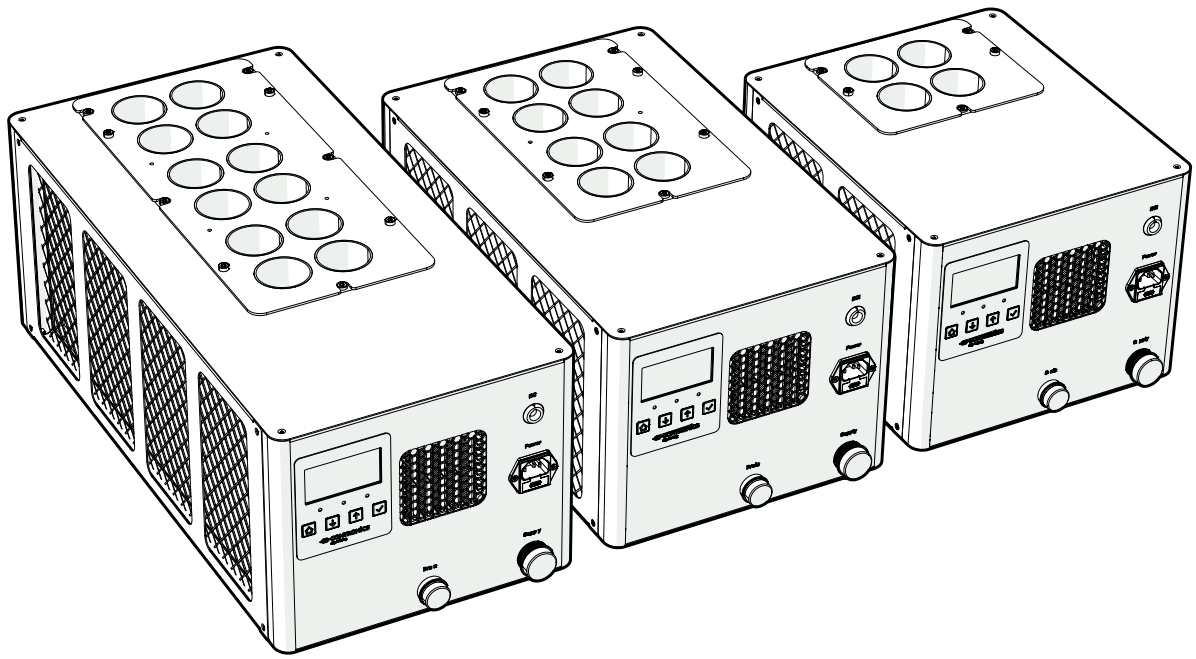
Ultrasonic humidifier

EP DM4
EP DM8
EP DM12

EN - Original instructions



CONTRONICS
dry misting

Preface

45% of all beautiful crops that grow on our fields ends up wasted. This not only puts a heavy burden on our environment, but is also unacceptable in a world with a growing population and so many mouths to feed.

Dry Misting is a technology that spreads tiny drops of water in the air, creating a thin layer of mist. As the mist evaporates, the humidity rises and the temperature drops naturally. When applied on fresh products, Dry Misting results in retaining freshness, colour and nutrients. Extending the shelf life of these products up to twice as long and hereby reducing food waste.

At Contronics, we are on a mission is to reduce food waste by applying Dry Misting throughout the entire fresh food supply chain.

Thank you for your purchase and joining us on this mission!

Copyright disclaimer

Liability disclaimer

Contronics Engineering B.V. does not accept any liability due to incorrect installation, maintenance or operation of the equipment described in this manual, or due to the use of components that are not authorised by Contronics.

Table of Contents

1 About this document

This instruction manual contains the information necessary to properly and safely install, operate, commission and maintain your humidifier.

Store this manual in or near the humidifier for future reference.

1.1 Intended readers

This instruction manual is intended for the following readers:

- The owner of the humidifier.
- The technician that performs the installation, commissioning and/or maintenance of the humidifier.
- The operator of the humidifier.

Make sure you have fully read and understood the contents of this manual before installing, operating or performing maintenance on the humidifier.

1.2 Language

This instruction manual is originally written in English (GB) and has been translated to:

- Dutch (NL)
- French (FR)
- German (DE)

1.3 Symbols used in this manual

The following symbols are used throughout this manual to highlight important information:

Symbol	Definition
⚠ WARNING	Indicates a hazardous situation that, if not prevented, could result in death or serious injury or serious damage to the product or the environment.
⚠ CAUTION	Indicates a hazardous situation that, if not prevented, could result in moderate or minor injury or minor damage to the product or the environment.
NOTICE	Indicates useful information that is not related to hazardous situations.
	Indicates a reference to another paragraph within this document.

Symbol	Definition
	Indicates a reference to tools or materials that are not provided along with the humidifier.
	Indicates a reference to an OEM manual or another external document.

1.4 Terminology

The following terms are used throughout this manual:

Term	Definition
Transducers	Components that convert an electrical signal to mechanical vibrations. Located on the bottom of the water reservoir.
Mist	The humidified air that is created by the humidifier.
Mist distribution system	The network of pipes through which the mist is transported to the area that needs to be humidified.
RO water	Demineralised water that has been filtered via reverse osmosis.

1.5 Product variations

This manual applies to the following humidifiers:

- EP DM4
- EP DM8
- EP DM12

All models have identical functionality. The models also vary in capacity, amount of air outlets and length.

NOTICE

The illustrations in this manual show the EP DM4, unless stated otherwise.

1.6 Warranty

A warranty period of one (1) year applies to this humidifier. The general terms and conditions of Contronics apply to this warranty.

The general terms and conditions of Contronics can be found in the appendix of this document.

1.7 Contact information

For more information about your humidifier or this document, please contact:

CONTRONICS dry misting

Contronics B.V.
Tel: +31(0)413 487 000
Mail: info@contronics.nl
Ambachtsweg 8
5492 NJ, Sint-Oedenrode
The Netherlands

2 About the product

This chapter provides all the information necessary to understand the humidifier.

2.1 Intended use

The humidifier is intended to be used to generate and distribute humidified air with the goal of preserving fresh produce.

2.1.1 Unintended use

The humidifier is not intended for use in healthcare premises or other locations where the occupants or materials are adversely sensitive to airborne bacteria, viruses, dust, and debris.

The humidifier is not intended to be supplied with any other liquids other than water.

The humidifier is not intended for outdoor use.

NOTICE
Contronics does not accept liability for injury, product damage or reduced performance due to unintended use of the humidifier.

2.1.2 Other applications

The humidifier may be applied in other situations than described in this document.

Various information sheets and drawings about other applications can be downloaded from www.contronics.nl.

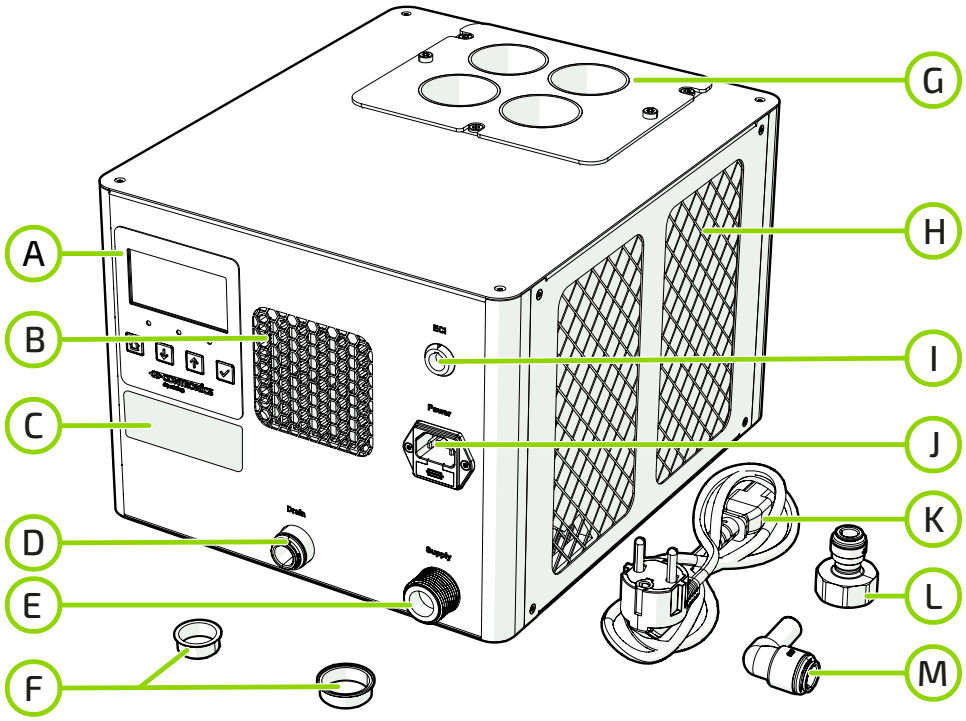
2.2 Description

The function of the humidifier is to generate and transport humidified air. This is done as follows:

1. Water is transported into an internal water reservoir. Excess water is discharged.
2. Air is sucked into the humidifier by a fan. The air passes through a filter to remove any pollution.
3. High-frequency vibrations (1.7 MHz) are generated by transducers at the bottom of the water reservoir.
4. Water droplets (1 – 3 µ) are ejected above the water surface.
5. Water droplets mix with the air.
6. Humidified air is transported out of the humidifier into the connected distribution system.

2.3 Main components

The humidifier consists of the following main components:



- A Display & controls
- B Air outlet for internal cooling
- C Label
- D Water drain connection
- E Water supply connection
- F Water supply and drain covers
- G Mist outlets
- H Air inlets & filters
- I External control interface
- J Power cable socket (C13)
- K Power cable
- L Water supply connection piece
- M Water drain connection piece

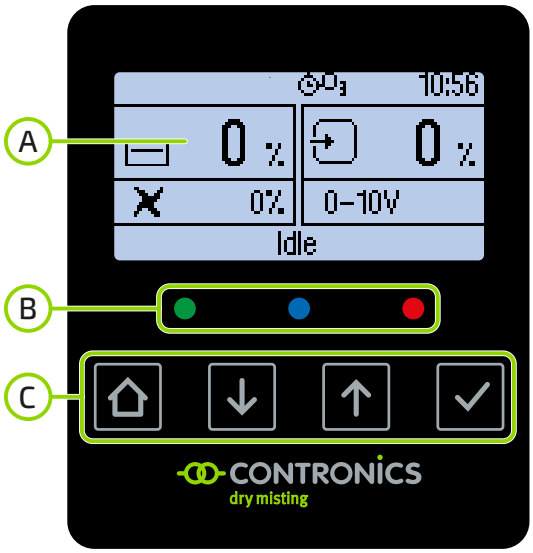
A detailed parts list of the humidifier can be found in §9.5 .

2.4 Display & controls

The humidifier is controlled through a display, located on the front panel of the humidifier. The display allows you to:

- Monitor the performance.
- Change the performance settings.
- Receive error messages.

The display consists of the following components:



A LCD display
B Feedback LEDs
- Green
- Blue
- Red

C Buttons
- Home
- Down
- Up
- Confirm

For instructions on how to use the display, see §7.2 .

The feedback LEDs communicate information about the status of the humidifier:

Colour	Status	Meaning
	On	Flushing cycle is active.
	Blinking	Water reservoir is being filled.
	Off	Water reservoir is full.
	On	Mist is being produced. The intensity of the LED indicates the set capacity of the humidifier: • Weak = Low capacity. • Strong = High capacity.
	Blinking	Ozone is being produced.
	Off	No mist or ozone is being produced.
	On	Error has occurred and is shown on the display.
	Blinking	Warning is shown on the display.
	Off	No errors or warnings are shown.

2.5 Ozone generator

The humidifier is equipped with an ozone generator. This component generates volatile ozone (O_3) gas that kills pathogens. The ozone is transported through the humidifier and distribution system to disinfect every component.

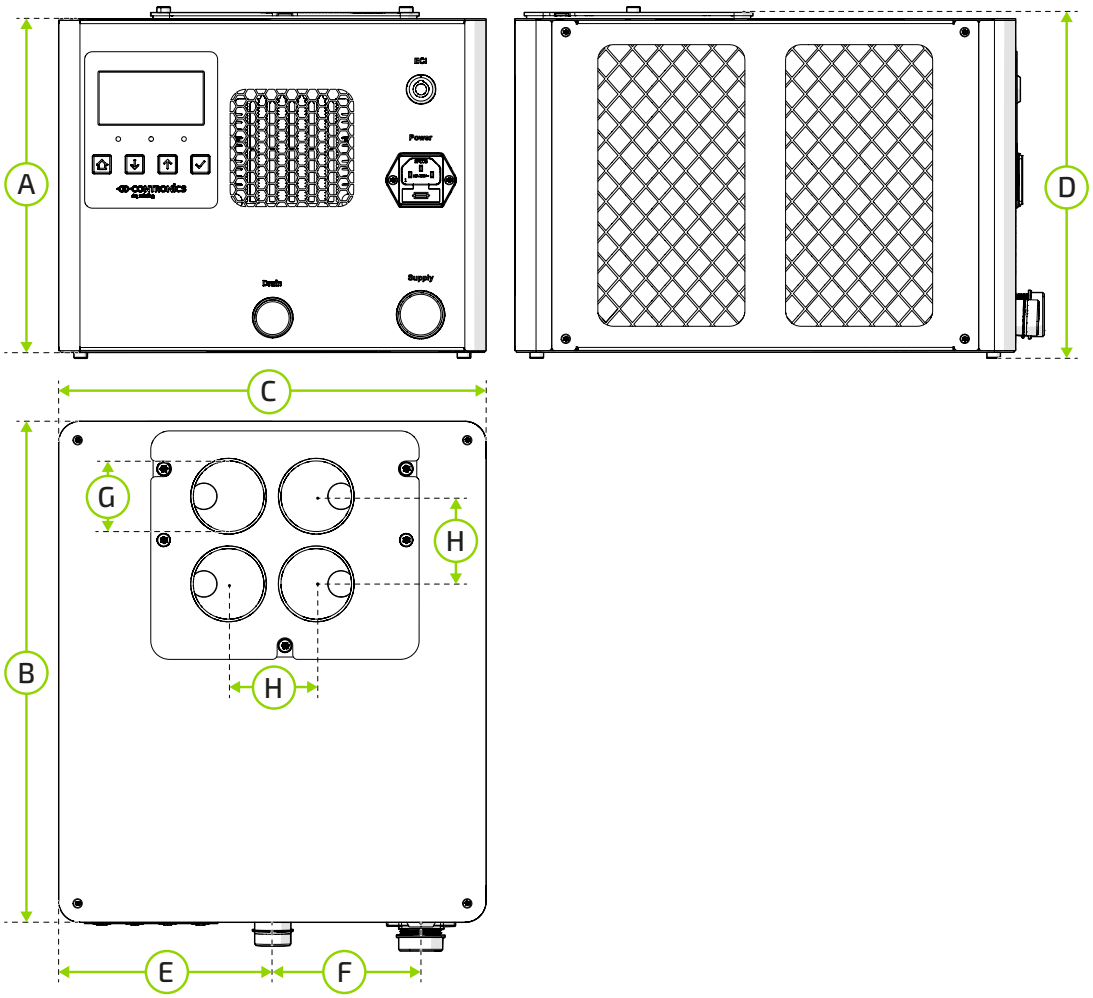
NOTICE

The amount of ozone generator modules varies per model:

- *The EP DM4 has 1.*
- *The EP DM8 has 2.*
- *The EP DM12 has 3.*

For instructions on how to program the ozone generator, see §7.4 .

2.6 Dimensions



Model	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)
EP DM4	213	320	273	224.4	136.5	95	45.1	56
EP DM8	213	440	273	224.4	136.5	95	45.1	56
EP DM12	213	560	273	224.4	136.5	95	45.1	56

2.7 Label & specifications

Important specifications of the humidifier can be found on the label:

The label is located on the front panel, below the display (see §2.3).

2.7.1 Physical specifications

The physical specifications of the humidifier are shown in the following table:

Model	Unit	EP DM4	EP DM8	EP DM12
Weight	kg	10.2	13.6	17.1
Water reservoir volume	L	0.7	1.4	2
Water supply connection (outer diameter)	inch	¾ (BSP Male thread)		
Water drain connection (inner diameter)	inch	½ (Quick connection)		

2.7.2 Performance specifications

The performance specifications of the humidifier are shown in the following table:

Model	Unit	EP DM4	EP DM8	EP DM12
Capacity	kg/h	+/- 3.3	+/- 6.6	+/- 9.9
Air flow	m^3/h	0 - 50	0 - 100	0 - 150
Supply voltage	VAC @Hz	110 - 240 @ 50 / 60	110 - 240 @ 50 / 60	110 - 240 @ 50 / 60
Power consumption	W	210	400	600

Model	Unit	EP DM4	EP DM8	EP DM12
Fuse	AT	3.15	6.3	8.0
Water supply pressure	Bar	0.2 - 6	0.2 - 6	0.2 - 6
Water supply temperature	°C	1 - 25	1 - 25	1 - 25
Ambient temperature	°C	0 - 40	0 - 40	0 - 40

2.7.3 Service life

The transducers are the critical components that determine the service life of the humidifier. The expected service life of the transducers is 10,000 hours.

NOTICE

- *Follow the instructions in this manual to maximise the service life of the transducers and the humidifier.*
- *If the transducers have reached the end of the service life, contact Contronics to replace these components.*

2.8 Optional components

The following components of the humidifier can be included in the delivery upon request.

2.8.1 Coupling pieces

Various coupling pieces can be connected to one or more air outlets of the humidifier. These coupling pieces determine the air flow for each part of the distribution system.

The following coupling pieces are available:

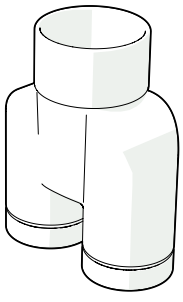
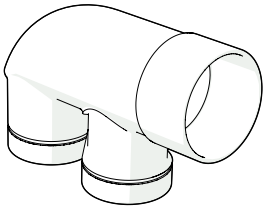
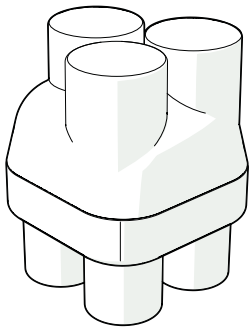
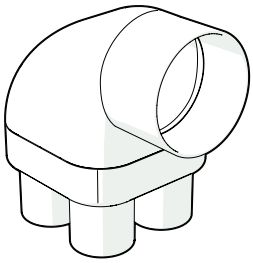
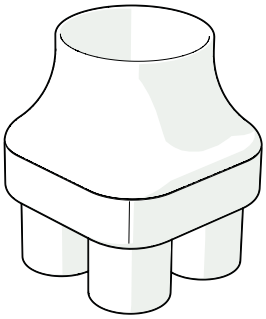
Image	Orientation	Air inlets	Air outlets	Outlet Ø	Part number
	Vertical	2	1	50 mm	MP DM-CON1X50V
	Horizontal	2	2	50 mm	MP DM-CON1X50H

Image	Orientation	Air inlets	Air outlets	Outlet Ø	Part number
	Vertical	4	3	50 mm	MP DM-CON3X50V
	Horizontal	4	1	80 mm	MP DM-CON1X80H
	Vertical	4	1	80 mm	MP DM-CON1X80V

2.8.2 Water filter unit

When a tap water supply is used, a RO water system must be installed between the water supply and the humidifier.

NOTICE

Reverse osmosis (RO) water filtration systems can be supplied by Contronics.

2.8.3 External control interface

An external controller or humidity sensor can be connect to the front panel of the humidifier (see §2.3).

NOTICE

For more information about the options of the external control interface, please contact Contronics.

2.9 Conformity

This humidifier carries the CE mark of conformity to the following directives:

- EMC directive: 2014/30/EU
- Low voltage directive: 2014/35/EU
- RoHs directive: 2011/65/EU
- WEEE directive: 2012/19/EU

The full declaration of conformity is available upon request. Please contact Contronics (see §1.7).

3 Safety

This chapter provides all the information necessary to safely interact with the humidifier.

3.1 Safety precautions

The following safety precautions are incorporated into the design of the humidifier to prevent dangerous situations:

- **Low water level shut-off system**
  The transducers will overheat if they vibrate when there is no water in the reservoir. A float switch in the water reservoir is activated when the water level drops below the minimum height. The transducers are deactivated and an error message is shown on the display.

- **Overflow protection**
  Overflow of the water reservoir may cause damage to the internal components of the humidifier. The water level in the reservoir is controlled by an overflow that is directly connected to the water drain.

- **Ozone generator back-up battery**
  The timer of the ozone generator is powered with a non-rechargeable back-up battery (CR2032) when there is no mains power available.

- **Overheating protection**
  When the internal temperature of the humidifier reaches the maximum allowed value (approximately 70 °C), a temperature sensor in the humidifier activates the overheating protection. The capacity of the humidifier is gradually reduced until the humidifier cools down.

For instructions on how to resolve overheating issues, see §8.3 .

3.2 Personal protection

Equip yourself with at least the following personal protective equipment:

During installation	During maintenance
 Wear protective boots	 Wear protective gloves
	 Wear safety glasses

3.3 Qualification of personnel

All procedures described in this document must be performed by someone who:

- has fully read and understood the contents of this manual;
- has fully read and understood the applicable laws and regulations regarding workplace safety;
- is authorised by the owner.

In addition, the installation of the humidifier must be performed by someone who has completed the installation training offered by Contronics.

The humidifier may not be used by persons (including children) with reduced physical, sensory, or mental abilities, or persons lacking experience and knowledge, unless they are being supervised by a person responsible for their safety or have received proper instruction on the operation of the humidifier.

3.4 Safety instructions

The humidifier poses some residual risks when incorrectly installed, commissioned, operated or maintained. Follow the instructions in this section to prevent hazardous situations that may arise.

3.4.1 Transport & storage

⚠ CAUTION

Always transport the humidifier in the original packaging. Transporting the humidifier in any other packaging may damage the humidifier and void the warranty.

⚠ CAUTION

Risk of damage to internal components. Water residue may remain in the reservoir:

- Always transport or store the humidifier in upright position.
- Always transport or store the humidifier in temperatures higher than 5 °C.

3.4.2 Installation & commissioning

⚠ WARNING

Risk of electric shock. The humidifier is powered by the mains power supply. Live electric components are exposed when the access panels or casings are removed. Touching live parts may cause severe injury or even death. To prevent this:

- When performing maintenance on the humidifier, remove the power cable from the humidifier and wait until the display goes dark. Setting the capacity to 0 does not shut off the power supply to the humidifier.
- Do not remove any casing panels when the humidifier is connected to a mains power supply.
- Make sure both filters are installed.
- Make sure that all casing panels are present and fastened when the humidifier is in operation.

⚠ CAUTION

Risk of damage to internal components. The humidifier has an open water reservoir. Overflow of the reservoir may damage the components inside the humidifier. To prevent this:

- Disconnect the power cable from the humidifier and empty the water reservoir before transport or performing maintenance activities.
- Keep the humidifier level and motionless while it is in operation and for up to two (2) minutes afterwards.
- Make sure the water is properly discharged through the water drain. Make sure the water drain is never blocked.

⚠ CAUTION

Risk of electrostatic shock. The electronic components inside the humidifier are sensitive to electrostatic discharge (ESD). Do not touch the circuit boards or other electronic components inside the humidifier.

⚠ CAUTION

Risk of reduced performance. When the humidifier distributes humidified air to another room, make sure that both rooms have the same atmospheric pressure.

⚠ CAUTION

Risk of damage to the humidifier. Joining the outlets of multiple humidifiers together may cause water to flow into a humidifier that is switched off. Do not connect the air distribution system or water drain pipes of multiple humidifiers to each other.

⚠ CAUTION

Risk of contamination. Contamination may enter the humidifier or distribution system during installation or maintenance. To prevent this:

- Wear gloves when installing or performing maintenance on the humidifier.
- Keep all components clean during installation.
- Disinfect the humidifier after installation.

⚠ CAUTION

Risk of damage to electronic components. The humidifier contains sensitive electronic components. Only connect the unit to a mains power supply with a supply voltage that matches the voltage specified on the label (see §2.7).

⚠ CAUTION

Risk of damage to the humidifier. The water drain connection is not pressurized. A blocked drain channel may damage the humidifier:

- The outlet of the drain channel must be free. Do not place the outlet under water.
- Make sure that the water drain connection on the humidifier is the highest point in the water drain channel.
- Do not place the humidifier on a tray with raised edges.

3.4.3 Operation

⚠ WARNING

The humidifier is not intended for use in healthcare premises or other locations where the occupants or materials are adversely sensitive to airborne bacteria, viruses, dust, and debris.

3.4.4 Maintenance

⚠ WARNING

Risk of injury to respiratory system. Ozone is harmful to your health if the gas is inhaled over a longer period of time or in a higher concentration. To prevent this:

- Do not program the ozone disinfection process to run when there are people in the vicinity of the air distribution outlets.
- Do not disconnect the air distribution system or water connections or dismantle the casing when the ozone generator is active.

⚠ CAUTION

Risk of product damage. The use of harsh or abrasive cleaning materials may damage the humidifier. To prevent this:

- Do not clean the humidifier with solvents, aromatized, halogenized hydrocarbons or other harsh chemicals.
- Do not clean the humidifier with hard or metallic brushes, or any other cleaning materials that could leave scratches on wet, plastic and metal surfaces.

3.4.5 Hygiene

⚠ WARNING

Risk to hygiene and health. Improper maintenance of the humidifier may cause pathogens to originate from the water reservoir. These pathogens may be spread along with the humidified air and transported via the distribution system. Failure to prevent may cause injuries that require medical care. To prevent this:

- Regularly clean or replace the air filter panels on both sides of the humidifier.
- Supply the humidifier with demineralized water.
- Regularly run a flushing cycle (see §7.3).
- Regularly run an ozone disinfection program (see §7.4).

4 Transport & storage

This chapter provides all the information necessary to transport and store the humidifier.

4.1 Packaging

The humidifier is delivered in a reusable cardboard packaging.

NOTICE

- *Some traces of water may be found in the packaging. The humidifier is thoroughly tested before shipping and some water may remain in the reservoir before it is packed.*
- *Store the packaging for later use. The packaging is reusable and can be used for storage or for re-shipping the humidifier for maintenance activities.*

4.2 Storage

Store the humidifier in the original packaging until it is installed, or when storing the humidifier for a long period of time.

Store the humidifier in a room that meets the following requirements:

- Room temperature between 5 and 40 °C (41 and 104 °F).
- Room humidity between 10 and 75% (non-condensing).

4.3 Transport

⚠ CAUTION

Always transport the humidifier in the original packaging. Transporting the humidifier in any other packaging may damage the humidifier and void the warranty.

5 Installation

This chapter provides all the information necessary to install the humidifier.

5.1 Safety

⚠ WARNING

Before installing the humidifier, make sure you have read and understood the relevant safety instructions in §3.4 . Important safety instructions will be repeated throughout this chapter.

5.2 Removing and inspecting the packaging

After receiving the humidifier, do the following:

1. Inspect the outside of the packaging for damage.
2. Open the packaging and remove the contents. This includes the following:
   - Humidifier
   - Power cable
   - Water connection pieces
   - Quick start guide

NOTICE

Any custom components are delivered separately (see §2.8.1).

3. Inspect the humidifier and other components for damage.
4. Verify that the model type on the type plate of the humidifier matches the one on the order confirmation.

NOTICE

- *Report any damage to the packaging, damage to the components or missing components to Contronics or your supplier within 48 hours after delivery.*
- *Store the packaging for later use. The packaging is reusable and can be used for storage or for re-shipping the humidifier for maintenance activities.*

5.3 Placing the humidifier

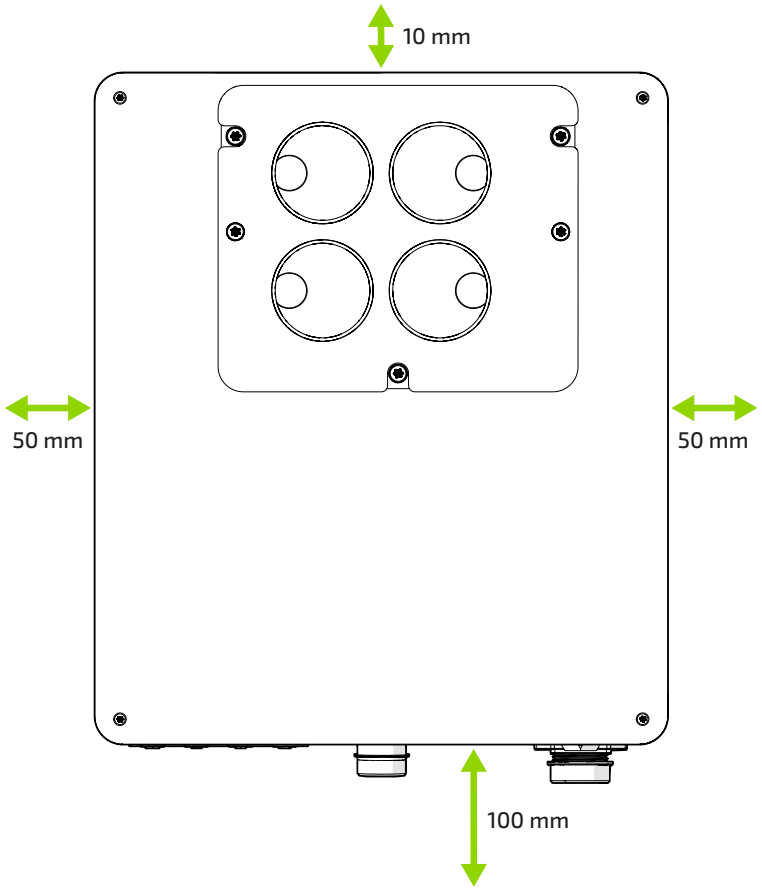
5.3.1 Location requirements

Select a location that meets the following requirements:

- Ambient temperature between 0 and 40 °C.
- Humidity of less than (<) 100%.
- Accessible for operation and maintenance.
- An unused earthed power outlet nearby.

5.3.2 Clearances around the humidifier

To ensure optimal performance and allow for easier operation and maintenance, place the humidifier with the following clearances:



5.3.3 Instructions

Place the humidifier as follows:

- Place the humidifier on a flat, stable and level surface.
- Do not place the humidifier:
  - in a closed tray with raised edges;
  - on hot or cold surfaces;
  - near vibrating components;
  - near a heat source.

5.4 Water connections

The humidifier must be connected to a water supply and water drain.

5.4.1 Connecting the water supply

Required materials:

- Water supply
  - *Dynamic pressure: 0.2 - 6 Bar*
  - *RO water*
  - *Temperature: 1 - 25 °C*
  - *Backflow preventer*
- Hose 3/8" HG

To connect the water supply:

1 Remove the protection cap from the water supply connection of the humidifier.
2 Screw the connection piece onto the water supply connection.
3 Thoroughly flush the supply pipe with clean water.
4 Connect the piping to the connection piece.
5 Connect the piping to a water supply.

NOTICE

If the water supply is far away from the humidifier or if multiple humidifiers are connected to the same water supply, install a shut-off valve on the supply pipe, close to the humidifier.

5.4.2 Connecting the water drain

Required materials:

- Hose
  - *½" JG*
  - *Max. length of 50 cm*
- Air gap funnel (min. Ø 40 mm)

Make sure the water drain meets the following requirements:

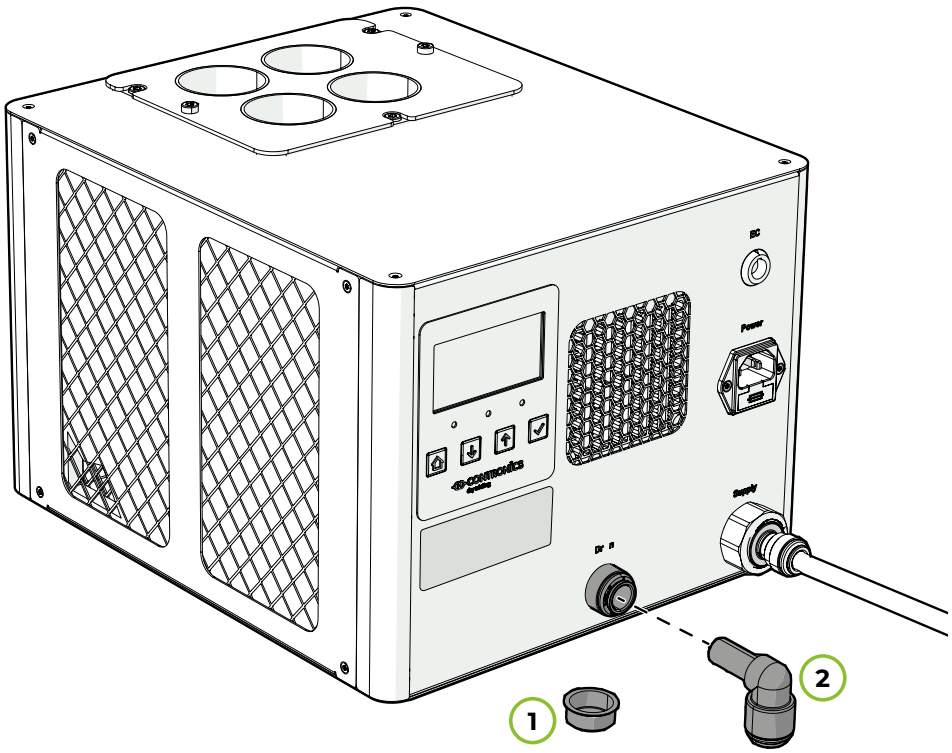
- Drain piping material is suitable for RO water.

NOTICE

Do not use copper piping.

- Drain line connections must be installed according to local plumbing codes.
- The drain line must be properly fixed and easily accessible for service.
- Each drain line must be installed with a constant decline (minimum of 2 degrees).
- The drain line should be as short as possible.
- Each drain line must lead to its own separate air gap funnel with trap, before connecting to the drain.
  - The open end of each drain line should not touch the funnel.
  - The minimum allowed air gap is 20 mm.
  - Each drain line must be secured to prevent the line from slipping out of the funnel or going through the funnel.
- Floor drains present under the humidifier in case of leaks or overflowing water are recommended.

To connect the water drain:



1 Remove the protection cap from the water drain connection of the humidifier.
2 Insert a connection piece into the water drain connection.
3 Thoroughly flush the drain pipe with clean water.
4 Connect the drain pipe to an air gap funnel, or another connection type that does not apply pressure or suction to the drain pipe.
5 Secure the drain pipe to prevent it from slipping out of the funnel.
6 Connect the air gap funnel to a vertical water drain.

⚠ CAUTION

Risk of damage to the humidifier. The water drain connection is not pressurised. Any pressure or suction applied to the drain pipe may damage the humidifier:

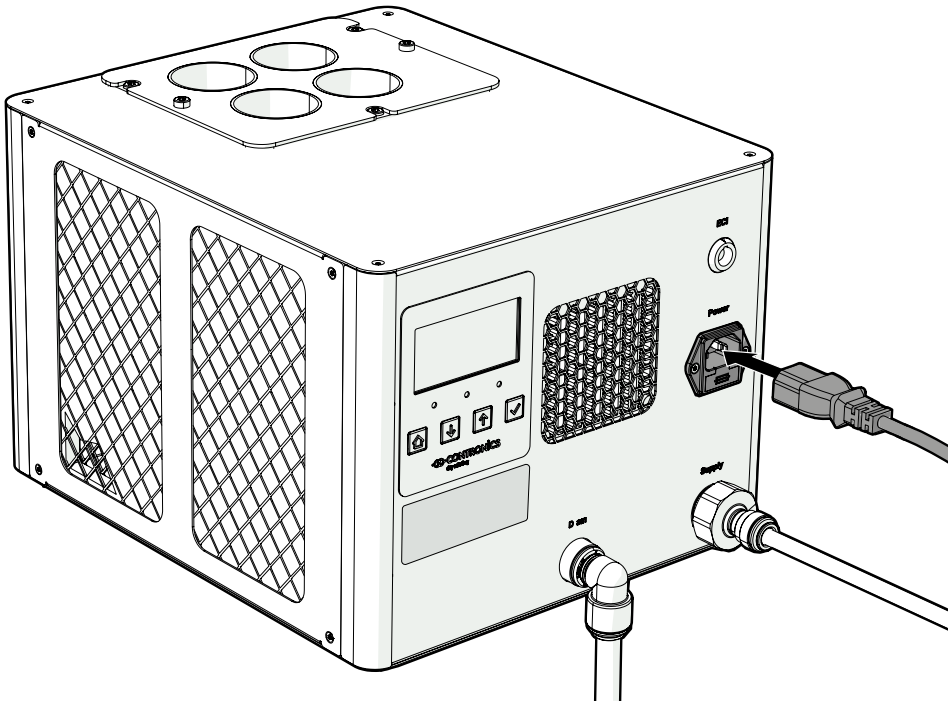
- The outlet of the drain pipe must be free. Do not place the outlet under water.
- Make sure that the water drain connection on the humidifier is the highest point in the water drain channel. Ensure a constant decline of at least 2 degrees.
- Do not place the humidifier on a tray with raised edges.

5.5 Electrical connections

The humidifier must be connected to a power supply. An optional humidity sensor or external controller can also be connected to the humidifier.

5.5.1 Connecting to a power supply

To connect the humidifier to a power supply:



1 Plug the power cable into the socket (C13) on the front panel of the humidifier.
2 Plug the other end of the power cable into an earthed power outlet.

5.5.2 Connecting the external controller or sensor (optional)

To connect the sensor:

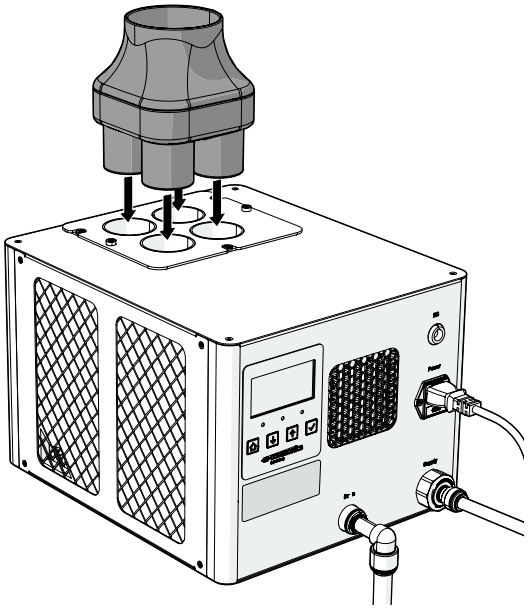
1 Mount the sensor near an outlet of the distribution system.
2 Plug the external controller or sensor cable into the external interface connection on the front panel of the humidifier.

NOTICE
The external control signal should not be earthed.

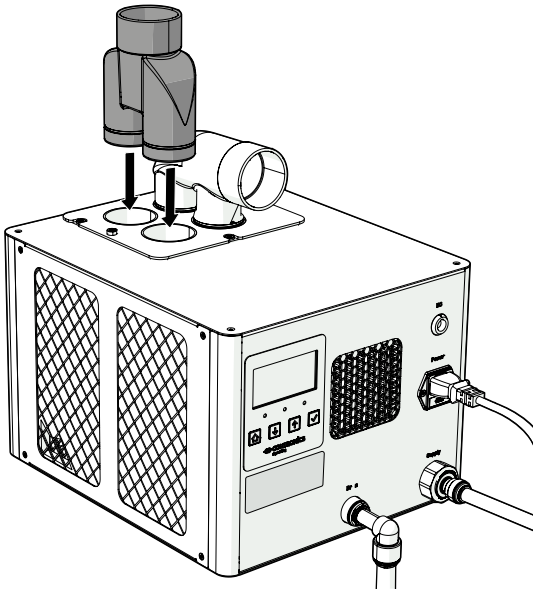
5.6 Connecting the air distribution system

Required tools:
- Coupling pieces (see §2.8.1)
- Piping (Ø80 or Ø50 mm)
- Flexible hose with connector

To connect the air distribution system to the humidifier:



Example 1



Example 2

1 Place the coupling piece on the air outlets on top of the humidifier. Make sure all air outlets are connected.

NOTICE
All air outlets of the humidifier must be connected to the air distribution system. Open air outlets will severely hinder the capacity of the humidifier.

2 Connect the distribution piping to the coupling pieces. Pay attention to the following:
   - Use piping with a constant inner diameter of 80 mm or 50 mm.
   - Avoid sharp bends. The recommended maximum bend angle is 30 °.
   - Keep any flexible piping as short as possible, with a maximum length of 2 meters.
   - Flexible piping should allow condensate to flow back to the humidifier.
   - Avoid horizontal sections in the distribution system.
   - Avoid merging flexible pipes.
3 Tighten all connections.

6 Commissioning

This chapter provides all the information necessary to commission the humidifier after installation.

6.1 Safety

⚠ WARNING

Before commissioning the humidifier, make sure you have read and understood the relevant safety instructions in §3.4 . Important safety instructions will be repeated throughout this chapter.

6.2 Installation checklists

Use the checklists in this section to evaluate the installation of the humidifier.

6.2.1 Placement

The placement of the humidifier must meet the following requirements:

☐ The humidifier is placed on a stable, flat and level surface.
☐ The humidifier is placed nearby an unused earthed power outlet.
☐ The room has an ambient temperature between 0 and 40 °C and humidity of less than (<) 100%.
☐ The humidifier is accessible for operation and maintenance.

6.2.2 Electrical connections

The electrical connections must meet the following requirements:

- ☐ The power supply meets the voltage and current requirements that are shown on the label (see §2.7).
- ☐ All cables are free of tension.
- ☐ All electrical connections conform to applicable national and local regulations.
- ☐ All casing panels are present and fastened.

6.2.3 Water connections

The **water supply connection** must meet the following requirements:

- ☐ The water supply pipe is clean and free of leaks.
- ☐ All connections are properly fastened.
- ☐ A shut-off valve has been installed on supply pipe if necessary.
- ☐ The water supply meets the following requirements:
  - Pressure: 1 - 6 bar
  - Hardness: < 8 °dH
  - Temperature: 1 - 25 °C (34 - 77 °F).

The **water drain connection** must meet the following requirements:

- ☐ The water drain pipe is clean.
- ☐ All connections are properly fastened.
- ☐ The end of the water drain pipe is unobstructed.
- ☐ The water drain connection is the highest point in the water drain channel, with a minimal decline of at least 2 degrees to the end point.
- ☐ The drain piping is suitable for RO water (non-copper piping).

6.2.4 Air distribution system

The connection to the air distribution system must meet the following requirements:

- ☐ All bends have an angle of less than (<) 30°.
- ☐ All piping has a constant inner diameter. The recommended diameter is Ø 80 mm OR Ø 50 mm, depending on the coupling piece.
- ☐ There are no horizontal sections of piping in the system.
- ☐ The system contains no unnecessary flexible piping.
- ☐ Any pieces of flexible piping are shorter than 2 meters.
- ☐ Flexible pipes are not merged.

6.3 Performing a functional test

Perform a functional test of the humidifier when the humidifier is switched on for the first time:

1 Open the water supply.
2 Set the humidifier to maximum capacity.
3 Plug the power cable into the socket (C13) on the humidifier.
4 Make sure the humidifier is connected to a mist distribution system.
5 If installed, open the shut-off valve in the water supply line.

For instructions on how to adjust the settings of the humidifier, see §7.2 .

6 Check the following:
   - Water flows into the humidifier through the supply pipe.
   - The water supply pipe and connection are free of leaks.
   - The water flow stops after approximately 60 seconds.
   - The production of mist starts after a few seconds.
7 Unplug the power cable from the humidifier.
8 Check the following:
   - After ±20 seconds, water flows out of the humidifier through the drain pipe.
   - The water drain pipe and connection are free of leaks.
   - After ±2 minutes, the water reservoir is completely empty.

NOTICE

The green feedback LED blinks when the water reservoir fills up.

9 Plug the power cable into the socket (C13) on the humidifier.
10 Set the humidifier to the desired capacity.
11 If necessary, adjust the air speed.

For instructions on how to adjust the settings of the humidifier, see §7.2 .

7 Operation

This chapter provides all the information necessary to operate the humidifier.

7.1 Safety

⚠ WARNING

Before operating the humidifier, make sure you have read and understood the relevant safety instructions in §3.4 . Important safety instructions will be repeated throughout this chapter.

7.2 Using the display

The humidifier is operated via the display on the front panel.

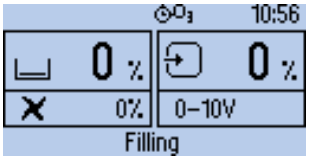
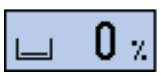
7.2.1 Controls

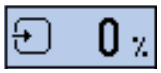
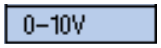
The display is operated with the four buttons below the screen:

	Press to go back to the previous menu.
	Press to select the next option.
	Press to select the previous option.
	Press to proceed or to confirm.

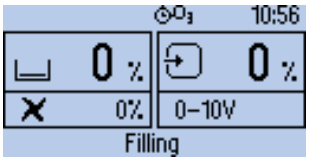
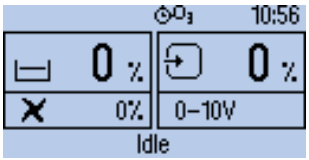
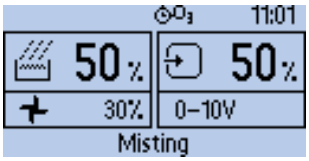
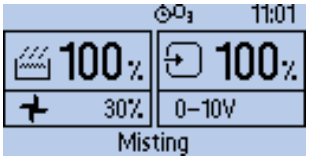
7.2.2 Status screen

The display shows a status screen when the humidifier is active. The status screen contains current information about the performance of the humidifier.

	Complete status screen
	Ozone disinfection cycle status and time
	Water reservoir level and misting capacity
	Fan mode and capacity

	Humidification mode and capacity
	External control signal
	Humidifier status

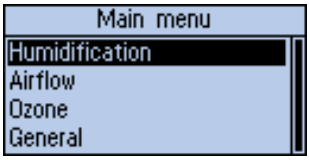
The following status screens are commonly shown during each humidifier status:

	**Filling** The humidifier is filling the water reservoir. The fan and mist generator are not active. An ozone disinfection cycle is set on a timer. An external control signal of 0 - 10 V is present.
	**Idle** The water reservoir is full. The humidifier is idle and ready to start the humidification process.
	**Misting** The humidifier is generating and distributing mist at 50% capacity. The fan is operating at 30% capacity.
	The humidifier is generating and distributing mist at 100% capacity.

7.2.3 Main menu

Press ⌂ to exit the status screen and enter the main menu.

The main menu has four options:



Option	Humidification	Airflow	Ozone	General
Description	Settings and information regarding the humidification process.	Setting the airflow from the humidifier.	Settings regarding the schedule of the ozone disinfection cycle.	Settings and information about the humidifier in general.
Contents	*Humidity set-point**		*Mode*	*Language*
	Manual capacity		*Start*	*Clock*
	Mode		*Duration*	*Advanced*
	*Bandwidth**			*Factory defaults*
	Minimum capacity			*Device information*
	Maximum capacity			

** Only available when the humidification mode Sensor is active.*

7.2.4 Selecting a humidification mode

The display can be used to select the way in which the humidification process is regulated. The following options are available:

Manual capacity
The humidification capacity is set manually in the display of the humidifier.

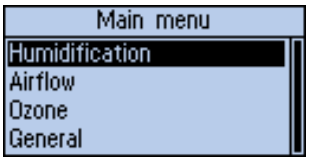
Controller
The humidification capacity is controlled via an external controller that is connected to the external interface of the humidifier.

- *Use "Controller 0-10 V" with most accessories.*
- *Use "Controller 4-20 mA" if requested.*

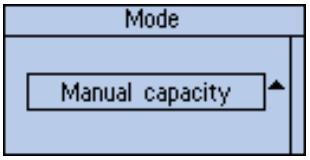
Sensor
The humidification capacity is controlled via a humidity sensor in the area that is being humidified.

- *Use "Sensor 0-10V" for EP HS-91P-DM sensors.*
- *Use "Sensor 0-1 V" for EP HS-91P sensors.*
- *Use "Sensor 4-20 mA" for sensors with a 4-20 mA current output.*

To select a humidification mode:



1 Press ⌂ to open the main menu.
2 Navigate to Humidification and press ✓ to confirm.

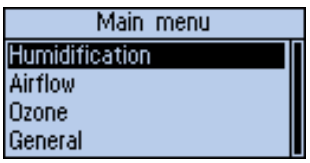


3 Navigate to Mode and press ✓ to confirm.
4 Press ↑ or ↓ to select an option.
5 Press ✓ to confirm.

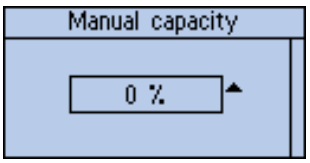
7.2.5 Adjusting the humidification capacity

NOTICE
This setting is only available when the humidification mode is set to Manual capacity (see § 7.2.4).

The display can be used to adjust the humidification capacity of the humidifier:



1 Press ⌂ to open the main menu.
2 Navigate to Humidification and press ✓ to confirm.



3 Navigate to Manual capacity and press ✓ to confirm.
4 Press ↑ or ↓ to increase or decrease the capacity.
5 Press ✓ to confirm.

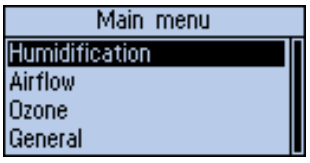
7.2.6 Adjusting the humidification bandwidth and humidity setpoint

NOTICE

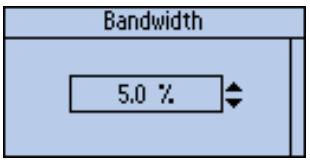
These settings are only available when the humidification mode is set to Sensor (see §7.2.4).

When the humidifier is controlled via a humidity sensor, the bandwidth and humidity setpoint determine how the humidification capacity is regulated. The humidity setpoint describes the air humidity level that is desired. The bandwidth describes the offset from the setpoint at which the humidifier starts to regulate the capacity.

To set the humidification bandwidth:

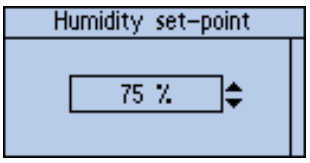


1 Press ⌂ to open the main menu.
2 Navigate to Humidification and press ✓ to confirm.



3 Navigate to Bandwidth and press ✓ to confirm.
4 Press ↑ or ↓ to increase or decrease the bandwidth.
5 Press ✓ to confirm.

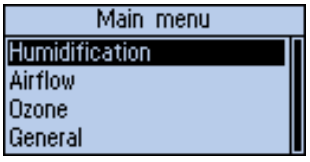
To adjust the humidification setpoint:



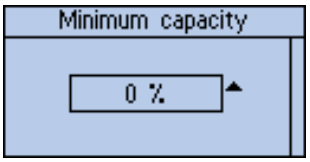
6 Navigate to Humidity setpoint and press ✓ to confirm.
7 Press ↑ or ↓ to increase or decrease the setpoint.
8 Press ✓ to confirm.

7.2.7 Adjusting the humidification capacity range

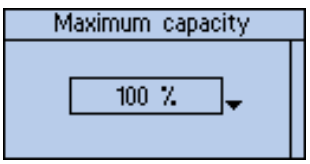
To adjust the humidification capacity range:



1 Press ⌂ to open the main menu.
2 Navigate to Humidification and press ✓ to confirm.



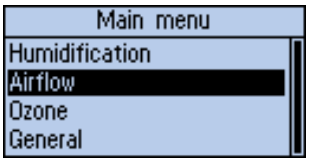
3 Navigate to Minimum capacity and press ✓ to confirm.
4 Press ↑ or ↓ to increase or decrease the capacity.
5 Press ✓ to confirm.



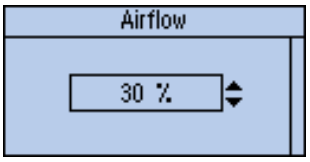
6 Navigate to Maximum capacity and press ✓ to confirm.
7 Press ↑ or ↓ to increase or decrease the capacity.
8 Press ✓ to confirm.

7.2.8 Adjusting the airflow

The display can be used to adjust the airflow of the humidifier:



1 Press ⌂ to open the main menu.
2 Navigate to Airflow and press ✓ to confirm.



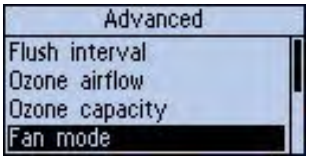
3 Press ↑ or ↓ to increase or decrease the air flow.
4 Press ✓ to confirm.

7.2.9 Adjusting the fan mode

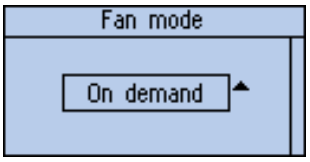
The display can be used to select the way in which the fan is regulated. The following options are available:

- **On demand**
  Fan is only active when there is a humidification demand. This is the default mode.
- **Continuous**
  Fan is always active, even when there is no humidification demand.

To select a fan mode:



1 Press ⌂ to open the main menu.
2 Navigate to General and press ✓ to confirm.
3 Navigate to Advanced and press ✓ to confirm.



4 Navigate to Fan mode and press ✓ to confirm.
5 Press ↑ or ↓ to select an option.
6 Press ✓ to confirm.

7.3 Performing a flushing cycle

The humidifier frequently performs an automatic flushing cycle. This procedure prevents pathogens from forming by removing any stagnant water from the humidifier.

7.3.1 Flush sequence

A flushing sequence consists of the following steps:

- The green feedback LED starts glowing. This indicates that the flushing cycle has started.
- The distribution of humified air stops.
- All water is drained from the humidifier.

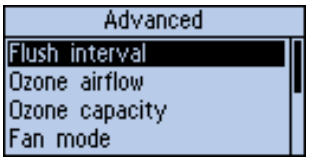
- The water reservoir is flushed for approximately 15 seconds.
- The humidifier is filled with fresh water. The green feedback LED blinks during this procedure.
- The green feedback LED stops glowing when the reservoir is full.
- The humidifier restarts normal operation.

7.3.2 Adjusting the frequency

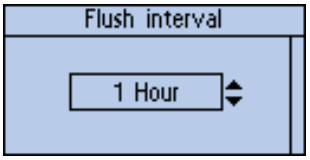
The standard factory setting for the flushing cycle is once per hour. If necessary, you can decrease the frequency.

⚠ WARNING
Do not disable the flushing cycle.

To adjust the frequency of the flushing cycle:



1 Press ⌂ to open the main menu.
2 Navigate to General and press ✓ to confirm.
3 Navigate to Advanced and press ✓ to confirm.



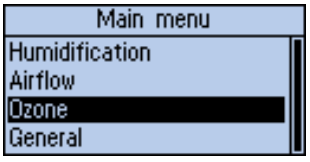
4 Press ↑ or ↓ to increase or decrease the amount of hours in between the flushing cycles.
5 Press ✓ to confirm.

7.4 Programming the ozone generator

The ozone generator contains a timer that controls the frequency of the ozone disinfection cycle. You can program the to match the application.

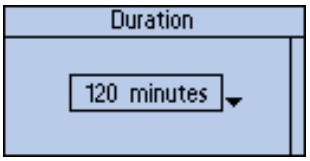
The standard factory setting for the ozone disinfection cycle is once per day, between 2:00AM and 4:00AM.

To adjust the starting time and duration of the ozone disinfection cycle:



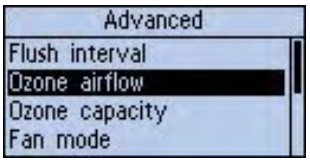
1 Press ⌂ to open the main menu.
2 Navigate to Ozone and press ✓ to confirm.

3 Press ↑ or ↓ to adjust the hours and press ✓ to confirm.
4 Press ↑ or ↓ to adjust the minutes and press ✓ to confirm.

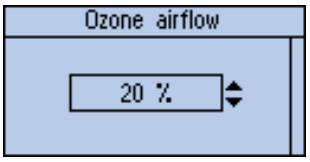


5 Navigate to Duration and press ✓ to confirm.
6 Press ↑ or ↓ to adjust the duration of the cycle.
7 Press ✓ to confirm.

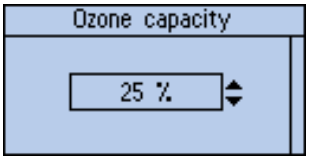
To adjust the properties of the ozone disinfection process:



1 Press ⌂ to open the main menu.
2 Navigate to General and press ✓ to confirm.
3 Navigate to Advanced and press ✓ to confirm.



4 Navigate to Ozone airflow and press ✓ to confirm.
5 Press ↑ or ↓ to adjust the ozone gas air flow.
6 Press ✓ to confirm.



7 Press ⌂.
8 Navigate to Ozone capacity and press ✓ to confirm.
9 Press ↑ or ↓ to adjust the ozone gas capacity.
10 Press ✓ to confirm.

⚠ WARNING

Risk of injury to respiratory system. Ozone is harmful to your health if the gas is inhaled over a longer period of time or in a higher concentration. To prevent this:

- Do not program the ozone disinfection process to run when there are people in the vicinity of the air distribution outlets.
- Do not disconnect the air distribution system or water connections or dismantle the casing when the ozone generator is active.

NOTICE

The timer of the ozone generator is powered with a non-rechargeable back-up battery when there is no mains power available.

8 Troubleshooting

This chapter provides all the information necessary to resolve the most common errors that occur in the humidifier.

NOTICE

Please contact Contronics if you are unable to resolve an error with the instructions in this chapter or if an error occurs that is not mentioned in this chapter.

8.1 Performance issues

The following table provides an overview of potential performance issues. Follow the instructions to resolve an issue:

Message	Cause	Instructions
The humidifier does not reach the set capacity.	Oil or grease residue in the water reservoir, as a result of a dirty water supply pipe. This is common in stainless steel piping.	1 Disconnect the water supply pipe and clean it with water and dish soap. 2 Clean the water reservoir with water and dish soap. 3 Rinse the supply pipe and water reservoir with clean water.
The humidifier does not switch on when a capacity is set.	The water supply valve is disabled during long periods without a water supply.	1 Set the humidifier to a capacity above 0. 2 Wait 3 minutes. The humidifier should start taking water automatically.

8.2 Display messages

The following table provides an overview of the error or warning messages that may be shown on the display. Follow the instructions to resolve an error:

Message	Type	Cause	Instructions
Heatsink temp. sensor fault	Error	Heatsink temperature sensor is faulty	Check connections or replace sensor
Water temp. sensor fault	Warning	Water temperature sensor is faulty	Check connections or replace sensor
Pressure sensor fault	Warning	Pressure sensor is faulty	Replace the electronics box.
Cooling fan fault	Warning	Cooling fan is faulty or has a bad connection.	Re-connect or replace the cooling fan
Blower fan x fault	Error	Blower fan x faulty or has a bad connection.	Re-connect or replace the blower fan x.

Message	Type	Cause	Instructions
Drain fault	Error	Water reservoir full: Clogged drain connection or faulty drain valve	Clean the drain valve and make sure it is open. or Replace the drain valve.
		Water reservoir empty: Faulty or sticky float switch	Clean the float switch. or Replace the float switch.
Water supply valve safety	Warning	Water supply valve is open for 3 minutes without float switch detecting a high level. Fill valve is automatically disabled for 6 minutes to let it cool down.	Check the water supply pressure. or Replace the water supply valve.
MDRV no communication	Error	MDRV PCB faulty	Check the connections. or Replace the electronics box.
OZONX no communication	Error	OZON x PCB faulty	Check the connections. or Replace the fan/ozone module assembly.
RTCC no communication	Error	Clock chip faulty	Replace the electronics box.
RTCC oscillator failed	Warning	Clock not working	Replace the electronics box.
Time not set, OG disabled	Warning	Time was never set.	Set the correct time in the General menu.
Low battery, OG disabled	Warning	Clock back-up battery is empty.	Replace the CR2032 battery on the MAIN PCB.
High temp. reduced cap.	Warning	High ambient temperature.	Lower the ambient temperature or move the humidifier to a cooler location.
Overheating	Warning	Various	See §8.3 .

NOTICE

- *Error messages are shown on the display, in place of the humidifier status (see §7.2.2).*
- *The red feedback LED shows the severity of the error (see §2.4).*

8.3 Overheating

You can recognise overheating of the humidifier as follows:

- The red feedback LED starts to blink.
- A warning message is shown on the display.
- The capacity of the humidifier is reduced
- The humidifier switches off automatically.
- The humidifier will automatically switch on again when it has cooled down.

The following table provides an overview of potential issues that cause the humidifier to overheat. Follow the instructions to resolve an issue:

Cause	Instructions
Air inlet is blocked.	Make sure the humidifier has enough free space in every direction (see §5.3.2).
Air outlet is blocked.	
Ambient temperature is too high.	Reduce the ambient temperature of the room where the humidifier is installed. The temperature must be lower than 40 °C.
Water supply temperature is too high.	Reduce the temperature of the water that is supplied to the humidifier. The temperature must be lower than 25 °C.
Water drain is blocked.	Make sure: • The end of the water drain pipe is unobstructed. • The water drain connection is the highest point in the water drain channel, with a minimal decline of at least 2 degrees to the end point.
Ventilator speed is set too low.	Increase the speed of the fan.

9 Maintenance

This chapter provides all the information necessary to perform maintenance on the humidifier.

9.1 Safety

⚠ WARNING
Before operating the humidifier, make sure you have read and understood the relevant safety instructions in §3.4 . Important safety instructions will be repeated throughout this chapter.

⚠ CAUTION
All maintenance must be carried out by Contronics or by maintenance personnel authorised by Contronics. The humidifier can be shipped to Contronics in the original packaging.

9.2 Regular maintenance

The humidifier requires yearly maintenance to ensure optimal and safe performance.

9.2.1 Preparation

⚠ CAUTION
Keep the humidifier level while dismantling.

To prepare the humidifier for maintenance:

1. Remove the power cable from the power outlet.
2. Wait until the ventilator stops moving and the display goes dark.
3. Close the water supply.
4. Disconnect the water supply pipe.
5. Disconnect the humidity sensor or external controller.
6. Tilt the humidifier forward until no more water flows out of the water drain connection.
7. Disconnect the water drain pipe.

9.2.2 Cleaning the water reservoir

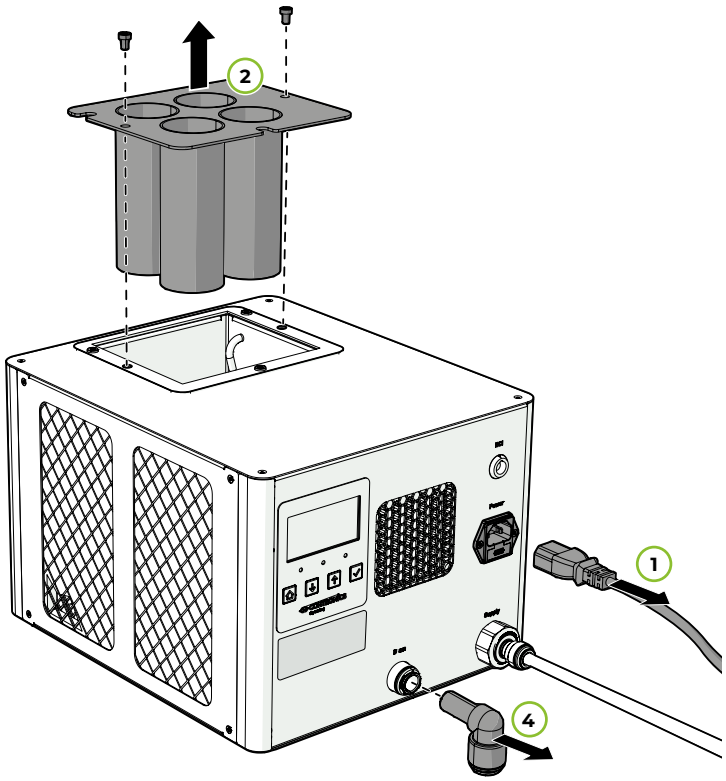
Required tools

- Torx screwdriver (T25)
- Soft brush or cloth

To clean the water reservoir:

⚠ CAUTION

Make sure that the transducers are not damaged during cleaning.



1. Disconnect the power cable from the humidifier.
2. Wait until the display goes dark.
3. Remove the mounting plate for the coupling pieces. Use a Torx screwdriver (T25).
4. Wait until the water reservoir is completely empty.
5. Clean the water reservoir. Use a soft brush or cloth.
6. Remove the connector piece from the water drain connection.
7. Clean the water drain connection with a small, round brush.
8. Insert the connector piece back into the water drain connection.
9. Flush the water drain channel with clean water.
10. Reassemble the water reservoir.
11. Connect the power cable to the humidifier.

9.3 Replacing the transducers

The transducers are the most sensitive components of the humidifier and must be replaced after approximately 10,000 operating hours.

⚠ CAUTION

The replacement of the transducers can only be done by Contronics or representatives authorised by Contronics.

9.4 Cleaning or replacing the air filters

The air filters must be cleaned at least every 12 months of operation.

The air filters must be replaced ever 24 to 36 months.

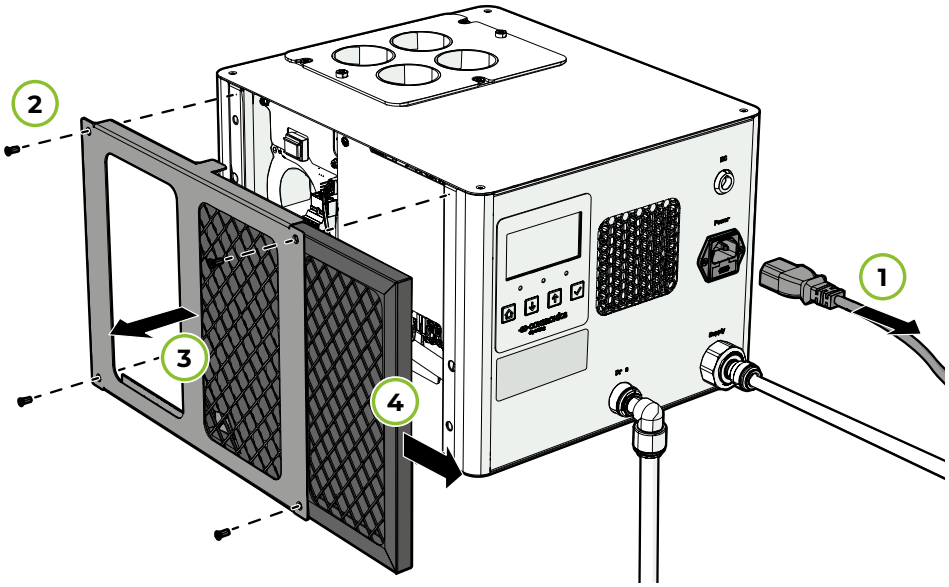
Clean or replace the air filters more often if:

- the performance of the humidifier is reduced.
- the humidifier is installed in a room with poor air quality.

Required tools:
- Torx screwdriver (T10)
- Vacuum cleaner or compressed air

To remove the air filters:

1 Disconnect the power cable from the humidifier.
2 Wait until the display goes dark.



3 Remove the screws of the left side panel of the humidifier.
4 Remove the side panel.
5 Slide the air filter out of the side panel.
6 Repeat for the other side panel.

To clean the air filters:	To replace the air filters:
• Use compressed air to blow pollution out of the filter. *or* • Use a vacuum cleaner to suck pollution out of the filter.	• Order replacement parts from Contronics. See §1.7 .

To place the air filters back:

7 Slide the air filters into the side panels. Make sure the arrow on the filter points inward.
8 Place the side panels on the humidifier.
9 Insert and tighten the screws.
10 Connect the power cable to the humidifier.

9.5 Exploded view & replacement parts

NOTICE

To order any replacement parts, please contact Contronics (see §1.7).

The humidifier consists of the following components:

No.	Description	Art. no.
1	Cable assembly Ozon-line A	RP CA-FAN-DM4
	Cable assembly Ozon-line B	RP CA-FAN-DM8
	Cable assembly Ozon-line C	RP CA-FAN-DM12
2	M6 5kOhm 35cm AWG24 yellow	RP CA-TEMPSENS-02
3	Cable assembly TRANSDUCER C (DM4/8/12)	RP CA-TRANS-DM12
	Cable assembly TRANSDUCER A (DM4)	RP CA-TRANS-DM4/8/12
	Cable assembly TRANSDUCER B (DM4/8)	RP CA-TRANS-DM8/12
4	DM4 electronics box	RP DM4-ELEC
	DM8 electronics box	RP DM8-ELEC
	DM12 electronics box	RP DM12-ELEC
5	DM4 Gasket Reservoir/Top plate	RP DM4-GASKET
	DM8 Gasket Reservoir/Top plate	RP DM8-GASKET
	DM12 Gasket Reservoir/Top plate	RP DM12-GASKET
6	Air filter 45 PPI/208x240x12.7	RP DM4-AIRFILT
	Air filter 45 PPI/208x360x12.7	RP DM8-AIRFILT
	Air filter 45 PPI/208x480x12.7	RP DM12-AIRFILT
7	DM drain assembly	RP DM-DRAIN-01
8	DM fan/O3 module assembly	RP DM-FAN-01
9	Front plate membrane keyboard	RP DM-KEYB-01
10	Tin: Transducer holder set DM	RP DM-TRANS-01
11	DM Water inlet assembly	RP DM-WINLET-01
12	Float switch assembly	RP SFLOAT-01

10 Decommissioning & disposal

This chapter provides all the information necessary to decommission and dispose of the humidifier.

10.1 Decommissioning the humidifier

To decommission the humidifier:

1. Remove the power cable from the power outlet.
2. Wait until the ventilator stops moving and the display goes dark.
3. Close the water supply.
4. Disconnect the water supply pipe.
5. Disconnect the humidity sensor or external controller.
6. Tilt the humidifier forward until no more water flows out of the water drain connection.
7. Disconnect the water drain pipe.

10.2 Disposing of the humidifier

The humidifier consists of various materials that require specific disposal methods. By disposing of each material correctly, you may help prevent damage to the environment and public health. In addition, recycling of materials helps preserve natural resources.

10.2.1 Packaging

Dispose of the cardboard packaging along with the household paper waste.

10.2.2 Mechanical components

Bring any damaged or worn out mechanical components of the humidifier to certified recycling center. These components include:

- Casing
- Water connection pieces
- Water reservoir
- Gaskets
- Airfilters

10.2.3 Electronic components

Bring any damaged or worn out electronic components to a certified recycling center separately. Take into account local regulations. These components include:

- Display
- Water supply valve
- Float switch
- Transducers
- PCBs
- Cable assemblies (transducer & ozon generator)
- Electronics boxes

10.2.4 Battery

The humidifier contains a Lithium CR2032 button cell battery. The battery powers the internal clock and is located on the main PCB behind the panel on the left side.

To dispose of the battery:

- Deliver the battery to a local recycling facility.

⚠ CAUTION
Batteries may contain toxic heavy metals and meet the requirements of hazardous waste. Do not dispose of the battery along with household waste.
Appendices

Declaration of conformity

Contronics Engineering B.V.
Ambachtsweg 8
5492 NJ Sint-Oedenrode
The Netherlands

Hereby declares that products:

- EP DM4;
- EP DM8;
- EP DM12;

produced and delivered by Contronics Engineering B.V., are in accordance with the following CE directives:

- Low Voltage Directive 2014/35/EU
- Electromagnetic Compatibility Directive 2014/30/EU
- RoHS Directive 2011/65/EU
- Batteries and Accumulators Directive 2013/56/EU

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CE