ULTRAVIOLET DISINFECTION

# IT SERIES

## UV 80 IT

***MANUAL OF INSTALLATION, USE AND SERVICING***

English 01-2015 Rev. 06-2019 Rev.C

# *INDEX*

# 1. Introduction

This manual is for the following models of UV IT Series.

*UV 80 IT*

This Pressure UV Systems is manufactured by **S.I.T.A. s.r.l.**

These operating instructions contain important information for the operation and maintenance of the equipment.

Please ensure that these operating instructions are carefully read by all relevant persons before putting into operation, to ensure the safe use of the UV system. The operating instructions are an integral part of the equipment supply.

Before putting into operation, all the conditions necessary for safe operation of the equipment must be fulfilled.

The installation, commissioning and maintenance of the equipment should only be carried out by qualified personnel.

The equipment should only be operated by authorized personnel who have been trained accordingly.

No modifications should be made to the equipment without consulting S.I.T.A., as this could effect the safe operation of the unit. S.I.T.A. shall not be held responsible for damage resulting from unapproved modifications.

**INSTRUCTION:**

*The operating instructions are to be kept where they will be accessible for operating and maintenance personnel.*

# 2. General Principles

The ***UV 80 IT SERIES*** sterilizers have been planned specially for destroying harmful bacteria and viruses present in your water.
Their working is based on a physical principle which is a warrant of security: the output of ultra-violet irradiation.
The UV light given out by special mercury fumes lamps (UV-C rays λ= 254nm) is highly germicidal because it interacts with DNA and RNA, at a molecular level.
The deep bio-structural disorder caused by such irradiation interferes with the development and the ability of reproduction of every kind of micro-organism, making it harmless.
Generally it is better to mount a pre-filter before the UV sterilizer, in this way the impurities of every nature and consistence are kept.
This system comes to be necessary if we want to have a high degree of sterilization, infact the non-filtration and removal of suspended particles in the water has, as a consequence, a decrease of the sterilizer's efficiency.
If the water to be treated contains sulphydric acid or more than 0.3 p.p.m. of iron or filtrable solids, once passed through the sterilizer, it leaves a residual sediment on the quartz sleeve, which, therefore, must be periodically cleaned (the frequency depends on the quantity and quality of water treated).
The sterilization equipment is constituted by different electronical and electromechanical components assembled in such a way to realize effectively the sterilization process, giving a bacteriologically pure water.

## *GENERAL DIRECTIONS*

According to the European rules EN 60204-1 (safety of the set-up off the electrical equipment-general rules) the low tension electrical instruments (rule 2014/35/CE) must be connected to a current-tap provided with grounding.

## *SAFETY DIRECTIONS*

The light of ultra-violet lamps can cause serious burns to unprotected skin and eyes, therefore it is recommended not to connect it to the current tap without having before ensured the UV lamp in its housing and inserted the PVC cover.

## *INDICATIONS FOR THE DISPOSAL*

We remind that, according to what is fixed by D.L. 4 May 2014, N°27 "Accomplishment of directive 2011/65/CE, concerning the reduction of dangerous subrtances in electric and electronic equipments" both mercury vapours lamps and electrical panels, when no more used, must be considered as special waste, and in the same way disposed of.
To do that, it is possible to address to specialized centres for the recovery of dangerous materials, or to contact directly our technical department.

## *ELECTRICITY*

The lightning flash and arrowhead symbol is to alert the user to the presence of un-insulated "DANGEROUS VOLTAGE" within the enclosure.

The equipment may only be opened if the mains supply is isolated. The mains supply must not be restored as long as the equipment is open. This applies to both the electrical control panel and the reactor vessel.

Attention:

Working on live equipment is forbidden.

INFORMATION TO USERS pursuant to art. 14 of the 2012/19 / EU DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 on waste electrical and electronic equipment (WEEE)

The crossed bin symbol on the appliance or on its packaging indicates that the product at the end of its useful life must be collected separately and not disposed of together with other mixed urban waste.

Please contact your municipality, or local authority, for all information regarding the separate collection systems available in the area. The retailer is obliged to collect the old equipment free of charge when buying new equipment of an equivalent type, for the purpose of starting the correct recycling / disposal.

Appropriate separate collection for the subsequent start-up of the disused equipment for recycling, treatment and environmentally compatible disposal helps to avoid possible negative effects on the environment and on health and favors the re-use and / or recycling of the materials it is composed of the equipment

## *INSTALLATION GUIDANCE*

The reactor control panel utilises air cooling. The following guidelines must be adhered to when locating the unit.

The reactor and control panel must not be located in a position where the ambient air temperature exceeds 40ºC.

The reactor and control panel must not be located adjacent to other equipment that directly emit heat

The reactor and control panel must not be located adjacent any chemical equipment that is likely to emit fumes.

The reactor should be located within the piping system in such a manner as to ensure that sufficient clearance is available in a horizontal direction to allow for lamp replacement and wiper maintenance. See the relevant data information included in this manual.

The reactor must be positioned with the side flanged pipe connections pointing in an upwards direction.

Never install the reactor in a position directly adjacent to chemical dosing points.

# 3. Permissible operating range (data) according to ÖNORM M5873-1:2001

Permissible range of operation is the result of typetest according to ÖNORM M5873-1:2001.
For each UV-transmittance (%) is reported the minimum reference irradiance ($W/m^2$) and the maximum flow ($m^3/h$) considering that the minimum Reduction Equivalent Fluence demanded is 400 $J/m^2$.

| UV 80 IT | | | |
|---|---|---|---|
| **UV-trasmittance %T100 (100mm)** | **UV-trasmittance %T10 (10mm)** | **Minimum reference irradiance Emin** | **Maximum flow Qmax** |
| **%** | **%** | **W/m2** | **m3/h** |
| < 9 | < 78,6 | not permitted | 0,00 |
| 9 | 78,6 | 97,14 | 14,59 |
| 10 | 79,4 | 100,48 | 15,90 |
| 11 | 80,2 | 103,54 | 17,14 |
| 12 | 80,9 | 106,36 | 18,32 |
| 13 | 81,5 | 108,98 | 19,45 |
| 14 | 82,2 | 111,44 | 20,53 |
| 15 | 82,7 | 113,76 | 21,57 |
| 16 | 83,3 | 115,95 | 22,57 |
| 17 | 83,8 | 118,04 | 23,55 |
| 18 | 84,2 | 120,03 | 24,50 |
| 19 | 84,7 | 121,95 | 25,43 |
| 20 | 85,1 | 123,80 | 26,35 |
| 21 | 85,6 | 125,60 | 27,24 |
| 22 | 85,9 | 127,34 | 28,13 |
| 23 | 86,3 | 129,04 | 29,00 |
| 24 | 86,7 | 130,70 | 29,87 |
| 25 | 87,1 | 132,33 | 30,73 |
| 26 | 87,4 | 133,93 | 31,59 |
| 27 | 87,7 | 135,51 | 32,45 |
| 28 | 88,0 | 137,07 | 33,31 |
| 29 | 88,4 | 138,62 | 34,16 |
| 30 | 88,7 | 140,15 | 35,02 |
| 31 | 88,9 | 141,67 | 35,89 |
| 32 | 89,2 | 143,18 | 36,75 |
| 33 | 89,5 | 144,68 | 37,63 |
| 34 | 89,8 | 146,18 | 38,51 |
| 35 | 90,0 | 147,68 | 39,39 |
| 36 | 90,3 | 149,17 | 40,29 |
| 37 | 90,5 | 150,67 | 41,19 |
| 38 | 90,8 | 152,16 | 42,10 |
| 39 | 91,0 | 153,65 | 43,03 |
| 40 | 91,2 | 155,15 | 43,96 |
| 41 | 91,5 | 156,64 | 44,90 |
| 42 | 91,7 | 158,14 | 45,86 |
| 43 | 91,9 | 159,65 | 46,82 |
| 44 | 92,1 | 161,16 | 47,80 |
| 45 | 92,3 | 162,67 | 48,79 |
| 46 | 92,5 | 164,18 | 49,79 |

| | | | |
|---|---|---|---|
| 47 | 92,7 | 165,70 | 50,80 |
| 48 | 92,9 | 167,22 | 51,83 |
| 49 | 93,1 | 168,75 | 52,86 |
| 50 | 93,3 | 170,28 | 53,91 |
| 51 | 93,5 | 171,81 | 54,98 |
| 52 | 93,7 | 173,35 | 56,05 |
| 53 | 93,8 | 174,89 | 57,14 |
| 54 | 94,0 | 176,43 | 58,23 |
| 55 | 94,2 | 177,98 | 59,34 |
| 56 | 94,4 | 179,53 | 60,47 |
| 57 | 94,5 | 181,08 | 61,60 |
| 58 | 94,7 | 182,63 | 62,74 |
| 59 | 94,9 | 184,19 | 63,90 |
| 60 | 95,0 | 185,74 | 65,06 |
| 61 | 95,2 | 187,30 | 66,24 |
| 62 | 95,3 | 188,85 | 67,42 |
| 63 | 95,5 | 190,40 | 68,61 |
| 64 | 95,6 | 191,95 | 69,82 |
| 65 | 95,8 | 193,50 | 71,03 |
| 66 | 95,9 | 195,05 | 72,24 |
| 67 | 96,1 | 196,59 | 72,24 |
| 68 | 96,2 | 198,13 | 72,24 |
| 69 | 96,4 | 199,67 | 72,24 |
| 70 | 96,5 | 201,19 | 72,24 |
| 71 | 96,6 | 202,72 | 72,24 |
| 72 | 96,8 | 204,23 | 72,24 |
| 73 | 96,9 | 205,74 | 72,24 |
| 74 | 97,0 | 207,24 | 72,24 |
| 75 | 97,2 | 208,73 | 72,24 |
| 76 | 97,3 | 210,21 | 72,24 |
| 77 | 97,4 | 211,68 | 72,24 |
| 78 | 97,5 | 213,13 | 72,24 |
| 79 | 97,7 | 214,58 | 72,24 |
| 80 | 97,8 | 216,01 | 72,24 |
| 81 | 97,9 | 217,43 | 72,24 |
| 82 | 98,0 | 218,83 | 72,24 |
| 83 | 98,2 | 220,22 | 72,24 |
| 84 | 98,3 | 221,59 | 72,24 |
| 85 | 98,4 | 222,94 | 72,24 |
| 86 | 98,5 | 224,27 | 72,24 |

***Table max flow at each UVT obtained with interpolation of the test points results***

In the table is shown the maximum flow rate that the UV system can treat at each transmittance of the water.

eg. at water UVT(10) = **91%** the UV system can treat max 43.03 **$m^3/h$** . and the minimum irradiance is 153.65 $W/m^2$.

NOTE: In this condition the alarm threshold level of the UV system MUST be set at 153.65 $W/m^2$. Once that the end user knows approximately the UVT% of the water then he can check the min Irradiance in $W/m^2$ that the system can show to give at least 400 $J/m^2$.

An UV irradiance higher than the threshold level means that the dose is higher than 400 J/$m^2$ and this guarantee a good disinfection. If it's lower than the user must clean the quartz sleeves, clean the sensor measuring window or check the UVT% of the water. The irradiance threshold level can be set in the electrical panel.

# 4. Instruction for installation and servicing

General premise

The installation of the ***UV 80 IT SERIES*** sterilizer units must be carried out by specialized staff, scrupolously following the instructions given hereby. It has been moreover considered necessary to give some general information about the electrical and water connections.

**Cautions:** check that the UV panel is not connected to the power supply and that the tap of the water to be treated is turned off.

- Connect the delivery of the water to be treated to the special water connection
- Turn on water and check for possible leaks in any part of the unit
- Connect the plug to the current tap
- Check that the disinfected water comes out and that the LEDS on the panel of the control board, signal the correct working

Let the disinfected water flow down to outlet for at least 10 minutes before using it, in order to make the possible impurities present in the unit drain out.

NOTE: it is recommended to install a water filter directly before the UV sterilizer in order to remove the suspended particles, eventually present in the water to be treated, which could limit the efficiency of sterilization.

**CHECKS**

The ***UV 80 IT SERIES*** is ready for producing disinfected water, once the connection to the water system and to the electrical grid is carried out. The unit works automatically, the electronical boards which control the signals reaching the control panel, allow the visualization (or the sonorization) of the correct working or of anomalies which may occur during the operating of the unit.

**MAINTENANCE**

The UV System of ***UV 80 IT SERIES*** have been projected and realized by S.I.T.A. Srl with simple and functional principles which make the checking procedures and the periodical servicing particularly easy.

The main points which characterize the ordinary servicing are the following: check quarterly the quartz sleeves, which contain the UV lamps, in order to ensure the maximum disinfection, for the cleaning.

Maintenance work may only be carried out by personnel who have been trained and authorized for this work by the owner and/or user. The owner and/or user must ensure that the maintenance personnel are familiar with the safety measures and regulations, and that they also comply with them, in addition to having read and understood the operating instructions.

Only original replacement parts from the supplier must be used.

The following are the recommended service intervals for replacement parts:

UV lamp change - once per 14000 hours

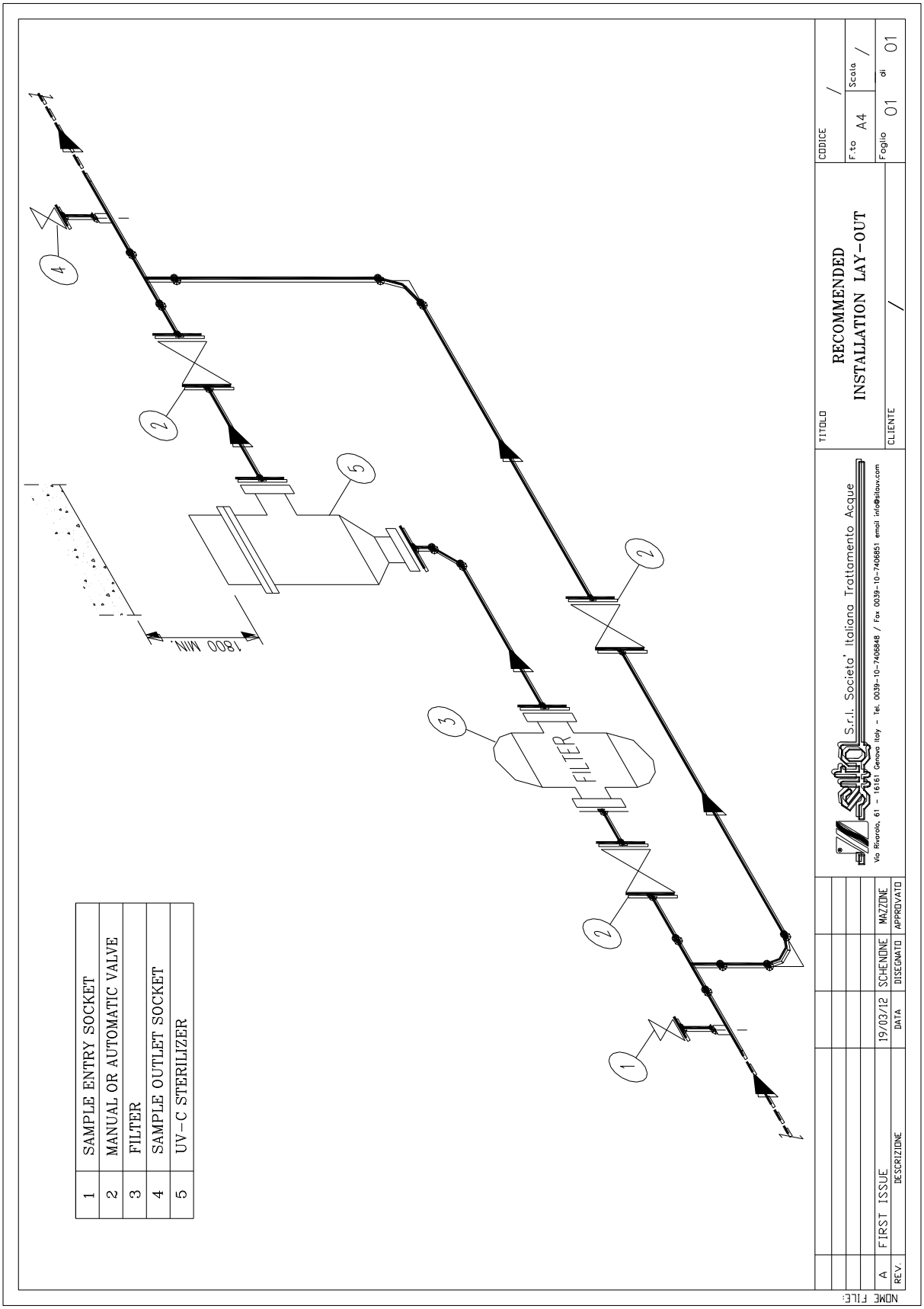
UV lamp o-ring change - once per year

UV lamp thimble clean - frequency depends on the quality of the water

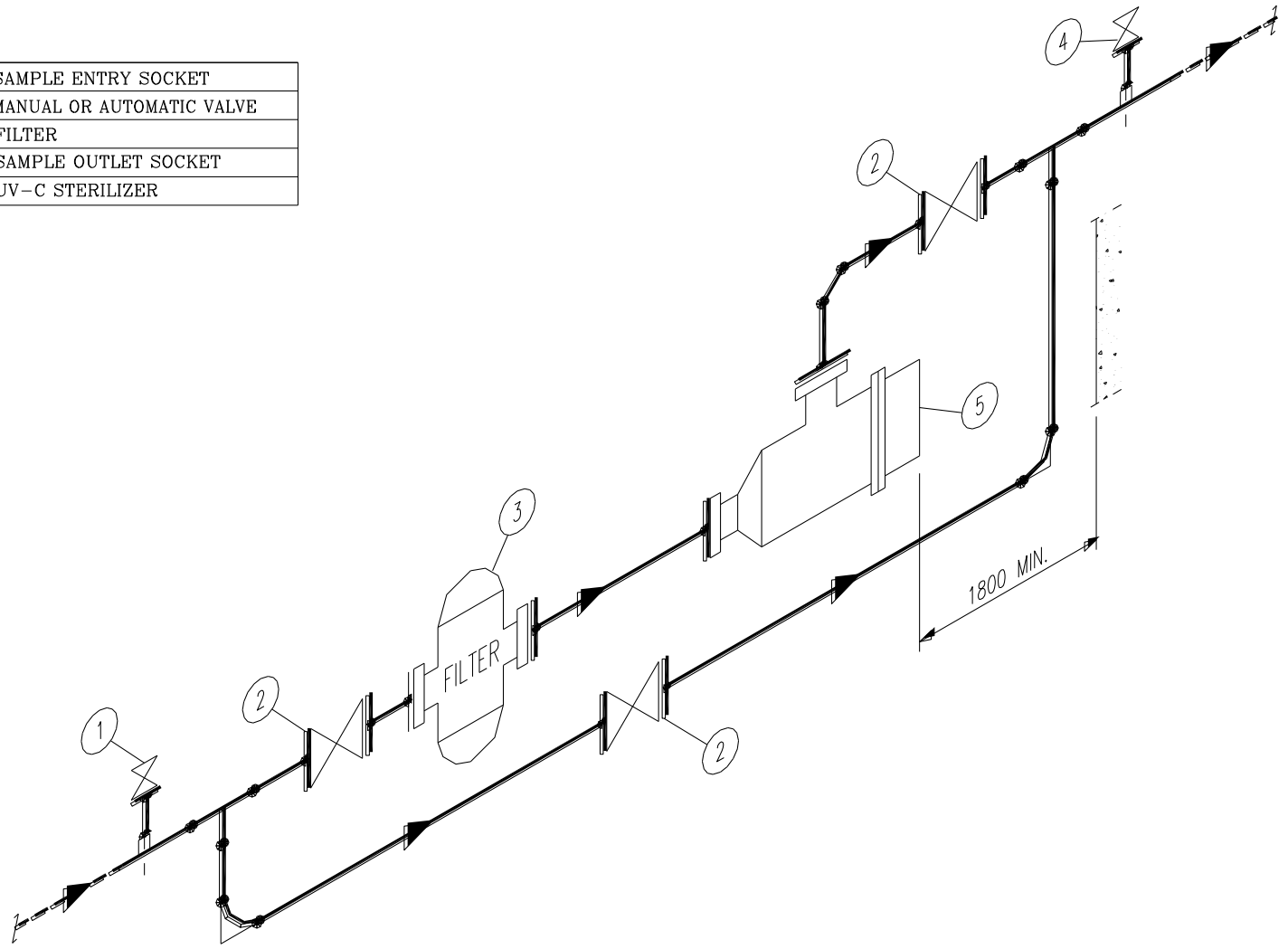
Control Panel filter mat - clean or change at same time as UV lamp change.

In addition the wiper drive mechanism should be inspected on a yearly basis.

## 4.1. Installation scheme recommended



| | |
|---|---|
| 1 | SAMPLE ENTRY SOCKET |
| 2 | MANUAL OR AUTOMATIC VALVE |
| 3 | FILTER |
| 4 | SAMPLE OUTLET SOCKET |
| 5 | UV–C STERILIZER |




NOME FILE:

| REV. | DESCRIZIONE | DATA | DISEGNATO | APPROVATO |
|---|---|---|---|---|
| A | FIRST ISSUE | 19/03/12 | SCHENONE | MAZZONE |


S.r.l. Societa' Italiana Trattamento Acque
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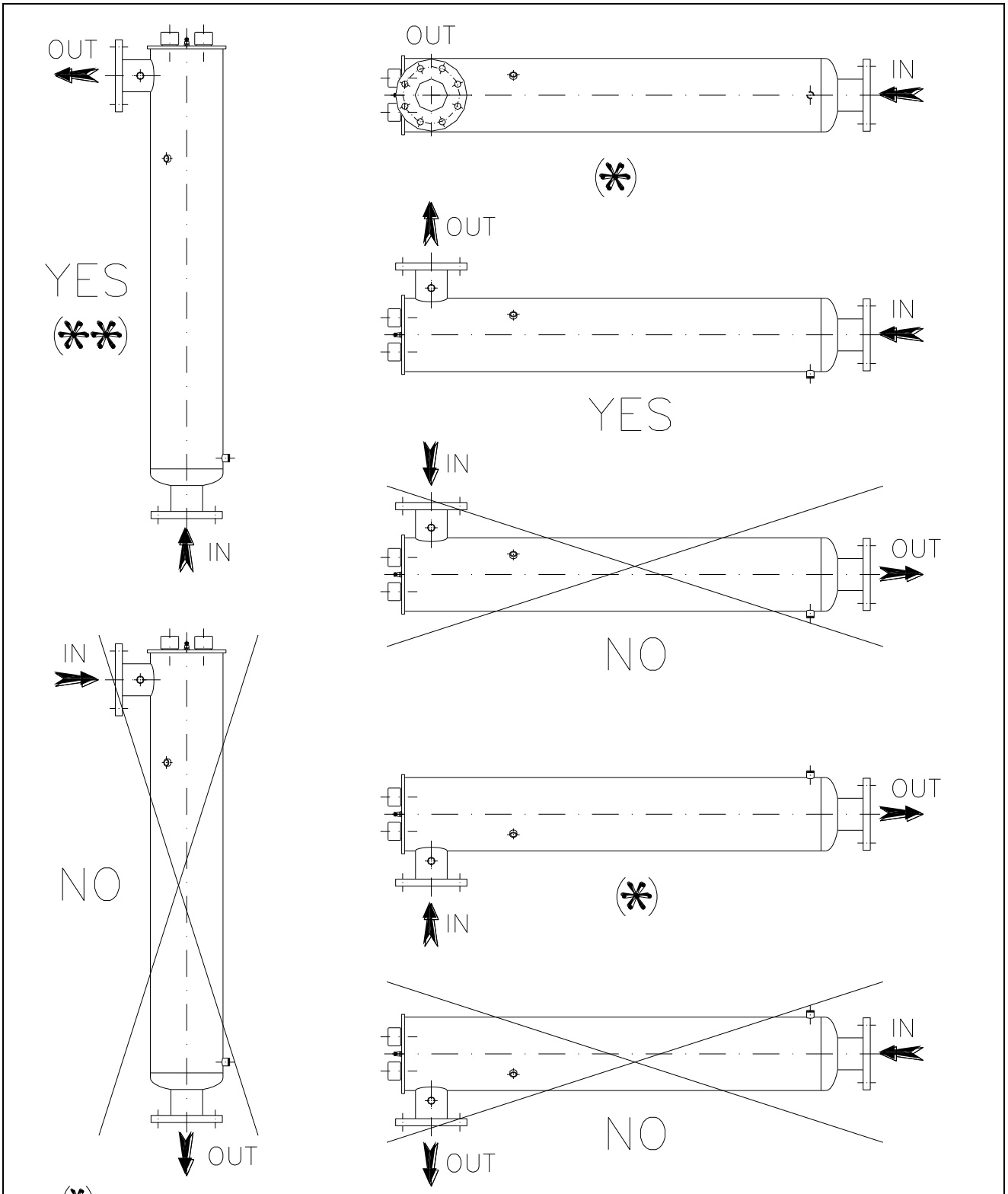
TITOLO
RECOMMENDED
INSTALLATION LAY–OUT

CLIENTE /

CODICE /

F.to A4 | Scala /

Foglio 01 di 01



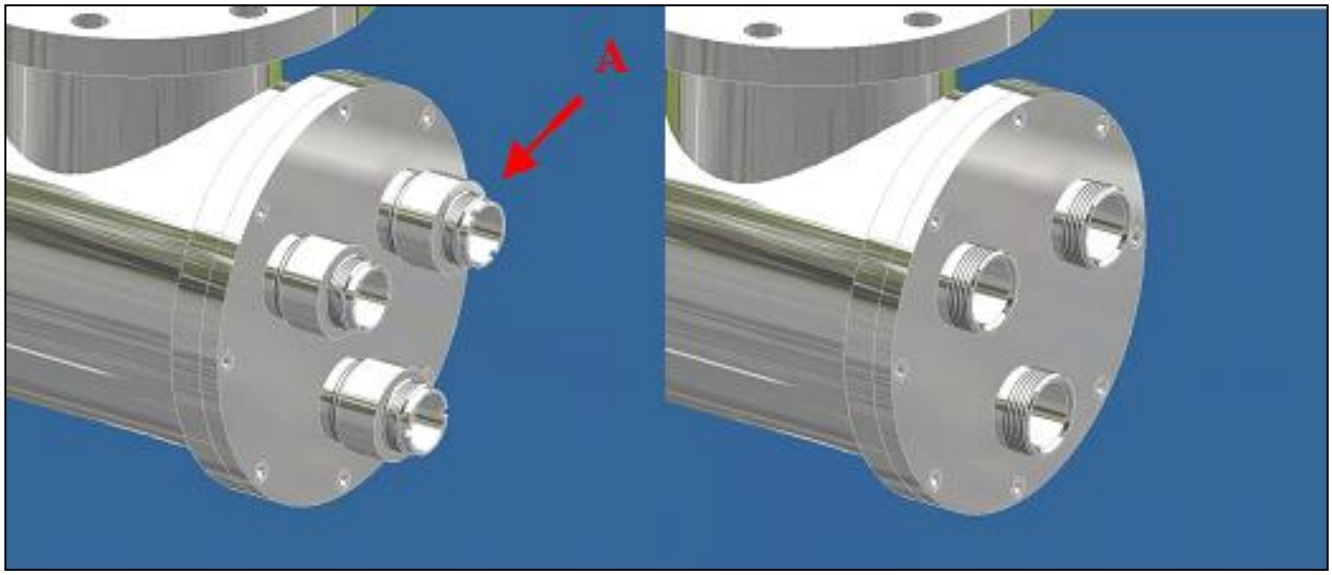

(*) _ NON CONSIGLIABILE (POSSIBILI ACCUMULI DI ARIA / IMPIANTO NON COMPLETAMENTE SCARICABILE)
_ NOT SUGGESTED (POSSIBLE AIR IN THE CHAMBER / CHAMBER NOT FULLY DRAINABLE)

(**) _ NON CONSIGLIABILE PER UV 80, 120, 200, 400 IT (CONTATTARE IL PRODUTTORE PER QUESTO TIPO DI APPLICAZIONE)
_ NOT SUGGESTED FOR UV 80, 120, 200, 400 IT (FOR THIS TYPE OF INSTALLATION, PLEASE CONTACT THE MANUFACTURER)

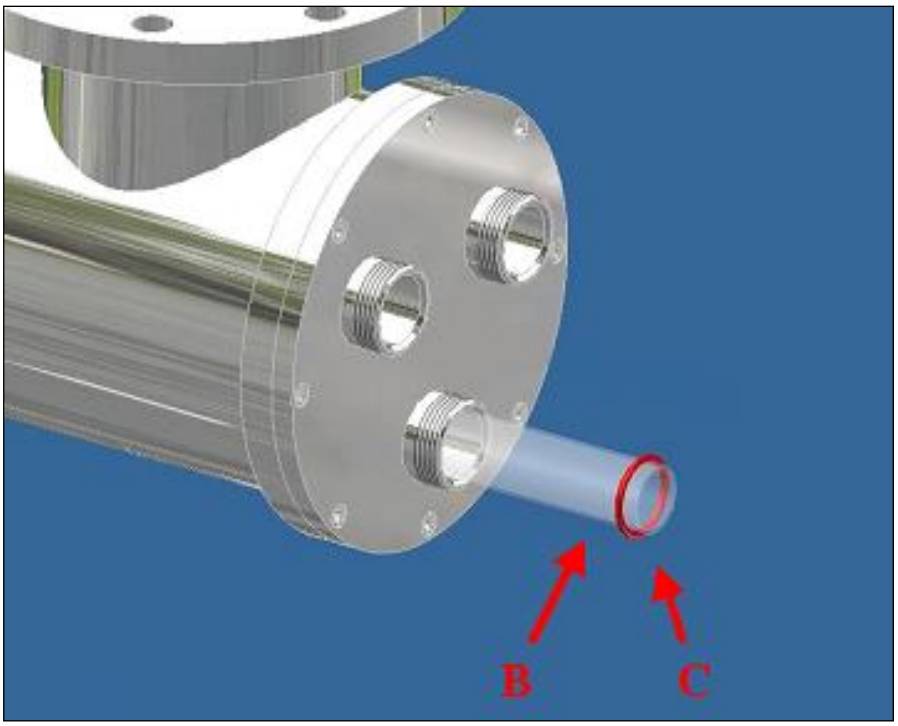
# 5. The UV Chamber Installation

## 5.1. Assembling of the UV chamber

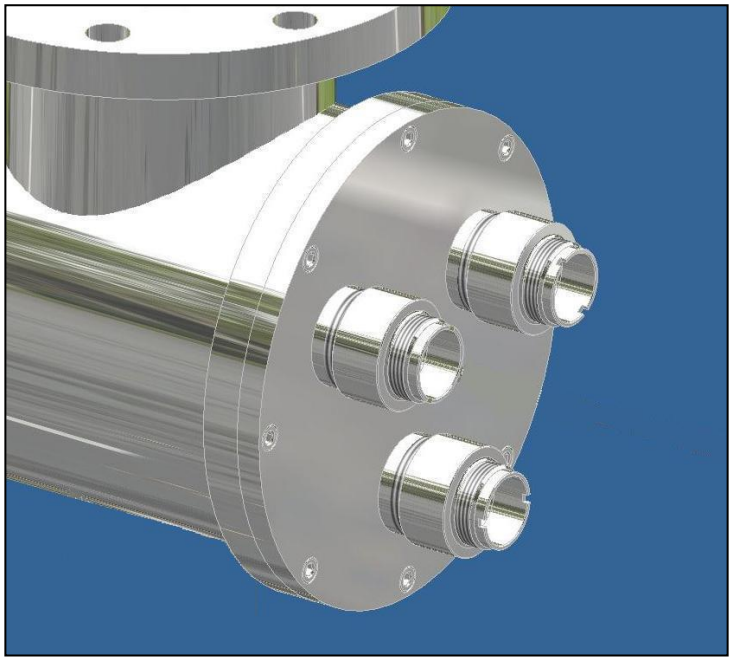
● Unscrew the s/s sleeve bolts (A) from both sides by using the key supplied.



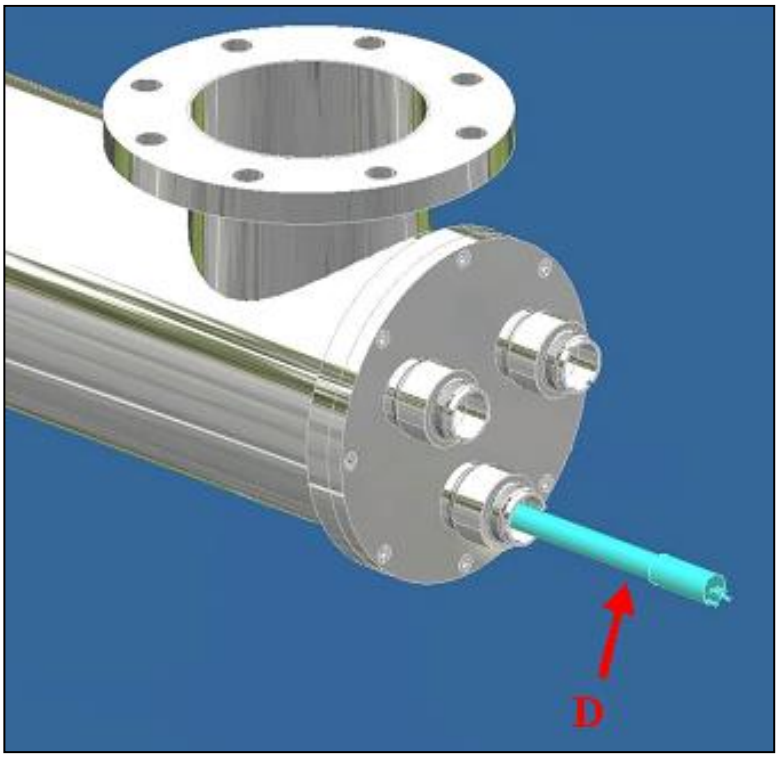

● Insert the quartz sleeves (B) by using the special bar supplied and the o-rings 38x4 (C) on both sides of the quartz sleeves.



● Screw again the s/s sleeve bolts on both sides of the UV chamber, and carry out the hydraulic test, verifying that the o-rings are watertight and that no water leaks outside the sleeve bolts or inside the quartz sleeves.

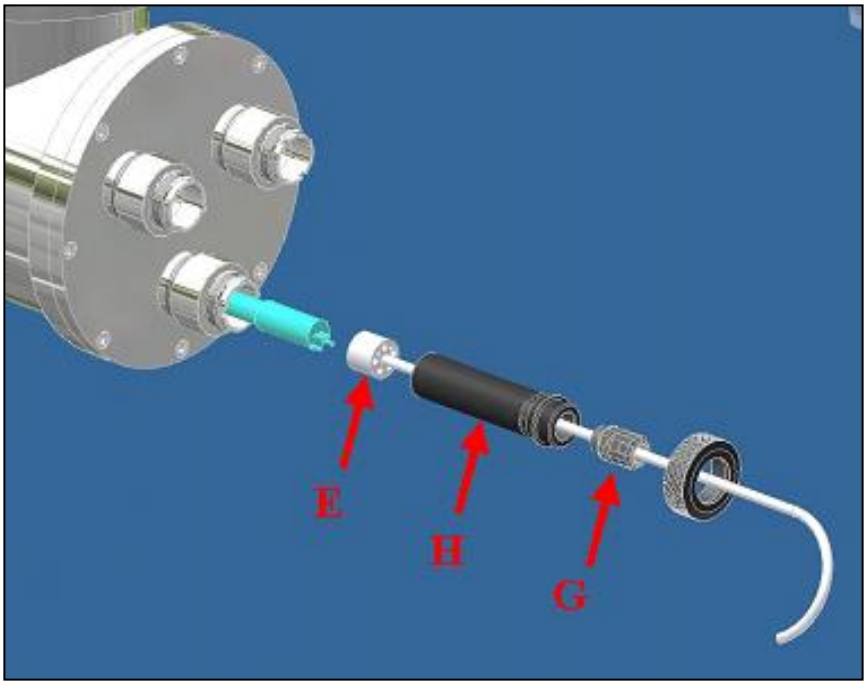


● On the openable side of the UV chamber, insert the UV-C lamps (D) into the quartz sleeve previously mounted.

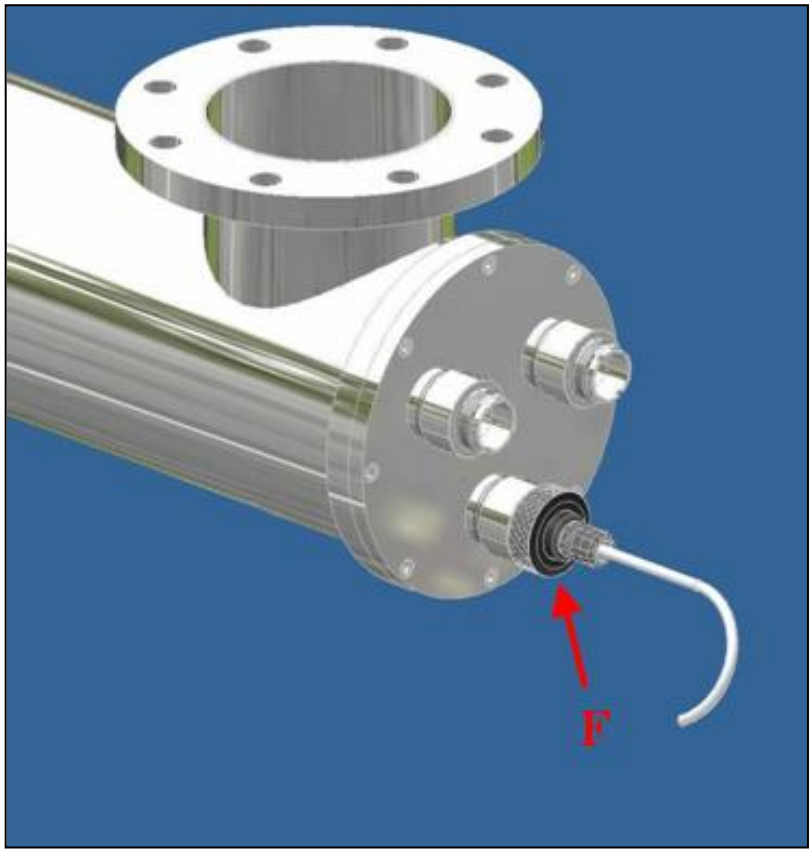


● Each lamps has 2 wires connected from the top to the bottom .Lamps must be inserted into the chamber with these wires in the opposite side to the sensor.
To do this the two pins (signed with the red circle in the photo below) must be in the opposite side to the sensor.


● Connect to the UV-C lamps the 4-pins connectors (E) mounted as on the figure together with the Ø 1 ¼" ring nuts (F), the PG9 nipples (G), and the 4-pins holders in black polyethylene (H) with the pertinent o-rings 2112 type.

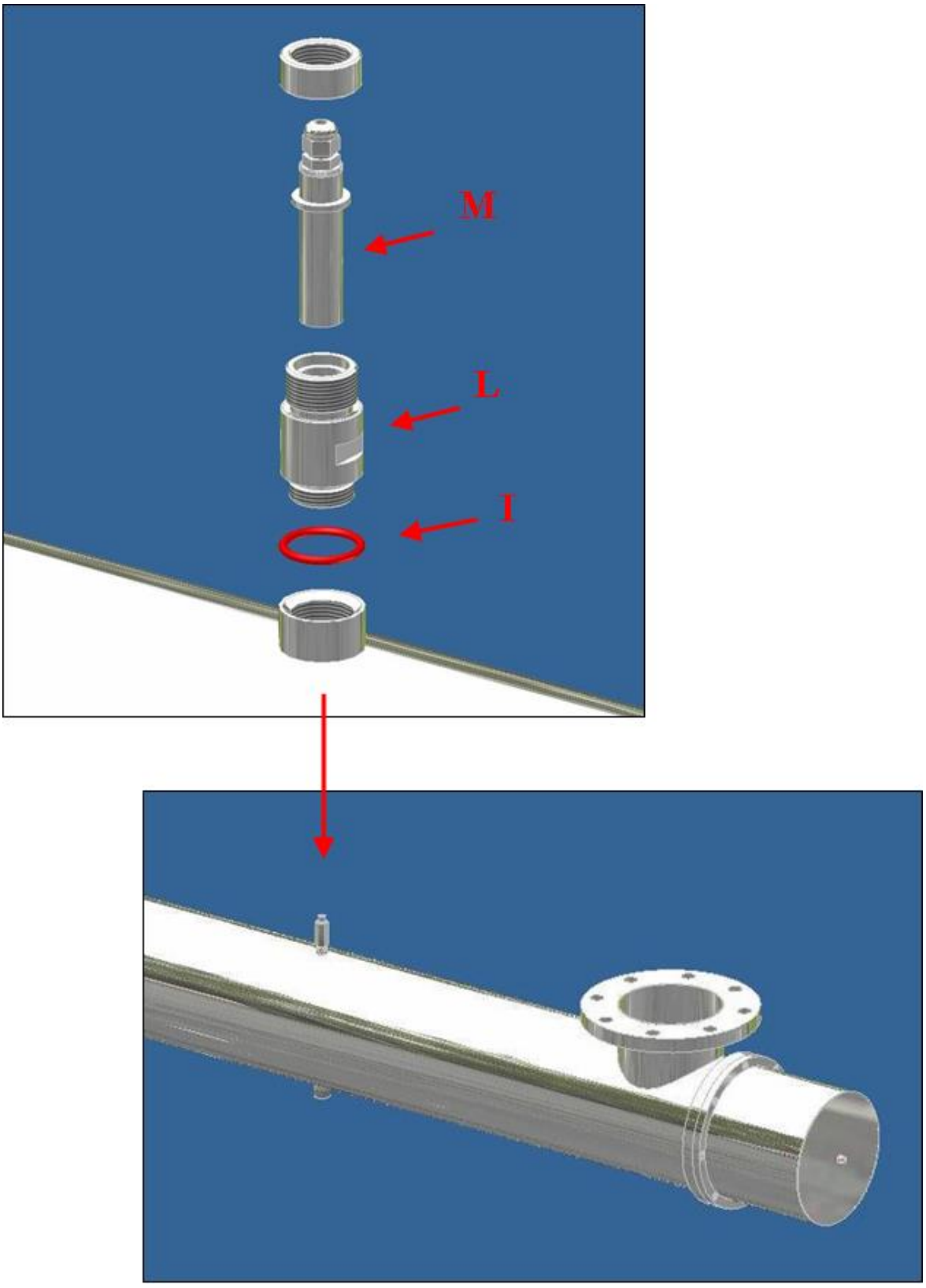


● Screw the Ø 1 ¼” ring nuts (F) on the s/s sleeve bolts.




● Mount  the o-ring (I) (4112 type) on the measuring window (L) and screw this one on the Ø 1” bush welded in the middle part of the UV chamber.

Insert the sensor (M) inside the measuring window and screw the ring nuts.
Finally, connect the pertinent electrical cable.




## 6. Safety measures and regulations

The equipment must be installed, put into operation and maintained by trained specialists. The owner and/or user must ensure that the operating personnel have been suitable instructed.

The equipment has been subjected to a hazard analysis, corresponding precautionary measures regarding the safety of persons and domestic animals have been made. Nevertheless, it is still possible that **danger could arise** as a result of incorrect use, bad maintenance, material changes, etc. These dangers are associated with:

- ✓ Electricity
- ✓ Mechanical dangers
- ✓ Exposure to high intensity UV light

## 6.1. Elettricity

The lightning flash and arrowhead symbol is to alert the user to the presence of un-insulated **"DANGEROUS VOLTAGE"** within the enclosure.

The equipment may **only** be opened if the mains supply is isolated. The mains supply must **not** be restored as long as the equipment is open.

**ATTENTION:**
Working on live equipment is forbidden.

## 6.2. Mechanical dangers

The equipment contains glass which must be handled with care.
Broken lamps emits dangerous mercury vapours.

## 6.3. Esposure to high intensity UV light

The reactor contains UV emitting lamps and if exposed while energised can cause serious eye and skin damage. Ensure that the mains supply is isolated before opening any of the covers of the reactor.

# 7. Run the System

The commissioning personnel authorised by the owner and/or user, must read and understand the operating instructions.

The commissioning personnel must be familiar with the safety measures and regulations applicable to the country/area in which the system is installed.

### Turn On/Off the system

The preconditions for starting are:

- ✓ Water is flowing through the vessel.
- ✓ The electrical panel is feeded
- ✓ The lamps have been turn off for 10 minutes

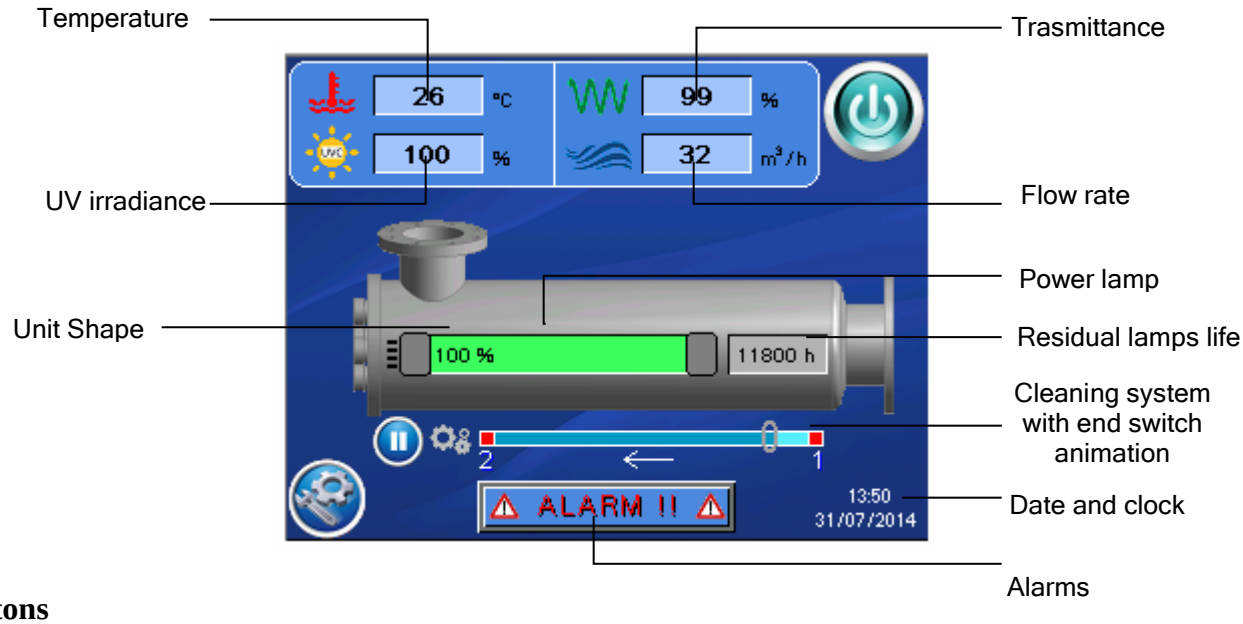
If all these conditions are respected turn on the general switch.

To shut OFF  the system turn off the general switch. To shut OFF the lamps but still give power to the el panel push the OK button for more than 3 sec.

# 8. Touch Screen Panel

## 8.1. Main Screen

Main screen of the system.
It displays the parameters of flow rate, transmittance, temperature, irradiation, lamps hour meter and quartz cleaning system (if available). It also displays the lamps power. In case of alarm flashing "ALARM button" is displayed.

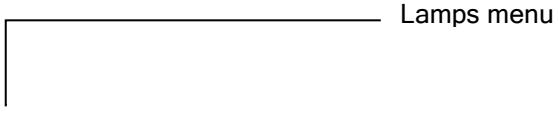



**Buttons**

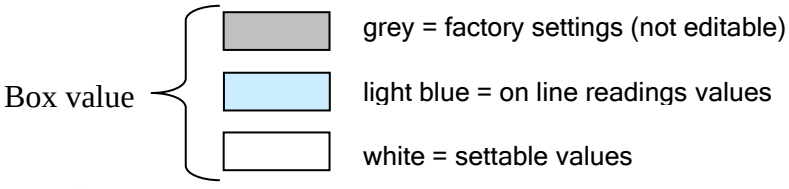
| | |
|---|---|
|  | **ON/OFF**<br>-) Turn on and off the UV lamps. |
|  | **SETTING MENU**<br>-) It allows to access the settings menu. The user can set all the parameters useful measures and operation of the system, operate the UV system and read all the parameters that the system records or stores (see “Main menu”). |
|  | **Manual Start/Stop cleaning system**<br>-) If the system is equipped with a cleaning system, it allows to start and stop the cleaning system (when automatic cleaning system is activated the button is disabled). |
|  | **Alarms button**<br>-) Visible in case of alarm. Touch to access to the alarm and lamps status visualization (see "Alarm screen"). |

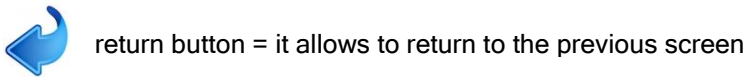
## 8.2. Setting menu

In this menu the user can set, read and manage all the necessary parameters for the measures and the operation of the system.




| | | |
|---|---|---|
| BAR MENU |  | **DATALOG - EVENTS**<br>-) It allows to visualize the datalog and the events of the system.<br>**LANGUAGES MENU**<br>-) It allows to change the language both of the user and the system.<br>**MAINTENANCE MODE**<br>-) It allows to set the system in maintenance mode (disable the alarms and stop the cleaning system motor).<br>**PASSWORD MENU**<br>-) It allows to access password-protected menu. The user cannot enter this menu unless authorized by the manufacturer. |
| CIRCLE MENU |  | **SETTINGS MENU OF THE SYSTEM**<br>-) Each button allows the access to the setting of a specific component / system optional (if not available the button will appear greyed and the submenu is not available):<br>- lamps<br>- electric board<br>- irradiation sensor - temperature<br>- cleaning system<br>- water parameters (flow rate and transmittance) |

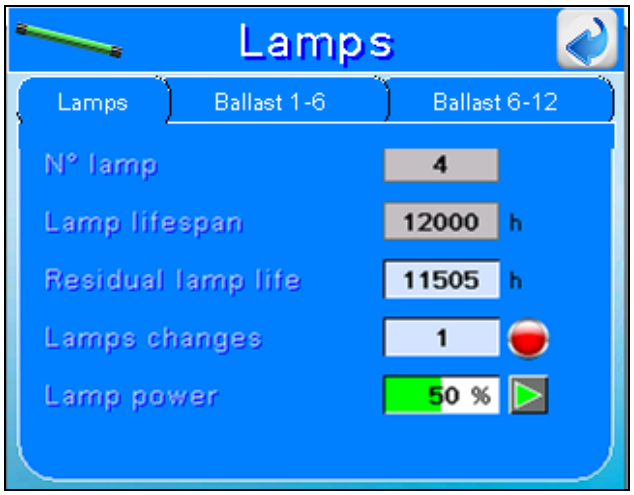



## 8.3. Lamps menu

The sub-menu where the user can read and set the parameters that control the lamps:

**Module 1: Lamps**




- **N° lamps**: represents the number of lamps of the UV system.

- **Lamps lifespan**: represents the lamps maximum working hours.

- **Residual lamp life**: represents the lamps remaining working hours. It 'a countdown indicative of the residual lamps life from their last exchange.
  *When this countdown reaches zero, an alarm alerts the user that lamps must changed.*
  *The countdown must be reactivated at every lamp change.*

  *The button*  *restart the countdown.*
  *This operation sets the "Lamp Life Hour Meter" to the value of the useful life of the lamp. When the operator does this operation the number of lamp changes is also automatically updated.*

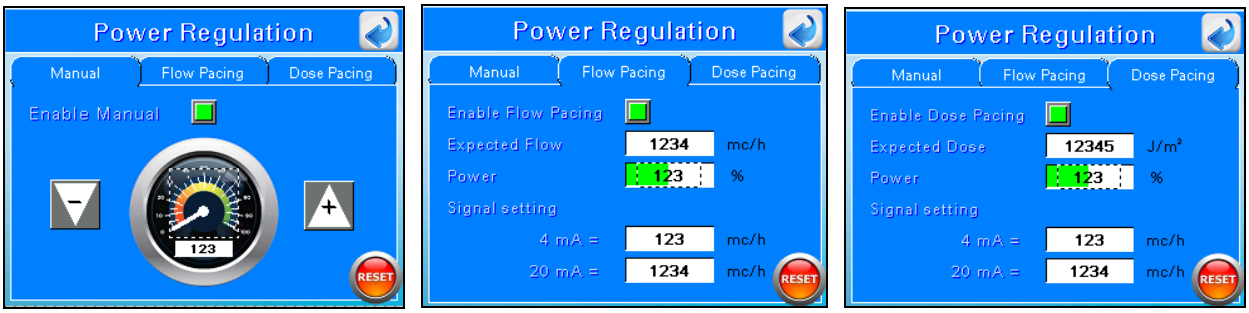
- **Lamps changes**: counter displays the number of lamp changes.

  *At each lamp change the countdown must be restarted touching*  *and N ° of changing is automatically updated.*

- **Lamp power**: displays the lamps power level. The value range is from 50% to 100%.

  *With the button*  *the user can access to power regulation screen and set the power value (see next screen). Access to the screen is protected by a 5-digit password.*

**Power Regulation (only for PR)**




**Module 1: Manual**

Enabling this option the user can adjust the lamps power level manually from a minimum of 50% to a maximum value of 100%. With the RESET button user can restore the default value to 100%.

**Module 2: Flow Pacing**

Enabling this option user can set the expected water flow. In case of water flow higher than the expected value then the UV panel will increase lamp power and vice versa.%.

- **Expected flow:** setting the expected flow.

- **Signal Setting:** the panel has a 4/20 mA input signal that describes the flow rate read by the flowmeter. The signal can be set:

Associate values 4 and 20 as the minimum and maximum flow rate determined mc/h.

Press button RESET to restore the factory setting value.

**Module 3: Dose Pacing**

Enabling this option user sets a UV dose value to be maintained. The UV panel will automatically regulate lamp power to maintain this value.
For Instance, if the flow increases and the UV dose decreases then the panel will increase lamp power.

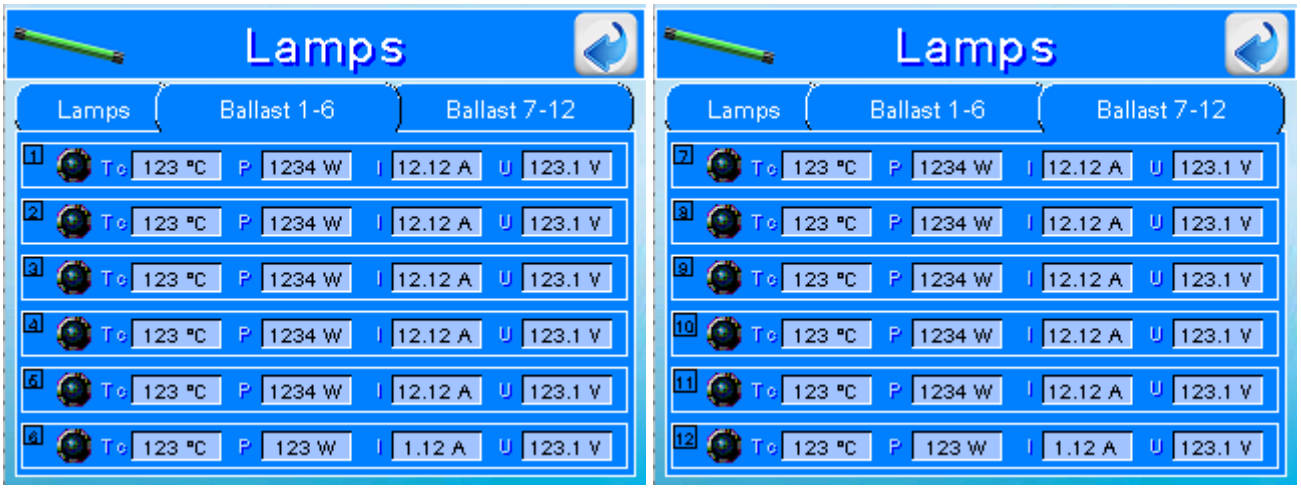
- **Expected dose:** setting the expected dose.

- **Signal Setting:** the UV707MBS2 special board has a 4/20 mA input signal that describes
  the flow rate read by the flowmeter. The signal can be set:

Associate values 4 and 20 as the minimum and maximum flow rate determined mc/h.

Press button RESET to restore the factory setting value.

**Module 2-3: Ballast 1-6 (7-12)**

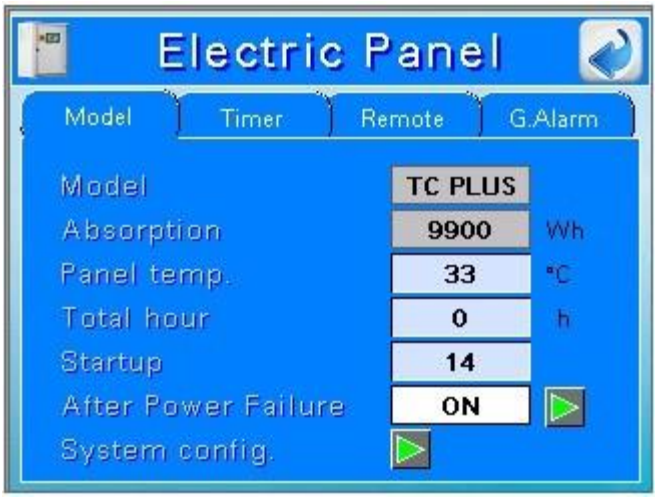



This screen displays the parameters of temperature, power, current and voltage of each lamp.

## 8.4. Panel menu

Submenu where the user can read and set the framework parameters of the system.
The panel menu is divided into 4 modules.

**Module 1: Model**




- **Model:** displays the control panel type.
- **Absorption:** shows the theoretical panel value of absorption preset by password menu
- **Panel temperature:** displays the temperature inside the panel in Celsius Degree.

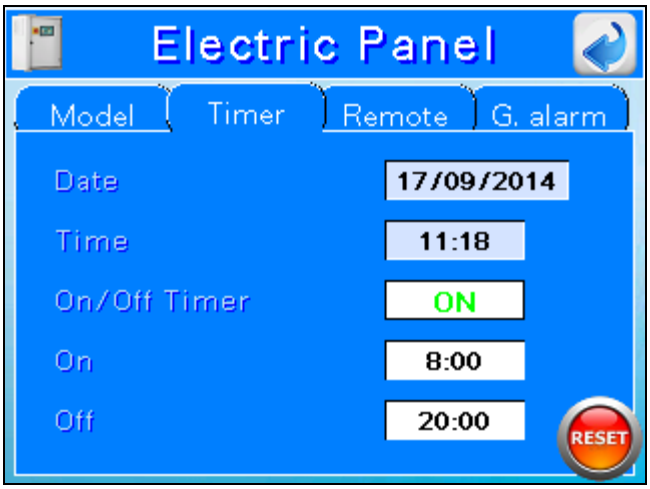
***Important!***
*If the temperature is higher than the threshold then the system will automatically turn off. In this case, a message will appear "SHUTDOWN DUE TO HIGH PANEL TEMPERATURE".*

- **Total hour:** represents the total life of the system.
- **Startup:** represents the number of ignitions.

***Important!***
*If the frequency of switching on / off is too high UV lamps reduce their efficiency and their useful lives.*

- **After power failure:** Touching you can set the behaviour of plant in case of power failure. By selecting ON, once the panel is powered up, the lamps will automatically turn on again, vice versa by selecting OFF, the lamps will remain off and the system in Standby
- **System config:** touching on user can access to the PLC system configuration.

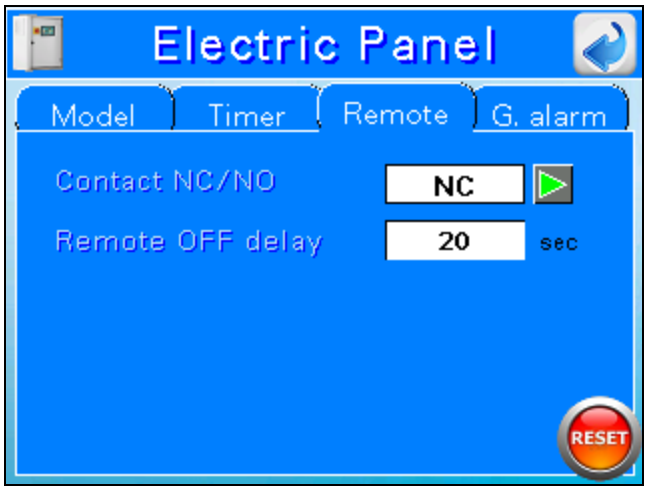
**Module 2: Timer**




- **Date:** shows the current date.
- **Time:** shows the current time
- **On/Off Timer:** it allows to able/disable the automatic start and stop of the lamps.
- **On:** sets the time for automatic start up.
- **Off:** sets the time for automatic shutdown.

Press RESET to restore the factory setting value.

**Module 3: Remote**



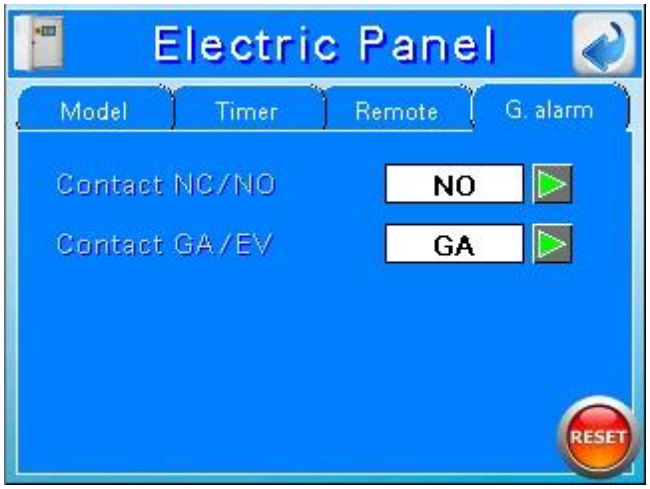

- **Contact NC/NO:** It allows to set the remote ON/OFF contact.
  **NO** (factory settings) = The UV system works when the REMOTE ON/OFF contact is open (see electrical diagram).
  **NC** = The UV system works when the REMOTE ON/OFF contact is closed (see electrical diagram).

***Important!***
*This setting fulfils the Fail Safe Open requirement (in case the cable connected to the remote ON/OFF contact is cut then the system turns OFF).*

- **Remote OFF delay:** It allows to set the shutdown delay from remote contact. This setting can helps when the remote ON/OFF contact is directly connected to a flow switch. By increasing the remote off delay the system does not shut off for short flow stop.

***Important!***
*The remote off delay cannot be too long otherwise the chamber may reach over temperature.*

**Module 4: G. alarm**




- **Contact NC/NO:** It allows to set the General Alarm contact.
  **NO** (factory settings) = it allow to set UV system General Alarm in normal open condition (see electrical diagram).
  **NC** = it allow to set UV system General Alarm in normal close condition (see electrical diagram).

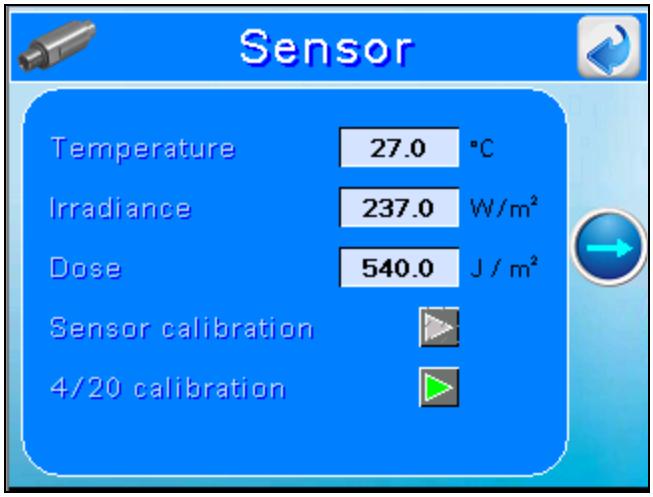
- **Contact GA/EV:** It allows to set the general alarm contact status in case of shutdown from the user.
  **GA** (factory settings) = In this case water flow does not stop if an electrovalve is driven by the General Alarm Contact
  **EV** = In this case water flow stops if an electro valve is driven by the General Alarm Contact.

## 8.5. Sensor menu

Submenu where the user can read and set the parameters that control the irradiance/temperature sensor.

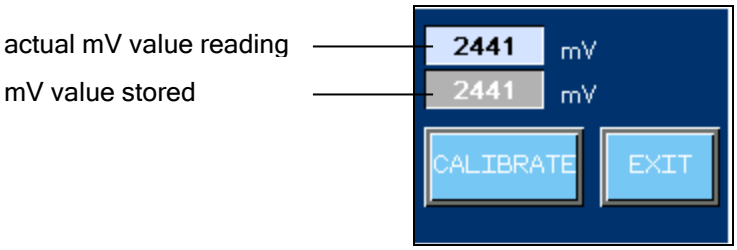
With the button  you can switch from screen 1 to screen 2.

**Screen 1:**




- **Temperature:** displays the collector temperatures in Celsius Degrees.
- **Irradiance:** shows the UV-C irradiance read by the sensor placed at the edge of the collector. The signal of the radiation can be displayed in % or in W/m2.
- **Dose:** in case of panel connected to a flow signal, the system can also calculate UV dose expressed in J/m2 UV dose.
- **Sensor calibration:** if irradiance is displayed as % then it will be possible to calibrate the sensor.

  touching on  the user can open the pop-up calibration:



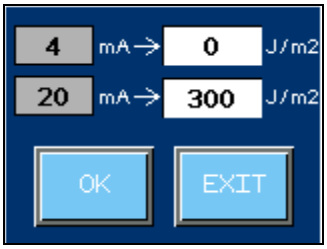

  Touching on "CALIBRATE" the user confirms that the signal read by the sensor corresponds to 100% of the radiation of the lamps.

***Important!***
*The sensor must be calibrated at every lamps changing.*

***Important!***
*To calculate the radiation factor % it is necessary that the lamps reach the steady state conditions. Delay time depends on lamps type and water temperature. We therefore advice to wait 30 min from the system start up.*

***Important!***
*The same operation can be done if the irradiation is shown in W/m2 (or the dose in J/m2.)*
*This operation can be performed only by authorized personnel.*

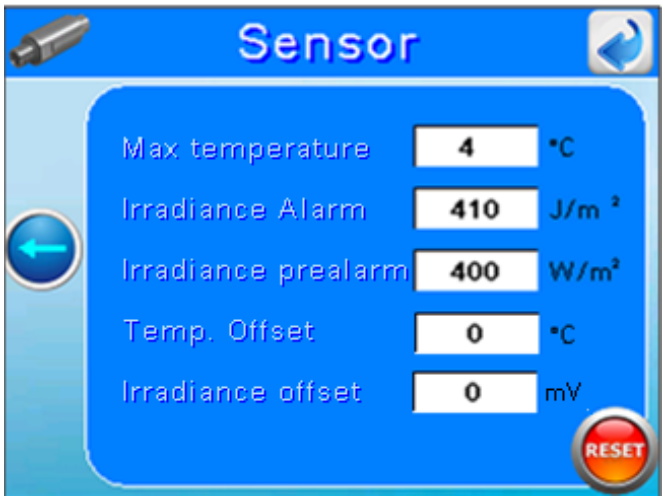
- **4/20 mA calibration:** The PLC has a 4/20 mA output signal which describes the water temperature and the UV dose (or UV Irradiance) calculated from PLC. The temperature signal in mA has a linear correspondence: 4mA= 0°C and 20mA=100°C. The output signal of the UV dose can be set:
  Touch on to open 4/20mA calibration popup menu:




Associate the values 4 and 20 mA to the minimum and maximum Dose (Irradiance). Touching "OK", the user calibrates the 4/20 mA output.

With the button user can switch from screen 2 to 1.

**Screen 2:**




this screen allows to set alarm thresholds.

- **Max temperature:** settable threshold that defines the maximum acceptable temperature in the plant before shut off for safety.

***Important***!
*In case of absence of flow the UV lamps can increase water temperature. This can damage lamps and UV system. If the temperature is higher than the threshold then the system will automatically turn off. In this case this message will appear "SHUTDOWN DUE TO HIGH CHAMBER TEMPERATURE".*

*Factory setting: 50°C*

- **Low irradiance (dose) pre-alarm:** If UV irradiance decreases below the pre-alarm threshold then an alert is displayed.
  To avoid this warning, clean the quartz containing lamps, replace the lamps or improve water quality.

***Important!*** *The pre-alarm threshold is set to be always higher than the alarm threshold (+10).*

***Important!*** *The irradiance can be displayed in % or in W/m2. In any case, the thresholds will have the same value.*

- **Low irradiance (dose) alarm**: If the output UV dose decreases below the alarm threshold then an alarm is displayed.

The water that passes through the UV system when the dose is below the alarm threshold can not be fully disinfected. To avoid this warning, clean the quartz containing lamps , replace lamps or improve water quality with an adequate pre-treatment.

Touch button RESET to restore the factory setting value.

- **Temp Offset:** To set the offset of the sensor temperature.
- **Irradiance Offset:** To set the offset of the sensor irradiance (dose) signal in mV **.**

## 8.6. Automatic cleaning system

Submenu where the user can read and set the parameters that control the automatic cleaning system.

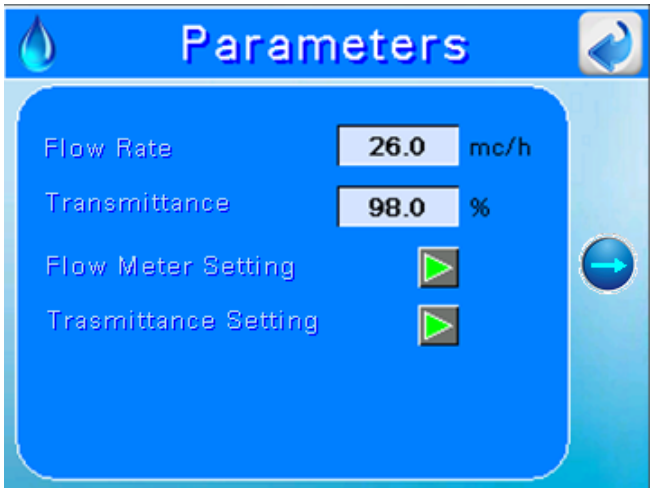

- **Auto Cleaning ON/OFF:** It allows to able/disable the automatic cleaning system.
- **Wipers cycles:** counter displays the number of wiper cycles
  *Touch the button*  to reset the numbers of wiper cycles .
- **Days:** to set the week days in which it is active the automatic cleaning system (green on, grey off)
- **Start:** to set the time start for automatic cleaning system.
- **Stop:** to set the time stop for automatic cleaning system.
- **Frequency:** to set the frequency of the automatic cleaning cycle between start and stop times.

## 8.7. Parameters

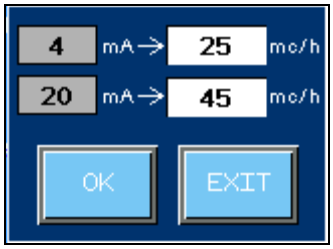
Submenu where the user can read and set the water parameter.

With the button  you can switch from screen 1 to screen 2.

**Screen 1:**




- **Flow rate:** displays the flow rate in mc/h.
- **Transmittance:** shows the water transmittance read by the UVT meter sensor in %.
- **Flow meter setting :** the UV707MBS2 special board has a 4/20 mA input signal which describes the water flow rate. The signal can be set:
  Touch on  to open 4/20mA calibration popup menu:

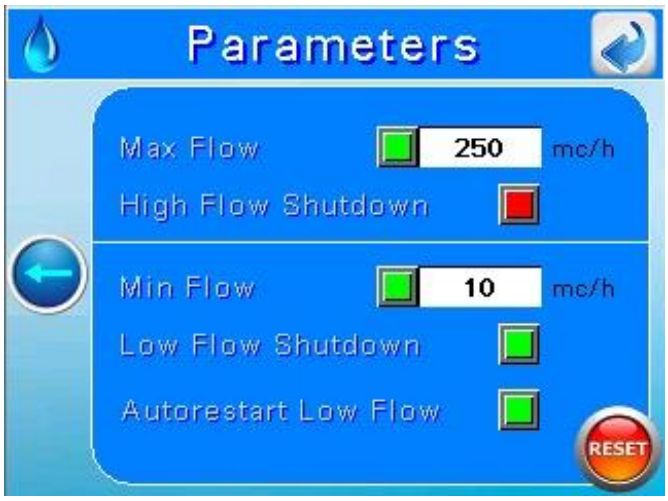



  Associate the values 4 and 20 mA to the minimum and maximum flow rate input. Touching "OK", the user calibrates the 4/20 mA input.

- **Transmittance setting :** the UV707MBS2 special board has a 4/20 mA input signal which describes the UVT transmittance. The signal can be set:
  Touch on  to open 4/20mA calibration popup menu:

  Associate the values 4 and 20 mA to the minimum and maximum flow rate input. Touching "OK", the user calibrates the 4/20 mA input.

**Screen 2:**




this screen allows to set alarm thresholds.

- **Max Flow:** settable threshold that defines the maximum acceptable flow rate in the plant before having the alarm. If the "**High Flow Shutdown**" button is activated the plant shut off for safety.

  *Factory setting: 9999 mc/h*

- **Min Flow:** settable threshold that defines the minimum acceptable flow rate in the plant before having the alarm. If the "**Low Flow Shutdown**" button is activated the plant shut off for safety. If the "**Autorestart Low Flow**" button is activated the plant turn on automatically when flow rate exceeds the minimum acceptable flow rate.

  *Factory setting:0 mc/h*

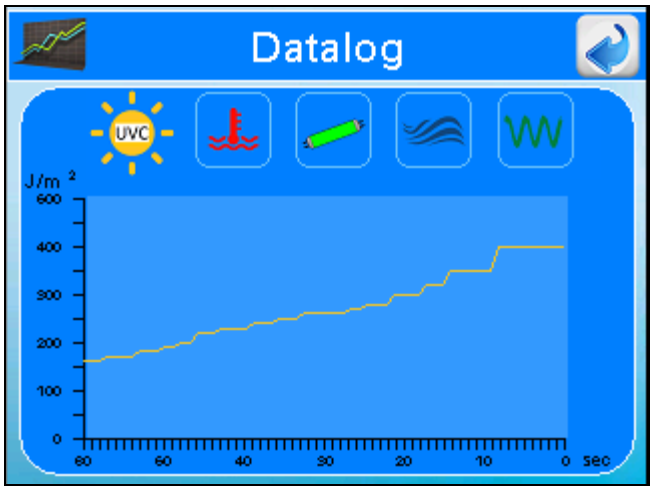
***Important***!
*In case of absence of flow the UV lamps can increase chamber temperature. This can damage lamps and UV system. If the temperature is higher than the threshold then the system will automatically turn off. In this case, this message will appear "SHUTDOWN DUE TO HIGH CHAMBER TEMPERATURE".*

Touch button RESET to restore the factory setting value.

## 8.8. Datalog - Events

Touching “datalog- event” button either the datalog screen or the event screen can be visualized.


**Datalog screen:**
Submenu where the user can view the trend of system parameter:




**Parameters:**

- Irradiance (Dose)
- Temperature (chamber and panel)
- Power lamps
- Flow rate (if avaiable)
- Transmittance (if avaiable)

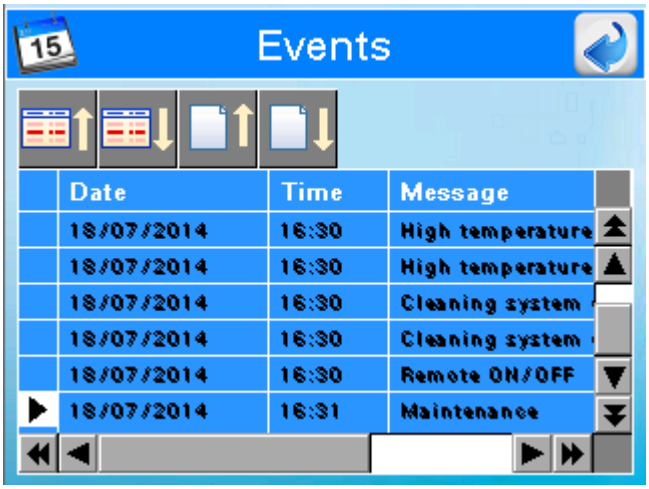
Touching on the different symbols the user has access to the respective chart.
Datalog displayed parameters values on line is carried out every 600 seconds with a frequency of 10s.
Datalog saved parameters values (with a frequency of 10s) is carried out every 2 years.
After this time the oldest data will be overwritten.

***Important!***
*To save the datalog it is necessary to connect an USB memory stick (of min 1 GB) on the PLC USB plug.*

***Important!***
*The files stored on a USB pen have .dat extension. Those files can be converted to .csv file, accessible with software Excel, Calc or similar, with a special conversion software. Obtain details on how to get the software.*

**Events screen:**

In this section alarms and events of the system are displayed:




The events are displayed in chronological order.
When the event is active, it is highlighted in red.
Displays shows up to 100 events, after which the oldest events will be overwritten.
The last 100 day events are saved into USB pen every day.

***Important!***
*The files stored on a USB key events are in .csv extension. Use Excel, Calc or similar software to open the files.*

## 8.9. List of alarms and troubleshooting

Each alarm activates the main relay (dry contact and 24 Vdc output). The message ALARM! on the Main Screen starts flashing. Press "ALARMS" on the screen to visualize the alarms. The screen lists all the possible alarms and shows the status of lights:

Push to access to
Lamp Status Screen


On → alarm active

Off → alarm disactive

LAMP FAULT → Each lamp of the UV system is identified with a number.
This message is visualized the lamp cable number is not working.

LAMP OFF → Each lamp of the UV system is identified with a number.
This message is visualized the lamp cable number is not working.

***Possible Causes:***

- ✓ Lamp Burned
- ✓ Ballast Burned

***Solutions:***

- ✓ Change the lamp
- ✓ Change the ballast

*Replace and connect the lamps only in the context switched off, wait 20 seconds before you restore power to allow the reset lighter. Otherwise, the igniter is not reset and the new lamp is not recognized.*

LOW DOSE → It's visualized in case the UV Irradiance (or Dose) is under the threshold level.

***Possible Causes:***

- ✓ Deposit on quartz sleeves lamp protection
- ✓ Variation on UV transmittance of the water
- ✓ Decrease of the UV-C output in lamp(s) due to the lamp ageing
- ✓ Deposit on quartz of the UV sensor

***Solutions:***

- ✓ Clean the quartz sleeve
- ✓ Filter the water
- ✓ Change the lamps
- ✓ Clean the sensor

PREALARM LOW DOSE → It's visualized in case the UV Dose is under the threshold level

***Possible Causes:***

- ✓ Deposit on quartz sleeves lamp protection
- ✓ Variation on UV transmittance of the water
- ✓ Decrease of the UV-C output in lamp(s) due to the lamp ageing
- ✓ Deposit on quartz of the UV sensor

***Solutions:***

- ✓ Clean the quartz sleeve
- ✓ Filter the water
- ✓ Change the lamps
- ✓ Clean the sensor

***Important***!

This alarm doesn't switch the main relays.

LAMPS EXHAUST → It's visualized in case the countdown of lamp life reaches 0 h. This means that the lamp worked for more than their lifespan.

| ***Possible Causes:*** | ***Solutions:*** |
|---|---|
| ✓ Lamp lifespan finished | ✓ Change the lamp(s) and press to restart the lamp hour meter count down |

PREALARM LAMPS EXHAUST → Display when the countdown of lamp life reaches 200 h. This means that the lamp worked for more than their lifespan.

| ***Possible Causes:*** | ***Solutions:*** |
|---|---|
| ✓ Lamp lifespan finished | ✓ Prepare to replace the lamps |

***Important***!
This alarm doesn't switch the main relays.

COMUNICATION ERROR → It's visualized in case the plc doesn't receive any signal from the UV707MBS2 modbus communication.

| ***Possible Causes:*** | ***Solutions:*** |
|---|---|
| ✓ No Communication between PLC and 707MBS2 card | ✓ Ask the manufacturer |

CLEANIG SYSTEM ERROR → It's visualized in case of problems in the automatic cleaning system

| ***Possible Causes:*** | ***Solutions:*** |
|---|---|
| ✓ End switches broken<br>✓ Cleaning system clogged | ✓ Ask the manufacter |

CHAMBER HIGH TEMPERATURE


This alarm shut down the panel. It's visualized in case the water temperature inside the chamber is higher then the settable threshold level (*factory setting 50°C*)

***Possible Causes:***

- ✓ No Flow
- ✓ Non correct signal from the temperature sensor

***Solution:***

- ✓ Check pumps, valves
- ✓ Check the temperature sensor

***Important!***
*In case of high water temperature the system shuts down for safety. The user must find the over temperature reason and restart the system manually. Automatic restart is not possible because it could generate cycling of over temperature shut down, cooling and automatic restart.*

## PANEL HIGH TEMPERATURE


This alarm shut down the panel. It's visualized in case the panel temperature is higher than the settable threshold level (*factory setting 50°C*).

***Possible Causes:***

- ✓ Problem on the fan
- ✓ Non correct signal from the temperature sensor

***Solution:***

- ✓ Check the fan
- ✓ Check the temperature sensor
- ✓ Clean/change the filter

***Important!***
*In case of high panel temperature the system shuts down for safety. The user must find the over temperature reason and restart the system manually. Automatic restart is not possible because it could generate cycling of over temperature shut off, cooling and automatic restart.*

***Important!***
*This alarms activates alarm relay that will be deactivated only when both a good temperature is restored and the system is restarted manually.*

## LOW FLOW


If shout down option is activated this alarm shuts down the panel . It's visualized in case the flow rate inside the chamber is lower than the settable threshold level (*factory setting 1 mc/h*)

***Possible Causes:***

- ✓ Low Flow
- ✓ Non correct signal from the flowmeter

***Solution:***

- ✓ Check pumps, valves
- ✓ Check the flowmeter

***Important!***
*In case of low flow the system shuts down for safety. The user must find the low flow reason and restart the system manually. Automatic restart is not possible because it could generate*

*cycling of low flow shut down.*

## HIGH FLOW


If shout down option is activated this alarm shutdowns the panel . It's visualized in case the flow rate inside the chamber is higher than the settable threshold level (*factory setting 9999 mc/h*)

***Possible Causes:***

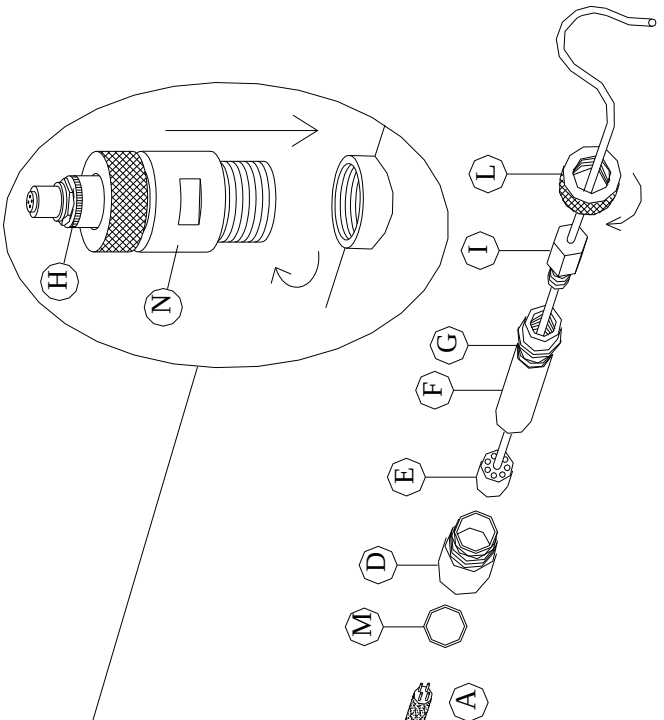
- ✓ High Flow
- ✓ Non correct signal from the flowmeter

***Solution:***

- ✓ Check pumps, valves
- ✓ Check the flowmeter

***Important!***
*In case of high flow the system shuts down for safety. The user must find the high flow reason and restart the system manually. Automatic restart is not possible because it could generate cycling of high flow shut down.*

# 9. Spare parts




| RIF./REF. | DESCRIZIONE / DESCRIPTION | UV 80 IT<br>UV 120 IT<br>UV 200 IT<br>UV 400 IT<br>CODICE/CODE | UV 10 IT<br>CODICE/CODE | UV 4 IT<br>UV 40 IT<br>CODICE/CODE |
|---|---|---|---|---|
| A | LAMPADA UV / UV LAMP | 028118 | 028119 | 028124IT |
| B | GUAINA AL QUARZO / QUARTZ SLEEVE | 028203 | 028202 | 028105 |
| C | O-RING QUARZO / QUARTZ SLEEVE O-RING | 028207 | OR4112 | 028061 |
| D | BLOCCAGUAINA / SLEEVE BOLT | 026425/316 | 026441 | 028060 |
| E | QUADRIPIN / FOUR-PIN | 028089/A | 028088 | 028088 |
| F | PORTA-QUADRIPIN / FOUR-PIN SLEEVE | 026430 | 026432 | / |
| G | O-RING 2075 | OR2112 | V185 | / |
| H | SENSORE Ø 1" O-NORM / SENSOR Ø 1" O-NORM | UV738 | UV738 | UV738 |
| I | PRESSACAVO PG9 / PG9 CABLE CLAMP | 028091 | 028091 | 028091 |
| L | GHIERA / FERRULE | 026426 | 026440 | / |
| M | GUARNIZIONE / GASKET | 026425G | 026441G | V140 |
| N | PORTASENSORE / SENSOR HOLDER | UV741 | UV741 | UV741 |

NOME FILE: .DWG

| REV. | DESCRIZIONE | DATA | DISEGNATO | APPROVATO |
|---|---|---|---|---|
| A | PRIMA EMISSIONE / FIRST ISSUE | 03/12 | SCHENONE | MAZZONE |



S.r.l. Societa' Italiana Trattamento Acque
Via Rivarolo, 61 - 16161 Genova Italy - Tel. 0039-10-7406848 / Fax 0039-10-7406851 email info@sitauv.com

TITOLO: UV SERIE IT / UV IT SERIES

CLIENTE: /

CODICE: /

F.to A4 | Scala /

Foglio 01 di 01

# 10. Warranty Condition

**WARRANTY CONDITIONS**

**SITA** works in compliance with ISO 9001-2015 quality procedures and subjects all equipments to accurate checks and tests.

**The SITA supplies and progressing are anyway guaranteed only in the limits of technical specifications and request and/or of the certificates and/or of the specific checks as agreed, for 24 months from the purchase date, provided that eventual defects are stated as fixed by art. No. 1495 of the civil code.**

**The stainless steel chamber is covered by warranty of 5 years only if used for compatible liquids and correctly installed.**

In no case the integral replacement of the product is forseen and any responsibility of sita is excluded for delays in the delivery of the goods to the customer, for claims of third parties towards the customer, for losses of goods, costs (installation, servicing and maintenance, transports, and so on) and damages of the customer due to the defect.

Moreover the product repaired or tampered by non-authorized third parties, and the product on which an intervention has been made for defect of for convenience tests, is excluded from the warranty.

Repairs are normally carried out in SITA warehouse or in authorized after-sales service centers signalled by SITA.

**The warranty does not cover:**

1. Accidental breakages due to the transport.
2. Breakages due to the use of equipments not in compliance with what is indicated on the use and maintenance manual or to carelessness.
3. Breakages to the connection to a power grid feeded with a tension different than the foreseen one (±10% of the nominal value as fixed by CEI rules)

**DO NOT TAMPER THE ADHESIVE LABELS OF IDENTIFICATION**

The adhesive label with the QC (Quality Control) number must be intact and readable; such number allows to enter the data bank of tests and to find the values obtained in the electrical test of the equipment.

The adhesive label with the S/N (Serial Number) number must be intact and readable; such number allows to enter the data bank of tests and to find the values obtained in the hydraulic test of the equipment.

In case of dispute the court of Genova will be competent.

## 11. Declaration Of Conformity

Unit produced in the factory of:

# S.I.T.A.
# Italian Company for Water Treatment

# EC DECLARATION OF CONFORMITY

The undersigned hereby declares, under full responsibility, that the unit:

**UV STERILIZER**

# IT SERIES

## UV 80 IT MODEL

IS IN COMPLIANCE WITH

- 2014/35/UE (low voltage directive)
- 2014/30/UE (electromagnetic compatibility)
- 2015/863/UE (RoHS3)
- 2012/19/UE (WEEE)
- IEC -EN 60204-1 norms (safety of machinery-electrical equipment of machinery)
- IEC -EN 55022 norms (characteristics of radio interference)
- D.M. 14 June 2017 (Implementation of Directive 2015/1787/UE on the quality of water intended for human consumption)
- 2014/68/UE (art.4 comm.3) (PED)

The validity of CE marking is subordinated to the equipment integrity. Any modification,if not authorized,will cancel the use of the CE marking.This will occurs in case the relevant risks have not been previously analyzed by our company,and a new EC Declaration of Conformity has been issued.