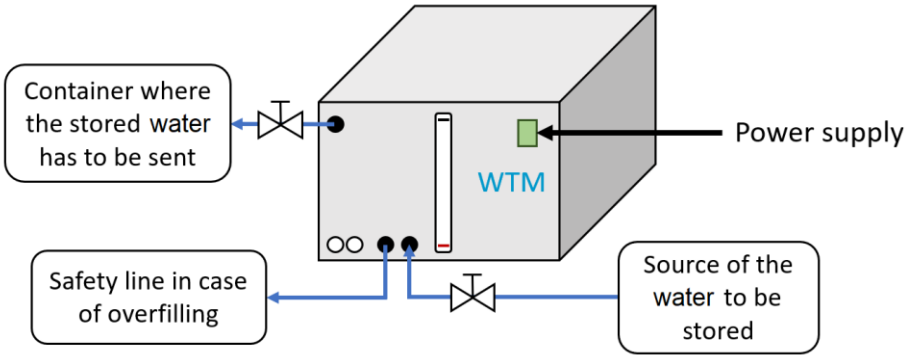


Figure 2 : General use of the WTM

- Turn “on” the system (label 12)
- The yellow led turns “on”;
- If the manual valve between WTM and source of water to be stored is open, this water enters the tank inside the WTM, filling it;
- The green led turns “on” as soon as the level indicator shows that the tank is filled for 2/3. This process requires some time; it depends on the pressure of the water coming from the source;
- When water is required (opening the manual valve on the outlet line of the WTM), the pump starts to work, provided that the green LED is “on.”

LEDs MEANING

Red led “on”: The pump circuit is not working correctly. The red LED can be “on” simultaneously with the yellow or the green LED).

Yellow led “on”: Not enough water inside the water tank.

Green led “on”: Proper functioning of the system. Except if also the red LED is “on”.

TROUBLESHOOTING

Yellow led:

- There is no water coming from the water source.
- The valve is not working correctly, check the fuse in the left fuse holder.
  If it is intact and there is no problem in the water supply, the electrovalve may be in overheating protection.

Red led:

- The pump is not working correctly, check the fuse in the right fuse holder. If it is intact, you may need to change the pump. Or there may be problems with the water line coming out from the WTM.

Red and green led:

- The water outlet line may have air inside that triggers an error. Make sure to fill the tube before turning on the WTM again.

You are ready to use the Water Tank Module 2.0.

Enjoy it!