Installation & operating manual
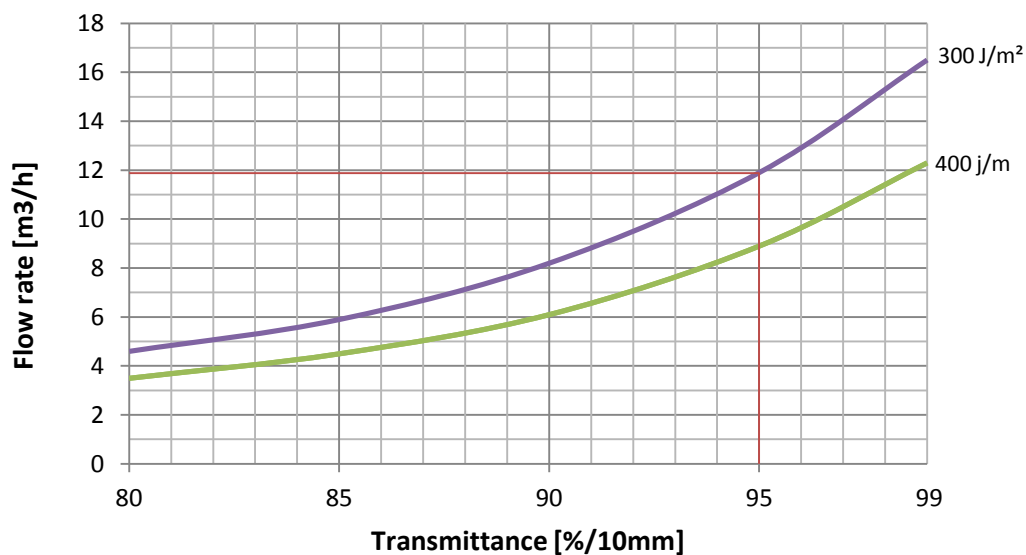
UV disinfection system

Validated series – V150

Congratulations with your new Validated series UV system!

This UV product is tested and validated bio dosimetric. The validation is according to the NEN-EN 14897:2006 norm. Using CFD modeling and theoretical calculations the reactor design has been optimized. By using bio dosimetric tests, the actual capacity is determined under actual conditions as they are in the field.

The capabilities of your system are listed below in relation to the UV-C transmission values, with a target dose of 300J/m² and 400J/m².

V150 Flow rate vs transmittance

Example: with a transmittance of 95% and a UV dose of 300 J/m², the maximum capacity would be 11,9 m³/h.

WARNING:
UV-C radiation damages eyes and skin.
Avoid direct radiation

Contents

1.   General

This manual describes the installation and operation of the UV disinfection device.
This unit will be used for the disinfection of water using UV-C radiation.
This UV disinfection device is not approved according the applicable regulations in the USA and Canada.

2.   What is UV-C

2.1.   Background to UV disinfection

The UV-C lamp contained within the UV disinfection device emits a specific light wavelength mainly concentrated around 254nm (nanometres). At this wavelength, the DNA-structure of the micro-organisms will be irreversibly damaged, leaving the micro-organisms unable to reproduce and multiply. Consequently the water is effectively disinfected.

The use of low pressure UV-C lamp technology offers major advantages. The system is extremely efficient in the immobilisation of bacteria, fungi and viruses, as the majority of the lamps output is concentrated at the most efficient bacterial killing wavelength. Furthermore, the unit is electrically very efficient, reducing running costs.

2.2.   Safety

UV-C radiation is harmful to all living tissue and can damage eyes and skin. Avoid direct radiation. Wear suitable protective clothing e.g. UV blocking glasses and skin protection (hoods & gloves). Before performing any maintenance on the UV disinfection device, ensure that it is electrically isolated and hydraulically de-pressurised.
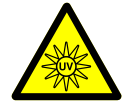
3.   Guarantee conditions

The UV disinfection device is guaranteed for a period of one year from date of delivery, provided that it is installed by a qualified person. Consumable parts e.g. the UV-lamp and quartz sleeve are not covered by this guarantee.

The guarantee does not cover failure due to accidents, incorrect installation or operation, misuse, unit modifications (if carried out by unauthorised personnel), transport damage, power failures or damage as a result of use other than for what the unit was originally designed for.

3.1.   Receipt of goods

This UV disinfection device has been manufactured under strict quality control procedures and has been fully checked before dispatch. Upon receipt, however, we recommend that you examine the contents of the package to check for signs of transport damage. If you believe there has been damage or that parts are missing, please contact your supplier immediately.

The package should contain the following parts:
1. The stainless steel (grade 316) UV reactor chamber with quartz sleeve already fitted.
2. Control unit complete with cables.
3. One UV lamp.
4. Wall mounting brackets (x 2).
5. Gloves.
6. This operation manual, including wiring diagram and spare parts list.

# 4.		Installation

## 4.1.		Qualified installer

The UV disinfection device may only be installed by a qualified person and following local regulations. Do not commence the installation before you have read and understood this manual completely.

## 4.2.		Installation of the UV chamber

Depending on the volume and the purpose of the water to be treated, the UV chamber can either be installed directly in-line or in a side stream arrangement.

For UV disinfection devices with a maximum lamp power of 120W, the UV chamber can be installed either horizontally or vertically. For UV disinfection devices with a lamp power > 120W, the UV chamber must be installed horizontally. The outlet connection must always be at the top of the unit to prevent air being trapped within the chamber. It should be noted that the quartz sleeve must be permanently immersed in flowing water for lamp cooling. Periods without water flow are safe for a short period (maximum time depending upon site conditions) when the UV chamber is filled with water. If there is a possibility of longer periods without a water flow, a 'Temperature Safety Sensor' should be fitted. A too high temperature may damage the UV lamp.

Important:
Ensure that you leave sufficient space at the cable connection side of the chamber for replacement of the UV lamp and quartz sleeve. The required space is equal to one UV chamber length.

The UV chamber is designed to withstand a normal working pressure of 10 bar, however, "water-hammer" may cause damage/breakage of the glass (quartz) components within the UV disinfection device.

Important:
The UV chamber must be earthed.
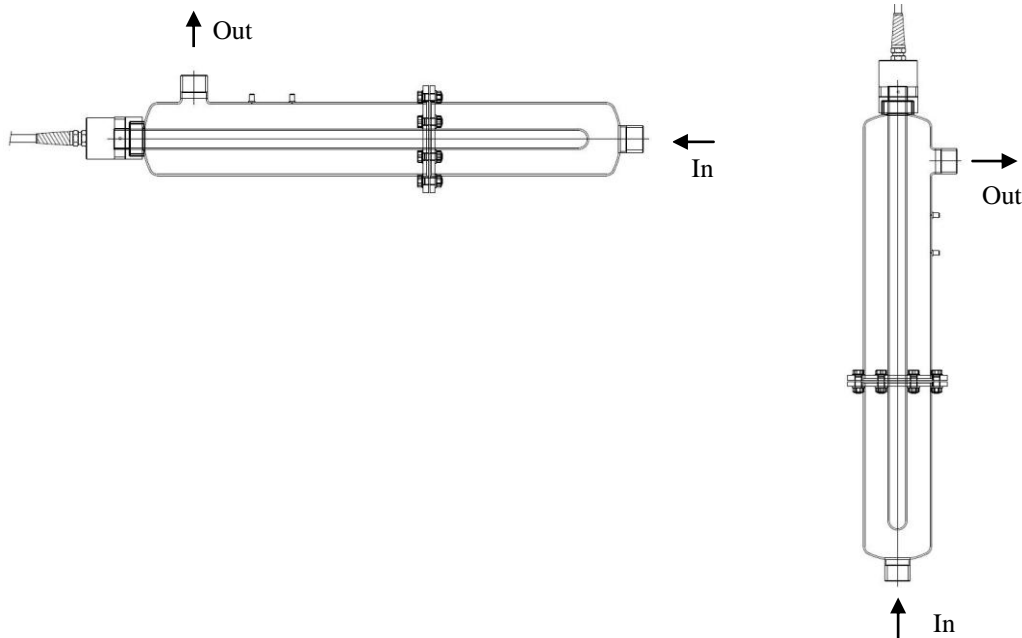
4.3. Installation of the control unit

The control unit must be placed in a dry position on or nearby the UV chamber.

Electrical connection:
The control unit must be earthed and protected by a suitably sized and fused supply with an earth leakage device.
See the electric connection in this manual for more details.

Alarm contacts:
The control unit is equipped with 2 volt free 'change-over' type contacts which can be used for the connection of an external alarm (pre- and main alarm). See chapter 6 for the alarm conditions.

Important:
The UV chamber must be earthed.

4.4. Temperature sensor (optional)

The Temperature Safety Control System options ensure that the UV disinfection device cannot overheat during possible long periods of zero water flow. If this unit is fitted with this option then it will be one of the following types:

a) Temperature Sensor Dump valve (TSD):
   A special temperature sensor head coupled to controller circuitry within the control unit is used to measure indirect the water temperature within the UV chamber. If the water temperature rises above the pre alarm temperature value, a signal is automatically sent to the solenoid valve to allow water to flow to drain. This allows fresh (cool) water into the UV chamber preventing the UV lamp from overheating. If the water temperature rises above the main alarm temperature value, the UV lamp is automatically switched off. When the water within the unit cools down (or the flow re-starts introducing cooler water into the chamber), the UV lamp is automatically switched back on.

   During unit installation, the solenoid valve (supplied with the UV disinfection device) should be installed in the pipe work just after the UV chamber outlet. The solenoid valve control cable is supplied pre-wired to the control unit. A standard 'MPM' type plug is supplied attached to the other end of the solenoid control cable, which should be connected to the solenoid in the normal manner (using the securing screw provided).

b) Temperature Sensor Safety (TSS):
   A special temperature sensor head coupled to controller circuitry within the control unit is used to measure indirect the water temperature within the UV chamber. If the water temperature rises above the main alarm temperature value, the UV lamp is automatically switched off. When the water within the unit cools down (or the flow re-starts introducing cooler water into the chamber), the UV lamp is automatically switched back on.

The temperature pre- and main alarm values can be changed, see chapter 6.3: "Menu structure".
The temperature sensor must be fitted on the UV chamber using the stud which is placed near the earth stud or by using the earth stud itself.

Temperature sensor with cable

Dump valve

4.5.   UV sensor (optional)

If this UV disinfection device has been fitted with a UV sensor then the following sections cover the installation, calibration and maintenance.

A special UV sensor coupled to controller circuitry within the control unit is used to measure relative the UV intensity. If the UV intensity drops below the UV pre alarm or UV main alarm set point a pre- or main alarm is generated.
The UV pre- and main alarm set points can be changed, see chapter 6.3: "Menu structure".

Every time that a new lamp is fitted into the UV disinfection device this monitor must be re-calibrated, see section UV monitor adjustment/calibration.

A new lamp has an effective output of 110% when first switched on, but after approximately 100 hours of use the output will reduce to 100%.

UV sensor   *UV sensor cable*

The UV sensor head is fitted to the specially provided boss located on the UV chamber. It is usually factory fitted prior to shipping. The sensor cable is supplied pre-wired to the control panel. Wire connection details are shown on the electrical connection diagram included with this manual.

UV monitor adjustment/calibration:
- The wires next to the lamp should not be in front of the UV sensor.
- Be sure there is no air in front of the measure window.
- The UV disinfectio**n** device must be in stable operation (lamp operating & water flowing).
- Check to make sure that the lamp is actually operating (either by viewing the light emitted from the clear plastic indicator ring built into the lamp connector assembly or using the 'Lamp On' indicator).
- Allow the lamp to burn for approximately 10 minutes before proceeding to the next step.
- **WARNING THERE ARE LIVE HIGH VOLTAGE COMPONENTS INSIDE THE CONTROL CABINET.**
- Open the cabinet and locate the UV Sensor PCB. On the PCB there are three press keys (red, black and white) for changing the values.
- Go to item "UV calibration" in the main menu:
  Press ← button to enter the calibration mode.
  Change the calibration value with ↑ or ↓ button (default 110%)
  Press ← button to activate the calibration.
  "Are you sure?" Press ↑ button for YES, press ↓ button for NO.
  Press ← button to activate above choice.

5. Starting procedure

Once the UV disinfection device has been installed in accordance with local requirements and conditions and the instructions in this manual, the UV disinfection device may be switched on for the first time.

The following procedure must be followed:

- Ensure that the UV chamber has been tested for leaks at the maximum operating pressure before the UV disinfection device is switched on. If any water leakage is observed do not proceed further.
- Turn the ON/OFF switch to ON.
- Check whether the UV lamp is functioning correctly. This will take a few seconds. The display shows "Lamp ignited", indicating correct operation of the UV lamp.
- Check that a faint purple/blue light is visible through the transparent ring at the end of the lamp connector (not possible if a brass locking set is used).
- Ensure that the water flow rate is correct and not exceeding the maximum treatment capacity of the unit. If the flow rate is higher than the permitted maximum flow, insufficient UV energy will be imparted into the water. Effective disinfection is not guaranteed.
  Regularly check the hours counter to ensure that the 8000 hours lamp life (or 16000 hours in case of a long life lamp) is not exceeded. At 730 hours left we advise you to contact your supplier for a replacement lamp. After 8000 hours(or 16000 hours in case of a long life lamp) operation, the level of UV-C being emitted by the lamps is insufficient to ensure effective disinfection and the lamp must be replaced.
- Calibrate the UV sensor (if applicable)

6.   Controls

On/Off switch : This will switch the UV disinfection device on or off.
Display   : Shows actual status of UV disinfection device.
Menu buttons : Step through the menu with three buttons.

Display

Menu buttons

On/Off switch
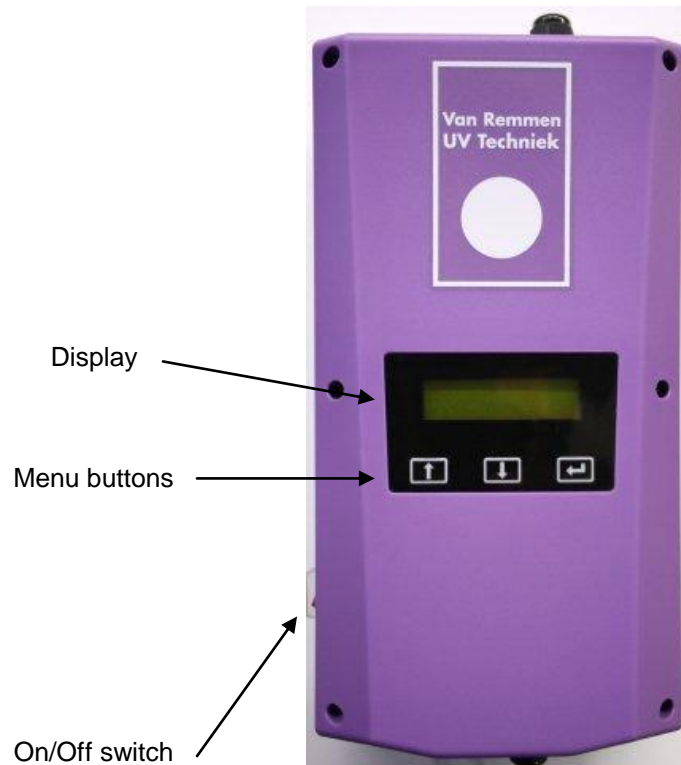
6.1.   Display messages
- Lamp defect.
- Hours pre alarm; 730 operation hours to go before lamp life time is over.
- Hours main alarm; lamp life expired.
- Flush active (optional); if the temperature rises above 35ºC the dump valve will be activated for 10 seconds (flush time). After 60 seconds waiting time the dump valve is activated again. This sequence will stop as soon as the temperature drops below 35ºC.
- Lamp off, temp too high (optional); if the temperature rises above 35ºC (lamp off type) or 50ºC (flush valve type) the lamp will be switched off automatically. If the temperature drops below 35ºC or 50ºC the lamp will be switched on automatically.
- UV pre alarm (optional); if the UV intensity drops below 70% a UV pre-alarm is generated. Quartz sleeve cleaning or lamp replacement is required soon.
- UV low (optional); if the UV intensity drops below 50% a UV low alarm is generated. Quartz sleeve cleaning or lamp replacement is required. Effective disinfection is not guaranteed.

6.2.   Menu Controls

⬆️ • Increment value
     • Change option

⬇️ • Decrement value
     • Change option

⬅️ • Enter menu
     • Enter change mode
     • Accept changed parameter

Enter menu:
   • Press ⬆️ button
Next menu item:
   • Press ⬆️ button
Previous menu item:
   • Press ⬇️ button
Change value / enter change mode:
   • Press ⬅️ button
Increment value / change option:
   • Press ⬆️ button
Decrement value / change option:
   • Press ⬇️ button

General:
-   At value changes keep button pressed for faster changes.
-   All changes and setups are stored when leaving the menu. If you stop pressing any of the control buttons for longer than 5 seconds, the menu will revert back to the default screen automatically.

6.3.   Menu structure

Operation screen:
Remaining lamp hours, warnings and errors, UV intensity (*optional)*

Menu items:
1.   "Hours left" - Number of remaining lamp hours left. (Resettable)
2.   "Starts" - Number of lamp starts. (Resettable)
3.   "SysStarts" - Number of system starts.
4.   "SystemHrs" - Number of system hours.
5.   "Language":
         Press ⬅️ button for entering change mode.
         Choose language (change with ⬆️ and ⬇️ button).
         Press ⬅️ button to confirm.
6.   "Lamp power & Software version".
7.   "UV calibration" (*optional):*
         Press ⬅️ button to enter the calibration mode.
         Change the calibration value with ⬆️ or ⬇️ button (default 110%)
         Press ⬅️ button to activate the calibration.
         "Are you sure?" Press ⬆️ button for YES, press ⬇️ button for NO.
         Press ⬅️ button to activate above choice.

UV option ⎬

8.   "Alarm settings" (*Password protected: Password is 8131)*:
         Press ⬅️ button to enter the alarm settings menu.
         Press the ⬆️ button and ⬇️ button to enter the password. Confirm each number with the ⬅️ button.
         • "Max lamp life" - Lamp life time in hours:
             Press ⬅️ button for entering change mode.
             Change the value with ⬆️ or ⬇️ button (default 8000hrs for standard lamps, 16000 hrs for long life lamps).
             Press ⬅️ button to confirm.
         • "Hours pre alarm" - Lamp hours left when the pre alarm is activated:
             Press ⬅️ button for entering change mode.
             Change the value with ⬆️ or ⬇️ button (default 730hrs).
             Press ⬅️ button to confirm.
         • "Hours main alarm" - Lamp hours left when the main alarm is activated:
             Press ⬅️ button for entering change mode.
             Change the value with ⬆️ or ⬇️ button (default 0hrs).
             Press ⬅️ button to confirm.

Temperature option

- "Temp pre alarm"   -   Lamp out type: too high temperature pre-alarm, lamp ON.
  Flush valve type: Temperature too high, flush valve activated.
  Press ← button for entering change mode.
  Change the value with ↑ or ↓ button (default: lamp out type 30ºC, flush valve type 35ºC).
  Press ← button to confirm.
- "Temp main alarm" -   Lamp out type: too high temperature main alarm, lamp turns OFF
  Flush valve type: Temperature too high, flush valve de-activated, lamp turns OFF
  Press ← button to enter change mode.
  Change the value with ↑ or ↓ button (default: lamp out type 35ºC, flush valve type 50ºC).
  Press ← button to confirm.
- "Flush time":
  Press ← button for entering change mode.
  Change the value with ↑ or ↓ button (default 10s).
  Press ← button to confirm.
- "Waiting time" i.e. the time before the controller re-check the temperature again:
  Press ← button for entering change mode.
  Change the value with ↑ or ↓ button (default 60s).
  Press ← button to confirm.

UV option

- "UV pre alarm":
  Press ← button for entering change mode.
  Change the value with ↑ or ↓ button (default 70%).
  Press ← button to confirm.
- "UV main alarm":
  Press ← button for entering change mode.
  Change the value with ↑ or ↓ button (default 50%).
  Press ← button to confirm.
- "Exit":
  Press ← button to exit the alarm settings menu.

9. "Reset values" - Reset the lamp hours left and lamp starts:
   Press ← button to enter the reset mode.
   "Are you sure?" Press ↑ button for YES, press ↓ button for NO.
   Press ← button to confirm.

6.4.   Alarm conditions

The UV disinfection device can activate 2 different alarms: a pre alarm and a main alarm.

Pre alarm:
- A beep every 30 sec.
- Pre alarm relay contacts activated.
- Will be generated for any of the following reasons:
  - 730 lamp hours are left.
  - UV intensity is lower than 70% (if UV sensor is fitted).

Main alarm:
- A beep every 5 sec.
- Pre alarm relay contacts activated.
- Main alarm relay contacts activated.
- Will be generated for any of the following reasons:
  - UV lamp life expired, the level of UV-C being emitted by the lamps is insufficient to ensure correct disinfection and the lamp must be replaced.
  - Lamp defect.
  - Temperature is equal or above 35ºC/50ºC(if temperature sensor is fitted).
  - UV intensity is lower than 50% (if UV sensor is fitted).

7. Maintenance

7.1. General

In general the UV disinfection device requires only minimal maintenance. A regular visual check of the operation of the UV lamp is generally all that is required. If the UV disinfection device is equipped with an external alarm a visual check is less important.

In case of a failure of the UV disinfection device, alternative means of water disinfection should be used until the UV disinfection device is operational again.

- Do not use alternative makes of UV lamp. Effective disinfection is not guaranteed and it may cause damage to electrical components and cause a safety hazard.
- Maintenance should only be performed once the unit has been electrically and hydraulically isolated.
- Wear suitable personal protective equipment during maintenance.

7.2. Replacing the UV lamp

UV lamp replacement must take place with a maximum interval of 8000 hours (or 16000 hours in case of a long life lamp). After this period the level of UV-C being emitted by the lamp is insufficient to ensure correct disinfection and the lamps must be replaced.

Never touch the UV lamp with bare hands. Remove any finger marks with a soft cloth and industrial alcohol (or similar). Wear gloves or use protective materials when handling UV lamps to prevent contamination of the lamp surface. UV lamps are fragile, support the UV lamp always with two hands. Take care when handling them to avoid breakage. Breakage of the UV lamp or the quartz sleeve is not covered by the warranty.

It is recommended to remove, check and clean the quartz sleeve during the replacement of the UV lamp. The quartz sleeve o-ring seal should also be replaced.

See: Lamp change procedure.

7.3. Lamp change procedure

To gain access to the lamp, loosen the locking (outer) section of the cable gland on top of the cover cap (A) before the cover cap is unscrewed. Prevent unscrewing of the reactor plug (B).
Now the old UV lamp (F) can be removed by gently pulling the lamp cable (E).

Installation of the UV lamp:

- Wear gloves to prevent contamination of the lamp surface.
- Before the installation of the UV lamp, the lamp should be checked for surface contamination (dirt or other marks). These should be removed using a soft cloth and industrial alcohol (or similar).
- Insert the lamp support spring (G) into the quartz sleeve (if not already present).
- Insert the UV lamp nearly all the way into the chamber. Do not drop the lamp into the quartz sleeve as this may cause breakage of the UV lamp and/or quartz sleeve.
- Connect the lamp to the 4 pin connector**.**
- Re-fit the cover cap, **hand tight is sufficient**. Feed the UV lamp as far as possible into the quartz sleeve by using the lamp cable. Re-tighten the cable gland.

Removal of the UV lamp is a reversal of the above procedure.
Whenever a new lamp is fitted, reset the hour counter (see Menu structure) and recalibrate the UV sensor (if applicable).

End of useful life/Disposal
UV lamps should be disposed of as special waste in the same manner as normal fluorescent lamps. This should be carried out in accordance with local environmental regulations or by an authorised disposal company. If in doubt, contact your supplier for advice.

7.3.1. Removal of the UV lamp

Step 1. Release the cable gland by turning it anti-clockwise.		*If the cable can be moved easily, the cable gland is loose enough.*
Step 2. Release the cover cap by turning it anti clockwise.		*Check that the lamp cable is not twisting!!* *Important:* *Prevent unscrewing of the reactor plug!*
Step 3. Take out the UV lamp carefully.		*Do not touch lamp with bare hands, wear gloves* *Warning, the UV lamp can still be hot!*
Step 4. Disconnect the connector from the UV lamp.		*Do not drop the UV lamp into the sleeve!*

7.3.2. Installing the UV lamp

Step 1. Check if the spring is inside the quartz sleeve, and insert the lamp carefully.		*Do not touch the UV lamp with bare hands, wear gloves.*
Step 2. Fit the lamp connector onto the UV lamp end.		*Do not drop the UV lamp into the quartz sleeve!*
Step 3. Hand tighten the cover cap (clockwise).		
Step 4. Tighten the cable gland (clockwise).		*Do not over tighten!!*
Step 5. Whenever a new lamp is fitted, reset the hour counter (see Menu structure) and recalibrate the UV sensor (if applicable).		

7.4.   Quartz sleeve cleaning

If there is hardness in the water a scale deposit may be formed on the quartz sleeve. This obstructs the UV-C radiation and subsequently adversely affects disinfection. If a light covering of scale is present on the quartz sleeve, carefully clean the quartz sleeve with a proprietary descaler or industrial acid e.g. citric acid. Ensure that the correct safety measures are taken and the correct personal protective equipment is used during this operation.

See: Quartz change procedure.

7.5.   Quartz change procedure

Installing new quartz sleeve:

- Wear gloves to prevent contamination of the quartz sleeve.
- Before use, the quartz sleeve should be cleaned using a clean cloth and industrial alcohol (or similar).
- Slide the sealing o-ring(D) down from the open end by about 5 cm.
- Gently insert the quartz sleeve into the chamber with the closed end first. Gently slide the quartz sleeve through the hole in the flow management plate until it meets the bottom support pin.
- Press the locking sleeve (C) onto the o-ring (ensure that the chamfer is facing the o-ring).
- Hand tighten the reactor plug (B) (clockwise).
- Fill the chamber with water and slowly increase the water pressure.
- Check for any leaks and retighten the reactor plug if required.
- Insert the lamp support spring (G).
- Carefully insert the UV lamp (see procedure for changing UV-lamps).

Removal of the quartz sleeve is a reversal of the above procedure.

7.5.1. Removal and cleaning of the quartz sleeve

Step 1. Remove the UV lamp as described in the "installing UV lamp" section		
Step 2. Release the reactor plug by turning it anti-clockwise.		
Step 3. Remove the locking sleeve and o-ring.		
Step 4. Carefully remove the quartz sleeve care fully.		*Do not touch the quartz sleeve with bare hands, wear gloves.*
Step 5. Clean the quartz sleeve with clean piece of cloth and proprietary descaler or similar.		*Do not use an aggressive cleaning method. This will damage the sleeve.*

7.5.2. Installing the quartz sleeve

Step 1. Carefully insert the quartz sleeve into the UV chamber.		*Take care to prevent breakage!*
Step 2. Ensure that the sleeve is in the correct position through the flow plate.		
Step 3. Fit a new o-ring and replace the locking sleeve (with the internal chamfer side towards the o-ring).		⚠️ WARNING make sure the chamfered corner is facing the o-ring
Step 4. Re-fit the reactor plug by turning it clockwise and hand tighten. Re-pressurise the chamber and check for leaks.		*Never touch the quartz sleeve with bare hands, wear gloves*
Step 5. Install the UV-lamp as described in the "Installing UV lamp" section.	*Use the gloves provided.*	

8.   Environment

Most parts of the UV disinfection device is manufactured from stainless steel . These must be disposed as metal waste.

The following parts have to be disposed of separately:
- Quartz sleeve and UV-C Lamp
- Control box

When decommissioning the UV disinfection device please follow the next steps:
1. Check that the power supply is turned off and the unit is de-pressurised.
2. Disconnect all power cables.
3. Let the liquid out of the chamber. Beware off local regulations.
4. Disconnect all couplings.
5. Dismount the UV disinfection device.

9.   Electrical connection

Customer incoming power connection terminals.
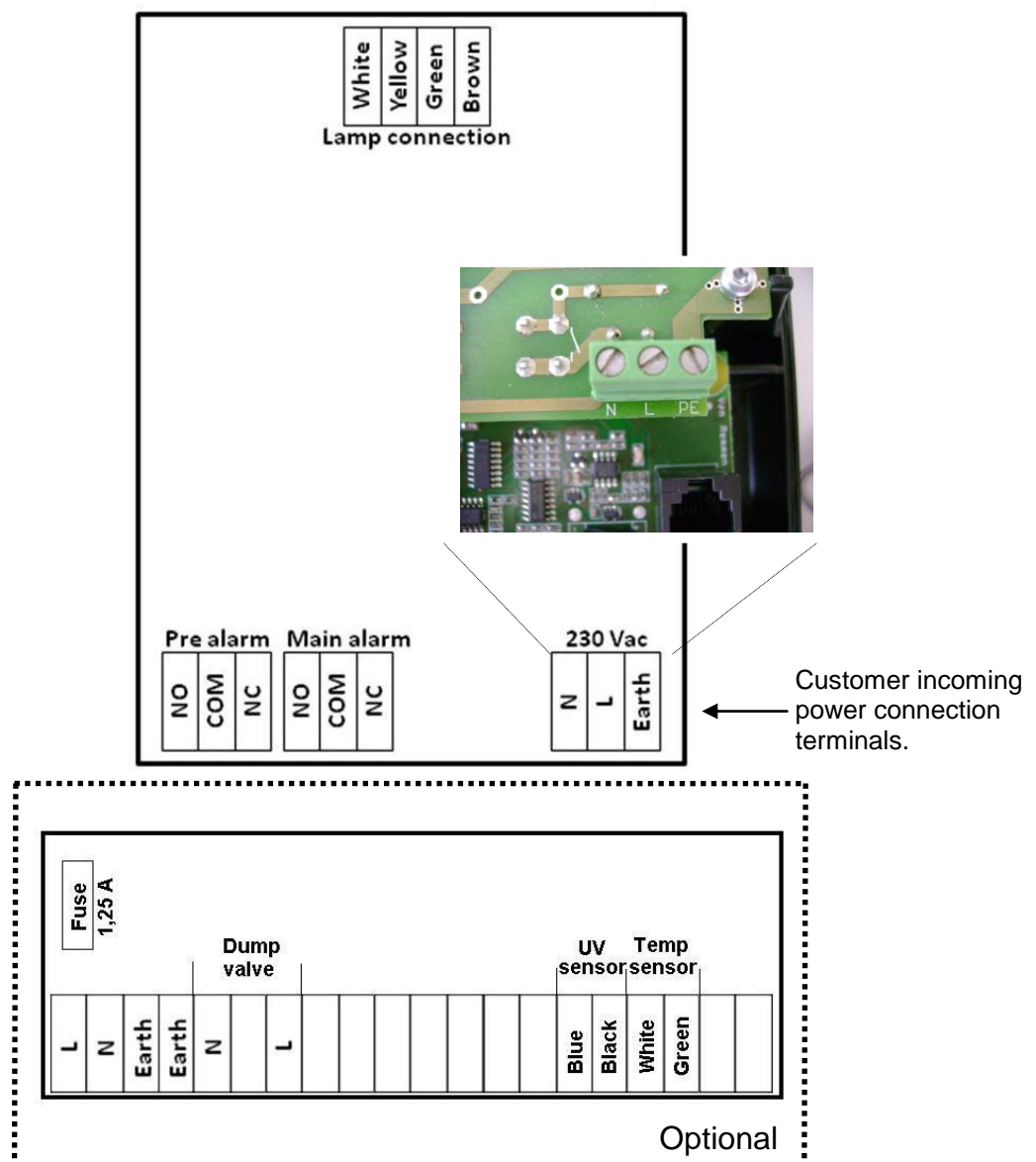
10.   Trouble shooting

The display will indicate the correct operation of the UV lamp. In case of malfunction, first try re-starting the unit by switching the unit off, waiting 30 seconds and then switching back on.

Type of malfunction	Possible cause	Procedure
Leakage at top of reactor	- O-ring damaged - Quartz sleeve broken or cracked	- Replace O-ring - Replace quartz sleeve
UV lamp not burning *Red lamp in on/off switch is OFF*	- No power - Main fuse blown - Main switch off - Internal error	- Connect power - Contact supplier - Switch unit on - Contact supplier
UV lamp not burning *Red lamp in on/off switch is ON*	- Lamp defect - Unit switched off due to too high temperature (only when a temperature sensor is used) - Loose lamp connection - Internal error	- Replace lamp - Unit will restart when UV chamber has cooled down - Check connections - Contact supplier
UV low message (if UV sensor is fitted)	- UV lamp too old - UV sensor dirty - Quartz sleeve dirty - Water transmission too low	- Replace lamp - Clean - Clean - Use the proper UV disinfection device and/or improve the transmission
UV reactor is hot	- No water inside reactor - No water flow	- Check if water is inside reactor - Check if water is flowing
Not enough disinfection	- UV lamp too old - Quartz sleeve dirty - Water flow rate too high - Water transmission too low	- Replace lamp - Clean - Reduce water flow rate - Use the proper UV disinfection device and/or improve the transmission
Message in display: - Lamp life expired - Flush active - Wait time - Llamp defect	- UV lamp too old - Waste valve is active due to over temperature - Lamp defect	- Replace UV lamp - Normal operation - Replace lamp

11.   Logbook

UV disinfection device serial number: ………………………………

Installation date …………………………………

Options:
☐ Temperature Sensor Dump   ☐ Temperature Sensor Safety
(with solenoid controlled dump valve)   ('Lamp-Off' type)

☐ UV Sensor   ☐ Quartz Sleeve Wiper System

Date	System hour counter	Lamp hour counter *	System starts	Lamp starts	Action	Carried out by
	0	8000 or 16000			Installed	

*Depending of type of lamp

12.   Parts and dimensions
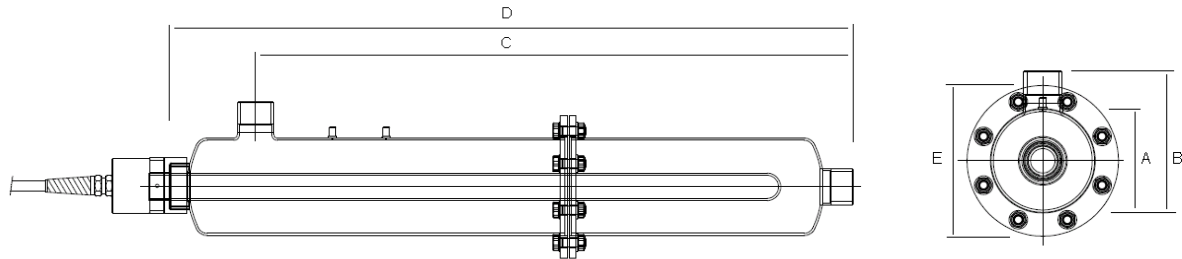
Dimensions:
A: 129 mm
B: 168 mm
C: 1041 mm
D: 1155 mm
E: 169 mm

In-outlet connections: 2" BSP-T male

Important:
Leave sufficient space at the cable connection side of the UV chamber for the replacement of the UV lamp and the quartz sleeve. This space should be equal to one UV chamber length(D).

13.   Technical data

Supply voltage:	230 V ± 10%
Frequency:	50/60 Hz
Ambient temperature:	5°C - 35°C
Protection level:	IP 55
Lamp power:	80 Watt
Lamp life:	approx. 8000hrs [1]
Installation;	horizontal or vertical
Lamp connection cable:	normal length: 1m (4 x 1mm²)
CE declaration of conformity:	Low Voltage Directive (2006/95/EC)
	EMC Directive (2004/108/EC)

[1] Frequent starting reduces useful lamp life by a considerable margin.

14.   Spare parts list

Use the description and numbers listed below and on the drawing, when ordering or describing parts of the UV system.

Internal chamfer faces towards lamp
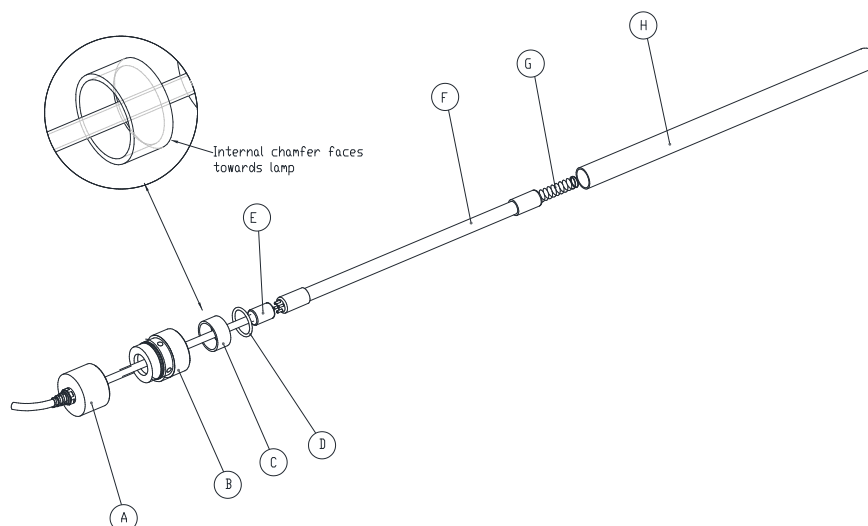
No	Description	Amount	Article code	Service Interval
A	Cover cap Ø25/28/30mm	1	262506	If applicable
B	Reactor plug Ø28mm metal	1	263020	If applicable
C	Locking sleeve Ø28mm metal	1	263007	If applicable
D	O-ring Ø28mm (viton)	1	250015	1 year
E	Lamp Cable 1m	1	360119	4 year
F	80 W UV-C replacement lamp	1	158001	8000 hours
G	Safety spring Ø28mm	1	250102	If applicable
H	Quartz Sleeve Ø28 x 1080mm	1	411080	4 year
	Teflon Flow Plate 130-28 2mm	1	214850	4 year
	Optional			
	UV sensor (1/4") standard	1	322510	4 year
	O-ring 7 x 3mm viton	1	250041	1 year
	UV sensor cable 1m	1	322509	If applicable
	Temperature sensor 1m cable	1	322300	If applicable
	Solenoid Dump Valve 1/2" 230VAC	1	511220	If applicable

15.   EMC Certificate of conformance

Van Remmen
UV Techniek

Van Remmen UV Techniek
Hooglandweg 3a | NL-8131 TE | Wijhe
The Netherlands

CE/EMC CERTIFICATE OF CONFORMANCE

This document certifies that the UV disinfection unit type V150 is based upon a design that conforms with EMC-DIRECTIVE 2004/108/EC (following harmonized standards: EN 50081-1 1992, EN 50082-2 1995, EN 55011 1991, EN 61000-3-2 1995).

July 2009

A.M. van Remmen
_____   _____
Quality Assurance   **Date**