NATDIS
disinfect with the power of nature

ND Air Active 90/300

Mounting and operating instructions

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1. Revision summary

Revision	Date	Comments/Changes
1.0	12-03-2021	Document created
2.0	06-04-2022	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 Definition of UVC-disinfection

UVC unit is dimensioned to deliver a dose of (as per by agreement) J / m2 on all light-accessible surfaces after a full cycle of the time (by agreement).

3.3. 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.

3.4 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 Surface
The installation must be installed according to the instructions.

4.1.2. Placement
The equipment may only be used in places where it can be securely fastened.

4.1.3 Temperature and humidity
The equipment can be used in temperatures between 10-40°C and max. 60% humidity as standard.

4.1.4. Storage and environment
The equipment is not designed for outdoor use or storage.
If the equipment meets saline or acidic moisture or liquid, this should be removed from the system as soon as possible to prevent corrosion.

4.1.5. 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 or further agreement.

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.

5.2 About the risk using UVC

In connection with 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.

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

5.3 UVC damages

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

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.

5.5 Safety

The following safety systems may be installed in connection with UVC systems:

- Sign's warning of the use of "Non-Coherent Optical Radiation" (in this case UVC light)
    - In and around the room.
- Instructions for personnel using the system

5.5.1 Disposal

- 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.

5.5.2 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 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 Bulb change:

1. Switch off and let the system cool down for at least 30 minutes.
2. Loosen the screws on the unit. The three bulbs are now available.
3. Carefully lift the bulbs free of clips.
4. Gently tilt the plug free of the bulb. NOTE Hold on to the bulb!
5. Switch to a new bulb
6. Attach plug to the new bulb and refit in clips.
7. Reassemble the unit with screws.

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

Dry cleaning includes a thorough vacuuming of the components. A vacuum cleaner equipped with a suitable filter for product and material residues must be used.

Never wipe product dust off dry, and never use compressed air for dry cleaning, as product dust will not be removed via these methods; and the product dust will simply be distributed around the area.

7.3.1 Cleaning frequency

The cleaning frequency depends on the production facilities. The cleaning intervals may therefore vary.

It is also recommended to minimize the general amount of dust around UVC systems, as this can result in coating and thereby impair UVC function and shorten the life of the lamps.

Vacuuming can be supplemented with wiping with a soft cloth and detergent. Here the local legal regulations in the area must be complied with.

Abrasives must not be used.

7.3.2 Detergents

Always observe the legal regulations when choosing detergent. Follow the warnings and safety descriptions on the individual containers and safety data sheets.

Information on suitable cleaning agents can be found in the following table:

Material	Suitable cleaning agent	Important instructions
Stainless steel	Isopropanol or other non-abrasive cleaner for metal and glass	Use a soft cloth
Glass	Isopropanol	Use a soft cloth

7.4. Cleaning procedure and inspection

The cleaning procedure must ensure efficient daily operation.

1. Clean gloves must be worn.
2. Cleaning is performed at least once a month, or according to requirements.
3. UV-equipment is cooled down and ready for cleaning.

In connection with the cleaning, the UV equipment must be inspected for breaks and defects.

Check the following:

1. All is intact without cracks and crushes.
2. Cables are seated and installed correctly.

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.