

A measured step forward™

Operations & Maintenance Manual

RACK LCD SERIES

UV 80/3 RACK LCD-LCD PLUS

UV 80/4 RACK LCD-LCD PLUS

UV 80/5 RACK LCD-LCD PLUS



Table of Contents

1. Introduction	3
2. General Principles and Safety Instructions	4
3. Instructions for Installation and Setting at Work	5
3.1 Suggested Installation Scheme	6
4. UV Chamber Installation	7
4.1 UV Chamber Assembling	7
4.2 UV Chamber Detailed Drawing	9
5. Electrical Panel Installation and Operation	10
5.1 Control Panel Description	10
5.2 Electrical Panel Installation and Operation.....	11
5.3 Switch ON / Switch OFF the lamps.....	11
6. RACK LCD Board Description	12
6.1 RACK LCD Electrical Panel - Internal Layout.....	12
6.2 LCD Display Board Description.....	13
7. Display Information (Troubleshooting)	14
8. Maintenance	20
9. Replace the Ballast.....	21
10. Warranty Conditions	22

1. Introduction

This manual is for the following models of RACK LCD SERIES:

UV 80/3 RACK LCD-LCD PLUS
UV 80/4 RACK LCD-LCD PLUS
UV 80/5 RACK LCD-LCD PLUS

Warning: This equipment requires regular maintenance to ensure the requirements of the drinking water treated and the maintenance of the improvements as stated by the manufacturer.

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 JESCO, as this could affect the safe operation of the unit. JESCO shall not be held responsible for damage resulting from unauthorized modifications.



INSTRUCTIONS:

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

2. General Principles and Safety Instructions

Information about UV irradiation:

The UV disinfection system of the RACK LCD series has been designed specifically for destroying harmful bacteria and viruses present in your water.

The UV light emitted by special mercury vapor lamps (UV-C rays $\lambda = 254\text{nm}$) 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 ability of micro-organisms to develop and reproduce, rendering them harmless.

Generally, it is better to mount a pre-filter onto the UV sterilizer in order to remove contaminants and particles that could interfere with the ultraviolet process.

This system is necessary if a high degree of sterilization is required. In fact, the nonfiltration and removal of suspended particles in water has, as a consequence, a decrease in 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 must be cleaned periodically (the frequency depends on the quantity and quality of water treated).

General directions:

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

Electrical Safety Instructions:



The lightning flash and arrowhead symbol is to alert the user to the presence of uninsulated "DANGEROUS VOLTAGE" within the enclosure. The equipment may only be opened if main supply is isolated. The main supply must not be restored as long as the equipment is open. This applies to both the electrical panel and the UV reactor vessel.

ATTENTION: Working on live equipment is prohibited.



UV Light Danger:

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 before having ensured that the UV lamp is in its housing and inserted in the PVC cover.

Pressure Danger:

The UV chamber could be under water pressure. Max working pressure is 145 psig (10 bar). UV chamber must be installed in accordance with our installation and commissioning instructions and used in accordance with operating and maintenance instructions.

ATTENTION: Ensure that system is depressurized before attempting any service or repair.

Indications for the disposal:

Please note that, according to what is outlined by D.L. 4 May 2014, № 27 "Accomplishment of directive 2011/65/CE, concerning the reduction of dangerous substances in electric and electronic equipment," both mercury vapor lamps and electrical panels, when no longer in use, must be treated as special waste, and as such disposed of.

To do that, please contact specialized centers for the recycling of dangerous materials, or contact our technical department directly.



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.

3. Instructions for Installation and Setting at Work

General premise: The installation of the RACK LCD SERIES disinfection units must be carried out by specialized staff, following the instructions hereby provided exactly as instructed. Moreover, it is necessary to provide some general information about the electrical and water connections.

Caution: 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 on the control board, signal correct functioning

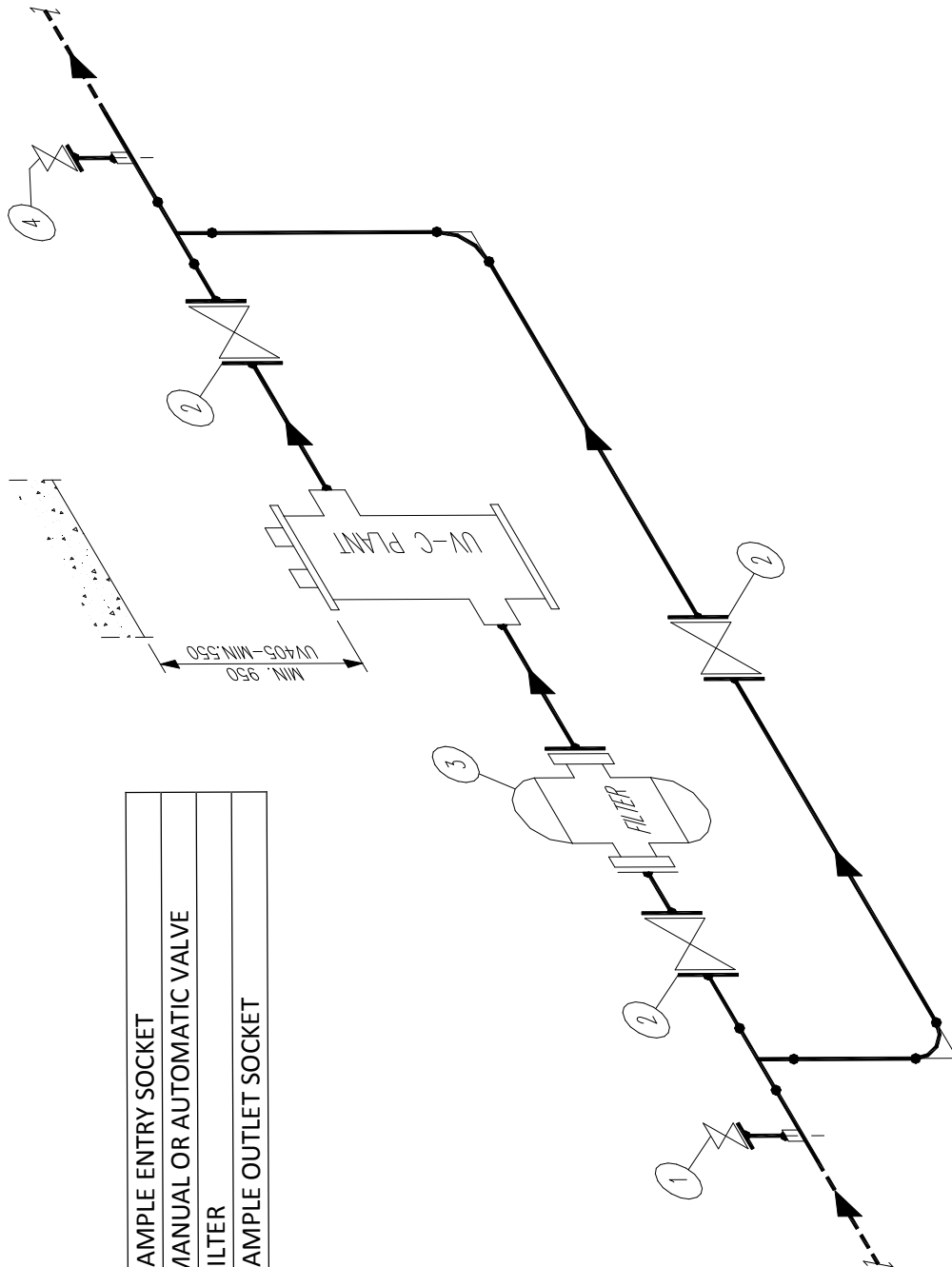
Allow the disinfected water to flow down to outlet for at least 10 minutes before utilization, in order to allow possible impurities present in the unit to drain out.

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

CHECKS

The RACK LCD 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 electronic boards which control the signals reaching the control panel, allow the visualizing (or the sounding) of the correct functioning or of anomalies which may occur during the operation of the unit.

3.1 Suggested Installation Scheme



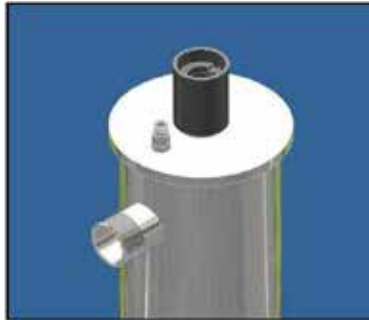
1	SAMPLE ENTRY SOCKET
2	MANUAL OR AUTOMATIC VALVE
3	FILTER
4	SAMPLE OUTLET SOCKET

4. UV Chamber Installation

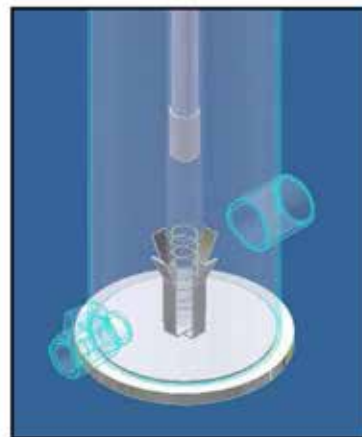
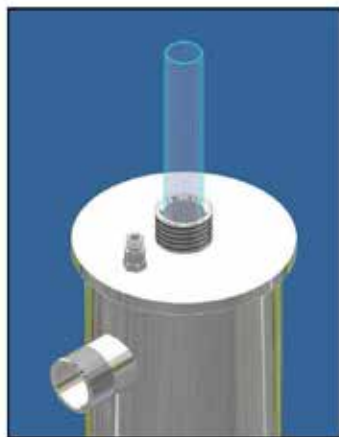
4.1 UV Chamber Assembling

Mount the valve kit supplied with the system.

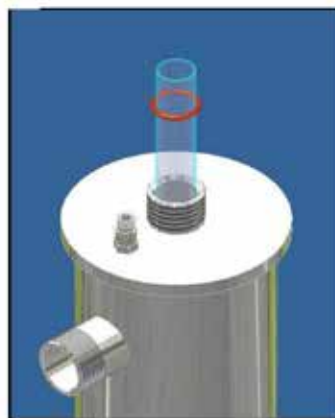
Unscrew the sleeve bolts:



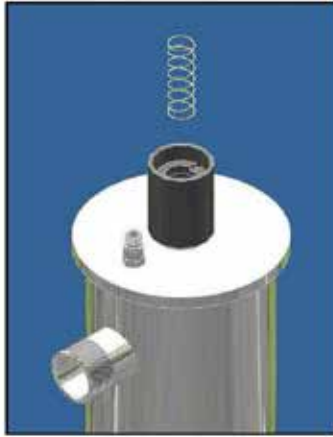
Insert the quartz sleeves carefully centering the spring at the bottom plate of the UV chamber:



Insert the o-ring \varnothing 23x4 into the quartz sleeve:

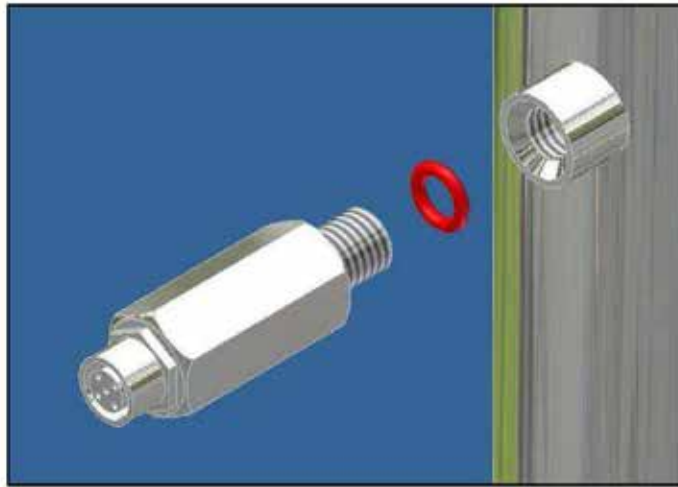


Screw the sleeve bolts and insert the lamp holder spring into the sleeve:



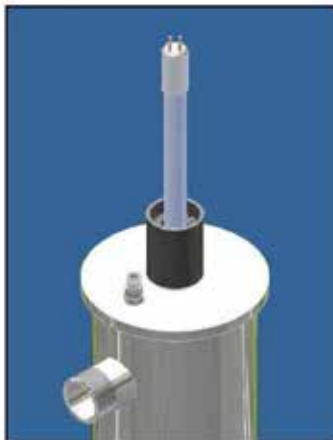
For the LCD PLUS UV system: Mount the o-ring (3043 type) on the probe holder and screw this one on the \emptyset ¼" bush welded in the middle part of the UV chamber.

Finally, connect the appropriate electrical cable:



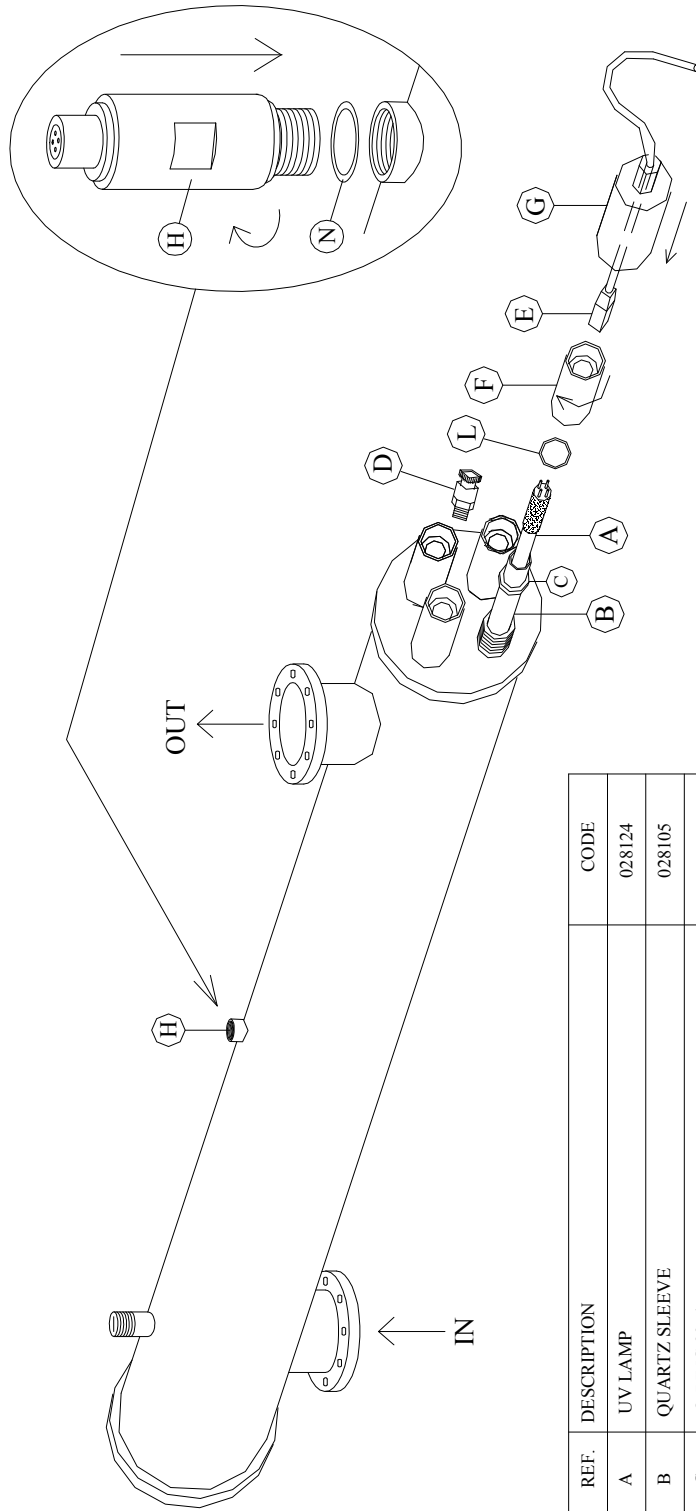
Carry out the hydraulic test, verifying that the o-rings are watertight and that there are not water leaks outside the sleeve bolts or inside the quartz sleeves.

Insert the UVC lamp into the quartz sleeve:



Important!
Handle the lamps
using gloves.

4.2 UV Chamber Detailed Drawing



REF.	DESCRIPTION	CODE
A	UV LAMP	028124
B	QUARTZ SLEEVE	028105
C	O-RING 23x4	028061
E	FOUR-PIN SOCKET	028088
F	NYLON SLEEVE BOLT	028060D
G	PVC CONTACT COVER	028034D
H	UV SENSOR Ø 1/4"	UV737S
D	VENT VALVE 1/8"	014460A/316
	LAMP HOLDER SPRING	028036
L	GASKET	V1-40
N	O-RING Ø10.78x2.62	OR3043

5. Electrical Panel Installation and Operation

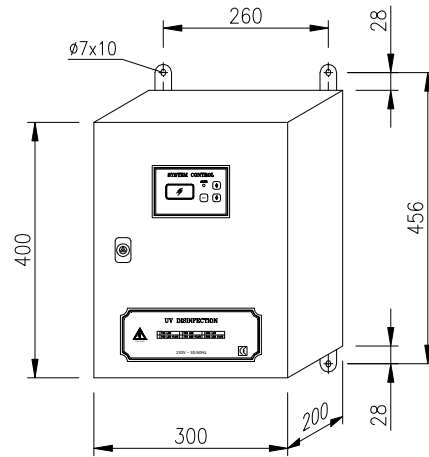
5.1 Control Panel Description



CONTROL PANEL	RACK LCD ² (PLUS)
Material and color	Painted Steel - RAL 7035
Dimensions	16 x 12 x 8 in.
Protection class	IP 54
Ambient temperature range	41 – 113 °F
Power supply	230 V - 50/60 Hz (115V - 50/60 Hz on request)
Lamp cable	8 ft.
Power supply cable	3 ft.
Monitor display	LCD
Hour meter	Yes for total system life
Resettable hour meter	Yes for lamp life control
Lamp function control	Yes
Alarm led	Yes
Free contact (NO - NC)	Yes - general alarm (max 2 A)
230 V output (NO - NC)	Yes - general alarm (max 2 A)
Remote ON/OFF contact	Yes (settable)
ON/OFF Timer	Yes (settable)
Reactor temperature measurement and alarm	Yes (°F) - settable value (shut off for high temperature) on PLUS MODELS
UV Irradiance measurement and alarm	Yes (% or W/m ² optional) - settable value on PLUS MODELS
4/20 mA output	Optional - for Irradiance and water temperature on PLUS MODELS
Audio alarm	Optional

5.2 Electrical Panel Installation and Operation

The electrical panel of the LCD series is equipped with 4 fixing brackets for wall mounting.



Connect the lamp socket to the lamp, place the ground wire in the slot along the sleeve bolt and connect its terminal to the M4 bolt welded on the UV chamber, insert the contact cover bringing it up to the beat, then rotate it in closure position



Finally, connect the power cable to the socket. Once connected to the power supply the UV lamp will turn on.

Do the following at the first start up and on every lamp replacement:

- 1) Activate the lamp life count down hour meter (see display description)
- 2) For the LCD PLUS system with UV sensor: operate the sensor calibration. This operation must be conducted after at least 5 minutes from lamp start, with quartz sleeve clean, with sensor measuring window clean and with steady water flow.

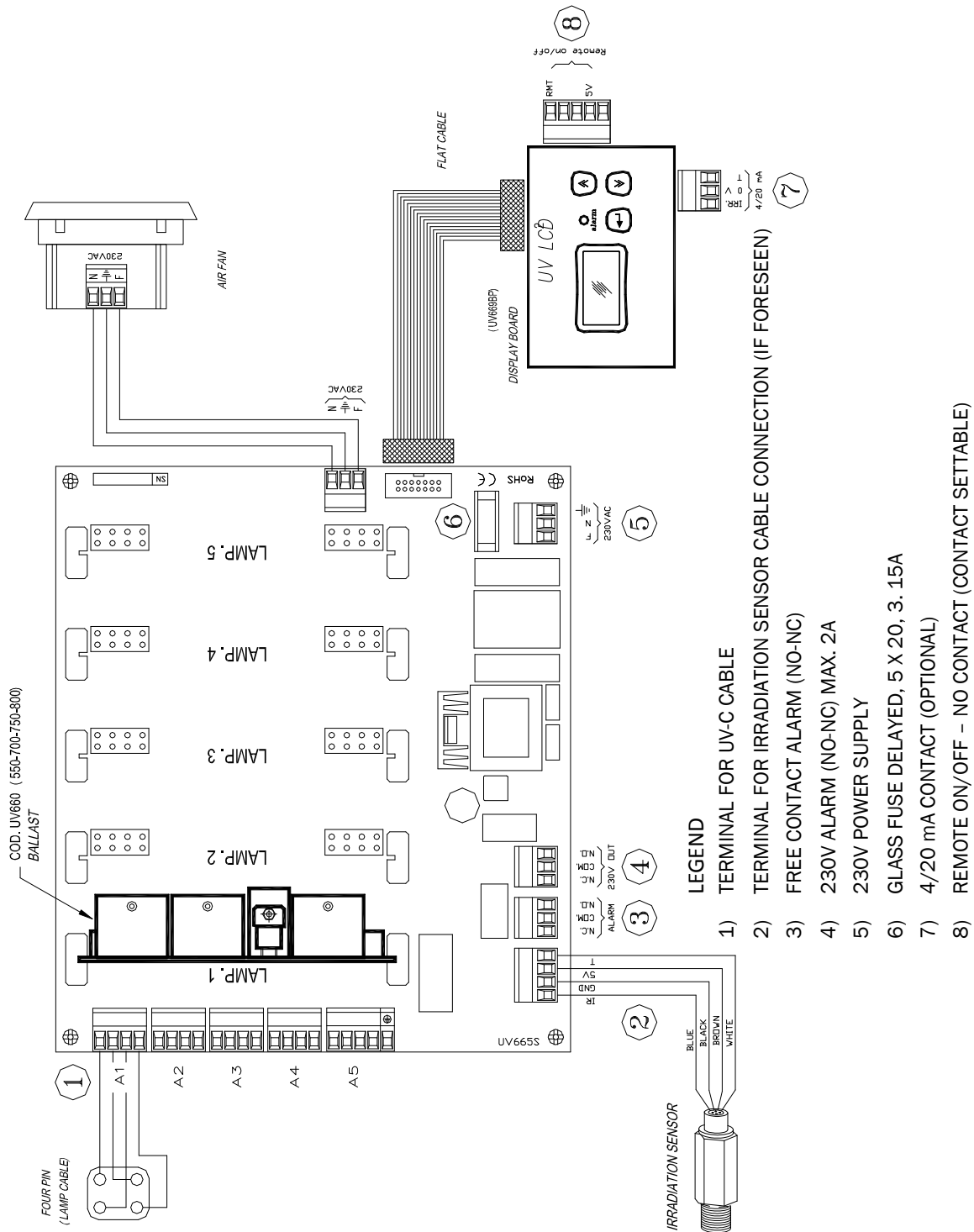
5.3 Switch ON / Switch OFF the lamps

Because of the small power of the electrical panel this is not equipped with power selector. Therefore, the panel is always powered but lamps can be switched ON/OFF in the following ways:

1. Holding down the OK (◀) button for 5 seconds (see display description)
2. Closing the remote ON/OFF contact (see electrical scheme)

6. RACK LCD Board Description

6.1 RACK LCD Electrical Panel - Internal Layout



6.2 LCD Display Board Description

Following are described the standard and optional terminals connection to the display board:

- It is possible to connect the sensor cable (usually this is connected on the main board).
- It is possible to connect the REMOTE ON/OFF contact, this is powered with 5Vdc that if closed to the RMT contact shuts off the lamps. The user can set the working of the remote ON/OFF contact by the display between N/O and N/C. The factory setting is N/O because it let the system working with nothing connected to the remote ON/OFF terminal.
- In case of LCD PLUS systems with optional 4/20 mA output then it's possible to connect to the 4/20 mA terminal. This signal is available for the water temperature and the UV irradiance.

The temperature signal has the following correspondence:

4mA = 32 °F (0 °C)
20 mA = 212 °F (100 °C)

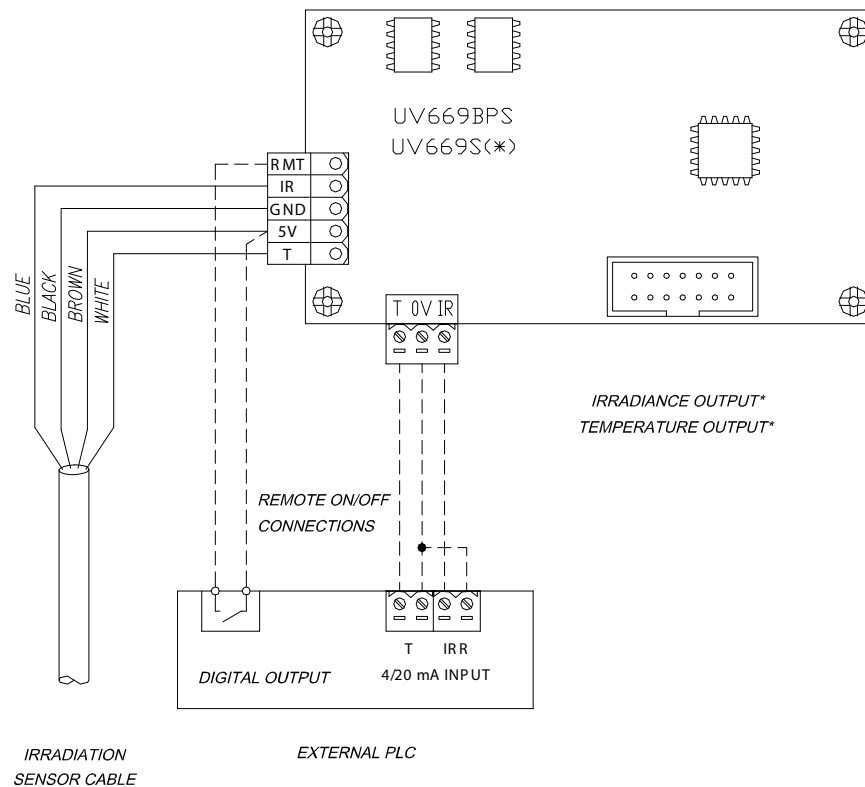
The irradiance signal has the following correspondence:

4mA = 0%
20 mA = Settable value on the display (factory setting 20 mA= 100%)



Important

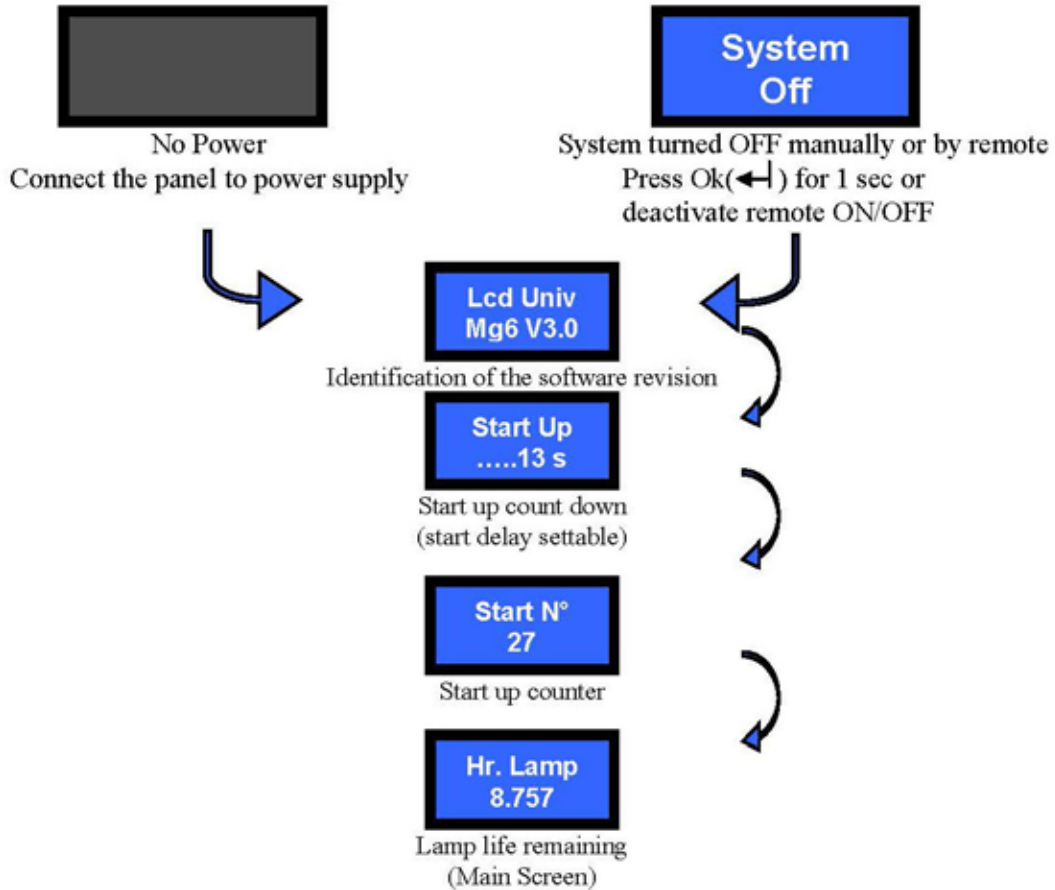
The 4/20 mA output signal can work with a max load of 150 ohm



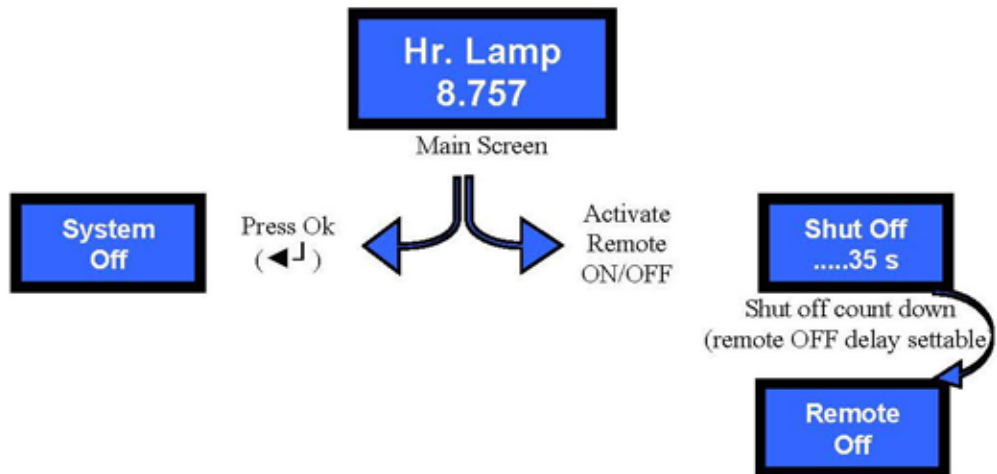
*optional on request

7. Display Information (Troubleshooting)

LCD DISPLAY MESSAGES – Start up:

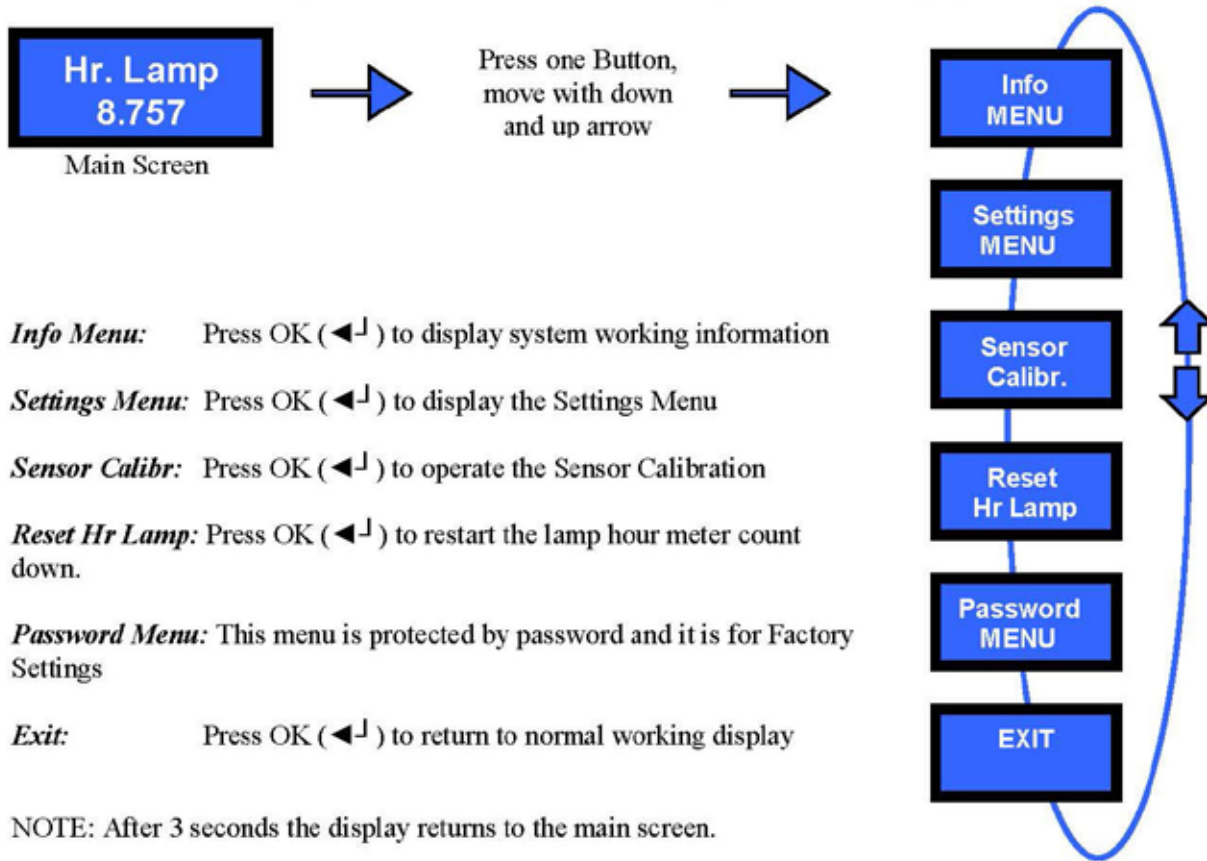


LCD DISPLAY MESSAGES – Shut Off:



LCD DISPLAY MESSAGES – Main MENU:

The main MENU describes the main functions of the control Panel
To enter the main menus push one of the 3 buttons. Move through the menus using up and down arrow buttons.



Info Menu: Press OK (◀↵) to display system working information

Settings Menu: Press OK (◀↵) to display the Settings Menu

Sensor Calibr: Press OK (◀↵) to operate the Sensor Calibration

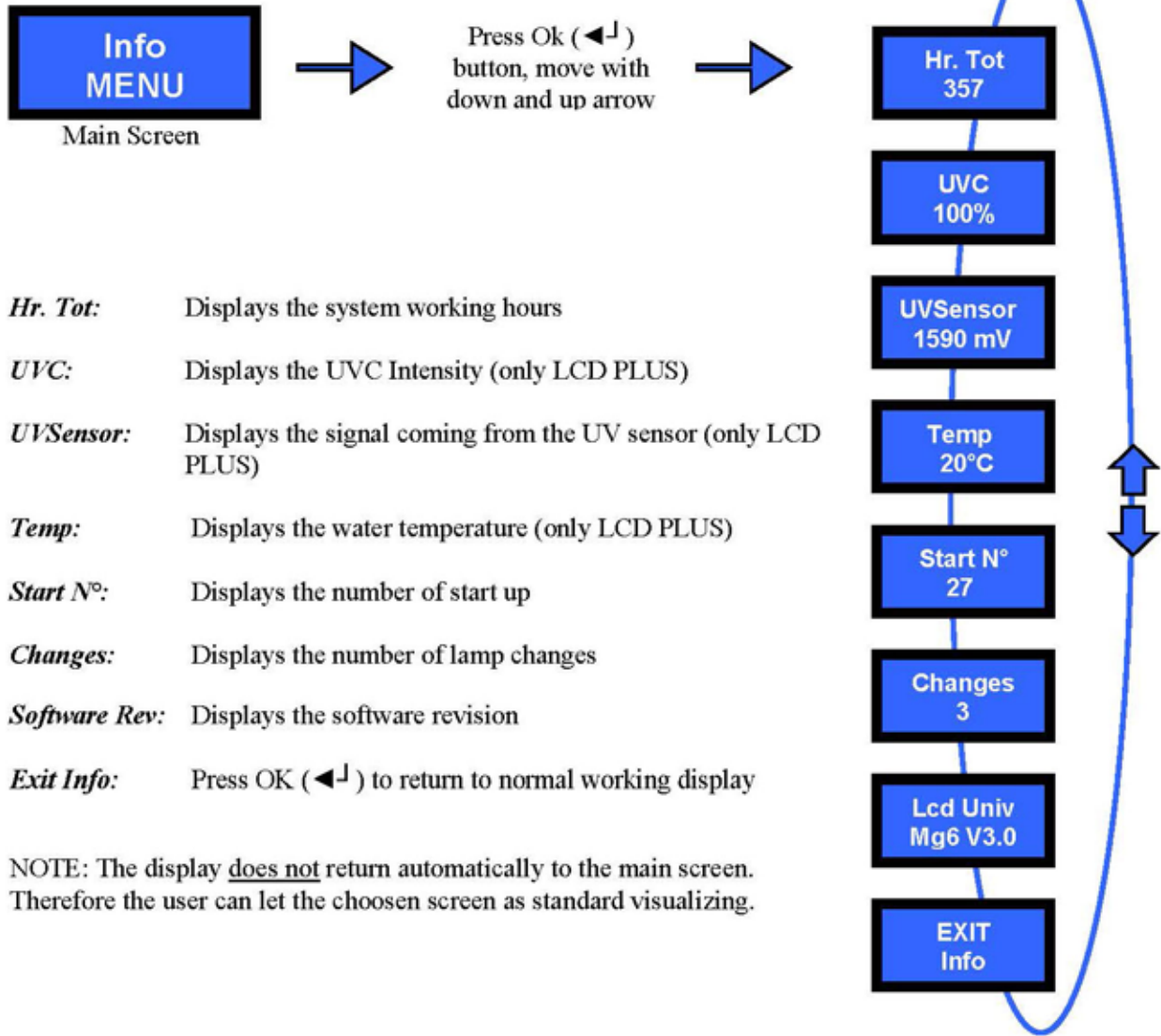
Reset Hr Lamp: Press OK (◀↵) to restart the lamp hour meter count down.

Password Menu: This menu is protected by password and it is for Factory Settings

Exit: Press OK (◀↵) to return to normal working display

NOTE: After 3 seconds the display returns to the main screen.

LCD DISPLAY MESSAGES – Info MENU:



- Hr. Tot:* Displays the system working hours
- UVC:* Displays the UVC Intensity (only LCD PLUS)
- UVSensor:* Displays the signal coming from the UV sensor (only LCD PLUS)
- Temp:* Displays the water temperature (only LCD PLUS)
- Start N°:* Displays the number of start up
- Changes:* Displays the number of lamp changes
- Software Rev:* Displays the software revision
- Exit Info:* Press OK (◀) to return to normal working display

NOTE: The display does not return automatically to the main screen. Therefore the user can let the choosen screen as standard visualizing.

LCD DISPLAY MESSAGES – Settings MENU:

Settings MENU

Main Screen

Press Ok (↵) button, move with down and up arrow

ON delay
9999 s

UVC 20mA
100%

Remote
N.O.

OFF delay
9999 s

Buzzer
Mode ON

Stop In
01 H

Stop For
08 H

Calibr. T
0°C

EXIT
Settings

ON delay: Press OK (↵) to set the start delay. This value is expressed in seconds. It allows to start the lamp and wait for the alarm warm up without alarms.

Increase/decrease values pressing arrows

UVC 20mA: Press OK (↵) to set the correspondence between 20 mA output and irradiance read from the UV sensor. The 4/20 mA output is optional on request available on the LCD PLUS models. Increase/decrease values pressing arrows

Remote: Press OK (↵) to set the remote ON/OFF working between NO and NC (NO = Normally Open, NC = Normally Closed).

Change settings pushing OK.

OFF delay: Press OK (↵) to set the remote shut off delay. This value is expressed in seconds. In case the remote ON/OFF is connected to a flow switch then this settings avoid shut OFF if water flow stops only for few seconds.

NOTE: To high frequency of ON/OFF decreases the lamp lifespan. Max 3 ON/OFF cycles per day are allowed.

This setting decreases the useless shut off for short water flow stops

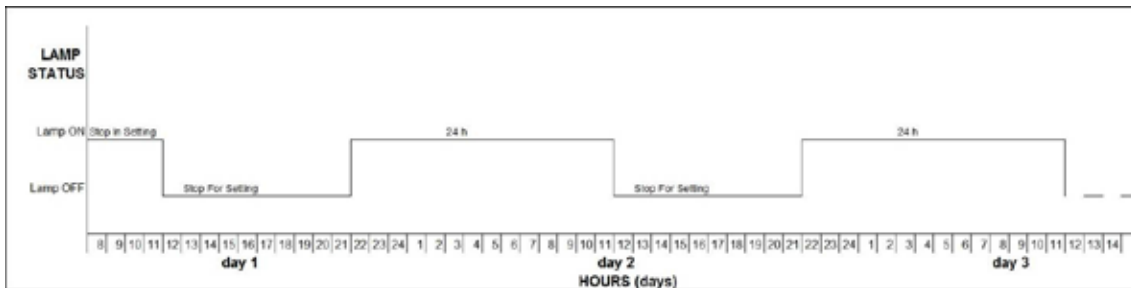
Increase/decrease values pressing arrows

Buzzer: Press OK (↵) to set the 230V output in buzzer mode. If a buzzer is connected to the 230V alarm then, in case of alarm the 230V output is set to drive the buzzer in intermittent operation (5 seconds ON, 5 minutes OFF).

Stop In: Press OK (↵) to set how soon the system will turn off automatically. After the first turn off the system will turn off the next day at the same time. Increase/decrease values pressing arrows. If Stop In value is set = 0 then the timer is deactivated.

Stop For: Press OK (↵) to set how long the system will remain off before automatic restart. Increase/decrease values pressing arrows. If Stop In value is set = 0 then the timer is deactivated.

Calibr. T: Press OK (↵) to set the water temperature if the sensor is not calibrated.



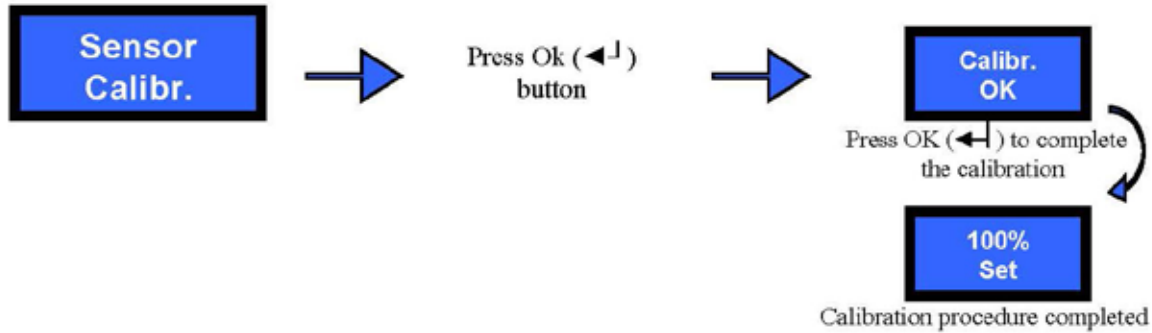
Timer Diagram example with *Stop In* set to 4 hours and *Stop For* set to 10 hours.

Exit: Press OK (↵) to return to normal working display

NOTE: After 3 seconds the display returns to the main screen.

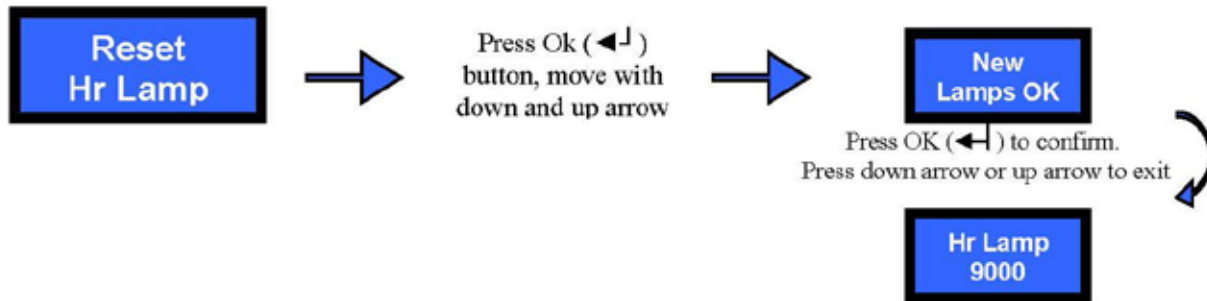
LCD DISPLAY MESSAGES – Sensor Calibr. (Only PLUS version):

This operation must be done at the first start up and on every lamp replacement, with quartz sleeves and sensor measuring window clean. Wait 5 minutes from the lamp start before operating the sensor calibration.

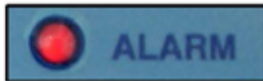


LCD DISPLAY MESSAGES –Reset Hr Lamp.:

This operation starts the count down of the lamp life hour meter. This operation must be done at the first lamp start and on every lamp replacement



LCD DISPLAY MESSAGES – Alarms/troubleshooting:



In case of any alarm the red LED is flashing.

List of alarms:



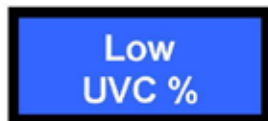
Indicates the lamp failure. If the system has 2 lamps the failed lamp is identified. Check:

- Connection to the lamp
- If lamp has failed
- If lamp starter has failed.



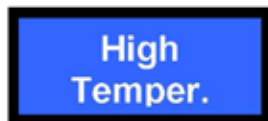
Indicates that the count-down hour meter of lamps life comes to zero. In such case replace the lamps and restart lamp hour.

Only for Plus



Indicates low irradiation. Check:

- If lamp life has expired
- If quartz sleeves are dirty
- If sensor windows is dirty
- If water quality has changed



Indicates high temperature in the UV chamber. This may happen when either there is no flow or there is air in the UV chamber. In such cases the system switches off.

Reset the alarm: Push OK(◀) for 5 sec to put the system in standby then press OK (◀) again to restart the UV system.

NOTE: In case of high temperature the panel turns off the lamp and this remains off even if temperature drops below the threshold level. This is necessary in case of no flow to avoid this cycling:

Lamp ON→ High Temperature→lamp turned off→Temperature lower then threshold→ lamp started again→ High Temperature→....

This can destroy the UV lamp, in case the user can accept this risk then ask the factory for setting change instructions.

LCD DISPLAY MESSAGES – Other Problems:



Display OFF in case of no electrical feeding or burned fuses

8. Maintenance

The UV System of DOMESTIC SERIES has been designed and realized by Jesco with simple and functional principles which make the checking procedures and the periodical servicing particularly easy.

The main points which characterize standard servicing are the following: check the quartz sleeves quarterly, which contain the UV lamps, in order to ensure maximum disinfection for 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 9000 hours

UV quartz sleeve clean - frequency depends on the quality of the water

O-ring for quartz sleeve - once per year

Procedure for UV lamp replacement (9000 h max.)

- 1) Disconnect the electrical box from the electrical power supply
- 2) Lift the cover slightly by turning, carefully loosening the electrical 4-pins connection and extract the lamp from the quartz sleeve
- 3) Remove the lamp from the packing, handling it carefully by its ends or by using gloves
- 4) Insert the new lamp into the quartz sleeve of the sterilizer
- 5) Connect the lamp to the electrical connection and replace the cover
- 6) Re-connect the equipment

Important!

For lamp replacement, it is not necessary to stop the water flow and drain the UV chamber.

Procedure for quartz sleeve cleaning

- 1) Disconnect the electrical box from the electrical grid and turn off water
- 2) Remove the lamp, as described for the lamp replacement instructions.
- 3) Depressurize and drain the UV system
- 4) Unscrew the sleeve-bolt and extract the quartz sleeve with care
- 5) Clean the quartz sleeve by wiping it with a cloth soaked with an acid solution such as vinegar or lemon
- 6) Reassemble the sleeve being sure to center the guide-spring fixed on the bottom, put the o-ring on the quartz sleeve, then tighten the sleeve-bolt; place the o-ring in the seat of the sleeve-bolt, insert the sleeve inside it, till it leans, then screw on the S/S chamber
- 7) Turn on water checking for possible leaks
- 8) Remount lamp, electrical connection and cover
- 9) Turn on the UV system

9. Replace the Ballast

Ballasts are installed into the motherboard in rack configuration. Each ballast starts one lamp.

Ballast from the left starts lamp 1 to lamp 5.

If one lamp is off then first test its ballast with another lamp. If the second lamp doesn't start too then the problem is in the ballast. Check the fuse before replacing the ballast with the following procedure.

If replacement fuse blows then the ballast shall be either repaired or replaced.

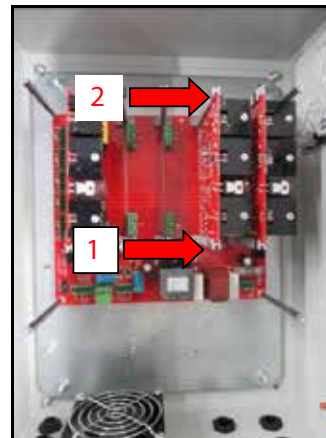


CAUTION: Before starting maintenance operation switch off the panel power supply.

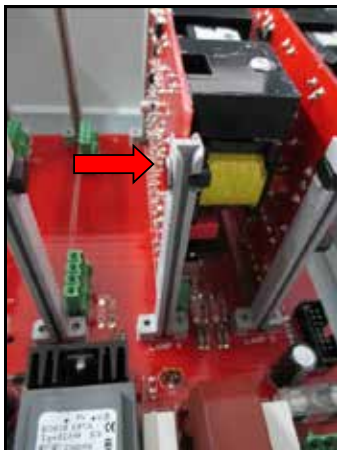
1. Unscrew the protection panel retaining screws.
2. Unlock the ballast from its plastic guides by pressing buttons 1 and 2.
3. Pull out the ballast.
4. Insert the new ballast and lock it pushing button 1 and button 2.
5. Screw the protection panel, close the panel door and start the panel.



Step 1



Step 2



Zoom on release button



Steps 3 and 4

10. Warranty Conditions

WARRANTY CONDITIONS

JESCO works in compliance with ISO 9001-2015 quality procedures and subjects all equipment to accurate checks and tests.

JESCO products are guaranteed only within 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 delivery date or 30 days from the purchase date, provided that defects are reported immediately.

The stainless steel chamber is covered by a 5-year warranty only if used with compatible liquids and correctly installed.

In no case the integral replacement of the product foreseen and any responsibility of JESCO is excluded for delays in the delivery of the goods to the customer, for claims of third parties against the customer, for losses of goods, costs (installation, servicing and maintenance, transport, and etc.) and damages of the customer due to the defect.

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

Repairs are normally carried out in the JESCO facility or in authorized after-sales service centers approved by JESCO.

The warranty does not cover:

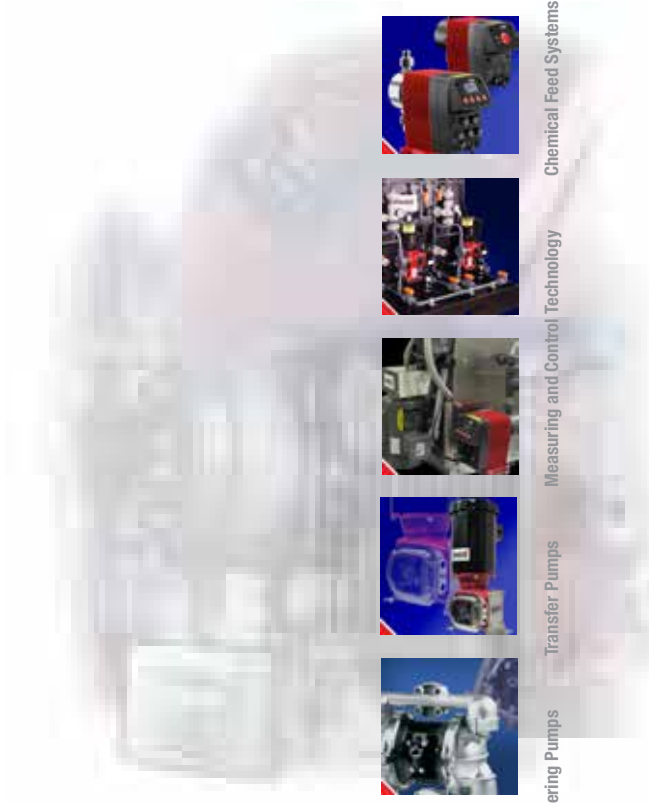
1. Accidental breakages due to transport.
2. Breakages due to the use of equipment not in compliance with what is indicated on the use and maintenance manual or due to carelessness.
3. Breakages to the connection to a power grid fed with a tension different than the foreseen one ($\pm 10\%$ of the nominal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

DO NOT TAMPER WITH THE ADHESIVE IDENTIFICATION LABELS

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

THIS PAGE INTENTIONALLY LEFT BLANK



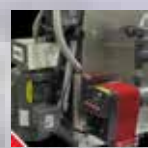
Accessories



Chemical Feed Systems



Measuring and Control Technology



Transfer Pumps



Metering Pumps

April 2019