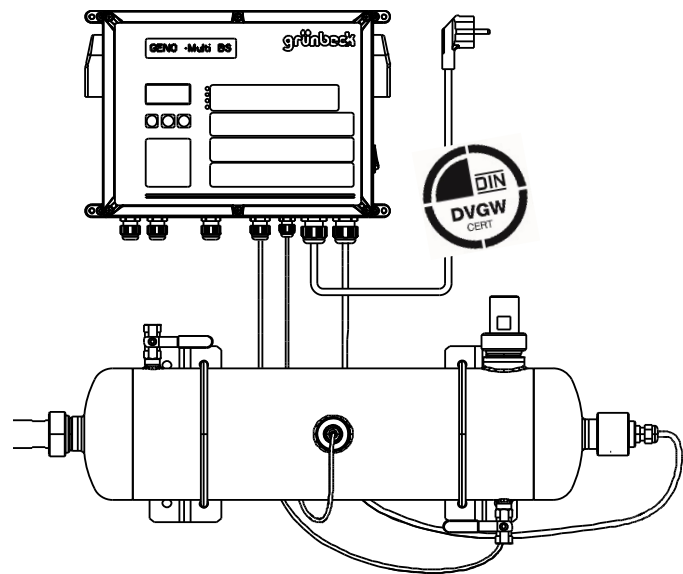


Operation Manual

Disinfection systems GENO-UV 60 S 120 S 200 S



According to the list given in §11 of the German Drinking Water Ordinance, GENO-UV disinfection systems intended for the application in drinking water must be operated according to DVGW worksheet W 294-1. This is only possible with systems tested and certified according to worksheet W 294-2

The UV disinfection systems type GENO-UV 60 S, 120 S and 200 S described in this operation manual comply with this requirement.

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Grünbeck Wasseraufbereitung GmbH

Josef-Gruenbeck-Str. 1 · 89420 Hoehstaedt
GERMANY

+49 9074 41-0 · +49 9074 41-100
www.gruenbeck.com · info@gruenbeck.com



A company certified by TÜV SÜD
in accordance with DIN EN ISO 9001,
DIN EN ISO 14001 and SCC

Content


This operation manual consists of several parts as shown in the table below. Please refer to the cover sheets of the individual parts for detailed information on their contents

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Publisher's information

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Responsible for contents:

Grünbeck Wasseraufbereitung GmbH

Josef-Grünbeck-Str. 1 89420 Hoechstädt/Germany

Phone +49 9074 41-0 Fax +49 9074 41-100

www.gruenbeck.com service@gruenbeck.com

Print: Grünbeck Wasseraufbereitung GmbH

Josef-Grünbeck-Str. 1, 89420 Hoechstädt/Germany

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EU Declaration of conformity

This is to certify that the system designated below meets the safety and health requirements of the applicable European guidelines in terms of its design, construction and execution.

If the system is modified in a way not approved by us, this certificate is void.

Manufacturer:	Grünbeck Wasseraufbereitung GmbH Josef-Grünbeck-Str. 1 89420 Hoechstaedt/Germany
Responsible for documentation:	Markus Pöpperl
System designation:	Disinfection system
System type:	GENO-UV 60 S; GENO-UV 120 S; GENO-UV 200 S
Serial number:	Refer to type designation plate
Applicable guidelines:	Low voltage (2014/35/EU) EMC (2014/30/EU)
Applied harmonised standards, in particular:	DIN EN 60335-1:2012-10, DIN EN 61000-6-2:2006-03, DIN EN 61000-6-3:2011-09
Applied national standards and technical specifications, in particular:	DVGW-W 294-2:2006-06
Place, date and signature:	<u>Hoechstaedt, 15.05.2019</u> i. V. 
	M. Pöpperl Dipl.-Ing. (FH)
Function of signatory:	Head of Technical product design

A General

Table of contents

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1 | Preface

Thank you for opting for a Grünbeck product. Backed by decades of experience in the area of water treatment, we provide solutions for all kind of processes.

Drinking water (raw water) is classified as food and requires particular care. Therefore, always ensure the required hygiene in operating and maintaining systems for drinking water treatment. This also applies to the treatment of water for industrial use if repercussions for the drinking water (raw water) cannot completely be excluded.

All Grünbeck systems and devices are made of high-quality materials. This ensures reliable operation over many years, provided you treat the systems with the required care. This operation manual assists you with important information. Therefore, read the complete manual before installing, operating or maintaining your system.

Customer satisfaction is our prime objective and providing customers with qualified advice is crucial. If you have any questions concerning this system, possible extensions or general water and waste water treatment, our technical service staff, as well as the experts at our headquarters in Hoechststedt, is available to help you.

Advice and assistance

For advice and assistance please contact your local representative (www.gruenbeck.com).

Our service hotline is available for emergencies on +49 (0)9074 / 41-333.

We can connect you with the appropriate expert more quickly if you provide the required system data. To ensure that this information is to hand at all times, please keep the precise equipment data to hand (refer to the type plate in chapter C-1).

2 | How to use this operation manual

This operation manual is intended for the operators of our systems. It is divided into several chapters (a letter is assigned to each of them) which are listed in the “Table of contents” on page 1 in alphabetical order. In order to find the specific information you are looking for, check for the corresponding chapter on page 1.

The headers and page numbers with chapter information make it easier to find your way around in the manual. In case of larger chapters, first check out page 1 of said chapter (e. g. H-1) where you will find more information on the contents of this chapter.

3 | General safety information

3.1 Symbols and notes

Important notes in this operation manual are characterised by symbols. Please pay particular attention to these notes in order to ensure a danger-free, safe and productive system operation.



Danger! Failure to adhere to these notes will cause serious or life-threatening injury, extreme damage to property or inadmissible contamination of drinking water.



Warning! Failure to adhere to these notes may cause injury, damage to property or contamination of the drinking water.



Attention! Failure to adhere to these notes may result in damage to the system or other objects.



Note: This symbol characterises notes and tips to make your work easier.



Tasks with this symbol may only be performed by Grünbeck's technical service or by persons expressly authorised by Grünbeck.



Tasks with this symbol may only be performed by qualified electrical experts according to the VDE guidelines or according to the guidelines of a similar local institution.



Tasks with this symbol may only be performed by water companies or approved installation companies. In Germany, the installation company must be registered in a water company installation directory as per §12(2) AVBWasserV (German Ordinance on General Conditions for the Supply of Water).

3.2 Operating personnel Only persons who have read and understood this operation manual are permitted to work with the system. The safety guidelines are to be strictly adhered to.

3.3 Designated application The system may only be used for the purpose outlined in the product description (chapter C). The guidelines in this operation manual as well as the applicable local guidelines concerning the drinking water protection, accident prevention and occupational safety must be adhered to.

In addition, appropriate application also implies that the system may only be operated when it is in proper working order. Any malfunctions must be repaired at once.

3.4 Protection from water damage



Warning! In order to properly protect the installation site from water damage:

- a) a sufficient floor drain system must be available or
- b) a water stop device (see chapter C Accessories) must be installed.



Warning! Floor drains that are channelled off to the lifting system do not function in case of a power failure.

3.5 Indication of specific dangers

Danger due to electricity! → Do not touch electrical parts with wet hands! Disconnect the system from mains before starting work on electrical parts of the system. Have qualified experts replace damaged cables immediately.

Danger due to mechanical energy! System parts may be subject to overpressure. Danger of injury and damage to property due to escaping water and unexpected movement of system parts. → Check pressure pipes regularly. Depressurise the system before starting repair or maintenance work on the system.

Hazardous to health due to contaminated drinking water! → The system may only be installed by a qualified company. The operation manual must be strictly adhered to! Ensure that there is sufficient flow. The pertinent guidelines must be followed for starting-up after long periods of standstill. Inspections and maintenance must be performed at the intervals specified!



Note: By concluding a maintenance contract, you ensure that all of the required tasks are performed on time. You may perform the interim inspections yourself.

4 | Shipping and storage



Attention! The system may be damaged by frost or high temperatures. In order to avoid damage of this kind:

Protect from frost during transportation and storage! Do not install or store system next to objects which radiate a lot of heat.

The system may only be transported and stored in its original packing. Ensure that it is handled with care and placed the right side up (as indicated on the packing).

5 | Disposal

Comply with the applicable national regulations.

5.1 Packaging

Dispose of the packaging in an environmentally sound manner.

5.2 Product



If this symbol (crossed out waste bin) is on the product, European Directive 2012/19/EU applies to this product. This means that this product and the 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 collection points available to you for disposing of your product.



For information on collection points for your product, contact your municipality, the public waste disposal authority, an authorised body for the disposal of electrical and electronic products or your waste collection service.

B Basic information (GENO-disinfection systems)

Contents

1 Laws, regulations, standards.....	B-1
2 Disinfecting effect of UV light	B-2
3 Room irradiation	B-3

1 Laws, regulations, standards

In the interest of good health, rules cannot be ignored when it comes to the processing of drinking water. This instruction manual takes the applicable German guidelines into account and provides all the information you need to safely operate your water treatment system.

Among other things, the regulations stipulate that

- only approved companies are permitted to make major modifications to water treatment facilities,
- and that tests, inspections and maintenance are to be performed on installed systems at regular intervals.

Especially when the water treated by means of this system is made available to third parties, it must be ensured that the German Drinking Water Ordinance is observed.

According to § 11 of the German Drinking Water Ordinance, the UV disinfection systems may only be applied if these have been tested corresponding to DVGW worksheet W 294-2. Grünbeck's UV disinfection systems GENO-UV 60-200 S comply with this requirement and have to be installed and operated according to DVGW worksheet 294-1 for the purpose of proper operation.



Note: In order for the operation of the UV disinfection systems to comply with the German Drinking Water Ordinance according to the DVGW's work sheet W 294 part 1, the water flow must be interrupted in case of a power failure, especially if the irradiation intensity is insufficient or there is a lamp failure. This can be ensured by means of the optional accessory (safety device) described in chapter C-6.



Attention! Without the above mentioned 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 system and contaminate the pipework. The resulting microbiological load of the water makes it unfit for human consumption.

In Germany only DVGW-certified UV-disinfection systems are approved for installation in drinking water systems!

2 Disinfecting effect of UV light

UV light (ultraviolet light) is light of wave lengths between 100 and 380 nm which are imperceptible (invisible) to the naked eye.

For the UV disinfection, the wave length of 254 nm is of major importance. This wave length is emitted by mercury-arc lamps whose built-up is similar to that of common fluorescent lamps.

The disinfecting properties of the UV light are due to the fact that light of a wave length of 254 nm is absorbed by the nucleic acids in the genetic material of micro-organisms. The absorption of the high-energy radiation results in the modification of the genetic material (DNA resp. RNA) and leads to an incapability to reproduce.

The room irradiation (light dose) required to inactivate the micro-organisms depends on the respective species and population. For fungi, spores and algae a much higher room irradiation is required compared to bacteria and viruses.

The DVGW's Technical Regulation W 294 stipulates a minimum room irradiation of 400 J/m² by which a reduction rate of 99.99% for viruses and bacteria is achieved.

For further details, please refer to DVGW worksheet W 294-1.

3 Room irradiation

The extent of the irradiation in the room depends on the intensity and the duration of the irradiation. The irradiation intensity on the other hand depends on the spectral absorption coefficient of the water at 254 nm (SAC_{254}). With regard to the UV disinfection the organic substances (e.g. humic acids) and the 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 wave length of 254 nm is invisible to the naked eye, the SAC_{254} can only be determined by a UV-VIS spectrometer.

The intensity of irradiation also depends on the age of the UV lamps. The performance of the UV lamps decreases with their increasing operating time. In order to still guarantee the required room irradiation, the lamp must be replaced at the end of its service life.

The period of irradiation results from the flow and the volume of the UV disinfection system. For the safe operation of UV systems the limitation of the flow is necessary, as is also required by DVGW worksheet W 294.

Subject to being operated properly, the GENO-UV disinfection systems provide the effective minimum room irradiation of 400 J/m² required by the DVGW.

C Product description (GENO-UV 60 S – UV 200 S)**Content**

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2 Technical specifications	C-1
3 Designated application	C-3
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5.5 Spare parts	C-8

1 Type designation plate

The type designation plate is located at the right side of the disinfection system's pressure vessel. If you have questions concerning the system, please specify the information shown on the type designation plate of the unit in order to speed up the processing of your request. Please copy the data given on the designation plate to the table below in order to have it handy whenever necessary.

Disinfection system	GENO-UV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	S		
Serial number:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	/	<input type="checkbox"/>
Order no.:	523	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

2 Technical specifications

The GENO-UV disinfection systems types 60 S – 200 S are used for the continuous disinfection of drinking water. They comply with the DVGW's Technical Rule W 294 (UV disinfection systems for the drinking water supply – requirements and tests) and are equipped with a selective UV system sensor. Provided the system is operated properly and according to the DVGW work sheet W294-1, it provides a room irradiation of at least 400 J/m².

All system data is summarised in table C-1 and refers to the standard design of the UV disinfection systems. Possible deviations in case of special designs will be indicated separately, if necessary.



Warning! In case of system failure or if the GENO-UV disinfection system is being switched off, the drinking water or the subsequent pipe system might become infested with germs.

Product description

GENO-UV 60 S – 200 S

Table C-1: Technical specifications		Disinfection devices GENO-UV					
		60 S	120 S		200 S		
Connection data							
Nominal connection diameter		DN 25/R 1"	DN 40/R 1 1/2"		DN 50/R 2"		
Drain connection, min.		DN 50					
Power supply [V]/[Hz]		230/50-60					
Connected load [VA]		75	145		215		
Max. power consumption [A]		0.33	0.63		0.94		
Protection/protection class		IP 54/Ⓢ					
Performance data							
Nominal pressure [bar]		PN 10					
Operating range [bar]		2 – 10					
Inlet water temperature [°C]		5 – 30				30-70	
SAC ₂₅₄ max. [m ⁻¹]		2.7			5.1	2.7	
Nominal flow (Q _{max/2}) [m ³ /h]		1.8	4.0		6.0	4.0	
Max. flow [m ³ /h]		3.3	8.0		12.0	8.0	
KV value [m ³ /h]		2.4	6.2		9.5	6.2	
Min. irradiation intensity at max. flow [W/m ²]		11.5	14.0		16.0	11.6	
Pressure loss at nominal flow rate (Q _{max/2})* [bar]		0.4					
Dimensions and weights							
A Installation length with screw connection [mm]		560	960		1212		
B Total length with screw connection [mm]		795	1185		1430		
C Headroom above centre of con. with screw con. [mm]		165	181		181		
D Headroom below centre of connection [mm]		130					
E Space req. on right of sys. for lamp replacement [mm]		560	950		1200		
F Space req. above system min. [mm]		350					
G Distance to wall from centre of connection, min. [mm]		610					
H Req. space for replacement of UV sensor, min. [mm]		300					
I Headroom centre of system with floor rack [mm]		610					
J Head room with screw con. 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]		12					
N Distance floor rack to wall, min. [mm]		30					
Weight empty [kg]		13	19		20		
Volume [l]		10	16		21		
Environmental data							
Ambient temperature [°C]		5 – 40					
Relative humidity of air, max. [%]		70					
Components							
Pressure vessel		material W 1.4404					
Protective quartz pipe		length [mm]	560	950		1200	
		∅ [mm]	28	28		28	
UV lamp		el. capacity [W]	60	120		200	
		max. service life [h]	16,000				
UV sensor / sensor shell		according to W294-3					
Flow stabiliser		material POM/EPDM					
2 ball valves		nominal diameter DN 8 (R 1/4")					
		material W 1.4301					
Control unit GENO-Multi BS							
Housing		h x w x d [mm]	255 x 340 x 115				
		material ABS					
Displays		operating time, irradiation intensity, switch-on counter, operating mode					
Outputs		ext. operating and fault signal, analogue signal output for irradiation intensity signal (4 – 20 mA ± 0– 50 W/m ²) switched power output (24 V~, max. 14 VA) to connect a safety device (solenoid valve) switched power output (24 V~, max. 14 VA) to connect a temperature-controlled flushing unit (solenoid valve)					
Mark of conformity/mark of certification							
DVGW mark of conformity		DW-9181BR0040	DW-9181BR5794		DW-9181BR5795		
Order no.		523 110	523 120		523 130		

* The pressure loss is determined by the flow stabiliser

3 Designated application

The GENO-UV disinfection systems are designed for the disinfection of drinking water. They are to be installed downstream of water treatment systems. The room irradiation required to kill bacteria and viruses is min. 400 J/m². At this room irradiation, a reduction rate of 99.99 % is achieved.

The GENO-UV disinfection systems are adapted to the water demand and quality to be expected at the installation site. The max. flow rate must under no circumstances be exceeded. In case of increasing demand or lower water quality, the system would have to be extended.

The safe disinfection of the water can only be guaranteed 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-term high load of germs indicating feces requires a treatment to separate particles.

The system may only be operated after all components had been installed properly. Safety devices must never be removed, tampered with, short-cut or otherwise rendered useless.



Note: In particular, this applies for the flow stabilisers contained in the scope of delivery which are designated to limit the flow rate. If these are not being used or their function is being tampered with, there is a risk that the disinfection systems are operated at a flow rate which is too high, thus losing the approval for their application in the drinking water sector.

The designated application also requires that the instructions given in this operating manual and the local safety regulations will be respected and the maintenance and inspection intervals be observed. The UV systems are approved for an SAC₂₅₄ value of up to 2.7 m⁻¹ (GENO-UV 200 S even up to 5.1 m⁻¹) and are accredited according to the DVGW's work sheet W 294. Therefore, the flow rate/irradiation intensity given in pairs in table C-2 guarantee a disinfection efficiency of min. 400 J/m².



Note: In order for the operation of the UV disinfection systems to comply with the Drinking Water Ordinance according to the DVGW's work sheet W 294 part 1, the water flow must be interrupted in case of a power failure, especially if the irradiation intensity is insufficient or there is a lamp failure. This can be ensured by means of the optional accessory (solenoid valve) described in chapter C-6.



Attention! Without the above mentioned safety device, the UV disinfection system cannot be operated according to the Drinking Water Ordinance. There is a risk that water which is not or insufficiently disinfected might enter the installation downstream of the system and contaminate the pipework. The resulting microbiological loading of the water makes it unfit for human consumption.

4 Applications restrictions

The SAK_{254} value (specific absorption coefficient at a wave length of the light of 254 nm) indicates how much light is lost in the water. As in a lot of water analyses the water transmission is also given, this value is included in the tables below as well. The transmission refers to the cuvette used for the measuring which is available in different sizes (thickness). In order to simplify the comparability of different water analyses, the transmission is indicated for cuvettes with a thickness of 10 mm, 50 mm and 100 mm.



Note: The transmission resp. the SAK_{254} value can only be determined in a lab and by means of a water analysis.

The water temperature also influences the capacity of the GENO-UV disinfection systems as the water temperature has an impact on the operating temperature of the lamp. Therefore, the systems shall only be operated within the indicated temperature range.

4.1 Application in drinking water

The UV disinfection system must be operated according to the DVGW's work sheet W 294-1. The index pair "flow rate" and "irradiation intensity" needs to be in the grey-coloured area of the operating diagram, i.e. the irradiation intensity must always exceed and the flow rate must always be below the value given in the table for the respective system. The systems are suitable for water with a SAK_{254} value of up to $2,7 \text{ m}^{-1}$ (GENO-UV 200 S even up to $5,1 \text{ m}^{-1}$). The corresponding data is indicated on the type designation plate. A UV sensor with 40°logo is to be used for the monitoring.

The indicated flow rates are limited by flow stabilisers in order to avoid the improper operation of the systems. According to the requirements of the work sheet DVGW W 294, the flow rates have to be adjusted by the inaccuracy of the flow stabilisers which means that the real flow rate is in the area of 90 – 100 % of the maximum flow rate indicated. The service life of the flow stabilisers is 12 months and they have to be replaced on the occasion of the extended maintenance service that takes place every year.

Table C-2: Application limits GENO-UV disinfection systems						
Disinfection system		GENO-UV 60 S	GENO-UV 120 S	GENO-UV 200 S		
Temperature	[°C]	5 - 30			30 - 70	
SAC ₂₅₄ -value	[m ⁻¹]	2.7		5.1	2.7	
□ 1 cm	[%]	94.0		89.0	89.0	
□ 5 cm	[%]	73.3		55.8	55.8	
□ 10 cm	[%]	53.8		31.2	31.2	
Max. flow	[m ³ /h]	3.3 (3.0)	8.0 (7.5)	12.0 (11.4)	8.0 (7.5)	
Flow stabiliser	colour	1 x red	2 x black 1 x red	2 x blue 1 x red	2 x black 1 x red	
Min. irradiation intensity	[W/m ²]	11.5	14.0	16.0	11.6	

* at a measuring field angle of 40°

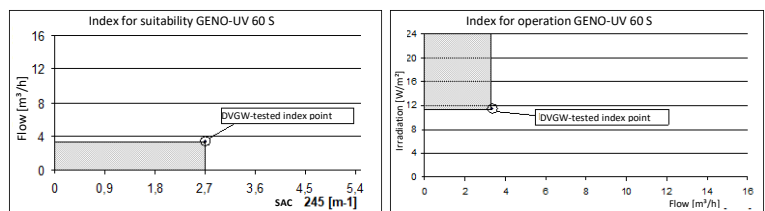


Fig. C-1 Index for suitability and index for operation GENO-UV 60 S

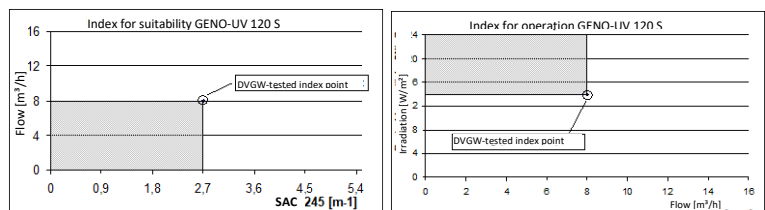


Fig. C-2 Index for suitability and index for operation GENO-UV 120 S

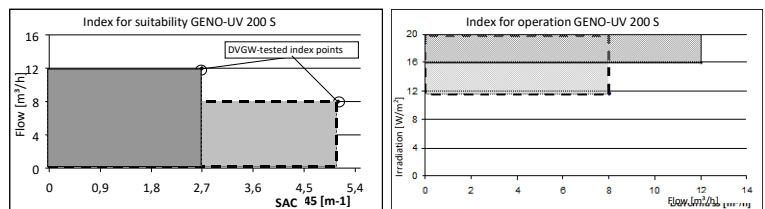


Fig. C-3 Index for applicability and index for operation GENO-UV 200 S

5 Scope of delivery

5.1 Basic equipment

- 1 Stainless steel pressure vessel
- 1 Protective quartz pipe
- 1 Moulded seal for protective quartz pipe
- 1 UV lamp

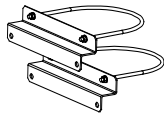


Note: For the UV lamps, a special warranty of max. 4000 operating hours or 12 months after installation, if the 4000 operating hours have not been reached by this time does apply.

- 1 Control unit GENO-Multi BS
- 1 UV sensor shell
- 1 UV system sensor
- 1 Flow stabiliser – cavity disk
- 1 Set of flow stabilisers to limit the maximum flow rate
- 1 Water meter screw connection, long, to install the cavity disk of the flow stabiliser in the outlet of the systems
- 1 Standard water meter screw connection
- 1 Operation manual
- 1 x Sealing paste to mount the protective quartz pipe

5.2 Optional accessories

- Temperature-controlled flushing unit with ½ " solenoid valve and contact temperature sensor (not for warm water UV) 523 825

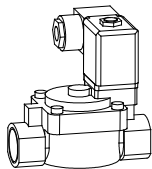


- UV protective goggles 522 810
- Fastening for wall mounting 523 800
- Floor rack GENO-UV 60 S 523 815

GENO-UV 120 S

GENO-UV 120 S 523 805

GENO-UV 200 S 523 810



- Safety device GENO-UV 60 S 523 870
(for control unit GENO-UV 120 S 523 875
GENO-Multi BS) GENO-UV 200 S 523 880

- S-WW/backwash filter drinking water filter BOXER pls. inquire
- USB data logger 523 830
- Flushing kit for UV disinfection systems residential version 520 020



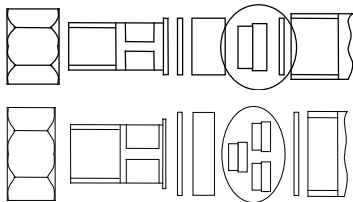
Note: Existing systems may be equipped with optional components. Our field service staff in your area as well as the Grünbeck headquarters will be pleased to submit further information.

5.3 Consumables

In order to ensure the reliable operation of the system, only genuine consumables should be used.

Cleaning agent GENO-Clean CP (10 x 1 litre bottle)		170 022
Spare UV lamp	GENO-UV 60 S	523 112
	GENO-UV 120 S	523 122
	GENO-UV 200 S	523 132

5.4 Wearing parts



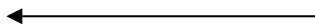
The following parts are considered to be wearing parts:

Flow stabiliser	GENO-UV 60 S	523 647e
	GENO-UV 120 S	523 648e
	GENO-UV 200 S	523 649e

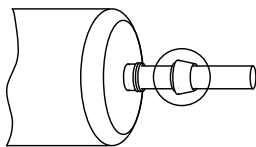
Observe flow direction!



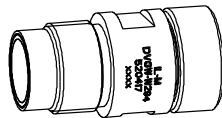
Note: The service life of the flow stabilisers of the GENO-UV disinfection systems depends on the operating conditions (refer to chapter H-4, 2.6 and 2.7)



UV sensor (measuring angle 40°, for control unit GENO-Multi BS)	523 612e
---	----------



Sealing ring for lamp	520 153
-----------------------	---------



Sensor shell	520 610e
--------------	----------



Note: Due to the UV radiation, the sealing and fastening elements of the sensor shell are subject to wear and tear and must be replaced on the occasion of the extended maintenance that takes place every two years.



Note: Although these are wearing parts, we grant a limited warranty of 6 months.

D Installation

Contents

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3 How to connect the system.....	D-5
3.1 Water connection.....	D-5
3.2 Electrical connection.....	D-6

1 General installation information

The installation site must offer adequate space. The required connections must be provided prior to the installation. For dimensions and connection data, please refer to table D-1.

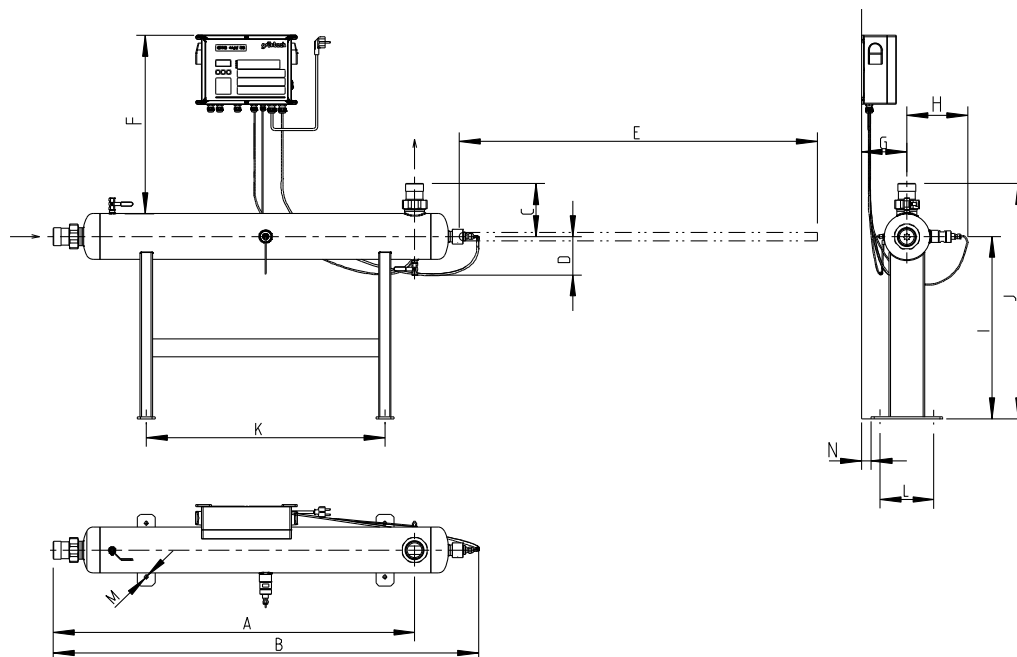


Fig. D-1: Dimensional drawing



Note: For the installation of systems with optional accessories (refer to chapter C-5.2), also observe the operation manuals supplied with these components.

Excerpt of table C1: Technical specifications		Disinfection systems GENO-UV			
		60 S	120 S	200 S	
Dimensions and weights					
A	Installation length with screw connection	mm	560	960	1212
B	Total length with screw connection	mm	795	1185	1430
C	Headroom above centre of con. with screw con.	mm	165	181	181
D	Headroom below centre of connection	mm	130		
E	Space req. on right of sys. for lamp replacement	mm	560	950	1200
F	Space req. above system min.	mm	350		
G	Distance to wall from centre of connection, min.	mm	125		
H	Req. space for replacement of UV sensor, min.	mm	300		
I	Headroom centre of system with floor rack	mm	610		
J	Headroom with screw con. 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	12		
N	Distance floor rack to wall, min.	mm	30		

1.1 Water installation

While installing the GENO-UV disinfection systems, certain rules must be strictly observed. Additional recommendations are given in order to facilitate the handling of the systems. The installation information described below is also illustrated in fig. D-2.

Binding rules



The installation of a UV disinfection system represents a major interference with the drinking water installation and therefore may only be performed by an authorised expert.

- Observe local installation guidelines and general regulations.
- For the installation and operation of GENO-UV disinfection systems, the DVGW work sheet W 294 Section 1 must be observed.
- Install a drinking water filter upstream (e.g. pureliQ:K).
- 0.5 m upstream and downstream of the UV disinfection system, the water pipe must be made of UV-resistant material (stainless steel, galvanised steel or copper). Plastic pipes are not suitable.
- Provide a drain connection (at least DN 50) at the installation site to discharge the water in case of system cleaning or maintenance
- A floor drain must be available at the installation site of the system (min. DN 50). If no floor drain is available, a safety device to prevent water damage must be installed.



Warning! Floor drains that are discharged to a lifting systems do not work in case of a power failure.

- Provide a shut-off valve directly upstream and downstream of the UV disinfection system.
- In case the water supply must not be interrupted, a bypass has to be provided.
- The safety device has to be installed in the piping system downstream of the system.



Note: In order for the operation of the UV disinfection systems to comply with the German Drinking Water Ordinance according to the DVGW work sheet W 294 Section 1, the water flow must be interrupted in case of a failure, especially if the irradiation intensity is insufficient or there is a lamp failure. This can be ensured by means of the optional accessory (solenoid valve) specified in chapter C-5.



Attention! Without the 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 system and contaminate the piping. The resulting microbiological loading of the water makes it unfit for human consumption.

- In case of longer idle periods without withdrawal of water, the system heats up. Water temperatures of up to approx. 60°C within the system are the result. If this is not acceptable, we recommend the installation of a temperature-controlled flushing unit (refer to chapter C-5) in order to initiate a temperature-controlled flushing of the system.



Note: The temperature increase has an impact on the UV lamp. With the increasing temperature (starting from a water temperature of approx. 25 °C), the irradiation intensity decreases and in case of high temperature may even fall below the limit value of the alarm.

1.2 Electrical installation

A shock-proof plug is adequate as electrical connection, provided it complies with the requirements indicated in table D-1 and is located at a distance of max. 1.5 m from the UV disinfection system. Make sure that the socket is continuously supplied with power and do not couple with light switch for example.

2 Preliminary work

1. Unpack all system components.
2. Check for completeness and perfect condition.
3. Erect system at the designated site.



Note: The easiest and safest way to mount the system is to use the fastener for wall mounting or the floor rack available as accessories (refer to C-5.2).

3 How to connect the system

3.1 Water connection

Make the water connection according to the installation drawing (Fig. D-2). Observe the guidelines and recommendations in section 1.



Note: The system must be mounted horizontally with the outlet directed upwards in order to be able to remove accumulated air.



Attention! The system is only tight after correct mounting of the protective quartz pipes. Perform leakage test after the installation of the protective quartz pipe.

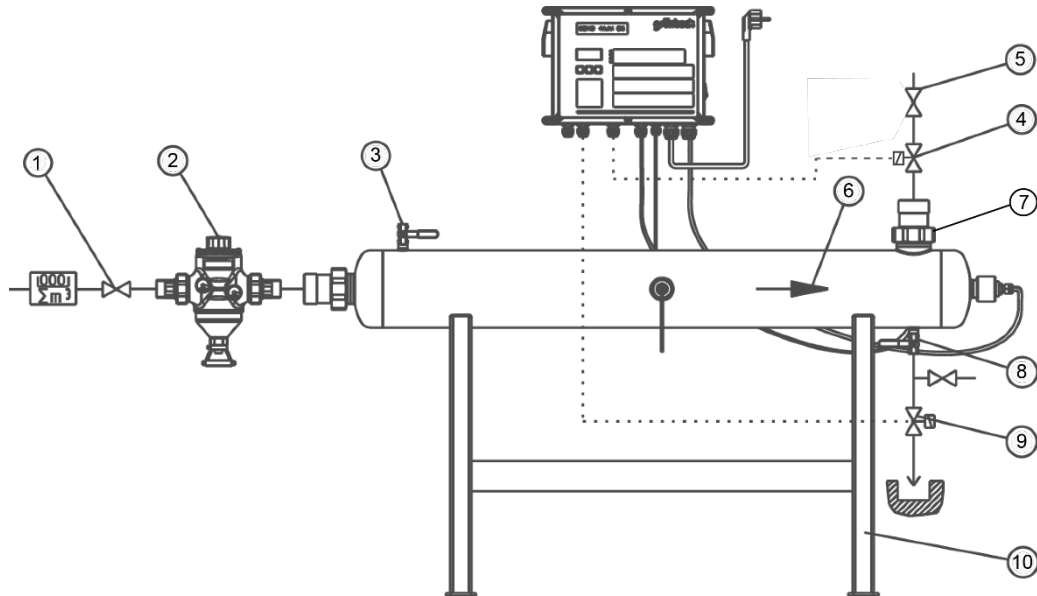
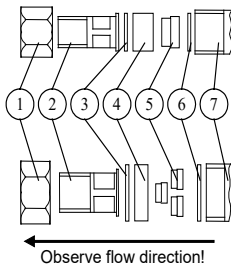


Fig. D-2 Installation drawing

- | | | |
|--|---|--|
| ① Inlet shut-off valve
(by others on site) | ⑤ Outlet shut-of valve
(by others on site) | ⑧ Flushing connection inlet |
| ② Drinking water filter or backwash filter (accessory) | ⑥ Flow direction | ⑨ Solenoid valve for temperature-controlled flushing (accessory) |
| ③ Flushing connection outlet | ⑦ Flow stabilisers | ⑩ Floor rack (accessory) |
| ④ Optional safety device (solenoid valve) | | |



- | | | |
|-------------------|----------------------------------|-------------|
| ① Union nut, long | ④ Cavity disc of flow stabiliser | ⑦ UV system |
| ② Insert | ⑤ Flow stabiliser | ⑧ |
| ③ HDPE seal | ⑥ HDPE seal | ⑨ |

The attached flow stabilisers have to be installed in the outlet of the UV disinfection system according to the figure on the left.



Note: A break of the protective quartz pipe may cause water leakage. The safety valve installed **downstream** of the system does not prevent water leaking from the pipework. Therefore a floor drain must be available at the installation site. With excessive idle times, manual system flushing via the "flushing connection inlet" can only be implemented in this way.



Attention! Observe the mounting direction of the flow stabilisers, otherwise they could be pushed out of the cavity disc.

3.2 Electrical connection

The required electrical connections must be implemented according to terminal plan D-3, D-4.



The work specified in this chapter may only be performed by trained and authorised electricians or electronics experts.



Danger! Danger due to electric energy! Mains voltage at terminals 20 ... 25. Do not connect the system to the mains before work is completed.

The GENO-UV systems are electrically wired. Therefore only the signal lines or signal transmitters have to be connected to the voltage-free contacts. If the system is switched off or in case of a failure, the contacts for the irradiation pre-alarm, the maintenance signal and the collective fault signal are open.



Note: The voltage-free contacts are energised, i.e. they must be connected to a suitable power supply (max. 24 V~, 1A).



Note: The reactor housing of the UV system must be connected to the equipotential bonding system of the building via a PE cable with a cross section of 6 mm² – 16 mm².

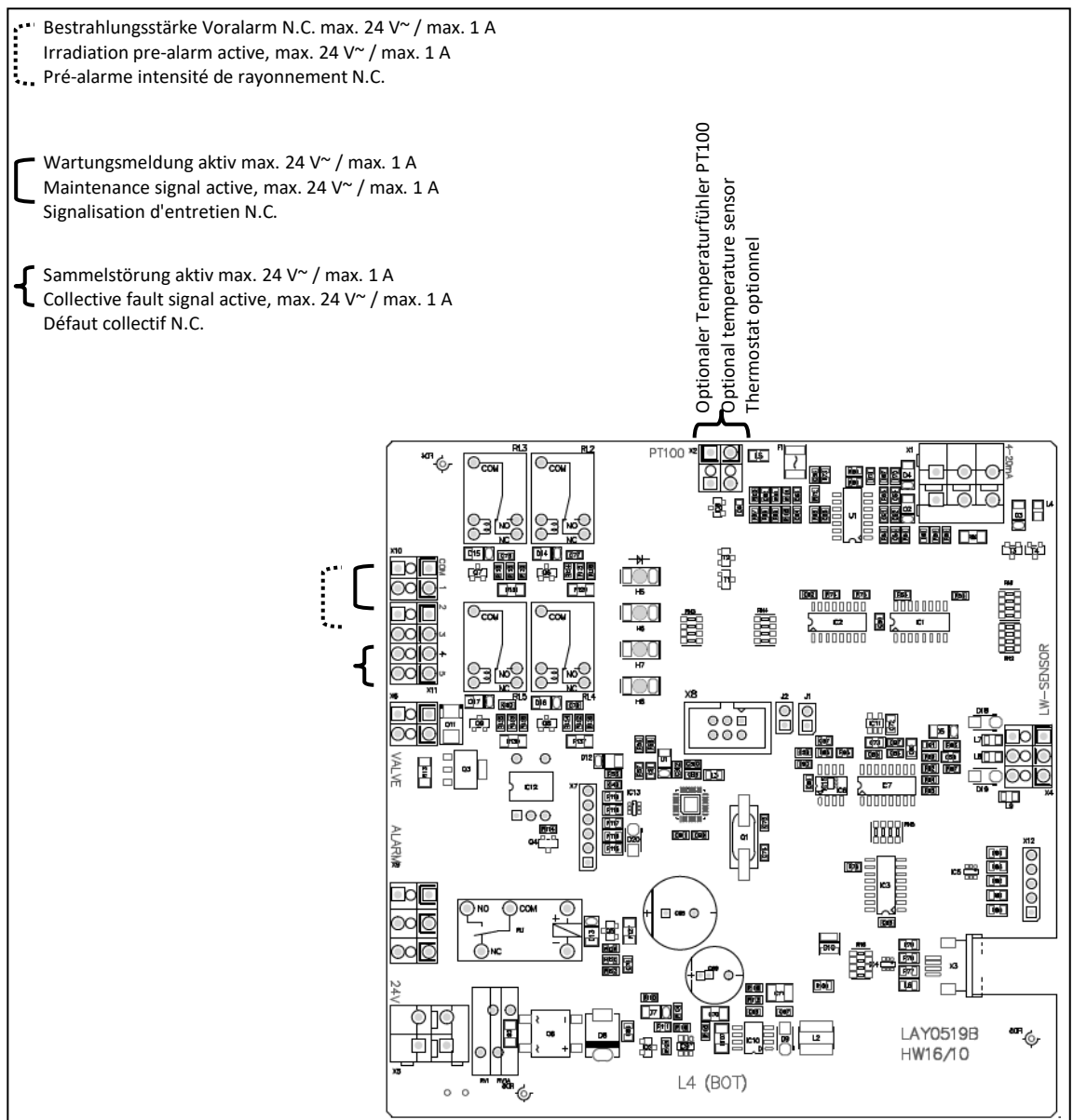
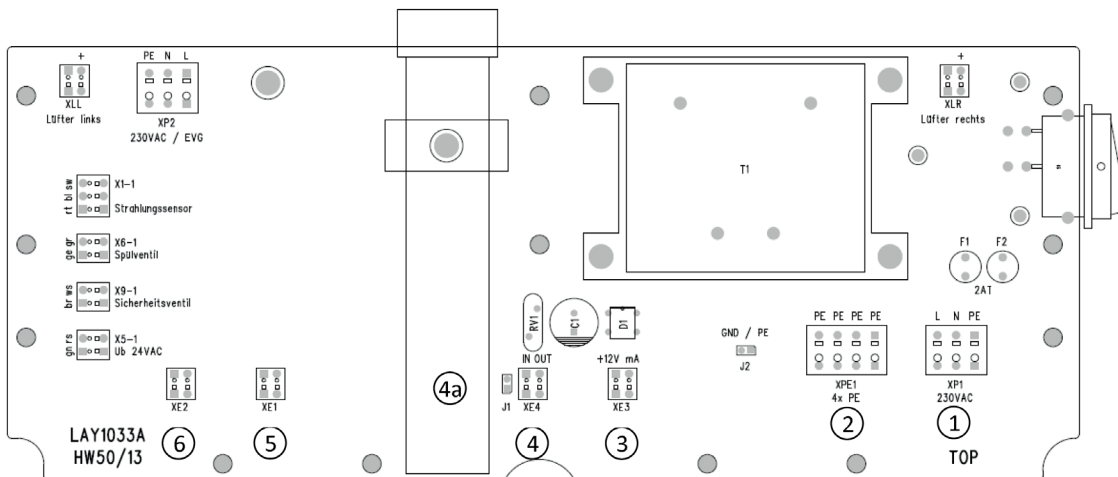


Fig. D-3: Voltage-free contacts / opt. temperature sensor PT100 on operating board



Pos.	Component	Terminal	Signal	Colour of litz wire
①	Feeder Fuses F1 and F2 (2 A T each) internal fuse protection	XP1 L	230 V / 50 Hz Phase	brown resp. black
		XP1 N	Zero conductor	blue
		XP1 PE	Earth conductor	yellow-green
②	Earth conductor	XPE1	Reactor grounding	yellow-green
③	UV sensor	XE 3 +12 V	Irradiation intensity sensor limit switch voltage + 12 V	brown+white
		XE 3 mA	Irradiation intensity sensor Signal input 4-20 mA	blue+black
④	Optional USB data logger: when installed in pos. 4a, jumper J1 must be pulled	XE4 OUT	Signal 4-20 mA (connect to data logger +)	
		XE4 IN	Signal 4-20 mA (connect to data logger -)	
⑤	Optional flushing solenoid valve	XE1	24 V~ L	black
		XE1	N	blue
⑥	Optional safety solenoid valve	XE2	24 V~ L	black
		XE2	N	blue

Fig. D-4: Terminal connection plan

E Start-up

Contents

1	How to mount the protective quartz pipe	E-1
2	How to mount the UV lamp	E-2
3	How to set the control unit	E-3
4	How to start up the system	E-4



Work with this symbol may only be performed by Grünbeck's technical service/authorised service company or by persons expressly authorised by Grünbeck.

1 How to mount the protective quartz pipe



Attention! Do not touch the protective quartz pipe with your bare hands. Touching it compromises the lamp's performance. Wear cotton gloves when mounting the protective quartz pipe.



Attention! When mounting the protective quartz pipe take care that protective quartz pipe (pos. 2) is inserted into the centre hole of the protective quartz sleeve guidance (inside the stainless steel vessel). Use supplied auxiliary mounting tool for the installation.



Note: In order to simplify the installation, you may apply some sealing compound to the inside of the seal. This will also facilitate the dismantling in case of maintenance work or spare part replacement.



Attention! Make sure that no sealing compound is applied in the area of the protective quartz pipe where the light generated by the UV lamp passes through.



Note: Do not tighten the nuts too much in order not to damage the quartz glass. Due to the tolerance of the components, the UV system might be tight even if the stainless steel binding ring (pos. 3, does not touch the pressure pipe (pos. 1).

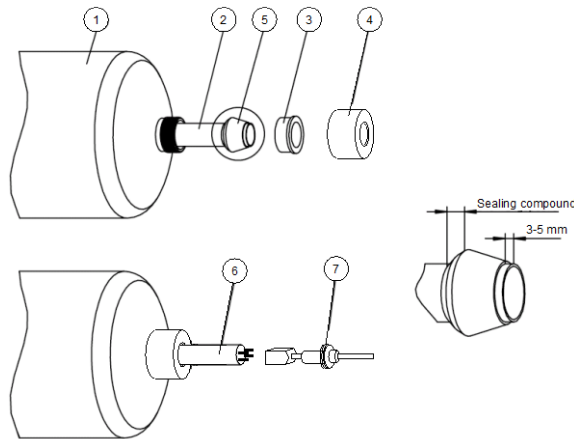


Fig. E-1 Installation drawing for type 60 – 200 AS

1. Unscrew the screw-in piece with spacer (pos. 7) from the brass screw connection (pos. 4) and loosen the cable screw connection of the screw-in piece.
2. Unscrew the screw connection (pos. 4) and remove the binding ring (pos. 3) made of stainless steel.
3. Mount the seal (pos. 5) according to the detailed drawing.
4. Apply the sealing compound to the seal according to the detailed drawing.
5. Insert the protective quartz pipe (pos. 2) into the pressure pipe (pos. 1) by using the auxiliary tool for the mounting of the protective quartz pipe.
6. Make sure that the protective quartz pipe is inserted correctly into the quartz pipe guidance inside the UV reactor.
7. Plug on the binding ring (pos. 3) made of stainless steel.
8. Strongly retighten the brass screw connection (pos. 4).

2 How to mount the UV lamp



Danger due to electric energy! Do not touch or replace the UV lamps unless the mains switch has been switched off.



Attention! Never touch the glass of the lamp with bare fingers. This will decrease lamp performance.



Warning! Never look directly into the UV lamp or the sensor shell if the UV system is switched on. The proper functioning of the UV lamp may only be checked while wearing suitable protective glasses (refer to accessories chapter C-5-2).

1. Insert the UV lamp (pos. 6) into the protective quartz pipe (pos. 2) up to approx. 60 mm.
2. Connect the UV lamp (pos. 6) to the plug in the stainless steel cap (pos. 7).
3. Completely insert the UV lamp (pos. 6).



Note: Make sure that the connecting cables that run alongside the lamp under no circumstances point towards the measuring window when the lamp is inserted into the protective quartz pipe. This ensures that the cables do not negatively influence the measuring of the irradiation intensity. Furthermore, the golden dots of the lamp should point downwards.

4. In order to fix the lamp, pull the cables as far as they will go through the cable screw connection of the screw-in piece (pos. 7) and then tighten the screw connections of the cable.



Fig. E-2 Installation drawing of UV 60 S – 200 S

- ① Lamp
- ② Cable

3 How to set the control unit

In general, there is no need to set the control unit as it is factory-set. If during start-up (refer to chapter E-4) a deviation is detected, the setting of minimum irradiation intensity must be carried out by the Grünbeck technical customer service.



Note: For detailed information on handling the control unit GENO-Multi BS refer to chapter F.

4 How to start up the system



Warning! There is a possibility that the drinking water is insufficiently disinfected. According to the DVGW worksheet W 291 (technical regulations for the disinfection of water supply systems) the piping downstream of the UV system must be disinfected prior to start-up.

1. Open shut-off device upstream of the UV system.
2. Switch on mains switch.
3. Open upper rinsing valve for ventilation if no air enters the piping system.
4. Close the rinsing valve when the system has been ventilated.
5. Open shut-off device downstream of the UV system.
6. Close shut-off device of the possibly installed bypass.



Note: After the system is switched on, the value displayed for irradiation intensity slowly starts to rise. As long as the value remains under the set limit value for the alarm, the red error LED lights up and the safety valve remains closed. Only when the limit value for the alarm is exceeded by approx. 0.5 W/m^2 , the red alarm LED starts flashing and the safety valve opens.



Note: The value displayed must correspond to the minimum irradiation intensity value indicated in table C-2 and to the data indicated on the type designation plate.

7. As soon as the indicated value for the irradiation intensity is more or less constant (after approx. 10 – 15 min) slowly remove the sensor from the sensor shell.
8. If the value for irradiation intensity falls to approx. 110 % of the set minimum irradiation intensity, the red alarm LED must start to flash.



Note: If the set value for the minimum irradiation intensity does not correspond with the data indicated on the type designation plate or if the pre-alarm of irradiation intensity does not respond at 110 % of the set limit value, the setting of the control unit is defective and must be corrected by the Grünbeck technical customer service.

9. Re-insert the sensor completely into the sensor shell and tighten the union nut.
10. Fill in the cover sheet and column 1 of the check list of the operation log.

F Operation (GENO-UV Multi BS)

Contents

1 Preface	F-1
2 How to operate the control unit	F-2
2.1 Operating panels and display	F-2
2.2 System start	F-3
2.3 Switching off the system.....	F-4
2.4 Pre-warning and maintenance display	F-4
2.5 Error display	F-4
2.6 Option: Temperature rinsing system	F-4

1 Preface

The GENO-UV disinfection systems are operated and monitored via the GENO-Multi BS control unit.

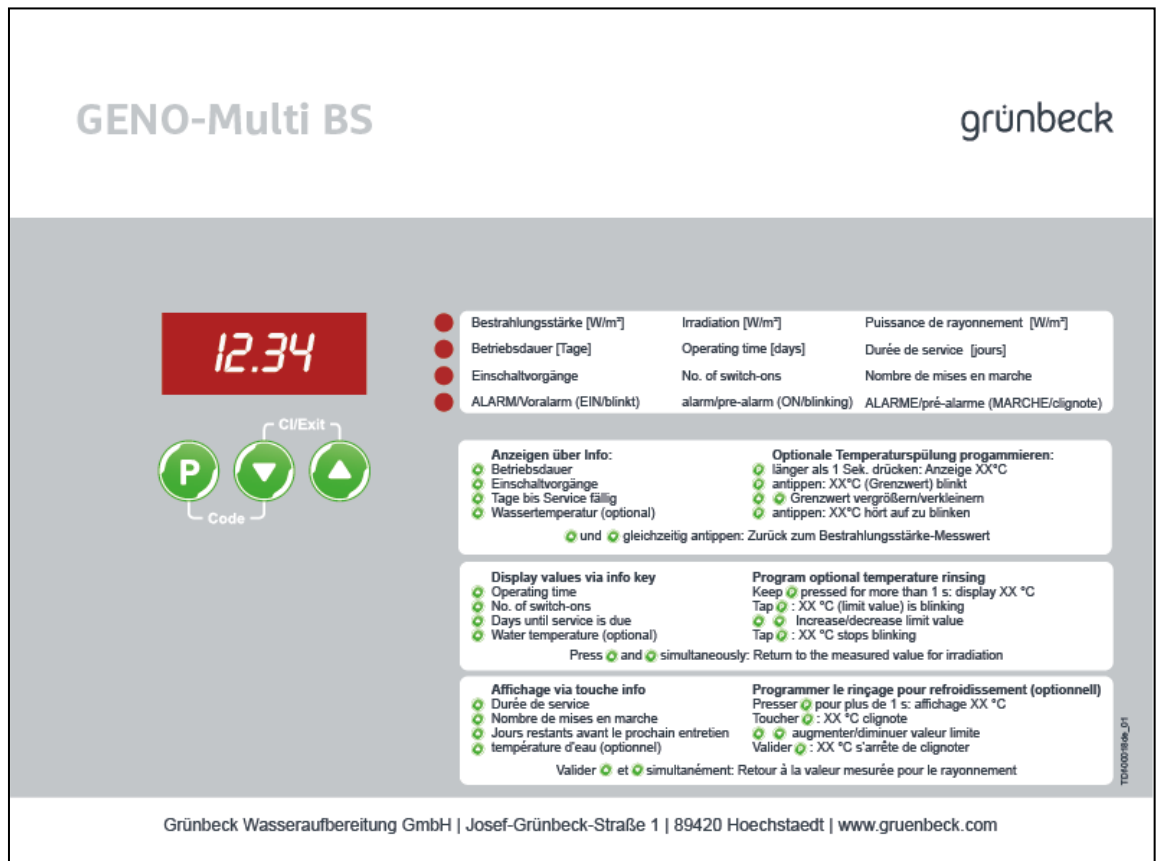


Fig. F-1: GENO-Multi BS control unit

2 How to operate the control unit

2.1 Operating panels and display



Fig. F-2: Operating panels and display

2.1.1 Display of Info level

Key	Display	Unit	LED
	Basic display of irradiation intensity XX.XX	W/m²	X
	Operating duration XXXX	Days	X
	Switch on processes XXXX		X
	Days until service is due XXXd	Days	--
	Return to basic display of irradiation intensity or optionally: Water temperature XX	°C	--

Alarm LED





If a malfunction is present or the irradiation intensity is < the limit value, the LED lights up continuously.
When the irradiation intensity is < the pre-alarm value, the LED flashes.

Mains switch

The mains switch is positioned on the right side of the housing.

2.1.2 Parameter programming

Key functions with parameter programming – requirement: basic display of irradiation intensity [W/m^2].

Key	Display
	<ul style="list-style-type: none"> Press and hold key > 1 sec.: access to operator programming level (optional: temperature rinsing system). Open the parameter for reprogramming – value begins to flash. Save parameter – value stops flashing.
	<ul style="list-style-type: none"> Reduce opened parameter (while the value flashes). Return to previous parameter.
	<ul style="list-style-type: none"> Increase opened parameter (while the value flashes). Continue to next parameter.
	<ul style="list-style-type: none"> Close opened parameter again without saving – the old set value is maintained. Return to basic display of irradiation intensity.

2.2 System start

- Switch on the mains switch. All segments briefly light up in the display as well as the four LEDs: irradiation intensity, operating duration, switch on processes and ALARM. The three ALARM, pre-warning and service voltage-free contacts are open. The optional safety valve is open. The optional temperature rinsing system is closed.
- The UV lamp is preheated by the ballast.
- The display of the irradiation intensity changes to $0.00 \text{ W}/\text{m}^2$, the operating duration, switch on processes and ALARM LEDs go out.
- After the heating up, the UV lamp ignites.
- The value in the display of the irradiation intensity display increases steadily. The ALARM LED lights up according to display of irradiation intensity and system type (UV 60 / 120 / 200 S). The ALARM, pre-warning and service voltage-free contacts are open or closed according to the state of the ALARM LED and the residual service interval duration. The optional safety valve is open or closed according to the irradiation intensity displayed. The optional temperature rinsing system is open or closed according to the water temperature and set rinsing temperature.



Note: If the starting procedure fails, the red ALARM LED lights up and the display of irradiation intensity stays at $0.00 \text{ W}/\text{m}^2$. Before attempting to start the system again, a minimum waiting time of 1 minute must be maintained between the switching off and switching on process.

2.3 Switching off the system

- The current-free, closed solenoid valves (optional safety and rinsing solenoid valve) close (flow is interrupted).
- The ALARM, pre-warning and service voltage-free contacts open.



Note: The UV system should not be switched off without a reason as each switching process reduces the service life of the UV lamp. The number of switch-on processes can be read on the control unit.

2.4 Pre-warning and maintenance display

- When the maintenance interval, independent of the irradiation intensity, has elapsed, the Service voltage-free contact opens. On the Info level the "Days until service is due" display shows 0d.
- When the irradiation intensity is only 10 % above the limit value, the LED ALARM flashes and the pre-warning voltage-free contact opens.
- In both cases the safety valve remains open.



Note: The ordinary ageing process of the UV lamp and dirt deposits within the system result in a decrease of the irradiation intensity. In this case, the system has to be rinsed and/or maintained (see chapter H).

2.5 Malfunction display

- The LED ALARM lights up if the irradiation intensity displayed falls below the limit value.
- The optional safety valve closes (flow is interrupted) and the ALARM voltage-free contact opens.



Warning Disinfection of the drinking water is inadequate. When the LED ALARM lights up on the system and the malfunction message Er 1 is shown, the water is only inadequately disinfected. Until the malfunction has been remedied, you should and must refrain from withdrawing water (also see chapter G).

2.6 Option: Temperature rinsing system

Also see the corresponding assembly instructions (Order no. 523 825).

- The scope of supply includes an application temperature sensor and a 1/2" solenoid valve for assembly to the rinsing connection.
- The current water temperature is displayed within the Info level.
- The desired rinsing temperature can be programmed in the range of 10 ... 60 °C. When this is achieved the rinsing solenoid valve opens, the display shows the error message Er 3 and fresh water is output into the drain. This cools down the pressure pipe. When the temperature is fallen below by 2 °C again, the rinsing solenoid valve closes and the error message Er 3 disappears.

G Troubleshooting (GENO UV systems with GENO-UV-Multi BS)

Contents

1 Basic information	G-1
2 Check UV lamp.....	G-3
3 Mechanical destruction of the lamp.....	G-3
4 Mechanical destruction of the lamp and the protective quartz pipe.....	G-4
5 Binding and disposal of free mercury residue	G-4

1 Basic information

Even carefully designed and manufactured technical systems that are properly operated may experience malfunctions. Table G-1 provides an overview of possible problems that may occur during the operation of GENO UV systems with GENO-Multi BS control units, and indicates their causes and corresponding remedies.

The GENO UV systems are equipped with an error detection and reporting system. Errors are indicated on the GENO-Multi BS control unit via the ALARM LED. A collective alarm, pre-warning message and service message can be output as voltage-free contacts.



Note: Contact the Grünbeck technical customer service in case of malfunctions that cannot be remedied with the information given in table G-1. When contacting the technical customer service, please indicate the system designation, serial number and the observations you may have made.

Table G-1: Troubleshooting

This is what you observe	This is the cause	This is what to do
Er 1 and UV lamp light up.	Irradiation intensity < limit value. <ul style="list-style-type: none"> • System is soiled inside. • Service life (16,000 h) of UV lamp is exceeded. 	Clean the system (rinse). Maintenance via Grünbeck technical customer service.
Er 1 and UV lamp do not light up.	<ul style="list-style-type: none"> • UV lamp is defective. • Ballast is defective. 	Inform the Grünbeck technical customer service.
Er 3	Temperature rinsing (only when optional temperature rinsing system is installed). <ul style="list-style-type: none"> • Water temperature > 38 °C. 	Normal operational behaviour after a longer period of time without water withdrawal. <ul style="list-style-type: none"> • Set rinsing temperature lower. • Check the functionality of the rinsing valve.
Er 4	Over temperature (only when optional temperature rinsing system is installed). <ul style="list-style-type: none"> • Water temperature > 40 °C. 	Set rinsing temperature lower. Check the functionality of the rinsing valve.
Er 5 or display EEEE	Wire fracture of UV sensor.	Connection plug of UV sensor inserted correctly? Inform the Grünbeck technical customer service.
Er 6 or Er 7	Wire fracture or short circuit of the temperature sensor (only when optional temperature rinsing system is installed).	Temporarily deactivate the temperature rinsing system option and inform the Grünbeck technical customer service.
Display and all LEDs are dark	<ul style="list-style-type: none"> • Mains switch is switched off. • Power supply is interrupted (integrated fuse, supply line). 	<ul style="list-style-type: none"> • Switch on mains switch. • Replace the fuse (see chapter D) or restore the power supply.
"Operating duration" LED flashes.	The maintenance interval has expired.	Inform the Grünbeck technical customer service.

2 Check UV lamp

Please observe the instructions given below when checking the UV lamp. The work processes specified are shown in Fig. E-1.



Danger! Danger due to electric energy! Do not touch or replace the UV lamps unless the mains switch has been switched off.



Warning! Never look directly into the UV lamp or sensor shell if the UV system is switched on. The proper functioning of the UV lamp may only be checked while wearing suitable protective glasses (refer to accessories in chapter C-5.2).

1. Switch off mains switch.
2. Unscrew the screw-in piece (pos. 7) and pull out the UV lamp (pos. 6) approx. 50 mm.
3. Switch on mains switch after a waiting time of 60 sec.
4. Spiral-wound filament at lamp connection must start glowing.
5. The UV lamp ignites after a few seconds.
6. Switch off mains switch.
7. Replace possibly defective UV lamp by a spare UV lamp (refer to accessories).
8. Switch on mains switch after a waiting time of 60 sec.
9. If the UV lamp does not ignite after a few seconds, notify Grünbeck's technical customer service/authorised service company.
10. If you have succeeded in starting the system (refer to chapter F-2), switch off mains switch, completely insert UV lamp (pos. 6) and refasten the screw-in piece (pos. 7). Make sure that the connecting cables along the lamp are point downwards (refer to Fig. E-2).
11. Switch on system after a waiting time of 60 sec.
12. If you do not succeed in starting the system, inform the Grünbeck technical customer service.

3 Mechanical destruction of the lamp

In case of mechanical destruction of the lamp, the UV system must be disconnected from the water-carrying network and then drained. The protective lamp pipe and the fragments of the lamp can then be removed from the protective pipe.

Afterwards, the protective quartz pipe should be replaced or at least thoroughly cleaned with GENO-clean CP, as the mercury residue in the protective quartz pipe negatively influences the UV light generated by the lamp.

Free mercury must be bound by means of adequate agents and then disposed of (refer to no. 5).



Warning! As, due to the destruction of the lamp, mercury will escape, the lamp fragments must be stored in an air-tight container until they can be disposed of. The same applies for a replaced protective quartz pipe and for the detergent used for cleaning purposes. Use a suitable waste management company (e.g. a collecting point for special refuse).

4 Mechanical destruction of the lamp and the protective quartz pipe

In case of a mechanical destruction of the lamp and the lamp cladding pipe **at the same time**, the UV system must be disconnected from the network and disassembled. The fragments of the cladding pipe and the lamp have to be removed through the mounting hole of the quartz pipe. The water remaining in the system as well as the fragments of the quartz pipe must be collected and correctly disposed of.

After the system is remounted, it must be rinsed with GENO-clean CP as specified in chapter H-2 in order to remove mercury residue from the system.

Free mercury must be bound by means of adequate agents and then disposed of (see point 5).



Warning! The water remaining in the system which is contaminated by mercury must be collected and stored in an air-tight container until it can be disposed of. The same applies for the detergent used for rinsing. Use a suitable waste management company (e.g. a collecting point for special refuse).

5 Binding and disposal of free mercury residues

If free mercury has escaped from the lamp, it has to be bound, collected and directed to a suitable waste management company (e.g. a collecting point for special refuse).

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, iodized activated carbon and metal powders would take years to complete.

Never discharge residues of mercury and its compounds to the drain (formation of amalgam in the lead siphon, environmental poisoning).

H Maintenance and care (GENO UV systems with GENO-Multi BS)

Contents

1	Basic information	H-1
2	Inspection	H-2
3	Service and maintenance	H-2
	3.1 Overview of service work	H-2
	3.2 Overview of maintenance work (375 days of operation)	H-2
	3.3 Overview of maintenance work (750 days of operation).....	H-4
4	Information regarding operation log	H-4
5	Spare parts	H-4

1 Basic information

In order to guarantee the reliable function of the UV disinfection systems over a long period of time, some maintenance has to be performed at regular intervals. As far as the UV disinfection of drinking water is concerned, the guidelines stipulated in the DVGW work sheet W 294-1 must be observed:

The work sheet W 294 stipulates:

- Cleaning and rinsing of the UV disinfection system at regular intervals.
- Replacement of the UV lamps when they have reached the max. service life indicated.
- Inspection and calibration of the UV system sensor every 6 months.
- Replacement of the UV sensor after 24 months at the latest.

The operation log which serves as documentation for the maintenance work performed is attached to this operation manual.



Note: By performing the required service and maintenance work at regular intervals you can ensure the proper functioning of your UV systems. In accordance with the DVGW work sheet W 294, Section 1, we recommend service of the system every 6 months and maintenance work every 12 months. Please contact your local Grünbeck representative to arrange an appointment for maintenance work (refer to attached list of Grünbeck representations). Also make sure to observe our general warranty conditions. The conclusion of a maintenance contract ensures that all required maintenance work will be performed in due time.

2 Inspection

You can carry out regular inspection yourself - this is mandatory at least every two months.

Check for tightness of all system components.

Check the control unit for errors (see chapter G, malfunctions).

3 Service and maintenance

3.1 Overview of service work (every 183 days of operation)

- Check the system sensor with the aid of a reference radiometer in accordance with DVGW worksheet W294 (40° measurement angle) and recalibrate if required.
- Check the sensor shell and replace if necessary.
- Check the lamp plug and replace if necessary.
- Check the seals and replace if necessary.
- Check the functionality of the optional safety device.
- Check the functionality of the optional temperature rinsing system.
- Rinse the UV disinfection system if necessary (permissible chemical: GENO-clean CP).
- Clean the protective pipes if necessary.
- Record all data and work performed, including repair work, in the operation log.
- Hand over the system and operation log to the operator.

3.2 Overview of maintenance work (every 365 days of operation)

- Hot water UV systems (30 – 70 °C): replace.
- Record all data and work performed, including repair work, in the operation log.
- Hand over the system and operation log to the operator.

3.3 Overview of maintenance work (every 730 days of operation)

- All devices: Replace parts subject to wear.
- Record all data and work performed, including repair work, in the operation log.
- Hand over the system and operation log to the operator.

3.4 System rinsing

By rinsing the UV system, deposits which have settled on the system during operation are removed. These deposits are for example iron, manganese, copper, scale etc. For rinsing, a rinsing set and rinsing agent are required (see chapter C-5).

Scope of delivery of the rinsing set:

The rinsing set mainly consists of a tank, a pump, hoses and the corresponding connecting pieces.

The rinsing agent GENO-clean CP is an acidic mixture developed for the removal of scale, iron, manganese and other residues. For more detailed information, please refer to the product and safety data sheet of the rinsing chemical.

The rinsing process is performed as follows:

- Close shut-off devices in the inlet and outlet
- Shut down the UV system
- Connect rinsing set to rinsing valves (inlet at the bottom, outlet at the top).
- Fill the rinsing set with water and add the correct amount of rinsing agent (GENO-clean CP, see chapter C-5) to the rinsing tank (for the correct amount of chemical, refer to the operation manual of the rinsing set).
- Switch on the rinsing pump and rinse the system for at least 30 min. and in case of extensive contamination for at least 60 min. Afterwards, drain the UV system and neutralize the chemical if necessary.
- Rinse the UV system several times (3 – 4 x the content of the system) with clear water through the outlet valve in order to remove chemical residues. Close the rinsing valves.
- Put the UV system into operation again and open the shut-off devices in the inlet and the outlet of the system

4 Information regarding operation log

The operation log is located in the insert at the back of this folder. When starting up the system, make sure to record all data on the cover sheet of the operation log and fill in the first column of the checklist.

The service technician will fill in a column of the operation log whenever maintenance is performed. The operation log thus provides you with evidence of proper maintenance.

5 Spare parts

For spare parts and consumables, please contact your local representative (refer to the list in the operation manual).




Note: For detailed specification of wearing parts, please refer to chapter C-5.

System designation				
GENO-UV		60 S	120 S	200 S
General	manufacturer/distributor	Grünbeck Wasseraufbereitung GmbH		
	Pressure stage	PN 10		
	Temperature range	5 – 30 °C		30-70°C
	Installation position/flow direction	horizontal / centric inlet (on left), radial outlet (upper right)		
	Nominal connection diameter	1" (DN 25)	1½" (DN 40)	2" (DN 50)
	SAC ₂₅₄ max.	2.7 m ⁻¹		5.1 m ⁻¹ 2.7 m ⁻¹
	Maximum flow rate	3.3 m ³ /h	8.0 m ³ /h	12.0 8.0 8.0
	Minimum irradiation intensity* at max. flow rate	11.5 W/m ²	14.0 W/m ²	16.0 11.6 11.6
	Weight empty/volume	13 kg/15 dm ³	19 kg/27 dm ³	20 kg/36 dm ³
	Power supply	230 V, 50/60 Hz		
	Power input/capacity	0.33 A/75 VA	0.63 A/145 VA	0.94 A/215 VA
	Installation length with screw connections	575 mm	970 mm	1215 mm
UV lamp (quantity 1)				
	Designation	UV lamp for UV 60 S	UV lamp for UV 120 S	UV lamp for UV 200 S
	Power consumption	65 VA	135 VA	205 VA
	UV emission at 254 nm	20 Watt	42.5 Watt	60 Watt
	Order no.	523 112	523 122	523 132
Ballast (quantity 1)				
	Designation	electronic ballast (ECG)		
	Type	65 – 80 W	100 – 150 W	160 – 200 W
	Order no.	523 111e	523 121e	523 131e
Cladding tube (quantity 1)				
	Designation	Protective quartz pipe for UV 60 S	Protective quartz pipe for UV 120 S	Protective quartz pipe for UV 200 S
	Length/diameter/wall thickness	560/28/1.5	950/28/1.5	1200/28/1.5
Measuring window (quantity 1)				
	Designation	Sensor shell		
	Order no.	FUV 38.6/30 G1" 520 610		
UV sensor (quantity 1)				
	Designation	DVGW UV sensor		
	Measuring range	0 – 50 W/m ² /		
	Output signal	4 – 20 mA		
	Measuring field angle	40°		
	Order no.	523 612e		
Display unit (quantity 1)				
	Manufacturer	Grünbeck Wasseraufbereitung GmbH		
	Designation/type	GENO-Multi BS		
	Displays	irradiation intensity: 0 – 50 W/m ² /operating hours: 0 – 9999 days Switch on processes: 0 - 9999		
	Power supply	230 V, 50/60 Hz		
	Power input	0.05 A/		
	Capacity	10 VA		
	Order no.	523 615		
Cleaning process				
	chemical	Rinsing with rinsing set for residential systems and GENO-clean CP		
* at a measuring field angle of 40°				

Type designation plate GENO-UV 60 S

Disinfection system GENO-UV 60 S

Year of construction	2019	Serial no.	
Technical Data:			
Nom. connection diameter	1" (DN 25)	UV sensor:	Designation DVGW UV sensor
Pressure stage	PN 10	Order no.	523 612e
Max. operating pressure	10 bar	Number	1
Power supply	230 V 50/60 Hz	Meas. field angle	40°
Power input		Measuring range	0-50 W/m ²
Protection/protection class	IP 54/I	Output signal	4-20 mA
Installation position	horizontal	Lamp:	
Water temperature inlet	5 - 30 °C	Designation	UV lamp for UV 60 S
Index:			
Suitability for SAC-254-values	up to 2.7 m ¹	Order no.	523 112
Admissible flow up to max.	3.3 m ³ /h	Number	1
Min. irradiation intensity to be maintained	11.5 W/m ²	Please observe operation manual and maintenance instructions!	
Cladding pipe:			
Designation	Protective quartz pipe for UV 60 S	The system certification is confirmed by the test number of DVGW DW-9181BR0040	
Order no.	523 620		
Number	1		


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Josef-Grünbeck-Str. 1 • 89420 Höchstädt/Da
 www.gruenbeck.de • info@gruenbeck.de

Type designation plate GENO-UV 120 S

Disinfection system GENO-UV 120 S

Year of construction	2019	Serial no.	
Technical Specification:			
Nom. connection diameter	1 1/2" (DN 40)	UV sensor:	Designation DVGW UV sensor
Pressure stage	PN 10	Order no.	523 612e
Max. operating pressure	10 bar	Quantity	1
Power supply	230 V 50/60 Hz	Meas. field angle	40°
Power input		Measuring range	0-50 W/m ²
Protection/protection class	IP 54/I	Signal output	4-20 mA
Installation position	horizontal	Lamp:	
Inlet water temperature	5 - 30 °C	Designation	UV lamp for UV 120 S
Index:			
Suitability for SAC 254 values	up to 2.7 m ¹	Order no.	523 112
Admissible flow up to max.	8.0 m ³ /h	Quantity	1
Min. irradiation intensity to be maintained	14.0 W/m ²	Please observe operation manual and maintenance instructions!	
Cladding pipe:			
Designation	protective quartz pipe for UV 120 S	The system certification is registered under the DVGW number DW-9181BR5794	
Order no.	522 627		
Quantity	1		


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Type designation plate GENO-UV 200 S

Disinfection system GENO-UV 200 S

Year of construction	2019	Serien-Nr.	
Technical Specification:			
Nom. connection diameter	2" (DN 50)	Cladding pipe:	Designation protective quartz pipe for UV 200 S
Pressure stage	PN 10	Order no.	522 628
Max. operating pressure	10 bar	Quantity	1
Power supply	230 V 50/60 Hz	Lamp:	
Power input		Designation	UV lamp for UV 200 S
Protection/protection class	IP 54/I	Order no.	523 132
Installation position	horizontal	Quantity	1
Index:			
Inlet water temperature	5-30 30-70 °C		
Suitability for SAC 254 values up to	5.30 3.70	°C	
Admissible flow up to max.	2.7 5.1	m ³ /h	
Min. irradiation intensity to be maintained	12.0 8.0	m ³ /h	
	16.0 11.6	W/m ²	
UV sensor:			
Designation	DVGW UV sensor	Please observe operation manual and maintenance instructions!	
Order no.	523612e	The system is registered under the DVGW number DW-9181BR5795.	
Quantity	1		
Meas. field angle	40°		
Measuring range	0-50 W/m ²		
Signal output	4-20 mA		


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Operation log

Customer

Name:

Address:

.....

.....

GENO -UV disinfection system

(please check appropriate box)

60 S

120 S

200 S

Serial number

Year of construction:

Installed by

Installed on

Connection data:

(please check appropriate box)

Drain connection yes no
DIN EN 1717

Floor drain available yes no

Pipe leading to disinfection system galvanised
 copper
 plastic

Maintenance work on UV disinfection systems GENO-UV Checklist					
Please enter measured values. Confirm checks with YES/NO or OK or record repair work performed.					
Maintenance performed (date)	Start-up				
Max. flow rate (also indicate colour of flow stabiliser) in m ³ /h					
Flow stabiliser replaced	X				
Irradiation intensity pre-warning in W/m ² (control on electronics)					
Irradiation intensity measured by system sensor in W/m ²					
Irradiation intensity measured by reference sensor in W/m ²					
Deviation between system sensor and reference sensor in W/m ² /%					
Measured value corrected* (yes/no)					
If yes, by how much (absolute/% of value measured by system sensor)					
Sum of all corrections in %					
Sensor replaced** (yes/no)					
Operating duration in hours					
Safety device checked					
System checked for tightness					
UV lamp(s) replaced	X				
Lamp plug checked	X				
Seal of quartz glass checked	X				
UV system flushed	X				
Protective quartz pipes checked	X				
Sensor shell checked	X				
Remarks					
Customer service technician					
Company					
Work time certificate (no.)					
Signature					
<p>* If the value measured by the system sensor is in the range of +/- 10% of the value measured by the reference sensor, the calibration can be implemented by a service technician on site.</p> <p>** If the value measured by the system sensor is outside the limits indicated above or if the sum of all corrections exceeds 20 % or after two years at the latest, the sensor must be replaced.</p>					

Maintenance work on GENO-UV disinfection systems			
Checklist			
Please enter measured values. Confirm checks with YES/NO or OK or record repair work performed.			
Maintenance performed (date)			
Max. flow rate (also indicate colour of flow stabiliser) in m ³ /h			
Flow stabiliser replaced			
Irradiation intensity pre-warning in W/m ² (control on electronics)			
Irradiation intensity measured by system sensor in W/m ²			
Irradiation intensity measured by reference sensor in W/m ²			
Deviation between system sensor and reference sensor in W/m ² %			
Measured value corrected* (yes/no)			
If yes, by how much (absolute/% of value measured by system sensor)			
Sum of all corrections in %			
Sensor replaced** (yes/no)			
Operating duration in hours			
Safety device checked			
System checked for tightness			
UV lamp(s) replaced			
Lamp plug checked			
Seal of quartz glass checked			
UV system flushed			
Protective quartz pipes checked			
Sensor shell checked			
Remarks			
Customer service technician			
Company			
Work time certificate (no.)			
Signature			
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Maintenance work on GENO-UV disinfection systems					
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Please enter measured values. Confirm checks with YES/NO or OK or record repair work performed.					
Maintenance performed (date)					
Max. flow rate (also indicate colour of flow stabiliser) in m ³ /h					
Flow stabiliser replaced					
Irradiation intensity pre-warning in W/m ² (control on electronics)					
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Maintenance work on GENO-UV disinfection systems			
Checklist			
Please enter measured values. Confirm checks with YES/NO or OK or record repair work performed.			
Maintenance performed (date)			
Max. flow rate (also indicate colour of flow stabiliser) in m ³ /h			
Flow stabiliser replaced			
Irradiation intensity pre-warning in W/m ² (control on electronics)			
Irradiation intensity measured by system sensor in W/m ²			
Irradiation intensity measured by reference sensor in W/m ²			
Deviation between system sensor and reference sensor in W/m ² %			
Measured value corrected* (yes/no)			
If yes, by how much (absolute/% of value measured by system sensor)			
Sum of all corrections in %			
Sensor replaced** (yes/no)			
Operating duration in hours			
Safety device checked			
System checked for tightness			
UV lamp(s) replaced			
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