UVGERMI®

ULTRAVIOLETS DE HAUTE TECHNOLOGIE

The specialist in microbiological water treatment using ultraviolet reactors

FRENCH MANUFACTURING

UVSTART W48

TECHNICAL MANUAL

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SOMMARY

I. ULTRAVIOLET TREATMENT

To ensure the potabilisation of water, it must be chemically potable *before* undergoing UV treatment.

Ultraviolet water treatment is a 100% physical process that mimics the disinfecting effect of sunlight using UV lamps.

Feed water may contain a significant number of microorganisms, some of which are harmless, while others may be pathogenic (such as fecal streptococci, fecal coliforms, Legionella, etc.).
To make the water drinkable, these bacteria must be completely removed.

The French drinking water standard for bacteriological quality is as follows:

- Escherichia coli: 0 CFU / 100 mL
- Enterococcus: 0 CFU / 100 mL
- Heterotrophic plate count at 22 °C: < 300 CFU / mL (recommended)
- Heterotrophic plate count at 37 °C: < 100 CFU / mL (recommended)
- Thermotolerant coliforms: 0 CFU / 100 mL
- Fecal streptococci: 0 CFU / 100 mL
- Sulfite-reducing anaerobic bacteria: 0 CFU / 100 mL

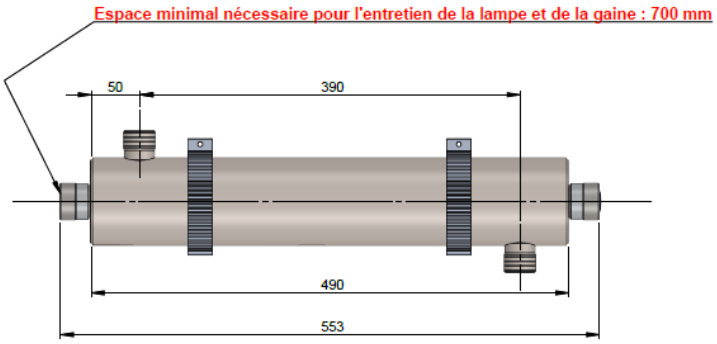
The UV lamp emits light with peak intensity at 253.7 nanometers. At this specific wavelength, both pathogenic and non-pathogenic microorganisms are completely inactivated, ensuring bacteriologically safe drinking water.

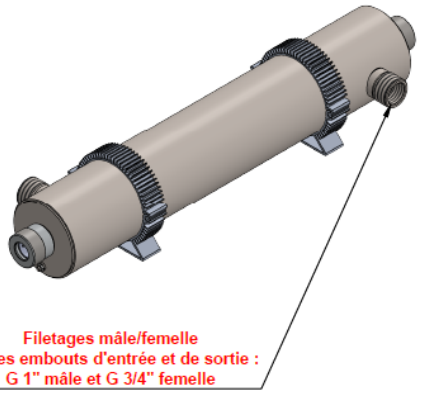
The UVSTART W48 can be used to treat well water, borehole water, or supply water contaminated with bacteria.

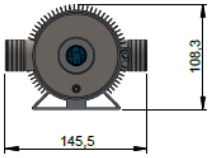
II. DESIGN

The UVSTART W48 is a closed cylindrical reactor made of food-grade stainless steel. It is equipped with a low-pressure mercury vapor lamp that emits at the germicidal wavelength of 253.7 nanometers, with an electrical power of 48 watts.

The UV lamp is powered by an electronic control unit.







Inside the treatment chamber, the UV lamp is housed in a quartz sleeve. This design prevents the lamp from being cooled by the flow of water, as its optimal operating temperature is around 40°C. The layer of air between the lamp and the quartz sleeve is sufficient to maintain this temperature. The quartz sleeve acts both as a physical barrier between the lamp and the water, and as electrical and thermal insulation.

Two aluminum mounting brackets serve a dual purpose: securing the reactor to the wall and dissipating heat during temperature rises, especially when there is no water flow.

The entire system is controlled by an electrical panel that manages lamp ignition, continuous operation, and records the number of operating days.

III. TECHNICAL DATA

Average flow rate (98% UV transmittance, 1 cm water layer, UV dose 40 mJ/cm²)	2.6 m^3/h
Power supply (V) – frequency (Hz)	230/50-60
Electrical power (W)	48
UV-C germicidal power at 254 nm (W)	18
Maximum operating pressure (bar)	6
Inlet – outlet water connections:	¾ female / 1'' BSPP male
Lamp specifications:	
1 lamp 48 W	Low-pressure mercury vapor UV emitter
Lamp useful life	16 000 hours
Reactor material	Food-grade stainless steel 304 TP
Total height (mm)	553
Width (mm)	145.5
Depth(mm)	108.3

IV. UVC DOSE

The recommended dose for drinking water treatment is a minimum of 40 mJ/cm² at every point within the treatment chamber.

UV Transmittance (%) of a 10 mm water layer	**Flow rate (m^3/h) à 25 mJ/cm²**	**Flow rate (m^3/h) à 30 mJ/cm²**	**Flow rate (m^3/h) à 40 mJ/cm²**
98	4.2	3.5	2.6
95	4.0	3.3	2.5
90	3.7	3.0	2.3

For a flow rate of 2.5 m³/h and a water UV transmittance of 95% (10 mm water layer), the delivered UV dose is 40 mJ/cm² at end of lamp life.

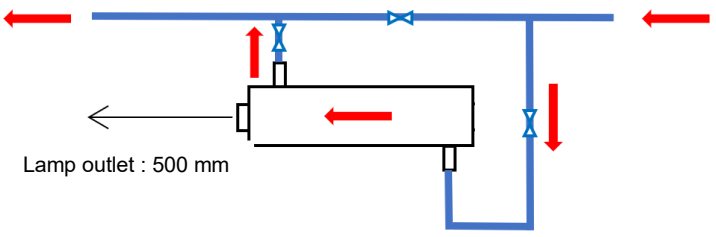
V. INSTALLATION

The UVSTART W48 is installed on the main water supply line. Its mounting system allows it to be fixed directly to the wall.

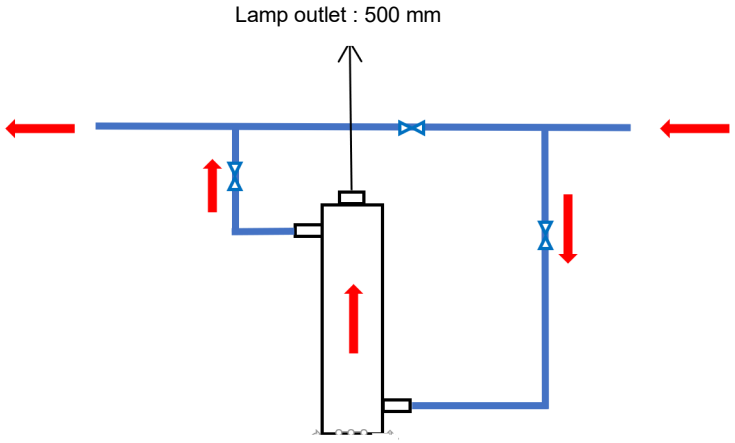
It can be installed in either a horizontal or vertical position. The inlet and outlet connections are ¾" female (20/27) and 1" male (26/34).

It is essential to always connect the water inlet to the lowest port on the reactor — this ensures filling from the bottom and air evacuation through the upper outlet.

Horizontal installation:



Vertical installation :



It is necessary to leave at least 550 mm of clearance on the lamp side of the UVSTART W48, or to ensure easy disassembly of the unit, in order to replace the UV lamp and clean the quartz sleeve.

The maximum operating pressure is 6 bar. It is recommended to install a pressure regulator upstream of the unit if the supply pressure exceeds this limit.

The effectiveness of the UV treatment depends on the clarity of the water. It is strongly recommended to install a pre-filtration system with a mesh size of 25 µm or finer to remove suspended solids before UV treatment.

The unit must be protected from freezing, excessive heat, and humidity. It must not be installed outdoors.

To ensure maximum effectiveness of the ultraviolet treatment, we recommend performing a shock disinfection of your plumbing system.

During this procedure, the UVSTART W48 must be switched off.

Depending on your system configuration, carry out one of the following shock disinfection methods:

Disinfection directly in the well or borehole:

- Pour between 250 mL and 500 mL of bleach (9.6%) per cubic meter of water into the well or borehole.
- Allow the solution to sit for 8 to 12 hours.
- Flush water through the entire household plumbing system until the chlorine odor disappears completely.
- Do not consume the water during this process.
- Once finished, switch on the UVSTART W48.

Disinfection of pipes when a filter is installed upstream of the UV reactor:

- Remove the filter cartridge.
- Fill the filter housing 2 to 3 times with a half-diluted bleach solution (9.6%).
- Flush water through the plumbing system until the chlorine odor disappears completely.
- Do not consume the water during this process.
- Reinstall the filter cartridge.
- Switch on the UVSTART W48.

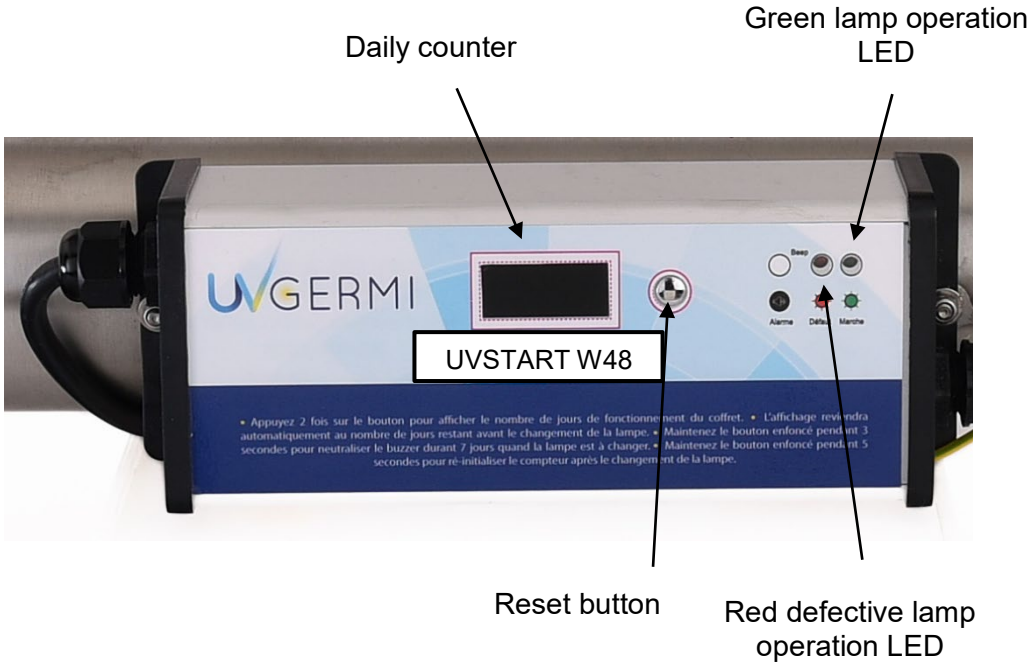
We recommend performing a shock disinfection of the plumbing system once per year.

VI. ELECTRICAL CONNECTION

The electrical connection is made using a 3-pins plug with grounding.
Before plugging in the unit, make sure the power supply matches the unit's rated voltage: 230 volts, 50/60 Hz.
Your electrical installation must be protected in accordance with standard NF C 15-100.
The ground wire from the control box must be connected to the reactor body.

VII. GETTING STARTED

Electrical box *:*



Operation :

Before switching on the unit, ensure that it is properly installed and that there are no leaks in the pipework.

Allow water to circulate through the reactor for 10 minutes before inserting the UV lamp into the stainless steel chamber. The lamp is delivered unmounted inside the reactor.
Make sure there is no water inside the quartz sleeve before inserting the lamp.

Plug in the unit. The green LED indicating lamp operation will turn on.

After a few seconds, the lamp will ignite. You can check the proper operation of the lamp via the green status LED on the control panel.

The digital display shows either the number of remaining operating days for the lamp (counting down from 365 to 0), or the total operating time of the control unit (counting up from 0 to 9999 days).
Briefly press the reset button to switch between the two displays.
After a few seconds, the display will automatically return to showing the number of days remaining before the lamp must be replaced.

The red LED lights up in the event of a lamp or ballast failure, or when the lamp reaches end of life.
The green LED remains on during normal operation.
An audible alarm is triggered in case of a fault:

- If the lamp is faulty, the alarm emits 1 beep per second.
- If the ballast is faulty, the alarm emits an intermittent signal (1-second beep followed by 5 seconds off).

To acknowledge the alarms (audible alarm and fault indicator), it is necessary to unplug the control unit and wait 30 seconds before restarting the system.

The UVSTART W48 must remain powered on at all times, even when there is no water consumption. It is normal for the water to be warm if no water has been drawn for several hours.

Frequent on/off cycles (more than 5 times in 24 hours) or operation without water inside the treatment chamber are not allowed, as they reduce the lifespan of the UV lamp.

The UVSTART W48 must operate with water temperatures between 5 °C and 60 °C. Exceeding this range may result in damage to the equipment.

VIII. SAFETY INSTRUCTIONS

Do not expose your eyes or skin directly to the UV lamp of the UVSTART W48.

Always switch off the lamp before performing any maintenance operations. If you need to inspect it, wear appropriate protective glasses (plastic safety glasses).

The UVSTART W48 must only be used for its intended purpose. It must not be used to treat flow rates higher than the recommended maximum.

Safety and proper operation are only guaranteed if the system is installed in accordance with the guidelines provided in this manual.

The treated water must not be colored or contain suspended solids. Filtration may be necessary. It is recommended to measure UV transmittance at 254 nm to ensure it is greater than 90%.

The water must be chemically and physically potable before UV treatment.

IX. MAINTENANCE

Maintenance is limited to replacing the UV lamp and sealing gaskets, and cleaning the quartz sleeve.

UV lamp

The UV lamp has a limited lifespan of 16 000 hours. Beyond this duration, water treatment is no longer guaranteed.

Lamp replacement :

- When the lamp is faulty.
- Mandatorily every 16,000 hours or every 2 years, even if the lamp is still operating (refer to the day counter). The lamp must be replaced every 2 years. However, the counter must be reset every year (365 days). The control unit emits a beep and displays the value “A3”. The reset procedure is printed on the label of the control unit.

An intermittent audible alarm and the value “A3” on the display indicate that the lamp has reached the end of its life. You must replace the lamp, even if it still appears to be working after 2 years. If immediate replacement is not possible, the alarm can be postponed for 7 days by pressing the reset button for 5 seconds. This operation can be repeated up to 4 times.

The quartz sleeve protecting the lamp makes lamp replacement simple: the UVSTART W48 does not need to be drained or disassembled.

Lamp replacement procedure :

- Disconnect the unit from power
- Remove the flexible cap covering the lamp
- Gently pull on the lamp cable to expose the connector
- Carefully disconnect the lamp from the connector by holding the lamp base firmly
- Secure the cable safely
- Remove the lamp manually
- Follow the steps in reverse to install the new lamp
- Reset the counter

To reset the lamp life counter after replacement : press and hold the reset button until "RESET" appears on the display. Continue holding for another 5 seconds until the display shows "0365" and the alarm sounds. Then release the button.

When replacing the lamp, avoid touching the glass directly. Clean the lamp with alcohol to remove any fingerprints.

Note: Like fluorescent tubes, a used UV lamp must be disposed of in accordance with national regulations (return to the manufacturer or take to a recycling center). It must not be discarded with regular household or industrial waste, as the lamp contains mercury particles.

Quartz sleeve and sealing gaskets

When the quartz sleeve protecting the lamp becomes dirty, water treatment efficiency is reduced.
It is necessary to remove and clean the quartz sleeve at least once a year.

This cleaning is done using a diluted acid solution (hydrochloric acid, phosphoric acid, vinegar, etc.).

Before cleaning the quartz sleeve, the water supply must be shut off and the pipes depressurized.

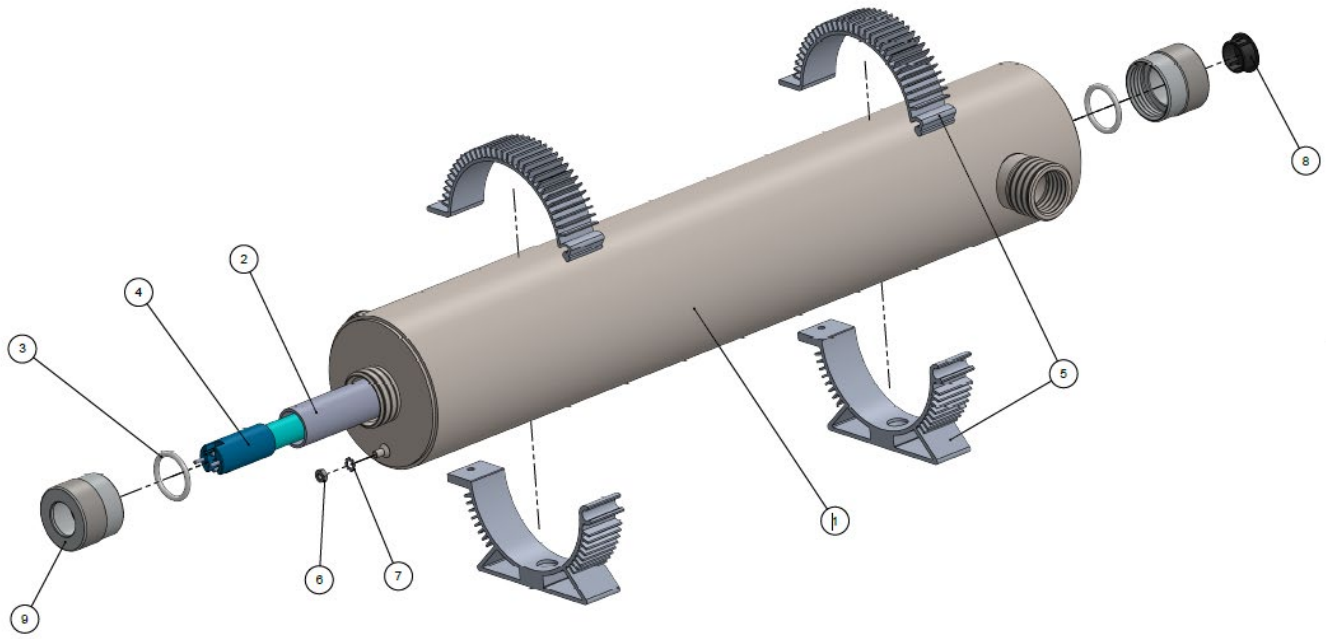
Quartz sleeve removal procedure :

- Switch off the unit
- Isolate the stainless steel chamber using the inlet and outlet valves
- Place a container under the UV reactor
- Remove the flexible cap covering the lamp
- Gently pull the lamp cable to reveal the connector
- Carefully disconnect the lamp from the connector by holding the base firmly
- Secure the cable
- Remove the lamp by hand and place it safely aside
- Unscrew the sealing nuts on both sides of the sleeve
- Hold the quartz sleeve in place
- Remove the O-rings and replace them
- Carefully slide the quartz sleeve out from either side in a straight, gentle motion
- Clean and rinse the sleeve
- Avoid getting water inside the sleeve. If any water gets in, dry the inside thoroughly

Quartz sleeve reassembly procedure:

- Carefully insert the dry sleeve through the reactor
- Place the new O-rings in the sealing nuts
- Hand-tighten the sealing nuts on both ends while centering the sleeve
- Fill the reactor with water and let it sit for 10 minutes to check for leaks
- After 10 minutes, reinstall the lamp
- Switch the unit back on

Exploded view of the UVSTART W48



Rep.	Article	Ind	Ind	Qté	Description
1	23000316	**A**	a	1	Ensemble mécanosoudé E/S M/F 1" - 3/4"
2	23000318	**A**	a	1	Gaine quartz ouverte des deux côtés 23 x 1,5 x 543 mm
3	19000086	**A**	a	2	Joint torique 23x3 NBR ACS
4	23000332	**A**	a	1	Lampe 48W 4 pins - UV GERMI
5	23000317	**A**	a	2	Collier de fixation en aluminium pour DN80
6	15000512	**A**	b	1	Ecrou M4 Inox (A2)
7	23000353	**A**	a	1	Rondelle GROWER M3 galva
8	23000354	**A**	a	1	Bouchon obturateur non fileté Ø 18,8 - 23 mm
9	24000014	**A**	a	2	Etanchéité lampe

X. TROUBLESHOOTING TABLE

SYMPTOM	POSSIBLE CAUSE	SOLUTION
The UV lamp does not light up, the green LED is off, the red LED is on, and the alarm beeps regularly (1 beep per second)	1- The lamp is not properly connected 2- The lamp is worn out or defective 3- One of the electronic components is faulty	1- Check the lamp connector 2- Replace the lamp 3- Contact your installer or after-sales service
The control unit no longer powers on	1- The power supply is defective 2- The control unit is out of order	1- Try a different power outlet 2- Contact your installer or after-sales service
Fault A3 The buzzer is sounding	1- The lamp has reached the end of its service life	1- Replace the lamp 2- Reset the counter to 365 days
Fault LF The buzzer is sounding	1- The lamp is no longer functioning 2- The connector is not properly plugged in	1- Replace the lamp and reset the counter to 365 days 2- Check the connector

XI. SPARE PARTS LIST

Code	Description	Qty	Ref. No.
23000354	Sealing cap	1	8
24000014	Open lamp sealing gasket	2	9
23000316	Welded mechanical assembly	1	1
24000096	Electrical control unit	1	/
23000332	48 W UV lamp, 4-pin	1	4
23000318	Quartz sleeve	1	2
19000086	O-ring 23 x 3 mm	2	3
23000317	Aluminum bracket	2	5

XII. DECLARATION OF CONFORMITY

Manufacturer's representative : UVGERMI

Hereby declares that the product described below, by virtue of its design and construction, complies with the applicable **CE directives**, in accordance with current safety and public health standards. Any modification of the product not approved by us shall render this declaration of conformity null and void.

Product designation: ULTRAVIOLET REACTOR

Model: UVSTART W48

Product serial number: See the number on the packaging box and on the electrical control unit

XIII. WARRANTY

The warranty for devices in the UVGERMI range is valid under the following conditions:

- 5 years for the stainless steel reactor (materials and welds), except in cases of use in highly corrosive environments (such as brackish or highly saline environments, seawater, proximity to acidic or corrosive products, or use of hydrochloric acid).

Warranty exclusions:

- Exceptional cases of corrosion, particularly electrolytic corrosion
- Damage caused by overpressure (e.g., water hammer)
- Exceeding the Maximum Operating Pressure
- Failure to comply with installation instructions
- Reactor operated without being pressurized or without water inside
- 1 year for all other components, excluding the UV lamp and sealing gaskets (considered consumables), and excluding the quartz sleeve in case of breakage

Warranty exclusions:

- Consumables (sealing gaskets, UV lamp, quartz sleeve breakage)
- Electrical components are not covered against overvoltage or lightning damage
- Modification or addition of components in the electrical cabinet
- Use of spare parts not supplied by UVGERMI
- Failure to comply with installation instructions
- Reactor operated without being pressurized
- Failure to comply with operating and maintenance guidelines

Caution: the quartz sleeve and the UV lamp are not covered under warranty in case of breakage.

Defective parts must be returned along with the name of the device and its serial number (located on the electrical control unit) to the company UVGERMI, which will proceed with a replacement after technical inspection.

- The warranty takes effect from the date of invoice to the customer. A copy of the invoice must be sent to UVGERMI along with the returned defective parts.
- In the event of non-compliance with the installation rules or user instructions, UVGERMI cannot be held liable and the warranty will not apply.

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