



NANO TECH UV-C DISINFECTION SYSTEM

USER GUIDE

MODELS

NT-UV16

NT-UV40 and NT-UV40-T

NT-UV75 and NT-UV75-T

NT-UV87-TO (Ozone)

NT-UV130F and NT-UV130-TF

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1. SAFETY WARNINGS

IMPORTANT: The instruction manual you are holding includes essential information on the safety measures to be implemented for installation and start-up of this appliance. Therefore, the installer as well as the user must read the instructions before beginning installation and start-up. Keep this manual for future reference.

This device is intended for swimming pools and spas only; do not use it for potable water sanitation (drinking water).

The system must be connected only to a supply circuit that is protected by a Ground Fault Circuit Interrupter (GFCI), otherwise could result in electrical shock causing serious bodily injuries, including death.

The following safety instructions have to be taken into consideration when installing or using this ultraviolet disinfection system:

- Disconnect all power supplies during installation.
- Do not operate the ultraviolet system if the power supply lead is damaged.
- Replace damaged cords immediately.
- To avoid possible electrical shock, special care should be taken keeping all connections dry and off the ground. Do not touch the plug with wet hands.
- For each of the following situations, do not attempt to repair the appliance on your own; return it to an authorized service facility for revision:
 - If the appliance falls into the water, DO NOT reach for it! First unplug it and then retrieve it. If electrical components of the appliance get wet, unplug the appliance immediately.
 - Do not operate this UV-C system if the cord or plug is damaged, if it is not operating properly after a fall or otherwise caused damage.
- Never look at the UV lamp directly while it is operating, as it may cause eye injury, burns, or even blindness.
- Lamps and quartz sleeves are extremely delicate. Care should be taken when handling or replacing these components:
 - Wear cotton gloves when handling lamps or sleeves.
 - Hold bulbs by the ends only and never touch the glass with bare hands, since it would leave dirt which would reduce its working life.
 - If any fingerprint is left, clean it with alcohol.
- Allow the ultraviolet lamps to cool before handling.
- Make sure that the nut, the washer and the O-Ring are correctly positioned, otherwise the quartz sleeves could be expelled from their holder at speed and injure you.
- Special safety warning must be taken into consideration for the model Nano-Tech UV-C Ozone NT-UV87-TO:
 - The UV lamp generates ozone that emits a strong odour, even in very small quantities, and can be harmful for eyes, nose and skin.
- Check the system for any leakage. A proper installation and the correct position of the sealing rings are of crucial importance.

2. INTRODUCTION

Ozone and UV-C are the two most efficient disinfection processes in water treatment. By mixing these two concepts in one unique equipment you will keep your swimming pool water always fresh, crystal clear and totally disinfected, reducing the use of chlorine to a minimum.

2.1 HOW DOES ULTRAVIOLET DISINFECTION WORK?

Ultraviolet technology is a non-chemical approach to disinfection. In this method of disinfection, nothing is added which makes this process simple, inexpensive and requires very low maintenance. UV-C light is becoming increasingly favoured by the pool industry as its ability to break down and remove chloramines, which will cause eye, skin and nose irritation, and breathing difficulties.

UV-C light at a particular wavelength 253.7nm is a very powerful germicide. It deactivates the DNA of bacteria, viruses and other pathogens and thus destroys their ability to multiply and cause disease (Figure 1).

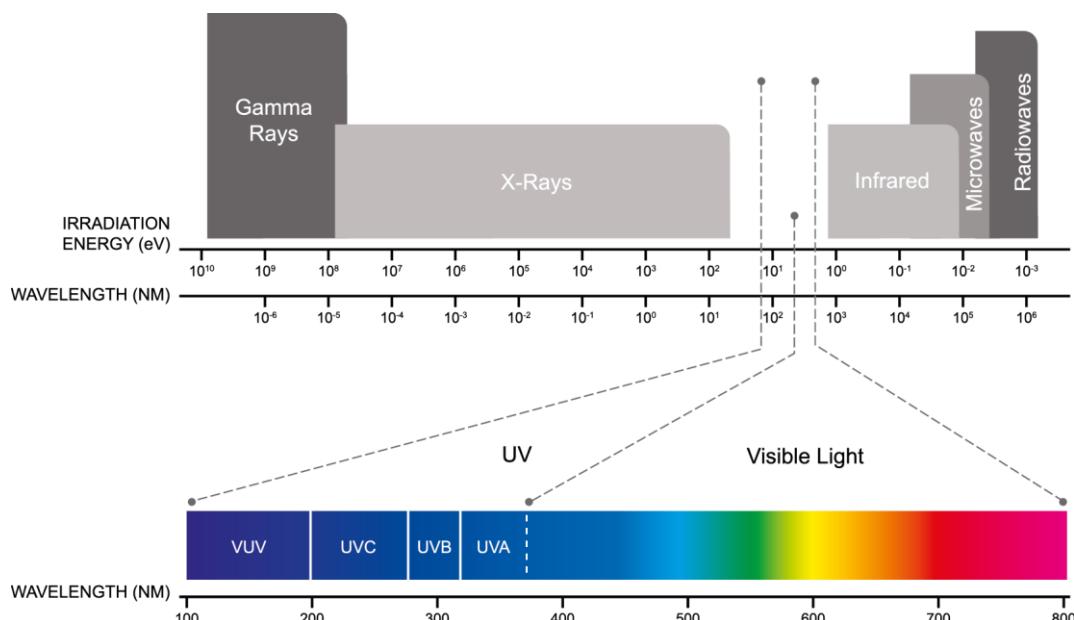


Figure 1

UV dose of 30mJ/cm² is sufficient for disinfection of the water and protection against 99.9% chlorine-resistant microorganisms.

2.2 HOW DOES OZONE DISINFECTION WORK?

Emaux has developed a special model which combines the ozone and UV-C technology in one unique equipment (see technical specifications for NT-UV87-TO).

Nano-Tech UV-C & Ozone (NT-UV87-TO model) contains a high intensity Ultraviolet lamp different from the other UV models. This special lamp emits two separate wavelengths within the UV spectrum: 254 nm and 185 nm.

While the 254 nm wave deactivates the DNA of bacteria, viruses and other pathogens, the 185 nm wave is responsible for converting the oxygen contained in the quartz sleeve area into ozone.

The ozone produced is introduced into the water stream by Venturi effect.

Finally, the ozone and the ultraviolet radiation will work together to destroy micro-organism such as moulds, Legionella bacteria, parasites, algae or viruses, and also breaks down urine, transpiration, cosmetics and sun cream particles without leaving any by-products (Figure 2).

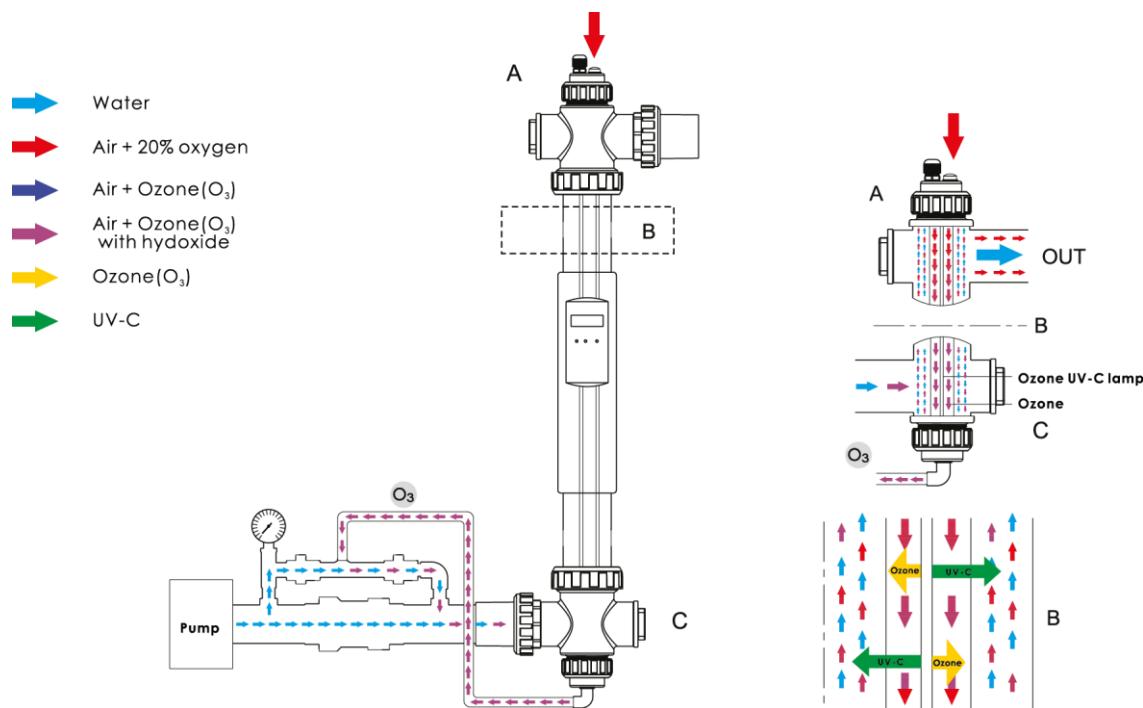


Figure 2

3. MAIN ADVANTAGES

ULTRAVIOLET ADVANTAGES

- Protects your pool against pathogenic organism and algae
- Environmentally friendly
- No risk of allergies
- Non-irritating to skin
- Corrosion and Odour-free
- Reduces chlorine consumption up to 85%
- UV-C low pressure lamp life of 9000 hours, Amalgam lamp life of 12000 hours
- The device indicates when the lamp must be replaced (only models with timer)
- Housing with mirror polished Stainless Steel AISI-316L that increases the UV-C radiation reflection, thereby increasing the efficiency up to 35%
- Easy installation and maintenance

OZONE ADVANTAGES (only NT-UV87-TO)

- Protects your pool against pathogenic organism and algae
- Environmentally friendly
- No risk of allergies
- Non-irritating to skin
- Corrosion and Odour-free
- Reduce chlorine consumption up to 90%
- Ozone lamp life of 10000 hours
- The device indicates when the lamp must be replaced
- Urine, sun cream, cosmetics and transpiration particles are broken down by ozone
- Low maintenance
- Cost-saving

4. INSTALLATION RECOMMENDATIONS

Install the unit taking into consideration the access and space for servicing, and in a position where the lamp can be taken out easily (refer to the Chapter 7 "Plumbing installation" for further details). It is important to choose your disinfection system according to the flow rate required for the installation. If water passes through the unit too fast, the exposure time required for its maximum efficiency will be not enough. For this reason, the ultraviolet equipment selected for your pool should correspond to the maximum flow rate of your filtration system (pumps).

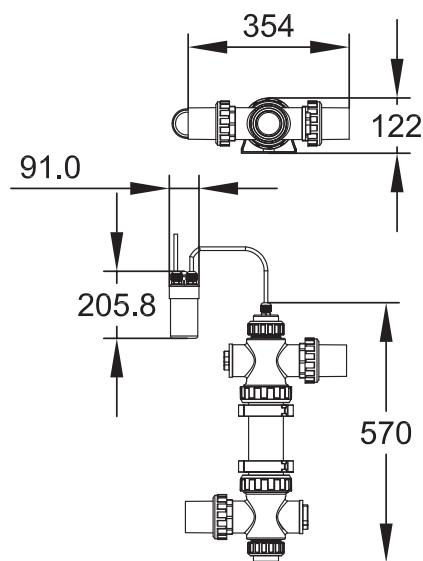
We also recommend to install the unit in a by-pass.

5. TECHNICAL SPECIFICATIONS

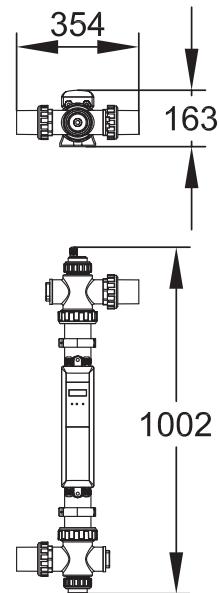
MODEL	MAIN FEATURE	MAX. FLOW RATE (m ³ /h)	INPUT POWER (W)	TYPE OF UV LAMP
NT-UV16	UV	7	16	TUV 16W 4P SE
NT-UV40	UV	20	40	TUV 36T5 HE 4P SE
NT-UV40-T	UV with timer			
NT-UV75	UV	25	75	TUV 36T5 HO 4P SE
NT-UV75-T	UV with timer			
NT-UV87-TO	UV and Ozone with timer	25	87	GHO36T5VH
NT-UV130-F	UV with flow switch			
NT-UV130-TF	UV with timer and flow switch	30	130	Amalgam UV-C Lamp TUV 130W XPT SE

	NT-UV87-TO	OTHER MODELS
Power Supply	230V, 50-60Hz	120/230V, 50-60Hz
Maximum Working Pressure	3 bar	3 bar
Connection size	1½''/ 2''	1½''/ 2''
Performance at recommended flow rate	30 mJ/cm ²	30 mJ/cm ²
Low Pressure Lamp Lifetime	N/A	9000 hours
Amalgam lamp Lifetime	N/A	12000 hours
UV and Ozone Lamp Lifetime	10000 hours	N/A
IP Protection	IP 54	IP 54
Maximum Ozone production	0.6 gram	N/A

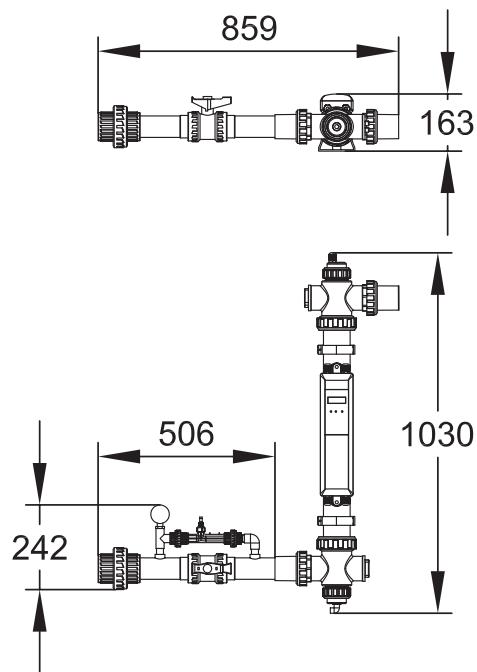
6. DIMENSIONS



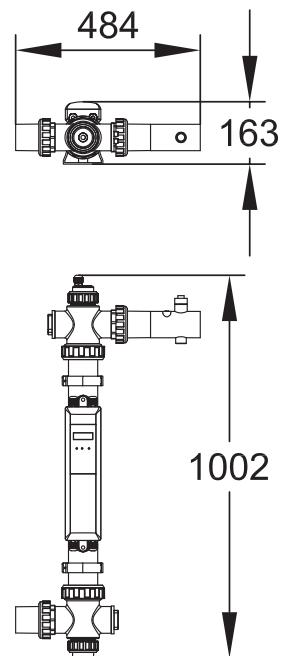
NT-UV-16



NT-UV40 / NT-UV40-T
NT-UV75 / NT-UV75-T



NT-UV87-TO



NT-UV130F / NT-UV130-TF

7. PLUMBING INSTALLATION

This UV-C disinfection system comes with all internal components assembled and it is ready to be installed. Only pipes connections should be made before starting up the equipment.

To achieve the correct installation, please follow the recommendations listed below:

- Never install the UV-C system in an area exposed to full sunlight. This equipment must be installed in a dry and ventilated area.
- The UV-C system must be fitted in a vertical position, and leaving a minimum space of 30 cm underneath and 1.5 meters at the top of the equipment for servicing and replacing the lamp.
- The UV-C system will need to be plumbed into the swimming pool / spa / water feature circuit, always after the filter and before pH regulator or salt electrolysis system (if any).
- If the filtration pump exceeds the maximum flow rate allowed for the UV-C system, a by-pass circuit will be required.
- Fit the UV-C system with the supplied clamps in a fixed position and hand-tighten the 3 part couplings. Never use a wrench, tongs or other tools to tighten synthetic parts.
- Make the UV-C connections 1 ½" or 2" to the circuit pipes.
- Activate the pump and check that there is not any leakage in the circuit.
-

7.1 PARTICULAR REQUIREMENTS FOR NANO-TECH UV-C OZONE SYSTEM

Follow the instructions below for installing Nano-Tech UV-C Ozone System:

- Fit the manometer onto the Venturi circuit using Teflon tape. Hand-tighten the manometer.
- Insert the threaded socket into the UV-C system inlet connection. The other side of the socket will be connected with PVC glue to the entire Venturi circuit. The Venturi circuit must be installed in a horizontal position (see Figure 3).
- Take the hose of the non-return valve. Fit the longest section of the hose to the bottom side of the device on the air valve and press the clamp inwards. Place the short section of the hose onto the adapter of the Venturi circuit.
Important! The air coupling on the top of the ozone device is intended to suck the air for ozone generation, so no hose is fitted there.
- Mount the complete device, including the Venturi circuit at the desired place between the piping.
- The quality of the ozone air in the system can be adjusted using the ball valve. The closer it is positioned, the more ozone air will enter the circuit. The ideal range on the manometer is between 0.4 and 0.7 bar (Figure 4).



Figure 3

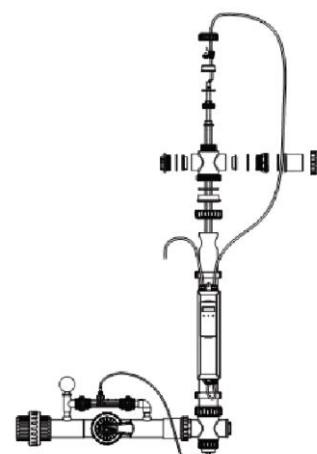


Figure 4

8. ELECTRICAL INSTALLATION

This UV-C disinfection system operates at 110/230V and 50/60 Hz. The connections of the device to the electric power supply must be done by the electrical control box of the pumps, so that the filtration pump and the UV-C system are connected simultaneously.

In case of the models NT-UV130-F and NT-UV130-TF, the integrated flow switch will automatically switch the device off if no water is flowing through it.

In order to install the earth cable, proceed as follows (see Figure 5):

- Pull the cable through the cable gland.
- Place the end of the cable into the earth bolt of the housing.
- Place a hexagonal nut between two toothed washers on the top end of the cable.
- Finally place the lock nut onto the earth bolt.
- Tight the nut with a spanner. Do not tighten too firmly, otherwise you may crack the cable gland.
- The transparent nut that was screwed on the earth bolt on delivery has not further use, and can be discarded.

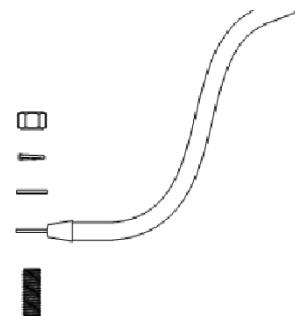


Figure 5

9. START UP

Before starting up the UV-C system, perform the following actions:

- Backwash the filter and make sure it is completely clean.
- Make sure the pool does not contain copper, iron nor algae.
- Check and adjust the chemical parameters of your pool or spa. The proper chemical balance is essential for the correct UV-C system operation, and it also helps to reduce drastically the use of chemicals sanitizers.
 - pH: 7.2 – 7.6
 - Total alkalinity: 60 – 120 ppm
 - Hardness: less than 120 mg/l
 - Turbidity: less than 1 NTU
 - TSS (Total suspended solids): less than 10 mg/l
 - UV Transmittance: more than 75%.
- Check the hydraulic connections and ensure there is no leakage.
- Release the air from the circuit through the air relief valve installed on the filter (if equipped).

10. OPERATION

10.1 DIGITAL TIMER*

*Available for the following models:
NT-UV40-T, NT-UV75-T, NT-UV130-TF, NT-UV87-TO.

The following three functions are available thanks to the digital timer (Figure 6):

- UV lamp lifetime meter
- Schedule timer
- Clock

UV LAMP LIFETIME METER

As soon as the above mentioned model with Timer is switched on, the program will carry out a self-test. The display will automatically show the following code: 8888 (display test); software version number; 50Hz or 60Hz indication of the mains frequency.



Figure 6

Following this, the display will show the meter reading:

- For the models NT-UV40-T and NT-UV75-T: When the UV-C lamp is switched on for the first time, or after the 'Reset' function has been used, the value '9000' will appear on the display. A dot next to the digit on the far right of the display will blink every second: this indicates that the counter is running.
- For the models NT-UV130-TF and NT-UV87-TO: When the UV-C lamp is switched on for the first time, or after the 'Reset' function has been used, the value '9000' will appear on the display. A dot next to the digit on the far right of the display will blink every second: this indicates that the counter is running. The real lifetime of these lamps is of 12000 and 10000 hours respectively, but the display can only show 4 digits. You can adjust the number of hours manually once 3000 hours (for NT-UV130-TF) or 1000 hours (for NT-UV87-TO) have passed (please find the instructions below).
- If the UV-C system was used previously, once it is switched on again the display will indicate the last value before it was switched off. If you increased or reduced the value of the meter manually, the display will indicate the latest counter reading before it was switched off.

MANUAL ADJUSTMENT

- Press the button 'MENU' and select the option 'Hr' by pressing 'MENU' again.
- The flashing number shown on the screen will indicate the hours left for replacing the lamp.
- Press the button 'MENU' to modify the hours.
 - Use the buttons ▲ and ▼ to increase or decrease the counter value in steps of 500 hours from the initial value up to the maximum value of 9500 and the minimum of 500.
 - Once the desired hour is reached, stand off for 10 seconds until it stops flashing and confirm the set hour chosen.

The time meter will indicate in the following manner that the lamp must be replaced:

- From hour position 0672, the display will blink every second. The lamp is to be replaced within 4 weeks.
- From hour position 0336, the display will blink every half second. The lamp is to be replaced within 2 weeks.
- From hour position 0168, the display will blink every 1/4 second. The lamp is to be replaced within 1 week.
- At an hour position of 0000, the digits will blink continuously, and the meter will not continue to count down. The lamp must be replaced.

SCHEDULE TIMER

This function allows you to schedule the working hours desired for the proper disinfection of the pool.

- Press the button 'MENU' and use the buttons ▲ or ▼ until you reach the option 'UV'. Press 'MENU' to select.
- 'UV00' means midnight 00:00h; Press ▲ or ▼ to change the time from 0h to 24h. 'UV01' means 01:00 am; 'UV02' means 02:00 am, etc.
- Press the button 'MENU' to select the hour.
- The selected hour will be flashing. Press ▲ or ▼ to select if at this hour the device will be switched on or off. Wait for 10 seconds until it stops flashing and confirm the selection.
- Press the button 'MENU' if you want to go back or select another hour.

CLOCK

This function allows you to set the clock according to the current time.

- Press the button 'MENU' and use the buttons ▲ or ▼ until you reach the option 'rest'. Press 'MENU' to select.
- The hour indicator will flash. Press ▲ or ▼ to select the desired hour. Wait for 10 seconds until it stops flashing to confirm the hour.
- Press 'MENU' to select the minutes, and minute indicator will flash. Press ▲ or ▼ to select the desired value. Wait for 10 seconds until it stops flashing to confirm the settings.

10.2 FLOW SWITCH*

***Available for the following models: NT-UV130-F, NT-UV130-TF.**

These models are supplied with Amalgam UV lamp recognized as the strongest in the UV-C market.

Consequently, it is very important that the lamp works always with a minimum flow rate. For that reason, the flow switch installed in the chamber will automatically switch the device off if no water is flowing through it.

11. MAINTENANCE

To ensure the correct operation and a long life of this UV-C system, regularly check the chemical parameters and maintain them within the recommended range:

- pH: 7.2 – 7.6
- Total alkalinity: 60 – 120 ppm
- Hardness: less than 120 mg/l
- Turbidity: less than 1 NTU
- TSS (Total suspended solids): less than 10 mg/l
- UV Transmittance: more than 75%.

11.1 LAMP AND QUARTZ GLASS MAINTENANCE AND REPLACEMENT

The device must be cleaned twice a year. If there is an increase in algae and/or scale, the quartz glass tube in which the lamp is positioned must be cleaned using a soft cloth with spirit vinegar or acid.

The UV-C lamps must be replaced once their lifetime comes to the end. Please refer to the following table:

MODEL	LAMP LIFETIME (OPERATING HOURS)
NT-UV16	
NT-UV40	
NT-UV40-T	9000
NT-UV75	
NT-UV75-T	
NT-UV87-T0	10000
NT-UV130-F	
NT-UV130-TF	12000

Always switch off the power supply when replacing the lamp. If necessary, consult the spare parts drawing during replacement, maintenance or dismantling.

The procedure for replacing the lamp is as follows:

- Stop the circulation pump so that no water is flowing into the unit.
- Allow the ultraviolet lamp to cool for at least 30 minutes before handling.
- Untighten the external union nuts, and drain the water from the device.
- Unthread the top union nut with the cable and carefully remove the lid with the cable gland from the housing.
- Helped by the own cable, remove the lamp from the UV-C system through the central hole in the quartz glass holder. As these parts are very fragile, caution is essential. Do not touch the lamp with bare hands; use a soft cloth or cotton gloves to handle the lamp. If the lamp has been touched, it is recommended to clean it again using a soft cloth and some alcohol.
- If the quartz glass needs cleaning or replacing, unthread the quartz glass holder and carefully remove the quartz glass with the sealing ring. Use a soft cloth or cotton gloves to handle the quartz glass. If it has been touched, it is recommended to clean it again using a soft cloth.

- Introduce the cleaned or a new quartz glass. Ensure that it is introduced exactly in the initial position. Do not forget the sealing ring on the top of the quartz glass.
- Hand-tighten again the quartz glass holder and introduce the new lamp carefully into the quartz glass through the same hole in the quartz glass holder.
- Install the cable gland for waterproofing to the lamp cable and thread the external union nuts.

11.2 STAINLESS STEEL HOUSING MAINTENANCE

The stainless steel interior can be cleaned with a soft brush. First of all, the UV-C and quartz lamps have to be removed following the below steps:

- Unthread the adaptor male - male $2\frac{1}{2}''$ – $2''$. Remove the sight glass from the opposite side of the adaptor. There are two more threaded adaptors inside the connections. These adaptors make the stainless steel housing holes to be aligned with the connections and sight glass. These two adaptors are placed in the thread of the connection and in the thread of the sight glass.
- Unthread the main union nut from the stainless steel housing, and remove the pressuring connector from inside the nut.
- Remove the PVC tee connections from the stainless steel housing using a plastic hammer.
- Remove the sealing ring from the stainless steel housing.
- Clean stainless steel housing and then assemble the UV-C system again:
 - Introduce the sealing ring on the stainless steel housing.
 - Assemble the PVC tee connections taking into consideration that the connections must coincide with the holes of the stainless steel housing.
 - Assemble again the pressuring connector and all the union nuts properly. Note that the adaptors that keep the position of the connections aligned with the stainless steel housing have to be threaded in a specific position so that the two holes can be used for an unscrew to help you to thread the adaptor.

11.3 ELECTRICAL UNIT REPLACEMENT

If the electrical unit needs to be replaced, first of all the earth connection must be disconnected from the electrical housing. The entire box must be unscrewed and the earth wiring must be disconnected from the device.

Unscrew the screw top and carefully disconnect the lamp holder from the lamp.

All these parts must be carefully kept, as they are not supplied with the new housing or electrical unit.

12. TROUBLESHOOTING

TROUBLE	POSSIBLE SOLUTION
UV-C system failure, possible lamp disconnection	<p>Disconnect the power cord from the electrical outlet, disassemble the lamp and verify if the lamp connector is fixed firmly in place.</p> <p>Verify if the electric cable is connected into an electrified circuit. Test the electrical circuit.</p> <p>Make sure you have not connected the device into any power source other than specified on the unit's label. If you have done so in error, the electrical unit might have been damaged and should be replaced. Contact your supplier for the replacement (Not warranted).</p>
The UV lamp no longer lit	<p>Verify that the electrical outlet where the UV-C System is plugged into has the proper voltage and the cable is securely plugged into the outlet.</p> <p>The lamp has burned out. Replace the UV lamp.</p> <p>The electrical unit has burned out. Contact your supplier for the replacement.</p>
Pool water is green	<p>Check the chemical balance of the pool.</p> <p>Check the UV-C system to make sure it is on.</p> <p>Run the UV-C system and the circulation pump longer. If the UV system is operated by a timer, increase a number of working hours.</p> <p>Consider replacing the UV lamp. After 4500 hours of operation, the lamp efficiency drops up to 80%. This is normal for all low-pressure type UV lamps.</p>
UV-C system makes noise when operating	<p>Check all connections and sealing rings, especially those near to the UV lamp and the quartz glass.</p> <p>Check the screws on the installation, and pay attention to those vibration points</p>
Water is coming out; the UV-C system is leaking	<p>Check all connections and sealing rings, make sure that all connections are threaded properly.</p> <p>Check the quartz glass if it is broken or damaged.</p>

13. WARRANTY POLICY

Emaux manufactures its products with the highest standard of workmanship, using the best materials available through state of the art process. Emaux proudly warrants its products as follows:

EXTENDED WARRANTY FOR SPECIFIC PRODUCTS (OFFERED FROM DATE OF INVOICE)

Product	Warranty Period
Filters & Filter Systems	2 years
Pumps	1 year
Underwater Lights	1 year (bulbs 90 days)
Ladders	1 year
Control devices	1 year
Heat Pumps & Heat Exchangers	1 year
Salt Chlorinators & UV Systems	1 year (2 years for cell material)
Pool Fittings	1 year
Cleaning Equipment & All others	1 year

13.1 EXCEPTIONS THAT MAY RESULT IN DENIAL OF A WARRANTY CLAIM

1. Damage caused by careless handling, improper repackaging or shipping.
2. Damage due to misapplication, misuse, abuse or failure to operate and install the equipment as specified in this manual.
3. Damage caused by a misuse, abuse or failure to operate and install the equipment out of the scope of a professional level demanded in similar equipment or installation type.
4. Damage due to unauthorized product modifications or failure to use Emaux original replacement parts.
5. Damage caused by negligence or failure to properly maintain products as specified in this manual.
6. Damage caused by failure to maintain water chemistry in conformity with the standards of the swimming pool industry for any length of time.
7. Damage caused by water freezing inside the product.
8. Accident damage, fire, natural disaster or other circumstances outside the control of Emaux.
9. Items repaired or altered in any way by any person that is not authorized by Emaux.
10. Wear & tear parts.

13.2 CLAIM PROCESS

Summary of Emaux Claim Process in 3 steps:

1. Claim: Customer contacts Emaux salesperson and provides complete details of the claim which includes:
 - a. Information about the failed product such as the part number(s) and serial number(s).
 - b. Description of the complaint/failure.
 - c. Pictures

2. Revision: Once the complaint is received, the product quality incident will then be reviewed by Emaux Quality Department following the "Emaux Warranty Policy".
3. Conclusion: After the investigation is completed, Emaux will inform the distributor accordingly.

13.3 WARRANTY OBLIGATION

Emaux warrants any of above items from workmanship and/or material(s).

Should a defect become evident during the term of warranty, Emaux will, at its option, repair or replace such item or part at its own cost and expense. Customer will need to follow the warranty claim procedures from Emaux in order to obtain the benefit on this warranty.

Emaux is not, however, responsible under this warranty for any cost of shipping or transportation of the equipment or parts thereof "to" or "from" our technical operations. Emaux is not liable for any loss of time, inconvenience, incidental expenses such as labour cost, phone calls, legal cost or material cost incurred in connection with the replacement or removal of the equipment, or any other consequential or incidental damage on persons or assets. Emaux will be not responsible for any business profit loss or operation stop due to the non-conformity product equipment. No indemnity or damages can be claimed on any account whatever.

13.4 WARRANTY OR REPRESENTATIONS BY OTHERS

No dealer or other person has authority to make any warranty or representation concerning Emaux or its products.

Accordingly, Emaux is not responsible for any such warranty or representation.