NATDIS
disinfect with the power of nature

ND Water 4000HHC – 21000HHC

Mounting and operating instructions

NATDIS I BRUNBJERG 70 I 6100 HADERSLEV I +45 22 680 680 I MAIL@NATDIS.DK I CVR: DK21586544 I NATDIS.DK

Content

1. Revision summary

Revision	Date	Comments/Changes
1.0	28-06-2021	Document created
2.0	11-04-2022	Added section

2. Hazard markings and safety signs

The following hazard markings are used on the equipment and have the following meaning:

Danger of non-coherent radiation

In this case UV light

Attention:

Protect eyes and skin against UVC light.

Danger

Electric current

Attention:

Access only for authorized personnel

3. Equipment information

3.1 Equipment purpose

The UV equipment is constructed to treat all light-accessible surfaces in the selected area in a chosen timeframe and area.

3.2 Function of UVC-installations:

- UV-installations are controlled by an on / off switch
- UVC-lamps are switched off if:
  - The on / off contact is switched off
- Restarting of the system
  - Prerequisite for switching on must be present

When observing faults: switch off main switch (switch off system) and consult service manual.

3.3 About the documentation

This manual has been made as a basis for the CE marking and is completed in accordance with Directive 2006/42 / EC of the European Parliament and of the Council of 17 May 2006.

The folder contains important information about the installation, including service manual and safety instructions.

It is recommended to keep the folder visible and close to, the machine and inform your staff about it.

4. Equipment overview

The UV-unit contains of:

Defined on the order confirmation.

4.1 Environment for the equipment

4.1.1 Requirement before use

The equipment should be used as a disinfection solution with the purchaser:

- The equipment must not be used until the system has been installed in accordance with the regulations.
- The equipment may only be operated by personnel who have been properly instructed in its use.
- Repairs, service, and maintenance may only be carried out by qualified persons with proper training.
- If constructive changes are made to the equipment, the CE marking will lapse.

4.1.6 Disposal of parts

Consumables must be disposed of in accordance with current legislation

UVC- lamps contain mercury and must be disposed of in accordance with current regulations for lamps containing mercury.

4.2. Mounting instructions

Installation of UV systems must be done according to specifications.

Installation and operation of the unit can be vertical or horizontal.

Note that to ensure the best possible venting of the UVC unit, it is recommended to let the water into the bottom of the pipe and out of the top of the pipe.

The UVC unit is mounted with the supplied clamps and is connected to power when there is water in the reactor.

After connecting power to the control box, the UV system, can be switched on.

On the front of the control box there are two lamps that indicate the function of the lamp. At green light, the lamp is on. At red light, the lamp is off or there is a fault in the system.

The UVC light is outside the visible spectrum and therefore bulbs should be replaced according to the following instructions.

• Installations with light 24/7 in normal temperature ranges	Change after 14 months of continuous operation
• Installations with light 24/7 in temperatures >40C or <10C	Change after 12 months of continuous operation
• Installations with frequent switch on and off	Max. 3000 on/off
• Installations with other type of use	Max. 2 years from delivery date
Avoid short-term (<5 min.) Switching on / off of bulbs. It has a strong degenerative effect on the life of the bulbs and is not covered by the warranty obligation.	

5. Safety in and around UV equipment

5.1 UVC physical:

UVC is shortwave radiation that loses its energy quickly in relation to distance from the source. The type of source for UVC used here loses its energy in relation to distance (meters). UVC is effectively stopped by transparent materials such as ordinary glass, plexiglass, plastic, most kind of clothing. Opaque materials usually block UVC.

Dose:

UV systems work with a treatment dose of: xx J / m2 per treatment (on light-accessible surfaces).

The table below taken from "A Non-binding guide to the Artificial Optical Radiation Directive 2006/25 / EC" indicates the recommended maximum dose for "NON COHERT" radiation per day.

Duration of exposure per 8 hour day	Irradiance (Effective) – W m^{-2}
8 hours	0,001
4 hours	0,002
2 hours	0,004
1 hour	0,008
30 minutes	0,017
15 minutes	0,033
10 minutes	0,05
5 minutes	0,1
1 minute	0,5
30 seconds	1,0
10 seconds	3,0
1 second	30
0,5 second	60
0,1 second	300

5.2 About the risk using UVC*:*

When using normal work clothes with full cover of skin and safety glasses, the risk of permanent damage from short-term exposure to UVC light is limited to the effect on the skin and the minimal risk of damage to the eyes.

In connection with the placement of UVC systems, warning signs is placed warning of the use of UVC.

Direct view to the UV equipment should be assessed in the specific cases.

5.3 UVC damages

Possible damage when exceeding the dosage of UVC light in accordance with current instructions, see section 5.1 above

5.3.1 One-time injuries:

In case of minor exceedance, factor 4 -6

Risk of:

- Eyes, short-term irritation 24-48 hours (welding eyes)
- Skin, slight redness

In case of moderate exceedance, factor 6 -10

Risk of:

- Eyes, severe irritation 24-48 hours (severe cases of welding eyes, with short-term loss of vision)
- Skin, severe redness like light to medium sunburn.

In case of severe exceedance factor +10

Risk of:

- Eyes, permanent damage, impaired vision
- Skin, Severe sunburn; 2nd degree combustion.

5.3.2 Repeated daily dose overruns:

- Eyes, permanent damage, impaired vision
- Skin, development of various types of skin cancer (presumed, not detected)

In the situation in question, it has been included in the assessment that this is a production area with the use of full clothing in the work area.

5.4 Environment:

5.4.1 Staff:
The UVC-lamps are installed in a professional work environment where instructions are part of everyday life and where unauthorized personnel should not have access to turn on the UVC light.

5.4.2 Installation:
The control box is fitted with a switch with the option of installing a padlock and secure against unintentional use.

5.5 Safety:

5.5.1 Disposal after use

- Before dismantling the installation, a plan for disassembly must be prepared.
- The plan must include a risk assessment for the work as well as for disposal of installation and the spare parts.
- Plan and risk assessment must be prepared in accordance with current rules at the time of dismantling.

Scrapping

- The system is dismantled and sorted into categories as required by applicable environmental requirements
- The installation is subject to Directive 2008/98 / EC and Directive 2002/96 / EC on waste.
- When the system is obsolete, all existing components must be sorted and handed in at an approved recycling site, or at an approved recycling company.
- The system must not be disposed of with unsorted household waste. Use the local collection points for the disposal of electrical and electronic components and ensure that all relevant regulations are observed.

The system consists of the following parts and must be sorted accordingly:

- Iron.
- Aluminum
- Plastic. (hard and soft)
- Rubber.
- Electrical components.
- Electronics
- Copper
- Other metals.

- If parts of the systems are resold for purposes other than disposal, it is the owner's responsibility to make the recipient aware of the disposal rules.

5.5.4 Procedure when a bulb containing mercury is crushed

1. Evacuate people and animals from the room
2. Ventilate the room for at least 15 minutes before starting the clean-up
3. Use protective equipment such as gloves and safety goggles
4. Pick up the broken pieces and dirt with two pieces of cardboard
5. You can use tape to pick up small pieces
6. After cleaning up, clean the area with a damp cloth or towel to remove small particles
7. Collect all pieces and dirt in a tight container and dispose of as special waste (recycling site)

6. Service and maintenance

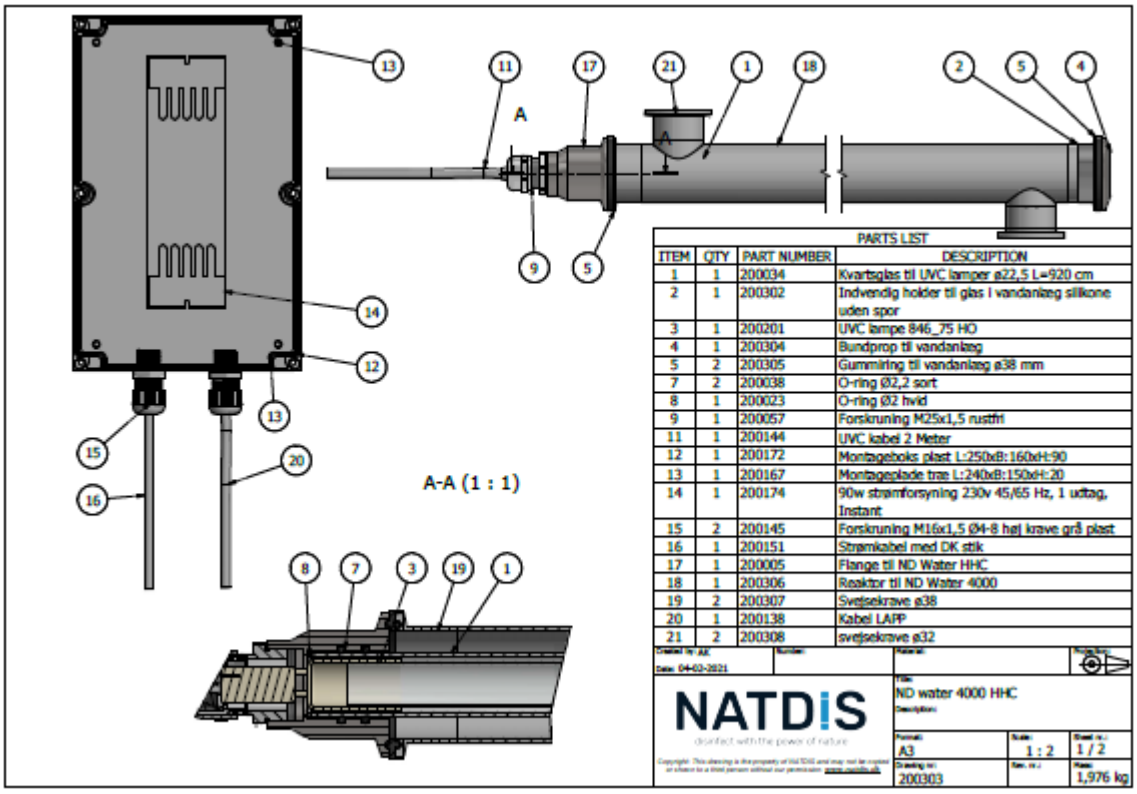
Gloves should comply with EN388: 2019-4121X.

All service and maintenance must be performed without danger.

System must be shut off and cooled down before service is performed.

Access to bulb change or quartz glass change can be done by detaching lamps from fittings / clips.

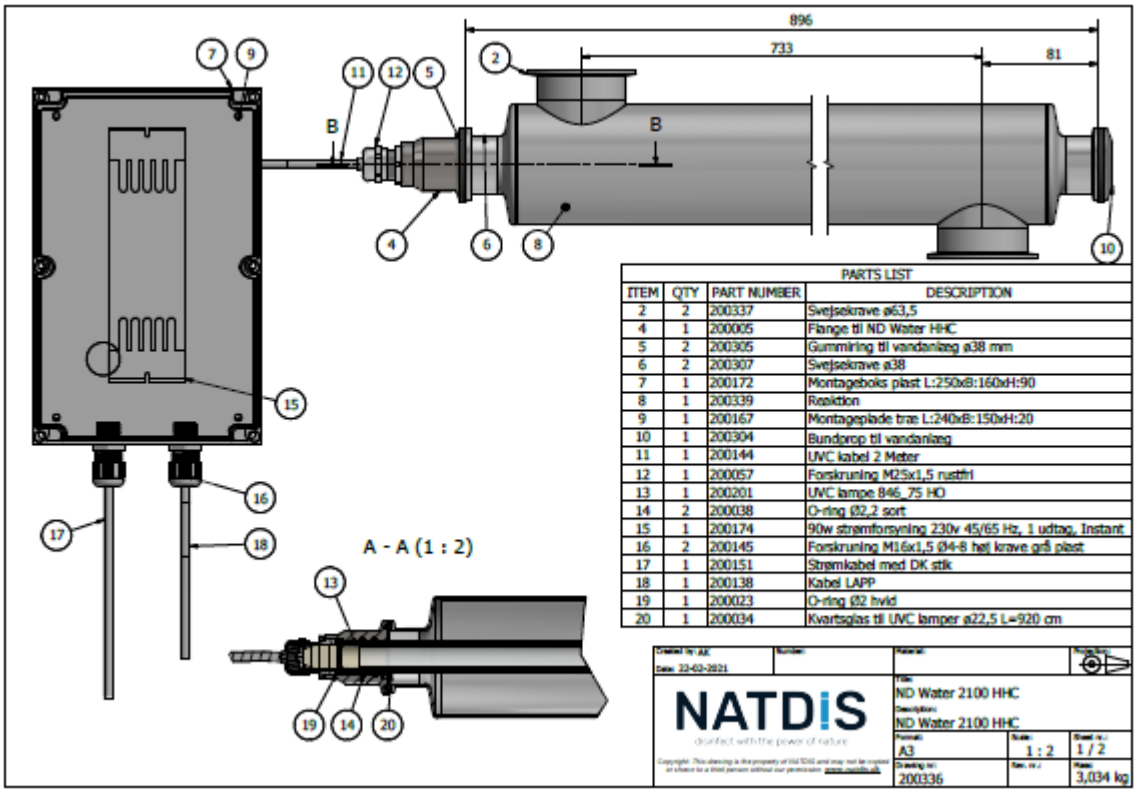
6.1 Service overview



PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	200034	Kvartsglas til UVC lamper ø22,5 L=920 cm
2	1	200302	Indvendig holder til glas I vandanlæg silikone uden spor
3	1	200201	UVC lampe 846_75 HO
4	1	200304	Bundprop til vandanlæg
5	2	200305	Gummiring til vandanlæg ø38 mm
7	2	200038	O-ring Ø2,2 sort
8	1	200023	O-ring Ø2 hvid
9	1	200057	Forskruning M25x1,5 rustfri
11	1	200144	UVC kabel 2 Meter
12	1	200172	Montageboks plast L:250xB:160xH:90
13	1	200167	Montageplade træ L:240xB:150xH:20
14	1	200174	90w strømforsyning 230v 45/65 Hz, 1 udtag, Instant
15	2	200145	Forskruning M16x1,5 Ø4-8 høj krave grå plast
16	1	200151	Strømkabel med DK stik
17	1	200005	Flange til ND Water HHC
18	1	200306	Reaktor til ND Water 4000
19	2	200307	Svejsekrave ø38
20	1	200138	Kabel LAPP
21	2	200308	svejsekrave ø32

NATDIS
disinfect with the power of nature

ND water 4000 HHC		
A3	1 : 2	1 / 2
200303		1,976 kg



PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
2	2	200337	Svejsekrave ø63,5
4	1	200005	Flange til ND Water HHC
5	2	200305	Gummiring til vandanlæg ø38 mm
6	2	200307	Svejsekrave ø38
7	1	200172	Montageboks plast L:250xB:160xH:90
8	1	200339	Reaktion
9	1	200167	Montageplade træ L:240xB:150xH:20
10	1	200304	Bundprop til vandanlæg
11	1	200144	UVC kabel 2 Meter
12	1	200057	Forskruning M25x1,5 rustfri
13	1	200201	UVC lampe 846_75 HO
14	2	200038	O-ring Ø2,2 sort
15	1	200174	90w strømforsyning 230v 45/65 Hz, 1 udtag, Instant
16	2	200145	Forskruning M16x1,5 Ø4-8 høj krave grå plast
17	1	200151	Strømkabel med DK stik
18	1	200138	Kabel LAPP
19	1	200023	O-ring Ø2 hvid
20	1	200034	Kvartsglas til UVC lamper ø22,5 L=920 cm

NATDIS
disinfect with the power of nature

ND Water 2100 HHC		
ND Water 2100 HHC		
A3	1 : 2	1 / 2
200336		3,034 kg

6.2 Bulb change:

1. Switch off and let the system cool down for at least 30 minutes.
2. Loosen the screw connection around the cable.
3. Carefully pull back on cord until the bulb comes free of flange.
4. Carefully tilt the plug free of the bulb. NOTE Hold on to the bulb!
5. Carefully pull the bulb out of the quartz glass.
6. Switch to a new bulb and insert it into the quartz glass.
7. Attach the plug to the new bulb and refit the screw connection.

6.3 Change of quartz glass:

1. Switch off and let the system cool down for at least 30 minutes.
2. Remove bulb as specified in section 6.1.
3. Loosen the clamps at the top
4. Quartz glass and flange can now be carefully pulled out of the reactor
5. Hold on to quartz glass and flange
6. Gently pull straight forward into the quartz glass
7. Carefully pull in quartz glass until it releases the flange – NOTE beware of glass splinters
8. Attach new quartz glass to flange and re-insert the new bulb
9. Attach plug to bulb and close with screw connection.
10. Place the quartz glass in the same position and reassemble.

6.4 Error

In case of insufficient disinfection, please check the following:

Possible causes	Solution
Dirt on the quarts glass	Cleaning – avoid using abrasives or tools and finish with an alcohol-based agent to remove grease
Overheating	Check that there is water flow in the unit
Air in the unit	Vent the unit by sending water unto the button of the reactor and out through the top
Expiration of life on bulb	Replace the bulb. Note that the bulb is guaranteed for 10.000 hours (14 months) and that the bulb will still work after that. The efficency is declining after 10.000 hours of use and the bulb should be replaced.

7. Cleaning of UVC-Systems

7.1 Purpose

Systematic cleaning is part of the maintenance of the equipment and contributes to the optimal function of the equipment. At the same time, cleaning will ensure ongoing inspection of the condition of the equipment.

The following sections provide procedures that describe how routine cleaning is performed for equipment provided by NATDIS.

7.2. Precautions

WARNING!

Danger of non-coherent radiation

In this case UVC light.

Attention:

Protect eyes and skin against UVC-light.

Equipment supplied by NATDIS may only be cleaned when the system is switched off and in a safe condition.

All work on UVC systems requires that the system is secured before work begins. Cleaning must only be done when the system has stopped and cooled down!

Use clean gloves are required

Attention:

Protect your hands from heat, sharp edges, and glass splinters with gloves. Must comply with EN388: 2019-4121X

Always comply with local regulations when choosing a cleaning agent. Follow the warnings and safety descriptions on the individual containers and safety data sheets. Abrasives must not be used.

7.3. Cleaning

The quartz glass should be inspected for coatings annually or more often if there is ocher or lime in the water.

Procedure:

1. Turn off the unit
2. Shut off the water flow and loosen the clamp at the top of the reactor.

3. Carefully pull the quartz glass out of the reactor. Wear clean gloves when touching the quartz glass.
4. Finish by wiping with an alcohol-based cleaner. A low pH cleaner can be used. Do not use abrasives or cleaning tools.
5. The plate in the bottom of the reactor can be removed when cleaning. In some models, a silicone gasket is fitted at the bottom, and it should be replaced when changing the bulb.

In connection with the cleaning, the UV unit must be inspected for defects.

Check the following:

1. Glass is intact without cracks
2. Cables are properly mounted
3. Gaskets by clamps are tight

8. Liability and Warranty

We are only liable for warranty claims under national law. The following warranty is provided on bulbs as standard; 10,000 hours burning time with continuous operation or 3000 on / off or max. 2 years from time of delivery.

Avoid many short-term on and off switching of UV equipment. It has a strong degenerative effect on the life of the bulbs and is not covered by the warranty obligation.

Breakage and glass damage are not covered by the warranty.

Our general terms of sale and delivery are always valid.

We cannot be held responsible for damages caused by:
- Operating errors caused by non-compliance with these guidelines.

Warranty lapses upon:
- Operation with spare parts that are non-original.
- Defective or incorrect installation
- Installation of unsuitable accessories
- Incorrect operation
- Removal, manipulation, or removal of safety equipment
- Unproper performance of service and maintenance
- Wear and lack of maintenance
- Effects on vibrations from the installation site
- Impacts in the environment or installation, which we did not have the opportunity to anticipate at the time of dimensioning.