



# Ultraviolet 40S – 60S

## TECHNICAL DATA SHEET



M012-76 – Rev. 00 - 04/2018

The devices described in this manual are ultraviolet (UV-C) water sterilisers, with the ultraviolet light generated by special low pressure mercury-vapour lamps, also called germicide lamps. The lamps are located within the sterilisation chamber, protected by a quartz tube that isolates them from direct contact with water and irradiate water passing through the sterilisation chamber with ultraviolet light. The wavelength of the ultraviolet rays is 254nm (maximum sterilisation capacity).

When the ultraviolet germicide energy comes into contact with bacteria, viruses, lactic ferments, algae, protozoa, etc. that may be present in the water, it enters the external membrane of the cell and destroys its DNA (Deoxyribonucleic acid), the fundamental building block of all living organisms.

The ultraviolet steriliser allows eliminating micro-organisms passing through it almost entirely (over 99%), if the UV ray dosing parameters and the water energy absorption coefficient are met. In order to fully destroy most bacteria, the required dose is at least 13,000 units of UV energy with wavelength of 254nm. The energy (or dosing) unit is in MicroWattsecond/cm<sup>2</sup>. The "S" series ultraviolet systems have a dosing capacity of 40,000 MicroWattsecond/cm<sup>2</sup> at the flow rate listed in the following table.

### ENERGY ABSORPTION COEFFICIENT

This is a lab measurement to calculate the UV energy absorbed by the water. The higher the value, the lower is the diffusion of UV rays through the body of water and therefore its bactericide power. The optimal dosing value is achieved when the absorption coefficient is lower than 0.1 and this is reached if water coming into the steriliser has the following minimum quality specification. Normally the inverse value is used, i.e. the Transmittance T10 which is the percentage of UV light that passes through a thickness of 10mm of water. The higher this value, the deeper the UV-C lights enters efficiently into the water. Transmittance T10 for drinking water is always higher than 96%.

### OPERATING LIMITS FOR INFEEED WATER

Turbidity	: 1 NTU max
Suspended solids	: 2mg/l max
Manganese	: 0.05mg/l max
Iron	: 0.3mg/l max
Hydrogen sulphide	: 0.05mg/l max
Colour	: absent
pH	: 6.5-9.5

### SHIPMENT

The system is shipped in a single package on a pallet. The package includes another box containing the lamps and quartz tubes.

**WARNING:** do not remove the UV ray lamp from the packaged before having installed the hydraulic and electrical components of the system.

## WARNINGS

- **Equipment used to treat drinking water in compliance with the provisions of M.D. 25/2012.**
- See the technical manual supplied with the systems for all information and warnings.
- **The installation must be performed by qualified personnel, in compliance with M.D. 37/08 and the best practices, according to the instructions of the technical manual.**
- Any handling, installation, maintenance and repairs of the systems must be performed by trained qualified personnel, in compliance with M.D. 37/08 and the best practices, according to the instructions of the technical manual.
- The room where systems, accessory material and consumables are located must meet the safety, operation and storage requirements set out by current regulations.
- Water produced by each device must be used for the specific use it is intended to. Culligan will not be liable for the consequences of improper use of water generated by its equipment.
- Any system malfunctions must be timely communicated to the Culligan support centre. Culligan will not be liable for the consequences of continuous use of a system that has shown malfunctions.
- When necessary, the selection, dosing and handling of chemicals must be performed by professional qualified personnel in accordance with the instructions by Culligan and the Material Safety Data Sheets.
- Disposal of waste or consumables of the water treatment systems must be compliant with current regulations.
- Do not place the equipment on top of other appliances.
- Place the equipment away from heat sources.
- In case of faults (water leaks or other), disconnect the power supply and close the water inlet shut-off cock.
- If water is not delivered for more than 24 hours, empty the treated water accumulation tank completely and wait for it to be filled up again before using it.
- Culligan will also not be held liable in the following specific cases:
  - improper use of the equipment;
  - use in violation of specific national regulations (power supply, installation and maintenance);
  - installation performed without following the instructions of this manual;
  - supply faults (electrical discharges, voltage drops, water supply overpressure, low water pressure);
  - unsuitable operating environment temperature;
  - lack of required maintenance;
  - unauthorised modifications or operations;
  - use of non-genuine spare parts or spare parts that are not specific for that model;
  - total or partial failure to follow instructions;

the operator must adopt common sense when using the equipment for anything else that is not explicitly specified.

## WARRANTY

The system has a two-year warranty, according to the Culligan certificate/warranty request. The warranty is null and void if the system and/or its components are tampered with or damaged by supply overvoltage. The warranty is null and void when conditions or use are different than the intended use of the system.

## TECHNICAL DATA

The S Series UV ray sterilisers include:

- 1 Cylindrical AISI 316 L stainless steel sterilising chamber with threaded and/or flanged fittings. The sterilising chamber is already set up to install the UV-meter sensor and the gas F 3/8" hole to install the pit of the thermostat.
- 1 Epoxy-painted steel electrical panel containing the electronic boards (ballast) to turn on the lamps (high-frequency operation).

It is fitted with:

- 0-1 switch
- Microcontroller with backlit LCD display with 3 warning lights (line, alarm, operation) that displays the following functions:
  - Lamp operation status
  - Resettable lamp duration hour meter (**Lamp hours**)
  - Non-resettable system duration hour meter (**Tot. hours**)
  - Alarms
- Low pressure mercury-vapour lamps with *Slimline* quartz bulb, with four connection pins on a single end.
- Tubes (quartz sleeves) and O-Ring pressing caps for hydraulic sealing.

## OPTIONAL DEVICES

- UV-METER
- Temperature adjustment with double operating set
- Sight glass
- Drain kit

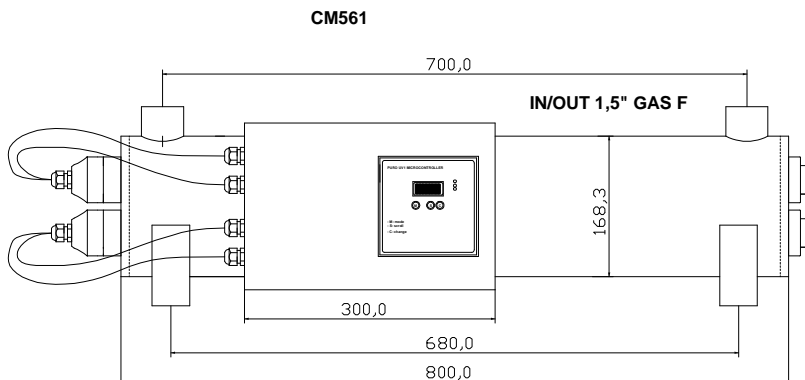
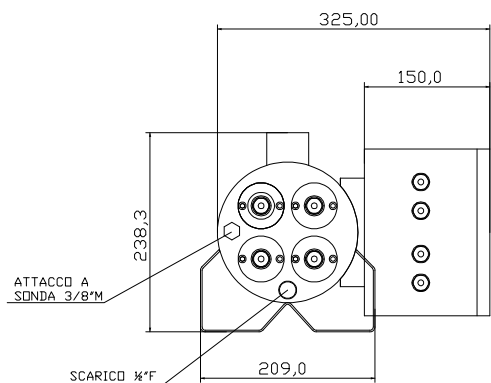
## LAMP IGNITION SYSTEM

The UV lamp operation is controlled by ballasts. Ballasts are high-frequency electronic reactors that increase voltage and ignite and supply UV germicide fluorescent lamps. These are ballasts with pre-heating ignition in order not to shock the lamps excessively during ignition. The ballasts are fitted with network sinusoidal absorption and filtering system (PFC) in order not to create interferences on the network, and are self-protected, i.e. they automatically switch off if the lamps cannot be ignited. Each ballast turns on two lamps. Each germicide lamp has a power of 40W, 14 of which are UV-C watts at 254Nm. Avoid turning the lamps on and off rapidly. The average estimate duration of the lamps is 9000 hours. The LED display on the panel shows the operating status of the lamps; when a lamp does not turn on, or turns off during operation, the LCD display shows the relevant alarm.

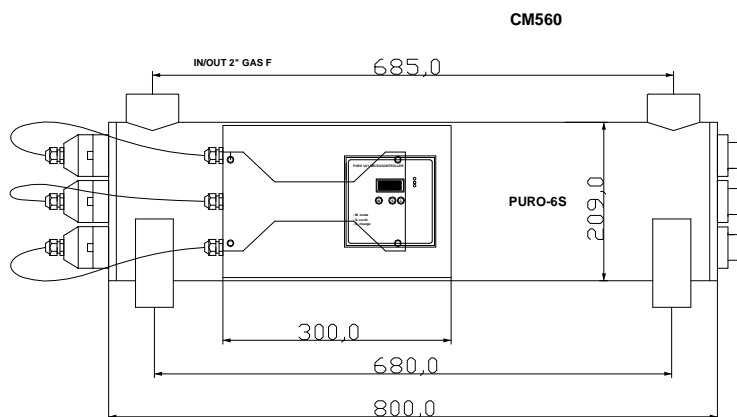
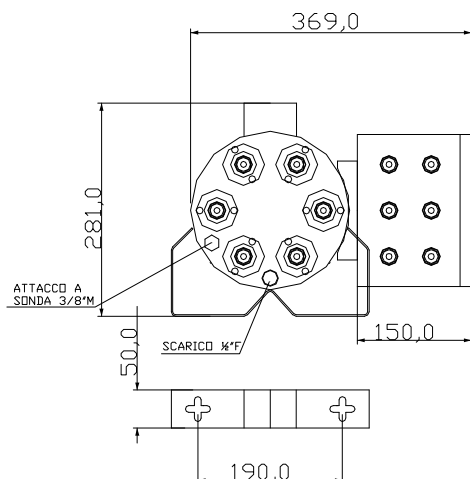
## TURBULATOR

All "S" series systems are fitted with a turbulence system. Partitions (walls) perpendicular with the flow are located in the sterilising chamber, forcing the flow to cross the lamp beam several times in order to better irradiate it. The same system also noticeably facilitate assembling and removing the quartz tubes, as it acts as a guide for them.

## SIZE



**UV 40 S**



**UV 60 S**

ATTACCO A SONDA 3/8	PROBE FITTING 3/8
SCARICO	DRAIN

**Table 1**

## TECHNICAL DATA

Ultraviolet model	Maximum flow rate m <sup>3</sup> /h *	Power absorbed by the system VA	Lamp power W	Weight	
				During operation	For shipment
<b>40S</b>	11.5	210	4 x 40	51 kg	45 kg
<b>60S</b>	17	300	6 x 40	60 kg	52 kg



- **Maximum operating pressure** : **8bar**
- **Operating temperature** : environment 4-45°C, water 2-80°C
- **Head loss at maximum flow rate** : 0.2bar
- **Power supply** : 230V~/ 50-60 Hz – single-phase

\* For primary water with irradiation 400 J/m<sup>2</sup> Transmittance T<sub>10</sub>>94%

## HYDRAULIC INSTALLATION: HYDRAULIC CONNECTION WITH BY-PASS

