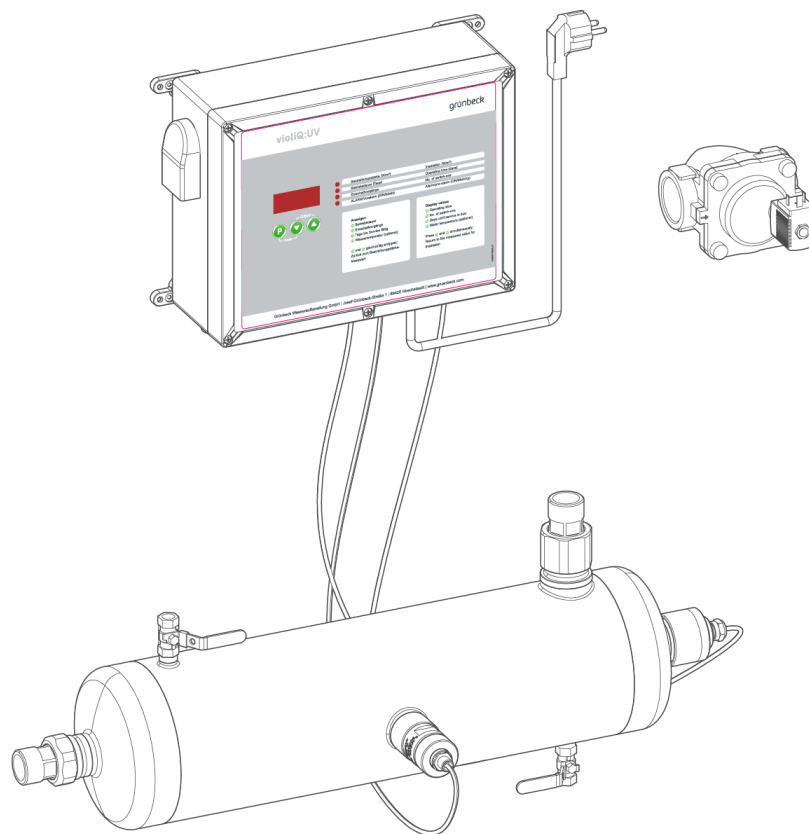


We understand water.



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## UV disinfection system | violIQ:UV20/66/85

Operation manual

grünbeck

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Subject to technical modifications.  
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# 1 Introduction

This manual is intended for owners/operating companies, users, as well as qualified specialists, and ensures the safe and efficient handling of the product. The manual is an integral part of the product.

- Carefully read this manual and the component instructions contained therein before you operate your product.
- Comply with all safety information and handling instructions.
- Keep this manual and all other applicable documents, so that they are available when needed.

Illustrations in this manual are for basic understanding and can differ from the actual design.



According to the list as per § 20 of the German Drinking Water Ordinance, UV disinfection systems to be used for drinking water must be tested in accordance with DIN 19294-1. Grünbeck's UV-disinfection systems violiQ:UV20/66/85 meet this requirement. For proper operation, the UV disinfection systems violiQ:UV20/66/85 must be installed and operated in accordance with the stipulations of DVGW worksheet W 294-1.

The UV disinfection systems type violiQ:UV20/66/85 included in this operation manual meet this requirement.

## 1.1 Validity of the manual

This manual applies to following products:

- Disinfection system violiQ:UV20
- Disinfection system violiQ:UV66
- Disinfection system violiQ:UV85
- Special versions which essentially correspond to the indicated standard products. For information on changes, please refer to the respective information sheet that is enclosed, if applicable.

## 1.2 Other applicable documents

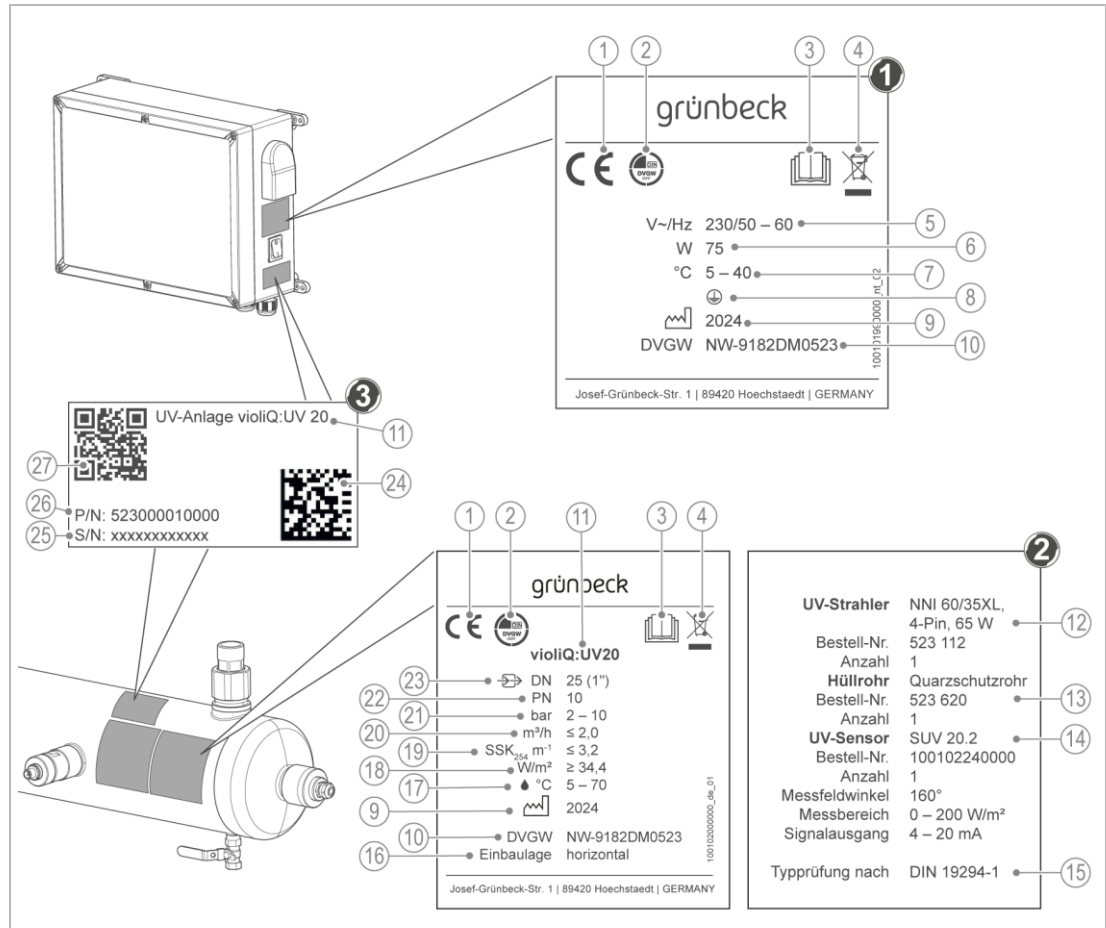
- Instructions for components from other manufacturers
- Safety data sheets for chemicals

### 1.3 Product identification

You can identify your product by means of the product designation and the order number on the type plate.

- Check whether the products indicated in chapter 1.1 correspond to your product.









The type plates are located on the control unit and the irradiation chamber.



Designation	
1	CE mark
2	DVGW test mark
3	Observe the Operation Manual
4	Disposal information
5	Mains connection
6	Rated load
7	Ambient temperature
8	Protection class
9	Date of manufacture
10	DVGW registration number
11	Product designation
12	Information on UV lamp
13	Information on protective pipe
14	Information on UV sensor

Designation	
15	Standard for type approval test
16	Installation position of irradiation chamber
17	Water temperature
18	Minimum irradiance
19	Spectral attenuation coefficient SSK <sub>254</sub>
20	Nominal flow
21	Operating pressure
22	Nominal pressure
23	Nominal connection diameter
24	Data matrix code
25	Serial no.
26	Order no.
27	QR code

## 1.4 Symbols used

Symbol	Meaning
	Danger and risk
	Important information or prerequisite
	Useful information or tip
	Written documentation required
	Reference to further documents
	Work that may only be carried out by qualified specialists
	Work that must be carried out by qualified electricians only
	Work that must be carried out by technical service personnel only

## 1.5 Depiction of warnings

This manual contains information with which you must comply for your own personal safety. The information and instructions are highlighted by a warning symbol and are structured as shown below:



**SIGNAL WORD** Type and source of the hazard

- Possible consequences
- ▶ Preventive measures

The following signal words are defined depending on the degree of danger and might be used in this document:

Warning sign and signal word	Consequences when disregarding the information/instructions	
 <b>DANGER</b>		Death or serious injuries
 <b>WARNING</b>	Personal injury	Possible death or serious injuries
 <b>CAUTION</b>		Possible moderate or minor injuries
<b>NOTE</b>	Damage to property	Possible damage to components, the product and/or its functions, or anything in its vicinity

## 1.6 Requirements for personnel

During the individual lifecycle phases of the system, different persons carry out work on the system. This work requires different qualifications.

### 1.6.1 Qualification of personnel

Personnel	Prerequisites
User	<ul style="list-style-type: none"> <li>• No special expertise required</li> <li>• Knowledge of the tasks assigned</li> <li>• Knowledge of possible dangers in case of inappropriate behaviour</li> <li>• Knowledge of the required protective equipment and protective measures</li> <li>• Knowledge of residual risks</li> </ul>
Owner/operating company	<ul style="list-style-type: none"> <li>• Product-specific expertise</li> <li>• Knowledge of statutory regulations on work safety and accident prevention</li> </ul>
Qualified specialist <ul style="list-style-type: none"> <li>• Electrical engineering</li> <li>• Sanitary engineering (HVAC and plumbing)</li> <li>• Transport</li> </ul>	<ul style="list-style-type: none"> <li>• Professional training</li> <li>• Knowledge of relevant standards and regulations</li> <li>• Knowledge of detection and prevention of potential hazards</li> <li>• Knowledge of statutory regulations on accident prevention</li> </ul>
Technical service (Grünbeck's technical service/authorised service company)	<ul style="list-style-type: none"> <li>• Extended product-specific expertise</li> <li>• Trained by Grünbeck</li> </ul>

### 1.6.2 Authorisations of personnel

The following table describes which activities are allowed to be performed by whom.

	User	Owner/operating company	Qualified specialist	Technical service
Transport and storage		X	X	X
Installation and mounting			X	X
Start-up			X	X
Operation and handling	X	X	X	X
Cleaning		X	X	X
Inspection		X	X	X
Maintenance			X	X
			X	X
Troubleshooting	X	X	X	X
Repair			X	X
Shutdown and restart			X	X
Dismantling and disposal			X	X

### 1.6.3 Personal protective equipment

- ▶ As an owner/operating company, ensure that the required personal protective equipment is available.

The following components fall under the heading of personal protective equipment (PPE):



Protective gloves



Protective footwear



Protective overall



Protective goggles



UV safety goggles



Mask



## 2 Safety

### 2.1 Confirmation of conformity



With the CE marking, we confirm that the product complies with the requirements set out in the EU directives and EU regulations. You will find the declaration of conformity at [qr.gruenbeck.de/downloads](http://qr.gruenbeck.de/downloads)

According to § 20 of the German Drinking Water Ordinance, UV disinfection systems must only be used if tested according to DIN 19294-1. Grünbeck's UV disinfection systems violiQ:UV20/66/85 meet this requirement.

- In Germany, only DVGW-certified UV disinfection systems are approved for use in the drinking water sector.
- For operation of the UV disinfection systems in compliance with the German Drinking Water Ordinance (TrinkwV) in accordance with DVGW work sheet W 294-1, it is required that the water flow is interrupted in the event of a power failure.
- Without a safety device, the UV disinfection system cannot be operated according to the German Drinking Water Ordinance. There is a risk that water which is not or insufficiently disinfected might enter the installation downstream of the UV disinfection system. This can result in a contamination of the pipes and microbiological loading of the water making it unfit for human consumption.

### 2.2 Safety measures

- Only operate your product if all components are installed properly.
- Obey the local regulations on drinking water protection, accident prevention and occupational safety.
- Do not make any changes, alterations, extensions or program changes on your product.
- Only use genuine spare parts for maintenance or repair.
- Keep the premises locked to prevent unauthorised access and to protect endangered or untrained persons from residual risks.
- Comply with the maintenance intervals (refer to chapter 8.2). Failure to comply can result in the microbiological contamination of your drinking water system.
- Be aware of a possible risk of slipping due to leaking water on the floor.

#### 2.2.1 Mechanical hazards

- You must never remove, bridge, or otherwise tamper with safety equipment.
- For all work on the system that cannot be carried out from the ground, use stable, safe and self-standing access aids (e.g. stepladders).

- Make sure that the system is installed so that it cannot tip over and that the stability of the system is guaranteed at all times.

## 2.2.2 Pressure-related hazards

- Components can be under pressure. There is a risk of injuries and damage to property due to escaping water and unexpected movement of components. Check the pressure pipes on the system regularly for leaks.
- Before starting repair and maintenance work, make sure that all affected components are depressurised.

## 2.2.3 Electrical dangers

There is an immediate danger of fatal injury from electric shock when touching live components. Damage to the insulation or individual components can be life-threatening.

- Only have a qualified electrician carry out electrical work on the system.
- In case of damage to live components, switch off the voltage supply immediately and arrange for repair.
- Switch off the supply voltage before working on electrical system components. Discharge the residual voltage.
- Never bridge electrical fuses. Do not disable fuses. Use the correct current ratings when replacing fuses.
- Keep moisture away from live parts. Moisture can cause short-circuits.

## 2.2.4 Danger due to chemicals

- Chemicals can be hazardous to the environment and health. They can cause skin and eye burns as well as irritation of the respiratory tract or allergic reactions.
- Avoid any skin/eye contact with chemicals.
- Use personal protective equipment.
- Read the safety data sheet before handling chemicals. Adhere to the instructions for various activities/situations.
- Current safety data sheets for chemicals are available for download at [www.gruenbeck.com/service/documents-and-downloads](http://www.gruenbeck.com/service/documents-and-downloads)
- Follow in-house instructions when handling chemicals. Make sure that protective and emergency equipment such as emergency showers and eyewash are available where required, and functional.

### **Mixing and residual amounts of chemicals**

- Do not mix different chemicals. Unforeseeable chemical reactions with risk of death may occur.
- Dispose of residual amounts of chemicals in accordance with local regulations and/or in-house instructions.
- Residual amounts from used containers should not be transferred into containers with fresh chemicals in order not to impair the effectiveness of the chemicals.

### **Labelling/Minimum shelf life/Storage of chemicals**

- Check the labelling of the chemicals. The labelling of chemicals must not be removed or rendered illegible.
- Do not use unknown chemicals.
- Comply with the use-by date (minimum shelf life) stated on the label.
- If stored incorrectly, chemicals could change their state of matter, crystallize, outgas, or lose their effectiveness. Store and use the chemicals at the indicated temperatures only.

### **Cleaning/Disposal**

- Immediately absorb spilled chemicals with suitable binding agents.
- Collect and dispose of chemicals in such a way that they cannot pose any risks to people, animals, or the environment.

## **2.2.5 Groups of persons requiring protection**

- Children must not play with the product.
- This product must not be used by persons (including children) with limited abilities, lack of experience or knowledge.
- Children should be supervised to ensure that they do not play with the product.

## 2.3 Product-specific safety instructions



Unintentional use of the UV system or damage to the housing can result in the escape of dangerous UV-C radiation.

- UV-C radiation can damage the eyes and skin even in small doses.
- A UV system with obvious damage must not be operated.
- ▶ Have a UV-C lamp checked and replaced by a technician (refer to chapter 9.2).



### **WARNING** Dangerous UV-C radiation



- Eye damage
- ▶ Only operate the UV-C lamp if it is installed in the device housing.



- ▶ Only operate the UV device with the UV sensor installed.



- ▶ Do not remove the UV sensor from the UV-C lamp during operation.
- ▶ Wear UV safety goggles when working on the UV lamp and UV sensor

### 2.3.1 Safety devices



### **CAUTION** Operation without safety device

- Without a safety device, the UV system cannot be operated according to the German Drinking Water Ordinance.
- There is a risk that water which is not or insufficiently disinfected might enter the installation downstream of the UV system.
- This can result in a contamination of the pipes and microbiological loading of the water making it unfit for human consumption.
- ▶ Always install a safety device (refer to chapter 8.6.1)



With increasing idle times without water withdrawal, the UV system heats up.



### **CAUTION** Temperature increase in the UV system

- Water temperatures of up to 60 °C can occur in the UV system.
- The increase in temperature has an impact on the UV lamp.  
With the increasing temperature (starting with a water temperature of approx. 25 °C), the irradiance decreases and in case of high temperatures can even fall below the alarm limit value.
- ▶ Use temperature-controlled flushing to flush the UV system subject to the temperature (refer to chapter 3.5).

## 2.3.2 Signals and warning devices

### Labels on the product



Risk of electric shock



Risk due to optical radiation



Risk of explosion



UV irradiation



Risk due to mercury



The affixed information and pictograms must be clearly legible.  
They must not be removed, soiled, or painted over.

- ▶ Obey all warnings and safety instructions.
- ▶ Immediately replace illegible or damaged symbols and pictograms.

## 2.4 Conduct in emergencies

### 2.4.1 In case of water leaks

1. De-energise the system. Disconnect the mains plug.
2. Locate the leak.
3. Eliminate the cause of the water leak.

## 3 Product description

### 3.1 Intended use

- The UV disinfection systems violiQ:UV are designed for the disinfection of cold drinking water.
- The UV disinfection systems violiQ:UV are to be installed downstream of the water treatment systems.
- The room irradiation required to kill bacteria and viruses is at least 400 J/m<sup>2</sup>. At this room irradiation, a reduction rate of 99.99 % is achieved.
- The UV disinfection systems violiQ:UV are adapted to the water demand and the water quality to be expected during installation and are suitable up to a spectral attenuation coefficient SSK<sub>254</sub> of 3.2 m<sup>-1</sup>. The maximum flow must not be exceeded under any circumstances. At an attenuation coefficient SSK<sub>254</sub> of 3.2 m<sup>-1</sup>, the flow and the irradiance indicated in the technical specifications guarantee a disinfection effectiveness of at least 400 J/m<sup>2</sup>.
- A reliable disinfection of the water can only be achieved if the water is mostly free of turbidities and only slightly loaded with regard to microbiological growth. Water containing turbidities or a permanently low or short-time peak load of germs indicating faeces requires a treatment to separate particles.
- For operation of the UV disinfection systems in compliance with the German Drinking Water Ordinance in accordance with DVGW work sheet W 294-1, it is necessary to interrupt the water flow in the event a power failure, especially if the irradiance is insufficient or there is a lamp failure.

The UV systems must only be operated if all components are installed properly.

Safety equipment must never be removed, bridged or otherwise tampered with or disabled.



- This applies in particular to the flow stabilisers supplied with the UV system which are designed to limit the flow. If these are not used or if their function is otherwise manipulated, there is a risk that the UV systems are operated with a flow that is too high. As a result, the UV systems lose their approval for use in drinking water.

### 3.1.1 Foreseeable misuse

- Without a safety device, the UV disinfection system violiQ:UV cannot be operated according to the German Drinking Water Ordinance.
- » There is a risk that water which is not, or is insufficiently, disinfected might enter the installation downstream from the system. This can result in a contamination of the pipes and microbiological loading of the water making it unfit for human consumption.
- Operation of the UV disinfection system in the event of obvious damage.

## 3.2 Application limits

The SKK254 (spectral attenuation coefficient at a wavelength of light of 254 nm) indicates how much light is lost in the water.

The table below also indicates the water transmission. The transmission data refers to the size of the cuvette used for measuring. For better comparability of different water analyses, the transmissions are given for cuvette thicknesses of 10 mm, 50 mm and 100 mm.



The transmission or the spectral attenuation coefficient SKK254 can only be determined by a water analysis in the laboratory.

The temperature of the water also has an influence on the performance of the UV disinfection systems as the water temperature affects the operating temperature of the lamps. Therefore, the UV systems must only be operated within the specified temperature range (5 –70 °C).

### 3.2.1 Use in drinking water

The characteristic pair of flow rate and irradiance must be in the grey area of the operating diagram, i.e. the irradiance must always be above, and the flow rate must always be below the value indicated for the respective UV system in the table. The UV systems are suitable for water with a spectral attenuation coefficient SSK<sub>254</sub> of up to 3.2 m<sup>-1</sup>.

The relevant data is shown on the type plate. For monitoring purposes, use a UV sensor with a 160° logo.

The indicated flows are limited by using flow stabilisers in order to prevent incorrect operation of the UV systems.

- The service life of the flow stabilisers is 12 months. The flow stabilisers must be replaced during the annual major maintenance.

#### Application limits

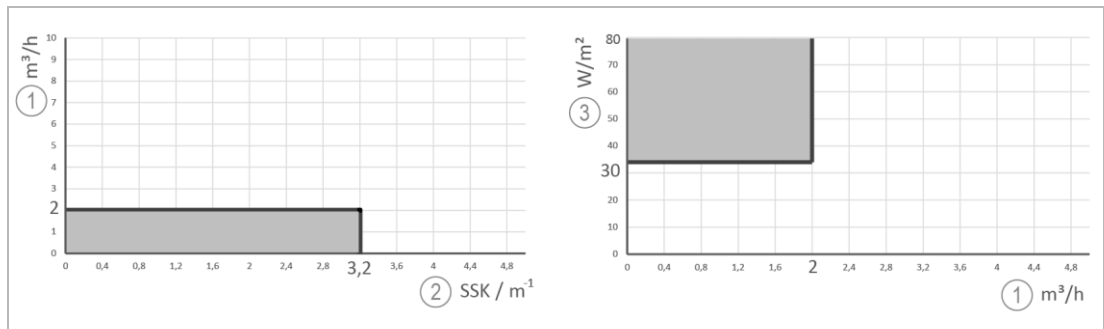
		violiQ:UV20	violiQ:UV66	violiQ:UV85
Water temperature	°C	5 – 70		
Spectral attenuation coefficient SSK <sub>254</sub>	m <sup>-1</sup>	≤ 3.2		
τ1 cm	%	93.0		
τ5 cm	%	69.6		
τ10 cm	%	48.4		
Nominal flow	m <sup>3</sup> /h	≤ 2.0	≤ 6.6	≤ 8.5
Irradiance*	W/m <sup>2</sup>	≥ 34.4	≥ 39.9	≥ 31.6
Flow stabiliser	Colour	1x red	2x black 1x red	2x blue 1x red

\* At a measuring field angle of 160°

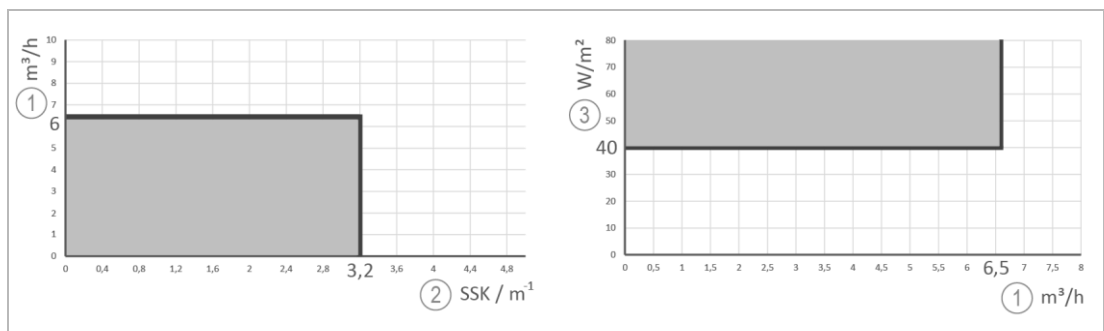


### 3.2.1.2 Operating and suitability characteristic

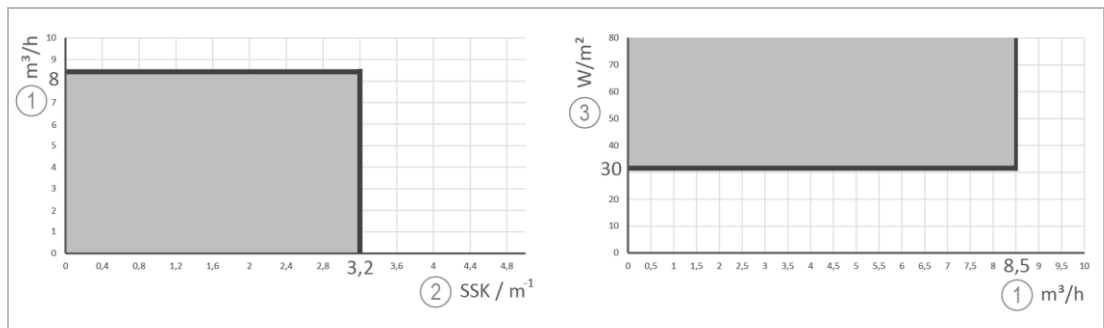
#### violiQ:UV20



#### violiQ:UV66



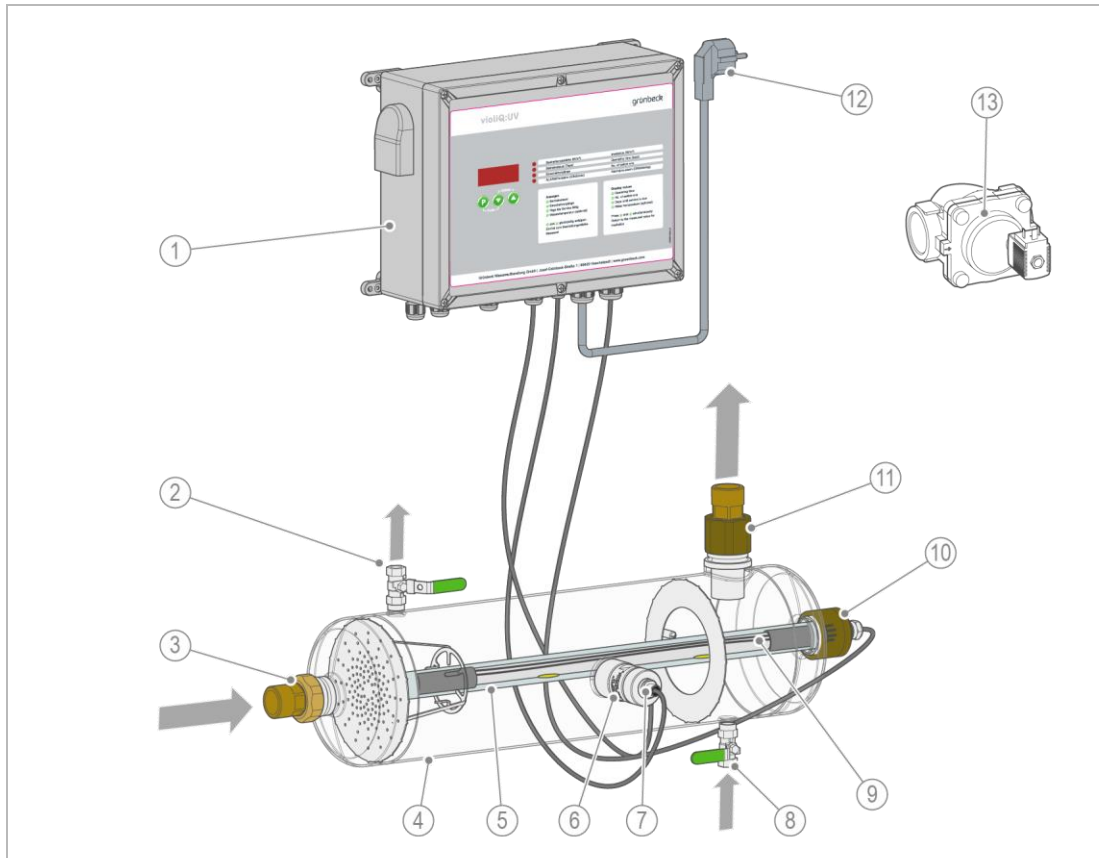
#### violiQ:UV85



Designation	
①	Flow in m <sup>3</sup> /h
②	Spectral attenuation coefficient SSK <sub>254</sub> in m <sup>-1</sup>

Designation	
③	Irradiance in W/m <sup>2</sup>

### 3.3 Product components



Designation	Function
1 Control unit violiQ:UV	To control, monitor and forward signals
2 Ball valve	Outlet for flushing the irradiation chamber and for venting
3 Water meter screw connection	Standard, for water inlet
4 Irradiation chamber	Pressure pipe made of stainless steel as reactor housing
5 Protective quartz pipe	To house the UV lamp
6 Sensor shell	To house the UV sensor
7 UV system sensor	To measure the irradiance
8 Ball valve	Inlet for flushing the irradiation chamber
9 UV lamp	For room irradiation with UV light
10 Brass screw connection	For protective quartz pipe with UV lamp
11 Water meter screw connection	Long, for water outlet with flow stabiliser
12 Mains plug	For Schuko socket
13 Safety device	To shut off the water pipe in case of insufficient water quality

## 3.4 Functional description

The UV disinfection systems violiQ:UV20/66/85 are designed and certified according to DIN 19294-1. They feature a UV sensor according to DIN 19294-3 and operate with a room irradiation of at least 400 J/m<sup>2</sup>.

### 3.4.1 Disinfecting effect of UV light

UV light (ultraviolet light) is light with a wavelength between 100 and 380 nm. These wavelengths are below the sensitivity limit of the human eye and therefore invisible. For UV disinfection, the wavelength at 254 nm is of particular importance. This wavelength is emitted by mercury-arc lamps.

The disinfecting effect of UV light is due to the fact that light with a wavelength of 254 nm is absorbed by the nucleic acids in the genetic material of micro-organisms. The absorption of the high-energy radiation alters the genetic material (DNA and RNA) and leads to an incapability to reproduce.

The room irradiation (light dose) required to inactivate micro-organisms depends on the respective species and population of the micro-organisms. Fungi, spores and algae require a much higher room irradiation than bacteria and viruses.

- According to DIN 19294-1, a minimum room irradiation of 400 J/m<sup>2</sup> achieves a reduction rate of 99.99 % for viruses and bacteria.  
For further and more detailed information, please refer to DVGW worksheet W 294-1.

### 3.4.2 Room irradiation

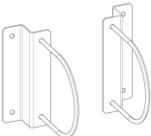
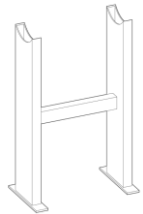
The intensity of the room irradiation depends on the irradiance and the irradiation time. The irradiance on the other hand depends on the specific attenuation coefficient of the water at 254 nm (SSK<sub>254</sub>). With regard to UV disinfection, the organic substances (e.g. humic acid) and inorganic salts (e.g. iron or manganese ions) contained in the water are of major importance as these absorb the UV light at 254 nm and thus reduce the transmission. As the wavelength of 254 nm is in a range invisible to the eye, the SSK<sub>254</sub> can only be determined by a UV-VIS spectrometer and not with the naked eye.

In order to maintain the irradiation time, the flow rate of the UV systems is limited to ensure the residence time required for disinfection in the irradiation chamber. Furthermore, the irradiance is subject to the age of the UV lamps. The performance of the UV lamps decreases with their increasing operating time. In order to continue to guarantee the required room irradiation, the UV lamp must be replaced at the end of its service life.

Subject to being operated properly, all UV disinfection systems violiQ:UV20/66/85 meet the effective minimum room irradiation of 400 J/m<sup>2</sup> required by the standards.

### 3.5 Accessories/optional equipment

You can retrofit your product with accessories. Please contact your local Grünbeck representative or Grünbeck’s headquarters in Hoechststedt/Germany for details.

Illustration	Product	Order no.
	<b>Temperature flushing for violiQ:UV (DVGW - German Association of the Gas and Water Industry)</b> To prevent the water in the UV system from heating up	<b>523 825</b>
	<b>Flushing kit for cleaning UV systems with GENO-clean CP</b> To clean the UV system	<b>520 020</b>
	<b>UV safety goggles</b>	<b>522 810</b>
	<b>Wall bracket for UV systems</b> To mount the UV system on the wall	<b>523 800</b>
	<b>Floor rack</b> To place the UV system on the floor	
		<b>violIQ:UV20</b> <b>523 815</b>
		<b>violIQ:UV66</b> <b>523 805</b>
	<b>violIQ:UV85</b> <b>523 810</b>	
	<b>USB data logger for violiQ:UV</b> To record the irradiance	<b>523830010000</b>

## 4 Transport, installation and storage

### 4.1 Shipping/Delivery/Packaging

The system parts/packages are fixed on a pallet at the factory and secured against tipping.

- ▶ Check immediately upon receipt for completeness and transport damage.

### 4.2 Transport/Set-up

- ▶ Transport the product in its original packaging only.
- ▶ When transporting the product on site and setting it up, make sure to always place it the right way round, if so indicated on the packaging.
- ▶ Use protective shoes and gloves during transport.
- ▶ Place the system parts/packages on a level and stable surface. Take the weight of the system parts/packages into account.



#### CAUTION

Unhandy size of system parts during transport

- Crushing due to slipping and falling system parts
- ▶ Transport or lift the system components with two persons.
- ▶ Keep unauthorised persons away when transporting and setting up system components.

### 4.3 Storage

- ▶ When storing it, protect the product from the effects of the following:
  - Moisture, wetness
  - Environmental impacts such as wind, rain, snow, etc.
  - Frost, direct sunlight, severe heat exposure
  - Chemicals, dyes, solvents and their vapours

## 5 Installation

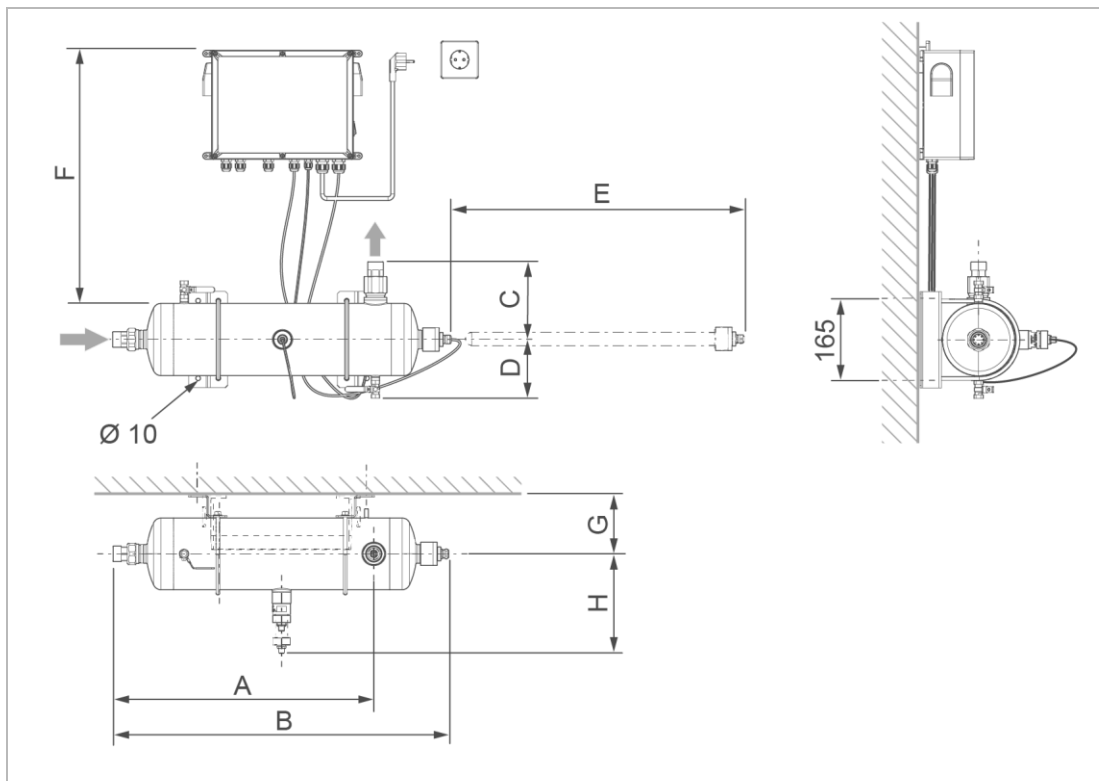


The system installation may only be carried out by a qualified specialist.

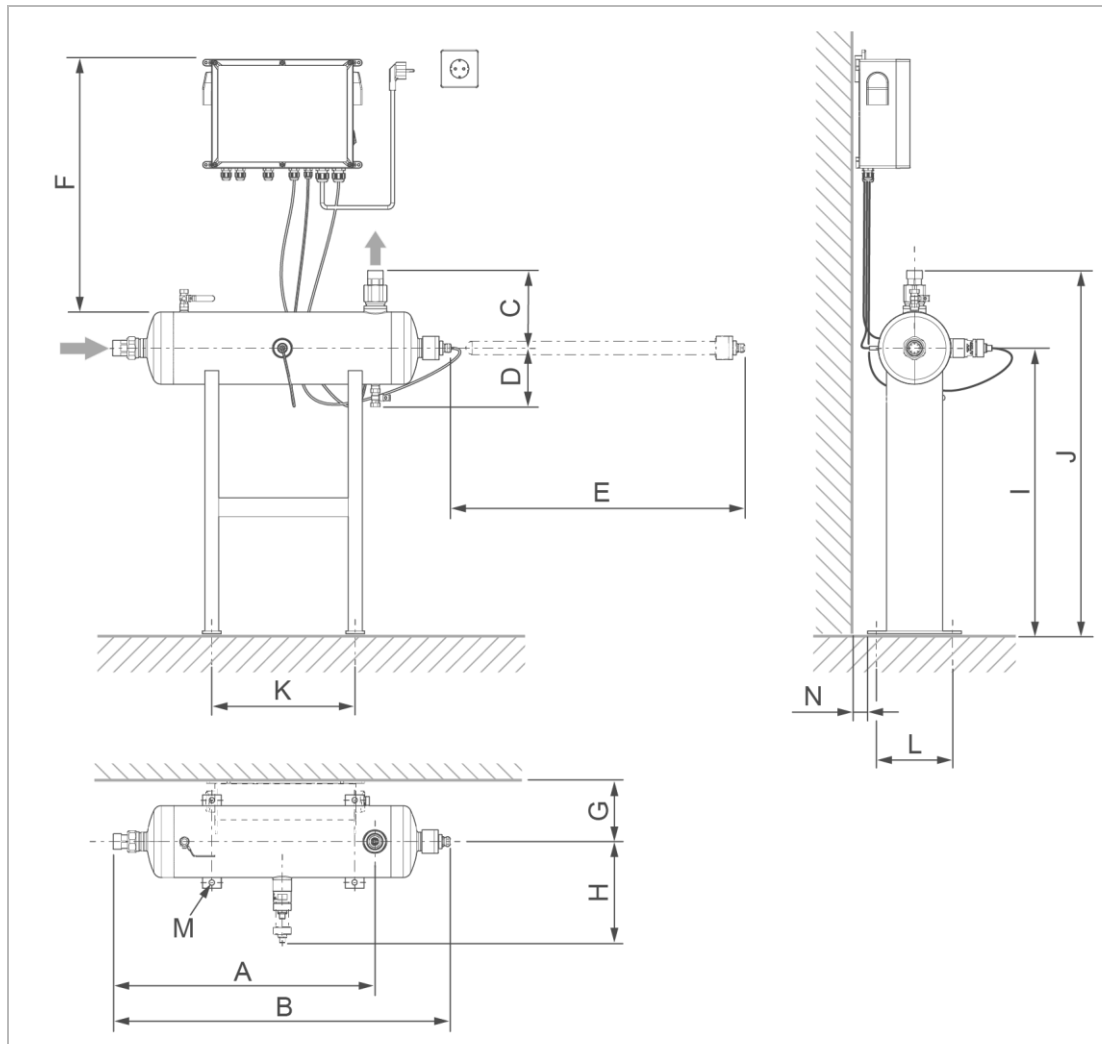


The installation site must offer adequate space. The required connections must be provided before the system is installed.

### Space required and installation dimensions (for wall mounting)



### Space required and installation dimensions (with floor rack)



Dimensions and weights		violIQ:UV20	violIQ:UV66	violIQ:UV85	
A	Installation length with screw connection	mm	560	960	1212
B	Total length with screw connection	mm	795	1185	1430
C	Overall height above centre of connection with screw connection	mm	165	181	181
D	Overall height below centre of connection	mm		130	
E	Clearance required on the right of system for lamp replacement	mm	560	950	1200
F	Clearance required above the system	mm		≥ 350	
G	Distance to wall from centre of connection	mm		≥ 125	
H	Clearance required for replacement of UV sensor	mm		≥ 300	
I	Overall height centre of system with floor rack	mm		610	
J	Overall height with screw connection, with floor rack	mm		791	
K	Distance between holes to fasten floor rack, width	mm	306	550	800
L	Distance between holes to fasten floor rack, depth	mm		180	
M	Diameter of bore to fasten floor rack	mm		Ø 12	
N	Distance of floor rack to wall	mm		≥ 30	

## 5.2 Requirements for the installation site

Obey the local installation directives, general guidelines and technical specifications.

- Protection from frost, severe heat exposure and direct sunlight
- Protection from chemicals, dyes, solvents and their vapours
- Horizontal installation surface and/or even wall surface with the corresponding load-bearing capacity to support the operating weight of the product
- Sufficiently illuminated as well as aerated and ventilated
- Access for maintenance work (take required space into consideration)
- On-site obstacles/restrictions must be indicated in advance and taken into account in the design of the system.

### Required space

- The following clearances must be available to operate the UV disinfection system:
  - At least 800 mm in front of the system
  - Upwards at least 350 mm
- Maintain the required clearances for changing the UV sensor and UV lamp.

### Water installation

- In case the optional temperature-controlled flushing is used, a drain connection  $\geq$  DN 50 must be available.
- Always install a drinking water filter and, if required, a pressure reducer upstream of the UV disinfection system.
- Upstream and downstream of the UV disinfection system, shut-off valves must be provided.
- The safety device must be installed in the pipe network downstream from the UV disinfection system.
- 0.5 m upstream and downstream of the UV disinfection system, the water pipes must be made of UV-resistant material (stainless steel, galvanised steel or copper).
  - Water pipes made of plastic are not suitable.
- The installation location must be provided with a floor drain.  
If no floor drain is available, a safety device with water stop function must be installed in order to prevent water damage.
  - Floor drains that discharge to a lifting system do not work in case of a power failure.



### Electrical installation

- Schuko socket with continuous power supply (max. 1.2 m from the control unit). The socket requires a permanent power supply and must not be connected to light switches, emergency heating switches or similar devices.
- The UV disinfection system must be equipped with a residual current device (RCD) whose rated tripping residual current must not exceed 30 mA.

## 5.3 Checking the scope of supply

- 1 Stainless steel pressure pipe (irradiation chamber)
- 1 Protective quartz pipe
- 1 Moulded seal for the protective quartz pipe
- 1 Sealing paste for installing the protective quartz pipe
- 1 UV lamp



The UV sensors have a special warranty period of a maximum of 4,000 operating hours or 12 months after installation if 4,000 operating hours have not yet been reached by then.

- 1 Sensor shell
  - 1 UV sensor
  - 1 Receiving disc of flow stabiliser
  - 1 Set of flow stabilisers
  - 1 Long water meter screw connection to install the flow stabilisers – receiving disc in the system outlet
  - 1 Standard water meter screw connection (inserts with union nuts)
  - 1 Control unit violiQ:UV
  - 1 Safety device
  - 1 Operation manual
- ▶ Check the scope of supply for completeness and damage.

## 5.4 Water installation

Regarding the installation and operation of UV disinfection systems, the DVGW work sheet W 294-1 must be complied with.



For operation of the UV disinfection systems in compliance with the German Drinking Water Ordinance in accordance with DVGW work sheet W 294-1, it is necessary to interrupt the water flow in the event a power failure, especially if the irradiance is insufficient or there is a lamp failure.

- ▶ The fastening material must be provided by the client on site according to the local conditions at the installation site  
(refer to chapter 5 "Installation dimensions for wall mounting or installation with floor rack")



The easiest and safest way to install the UV disinfection system is to use the wall bracket for wall mounting or the floor rack available as accessories (refer to chapter 3.5).

### NOTE

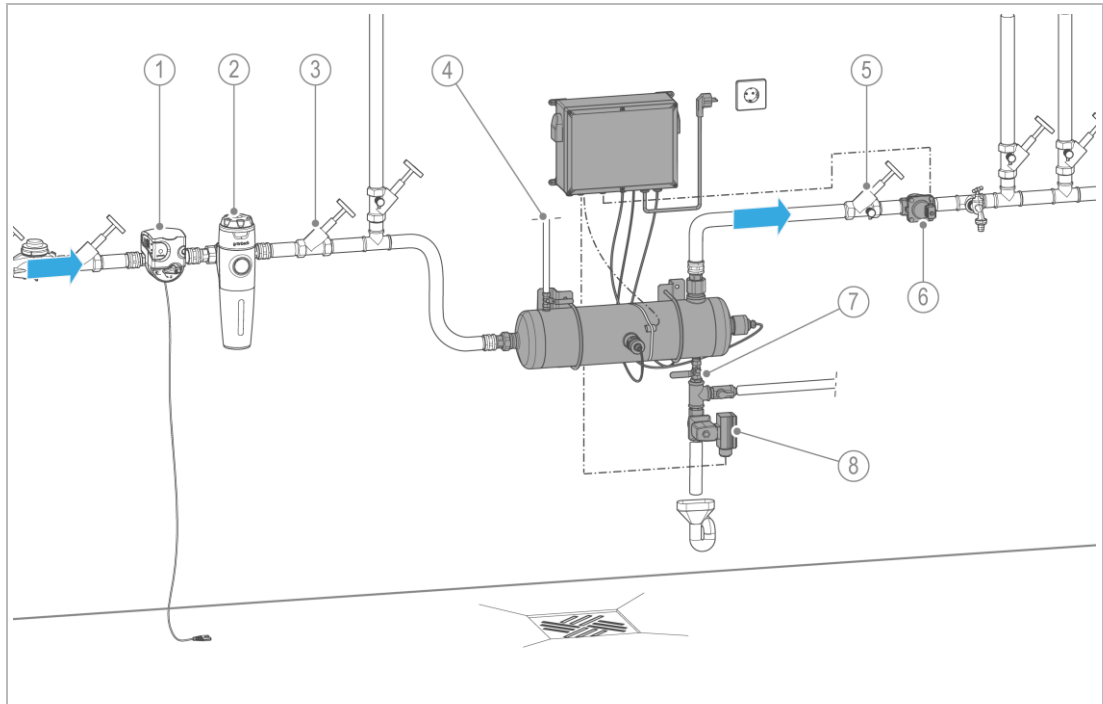
If the protective quartz pipe breaks, water might leak.

- The safety valve installed downstream from the UV disinfection system does not prevent water from leaking from the pipe network.
- ▶ Make sure that there is a floor drain in the installation room.
- » In the event of an excessively long idle time, this is the only way to flush the system manually via the "inlet flushing connection".



The UV systems are only tight when the protective quartz pipes are installed properly.

- ▶ Carry out a leak test after installing the protective quartz pipe.



Designation	
1	Safety device protectliQ
2	Drinking water filter, e.g. pureliQ
3	Inlet shut-off valve (provided by the client on site)
4	Outlet flushing connection

Designation	
5	Outlet shut-off valve (provided by the client on site)
6	Safety device (solenoid valve)
7	Inlet flushing connection
8	Solenoid valve for temperature-controlled flushing (optional accessory)

- ▶ Make the water connection according to the installation drawing.



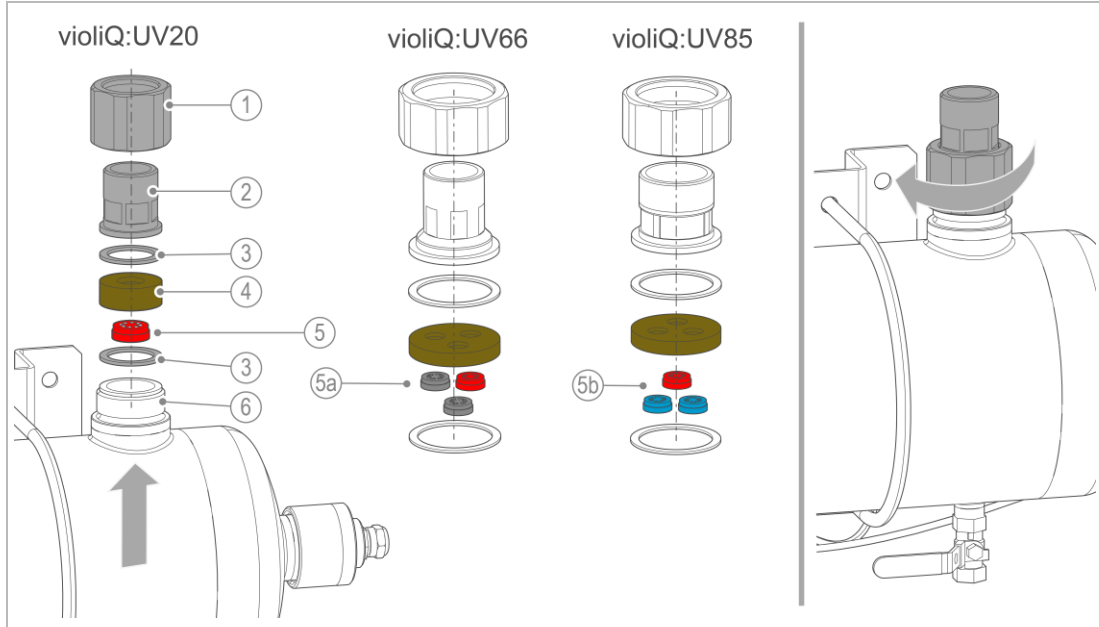
For proper operation, ensure that the inlet water pressure is at least 2 bar (2,000 hPa) and max. 10 bar (10,000 hPa).

- ▶ Mount the UV system horizontally with the outlet directing upwards in order to be able to remove accumulated air.

### 5.4.1 Installing the flow stabilisers



Pay attention to the mounting direction of the flow stabilisers, otherwise they will be pushed out of the receiving disc.



Designation	
1	Long union nut
2	Insert
3	HDPE seal
4	Receiving disc of flow stabiliser

Designation	
5	Flow stabiliser (1x red)
5a	Flow stabiliser (1x red, 2x black)
5b	Flow stabiliser (1x red, 2x blue)
6	Connection to the UV system

► Install the flow stabiliser into the outlet of the UV system according to the figure.

## 5.5 Electrical installation



The electrical installation may only be carried out by a qualified electrician.

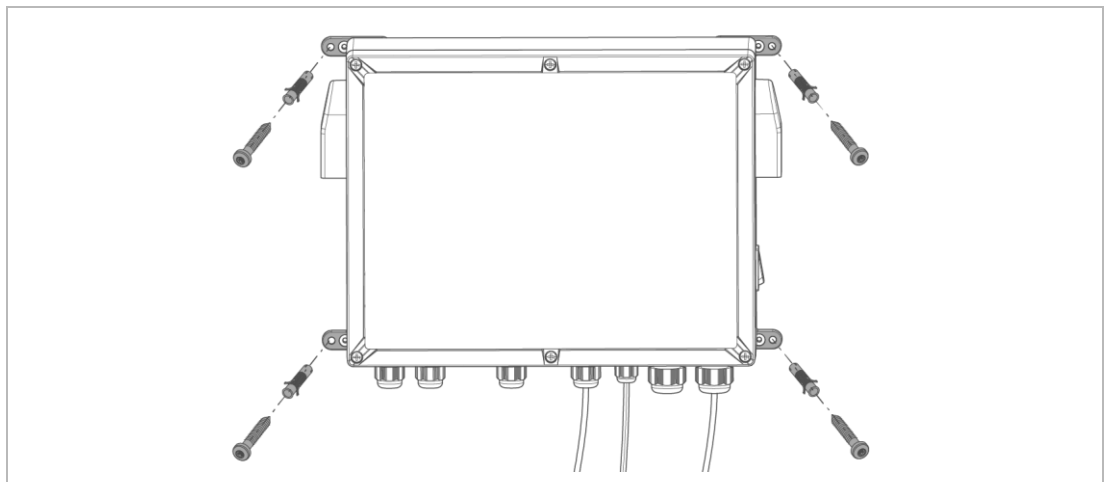


**DANGER** Life-threatening voltage of 230 V on terminals 20 ... 25

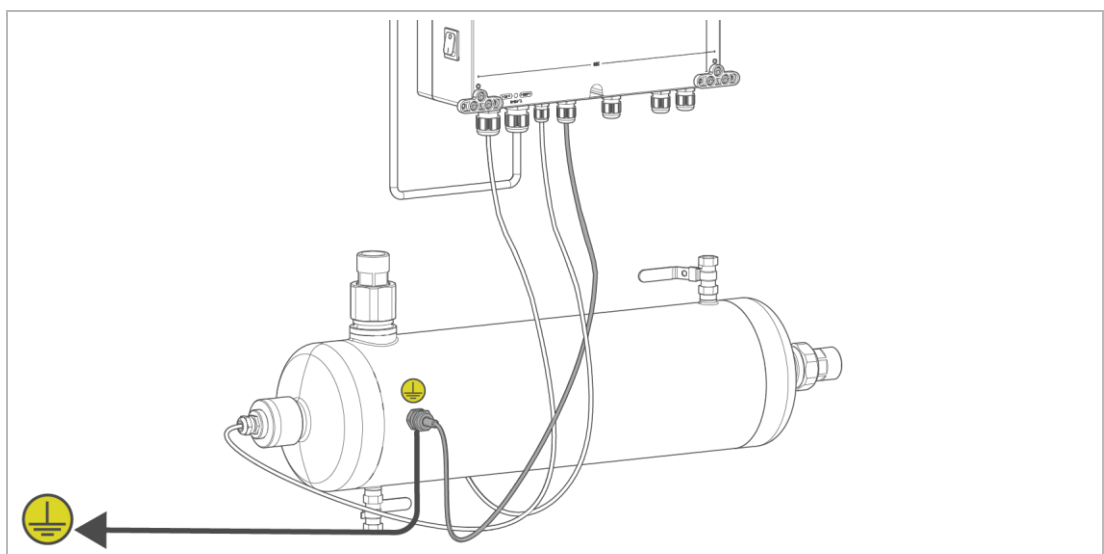
- Severe burns, cardiovascular failure, fatal electric shock
- ▶ Check the system for proper condition before start-up.
- ▶ Only plug the mains plug into the socket after the work has been completed.



The UV disinfection system must be equipped with a residual current device (RCD) whose rated tripping residual current must not exceed 30 mA.



1. Determine the position of the control unit (as close to the UV system as possible).
  - a Take the space required into consideration and make sure that the control unit is accessible for operation.
2. Fasten the control unit with the fastening materials provided by the client on site and according to the on-site wall situation.



3. Connect the protective conductor of the control unit to the connection on the reactor housing.



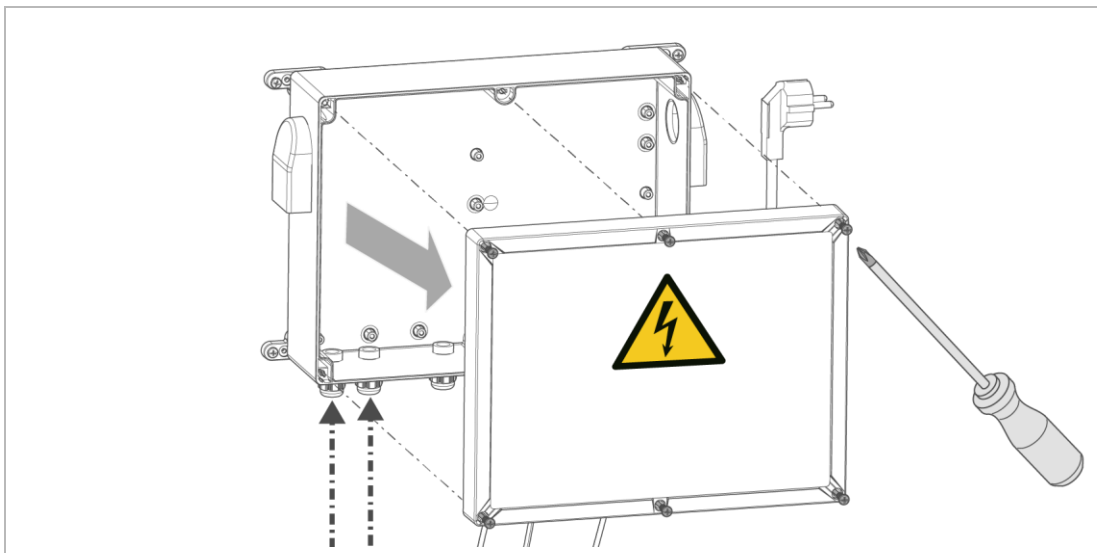
The reactor housing of the UV disinfection system must be connected to the building's equipotential bonding system via a PE cable with a cross-section of 6 mm<sup>2</sup> – 16 mm<sup>2</sup>.

The UV disinfection systems are electrically pre-wired.

Therefore, only possible signal lines or signal transmitters must be connected to the voltage-free contacts.

When the UV disinfection system is switched off, or in case of a malfunction, the contacts irradiance pre-alarm, maintenance signal and collective fault signal are open.

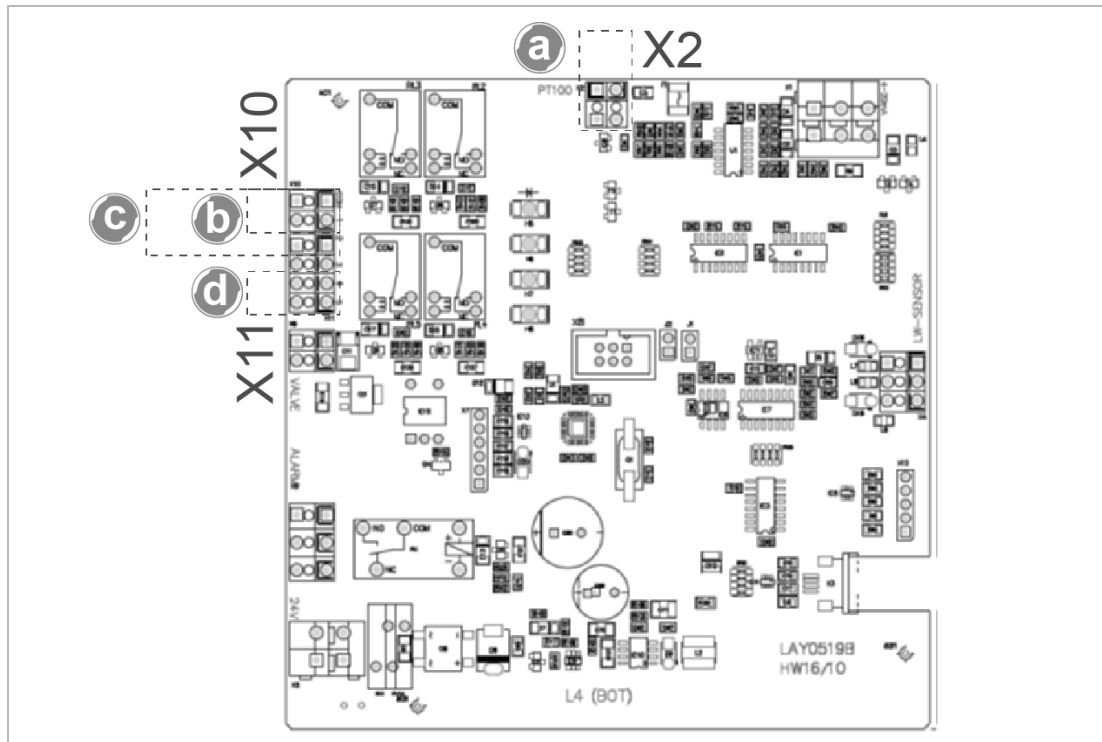
- The voltage-free contacts do not carry any voltage.
- ▶ Establish a suitable power supply (max. 24 V~, 1A) to the voltage-free contacts.



1. Open the cover of the control unit.
2. Establish the required electrical connections (refer to chapter 5.5.1).
3. Close the cover of the control unit.

## 5.5.1 Electrical connections

### Circuit board



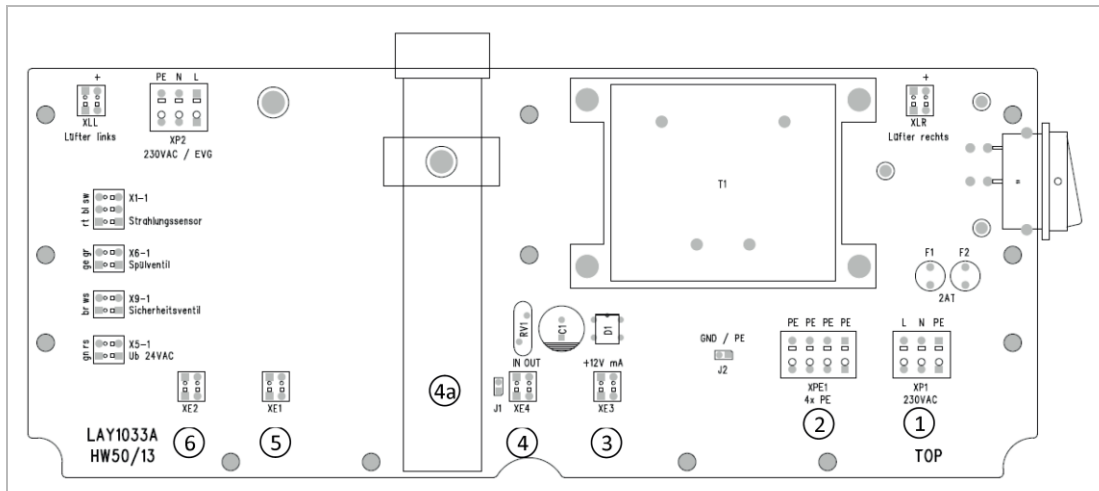
#### Designation

- a** Temperature sensor PT100 (optional)
- b** Maintenance signal active  
max. 24 V~ / max. 1 A

#### Designation

- c** Irradiance pre-alarm N.C.  
max. 24 V~ / max. 1 A
- d** Collective fault signal active  
max. 24 V~ / max. 1 A

### Terminal diagram



Item	Component	Terminal	Signal	Colour of litz wire
①	Mains cable Fuses F1 and F2 (2 A T each) internal fuse protection	XP1 L	230 V / 50 Hz phase	BN/BK (brown or black)
		XP1 N	Neutral conductor	BU (blue)
		XP1 PE	Protective conductor	YE-GN (yellow-green)
②	Protective conductor	XPE1	Reactor grounding	YE-GN (yellow-green)
③	UV sensor	XE 3 +12 V	Irradiance sensor transmitter voltage + 12 V	BU (blue)
		XE 3 mA	Signal input of irradiance sensor 4-20 mA	BK (black)
④	Optional USB data logger: If installed at ④a, jumper J1 must be removed	XE4 OUT	Signal 4-20 mA (to be connected to data logger +)	
		XE4 IN	4-20 mA signal (to be connected to data logger -)	
⑤	Optional flushing solenoid valve	XE1	24 V~ L	BK (black)
		XE1	N	BU (blue)
⑥	Safety solenoid valve	XE2	24 V~ L	BK (black)
		XE2	N	BU (blue)

### 5.5.2 Check electrical installation

1. Check the electrical connections for integrity.
2. Check the potential equalisation on the UV reactor.
3. Check the on-site AC/DC sensitive ground fault circuit interrupter (30 mA) for function.
4. Record the electrical test performed.



If the mains connection cable and/or electrical connections of the UV device are damaged, have them replaced by a qualified electrician.



## 6 Start-up



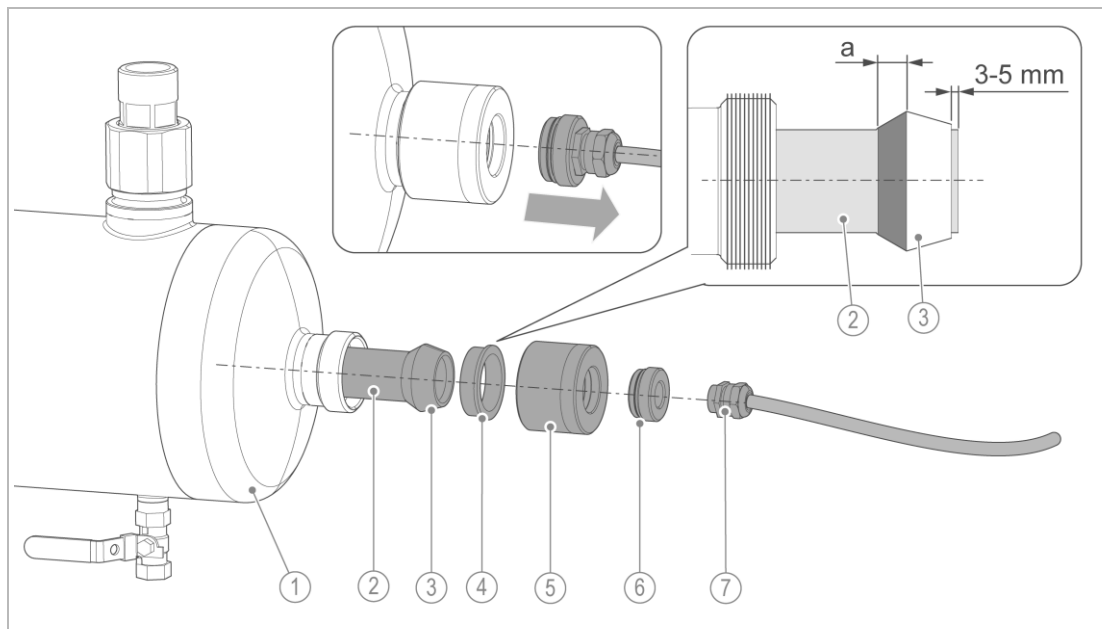
The initial start-up of the product must be carried out by technical service personnel only.

### 6.1 Installing the protective quartz pipe

**NOTE**

Do not touch the protective quartz pipe with bare hands.

- Touching it with bare hands will decrease performance.
- ▶ Use cotton gloves when installing the protective quartz pipe.



Designation	Designation
1 Pressure pipe	5 Brass screw connection
2 Protective quartz pipe	6 Screw-in part with spacer
3 Seal	7 Cable gland
4 Stainless steel binding ring	a Sealing paste

1. Remove the screw-in part with spacer from the brass screw connection.
  - a Loosen the cable glands of the screw-in part.
2. Unscrew the brass screw connection and remove the stainless steel binding ring.
3. Install the seal as shown in the detail drawing.
4. Apply the sealing paste to the seal as shown in the detail drawing.



Make sure not to apply any sealing paste to the area of the protective quartz pipe where the light passes through.



To facilitate mounting, a little sealing paste can be applied inside the seal. This also facilitates removal in case of maintenance.

**NOTE**

Do not touch the protective quartz pipe with bare hands.

- Touching it with bare hands will decrease performance.
- Use cotton gloves when installing the protective quartz pipe.

5. Insert the protective quartz pipe into the pressure pipe.



When installing the protective quartz pipe, make sure that the protective quartz pipe is inserted into the protective quartz pipe guidance inside the stainless steel vessel (UV reactor).

- ▶ Use supplied mounting aid for installation.

6. Plug on the stainless steel binding ring.

7. Tighten the brass screw connection hand-tight again.



Do not tighten the nuts excessively in order not to damage the quartz glass.

Due to the tolerance of the components, sealing of the UV system can already have been achieved even without the stainless steel binding ring touching the pressure pipe.

## 6.2 Installing the UV lamp



**DANGER** Lethal voltage of 230 V



- Risk of severe burns, cardiovascular failure, fatal electric shock
- ▶ Only carry out work on the UV lamp when the mains voltage is switched off – switch off the mains switch on the system beforehand and pull the mains plug.



**WARNING** Dangerous UV irradiation

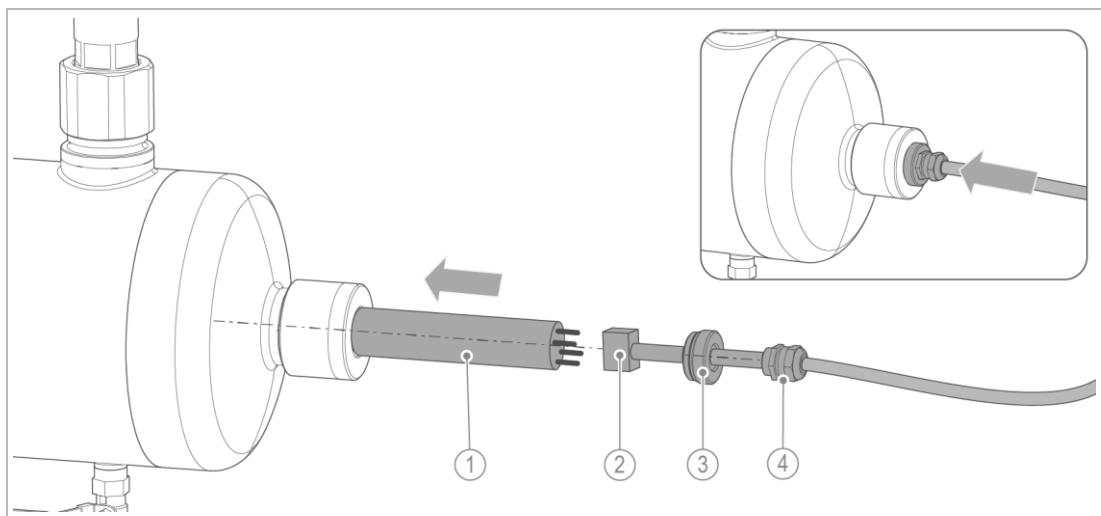


- Eye damage
- If the UV sensor is removed during operation, the UV lamp remains switched on.
- ▶ Never look directly into the UV lamp or the sensor shell if the UV system is switched on.
- ▶ Use appropriate safety goggles against UV light (refer to chapter 3.5).



**NOTE** Do not touch the UV lamp with bare hands

- Touching it with bare hands will decrease performance.
- Use cotton gloves when installing the UV lamp.

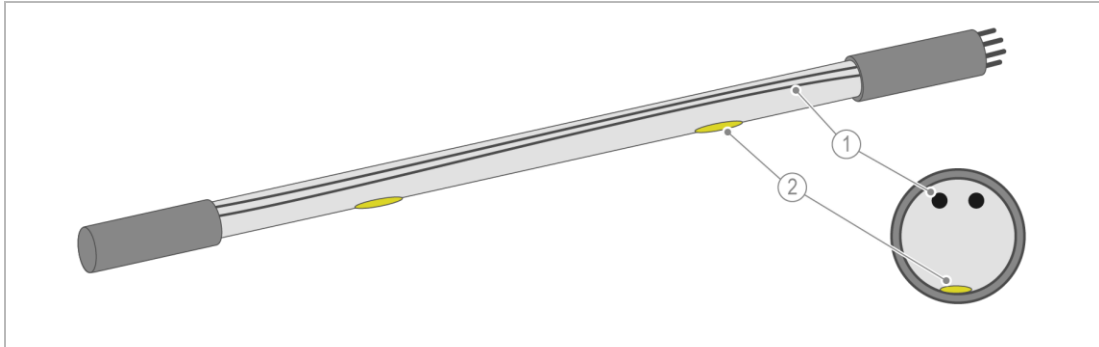


Designation	
1	UV lamp
2	Connector of the connection cable
3	Screw-in part
4	Cable gland

1. Insert the UV lamp into the protective quartz pipe up to about 60 mm.
2. Connect the UV lamp with the connector of the connection cable.
3. Completely insert the UV lamp into the irradiation chamber.



- ▶ Make sure that the connecting cables that run alongside the UV lamp point upwards when inserting the UV lamp and that the gold dots of the UV lamp point downwards.
- » This ensures that the connecting cables do not negatively affect the irradiance measurement.



Designation	Designation
1 Connecting cable in the UV lamp	2 Gold dots

4. In order to fix the UV lamp, pull the cables as far as they will go through the cable gland of the screw-in part.
5. Firmly tighten the cable gland.

## 6.3 Setting the control unit



For operation and handling of the control unit, refer to chapter 7.

The control unit is pre-set at the factory. As a rule, it is not necessary to adjust the control unit.

- ▶ Should you detect a deviation during start-up/commissioning:  
Inform Grünbeck's technical service
- ▶ The minimum irradiance must be set by technical service personnel.

## 6.4 Venting, checking and putting the system into operation



### WARNING

Insufficiently disinfected drinking water

- Infectious diseases due to contaminated drinking water
- ▶ Prior to start-up/commissioning, disinfect the pipe system downstream of the UV system.

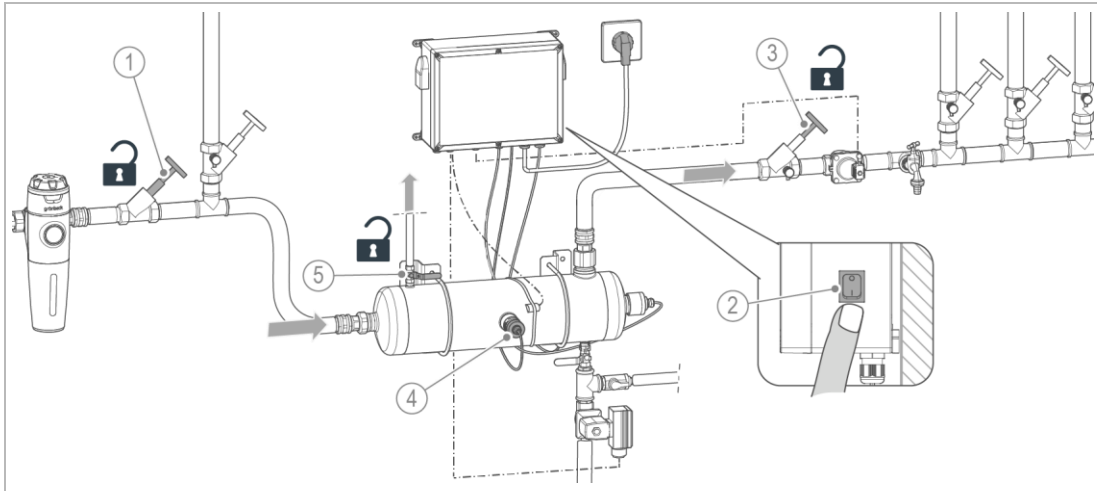


### WARNING

Dangerous UV irradiation



- Eye damage
- If the UV sensor is removed during operation, the UV lamp remains switched on.
- ▶ Never look directly into the UV lamp or the sensor shell if the UV system is switched on.
- ▶ Check the function of the UV lamp only while using appropriate safety goggles against UV light (refer to chapter 3.5).



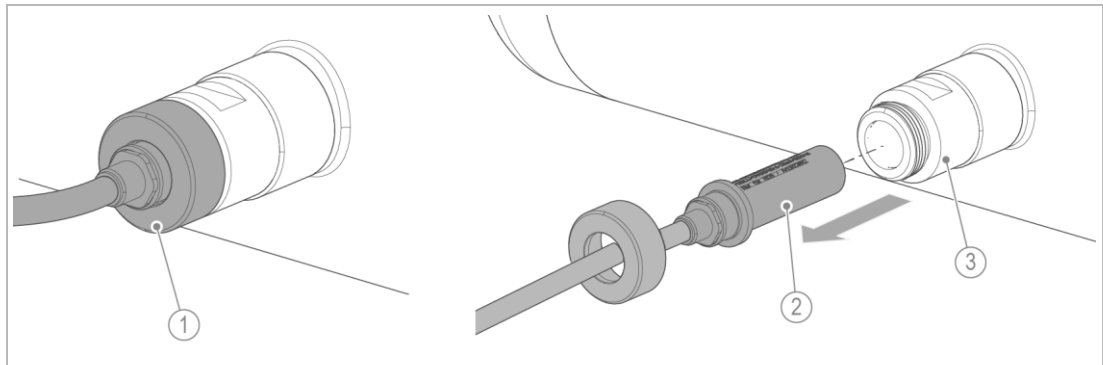
Designation	Designation
1 Inlet shut-off valve (upstream from the UV system)	4 UV sensor in sensor shell
2 Mains switch	5 Flushing valve for venting
3 Outlet shut-off valve (downstream from the UV system)	

1. Open the inlet shut-off valve upstream of the UV system.
2. Switch on the mains switch.
3. Open the upper flushing valve to vent the pipe network.
4. Close the flushing valve when the UV system has been vented.
5. Open the outlet shut-off valve downstream of the UV system.
  - a Close the shut-off device of the possibly existing bypass.



- After the system has been switched on, the irradiance value displayed slowly starts to increase.
  - » As long as the value remains below the set limit value for the alarm, the red **ALARM** LED lights up and the safety valve remains closed.
  - » The red **ALARM** LED only starts flashing, and the safety valve opens, when the limit value for the alarm is exceeded by approx. 0.5 W/m<sup>2</sup>.
- 6. Read off the value for the minimum irradiance.
  - » The value read must match the specified value for the minimum irradiance (refer to type plate and technical specifications).

- When the indicated irradiance value (after approx. 10 – 15 min) is constant:



Designation		Designation	
1	Union nut	3	Sensor shell
2	UV sensor		

7. Slowly pull the UV sensor from the sensor shell.

- » If the irradiance value falls to approx. 110 % of the set minimum irradiance, the red **ALARM** LED must first start flashing and then light up permanently.



If the set value for the minimum irradiance does not correspond with the data indicated on the type plate or if the irradiance pre-alarm does not respond at 110 % of the set limit value, the setting of the control unit is incorrect.

- Have the setting corrected by Grünbeck's technical service.

8. Fully insert the UV sensor into the sensor shell again and tighten the union nut.

9. Fill in the start-up log (refer to chapter 13.1).

## 6.5 Handing over the product to the owner/operating company

- ▶ Explain to the owner/operating company how the product works.
- ▶ Use the manual to brief the owner/operating company and answer any questions.
- ▶ Inform the owner/operating company about the need for inspections and maintenance.
- ▶ Hand over all documents to the owner/operating company for storage.

### 6.5.1 Disposal of packaging

- ▶ Dispose of packaging material as soon as it is no longer needed (refer to chapter 11.2).

### 6.5.2 Storage of accessories and spare parts

- ▶ Store accessories, spare parts and consumables in a safe place which is inaccessible to third parties.
- ▶ Make sure that required spare parts and consumables are available and reordered in good time (refer to chapters 8.5 and 8.6).



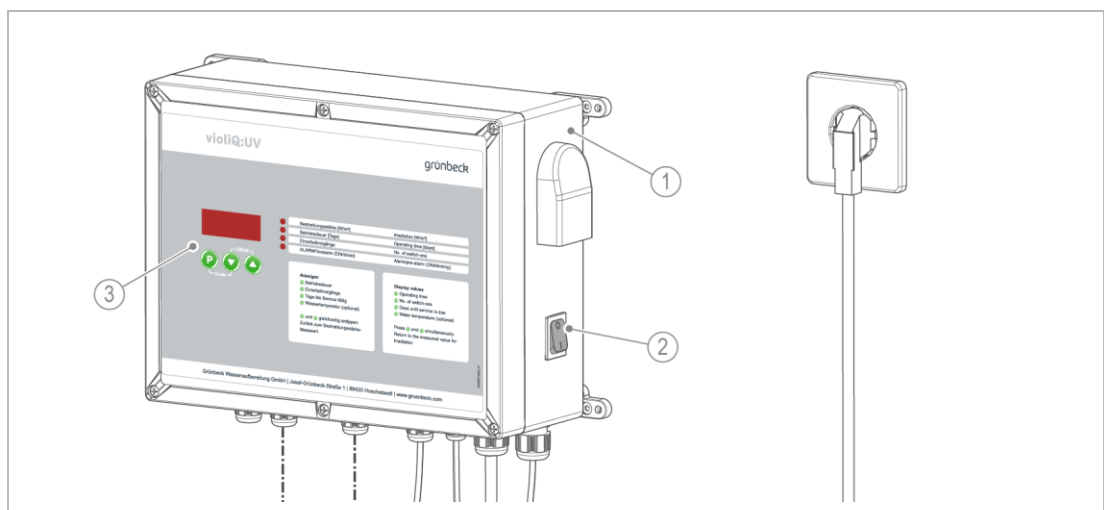
# 7 Operation



The UV disinfection systems must only be operated if all components are installed properly. Safety equipment must never be removed, bridged or otherwise tampered with or disabled.

The UV disinfection systems are operated and monitored by means of the control unit violiQ:UV .

## 7.1 Operating concept



Designation	Designation
1 Control unit violiQ:UV	3 Control panel
2 Mains switch	

- The control unit can be switched on and off at the mains switch.

### 7.1.1 Switching on the UV system

- ▶ Switch on the mains switch.
- All segments of the display and the 4 LEDs: irradiance, operating time, switch-on operations and ALARM light up briefly
  - The three voltage-free contacts ALARM, pre-alarm and service are open.
  - The optional safety valve is open.
  - The optional temperature-controlled flushing unit is closed.
- The electronic ballast preheats the UV lamp.
- The irradiance indicator switches to 0.00 W/m<sup>2</sup>, the LEDs for operating time, switch-on operations and ALARM go out.
- After the preheating phase, the UV lamp ignites.

- The numerical value of the irradiance indicator increases continuously.
- The **ALARM** LED lights up according to the irradiance indicator and the system type (violiQ:UV20/66/85).
- The voltage-free contacts ALARM, pre-alarm and service are either open or closed depending on the status of the **ALARM** LED and the interval remaining until the next maintenance.
- The optional safety valve is open or closed according to the irradiance indicator.
- The optional temperature-controlled flushing unit is open or closed according to the water temperature and the flushing temperature set.



In case a start attempt is unsuccessful, the red **ALARM** LED lights up and the irradiance indicator remains at 0.00 W/m<sup>2</sup>.

- ▶ In case of a new start attempt, maintain a wait time of at least 1 minute between switching off and switching back on.

### 7.1.2 Switching off the UV system



Do not switch off the UV system for no reason as each switch-on operation reduces the service life of the UV lamp.

The number of switch-on operations can be read on the control unit.

- Close the de-energised solenoid valves (safety valve and optional flushing solenoid valve) (flow interruption).
- The voltage-free contacts ALARM, pre-alarm and service open.

## 7.2 Operating elements and display

The values can be read and set on the control panel.

The current irradiance in W/m<sup>2</sup> is the basic display.







Designation	Meaning/function
1 Operating keys	
2 Display	Basic display of irradiance <b>XX.XX</b> in W/m <sup>2</sup>
3 LEDs	Indicate current operations by flashing or lighting up
4 Display values	Explanation of the key function and corresponding indication in the display

### 7.2.2 Display of Info level

Key	Display	Unit	LED
	Operating time <b>XXXX</b>	Days	X
	Switch-on operations <b>XXXX</b>		X
	Days until service is due <b>XXXd</b>	Days	-
	Water temperature (optional) <b>XX</b>	°C	-
+	Back to basic display of measured value for irradiance <b>XX.XX</b>	W/m <sup>2</sup>	
+	Access to the code-protected programming level • Opens the display of code request "Code C . 000"		

## 7.2.3 Programming the parameters

Key	Meaning/function
	<ul style="list-style-type: none"> <li>• Press and hold key &gt; 1 sec: Access to the user programming level (optional temperature-controlled flushing unit)</li> <li>• Opening the parameter for editing (display value starts flashing).</li> <li>• Save parameter (display value stops flashing)</li> </ul>
	<ul style="list-style-type: none"> <li>• Reduce the numerical value of a parameter (display value flashes)</li> <li>• Back to the previous parameter</li> </ul>
	<ul style="list-style-type: none"> <li>• Increase the numerical value of a parameter (display value flashes)</li> <li>• Switching to the next parameter</li> </ul>
	<ul style="list-style-type: none"> <li>• Closing open parameter without saving (previous display value is retained)</li> <li>• Returning to the basic display</li> </ul>

## 7.2.4 Display and LED signals

### 7.2.4.1 Pre-alarm and maintenance indicator

- When the maintenance interval, which is independent of the irradiance, has expired, the voltage-free service contact opens.
  - » The display indicates „Days until service is due“ **0d** in the Info level.
- When the irradiance is only 10 % above the limit value, the **ALARM** LED flashes and the voltage-free pre-alarm contact opens.
  - » The safety valve remains open in both cases.



The ordinary ageing process of the UV lamp and dirt deposits within the system result in decreased irradiance.

- ▶ In this case, flush the system and/or carry out maintenance.

### 7.2.4.2 Malfunction indication (Alarm/pre-alarm)

- If a malfunction is present or the irradiance is < the limit value, the **ALARM** LED lights up continuously.
- If the irradiance is < the pre-alarm value, the **ALARM** LED flashes.
  - » The safety valve closes (interruption of flow) and the voltage-free ALARM contact opens.



Warning against insufficiently disinfected drinking water

If the **ALARM** LED is illuminated on the system and the fault message **Er 1** is indicated, the water is only disinfected insufficiently.

- ▶ Do not withdraw any water until the malfunction has been remedied.

### 7.2.4.3 Temperature-controlled flushing unit (optional)



Refer to the mounting instructions of the temperature-controlled flushing unit (order no. 523 825).

The scope of supply includes a contact temperature sensor and a flushing solenoid valve 1/2" for installation on the flushing connection.

- In the Info level, the current water temperature is displayed.
- The desired flushing temperature can be programmed in the range of 10 – 60 °C.
- » Upon reaching the programmed flushing temperature, the flushing solenoid valve opens, the fault message **Er 3** is shown in the display and fresh water is discharged to the drain.  
By doing so, the pressure pipe is cooled down again. If the flushing temperature has decreased by 2 °C, the flushing solenoid valve closes again and the fault message **Er 3** goes out.

## 8 Maintenance and repair

Maintenance and repair includes the cleaning, inspection and servicing of the product.



The responsibility for inspection and maintenance is subject to local and national requirements. The owner/operating company is responsible for compliance with the prescribed maintenance and repair work.

As far as the UV disinfection of drinking water is concerned, the measures stipulated in the DIN work sheet W 19294-1 must strictly be adhered to.



By concluding a maintenance contract you are ensuring that all maintenance work is carried out on time.

- ▶ Only use genuine spare and wearing parts from Grünbeck.

### 8.1 Cleaning



Only have the cleaning work carried out by persons who have been instructed in the risks and dangers that can arise from the product.



#### WARNING

Perform damp cleaning of live components.

- Risk of electric shock
- Sparking possible due to short circuit
- Switch off the voltage supply before starting the cleaning work.
- ▶ Do not open any switch cabinets.
- ▶ Do not use any high-pressure equipment for cleaning and do not blast electrical/electronic devices with water.

#### NOTE

Do not clean the system with cleaning agents containing alcohol/solvents.

- These substances will damage plastic components.
- Varnished surfaces are affected.
- ▶ Use a mild/pH-neutral soap solution.
- ▶ Use personal protective equipment.
- ▶ Only clean the outside of the system.
- ▶ Do not use any strong or abrasive cleaning agents.
- ▶ Wipe the surfaces with a damp cloth.
- ▶ Dry the surfaces with a cloth.

### 8.1.1 Flushing the UV disinfection system

By flushing the UV system, deposits which have settled in the UV system during operation are removed. These deposits consist for example of iron, manganese, copper, scale, etc.

For the flushing, a flushing kit and a cleaning agent are required (refer to chapters 3.5 and 8.5).



The flushing kit essentially consists of a flushing container, a pump, hoses and corresponding connection pieces.

The cleaning agent GENO-clean CP is an acid mixture developed to remove scale, iron, manganese and other residues.

For more detailed information, refer to the product and safety data sheet of the cleaning agent.

Proceed as follows to flush the system:

1. Close the shut-off valves upstream and downstream of the UV system.
2. Put the UV system out of operation.
3. Connect the flushing kit to the flushing valves (inlet at the bottom, outlet at the top).
4. Fill the flushing kit with water and add the correct amount of cleaning agent (GENO-clean CP) to the flushing container (regarding the amount of the cleaning agent, refer to the operation manual of the flushing kit).
5. Switch on the flushing pump for at least 30 min.
  - a In case of severe contamination, flush for at least 60 min.
6. Drain the UV system and neutralise the cleaning agent, if necessary.
7. Flush the UV system several times (3 – 4 times the content of the UV system) with clear water through the outlet valve.
  - » The residues of the cleaning agent are removed.
8. Close the flushing valves.
9. Put the UV system back into operation.
  - a Open the shut-off valves upstream and downstream of the UV system.

## 8.2 Intervals



By way of regular inspections and maintenance, malfunctions can be detected in time and system failures might be avoided.

- ▶ As the owner/operating company, determine which components have to be inspected and maintained at which intervals (load-dependent). The intervals are subject to the actual conditions such as: Water condition, degree of impurities, environmental impacts, consumption, etc.

The interval table below shows the minimum intervals for the activities to be carried out.

Activity	Interval	Tasks
Inspection	2 months	<ul style="list-style-type: none"> <li>• Visual check of the UV system for leaks</li> <li>• Check controller for fault signals</li> </ul>
Maintenance	semi-annually or every 4,000 operating hours	<ul style="list-style-type: none"> <li>• Check all system components for their condition and for leaks</li> <li>• Check the UV sensor and adjust it, if necessary</li> <li>• Check the sensor shell and replace it, if necessary</li> <li>• Check the seals and replace them, if necessary</li> <li>• Check the safety device for function</li> <li>• Check the (optional) temperature-controlled flushing unit for function</li> <li>• Clean the UV system and flush it with clear water, if necessary</li> <li>• Clean protective pipes if necessary</li> </ul>
	annually or after 16,000 operating hours	<ul style="list-style-type: none"> <li>• Replace wearing parts</li> </ul>
	every 24 months	<ul style="list-style-type: none"> <li>• Replace UV sensor, sensor shell and seals</li> </ul>
	load-dependent	<ul style="list-style-type: none"> <li>• Replace UV lamp after max. service life has been reached</li> </ul>

## 8.3 Inspection

Regular inspection is absolutely essential. You, as owner/operating company, can carry out the regular inspections yourself.

We recommend inspecting the product at shorter intervals initially and later on as required.

- ▶ Conduct an inspection at least every 2 months.
  1. Check all system components for leaks.
  2. Check the control unit for fault messages (refer to chapter 9).



## 8.4 Maintenance

Regular work is necessary in order to ensure proper functioning of the product in the long term. DIN 19294-1 stipulates regular maintenance to ensure trouble-free and hygienic operation of the product.



Annual maintenance work requires expert knowledge. The maintenance work may only be carried out by the technical service (refer to the technical service manual).

### 8.4.1 Service work semi-annually or every 4.000 operating hours

1. Check the outside of the entire UV system for damage, corrosion and leaks.
2. Check the mains cable and the mains plug for damage and a tight fit.
3. Check all electrical connecting lines for damage and a tight fit.
  - a Have a damaged mains cable and electrical connection cables replaced by a qualified electrician.
4. Check all hose connections for leaks.
5. Check the UV sensor using a reference radiometer in accordance with DIN 19294-1 (160° measuring angle) – calibrate, if necessary.
6. Check the sensor shell – replace, if necessary.
7. Check the lamp connector – replace, if necessary.
8. Check the seals – replace, if necessary.
9. Check the safety device for function.
10. Check the optional temperature-controlled flushing unit for function.
11. Flush the UV system with GENO-clean CP, if necessary (refer to chapters 8.1 and 8.5).
12. Clean the protective pipes, if necessary.
13. Enter the data and work performed, including repairs, into the operation log and checklist.

## 8.4.2 Maintenance annually or every 16.000 operating hours

In addition to the service work:

14. Replace all wearing parts (refer to chapter 8.7).
15. Check the function of the housing fans on the control unit – clean, if necessary.
16. Check the condition and presence of warning labels and type plates – replace them if they are worn/illegible.
17. Reset the maintenance interval and, if necessary, the counter readings.
18. Enter the data and work performed, including repairs, into the operation log and checklist.
19. Hand over the UV system and the operation log to the owner/operating company.

## 8.5 Consumables

Product	Quantity	Order no.
Cleaning agent GENO-clean CP	(10 x 1 bottle)	<b>170 022</b>

## 8.6 Spare parts

For an overview of the spare parts, refer to our spare parts catalogue at [www.gruenbeck.com](http://www.gruenbeck.com). You can obtain the spare parts from your local Grünbeck representative.



Only use genuine spare parts from Grünbeck for proper and safe operation of your UV system. The operational safety of the UV system can be impaired if spare parts purchased from other manufacturers are used.

Image	Product	Order no.
	<b>Electronic ballast</b>	
	violiQ:UV20	<b>523 111e</b>
	violiQ:UV66	<b>523 121e</b>
	violiQ:UV85	<b>523 131e</b>
	<b>Control unit violiQ:UV without electronic ballast</b>	

### 8.6.1 Safety components

Image	Product	Order no.
	<b>Safety device</b>	
	For control unit violiQ:UV	
	violiQ:UV20	<b>523 870</b>
	violiQ:UV66	<b>523 875</b>
	violiQ:UV85	<b>523 880</b>






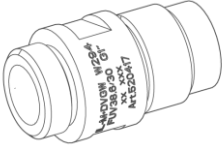
## 8.7 Wearing parts



Wearing parts must be replaced by qualified specialists only.

The parts listed below are considered to be wearing parts:

- Seals
- Control unit fan

Image	Product	Order no.
	<b>Replacement UV lamp</b>	
	The UV lamps (UV-C) have a service life of up to 16,000 hours	<b>violiQ:UV20</b> <b>523 112</b>
		<b>violiQ:UV66</b> <b>523 122</b>
		<b>violiQ:UV85</b> <b>523 132</b>
	<b>Protective quartz pipe with sealing ring</b>	
		<b>violiQ:UV20</b> <b>523 620</b>
		<b>violiQ:UV66</b> <b>522 627</b>
		<b>violiQ:UV85</b> <b>522 628</b>
	<b>Sealing ring for UV lamp</b> id = 27 mm, EPDM	<b>520 153</b>
	<b>Set of flow stabilisers (Obey flow direction)</b>	<b>violiQ:UV20</b> <b>523 647e</b>
	The service life of the flow stabilisers in the UV systems depends on the operating conditions	
	<b>UV sensor</b>	<b>100102240000</b>
	DVGW UV sensor SUV20.2, measuring angle 160°	
	<b>Sensor shell</b>	<b>520 610e</b>
	Due to the UV irradiation, the sealing and holding elements of the sensor shell are subject to wear and tear and must be replaced every 24 months	

## 9 Fault

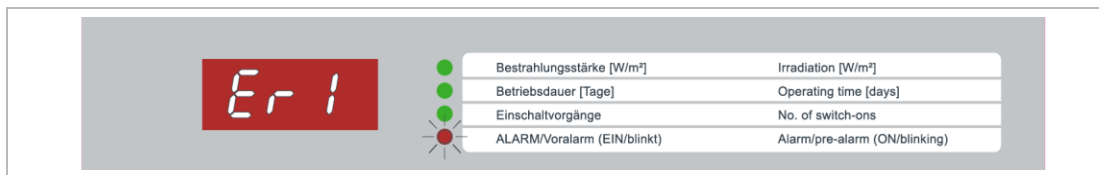


### WARNING

Contaminated drinking water due to stagnation

- Infectious diseases
- ▶ Have malfunctions eliminated immediately.

The UV disinfection systems are equipped with an error detection and reporting system. Malfunctions are indicated on the violiQ:UV control unit by means of the **ALARM** LED.



The messages below can be emitted as voltage-free contacts:

- Collective fault signal
- Pre-alarm signal
- Service signal

### 9.1 Messages

1. Eliminate the malfunction (refer to table).
2. Acknowledge the malfunction, if possible.
3. Monitor the display of the control unit.
4. If the malfunction reoccurs, compare the display message with the table below.

Display	Explanation	Remedy
Er 1 and UV lamp lights up	Irradiance < limit value	▶ Clean the system (flush)
	System dirty on the inside	▶ Have maintenance performed by technical service
	Service life (16,000 h) of UV lamp has been exceeded	
Er 1 and UV lamp does not light up	UV lamp defective	▶ Contact technical service
	Ballast defective	
Er 3	Temperature-controlled flushing (only in case of optional temperature-controlled flushing unit)	Normal operating response after a longer time period without water withdrawal:
	• Water temperature > 38 °C	▶ Set flushing temperature lower ▶ Check flushing valve for function
Er 4	Overtemperature (only in case of optional temperature-controlled flushing unit)	▶ Set flushing temperature lower
	• Water temperature > 40 °C	▶ Check flushing valve for function
Er 5 or display EEEE	Wire break of UV sensor	▶ Check connector plug of UV sensor – plugged in correctly?
		▶ Contact technical service
Er 6 or Er 7	Wire break or short circuit of the temperature sensor (only in case of optional temperature-controlled flushing unit)	▶ Temporarily deactivate the option temperature-controlled flushing unit
		▶ Contact technical service
Display and all LEDs are off	Mains switch is switched off	▶ Switch on mains switch
	Power supply is interrupted (integrated fuse, supply line)	▶ Replace fuse and/or restore power supply
LED <b>Operating time</b> is flashing	Maintenance interval has expired	▶ Have maintenance performed by the after-sales service



If a malfunction cannot be eliminated, the technical service personnel can take further measures.

- ▶ Contact technical service (refer to inner cover sheet for contact data).

## 9.2 Checking the UV lamp



For the removal and check of the UV lamp, refer to chapter 6.2.



A faulty UV lamp may only be replaced by a qualified specialist.



### DANGER

Lethal voltage of 230 V



- Risk of severe burns, cardiovascular failure, fatal electric shock



- ▶ Only carry out work on the UV lamp when mains voltage is switched off – switch off the mains switch on the system beforehand..



### WARNING

Dangerous UV irradiation



- Eye damage
  - If the UV sensor is removed during operation, the UV lamp remains switched on.
- ▶ Never look directly into the UV lamp or the sensor shell if the UV system is switched on.



- ▶ Check the function of the UV lamp only while using appropriate safety goggles against UV light (refer to chapter 3.5).

### NOTE

Do not touch the UV lamp with bare hands

- Touching it with bare hands will decrease performance.
- ▶ Use cotton gloves when installing the UV lamp.

1. Switch off the UV system using the mains switch.
2. Remove the screw-in part and pull out the UV lamp about 50 mm.
3. Switch on the UV system after a wait time of 60 sec using the mains switch.
  - » The filament at the lamp connection must start to glow.
  - » The UV lamp ignites after a few seconds.
4. Switch off the UV system using the mains switch.
5. If necessary, replace a defective UV lamp by a replacement UV lamp (refer to chapter 8.7).
6. Switch on the UV system after a wait time of 60 sec using the mains switch.
7. If the UV lamp once again does not start after a few seconds: Contact Grünbeck's technical service.
8. In case of a successful start:
  - a Switch off the UV system using the mains switch.
  - b Insert the UV lamp completely and remount the screw-in part.
  - c Make sure that the connecting cables that run alongside the lamp point downwards.

9. Switch on the UV system after a wait time of 60 sec using the mains switch.
10. In the event that there is no start:  
Contact Grünbeck's technical service.

### 9.2.1 Mechanical destruction of the UV lamp



#### WARNING

Mercury escaping from a destroyed UV lamp

- Health risk
- ▶ Store fragments of the lamp in an air-tight container until they can be disposed of.
- ▶ Store a replaced protective quartz pipe or a cleaning agent used for cleaning in an air-tight container until they can be disposed of.
- ▶ Take into consideration that a suitable waste management company must be used for disposal, e.g. a collecting point for problem substances (refer to chapter 11).

In case of a mechanical destruction of the UV lamp, the steps below must be carried out:

1. Disconnect the UV system from the water installation.
2. Drain the UV system.
3. Remove the protective quartz pipe.
4. Remove the fragments of the UV lamp from the protective quartz pipe.
5. Replace the protective quartz pipe or at least clean it thoroughly with GENO-clean CP.



Residues of mercury in the protective quartz pipe have a highly negative impact on the UV light generated by the UV lamp.

6. Bind free mercury with adequate means in order to be able to dispose of it.

## 9.2.2 Mechanical destruction of the lamp and the protective quartz pipe



### WARNING

Water contaminated with mercury in the UV system due to defective protective quartz pipe and defective UV lamp

- Health risk
- ▶ Collect the contaminated water in a container and store it in an air-tight manner until the water can be disposed of.
- ▶ Store a replaced protective quartz pipe or a cleaning agent used for cleaning in an air-tight container until they can be disposed of.
- ▶ Take into consideration that a suitable waste management company must be used for disposal, e.g. a collecting point for problem substances (refer to chapter 11).

In case of a mechanical destruction of the UV lamp and the protective quartz pipe at the same time, the steps below must be carried out:

1. Disconnect the UV system from the water installation.
2. Completely remove the UV system.
3. Remove the fragments of the UV lamp and of the protective quartz pipe through the mounting orifice of the quartz pipe.
4. Collect the water remaining in the UV system as well as the fragments of the quartz pipe to properly dispose of them.
5. After remounting the UV system, flush it with GENO-clean CP in order to remove mercury residues from the system.
6. Bind free mercury with adequate means in order to dispose of it.



## 10 Decommissioning

It is not necessary to take your product out of operation.



In case of longer absences, e.g. holidays, precautionary hygiene measures according to VDI 3810-2 and VDI 6023-2 must be taken in order to maintain drinking water hygiene after downtimes.

### 10.1 Temporary standstill

1. Switch off the control unit using the mains switch.
2. Leave all shut-off valves open.
3. If a longer downtime of the system is planned, a system shutdown must be carried out.

### 10.2 Putting the system out of operation

1. Switch off the control unit using the mains switch.
2. Pull the mains plug of the UV system.
3. Close the shut-off valves of the water pipe upstream and downstream of the system.
4. Vent and drain the UV system.

### 10.3 Restart

1. Flush the UV system (refer to chapter 8.1.1).
2. Put the UV system into operation and check it (refer to chapter 6.4).

### 10.4 Final decommissioning

The final shutdown of the UV system constitutes an intervention in your drinking water installation.

1. Check whether shutting down the system has an effect on the functional integrity of your drinking water system.
2. Have a qualified specialist dismantle the UV system (refer to chapter 11).

# 11 Dismantling and disposal

## 11.1 Dismantling



The work described herein represents an intervention into your drinking water system.

- ▶ Have this work performed by qualified specialists only.

  1. De-energise the system (discharge possible residual voltage).
  2. Close the shut-off valves upstream and downstream of the system.
  3. Vent and drain the system.
  4. Disconnect the system from the water installation.
  5. Disconnect the electric connections.
  6. Remove individual components such as accessories, if necessary.
  7. Transport the system secured on a pallet.

## 11.2 Disposal

- ▶ Comply with the applicable national regulations.

### Packaging

- ▶ Dispose of the packaging in an environmentally sound manner.

### NOTE

Risk to the environment due to incorrect disposal

- Packaging materials are valuable raw materials and can be reused in many cases.
- Incorrect disposal can cause environmental hazards.
- ▶ Dispose of packaging material in an environmentally sound manner.
- ▶ Comply with locally applicable disposal regulations.
- ▶ If necessary, commission a specialist company with the disposal.

### Free residues of mercury

If free mercury has escaped from the UV lamp, it must be bound, collected in an air-tight container and stored until it can be disposed of.

- ▶ Only use standard binding agents such as Mercurisorb (Flucka), Mercurisorb-ROTH (Roth) or Chemisorb-Hg (Merck) and proceed as indicated in the operating instructions.
- » Conversion by means of sublimed sulphur, iodised activated carbon and metal powders would take years to complete.
- ▶ Contact a suitable waste management company such as a collecting point for problem substances.



Never and under no circumstances discharge residues of mercury and its compounds to the sink/floor drain or drain connection – formation of amalgam in the lead siphon and environmental poisoning.

### Product



If this symbol (crossed-out wheellie bin) is on the product, this product or its electrical and electronic components must not be disposed of as household waste.

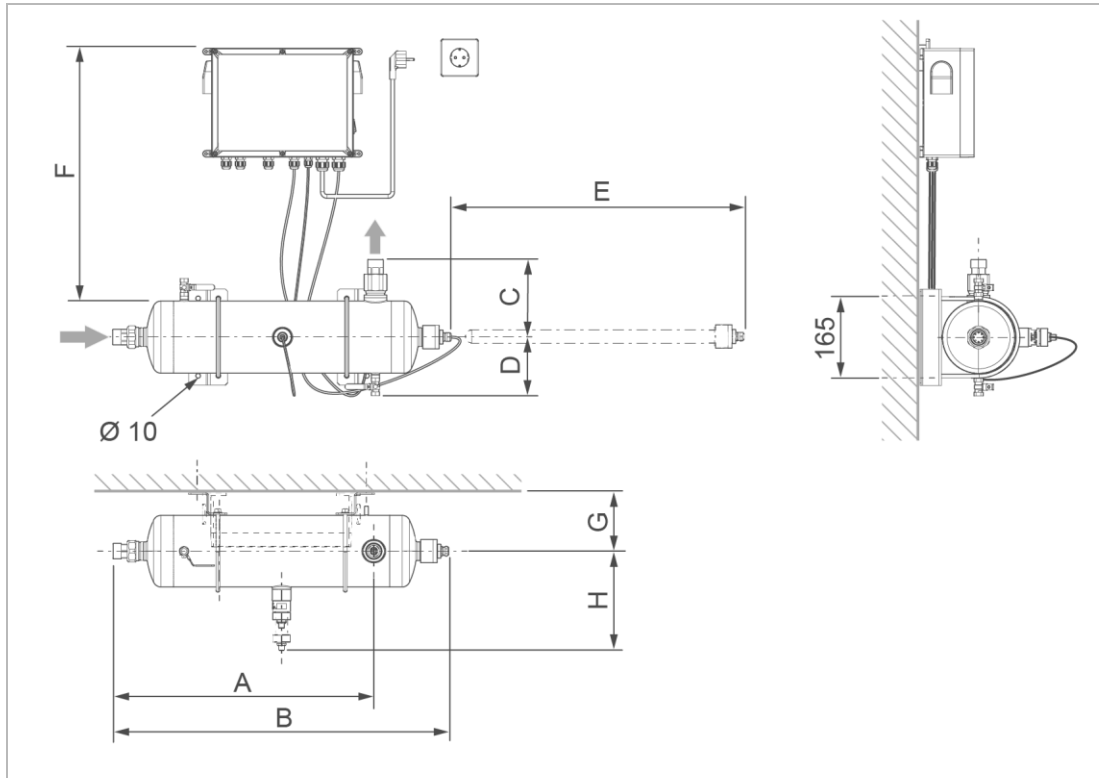
- ▶ Find out about local regulations on the separate collection of electrical and electronic products.
- ▶ Use the available collection points for the disposal of your product.
- ▶ If your product contains batteries or rechargeable batteries, dispose of them separately from your product.



For more information on take-back and disposal, go to [www.gruenbeck.com](http://www.gruenbeck.com).

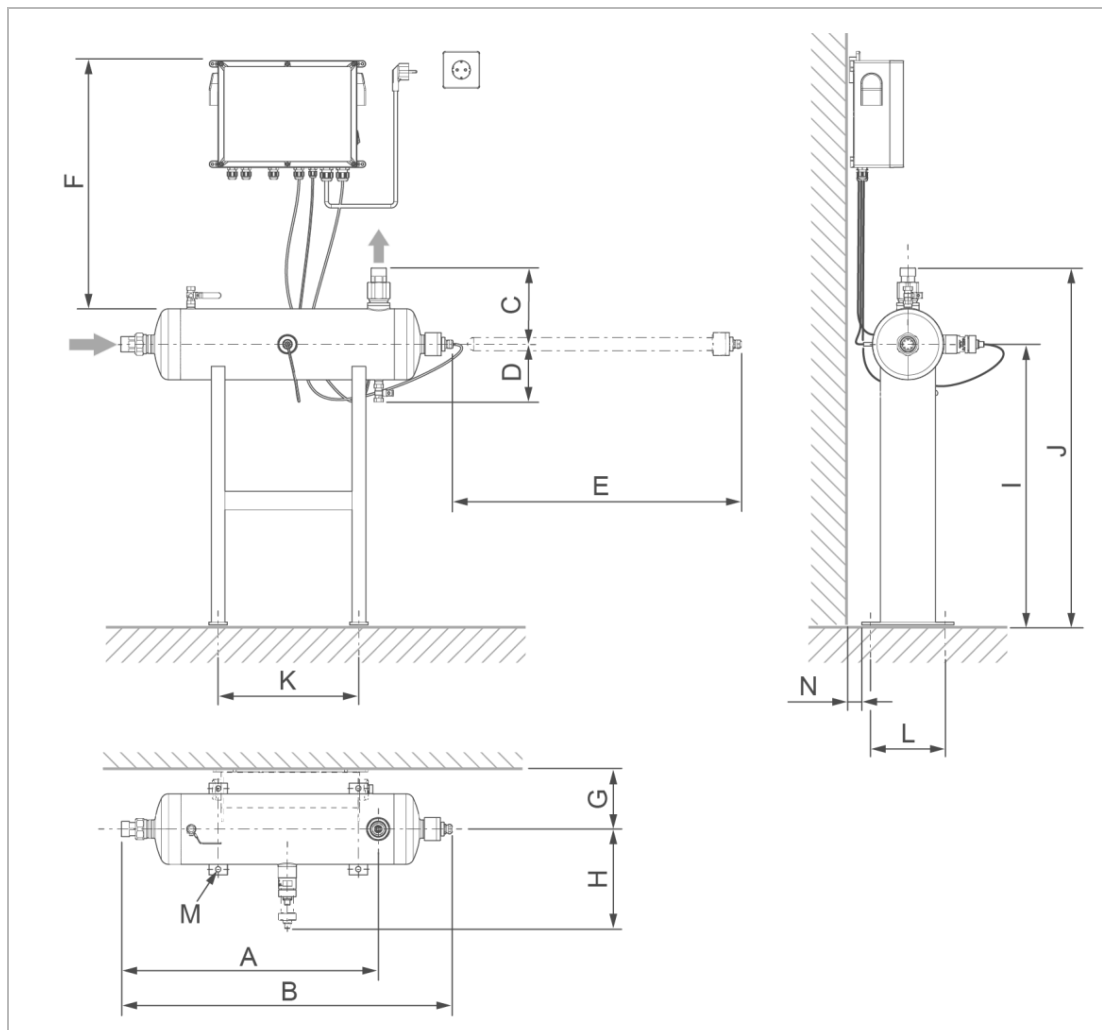
## 12 Technical specifications

### 12.1.1 Installation with wall mounting



Dimensions and weights			violIQ:UV20	violIQ:UV66	violIQ:UV85
A	Installation length with screw connection	mm	560	960	1212
B	Total length with screw connection	mm	795	1185	1430
C	Overall height above centre of connection with screw connection	mm	165	181	181
D	Overall height below centre of connection	mm		130	
E	Clearance required on the right of system for lamp replacement	mm	560	950	1200
F	Clearance required above the system	mm		≥ 350	
G	Distance to wall from centre of connection	mm		≥ 125	
H	Clearance required from centre of connection for replacement of UV sensor	mm		≥ 300	
	Empty weight	kg	13	19	20
	Volume	l	10	16	21

## 12.1.2 Installation with floor rack



Dimensions and weights			violiQ:UV20	violiQ:UV66	violiQ:UV85
A	Installation length with screw connection	mm	560	960	1212
B	Total length with screw connection	mm	795	1185	1430
C	Overall height above centre of connection with screw connection	mm	165	181	181
D	Overall height below centre of connection	mm		130	
E	Clearance required on the right of system for lamp replacement	mm	560	950	1200
F	Clearance required above the system	mm		≥ 350	
G	Distance to wall from centre of connection	mm		≥ 125	
H	Clearance required from centre of connection for replacement of UV sensor	mm		≥ 300	
	Empty weight	kg	13	19	20
	Volume	l	10	16	21

Dimensions of floor rack (accessories)			violiQ:UV20	violiQ:UV66	violiQ:UV85
I	Overall height centre of system with floor rack	mm		610	
Y	Overall height with screw connection, with floor rack	mm		791	
K	Distance between holes to fasten floor rack, width	mm	306	550	800
L	Distance between holes to fasten floor rack, depth	mm		180	
M	Diameter of bores on the floor rack	mm		Ø 12	
N	Distance of floor rack to wall	mm		≥ 30	

Connection data			violiQ:UV20	violiQ:UV66	violiQ:UV85
Nominal connection diameter			DN 25 (1")	DN 40 (1½")	DN 50 (2")
Drain connection			DN 50		
Installation position			horizontal, outlet at the top, self-venting		
Rated voltage range	V~		230 (-15 % /+10 %)		
Rated frequency	Hz		50/60		
Rated load	W		75	145	215
Protection class			⊕		
Performance data			violiQ:UV20	violiQ:UV66	violiQ:UV85
Nominal pressure			PN 10		
Operating range (operating pressure)	bar		2 – 10		
Spectral attenuation coefficient SSK254	m <sup>-1</sup>		≤ 3.2		
Nominal flow	m <sup>3</sup> /h		≤ 2.0	≤ 6.6	≤ 8.5
Minimum irradiance at max. flow	W/m <sup>2</sup>		≥ 34.4	≥ 39.9	≥ 31.6
Pressure loss at nominal flow*	bar		0.4		
* The pressure loss is determined by the flow stabilisers used					
Assemblies			violiQ:UV20	violiQ:UV66	violiQ:UV85
Pressure pipe (irradiation chamber)	Material		W 1.4404		
Protective quartz pipe	Length	mm	560	950	1200
	Ø	mm	28	28	28
UV lamp	Wattage	W	65	125	205
	Max. service life	h	16,000		
UV sensor/sensor shell			according to DIN 19294-3		
Flow stabiliser	Material		POM/EPDM		
2 Ball valves	Nominal diameter		DN 8 (R ¼")		
	Material		W 1.4301		
Control unit			violiQ:UV		
Housing	h x w x d	mm	255 x 340 x 115		
	Material		ABS		
Displays	operating time, irradiance, switch-on counter, operating state				
Outputs	external operating and fault signal, analogue signal output of irradiance signal (4 – 20 mA ± 0 – 200 W/m <sup>2</sup> ), switched power output (24 V~, max. 14 VA) for connection of a safety device (solenoid valve), switched power output (24 V~ max. 14 VA) for connection of a temperature-controlled flushing unit (solenoid valve)				
General data			violiQ:UV20	violiQ:UV66	violiQ:UV85
Water temperature	°C		5 – 70		
Ambient temperature	°C		5 – 40		
Humidity (non-condensing)	%		≥ 70		
DVGW registration number			NW-9182DM0523	NW-9182DM0526	NW-9182DM0527
ÜA registration number <i>The Office of the Vienna Provincial Government – City of Vienna</i>			R-15.2.3-21-17496		
Order no.			523000010000	523000030000	523000040000

# 13 Operation log



- ▶ Record the initial start-up and all maintenance activities.
- ▶ Copy the maintenance report.

UV disinfection system violiQ:UV \_\_\_\_\_

Serial no.: \_\_\_\_\_

## 13.1 Start-up log

Customer				
Name				
Address				
Installation/accessories				
Drinking water filter (make/type)				
Drain connection acc. to DIN EN 1717	<input type="checkbox"/> Yes		<input type="checkbox"/> No	
Floor drain	<input type="checkbox"/> Yes		<input type="checkbox"/> No	
Safety device	<input type="checkbox"/> Yes		<input type="checkbox"/> No	
Water pipe upstream of the disinfection system	<input type="checkbox"/> Galvanised steel	<input type="checkbox"/> Copper	<input type="checkbox"/> Plastic	<input type="checkbox"/> Stainless steel
Operating values				
Water pressure				bar
Water meter reading				m <sup>3</sup>
Irradiance				W/m <sup>2</sup>
Remarks				
Start-up				
Company				
Service technician				
Work time certificate (no.)				
Date/signature				

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# Maintenance no.: \_\_\_\_\_



Enter the measured values and operating data.

Confirm the tests with **OK** or record any repairs carried out.

Operating values		
Operating time		h
Max. flow (note down the colour of the flow stabiliser)		m <sup>3</sup> /h
Irradiance pre-alarm (check on electronics)		W/m <sup>2</sup>
Irradiance measured by the system's UV sensor		W/m <sup>2</sup>
Irradiance measured with the reference sensor		W/m <sup>2</sup>
Deviation of system sensor from reference sensor	W/m <sup>2</sup> /	%
Measured value corrected	<input type="checkbox"/> Yes	<input type="checkbox"/> No
If the value measured by the system sensor is within a range of +/- 10 % of the value measured by the reference sensor, an adjustment of the system sensor can be carried out by a service technician on site.		
If so, by how much of the value measured by the system sensor	absolute	%
Sum of all corrections		%
If the value measured by the system sensor is outside the limits indicated above or if the sum of all corrections exceeds 20 %, the system sensor must be replaced.		

Maintenance work	OK (YES)	NO
<b>Visual check</b>		
Entire UV system checked on the outside for damage, corrosion and leaks	<input type="checkbox"/>	
Mains cable and mains plug checked for damage and a tight fit	<input type="checkbox"/>	
All connecting lines checked for damage and a tight fit	<input type="checkbox"/>	
<b>Functional check</b>		
Sensor shell checked	<input type="checkbox"/>	
Safety device checked	<input type="checkbox"/>	
Lamp connector checked	<input type="checkbox"/>	
Seal of quartz glass checked	<input type="checkbox"/>	
Protective quartz pipe checked	<input type="checkbox"/>	
UV sensor replaced (every 2 years at the latest)	<input type="checkbox"/>	<input type="checkbox"/>
Flow stabilisers replaced	<input type="checkbox"/>	<input type="checkbox"/>
UV lamp replaced	<input type="checkbox"/>	<input type="checkbox"/>
UV system flushed	<input type="checkbox"/>	
Hose connections checked for leaks	<input type="checkbox"/>	
Function of UV system checked by withdrawing water	<input type="checkbox"/>	

**Remarks**

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Performed by		
Company:		
Customer service technician:	Date	Signature



# Maintenance no.: \_\_\_\_\_



Enter the measured values and operating data.

Confirm the tests with **OK** or record any repairs carried out.

### Operating values

Operating time		h
Max. flow (note down the colour of the flow stabiliser)		m <sup>3</sup> /h
Irradiance pre-alarm (check on electronics)		W/m <sup>2</sup>
Irradiance measured by the system's UV sensor		W/m <sup>2</sup>
Irradiance measured with the reference sensor		W/m <sup>2</sup>
Deviation of system sensor from reference sensor	W/m <sup>2</sup> /	%
Measured value corrected	<input type="checkbox"/> Yes	<input type="checkbox"/> No
If the value measured by the system sensor is within a range of +/- 10 % of the value measured by the reference sensor, an adjustment of the system sensor can be carried out by a service technician on site.		
If so, by how much of the value measured by the system sensor	absolute	%
Sum of all corrections		%
If the value measured by the system sensor is outside the limits indicated above or if the sum of all corrections exceeds 20 %, the system sensor must be replaced.		

### Maintenance work

	OK (YES)	NO
<b>Visual check</b>		
Entire UV system checked on the outside for damage, corrosion and leaks	<input type="checkbox"/>	
Mains cable and mains plug checked for damage and a tight fit	<input type="checkbox"/>	
All connecting lines checked for damage and a tight fit	<input type="checkbox"/>	
<b>Functional check</b>		
Sensor shell checked	<input type="checkbox"/>	
Safety device checked	<input type="checkbox"/>	
Lamp connector checked	<input type="checkbox"/>	
Seal of quartz glass checked	<input type="checkbox"/>	
Protective quartz pipe checked	<input type="checkbox"/>	
UV sensor replaced (every 2 years at the latest)	<input type="checkbox"/>	<input type="checkbox"/>
Flow stabilisers replaced	<input type="checkbox"/>	<input type="checkbox"/>
UV lamp replaced	<input type="checkbox"/>	<input type="checkbox"/>
UV system flushed	<input type="checkbox"/>	
Hose connections checked for leaks	<input type="checkbox"/>	
Function of UV system checked by withdrawing water	<input type="checkbox"/>	

### Remarks

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### Performed by

Company:		
Customer service technician:	Date	Signature

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## **Publisher's information**


### **Technical documentation**

If you have any questions or suggestions regarding this operation manual, please contact the Technical Documentation Department at Grünbeck

Email: [dokumentation@gruenbeck.de](mailto:dokumentation@gruenbeck.de)

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