
CRAWLSPACE DEHUMIDIFIER CTR 500 TT

USER MANUAL

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How are different materials affected by moisture?

All air contains a greater or lesser degree of moisture. We can't see it with the naked eye before it appears in the form of small water drops against a cold surface of metal or glass. But before moisture is visible, it 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.

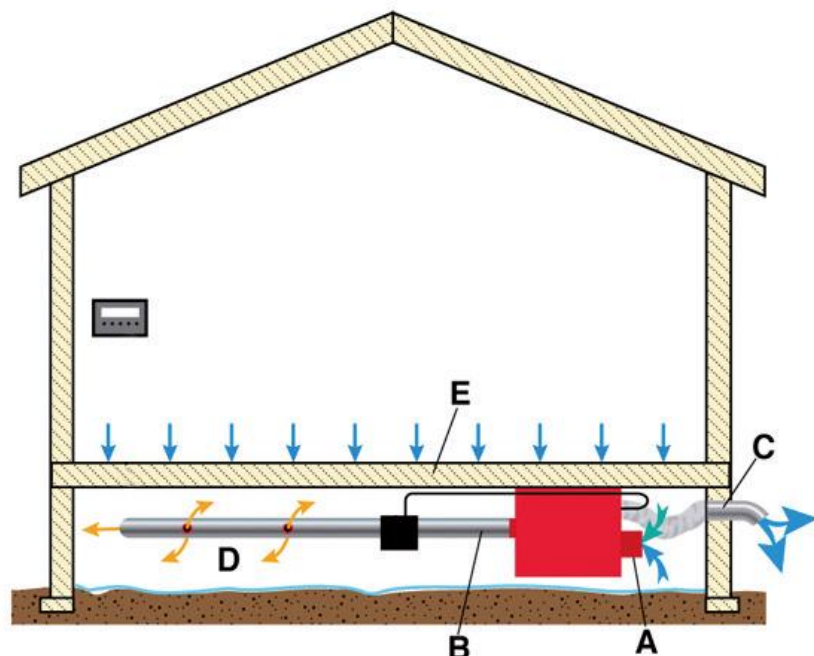
The difficult term of relative humidity

Air moisture is measured in relative humidity (% RH). This is a measurement of how much water the air holds at a particular temperature. At 100 % RH the air is saturated and the moisture falls in the form of small water droplets. **But steel starts to corrode at 60% RH. At 70% RH there is a risk of moulding.** A rule of thumb is that 50% RH is a good climate for most materials. But in the North, it is rarely 50% RH. In most places in the Nordic countries the average for the year is around 80% RH. The high relative humidity does not disappear in cold Nordic climates either. It can be equally high in winter or summer. And it is the relative humidity that counts.

How can one effectively eliminate mould and odors in a house with a crawlspace?

When outdoor air, particularly during the warm times of year, enters the crawl space (D) under the house it is cooled by the cool environment and the relative moisture increases and, therewith, the risk of mould attack and odours. **By drying the air, so that the relative humidity remains below 70%, mould can be prevented.**

The air in the crawl space is sucked into the dehumidifier (A). The dry air (B) must be distributed in such a way that the crawl space remains dry. At the same time as the dehumidifier dries all the air it removes all moisture (C) from the crawl space to the surroundings.



Description of dehumidifier CTR 500 TT

Function

In a crawl space one is dependent on a dehumidifier with a constant flow of dry air so that mould does not form. This is achieved using a rotating dehumidifier, type Corroventa CTR 500TT. The regeneration process is continuous. The dehumidifier is not dependent on the air temperature. The air can also be efficiently dehumidified far below freezing point. The fixed desiccant that is used is silica gel and can be regenerated a nearly unlimited number of times.

Silica gel is a crystal that can absorb a lot of moisture, approx. 40% of its own weight. There are different types to choose from for different areas of use. Inside the crystal there are lots of small microscopic pores. This means that the surface area of the walls inside the crystal is very large. One gram of silica gel has a moisture absorbent surface of 500 - 700 m².

A CTR 500TT dehumidifier contains desiccant with a total drying area of approx. 600,000 m². The dehumidifier is used to dry atmospheric air using the adsorption principle.

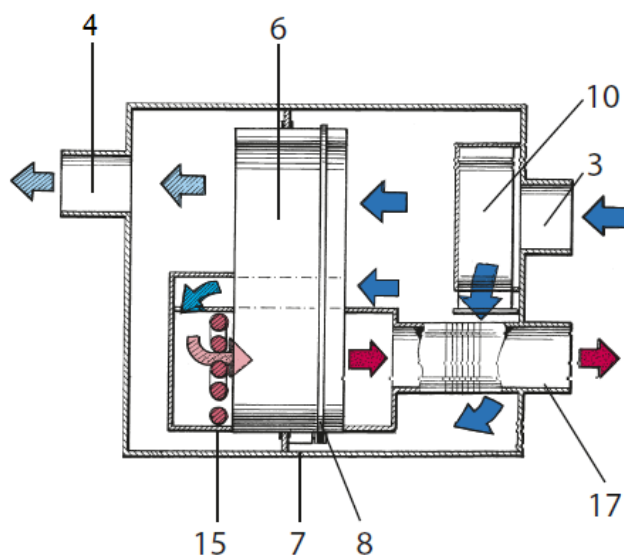
The adsorption rotor

The rotor has axially directed air ducts and consists of a highly active desiccant bonded in a ceramic structure. The desiccant is not water soluble and therefore cannot be washed away or blown out with exiting airflows.

The axially directed air ducts in the rotor give laminar flow with minimal pressure drop.

The dehumidification process

The desiccant is placed in a rotor (6). The air to be dried is sucked in through the inlet (3) by means of a process air fan (10). 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 rotates by means of a drive motor (7) and a drive belt (8). The moisture that is adsorbed in the rotor is driven out by a small portion of the process air being heated by the heater (15) and then passing a smaller part of the rotor, which is thus regenerated. The wet air is removed via the outlet (17) to the surroundings.



Construction external

Corroventa's adsorption dehumidifier CTR 500TT is specially designed for use in crawl spaces where the requirements are more stringent regarding durability, operational reliability and service life. It is therefore especially strongly constructed both externally and internally, see the front page.

CTR 500TT is manufactured from strong sheet steel and is powder coated both internally and externally. It comes with a practical carrying handle. The front of the dehumidifier consists of:

- 5 m oil and weather resistant cable with earthed plug for connection to an earthed 220 V socket, 1-phase alternating current 50Hz
- Hygrostat socket that fits Corroventa's own control panel.
- Run time meter that registers the time when the dehumidifier is connected.
- Inlet for process air, that is the air to be dried
- Filter door. To change the filter, open the quick release on the door after which the filter can be changed. Inside the filter is a rating plate with the dehumidifier's serial number.
- Outlet for wet air

On the rear of the dehumidifier there are two $\varnothing 100$ mm outlets and three $\varnothing 50$ mm outlets for dry air. The external connectors are made of 2 mm sheet steel and suitable for standard dimensions of spiral pipes, plastic pipes and spiral hoses.

Dehumidifier CTR 500TT has four elastic rubber feet.

Construction internal

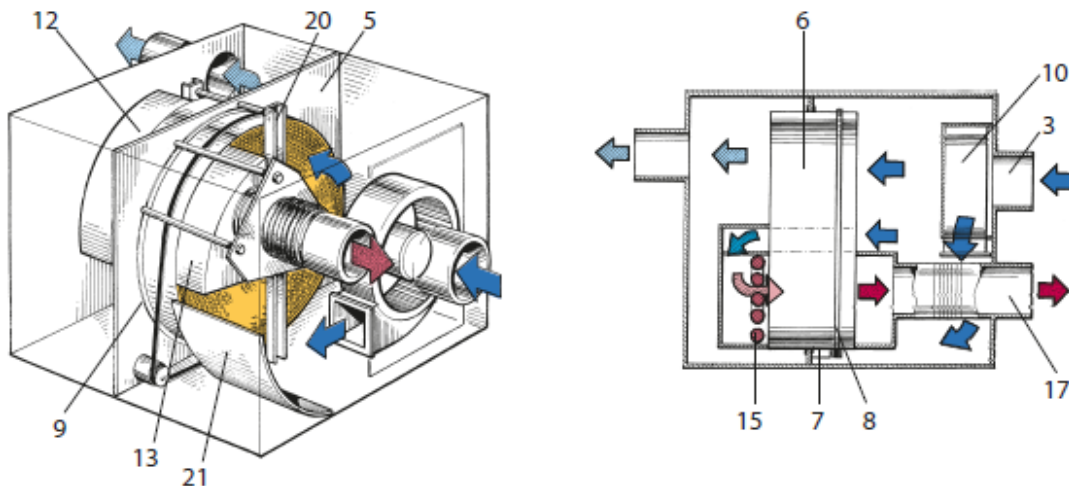
Electrical equipment is located in an internal distribution box and the rotor unit is attached to this by a quick release connector. The rotor unit contains the rotor (6), drive motor (7), drive belt (8), heating element (15) and covers (12,13), that is to say all internal components close to the fan (3).

The parts referred to in the schematic images are described in more detail below.

- (5) Elastically secured removable" drying pack"
- (6) Drying rotor with hub, bearing, spokes and blades
- (7) Drive motor with pulley for drive belt
- (8) Toothed drive belt
- (9) Rotor seal that forces air to pass through the drying rotor
- (10) Process air fan. There is a grille and filter between the process air fan and the process air inlet (3)
- (12) Heat cover that traps part of the process air for regeneration of the drying rotor
- (13) Collection cover for wet air
- (15) Heating element

(20) Rotor stay to secure the rotor in the drying pack. The rotor shaft is secured in the middle of the rotor stay

(21) Bent panel to facilitate air flow and thereby reduce flow losses



Control panel

For extra monitoring, the dehumidifier is equipped with a control panel that is placed in a suitable location in the house, see front page.

As long as the relative humidity is not too high (i.e. there is no risk of mould) a green lamp lights.

If the moisture content should exceed the critical limit for mould, because the dehumidifier does not work or the moisture load in the crawl space is too great, a red lamp lights.

A green lamp also lights as long as the ventilation in the crawl space is functioning. If the ventilation does not function because the fan does not have power the light goes out. To ensure the function of the fan, manual checks should be made at the dehumidifier or wet pipe outlet. **The ventilation must always function.**

If it stops operating, a red warning lamp comes on.



Installation

CTR 500 TT is a complete machine, ready for connection. All components required for operation are integrated and internally connected.

The local regulations for electrical installations must be followed.

Planning and design of a dehumidifying system covers:

- the dehumidifier's position and connections
- the shape of the duct system
- distribution of the correct air volumes
- the hygrostat's position and connection. This is described more in the next section.

Location of CTR 500TT

The dehumidifier must be placed in the crawl space so that the following requirements and demands are satisfied:

- effective distribution of the dry air with as simple a dry air duct system as possible
- simple duct routing for supply of dry air and removal of wet air
- simple electrical connection
- space and access for easy filter changes

The dehumidifier is installed in the area to be dehumidified. **It is ideally positioned near a wall on a bracket or shelf so that the filter is easy to access for replacement.**

Duct system

Inward process air can be ducted or work with free suction. Dry air should be ducted. **Wet air must be ducted so that the moisture laden wet air is vented outside the dehumidified area. Always use Corroventa's installation kit to achieve best function.**

Wet air

In certain cases, condensation can occur in the wet air hose. To avoid this, the hose must be laid with a fall from the machine. If a fall cannot be achieved directly from the machine one should make a drainage hole in the lowest part of the hose, to prevent water running back into the dehumidifier. **To further prevent condensation, the insulated sound damping hose provided in the "installation kit" must be used.**

To bare in mind

The wet air hose must not be replaced with one with smaller dimensions. If this occurs, the installation's function is affected and the dehumidifier can overheat.

Connection of control panel, (hygrostat section)

The hygrostat is placed in the crawl space where the conditions are considered suitable or particularly critical. It must not be located in a position where it is exposed to the dry air. It must not be located near sources of heat or cold or exposed to solar radiation. **The moisture sensor must be removed from its transport cover and hang freely from its cable.**



Connection of control panel (indicator box)

The indicator box must be placed in a suitable location in the house where it can be easily monitored. To avoid unnecessary electrical routing it should be as close to the dehumidifier/hygrostat as possible.

Operation and care

Start

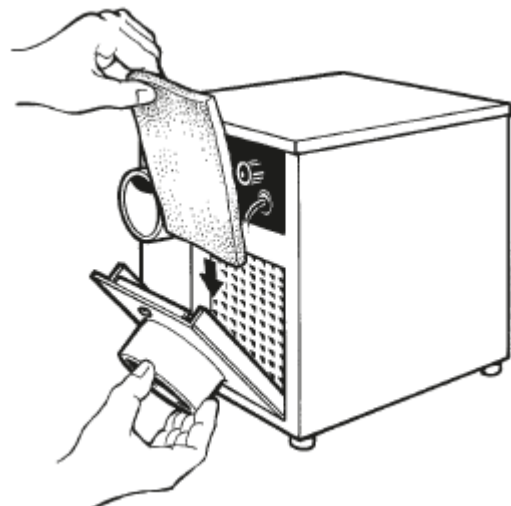
The machine should be checked immediately after receiving it. Faults and transport damaged parts must be reported immediately.

1. Check that **the filter is clean**
2. Check that there are no blockages in the connected duct system
3. Connect the dehumidifier to an earthed electrical socket 230V. An earth fault breaker should be used.
4. Does the rotor rotate? Look through the dry air opening.
5. Check the temperature of the wet air, which is significantly hotter than process air during dehumidifying.
6. **Follow the dehumidifier's function. Note in the service journal.**

Maintenance, service

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

Open the filter door and replace the filter with a new one.



Overheating

If the filter is very dirty or if the fan is broken, the dehumidifier will stop because of overheating, which causes the red warning lamp "operational stop" on the control panel to light.

Allow the machine to cool and pull the electrical plug out of the socket. If the machine has stopped because of a dirty filter it will run again after replacing the filter, once the plug is connected to the socket.

If the dehumidifier does not restart or stops again because the fan is broken, contact the installer.

Operation and service journal

Make notes of the filter changes in the table below. The operating hours reading is noted. Note any action taken in conjunction with the filter change or other inspection in the column "Notes".

Date	Run time meter hours	Filter replacement Yes / No	Notes

Installing control panel

Control panel consists of:

- indicator box located in main entrance, cloakroom or similar.
- hygrostat section with connection box is placed in the crawl space.

INSTALLATION ORDER:

NOTE! Ensure that the dehumidifier is unpowered!

1. Remove the cover of the indicator box.
2. Disconnect the cable with 6 connections and carefully pull them out of the indicator box.
3. Drill a hole between the crawl space and the upper floor.
4. Screw the hygrostat connector into the dehumidifier.
5. Install the hygrostat section with connection box.
6. Route the (according to point 2 above) disconnected cable up through the drilled hole to the upper floor.
7. Screw the indicator box into place at a suitable location using the screws provided (4 x).
8. Reinstall the previously disconnected cable (according to point 2 with 6 connections). The connectors' cable colors are installed on the corresponding color markings on the terminal block.
9. On the first page of the Technical description write down which office has installed it with contact person and a telephone number the customer can call if anything happens to the installation.

NOTE! Hygrostat section with connection box must not be opened!

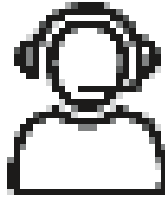
Technical data

Dry air volume	500 m ³ /h
Wet air volume	60-80 m ³ /h
Height x Width x Length	360 x 385 x 325 mm
Weight	21 kg
Power output	1780 W
"Actual power"	Approx. 1500 W
Power supply	220 V/50 Hz
Wet air outlet	∅ 76 mm
Process air inlet	2 x ∅125 mm
Dry air outlet	2 x ∅100 + 3 x ∅50 mm
Overheat protection setting	80 °C
Overheat protection (safety thermostat 1), setting	80 °C
Overheat protection (safety thermostat 2), setting	130 °C
Drying capacity at:	
20°C, 60% RH	32 l/24 hrs.
10°C, 60% RH	22 l/24 hrs.
5°C, 60% RH	19 l/24 hrs.

Process air in. The connection has an external dimension of 2 x ∅ 125 mm suitable for standard spiral pipes and spiral hoses.

Dry air out. The connections have an external dimension of 2 x ∅ 100 suitable for standard spiral pipes and spiral hoses and 3 x ∅ 50 mm suitable for standard plastic pipes and spiral hoses.

Wet air out. The connection has an external dimension of ∅ 76 mm.



DO YOU HAVE QUESTIONS OR NEED HELP?

*Visit www.corroventa.com or call +44(0) 161-2449523 to speak with an expert.
We have the knowledge and the equipment to find a solution as efficiently as possible.*

Corroventa develops, manufactures, sells and hires out high quality products for dealing with water damage, moisture, odours and radon. We are one of the market leaders and specialise in innovation within the industry. Our products are compact, effective, ergonomic and energy efficient. In emergency situations and during flooding, Corroventa's customers have access to one of the largest rental parks in Europe. We have sales offices and machine depots in several locations throughout Europe. All our manufacturing takes place in Bankeryd, Sweden.

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