



Van Remmen UV Techniek

Installation & Operation Manual

UV Disinfection Unit Type RUV 130-120



WARNING:

UV-C radiation damages eyes and skin.

Avoid direct radiation

Operation Manual
UV Disinfection Unit Type RUV 130-120

Contents

1.	GENERAL.....	3
1.1	APPLICATION	3
1.2	BACKGROUND UV DISINFECTION.....	3
2.	SAFETY	3
3.	GUARANTEE CONDITIONS.....	3
4.	INSTALLATION	3
4.1	RECEIPT OF GOODS	3
5.	INSTALLATION OF THE UV CHAMBER.....	4
5.1	TEMPERATURE SAFETY CONTROL SYSTEM	4
6.	INSTALLATION OF IGNITION CABINET.....	4
7.	STARTING PROCEDURE.....	5
8.	MAINTENANCE.....	5
8.1	GENERAL.....	5
8.2	REPLACING THE UV LAMP.....	5
8.3	LAMP CHANGE PROCEDURE.....	6
8.4	QUARTZ SLEEVE CLEANING	6
8.5	QUARTZ CHANGE PROCEDURE.....	6
9.	TROUBLE SHOOTING.....	6
10.	ELECTRICAL CONNECTION DIAGRAM.....	7
11.	TECHNICAL DATA	7
12.	PARTS LIST.....	8
13.	PARTS & DIMENSIONS	8

PLEASE NOTE THAT IF A UV INTENSITY METER IS FITTED TO THIS UV UNIT AN ADDITIONAL INSTRUCTION MANUAL WILL BE SUPPLIED.

Operation Manual

UV Disinfection Unit Type RUV 130-120

1. General

1.1 Application

This manual describes the installation and operation of the disinfection unit type RUV 130-120. This unit will be used for the disinfection of water using UV-C radiation.

1.2 Background UV Disinfection

The UV-C lamp contained within the UV unit emits a specific light wavelength mainly concentrated around 254nm (nanometers). At this frequency, 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. 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 unit, ensure that it is electrically isolated and hydraulically de-pressurised.

3. Guarantee Conditions

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

Also, 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.

4. Installation

Installation of the unit should only be carried out by suitably qualified personnel. Before commencing installation, this manual should be fully read and understood.

4.1 Receipt Of Goods

This UV unit has been manufactured under strict quality control procedures and has been fully checked before despatch. 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 Van Remmen UV Techniek immediately.

The package should contain the following parts:

1. The stainless steel (grade 316) UV reactor chamber, complete with 1 protective quartz sleeve.
2. Control (Ignitor) cabinet complete with cable, connector plug, lamp control LED and hours counter.
3. One 120 Watt UV lamp.
4. This operation manual, including wiring diagram and parts list.

5. Installation Of The UV Chamber

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

The maximum treatment capacity of the RUV 130-120 UV unit is 11.5 m³/h, based on clear potable grade water (90% transmission).

As standard the UV unit is fitted with externally threaded (BSPM) connections for ease of installation. Ensure that the unit is not placed too close to the outlet of any pumps and that there is suitable pre-filtration of the water to allow the UV unit to work effectively.

The UV chamber can be installed either horizontally or vertically, with the inlet connection at the bottom of the unit. This will prevent the possible formation of air pockets within the chamber. It should be noted that the quartz sleeves must be permanently immersed in flowing water to allow for lamp cooling unless a Temperature Safety Control System is fitted. Periods of no flow can be tolerated (of up to one hour maximum depending upon site conditions), providing that the chamber is full of water. Failure to ensure this could result in premature failure of components within the system.

Important:

Ensure that you leave sufficient space at the cable connection side of the chamber, to allow for changing of the UV lamp and quartz sleeve.

As an additional safety measure, the fitting of a strainer downstream of the UV unit could be considered. In the unlikely event of a quartz sleeve breakage, this strainer could be used to prevent glass contamination of the rest of the water system.

The UV unit is designed to withstand a normal working pressure of 10 bar, however, if not prevented "water-hammer" may cause damage/breakage of the glass (quartz) components within the unit.

5.1 Temperature Safety Control System

If the UV Unit is fitted with the Temperature Safety Control System option, this will ensure that the unit cannot overheat during possible long periods of zero water flow.

The temperature sensor (and associated controls & cabling) is pre-mounted onto the UV Reactor Chamber and a separate solenoid controlled valve is supplied. This solenoid controlled valve should be fitted in the water pipework close to the UV outlet connection (the top connection if mounted vertically). The valve has ½" BSPF inlet/outlet connections. The outlet from the valve should be suitably piped away to a drain.

The solenoid's power connection plug is pre-wired from the UV ignition cabinet and should be connected to the valve body once the valve has been fitted into the pipework. The valve controls are factory pre-set to allow a small quantity of water to flow to drain in the event of the UV Reactor Chamber reaching its pre-set limit.

6. Installation Of Ignition Cabinet

The ignition cabinet is mounted on the UV chamber using the special clamp(s) provided. If required it is possible to locate the ignition cabinet in another (dry) place near to the unit. For this purpose longer lamp connection cables are required.

Electrical connection

The unit must be earthed and protected by a suitably sized and fused supply.

- See enclosed electric connection diagram

Alarm contact:

The ignition cabinet is equipped with a set of volt free contacts for connecting to an external alarm. This would give remote alarm activation in the event of lamp failure.

7. Starting Procedure

Once the unit has been installed in accordance with the instructions contained within this manual, the unit may be switched on for the first time.

The following procedure must be followed:

- Turn the ON/OFF switch to ON.
- Check whether the UV lamp is functioning correctly. This takes about 10 seconds.
- Check that a faint purple/blue light is visible through the optical ring on the end of the lamp connectors.
- Check that the water flow rate is correct and not exceeding the maximum capacity of the unit. If the flow rate is higher than the permitted maximum flow, insufficient UV energy will be imparted into the water to ensure the correct level of disinfection.
- Regularly check the hours run meter to ensure that the 8000 hour lamp life is not exceeded. At 7000 hours we advise that you contact Van Remmen UV Techniek or your local distributor to arrange for replacement lamps.

After 8000 hours operation, the level of UV-C being emitted by the lamps is **insufficient** to ensure correct disinfection and the lamps must be replaced.

8. Maintenance

8.1 General

In general the UV-system requires only minimal maintenance. A regular visual check of the operation of the UV lamps is generally all that is required. This may be overlooked if the unit is equipped with an external alarm.

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

- Do not use alternative makes of UV lamp within the UV unit as this 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 personnel protective equipment during maintenance.

8.2 Replacing The UV Lamp

UV lamp replacement must take place at a maximum interval of 8000 operational hours. After this period the effectiveness of the lamps is insufficient and water disinfection cannot be guaranteed.

Never touch the UV lamp with bare hands. Remove any finger marks with a soft cloth and industrial alcohol. Wear gloves or use protective materials when handling UV lamps to prevent contamination of the lamp surface. UV lamps are fragile – take care when handling them to avoid breakage. Breakage of UV lamps or quartz's are not covered by the warranty.

It is also recommended that whilst replacing the UV lamps, the quartz sleeves are removed, checked and cleaned. The quartz O-ring seals should also be replaced.

See: Lamp Change Procedure

8.3 Lamp Change Procedure

To gain access to the lamp, loosen the locking (outer) section of the cable gland on top of the locking plug (1) before fully unscrewing the locking plug. Care should be taken to prevent the reactor plug (4) from unscrewing.

Installing The UV lamp:

- Before installing the UV lamp, the lamp should be checked for surface contamination (dirt or other marks) and if found, these should be removed using a soft cloth and industrial alcohol (or similar).
- Insert the lamp support spring into the quartz sleeve to act as a cushion for the lamp.
- Insert the UV-lamp into the chamber carefully without touching the glass and do NOT drop the lamp into the protective quartz sleeve as this may cause breakage of one or both components.
- Connect lamp to the 4 pin connector and feed it into the quartz sleeve using the connector cable.
- Fit the locking plug and tighten. Re-tighten the cable gland. No tools are necessary.

Removal of the UV lamp is a reversal of the above procedure.

End of useful life/Disposal

UV lamps are to be disposed of as special waste in the same manner as fluorescent lamps. This should be carried out in accordance with the local environmental regulations or by authorised disposal facilities. If in doubt, contact your Van Remmen UV Techniek for advice.

8.4 Quartz Sleeve Cleaning

If there is a high level of 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 carefully clean the quartz with a proprietary descaler, hydrogen peroxide or citric acid. Ensure that the correct safety measures and equipment is worn during this operation.

See: Quartz Change Procedure.

8.5 Quartz Change Procedure

Installing New Quartz sleeve

- Before use, the quartz sleeve should be cleaned using a clean cloth and industrial alcohol.
- Slide the O-ring down from the open end by about 5 cm.
- Insert the quartz sleeve into the chamber, closed end first. Slide the quartz sleeve in until it locates in the bottom centering plug.
- Press the locking sleeve (5) onto the O-ring.
- Hand tighten the reactor plug (4) (clockwise).
- Flood the chamber with water and slowly increase the water pressure.
- Check for leakage and retighten if required.
- Insert UV lamp (see procedure for changing UV-lamps).

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

9. Trouble Shooting

Operation Manual

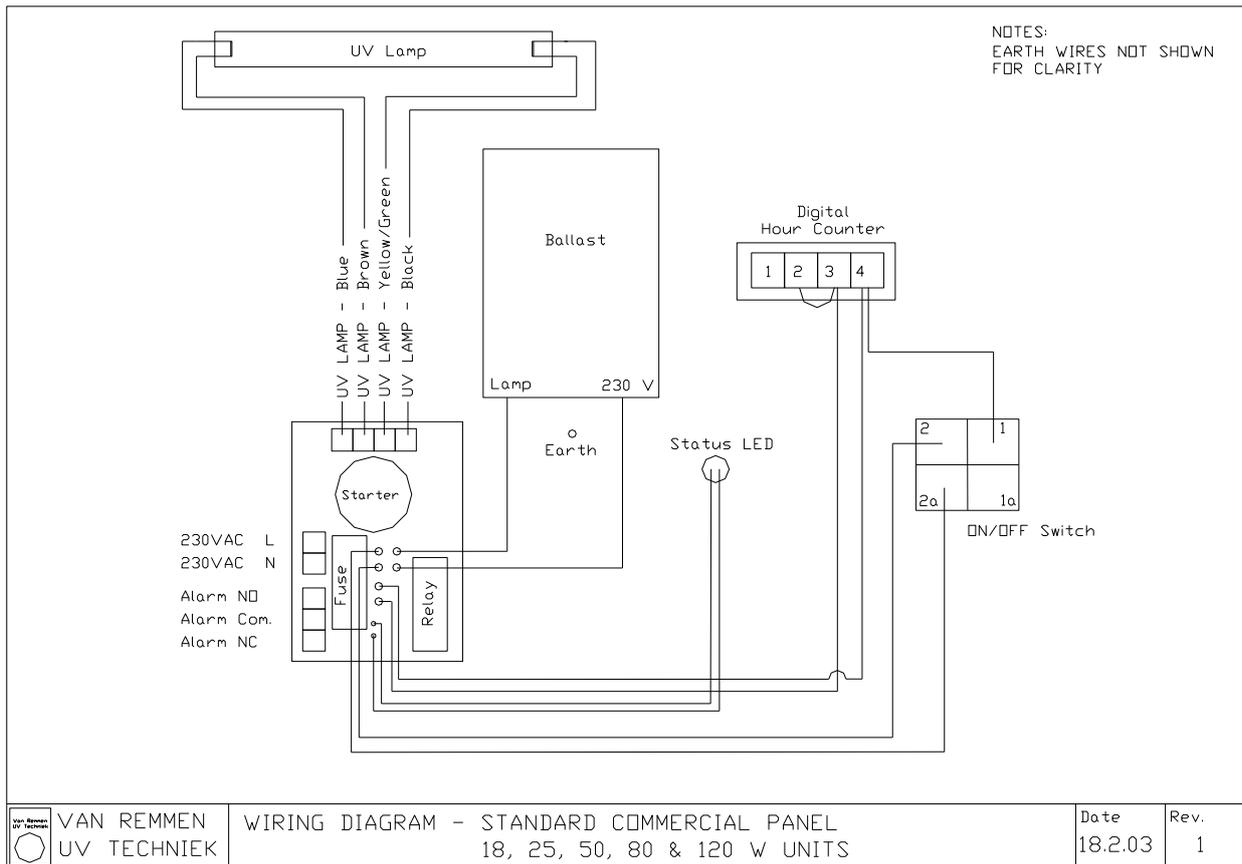
UV Disinfection Unit Type RUV 130-120

The LED on the ignition panel will indicate the correct operation of the UV lamp. In case of malfunction, first try re-starting the unit by switching the unit off and 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 LED not illuminated Switch not glowing	No power Internal error Main switch off	Connect power Contact supplier Switch unit on
UV Lamp not burning LED not illuminated Switch glowing	Starter defect Lamp defect	Replace starter Replace lamp
Not enough disinfection	UV lamp too old	Replace lamp

In case of any other malfunction, contact Van Remmen UV Techniek.

10. Electrical Connection Diagram



11. Technical Data

Supply voltage 230 V ± 10%

Operation Manual

UV Disinfection Unit Type RUV 130-120

Frequency	50 Hz
Ambient temperature	5°C - 40°C
Protection level	IP 54
Lamp Power	120 Watt
Lamp life	approx. 8000 hr ¹
Installation	horizontal or vertical
Lamp connection cable	max length: 2m 4 x 1,5 mm ²
Alarm output	NO/NC, Volt Free Contacts
Material UV chamber	SS 316 L (polished)
Material Cabinet	Aluminium (Commercial) ; Stainless steel (Industrial)
Dimensions:	
• Reactor chamber	990 long x 130 mm dia.
• Cabinet	180 x 120 x 90 mm
Total Weight	8,0 Kg (empty) 21 Kg (full)
Certification	CE and EMC

¹ Frequent starting reduces useful lamp life by a considerable margin!

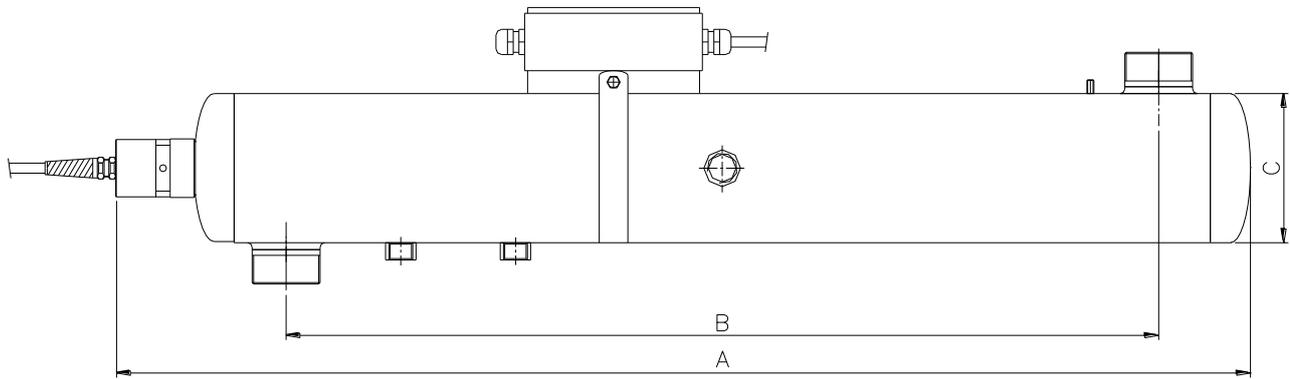
12. **Parts List**

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

Position	Description	Part No.	Quantity
	UV-C lamp 120 Watt	121203	1
	Quartz Sleeve	410930	1
	Lamp Connector with Cable (750 mm long)	360201	1
	Lamp Starter	330069	1
1	Locking Plug	263010	1
2	O-ring (41 x 1,78 mm)		1
3	Transparent Sleeve		1
4	Reactor Plug		1
5	Locking Sleeve		1
6	O-ring (25 x 4 mm)	250011	1
	Lamp Support Spring (in quartz)	250100	1
	Cable Gland PG9		1
	Chamber Clamp		2
	Control Cabinet		1
	Reactor Chamber		1
Optional	Connection UV-sensor $\frac{3}{4}$ "		1

13. **Parts & Dimensions**

Operation Manual
UV Disinfection Unit Type RUV 130-120



Dimensions:

- A : 990 mm
- B : 760 mm
- C : 130 mm

Lamp Coupling Detail

