
CRAWL SPACE DEHUMIDIFIER CTR 300 TT2

USER MANUAL



Corroventa[®]

Contents

Area of use	3
Manufacture directive.....	3
Safety information.....	5
Relative humidity and its impact on materials.....	6
How the dehumidifier works.....	7
Delivery check	8
Overview, controls and connections.....	8
Installation planning.....	10
Installation.....	11
External and internal preparations	11
Dry air duct	11
Installing the dehumidifier and its connections.....	13
Radon and odour problems, negative pressure control	16
Maintenance and service	17
Filter replacement	17
Checking rotor operation	17
Checking heater.....	18
Accessories	18
Fault tracing.....	19
Technical data	22

User instructions CTR 300TT2

Area of use

The CTR 300TT2 crawl space dehumidifier is intended for permanent installation in crawl spaces with the primary purpose of preventing the build up of mould and rot in the building construction by dehumidifying. By using the adsorption principle for drying the air in the space, the dehumidifier is effective at low temperatures and it also works just below freezing. CTR 300TT2 also has a patented solution for increasing the negative pressure in the crawl space without needing to reduce the efficiency of the dehumidifier. With the possibility of increased wet air volumes, the CTR 300TT2 is the right choice for buildings with radon problems or problems with bad air from the crawl space. A crawl space dehumidifier like this shall be dimensioned for 1.5 to 2 air exchanges per hour, which makes CTR 300TT2 suitable for crawl spaces with a volume of up to 180 -200m³.

For the user's comfort, for control and monitoring of the dehumidifier's operation and function, the CTR 300TT2 is developed for use with Homevision® Pro or Homevision® Lite. These contain control units, which are connected by cable to the dehumidifier as well as to a wireless control panel mounted in the living area. The control unit is equipped with a thermometer and hygrometer and independently controls operation of the dehumidifier. The system can be monitored and operational settings adjusted via the control panel. The control panel also shows any operational alarms and service reminders, such as filter replacement.

Properties:

• Energy efficient	• Service-friendly
• High capacity level	• Time meter
• Robust	• Homevision® Lite/Pro connection
• Very quiet	• Capacity to eliminate odour and radon problems

Manufacture directive

Crawlspac dehumidifier CTR 300TT2 is CE marked.

Disclaimer

- Incorrect installation and/or incorrect handling can cause property damage as well as injury.
- The manufacturer assumes no liability for damage arising as a result of failing to follow these instructions, not using the machine as intended. Such damage is not covered by the warranty.
- The warranty applies to damage to the machine caused by material or manufacturing defects and does not cover consequential failure.
- The warranty does not apply to consumables or to normal wear.
- It is the responsibility of the purchaser to inspect the goods upon delivery and to ensure its function according to the instructions in the manual during use.
- Changes or modifications to the machine must not be performed without written permission from Corroventa Avfuktning AB.
- The product, technical data and/or installation and operating instructions are subject to change without notice.

- These user instructions contain information protected by copyright laws. No part of this document may be reproduced, stored in an information storage system or transmitted in any way or by any means without Corroventa AB's written consent.

Any comments regarding the content of this document must be sent to:

Corroventa Avfuktning AB
Mekanikervägen 3
SE-564 35 Bankeryd
Sweden

Tel: +46 (0)36-37 12 00
Fax: +46 (0)36-37 18 30
E-mail: mail@corroventa.se

Safety information

The equipment can be used by children aged eight (8) years and above and by people with reduced physical or mental abilities or with lack of experience on the condition that they have received instructions and information on how it is used safely and that they understand the risks involved with its use.

Children must not play with the equipment. Cleaning and maintenance must not be carried out by children without the supervision of an adult.

Electrical installations carried out in connection with the dehumidifier installation must be performed by a professional in accordance with local and national regulations.

NOTE! Any modifications that affect the ventilation or pressure balance of a property can lead to changes in radon gas concentrations. When a dehumidifier is placed in a property with radon, contact a specialist to ensure a suitable overall solution.

The following instructions must also be observed:

1. The dehumidifier must not be powered on before installation is completed in accordance with this manual.
2. The dehumidifier must be connected to an earthed electrical socket, 1-phase 230VAC, 50Hz, with a maximum 16A fuse.
3. The dehumidifier must not be covered because this may lead to overheating and fire.
4. The dehumidifier must not be used as a work table, trestle or stool.
5. The dehumidifier is not intended to be stood or climbed on.
6. Never operate the dehumidifier without installing the filter as this may damage the dehumidifier. Ensure that the filter is clean. If it is blocked, the machine may overheat.
7. Do not allow the dehumidifier to draw in alkaline chemicals or organic substances with a high boiling point, such as oil, grease, solvents or similar. These can damage the rotor.
8. The dehumidifier may not be used in areas where it can produce explosive gases.
9. Do not insert objects into the intake or exhaust as this could damage the dehumidifier and injure people.
10. Place the dehumidifier on a stable and level bracket or shelf so that it cannot overturn.
11. Keep children, animals and bystanders away from the workplace.
12. Contact the supplier if the dehumidifier is damaged or if the plug or the electrical cable are damaged. Do not make any repairs yourself if you have not undergone the supplier's training.
13. Do not damage the electrical cable. The cable must not run through water or over sharp edges.
14. Never carry or drag the dehumidifier by the cable.
15. Using electrical equipment in very damp or wet conditions can be dangerous. Do not operate the dehumidifier if it is standing in water.
16. Always use an earth-fault breaker to minimise the risk of electric shock.
17. Water must not come into contact with the dehumidifier's electrical components. If it does, ensure that they are dried thoroughly before the dehumidifier is used again.
18. Pipes or hoses used to route wet air from the dehumidifier must withstand a temperature of at least 80°C.
19. Never open the dehumidifier without first ensuring that the dehumidifier is disconnected from power.

20. Servicing and repair of the dehumidifier must be carried out by authorised personnel.
Contact the supplier for further information.

21. The dehumidifier must not be used with accessories other than those described in this manual or approved by Corroventa Avfuktning AB.

Contact the supplier of this dehumidifier for further advice on the safety and use of the product.

Relative humidity and its impact on materials

All air contains a greater or lesser degree of moisture. We can't see it with the naked eye until it appears in the form of small water drops against a cold metal or glass surface for example. However, before it is visible, moisture is already causing problems by affecting materials and manufacturing processes, causing corrosion and growth of micro-organisms. It can be taken for granted that the Nordic climate is always humid. Large areas of water, in the shape of thousands of lakes and the surrounding sea, cause a lot of humidity.

Air moisture is measured and usually given in relative humidity (% RH). This is a measurement of how much moisture the air contains compared to how much it can hold in total at a given temperature and pressure. The higher the temperature, the more water the air can hold but it is the relative humidity which is calculated, and which must be controlled.

At 100% RH the air is saturated and the moisture falls in the form of small water droplets. Steel corrodes at 60% RH and at 70% RH there is a risk of mould. A rule of thumb is that 50% RH is a good climate for most materials, but here in Scandinavia, it is rarely that low. The annual average value in most places is instead around 80% RH and can be equally high in both summer and winter.

Moisture problems in crawl spaces and appropriate actions

When outdoor air, particularly during the warm times of year, enters the crawl space under the house it is cooled by the cool environment and the relative moisture increases. In extreme cases condensation and water droplets form. Additional moisture can also occur through evaporation from ground surface or from the surroundings via the foundation wall. And, of course, water can penetrate crawl spaces from surrounding ground.

The solution to these problems is the installation of a crawl space dehumidifier, a remedy that, for optimum results and operating economy, is best combined with the following:

- Downpipes that exit close to the crawl space are directed away to route the water away preventing it from entering the space.
- The ground surface in the crawl space is covered with a plastic sheet to prevent evaporation from the ground. Each missed, non-sealed, square meter of ground surface can mean a surplus of moisture of more than two litres of water per day.
- Vents and cracks in the crawl space are sealed to prevent outdoor air from entering.

How the dehumidifier works

The average temperature in a crawl space is low, something which makes the adsorption principle used in the CTR 300TT2 superb compared to dehumidifiers whose efficiency falls significantly when the temperature falls. The adsorption principle thus provides effective dehumidification at temperatures well below freezing.

The fixed desiccant that is used in CTR 300TT2 is silica gel, which can be regenerated an almost unlimited number of times. Silica gel is a crystal with many small microscopic pores giving the crystal's walls a massive surface area. A gram of this substance has a moisture absorption areas of 500 - 700m², which means that the desiccant in a CTR 300TT2 has a total drying area of approx. 75,000m². Silica gel can absorb a lot of moisture, up to 40% of its own weight. It is not water soluble and therefore cannot be washed away or blown out with exiting airflows.

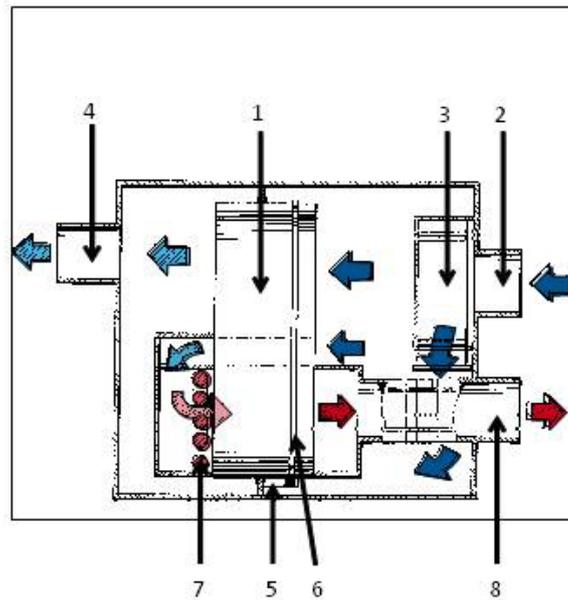
The dehumidification process

The desiccant is placed in a rotor (1). The air to be dried is sucked in through the inlet (2) by means of a process air fan (3).

The air passes a filter and then the drying rotor, after which the dehumidified air goes through the dry air outlet (4) to the area to be kept dry. The rotor has axially directed air ducts and consists of a highly active desiccant, silica gel, bonded in a ceramic structure. The axially directed air ducts in the rotor give laminar flow with minimal pressure drop.

The rotor rotates by means of a drive motor (5) and a drive belt (6). The moisture that is adsorbed in the rotor is driven out by a small portion of the process air being heated by the heater (7) and then passing a smaller part of the rotor, which is thus regenerated and also cleaned by the countercurrent principle.

The wet air is removed via the outlet (8) to the surroundings.



Delivery check

CTR 300TT2 is supplied with the following parts in the package:

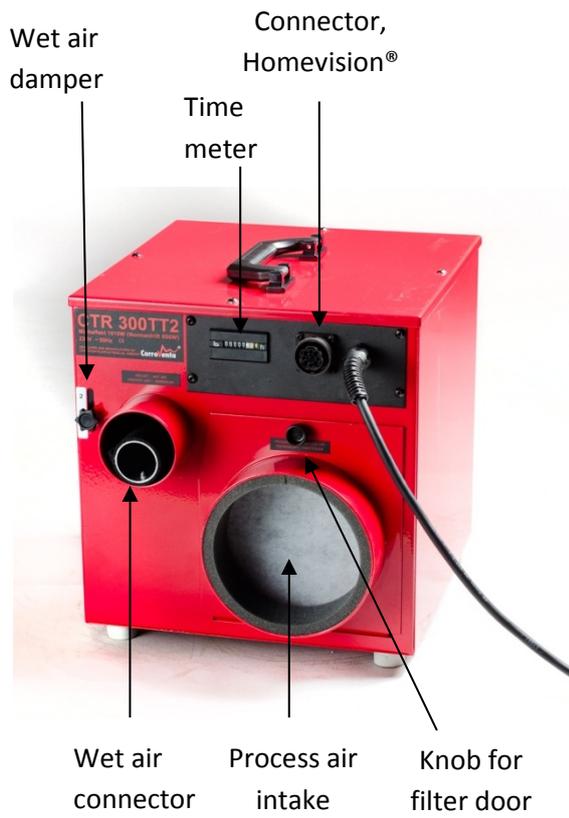
Crawlspace dehumidifier CTR 300TT2	1 x
Aluminium ring for wet air connection	1 x
Extra filter in addition to the one in the machine	2 x
Manual	1 x

Depending on the configuration purchased, the packaging also contains Homevision® Pro or Homevision® Lite, the component parts of which are shown in separate manuals.

Note: If this has not already been done, consider obtaining an Installation kit TT Multi, for a simple, energy efficient and well-functioning installation.

Overview, controls and connections

The images below show CTR 300TT2 with its external parts and controls.

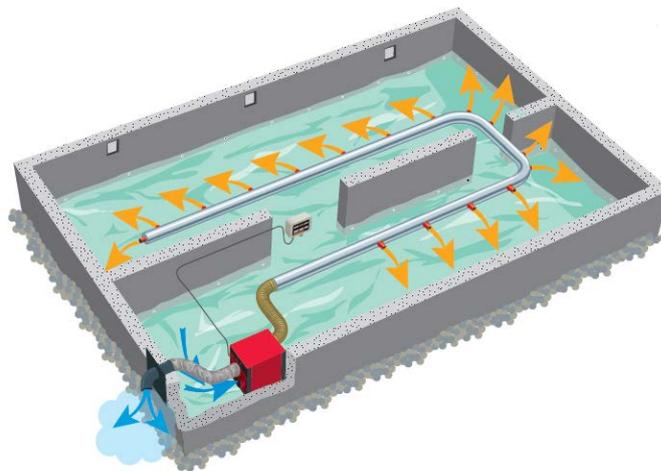


Not used in this application.

Installation planning

Before starting the installation, it is recommended to establish an installation plan for best results and minimum energy consumption. In this regard the dehumidifier is best placed beside an external wall in the crawl space so that:

- there is effective distribution of the dry air with as simple a dry air duct as possible
- hose routing for wet air is easy and any existing lead-ins to the crawl space can be used
- the machine is easy to access for maintenance and servicing, e.g. filter replacement
- the control unit can be placed so that it is not affected by the dry air, giving incorrect measurement values.



Note that:

- **The dry air duct must end one metre from the proposed dehumidifier location.**
- **The lead-in in the foundation wall must be about 60-70 centimetres from the dehumidifier and as high up as possible, so that the outlet is not covered by vegetation, leaves in autumn or snow in winter.**

Establish a scale drawing or diagram of the crawl space and draw in the proposed installation. Using this, verify that the distance between the dry air duct and external foundation in general is three to four metres. The first third of the dry air duct's length, the part nearest the dehumidifier, is left free from nozzles. 16 nozzles are then distributed along the remaining length. Remember that the dry air must be evenly distributed in the space and that the air must move freely in all parts of the crawl space. Direct the nozzles mainly towards the foundation wall and in a direction away from the dehumidifier. Be careful to direct the nozzles towards all corners of the space where the air can otherwise be still.

The reason why the dry air duct must be at a distance from the foundation walls is that the main part of the dehumidifier's capacity must be used for the air, the climate, in the space and not for drying the material of the foundation walls. The reason why the first nozzle is placed at a distance from the dehumidifier is that the control unit must be placed in close proximity to it and not be directly affected by the dry air, which would give incorrect measurement values and thus incorrect control.

Remember during the planning phase that the complete installation, except the dehumidifier, Homevision® control system and Installation kit TT Multi, also covers spiral pipes, bends and mounting materials etc. according to the diagram for the dry air duct. Furthermore, suitable material for sealing all vents and cracks in the crawl space is needed as well as durable plastic sheeting large enough to cover the entire ground surface in the crawl space. Durable tape is one of the possible options for sealing the plastic joints.

As part of the installation work, any downpipes that exit close to the crawl space are directed away and rainwater routed away, to prevent water entering the space.

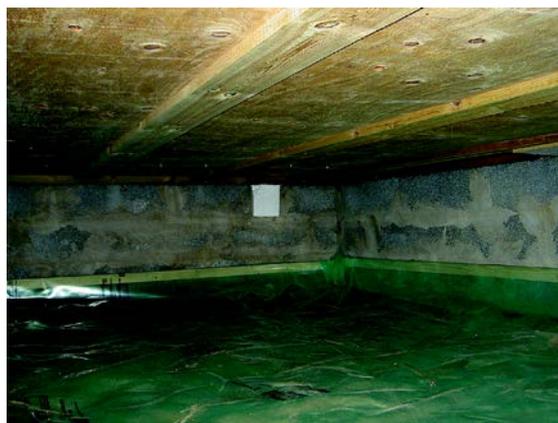
Installation

External and internal preparations

This installation description assumes that any downpipes that exit close to the crawl space have been directed away, so that rainwater is now routed away and no longer penetrates the crawl space.

Furthermore, any vents and cracks in the crawl space have been sealed to prevent outdoor air from entering.

The entire ground surface in the crawl space is covered with durable plastic sheeting. Be thorough with the installation and ensure good sealing by overlapping and using durable tape or another suitable method. Install the plastic right up against the foundation wall. In the example illustrated below, the seal against the foundations walls has been achieved by clamping the plastic sheeting using a timber batten. Remember that every missed, uncovered square metre can cause a surplus of moisture of two litres per day, depending of course on ground conditions and season.



Dry air duct

As described under Installation planning, the dry air duct, normally a spiral pipe, is installed to spread the dry air throughout the entire crawl space area. The dry air duct must start about 1 metre from the proposed dehumidifier location as the dry air hose is 1.2 metres long. The hose connection between dehumidifier and dry air duct prevents vibrations and thus noise from spreading through the duct.

The first third of the dry air duct's length, the part nearest the dehumidifier, is left free from nozzles. 16 nozzles are distributed along the remaining length, positioned so that the dry air is spread throughout the whole crawl space. Remember that the dry air must be evenly distributed in the space and that the air must move freely in all parts of the crawl space. Direct the nozzles mainly towards the foundation wall and in a direction away from the dehumidifier. Ensure that nozzles are directed towards all corners of the crawl space.

Note: Installation kit TT Multi contains 16 nozzles and they should all be used for CTR 300TT2.

Do not forget to install covers or seal the dry air duct's lower exit in another way, as per the example in the right-hand image below. If this is not done, the dehumidifier's efficiency worsens, the energy consumption increases and the majority of the air goes out at one point, whereupon the air in other parts of the crawl space can become still with resulting localised moisture problems.



Installing the dehumidifier and its connections



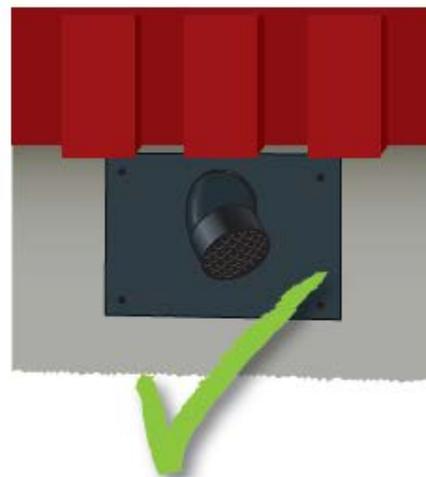
Note that any electrical installations carried out in connection with this work must be done by a qualified electrician in accordance with local and national regulations. CTR 300TT2 must be connected to an earthed, single phase 230VAC/50 Hz socket with a maximum 16A fuse. An earth-fault breaker is recommended with consideration of the environment in the crawl space.

The following instructions are based on using the TT Multi installation kit. Images and diagrams contain parts from this product.

Outside the house:

Install the wall plate with the pipe in through the hole in the foundation wall that was made for this purpose, or that possibly was there from before. Secure the plate with screw and plug from the installation kit.

Install the 45° pipe bend with protective grille and turn it in the desired direction. Check that the outlet is clear and not too close to the ground, so that the air flow is not obstructed by vegetation, leaves in the autumn and snow in the winter. The pipe must be bent downwards or diagonally downwards to prevent rain penetrating the space and entering the hose that is installed on the inside.



In the crawl space:



Wall brackets

In the location where the dehumidifier is to be installed, approx.1 metre from the dry air duct and a maximum of 0.7 metres from the wet air outlet in the foundation wall, use the hole template supplied with the installation kit and mark out the position of the holes. Ensure that the distance between the installed dehumidifier's upper edge and the roof (sub floor/blind floor) is at least 50 mm so that air can flow between them. Do not install higher than this, because it can cause a risk of overheating.

Drill out the four $\varnothing 12$ mm holes according to your markings and insert the supplied plugs. Screw the wall mountings in using the four coach screws supplied. Place the machine on the wall mountings.

Wet air hose

The silencer hose is installed at a slight bend between the wet air connector and the $\varnothing 80$ mm pipe that enters through the foundation wall from the installed wall plate. Carefully make a small hole in the outer sheath of the hose at the lowest point of the hose so that any condensation can run out. Take care when doing this, so that the hose is not pressed together preventing the air flow through the hose.

Correct installation, slight bend.



Incorrect installation, sharp bend



Dry air hose

Insert the nipple in the dry air hose and tighten with a hose clamp. Press the nipple in the dry air duct. Install the other end of the hose on the dry air connector on the dehumidifier using a hose clamp.

Control unit

Homevision® control unit must be installed at approximately half the height of the crawl space in a location that is not directly affected by dry air or radiation from hot or cold surfaces, so that the measured temperature and humidity values are as accurate as possible.

Screw the holder into the sub-floor, the roof of the crawl space, and slide down the control unit with cable and sensors. Connect the control unit cable to the dehumidifier. For further information about Homevision®, see its manual.

Damper settings

CTR 300TT2 is equipped with dampers, both for wet air and dry air, which together give the possibility of regulating wet air volumes and thereby the negative pressure in the crawl space. Wet air damper positions are marked 1 and 2 and dry air damper positions are marked A and B.

- In normal spaces, setting 1A is used.
- In the event of strong odour, 2A until the odour has gone and then 1A.
- For radon 2B.

See Radon and odour problems, under pressure control on the next page for more information.

Electrical cable

The dehumidifier is connected, when the installation work is completed, to an earthed single phase socket, 230VAC, 50 hz, with maximum 16A fuse. The socket that is used is recommended to be protected by a earth-fault breaker.

Radon and odour problems, negative pressure control

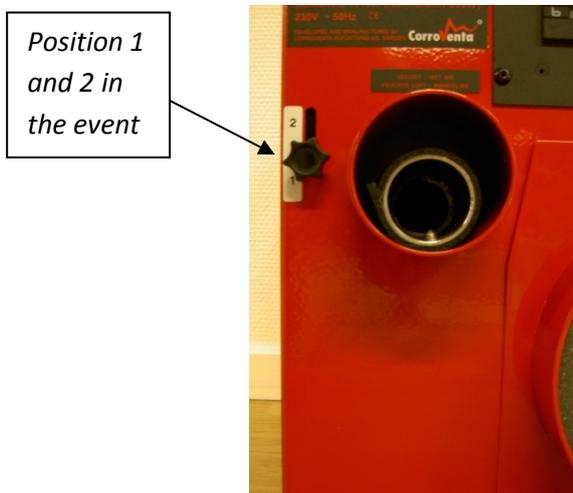
CTR 300TT2 has the capacity to vary the wet air volume and thereby the negative pressure in the crawl space, which can be used to improve the radon conditions or relieve issues with bad odours that penetrate the living accommodation from the crawl space. A patented solution that is applied to the machine means that this can occur without affecting the dehumidifier's efficiency.

Wet air volume is varied using two dampers, one on the wet air side and one on the wet air side . Wet air damper positions are marked 1 and 2 and dry air damper positions are marked A and B.

- In normal spaces, setting 1A is used.
- In the event of strong odour, 2A until the odour has gone and then 1A.
- For radon 2B.

The approximate wet air volumes that the different settings give can be read of the tables below.

Setting damper		Wet air volume m ³ /h
Wet air	Dry air	
1	A	45 – 55
2	A	90 – 110
2	B	110 - 130

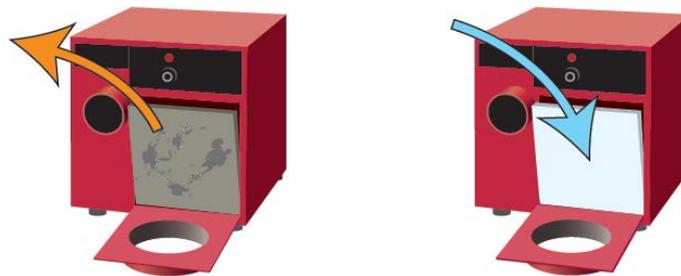


Maintenance and service

Filter replacement

The dehumidifier's filter must be replaced regularly, at least once a year. If the air filter is extremely dirty it must be replaced more often.

1. Disconnect the power from the dehumidifier.
2. Turn the button on the filter cover anti-clockwise and open the cover. Pull out the dirty filter from the machine and slide in the new one. Close the cover and turn the button clockwise to lock it.
3. Reconnect the power to the dehumidifier.



As a routine, also check the outlet at the outside of the foundation wall after replacing the filter, ensure that it is always unobstructed so that air can flow out freely.

Checking rotor operation

In event of repeated overheating when the heat protection has tripped, check that the rotor rotates according to the following instructions.



As this inspection must be carried out with the dehumidifier powered, the utmost caution must be observed. Do not insert your fingers or any tools into the machine!

1. Because the dehumidifier is connected to the power supply, remove the wet air hose from the machine using tools.
2. Using a torch, look into the machine through the connector, the pipe on which the hose was installed, and verify that the rotor rotates slowly. (The rotor's interior can be likened to a honeycomb structure)
3. Reinstall the wet air hose. If the rotor does not rotate, contact the dealer for repair.

Checking heater

Where warranted, Homevision® control panel gives a warning in the event of too high humidity, checks that the heater in the dehumidifier is working as intended.

1. When Homevision® control panel indicates that the dehumidifier is working, place your hand next to the wet air hose outlet by the foundation wall and verify that the air there is warm and humid.
2. If the air feels cold, the dehumidifier needs repairing. Contact your retailer.

If in doubt, due to prevailing weather conditions, about whether the air at the outlet is warm or not, follow the instructions below:



As this inspection must be carried out with the dehumidifier powered, the utmost caution must be observed. Do not insert your fingers or any tools into the machine!

1. When Homevision® control panel indicates that the dehumidifier is working, remove the wet air hose from the machine with tools.
2. Place your hand in front of the connector, the pipe on which the hose was installed, and verify that the air feels warm and humid.
3. Reinstall the wet air hose. If the air feels cold, the dehumidifier needs repairing. Contact your retailer.

Accessories

The following parts are available as accessories and consumables for CTR 300TT2:

Part number	Designation
20184	Filters

Fault tracing

Fault symptom	Probable cause	Actions
<p>Connection of control panel failed at installation. The control unit does not come up in the list of available devices that is presented on the control panel.</p>	<p>The control unit has already been powered for longer than two minutes and is therefore not available for connection.</p>	<p>Restart the control unit by disconnecting the current to it for a couple of minutes. Restart it again and try connecting the control panel.</p>
<p>The dehumidifier does not start when the connector is connected and Homevision® control panel does not connect to the control unit.</p>	<p>Power connection and/or control unit connection</p>	<p>Check that there is voltage in the electrical socket in which the dehumidifier is connected, that the fuse has not blown.</p> <p>Check that the cable to the control unit is correctly installed in the dehumidifier. This connector has a key that guides its position so turn the connector until it reaches the correct position and tighten.</p>

Fault symptom	Probable cause	Actions
<p>Homevision® control panel gives a warning that the dehumidifier's heat protection has tripped.</p>	<p>The air flow through the machine has been insufficient, which has caused the temperature to rise.</p>	<p>Check the filter and, if necessary, replace it. The dehumidifier restarts automatically when its internal temperature has dropped.</p> <p>If the fault persists after the above action: Check that the wet air duct is unobstructed, that the wet air hose is not pinched or sharply bent and that nothing blocks its outlet on the outside of the crawl space.</p> <p>If the above does not restore operation, check that the rotor in the dehumidifier still rotates. Follow the instructions under Service and maintenance in this manual.</p>
<p>Homevision® control panel gives a warning that the humidity in the crawl space is too high.</p>	<p>The humidity in the crawl space exceeds the set alarm level.</p>	<p>Before further action, check that the alarm level set in the system is relevant, that the humidity now found in the crawl space is a problem.</p> <p>Check that the air leaving the wet air hose outlet by the foundation wall is warm and humid, see instructions under Service and maintenance in this manual.</p> <p>Check that the wet air hose is correctly installed and has not come loose from the dehumidifier.</p> <p>Check that the rotor in the dehumidifier still rotates. Follow the instructions under Service and maintenance in this manual.</p> <p>Check the dry air distribution in the crawl space, that the dry air is still freely distributed via all nozzles in the entire space according to the installation description. If, for example, one of the pipe's end plates has fallen off, the necessary air distribution is not achieved.</p>

Check that the ground surface in the space is evenly covered by plastic and that any downpipes that exit close to the crawl space are directed away to prevent rainwater from entering.

If the problem persists the dehumidifier's capacity may possibly be sufficient for the additional moisture and should be swapped for a larger unit from the model programmed or supplemented with another machine. Consult the dealer to allow a technician to inspect the installation and determine the most appropriate action – replacement, supplementary or other action.

<p>Connection of control panel failed at installation. The control unit does not come up in the list of available devices that is presented on the control panel.</p>	<p>The control unit has been powered for longer than two minutes and is therefore not available for connection.</p>	<p>Restart the control unit by disconnecting the current to it for a couple of minutes. Try connecting to the control panel again.</p>

Technical data

Type LAF 50 LAF 50E LAF 50E2 LAF 100 LAF 100E LAF 150 LAF 150E

Dry air volume (m³/h)	200 – 300 *
Wet air volume (m³/h)	45- 130
Drying capacity at:	
20°C, 60% RH (litre/24 hrs/ kWh/litre)	21 / 0.97
10°C, 60% RH (litre/24 hrs/ kWh/litre)	14 / 1.46
5°C, 60% RH (litre/24 hrs/ kWh/litre)	12 / 1.70
Sound level, dBA 3m	Approx. 56 **
Connection	230VAC/50 Hz
Connection effect	1015W
Consumption during drying, normal operation	Approx. 850 W
Height x width x length (mm)	325 x 325 x 325
Weight, kg	16

**A crawl space dehumidifier like this shall be dimensioned for 1.5 to 2 air exchanges per hour, which makes CTR 300TT2 suitable for crawl spaces with a volume of up to 180 -200m³.*

***Sound level varies depending on installation.*