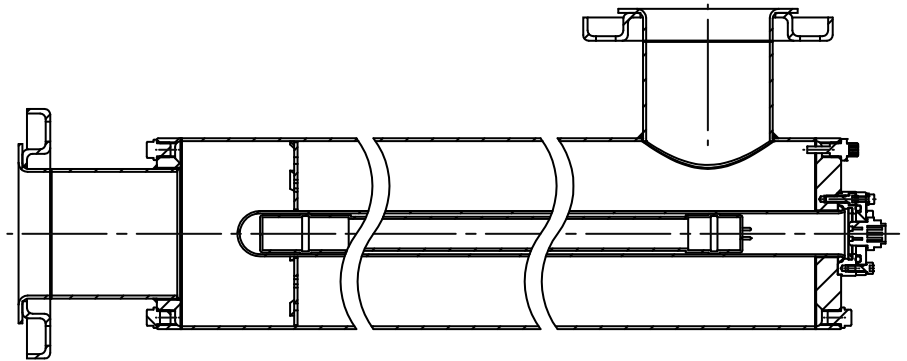


Assembly and operating instructions

DULCODES LP with Compact Control

UV system

EN

A2296

Please carefully read these operating instructions before use. · Do not discard.
The operator shall be liable for any damage caused by installation or operating errors.
The latest version of the operating instructions are available on our homepage.

General non-discriminatory approach

In order to make it easier to read, this document uses the male form in grammatical structures but with an implied neutral sense. The document is always aimed equally at women, men and gender-neutral persons. We kindly ask readers for their understanding in this simplification of the text.

Supplementary information

➞ Please read the supplementary information in its entirety.

Information



This provides important information relating to the correct operation of the unit or is intended to make your work easier.

Warning information

Warning information includes detailed descriptions of the hazardous situation, see ➞ *Chapter 2.1 'Labelling of Warning Information' on page 6.*

The following symbols are used to highlight instructions, links, lists, results and other elements in this document:

Tab. 1: More symbols

Symbol	Description
1. ➞	Action, step by step.
⇒	Outcome of an action.
➞	Links to elements or sections of these instructions or other applicable documents.
■	List without set order.
[Button]	Display element (e.g. indicators). Operating element (e.g. button, switch).
'Display/GUI'	Screen elements (e.g. buttons, assignment of function keys).
CODE	Presentation of software elements and/or texts.

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1 About this UV system

Application

DULCODES UV systems are used for disinfection:

- Potable water
- Industrial water

The water to be disinfected is subjected to short-wave UV radiation during the UV disinfection process. This so-called UV radiation kills any germs quickly and reliably.

The UV system can also be used for breaking down combined chlorine in swimming pool water.

DULCODES UV systems are supplied ready wired. The UV systems are available in different designs, defined by their identity code. The performance data can be found in the data sheet enclosed with the DULCODES UV system.

Scope of delivery:

- Reactor
- Lamp with lamp protection tube
- UV-C sensor
- UV control
- Front end unit in the housing
- Documentation

1.1 Correct and Proper Use



Correct and Proper Use

The operator is liable for damage caused by installation and operating errors!

- *The system is intended solely for the treatment of water.*
- *The system may only be used in accordance with the technical data and specifications outlined in the operating instructions!*
- *Any other use or modification of the system is prohibited.*
- *The system may only be operated by trained and authorised personnel!*
- *It is imperative that the information in the operating instructions relating to the different phases of the unit's service life is observed!*

2 Safety

2.1 Labelling of Warning Information

Introduction

These operating instructions provide information on the technical data and functions of the product. These operating instructions provide detailed warning information and are provided as clear step-by-step instructions.

The warning information and notes are categorised according to the following scheme. A number of different symbols are used to denote different situations. The symbols shown here serve only as examples.



DANGER!

Nature and source of the danger

Consequence: Fatal or very serious injuries.

Measure to be taken to avoid this danger.

Description of hazard

- Denotes an immediate threatening danger. If the situation is disregarded, it will result in fatal or very serious injuries.



WARNING!

Nature and source of the danger

Possible consequence: Fatal or very serious injuries.

Measure to be taken to avoid this danger.

- Denotes a possibly hazardous situation. If the situation is disregarded, it could result in fatal or very serious injuries.



CAUTION!

Nature and source of the danger

Possible consequence: Slight or minor injuries.
Material damage.

Measure to be taken to avoid this danger.

- Denotes a possibly hazardous situation. If the situation is disregarded, it could result in slight or minor injuries. May also be used as a warning about material damage.



NOTICE!

Nature and source of the danger

Damage to the product or its surroundings.

Measure to be taken to avoid this danger.

- Denotes a possibly damaging situation. If the situation is disregarded, the product or an object in its vicinity could be damaged.

***Type of information***

Hints on use and additional information.

Source of the information. Additional measures.

- *Denotes hints on use and other useful information. It does not indicate a hazardous or damaging situation.*

2.2 User qualification



WARNING!

Danger of injury with inadequately qualified personnel

The operator of the system / equipment is responsible for ensuring that the qualifications are fulfilled.

If inadequately qualified personnel work on the unit or loiter in the hazard zone of the unit, this could result in dangers that could cause serious injuries and material damage.

- All work on the unit should therefore only be conducted by qualified personnel.
- Unqualified personnel should be kept away from the hazard zone.

The pertinent accident prevention regulations, as well as all other generally acknowledged safety regulations, must be adhered to.

Training	Definition
Instructed personnel	An instructed person is deemed to be a person who has been instructed and, if required, trained in the tasks assigned to him and possible dangers that could result from improper behaviour, as well as having been instructed in the required protective equipment and protective measures.
Trained user	A trained user is a person who fulfils the requirements made of an instructed person and who has also received additional training specific to the system from the manufacturer or another authorised distribution partner.
Trained, qualified personnel	A trained, qualified employee is deemed to be a person who is able to assess the tasks assigned to him and recognize possible hazards based on his training, knowledge and experience, as well as knowledge of pertinent regulations. A trained, qualified employee must be able to perform the tasks assigned to him independently with the assistance of drawing documentation and parts lists. The assessment of a person's technical training can also be based on several years of work in the relevant field.
Electrical technician	An electrical technician is able to complete work on electrical systems and recognise and avoid possible dangers independently based on his technical training and experience as well as knowledge of pertinent standards and regulations. An electrical technician must be able to perform the tasks assigned to him independently with the assistance of drawing documentation, parts lists, terminal and circuit diagrams. The electrical technician must be specifically trained for the working environment in which the electrical technician is employed and be conversant with the relevant standards and regulations.
Service	The Service department refers to service technicians, who have received proven training and have been authorised by the manufacturer to work on the system.

2.3 Safety information



WARNING! **UV-C radiation**

Possible consequence: Serious injuries.

UV-C radiation is harmful to the eyes and skin.

- Only operate the UV lamp  when it is fully fitted and installed.
- Install the UV lamp in the UV system in accordance with the regulations prior to commissioning.



WARNING! **Live parts!**

Possible consequence: Fatal or very serious injuries.

- Measure: Disconnect the device from the power supply before opening it.
- Disconnect damaged and defective devices or devices that have been tampered with from the power supply.



WARNING! **Insufficient water treatment**

Possible consequence: Illness.

Please read the technical data sheet for your UV system.

Ensure that:

- The maximum permissible water flow rate is not exceeded.
- The UV transmission does not fall below the permissible level.
 - Otherwise, adequate treatment of the water cannot be guaranteed.



WARNING! **Falling objects**

Possible consequence: Crushing of feet.

Remedy: Wear safety shoes.



CAUTION! **Overheating of the lamp and reactor**

Possible consequence: Material damage.

- Only switch on the UV system after the reactor has been filled with water.



CAUTION!

Unauthorised operating parameters

Possible consequence: Material damage.

Ensure that:

- The installation place is dry and frost-free.
- There is guaranteed protection for the UV system from chemicals, dyes and vapours.
- The ambient temperature and the radiation temperature in the direct vicinity of the system do not exceed 40 °C.
- The maximum permissible operating pressure is not exceeded.
- There are no solid particles and no turbidity in the water to be treated.
- If necessary, fit an appropriate treatment system upstream of the UV system.

2.4 Safety equipment

Labels on reactor

ATTENTION: Hazardous ultraviolet radiation

⚠ UV-C radiation is harmful to the eyes and skin! The UV lamps may only be operated when installed. The UV system should be installed in accordance with all pertinent regulations prior to commissioning the UV lamps.

ATTENTION: Hazard

⚠ Disconnect the system from the mains power supply or switch off the master switch prior to commencing maintenance work. Depressurise the reactor prior to commencing maintenance work.

Labels on control cabinet

⚠ Disconnect the system from the mains power supply or switch off the master switch prior to opening.

2.5 Information in the Event of an Emergency

In the event of an emergency, switch the red-yellow main switch on the side of the control cabinet to OFF or disconnect from the mains power supply.

3 Storage, transport and ambient conditions

3.1 Permissible ambient conditions

During storage

Permissible ambient temperature: - 20 °C ... + 70 °C.

Humidity: maximum 95 % relative air humidity, non-condensing.

Other: No dust, no direct sunlight.

During operation

Permissible ambient temperature: + 5 °C ... + 40 °C.

Humidity: maximum 92 % relative air humidity, non-condensing.

Other ambient conditions: No dust, no direct sunlight. No corrosive gases, vapours and dust.

3.2 Packaging material



Packaging material

Dispose of packaging material in an environmentally responsible way. All packaging components carry the corresponding recycling code ♻️.

The packaging is intended to protect the components from damage before installation. Do not damage the packaging and only remove just before installation.

4 Function

INFORMATION! The shut-off valves and rinse valves do not form part of the scope of delivery of the UV system and are provided by the operator on site.

The water to be treated flows through the stainless steel reactor past the UV lamp. UV radiation disinfects the water.

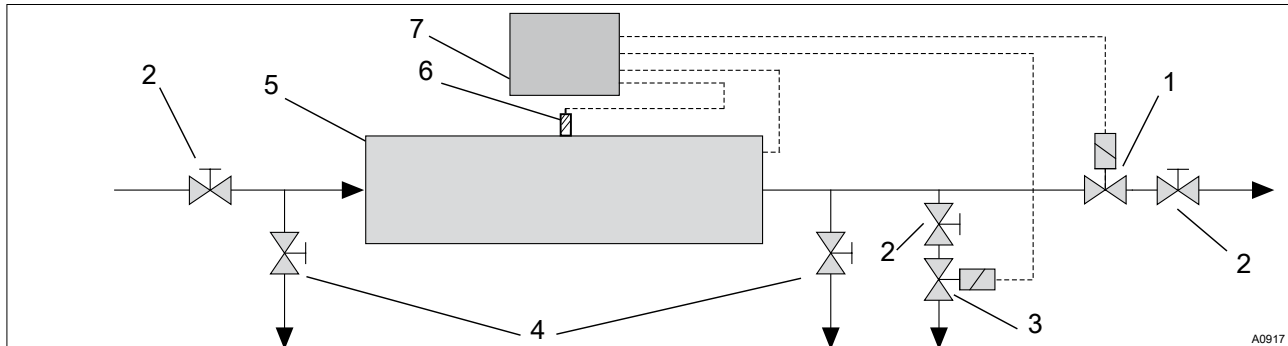


Fig. 1: Typical installation layout for a UV system

- 1 Shut-off valve
- 2 Shut-off valve
- 3 Rinse valve
- 4 Sampling taps, fireproof

- 5 Reactor
- 6 UV sensor
- 7 Controller

The UV low-pressure lamp used generates a very high output of UV radiation, which is effective for the treatment of water. The UV lamp is located in a quartz lamp protection tube with good UV transparency.

The compact design of the reactor and the flow result in evenly distributed radiation of the entire stream of water.

A control monitors the UV system in conjunction with the UV sensor.

4.1 Commissioning

Once the UV system has been switched on, the UV lamps are ignited. Following ignition, the UV lamps need several minutes to reach operating temperature.

The UV sensor monitors the UV lamps. As soon as the UV output has exceeded the safety threshold and commissioning rinse time t_4 has elapsed, the UV system switches to normal mode.

If the safety threshold is not exceeded within the maximum permissible warm-up time (which equates to commissioning rinse time t_4), the control switches off the UV system and goes into fault mode.

The UV system switches to normal operation mode after the commissioning rinse.

4.2 Normal mode

In normal mode, the UV sensor continues to monitor the UV output:

If the UV output falls below the warning threshold: A warning is output.

If the UV output falls below the safety threshold: The shut-off valve closes and the rinse valve opens after delay time t_0 has elapsed. However, if the safety threshold is not exceeded again within rinse time t_1 , then the control switches off the UV system and goes into fault mode.

All UV lamps are monitored to ensure that they operate optimally. If a UV lamp fails, the shut-off valve closes and the control switches off the UV system and goes into fault mode.

4.3 Switching off

When the UV system is switched off, the shut-off valve closes and the UV lamps are turned off. If the UV lamps require post-burning, then the lamps are only switched off after lamp post-burn time t_5 .

5 Operation and control (Compact Control)

The control of the UV system is used to monitor and control the connected UV lamps, valves etc.

The control monitors the lamps in the UV disinfection unit during operation, switches connected valves, and issues a message:

- when the required safety threshold is transgressed.
- when a thermal switch is required if a defined operating temperature is exceeded.
- when a flow detector is required if a defined flow is transgressed.

During operation, the control displays the radiation intensity in W/m^2 , the operating hours and the lamp activations alternately (60 seconds / 10 seconds / 10 seconds).

5.1 Operating modes

The control has 3 operating modes:

- Off
- Manual. Remote switching is not possible; the function is used for service purposes
- Automatic

The control can be switched to 'Automatic' operating mode externally.



Bridge in terminal 7/8

If the control is not controlled externally, then terminal 7/8 must be bridged.

Remote activation is provided by the contact of terminal 7/8.

5.2 Operating levels

The UV system is operated exclusively at operating level L5. L5 is the sole operating level authorised for operation in compliance with DVGW [German Technical Association for Gas and Water] W294 and ÖNORM [Austrian Standard] M5873-1.

There are 4 different modes:

- Operating mode
 - Default mode during operation of UV system
- Programming mode
- System parameter mode
- Test mode

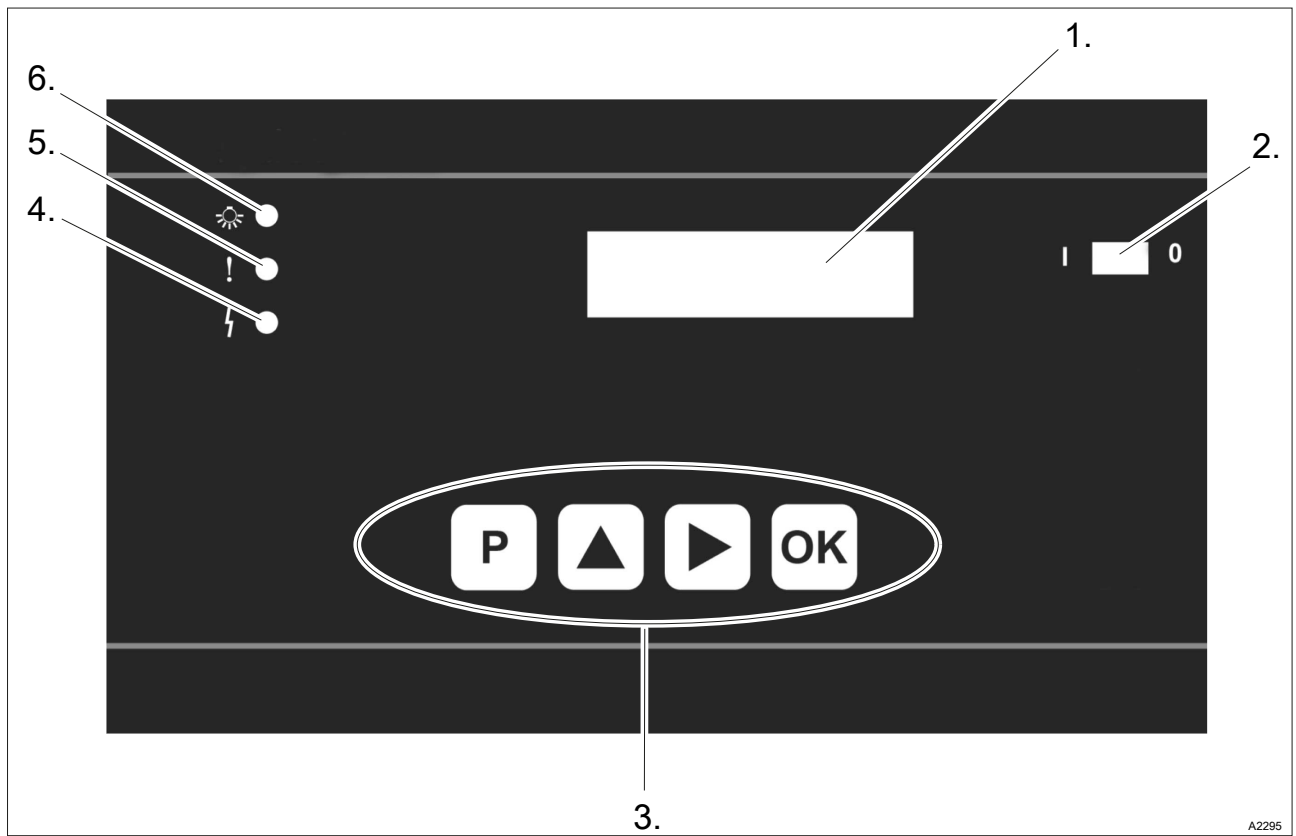


Fig. 2: Compact Control membrane keyboard

1. Display
2. Mains switch
3. Operating keys
4. LED, red, fault message indicator
5. LED, yellow, warning message indicator
6. LED, green, operating indicator

5.3 Programming the control

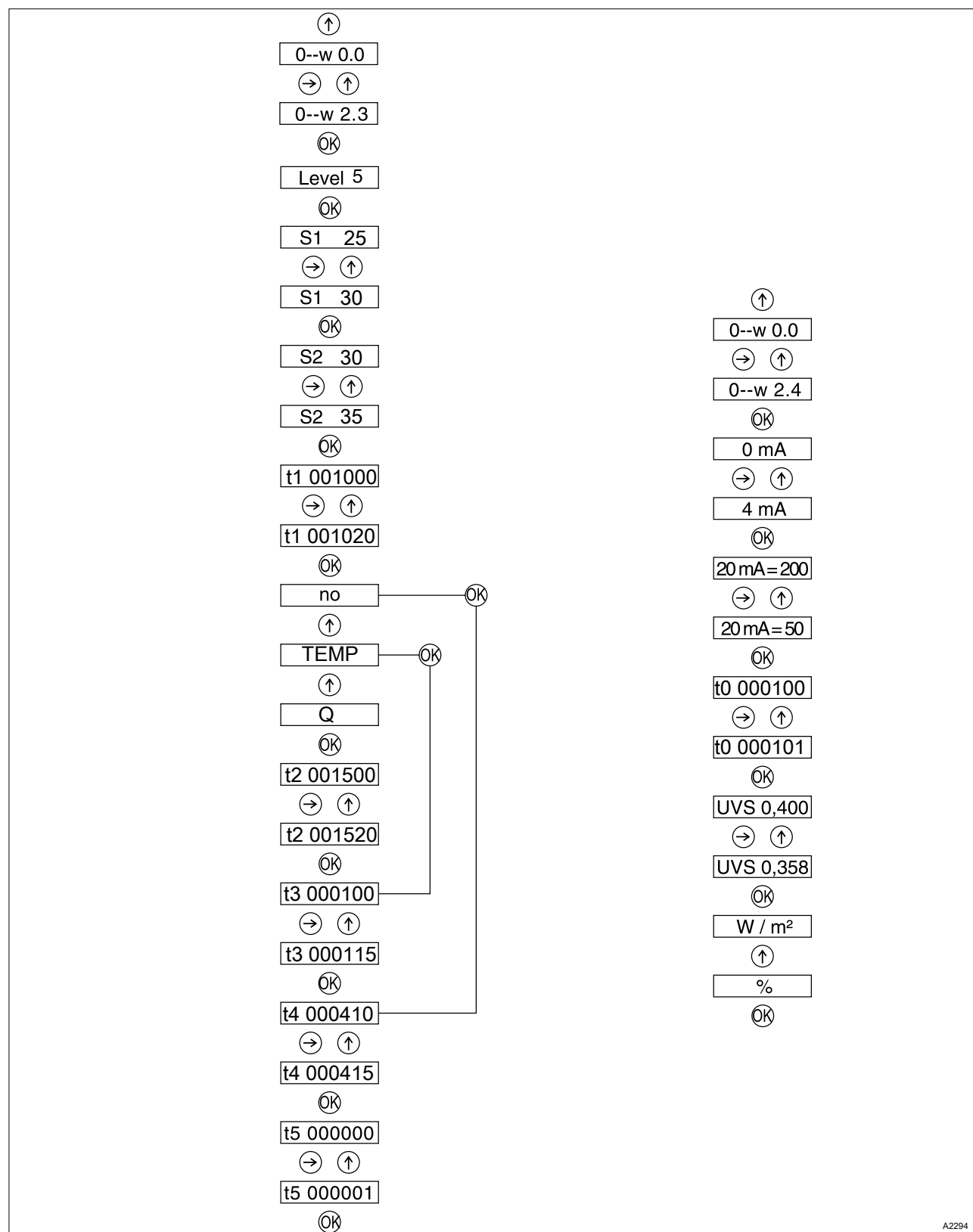


Fig. 3: Programming diagram

Requirements of the DVGW worksheet W 294: The following requirements must be stringently complied with if the control is used to operate a UV disinfection unit in compliance with DVGW worksheet W294 or ÖNORM M5873-1:

Threshold values:

- S1: Set to minimum reference radiation intensity (compare to operating data sheet, characteristic curves)
- S2: Set to 110 % radiation intensity (compare to operating data sheet)

DULCODES LP eco design without UVC sensor

A DULCODES LP eco has no UVC sensor. The LO operating level is set up in the control in which no parameters can be adjusted. The control fulfils the basic functions (such as switching On and Off, operating hours counter ...). The DULCODES LP eco design is not suitable for the disinfection of drinking water and has not been tested according to DVGW worksheet W294 or the ÖNORM M5873-1 standard.

5.3.1 Programming mode

1. Press ▲ until the key symbol $\bigcirc - w 0 . 0$ appears.
2. Programming mode key: $\bigcirc - w 2 . 3$.
3. Select operating level L5 using ►.
4. Confirm the selection.

Tab. 2: Adjustable parameters in programming mode depending on the operating level selected.

	L5*
S1 (25 w/m ²)	X
S2 (30 w/m ²)	X
t1 (10 minutes)	X
t2 (15 minutes)	X
t4 (4 minutes and 10 seconds)	X
t5 (0 Minutes)	X
TEMP	X
Q	X
NO	X

* = Sole operating level authorised for operation in compliance with DVGW W294 and ÖNORM M5873-1.

X = Programming possible or required.

Values in brackets () are factory settings.

5.3.2 Threshold values

S1: Safety threshold (deactivation)

S2: Warning threshold

The thresholds can be programmed in W/m². The thresholds can be programmed in double digits.

5.3.3 Times

The times can be programmed to six digits and the figures are displayed without any spaces between them. hhmmss = hours > minutes > seconds.

t1	The rinse period runs when S1 for the time t0 is transgressed. The rinse valve opens for the time t1.
t2	The interval time specifies the interval after which the UV system will periodically rinse for the time t3 (UV system without flow detector). If the UV system is operated with the flow detector, t2 starts running as soon as there is no flow in the UV system.
t3	The interval rinse time starts running when t2 has elapsed or if any connected thermal switch is activated. The rinsing valve then opens for the time t3.
t4	The commissioning rinse time starts once the UV system has been switched on. While t4 is running, the UV lamps reach full power.
t5	The post-burn time runs once the UV system has been switched off. The UV lamps continue to burn during t5.

5.3.4 Operating settings

T:	The UV system is equipped with a thermal switch. If the thermal switch (N/O) trips, the rinse valve opens for time t3. If the temperature does not decrease sufficiently due to the rinsing, the error message <i>[!TEMP!]</i> appears. When the temperature has decreased sufficiently, the UV system is switched on again.
Q:	If the flow detector (N/O) trips due to low flow, then time t2 starts running. Once t2 has elapsed, rinsing runs for t3. If the flow increases while t2 is running, rinsing does not take place and t2 is reset. While t3 is running, the flow detector remains inoperable.
NO:	Operating option for devices equipped with shut-off and rinsing valves but without a flow or temperature monitor. Times t2 and t3 are suppressed and cannot be adjusted. Intermittent interval flushing is impossible.

5.4 Function of operating keys



Bridge in terminal 7/8

If the control is not controlled externally, the terminal 7/8 must be bridged (2).

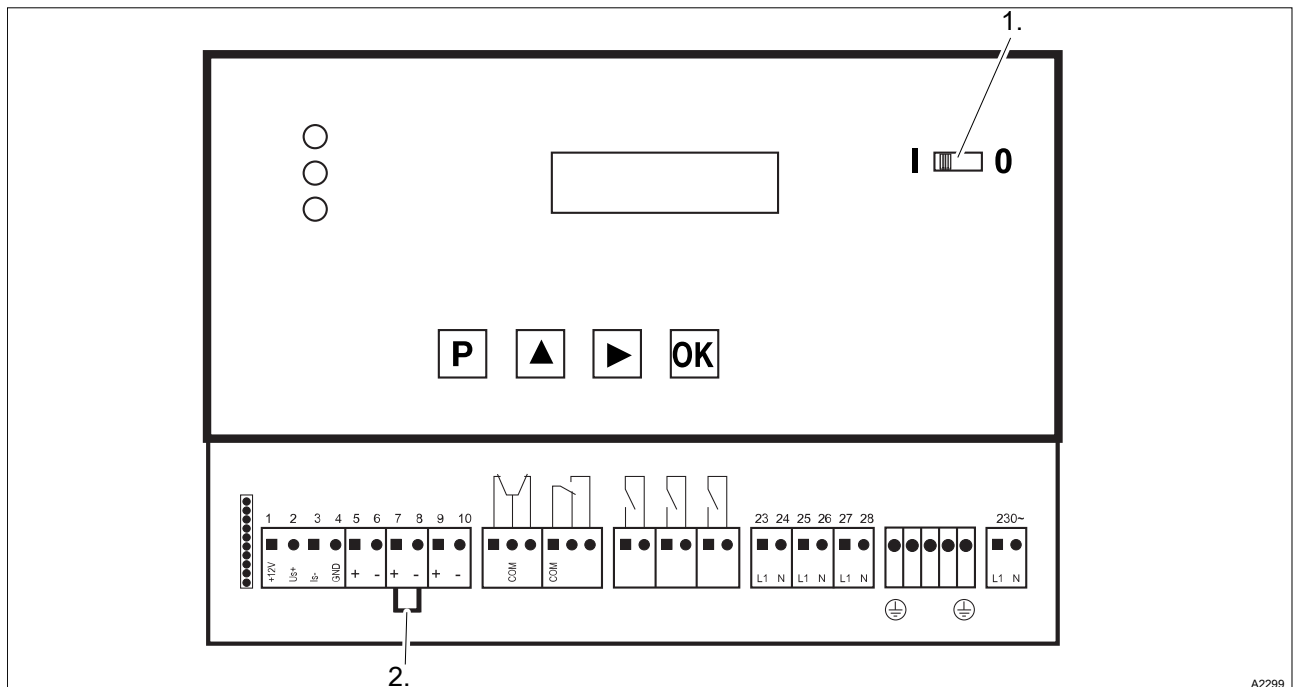


Fig. 4: Function of operating keys

1. Mains switch
2. Bridge for remote operation in AUTO operating mode

Tab. 3: Function of operating keys

Key	Function
▶	Moves the cursor / After entering key, changes operating level.
▲	Increases the value of the corresponding position.
OK	Confirms/saves an entry and switches to the next programming line
P	Switches operating mode.

If no operating key is activated within 3 minutes, the control switches back automatically to operating mode.

5.5 Device parameter mode

Device parameter mode key: $\bigcirc$ -w2 . 4

Calibration of the control is not required. The control calculates the value indicated on the display independently. The following programming is possible in device parameter mode:

X mA: Input of the 0 value for current output. A value between 0 and 9 can be entered.

XXX w/m² or %: Input of radiation intensity for 20 mA. Maximum value 200.

t0 XXXXXX (hhmmss factory setting 1 minute): The time elapsed until a fault is indicated. If the condition that caused the fault is removed during t0 (e.g. a short-term deterioration of the water quality due to the start-up of a pump and stirring up of dirt), the control switches back to operating status (delay time).

UVL X.XXX: Do not change this value, as there is no need to.

%; w/m²: Absolute (W/m²) and relative (%) switchover of the radiation intensity (no change).

5.6 Test mode

Test mode key: $\bigcirc$ -w 3 . 0

The test mode makes it possible to inspect the UV system. In test mode, all the UV lamps and connected valves are controlled by pressing OK. The LEDs do not light up.

5.7 Control mode

Controlling the UV sensor in compliance with the DVGW worksheet W294 or ÖNORM M5873-1.

Key $\bigcirc$ -w 3 . 0

"Lamp on" display.

1. ➤ Remove the UV sensor at the earliest 1 minute after the UV lamp has started.
2. ➤ Press OK to control the UV sensor.
3. ➤ Return to normal operating mode after controlling the UV sensor.

After 2 minutes, the UV system switches back automatically to the last operating mode.

- ⇒ The radiation intensity display cannot be calibrated on the UV system. In the event of an unauthorised deviation between the UV system's UV sensor display and the reference radiometer, the UV system's UV sensor must be replaced by a UV sensor with a valid calibration certificate.

6 Assembly and installation

- **User qualification, mechanical installation:** trained and qualified personnel, ↗ Chapter 2.2 'User qualification' on page 8
- **User qualification, electrical installation:** Electrical technician, ↗ Chapter 2.2 'User qualification' on page 8

6.1 Reactor

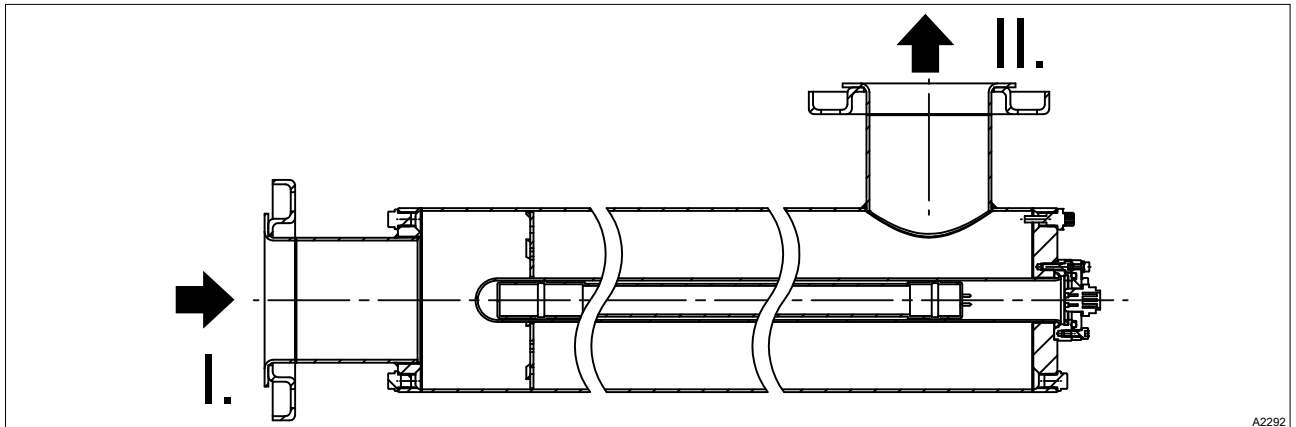


Fig. 5: Reactor

- I. Inlet
- II. Outlet

6.1.1 Assembly

Fitting position



NOTICE!

Maintenance work

Leave adequate clearance for maintenance work.

The required clearance for maintenance work, e.g. replacing lamp protection tubes, can be found in the dimensional drawing, ↗ Chapter 10.2 'Dimensional drawing' on page 40

Fix the reactor in place with appropriate fixing material (pipe clamp, frame). The fitting position can, in principle, be chosen at random and, if required, can be adapted to conditions on site.

6.1.2 Attaching the Warning Sign and Nameplate to the Reactor



NOTICE!

Attach the self-adhesive warning label supplied to the reactor so that it is clearly visible.



Attach the "Caution UV radiation" warning sign and the "160° opening angle" label directly adjacent to the sensor connector.

6.1.3 Hydraulic Connections



CAUTION!

Installation regulations

Possibility of incorrect assembly.

Carry out hydraulic connection of the reactor in accordance with the applicable general guidelines and local installation regulations.



Information for appropriate installation

- Provide valves upstream and downstream of the reactor to shut off the reactor for maintenance work.
- It is also recommended with reactors, which are regularly cleaned by filling them with a cleaning solution, that the water drain connector and the vent screw are replaced by appropriate valves.
- With larger reactors, it is recommended that they are filled through the water drain opening using an appropriate acid-resistant pump.
- If the reactor is filled with a pump, it is also useful to circulate the cleaning solution through the vent opening. This shortens the cleaning time and achieves a better result.

6.2 Electrical installation



WARNING!

Electrical connectors

Possible consequence: Fatal or very serious injuries.

- Please observe all generally applicable guidelines and local installation regulations.
- Only carry out installation work on the UV system if it is disconnected from the mains power supply.
- Connect a protective earth conductor to the reactor and to the reactor cover. Ensure a continuous power supply by means of a suitable fault current protection.
- Only permit an authorised electrical technician to open the control cabinet.
- Do not lengthen the connecting cable for the UV lamp or the UV sensor cable.
- Shorten the connecting cable for the UV lamp or the UV sensor cable to the required length.
- Ensure that the electrical installation is undertaken by an authorised electrical technician using the documents supplied (wiring diagram).

Tab. 4: UVC-U sensor connector

Designation	Cable	Function
+12V	Yellow cable	Power supply output +12 V/0.01 A for UV sensor
Us+	white cable	Voltage input 0 ... 5 V for UV voltage sensor
GND	Brown cable	Earth connection for UV sensors

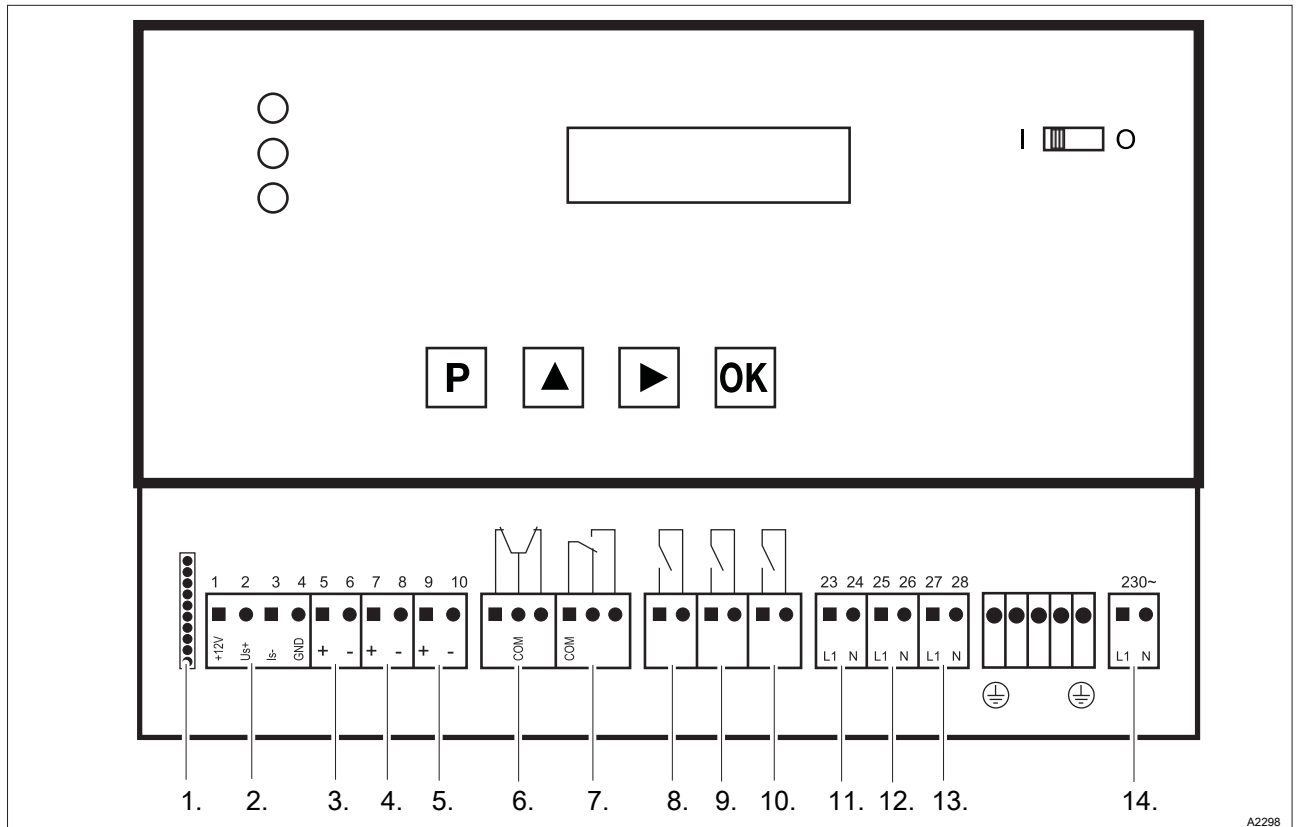


Fig. 6: Terminal assignment

1. Connector for lamp monitoring system
2. Connector for UV sensor
3. 20 mA output
4. Remote activation*
5. Flow or temperature monitoring
6. Power failure warning**
7. CCT fault/operation
8. End of UV lamp life
9. Rinse valve
10. Shut-off valve

11. UV lamp
12. Connector for valve 230 V ~
13. Connector for valve 230 V ~
14. Mains connection

* If the control is not controlled externally, this terminal must be bridged.

** In the event of a power failure, this terminal issues a *[Power failure]* message to the higher-level control.

6.3 Fitting the UV lamp protection tube

6.3.1 Fitting the UV lamp protection tube without the wiper

1. Loosen the bracket of the UV lamp protection tube with an Allen key and remove it.
2. Carefully pull the transport protection (grey plastic pipe) completely out of the reactor.
3. Use the transport protection as an insertion aid. Guide the grey plastic tube into the UV lamp protection tube until only around 30 cm of the plastic tube is projecting.

4. ➔ Carefully push the UV lamp protection tube until it reaches its stop position in the reactor.
5. ➔ Push a new O-ring onto the end of the UV lamp protection tube.
6. ➔



CAUTION!

- Check the UV lamp protection tube for damage before fitting.
- Never re-fit a damaged UV lamp protection tube.
- Ensure that the UV lamp protection tube is sitting correctly.

6.4 Assembling and connecting the UV lamp



WARNING!

Electrical installation

Cause: Danger from electrical voltage.

Possible consequence: Fatal or very serious injuries.

Measure: Prior to assembly and connection of the UV lamps, switch off the master switch or pull the mains plug out of the socket.



WARNING!

UV-C radiation

Cause: Danger due to ☠ UV radiation.

Consequence: UV radiation is harmful to the eyes and skin.

Measure: Only start up the UV lamps when they are properly installed.



NOTICE!

Premature UV lamp failure

Never touch the UV lamp glass with bare hands.

Fingerprints burn into the glass and can result in premature failure. Use a cloth moistened with alcohol to clean off fingerprints from the lamp before installation.



The UV system should be installed in accordance with all pertinent regulations prior to commissioning

With free-standing UV systems, attach the connecting plug with lamp cover to the UV lamp before the UV lamp is inserted into the lamp protection tube.

1. ➔ Insert the lamp cover O-ring into the groove provided.
2. ➔ Insert the UV lamp into the UV lamp protection tube and allow it to project out approx. 100 mm.

3. ➤ Attach the connector plug with lamp cover to the UV lamp.
4. ➤ Fully insert the UV lamp into the lamp protection tube
5. ➤ Place the UV lamp cover onto the UV lamp protection tube.
Use an Allen key to screw in the M6x16 fixing bolts provided and tighten manually.
6. ➤ Attach the pin plug with the lamp connection cable to the socket on the cover of the lamp and fix in place with the knurled nut.

7 Commissioning

- **User qualification, commissioning:** trained user, see  Chapter 2.2 'User qualification' on page 8

**Avoid frequent switching operations**

Avoid short switching intervals and switching operations. Frequent switching operations can have a negative effect on the service life of the UV lamp.

7.1 Check the control system programming

**WARNING!****Insufficient water treatment**

The UV transmission of the water must be known before commissioning the UV system.

Please read the technical data sheet for your UV system

Ensure that:

- the maximum permissible water flow rate is not exceeded and
- the UV transmission does not fall below the permissible level,
 - as otherwise adequate treatment of the water cannot be guaranteed because the radiation dose is too low.

**NOTICE!****Warning threshold**

Failure to set the warning thresholds in accordance with the data sheet will lead to warning alerts being given prematurely or late.

**Minimum irradiation intensity**

It is especially important to check whether the minimum radiation intensity is set in accordance with the information in the accompanying data sheet. If the minimum radiation intensity is undershot on a regular basis or is permanently undershot, then either the max. flow should be reduced or a water pretreatment process must be installed upstream in order to improve the water transmission value of the UV system.

7.2 Leak testing and ventilation of the reactor

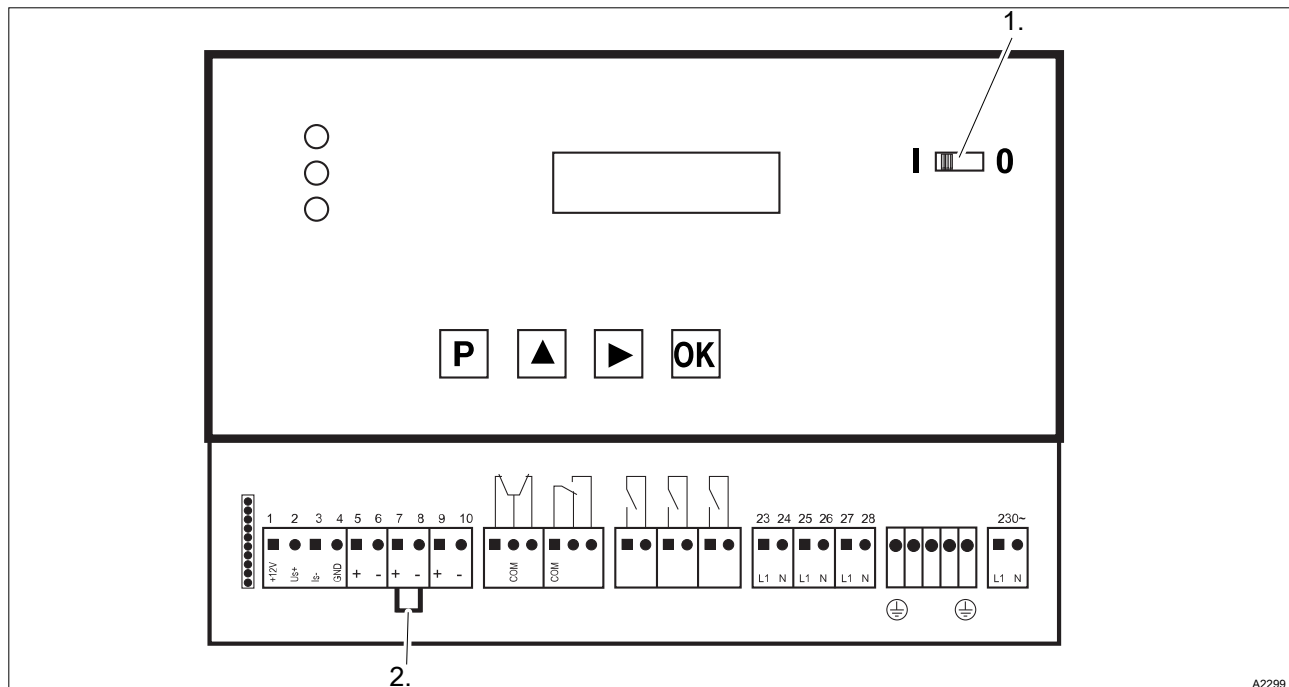
1. ➤ Open the bleed valve on the reactor.
2. ➤ Slowly open the shut-off valve upstream of the reactor.
3. ➤ Fill the reactor until water emerges from the bleed valve.
4. ➤ Close the bleed valve.
5. ➤ Check the reactor for leaks.
6. ➤ Open the shut-off valve downstream of the reactor (only necessary with a manual shut-off valve).

7.3 Switching on the UV system



Bridge in terminal 7/8

If the control is not controlled externally, the terminal 7/8 must be bridged (2).



A2299

Fig. 7: Function of operating keys

1. Mains switch
2. Bridge for remote operation in AUTO operating mode

1. ➔ Switch the device on. Switch the mains switch (1) or main switch on the control cabinet to ON.

⇒ All 3 LEDs light up in quick succession.

The software version number appears in the display followed by the operating modes *[OFF]*, *[M]* (Manual) or *[A]* (Automatic). In Manual, the display shows an *[H]* and the radiation intensity; in Automatic, the display indicates the current operating level *[L5]* and the radiation intensity.

2. ➔ Use *[P]* to select operating mode *[OFF]*.

⇒ When the control is controlled externally, *[AUTO-OFF]* appears in Automatic operating mode to make differentiation possible.

Selecting operating level L



The control must be in *[OFF]* operating mode.

3. ➔ Press $\uparrow$ and release it again.

⇒ The $\bigcirc$ -w 0.0 key symbol appears.

4. ➔ Enter 2.3 and confirm it with *[OK]*.

- ⇒ The programmable parameters for operating level 5 are displayed and can be modified if required. Practice-based values have been recorded for operating level 5, so that it is not always necessary to alter the parameters. However, if any adjustment is required, relevant details can be viewed in the '*Operation and control*' chapter.

5. ➤ Use "P" to switch to *[AUTOMATIC]* operating mode.

7.3.1 The displayed radiation intensity

The displayed radiation intensity, with a new UV lamp, clean quartz protection tube and clean UV sensor. The displayed radiation intensity must be as stable as possible after 10 minutes of operation and flowing water. The radiation intensity indicates how much UV radiation is reaching the UV sensor.

The radiation intensity is affected by:

- Water quality (transmission).
- Cleanliness of the quartz protection tube or sensor window.
- Temperature.
 - The higher the water temperature, the lower the UV lamp power.
- UV lamp operating temperature.
 - The UV lamp only reaches its optimum operating temperature after several minutes, see also t4.
- Age of the UV lamp.
 - The power of the UV lamp decreases over its operating life-time.

8 Maintenance

- **User qualification:** trained user, see [Chapter 2.2 'User qualification' on page 8](#)

Test mode is suitable for checking the correct working order of the control.

Replacing the sensor

To ensure operation in compliance with the standards, the ÖNORM and DVGW demand that the UV sensor is changed annually and that checks are performed using a calibrated reference radiometer.

Replacing the lamp

Lamp replacement is indicated by the flashing operating hours display. The end of lamp life relay is activated. Reset the operating hours display after the lamp has been replaced:

1. ➤ Press $\Rightarrow$ and then P, keep both keys pressed down for a short time and then release them.
 $\Rightarrow$ *[Count = 0 ?]* will then appear in the display.
2. ➤ Press OK within 1 second
 $\Rightarrow$ The operating hours and the number of lamp activations are deleted.

Power failure

In the event of a power failure, the current operating data (operating hours, number of activations and operating mode, error messages) are recorded in the EEPROM. All the values except the operating mode are reset to the default setting. However, if values have been changed through programming and saved, these values are saved in the EEPROM. Once power has returned, the control will restart automatically.

8.1 General Information

- **User qualification:** trained user, see [Chapter 2.2 'User qualification' on page 8](#)



WARNING! **UV-C radiation**

Possible consequence: Serious injuries.

UV-C radiation is harmful to the eyes and skin.

- Only operate the UV lamp  when it is fully fitted and installed.
- Install the UV lamp in the UV system in accordance with the regulations prior to commissioning.

**WARNING!****Live parts!**

Possible consequence: Fatal or very serious injuries

- Measure: Disconnect the device from the power supply before opening it.
- Disconnect damaged and defective devices or devices that have been tampered with from the power supply.

**CAUTION!****General precautionary measures**

Ensure that the reactor is at atmospheric pressure before carrying out any maintenance work.

**NOTICE!****Maximum permissible service life**

Replace the UV lamps at the latest when their maximum permissible service life expires. Otherwise, the operating safety of the UV system can no longer be guaranteed.

The maximum permissible service life is 14,000 operating hours, unless otherwise stated in the accompanying data sheet.

Maintenance of the UV system is limited to cleaning the UV sensor/UV sensor window and replacing the UV lamp at the end of its maximum permissible service life.

An operating log must be maintained in order to document any maintenance work carried out; a form is included in the Appendix.

8.2 Cleaning with Cleaning Solution by Filling the UV System

**NOTICE!****Handling the cleaning solution**

- It is also recommended with reactors, which are regularly cleaned by filling them with a cleaning solution, that the water drain connector and the vent screw are replaced by appropriate valves.
- With larger reactors, it is recommended that they are filled through the water drain opening using an appropriate acid-resistant pump.
- If the reactor is filled with a pump, it is also useful to circulate the cleaning solution through the vent opening.
 - This shortens the cleaning time and achieves a better result.
- If the cleaning solution is collected and stored in a suitable storage tank, it can be reused several times.

Cleaning the lamp protection tubes by filling the reactor with a cleaning solution:

1. ➤ Switch off the UV system.
2. ➤ Switch off the master switch or disconnect it from the mains power supply.
3. ➤ Close the shut-off valves upstream and downstream of the radiation chamber.
4. ➤ Drain the reactor.
5. ➤ Screw in the water drain screw again and tighten using minimal force.
6. ➤ Fill the reactor with the cleaning solution through the vent opening.
 - ⇒ Allow the cleaning solution to work for at least 20 minutes.
7. ➤ Open and remove the water drain screw.
8. ➤ Empty the reactor and dispose of the cleaning solution in accordance with the applicable regulations.
9. ➤ Flush the reactor thoroughly with clean water until all residue of cleaning solution has been removed.
10. ➤ Screw in the water drain screw and tighten using minimal force.
11. ➤ Slowly open the shut-off valve upstream of the reactor.
12. ➤ Fill the reactor until water emerges from the vent screw.
13. ➤ Close the air vent screw and tighten it using minimal force.
14. ➤ Open the shut-off valve downstream of the reactor, which is only necessary with a manual shut-off valve.
 - ⇒ Check the reactor for leaks.
15. ➤ Switch on the master switch or connect to the mains power supply.
 - ⇒ The UV system is ready for operation again.

8.3 Cleaning the UV lamp protection tube



NOTICE!

Cleaning the UV lamp protection tube

Clean the tube when the UV sensor signal falls below the warning threshold, without this being based on other causes, such as ageing of the UV lamp or significant worsening of the UV transmission.

**CAUTION!****Unsuitable cleaning agents**

Possible personal injury / material damage to UV systems.

- Do not use any acids that are corrosive or that cause stress cracks, such as e.g. hydrochloric acid.
- Read the material safety data sheet for the cleaning agent selected.
- Wear protective clothing when cleaning (protective eyewear, protective gloves ...).
- Ensure that no cleaning solution penetrates the lamp protection tube.
- When cleaning UV systems, ensure that no cleaning solution enters the pipework.

**NOTICE!****Disposal of cleaning agent**

Possible environmental hazard.

Dispose of the waste cleaning solution in accordance with the pertinent guidelines and regulations.

An annual clean of the UV lamp protection tubes when replacing the UV lamp suffices for many UV systems. Clean more frequently when operating with types of water that have a tendency to become dirty. The UV lamp protection tubes can be cleaned manually when dismantled or can be cleaned by filling the reactor with a cleaning solution. Acids, such as diluted phosphoric acid, acetic acid or diluted nitric acid, are particularly suitable for cleaning.

8.4 Replacing the lamp

**WARNING!****Live parts!**

Possible consequence: Fatal or very serious injuries.

- Measure: Disconnect the device from the power supply before opening it.
- Disconnect damaged and defective devices or devices that have been tampered with from the mains power supply.

**WARNING!****UV-C radiation**

Possible consequence: Serious injuries.

UV-C radiation is harmful to the eyes and skin.

- Only start up the UV lamp  when it is properly installed.
- Install the UV lamp into the UV system in accordance with the regulations prior to commissioning.



WARNING!

Insufficient treatment efficiency

Possible consequence: Illness.

Please read the Technical Data Sheet accompanying your UV system.

- Replace the UV lamps with new lamps at the very latest when:
 - The UV sensor signal approaches the minimum radiation intensity without this being due to other causes, such as the formation of a coating on the UV lamp protection tubes or a serious deterioration of the UV-transmission.
 - The operating life of the UV lamp is approaching the maximum service life of the lamp or has exceeded it.



CAUTION!

Fingerprints on the UV lamp

Possible consequence: Premature failure of the UV lamp.

- Only touch the glass of the UV lamp when wearing cotton gloves.
- Fingerprints or impurities burn into the glass and can result in premature failure.
- For this reason always clean the lamp thoroughly with a cloth moistened with alcohol before installing it.
- Then wipe the UV lamp with a soft, dry cloth.



NOTICE!

Clean the lamp protection tubes each time a lamp is replaced.

Dispose of used lamps in accordance with the applicable guidelines and directives. Usually they can be disposed of together with used fluorescent tubes.

1. ➤ Deactivate the UV system.
2. ➤ Switch off the master switch or disconnect it from the mains power supply.
3. ➤ Close the shut-off valves upstream and downstream of the reactor.
4. ➤ Loosen the fixing bolts of the lamp cover using an Allen key, remove the lamp cover and pull out the lamp by approximately 100 mm.
5. ➤ Loosen the UV lamp at the cable clamp with the aid of a slotted head screw driver.
6. ➤ Fully remove the UV lamp and place it to one side.
7. ➤ Check whether the O-ring on the UV lamp protection tube bracket is in the groove provided – ensure that the sealing surfaces of the O-rings are completely smooth and clean.

8. ➤ Fix the UV lamp to the cable clamp with the aid of a slotted head screw driver.
9. ➤ Insert the UV lamp fully into the UV lamp protection tube.
10. ➤ Place the UV lamp cover onto the UV lamp protection tube bracket and, using the fixing bolts provided, screw in and tighten with an Allen key.
11. ➤ Switch on the main switch or connect up to the mains power supply.
12. ➤ Switch on the UV system.
13. ➤ Slowly open the shut-off valve upstream of the reactor.
14. ➤ Open the shut-off valve downstream of the reactor (only necessary with a manual shut-off valve).
15. ➤ Delete the lamp data in the controller.

**WARNING!****Insufficient treatment efficiency**

Possible consequence: Death or illness.

Check minimum radiation intensity and warning threshold.

Check and, if necessary, reset the minimum radiation intensity and warning threshold when the UV lamp is replaced.

Only a correctly adjusted minimum radiation intensity will guarantee adequate treatment.

8.5 Checking the UV sensor

Controlling the UV sensor in compliance with DVGW worksheet W294 or ÖNORM M5873-1.

Key O-w 3.0

"Lamp on" display.

1. ➤ Remove the UV sensor at the earliest 1 minute after the UV lamp has started.
2. ➤ Press the OK key in order to control the UV sensor.
3. ➤ Return to normal operating mode after controlling the UV sensor.

After 2 minutes, the UV system switches back automatically to the last operating mode.

⇒ The radiation intensity display cannot be adjusted at the UV system. In the event of an unauthorised deviation between the UV system UV sensor display and the reference radiometer, the UV system UV sensor must be replaced with a UV sensor with a valid calibration certificate.

9 Troubleshooting and error messages



WARNING!

Live parts!

Possible consequence: Fatal or very serious injuries.

- Measure: Disconnect the device from the power supply before opening it.
- Disconnect damaged and defective devices or devices that have been tampered with from the mains power supply.
- Only permit an authorised electrical technician to undertake troubleshooting on the open control cabinet and replace components.

Tab. 5: Troubleshooting

Fault	Cause	Solution
UV radiation intensity is very low or 0.	Sensor connecting cable incorrectly attached.	Check connections and change if necessary.
Fault message: Display S1, minimum radiation intensity undershot, ↗ Tab. 6 'Error messages' on page 36	UV sensor and/or lamp protection tube is/are dirty.	Perform cleaning.
	UV lamp too old.	Replace UV lamp.
	The spectral attenuation coefficient SSK-254 of the water is too high.	Check the spectral attenuation coefficient SSK-254 of the water and reprogram S1 and S2 if necessary.
Fault message: Display S2, warning threshold undershot, ↗ Tab. 6 'Error messages' on page 36		Ensure that the maximum permissible flow is not exceeded in accordance with the characteristic curve.
The control cannot be controlled in [AUTO] operating mode.	Remote ON/OFF switch not connected or remote ON/OFF terminal not bridged.	Connect and activate remote ON/OFF switch or insert bridge in remote ON/OFF terminal

Tab. 6: Error messages

Error	Cause	Solution
Display: [!LAMP!]	Indicates a UV lamp malfunction and the number of malfunctioning UV lamps.	Check contacts. Replace the UV lamp.
Display: [TEMP!]	Indicates when the temperature of a connected thermal switch has been exceeded.	Change t2 and t3 (see programming)
Display: [! S1 ! / ! S2 !]	Indicates that the adjusted minimum radiation intensity / warning threshold has not been reached (e.g. due to water quality, deposit formation, operating life of the UV lamp).	Clean, check and if necessary replace the UV lamp

10 Technical data

Performance data



NOTICE! Data sheet

This technical data supplements the enclosed data sheet. If in doubt, the information on the data sheet applies.

Type	Number of lamps	Lamp power	Connected power
1x80 W	1	90 W	110 W
1x230 W	1	260 W	310 W
1x350 W	1	370 W	430 W

Type	Minimum clearance for maintenance work	Empty weight / Operating weight Reactor	Volume in litres Gross/Net
1x80 W	720 mm	14.5 kg / 24 kg	11.0/10.4
1x230 W	1065 mm	19 kg / 32 kg	14.8/13.5
1x350 W	1465 mm	30 kg / 60 kg	30.8/29.0

Permissible operating temperatures:

- Water temperature: 2 ... 40 °C
- Ambient temperature: 0 ... 35 °C

Requirements for the water to be treated:

- Maximum temperature: 40 °C
- Maximum operating pressure: 10 bar
- No corrosive or abrasive properties, chloride content < 250 ppm
- No tendency for sedimentation

10.1 Control cabinet



Wiring diagram provided

A system-specific wiring diagram (appendix) is delivered to you along with the UV system. In the event of any differences between the operating instructions and system-specific wiring diagram, the system-specific wiring diagram applies.

UV control	
Mains voltage V/Hz	230 (-10 %/+7 %) / 50/60
Fuse	Electronics and outputs, glass tube fuse, 4 A T
Maximum output load to be controlled	900 watts

UV control	
Degree of protection IP	54
Electronics power consumption	max. 5 W
L-N outputs	3
Display	1 line, 8-digit
Function displays	3 LED
Operating temperature min/max (outside the housing)	0 ... 35 °C
Maximum rel. air humidity	70 % (at 30 °C air temperature) operate in enclosed spaces only
Dimensions WxHxD mm	250 x 230 x 130

Tab. 7: Outputs

Component	Function	Status	Info
UV lamp	NO switch	230 V/5 A	
Shut-off valve	NO switch	Potential-free	
Rinse valve	NO switch	Potential-free	
Collective malfunction, CCT	Changeover contact	Potential-free	
Warning	N/C	Potential-free	COM together with loss of power
Loss of power	N/C	Potential-free	COM together with warning
End of lamp life	NO switch	Potential-free	
Current output	0/4 ... 20 mA	max. load 500 Ω	

Tab. 8: Relay status table

Message	Relay					
	CCT	Warning	Mains	End of UV lamp life	Shut-off valve	Rinse valve
Loss of power	1	1	1	1	2	2
Lamp malfunction	1	2	2	2	2	2
S1 UV radiation intensity	1	1	2	2	2	2
S2 UV radiation intensity	2	1	2	2	1	2
Collective malfunction	2	2	2	2	2	2
End of lamp life	2	2	2	1	2	2
Remote off	2	2	2	2	2	2
Operation	2	2	2	2	1	2
t1 Rinse time	1	1	2	2	2	1
t3 Interval rinsing duration	2	2	2	2	2	1
t4 Commissioning period	2	2	2	2	2	1
t5 After-flame period	2	2	2	2	2	2
1 = Relay energised; 2 = Relay de-energised						

10.2 Dimensional drawing

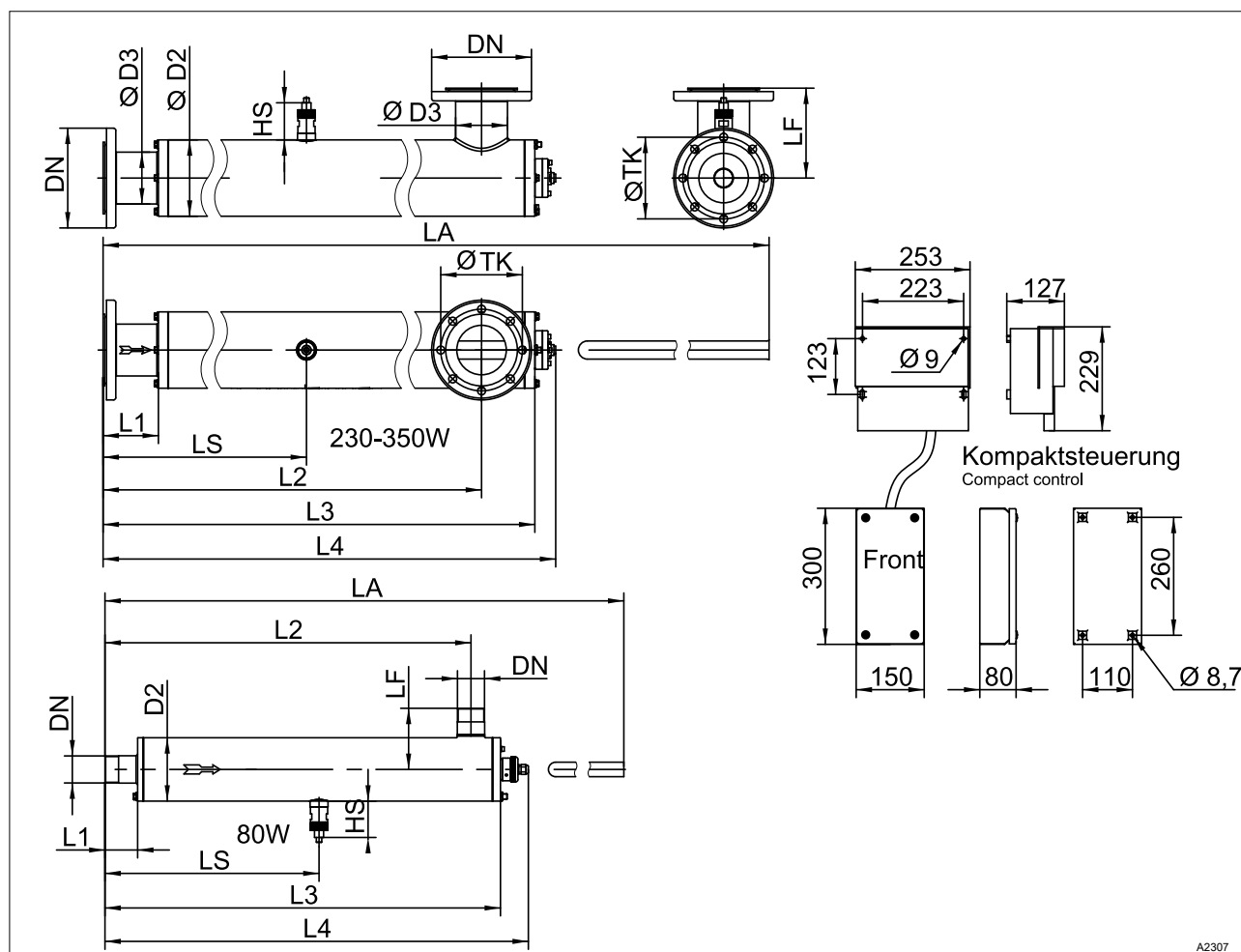


Fig. 8: Dimensional drawing.

10.2.1 Dimensions, PN10/DIN EN 1092-1

Type	1x80 W	1x230 W	1x350 W
DN	R 2"	80	100
Ø D1	---	10.2	10.2
Ø D2	139.7	139.7	168.3
Ø D3	---	88.9	114.3
Ø TK	---	160	180
L1	72	67	122
L2	807	1053.5	1522.5
L3	872	1151	1640
L4	934	1190	1679
LS	472	609	881
LF	135	138.5	198
LA	1610	2215	3105
HS			

All dimensions in millimetres.

10.2.2 Dimensions with ANSI flange, 145 psi, ANSI 150 lbs compatible

Type	1x230 W	1x350 W
DN	3"	6"
B1	23.62"	23.62"
B2	24.8"	24.8"
H1	29.92"	29.92"
H2	27.64"	27.64"
T1	8.27"	8.27"
T2	9.72"	9.72"
Ø D1	0.4"	0.4"
Ø D2	5.5"	6.63"
Ø D3	3.5"	4.5"
Ø TK	6"	9.5"
L1	2.64"	4.8"
L2	41.48"	59.94"
L3	45.31"	64.57"
L4	46.85"	66.10"
LS	23.98"	34.69"
LF	5.45"	7.8"
LA	87.2"	122.24"

All dimensions in inches.

10.2.3 Dimensions, PN16/DIN EN 1092-1

Type	1x80 W	1x230 W	1x350 W
DN	R 2"	80	100
Ø D1	---	10.2	10.2
Ø D2	139.7	139.7	168.3
Ø D3	---	88.9	114.3
Ø TK	---	160	180
L1	72	67	122
L2	807	1053.5	1522.5
L3	872	1151	1640
L4	934	1190	1679
LS	472	609	881
LF	135	138.5	198
LA	1610	2215	3105
HS			

All dimensions in millimetres.

11 Appendix

11.1 Spare parts, 80 W

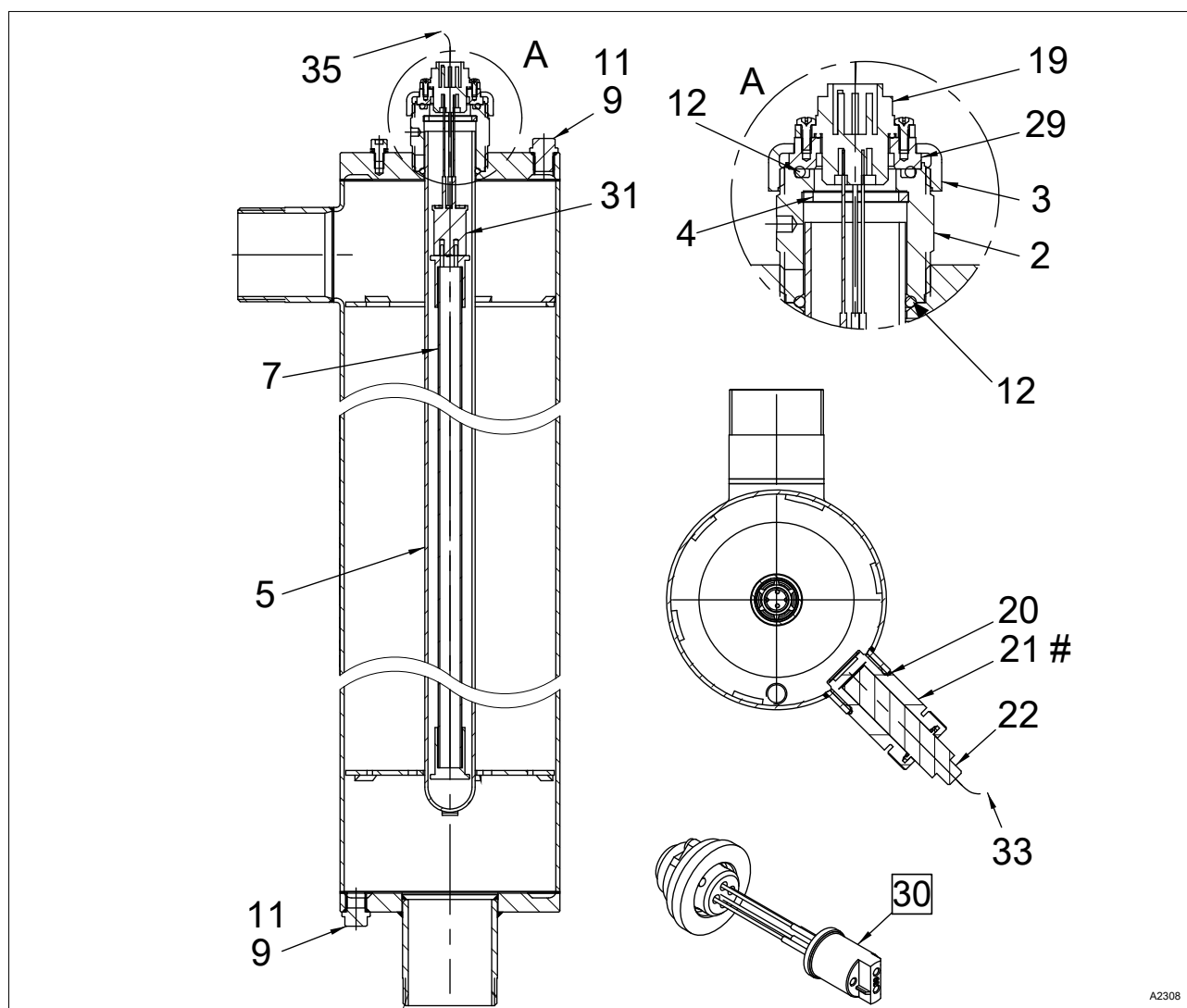


Fig. 9: Spare parts, 80 W // position numbers in a square are delivered as an assembly.

Tab. 9: Spare parts list, 80 W

No.	Designation	Spare parts number	Replacement interval	No.
2	Bracket Ø32 - G 1 1/2 - Ø50	1010503	As necessary	1
3	Knurled nut G 1 1/2 d55	1010525	As necessary	1
4	Retainer, Ø36.9/30.7x3, PTFE	1002751	As necessary	1
5	Lamp protection tube Ø32x2x650	1059182	3 years	1
7	UV lamp, 80W	1061751	14,000 hours	1
9	Locking screw, DIN 910, G 1/4A	1002752	As necessary	1
11	O-ring/M 10.50 - 1.50, EPDM/P	1001356	After each opening	1
12	O-ring/M 31.75 - 3.53, EPDM/P	1004920	After each opening	1
19	Flange plug PT9, 3+PE, series 69	1017625	As necessary	1
20	O-ring/M, 33.05 - 1.78, EPDM/P	1023570	After each opening	1

No.	Designation	Spare parts number	Replacement interval	No.
21	Sensor window, G1 x 20 (certified UV system)	1076121	As necessary	1
22	UVC sensor, DVGW 160° (certified UV system)	1076149	As necessary	1
22	UVC sensor, NPLP G1 14404 (non-certified UV system)	1075544	As necessary	1
29	Cover, Ø42, M 16 x 1.5x5	1010526	As necessary	1
30	Lamp cover with plug	1075124	As necessary	1
31	Socket with leads	1075082	As necessary	1
33	Sensor connection cable, UV-LP, 4.5 metres	1062303	As necessary	1
35	Lamp cable with cable socket, 2 metres	1075661	As necessary	1
--	EB 80 for 80 Watt for UV lamp	1075201	As necessary	1

11.2 Spare parts, 230 W

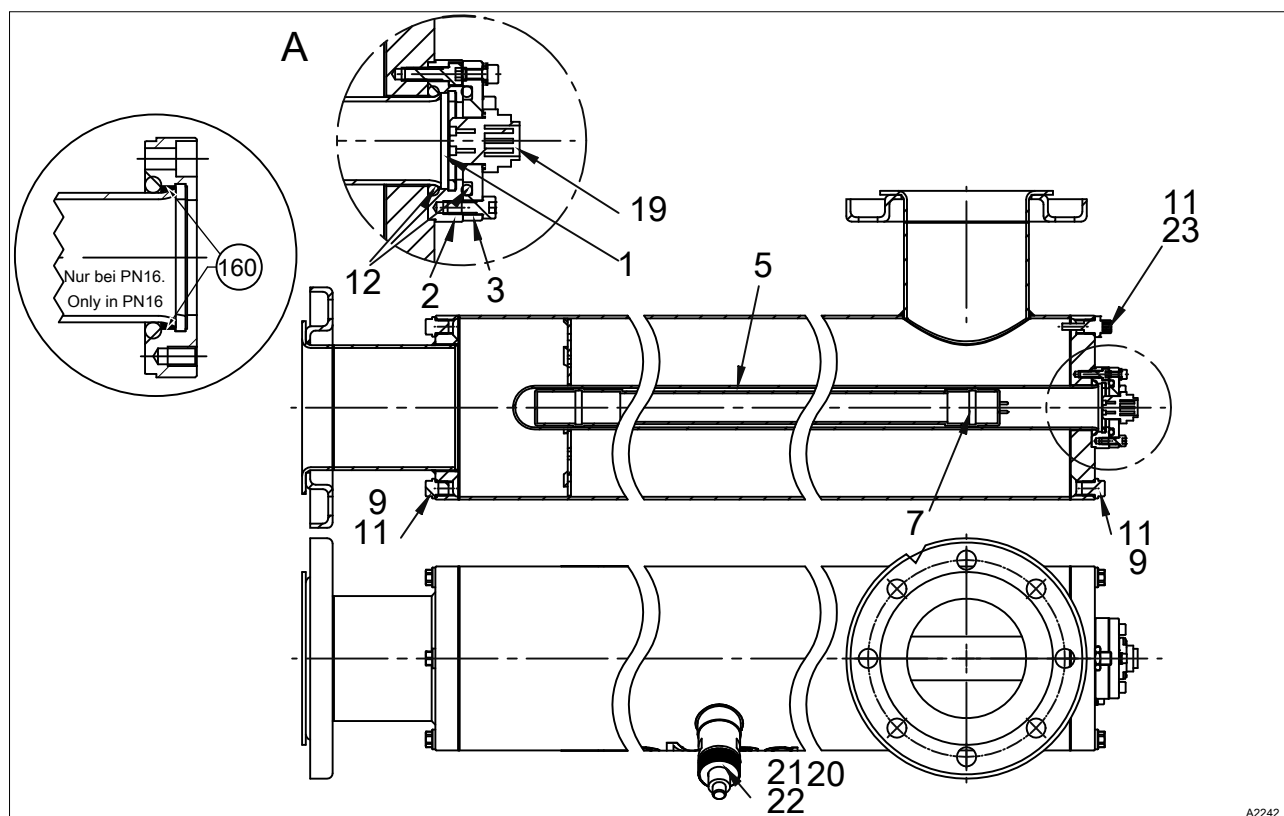


Fig. 10: Spare parts, 230 W

Tab. 10: Spare parts list, 230 W

No.	Designation	Spare parts number	Replacement interval	No.
2	Lamp holder, Ø74x16, 1.4404	1049341	As necessary	1
3	Lamp cover, Ø73x9, 1.4404	1049343	As necessary	1
4	Retainer, Ø48.5/39x3, PTFE REI	1035074	As necessary	1
5	Lamp protection tube with seal, Ø40*2*1050. no longer available, replaced by 1107758.	1058838	---	---
5	Lamp protection tube with seal, Ø40*2*1050. New. The new lamp protection tube is backward-compatible.	1107758	3 years	1
7	UV lamp, 230W	1061752	14,000 hours	1
9	Locking screw, DIN 910, G 1/4A	1002752	As necessary	1
11	O-ring/M 10.50 - 1.50, EPDM/P	1001356	After each opening	1
12	O-ring/M 40.00 - 5.00, EPDM/P	1023569	After each opening	2
19	Flange plug, PG9, 3+PE, Series 69	1017625	As necessary	1
20	O-ring/M, 33.05 - 1.78, EPDM/P	1023570	After each opening	1
21	Sensor window, G1 x 20, (certified UV system)	1076121	As necessary	1
22	UVC sensor, DVGW 160°, (certified UV system)	1076149	As necessary	1
22	UVC sensor, NPLP G1 14404 (non-certified UV system)	1075544	As necessary	1

No.	Designation	Spare parts number	Replacement interval	No.
30	Lamp cover with plug, UV-LP 230 + 350	1075127	As necessary	1
31	Socket with leads	1075083	As necessary	1
33	Sensor connection cable, UV-LP, 4.5 metres	1062303	As necessary	1
33	Sensor connection cable, UV-LP, 9 metres	1062314	As necessary	1
33	Sensor connection cable, UV-LP, 13 metres	1062315	As necessary	1
35	Lamp cable with cable socket, 4 metres	1062317	As necessary	1
35	Lamp cable with cable socket, 8.5 metres	1062318	As necessary	1
35	Lamp cable with cable socket, 12.5 metres	1062319	As necessary	1
160	PN16 only: Support ring, Ø 42x4, PTFE	1104884	As necessary	1
--	EB 380 for 230-watt and 350-watt UV lamp	1061780	As necessary	1

11.3 Spare parts, 1x350 W

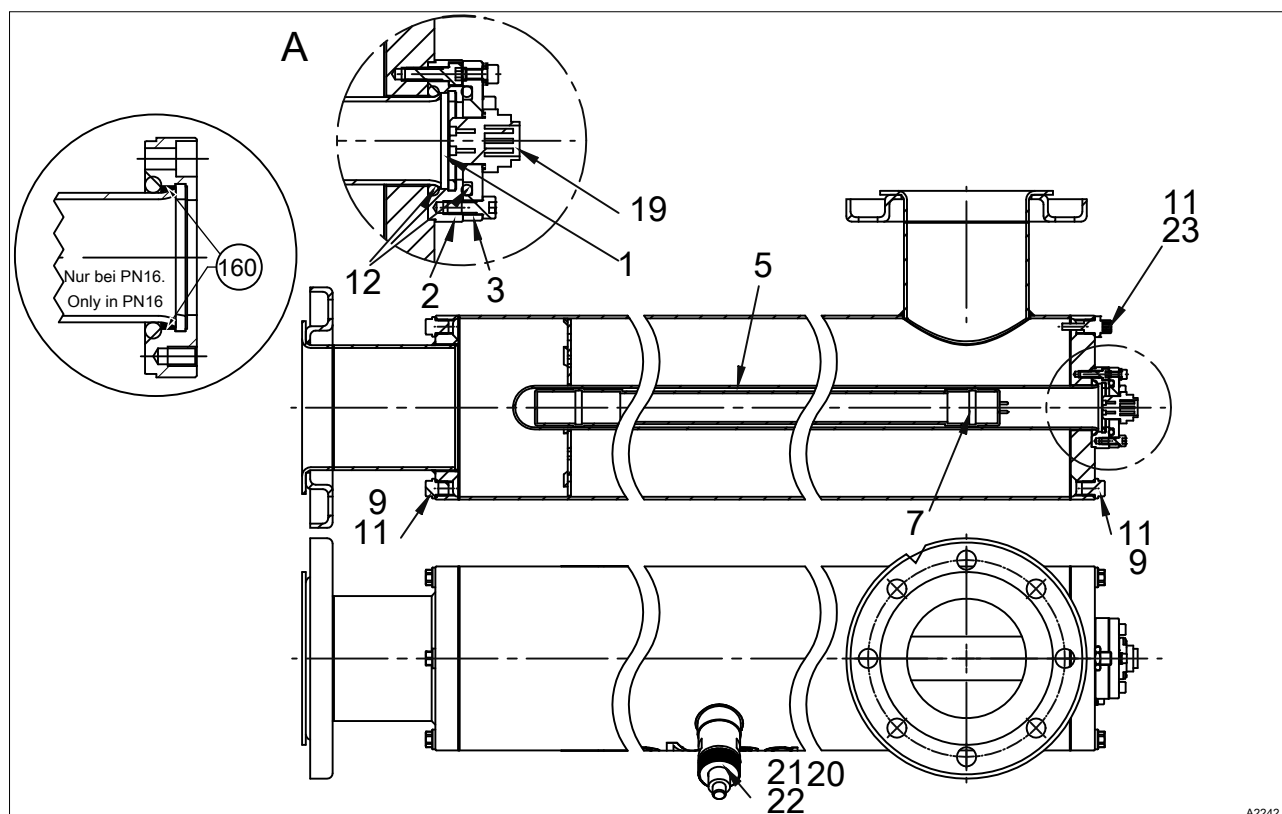


Fig. 11: Spare parts, 350 W

Tab. 11: Spare parts list, 1x350 W

No.	Designation	Spare parts number	Replacement interval	No.
2	Lamp holder, Ø74x16, 1.4404	1049341	As necessary	1
3	Lamp cover, Ø73x9, 1.4404	1049343	As necessary	1
4	Retainer, Ø48.5/39x3 PTFE	1035074	As necessary	1
5	Lamp protection tube with seal, Ø40*2*1450. no longer available, replaced by 1107757.	1049344	---	---
5	Lamp protection tube with seal, Ø40*2*1450. New. The new lamp protection tube is backward-compatible.	1107757	3 years	1
7	UV lamp, 350 W	1061418	14,000 hours	1
9	Locking screw, DIN 910, G 1/4A	1002752	As necessary	1
11	O-ring/M 10.50 - 1.50, EPDM/P	1001356	After each opening	1
12	O-ring/M 40.00 - 5.00, EPDM/P	1023569	After each opening	2
19	Flange plug, PG9 3+PE, Series 69	1017625	As necessary	1
20	O-ring/M, 33.05 - 1.78, EPDM/P	1023570	After each opening	1
21	Sensor window, G1 x 20, (certified UV system)	1076121	As necessary	1
22	UVC sensor, DVGW 160°, (certified UV system)	1076149	As necessary	1
22	UVC sensor, NPLP G1 14404 (non-certified UV system)	1075544	As necessary	1

No.	Designation	Spare parts number	Replacement interval	No.
30	Lamp cover with plug, UV-LP 230 + 350	1075127	As necessary	1
31	Socket with leads	1075083	As necessary	1
33	Sensor connection cable, UV-LP, 4.5 metres	1062303	As necessary	1
33	Sensor connection cable, UV-LP, 9 metres	1062314	As necessary	1
33	Sensor connection cable, UV-LP, 13 metres	1062315	As necessary	1
35	Lamp cable with cable socket, 4 metres	1062317	As necessary	1
35	Lamp cable with cable socket, 8.5 metres	1062318	As necessary	1
35	Lamp cable with cable socket, 12.5 metres	1062319	As necessary	1
160	PN16 only: Support ring, Ø 42x4, PTFE	1104884	As necessary	1
--	EB 380 for 230-watt and 350-watt UV lamp	1061780	As necessary	1

11.4 UV system operating log

[illegible]

12 Declaration of Conformity

We,

- ProMinent GmbH
- Im Schuhmachergewann 5 - 11
- D - 69123 Heidelberg, Germany,

hereby declare that the product specified in the following, complies with the relevant basic health and safety requirements of the EU Directive, on the basis of its functional concept and design and in the version distributed by us. Any modification to the product not approved by us will invalidate this declaration.

Tab. 12: Extract from the EU Declaration of Conformity for Devices with Motor Wipers

Designation of the product:	Dulcodes UV disinfection system
Product type:	UVCb X ≠ 4, 5
Serial number:	see nameplate on the device
Relevant EU directives:	EU Low Voltage Directive (2014/35/EU) EU-EMC Directive (2014/30/EU) EU Pressure Equipment Directive (2014/68/EU) EU RoHS Directive (2011/65/EU)
Harmonised standards applied, in particular:	EN 12100:2010 EN 60204-1:2009 EN 60335-1:2014 EN 60529:2014 EN 61000-3-2:2015 EN 61000-6-2:2006 EN 61000-6-3:2012 (UVCbXXX..., XXX ≠ 04O-06O) EN 61000-6-4:2011 (UVCbXXX..., XXX = 04O-06O)
Applied national standards and other technical specifications in particular:	AD 2000
Date:	Heidelberg, 20.04.2016

The EC Declaration of Conformity is available to download on our homepage.

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ProMinent GmbH
Im Schuhmachergewann 5 - 11
69123 Heidelberg, Germany
Telephone: +49 6221 842-0
Fax: +49 6221 842-419
Email: info@prominent.com
Internet: www.prominent.com

983472, 6, en_GB