CTR LKV 1000XT ADSORPTION DEHUMIDIFER

USER MANUAL

CorroVenta®

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User Manual CTR LKV 1000XT

Intended use

The CTR LKV 1000XT is an adsorption dryer with a built-in, air cooled condenser, developed and intended for construction drying and water damage restoration. With its built-in condensate pump allowing continuous use, it is ideal for emergency situations, construction drying or other situations where use of a wet air hose from a standard adsorption dryer is difficult.

Through use of the adsorption principle, the CTR LKV 1000XT functions well even at lower temperatures and through the cooling and the condensation of the wet air it produces 3kW of heat. As all other Corroventa machines, the CTR 500XT is very energy efficient and robust in its design, prerequisites for a very long life. The machine is very easy, both to use and to maintain.

Features:

• Energy efficient	• Service friendly
• High Capacity	• Hour/kWhr counter
• Robust	

Manufacturing Directive

CTR LKV 1000XT is CE approved.

Waiver of Liability

- Faulty, incorrect installations and/or incorrect use can cause damage to property and human injury.
- The manufacturer assumes no responsibility or liability for damages or injuries caused by non-compliance with the instructions herein, use for other purposes than the intended, or failure to observe its warnings. Such damage, injuries or liabilities are not covered by the product warranty.
- The product warranty does not cover consumables or normal wear and tear.
- It is the responsibility of the buyer to inspect the product at time of delivery and before use to ensure its good function. The product warranty does not cover damage resulting from use of faulty products.
- Changes or modifications to the equipment must not be made without written consent by Corroventa Avfuktning AB.
- The product, technical data and/or installation and operation instructions can be changed without prior notice.
- This manual contains information that is protected by the Intellectual Property laws. No part of this manual may be copied, stored in an information system or transferred in any form or in any way without the written consent of Corroventa Avfuktning AB.

Any comments on the contents of this document shall be sent or addressed to:

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564 35 Bankeryd
SWEDEN

Tel 036-37 12 00
Fax 036-37 18 30
E-post mail@corroventa.se

Safety information

This equipment is not intended to be used by individuals with physical or mental disabilities impeding their operation or understanding of it or by individuals lacking required knowledge or experience unless they are supervised and instructed by another person with responsibility for their safety.

Children must only use this equipment under supervision of an adult to ensure that it is not used as a toy, something that it is not designed for.

Electrical installations made in connection with the installation of the dehumidifier or the CTR 500XT shall be made by authorized personnel in accordance with local and national regulations.

Furthermore, the following warnings and instructions shall be read and observed:

1. The dryer is intended for indoor use only.
2. The dryer must not be powered until the installation is finished in accordance with this manual.
3. The powered dryer must not be covered as this can lead to overheating and fire hazard.
4. The dryer must not be used as table, trestle, pallet or stool.
5. The dryer must not be used to step or stand on.
6. Never use the dryer without the filter installed as this can cause damage to it. Ensure that the filter is clean. A cluttered filter can cause the dryer to overheat.
7. Bases or organic material with high boiling point such as oil, fat, solvents, boracol or similar substances must not be drawn into the dryer. It may damage the rotor.
8. The dryer must not be used in spaces where explosive gases can be present.
9. Do not stick objects into the air outlets or intakes as this can cause damage to the machinery as well as human injury.
10. Install the dryer steadily and leveled so that it cannot fall over.
11. Keep children, animals and spectators away from the work place while installation is undertaken.
12. If the dryer is broken, if the power connector or the cable is damaged, contact the retailer. Do not repair the equipment if you have not received specific training by the manufacturer.
13. Be careful not to damage the power cable. The cable must not go through water or pass sharp edges.
14. Never carry or tow the dryer by its cable.
15. To use electrical equipment in humid or wet environment can be dangerous. Never power the dryer if it is standing in water.
16. A residual-current device / ground fault circuit interrupter should be used to minimize the risk of electric shocks.
17. Water must not come in contact with the electrical components of the equipment. If this has happened, ensure that the equipment is dry before it is used again.
18. The power must always be disconnected before the dryer is opened.
19. Repairs and maintenance of the electronics and the electrical system of the dryer must only be made by qualified electrician.
20. The dryer must never be used with any other accessories than those listed in this manual or those specifically approved by Corroventa Avfuktning AB.

For further advice on product safety and use, please contact the supplier.

Relative humidity and its effect on substances

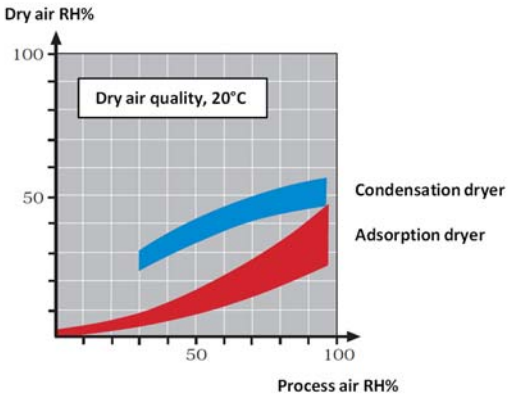
All air contains more or less moisture but the naked eye cannot see it until it condensates in small droplets on for instance a metal or glass surface. Already before it is visible however, the moisture affects substances and production processes, causes corrosion and micro organism growth.

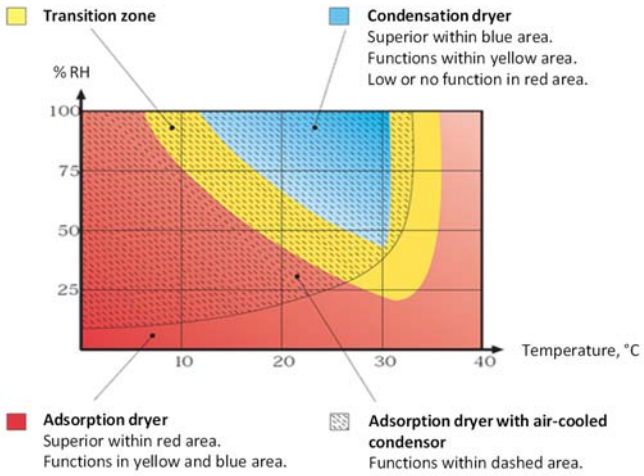
Air humidity is measured and referred to in terms of relative humidity (%RH) which is a measure how much water it contains relative how much it can contain at given temperature and pressure. The higher the temperature, the more water the air can contain but it is still the Relative Humidity that counts and that needs to be controlled if one wants to prevent corrosion or mould growth.

At RH 100% the air is saturated – there is fog and the moisture condensates in small droplets. Already at RH 60% steel corrodes and at 70% there is a risk for mould growth. As a rule of thumb, RH 50% is a good climate for most substances.

How to select dryer type

The adsorption principal has, compared to condensation drying, the advantage of a lower ambient temperature dependency. Adsorption functions even well below the freezing point while the capacity of a condensation dryer inevitably decreases rapidly with falling temperature, something that is depicted in the diagram below to the left. An adsorption dryer with built-in air cooled condenser like the LKV 1000XT can be said to bridge over these characteristics by functioning within a wide spectrum, including the primary zone of the traditional condensation dryer. It is, in other words, ideal for emergency situations and construction drying.
As a rule of thumb, a general aid in the selection of type, it can be said that a standard adsorption dryers like the CTR 150, 300 or 500 XT, is the primary choice for drying of unheated spaces or when material is to be dried. The latter is motivated by the fact that the adsorption dryer produces dryer air, generates a greater reduction of water content measured in grams per kilogram (Δx), easily deduced from the diagram below to the right and something that is directly correlated to the drying speed. Drying of layered constructions such as floor structures are, with advantage, dried with combined use of turbines, high pressure fans, installed for either suction or pressure drying.





Condensation dryers are used, in accordance with the diagram above, used in hot and humid conditions provided the goal and aim is drying of rooms, ambient air.

How the dryer works

The CTR LKV 1000XT is an adsorption dryer with a built-in, air cooled condenser through which ambient air is drawn by separate fan. The desiccant used in dryer itself is silica gel which can be regenerated an almost infinite number of times. Silica gel is a crystal with enormous amounts of microscopic pores which makes its total surface very large. A single gram has an active surface of 500 to 700m^2 which means that the desiccant of CTR 500XT has a total drying surface of approximately 218 000m^2. Silica gel is very potent and can absorb water corresponding up to 40% of its own weight. Silica gel is not water soluble and can therefore not be washed away nor dissipate into the passing air.

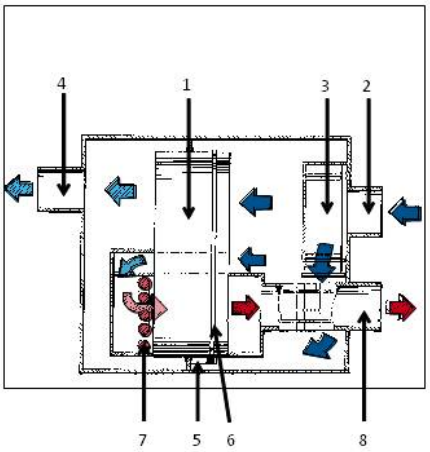
Dehumidification process

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

The air passes a filter and then the rotor where after the dried air passes through the dry air outlet (4) and into the environment to be dried. The rotor has air channels parallel to its axis and is made from a highly potent desiccant, silica gel, tied in a ceramic structure. The air channels in the rotor provide a laminar air flow with a low pressure drop.

The rotor is rotated by an electric motor (5) and a belt (6). The moisture that is adsorbed is removed by a small volume of process air that is heated (7) where after it is passed through a section of the rotor, thus regenerating it as well as cleaning it through the counter flow principle.

The wet air is evacuated through the wet air outlet (8) which, in the CTR LKV 1000XT, is lead to the condenser to be cooled and the re-circulated through the dryer as part of the new process air. The condensate from condenser pours down into the pump module and is evacuated by the pump.



Delivery inspection

The CTR LKV 1000XT is delivered with the following items included:

Dryer CTR LKV 1000XT	1 pc
Process air filter, white	2 pcs
Cooling air filter, black	1 pc
Manual	1 pc

Product Overview

Below pictures present CTR LKV 1000XT with all its external features and controls.


Dry air outlet, left
Dry air outlet, right
Condensate evacuation hose
Cooling air outlet

Installation

The CTR LKV 1000XT is very easy and quick to install, making it very suitable for emergencies as it very quickly can be up and running. It is positioned in the room/space to be dried in such a way that optimum air circulation is achieved. The better all the air is set in motion, the better and the quicker drying will result. The machine produces 450m^3 of dry air per hour and as the recirculation air flow rate should be between 1.5 and 2 per hour, it is sufficient for a volume of up to 300m^3.

Do not place the machine closer to a wall then 0.5 to 1 meter not to unnecessarily obstruct the air flow. To dry several spaces in parallel, dry air hoses can be connected to the dry air outlets

As for all drying, regardless of type or model of machine used, it is important that the room or space to be dried is well sealed in order for the process to be as energy efficient and quick as possible. Windows and doors shall be shut and in absence of such delimiters, plastic foils or other temporary sealing should be used. If the space to be dried is very small it is important to consider that the machine can produce up to 3kW of heat which, depending on situation, rapidly can increase the temperature and thus lower the drying capacity. The best performance of the CTR LKV 1000XT is achieved within the temperature interval of 0 to 25°C.

When drying wood or in other situations where there is a risk of drying to rapidly or to too low levels, the CTR LKV 1000XT can be used with a humidistat which is available as an accessory. With the help of that, a threshold relative humidity can be set at which the CTR LKV 1000XT stops. Should the humidity increase again, the machine will automatically restart.

The condensate evacuation hose is lead to sewage, floor drain, sink, toilet or similar. The built-in pump is capable of handling elevations of up to eight meters, allowing use of condensate evacuation point located higher than the machine itself.

> **Do not use the machine at temperature below 0°C as the water in the pump module will freeze.**

Installation in short, main points (see also page 7, Product Overview):

- Place the dryer so a good air circulation is achieved in the room.
  Avoid placing it closer to a wall than 0.5 to 1 meter not to unnecessarily obstruct the air flow. Use, if so required, dry air hoses to spread the air. Make sure that the dryer is leveled and stable so that it cannot fall over and cause damage.
- Lead the condensate evacuation hose to suitable evacuation point. The pump is capable of handling an elevation of four meters. Verify that the hose is not squeezed and that it is clean so that the water flow is not obstructed.
- Connect the cable to 1-phase, 230VAC fused to 10A or maximum 16A.
- For continuous operation, verify that the Man/Hyg selector is in position Man
- For drying of wood or in other situations where to quick drying or drying to too low levels can be a problem, put the Man/Hyg selector in Hyg position. Connect humidistat and set desired threshold level relative humidity.

- Verify, by looking into the dry air outlet, that the rotor is rotating and, by putting one hand in front of them, that both fans are running and that there is air blowing out of both the dry air outlets and the cooling air outlet. The dry air shall feel warmer than ambient air and that is best felt by the right dry air outlet which is closest to the heater. Note, when using humidistat that the set point might have to be temporarily lowered in order for the dehumidification and thus the heater to start.

When the work is finished, the user is encouraged to follow the instruction on how to empty the dryer that is placed on the label below the handle in order not to spill water on the floor or in the transportation vehicle. The instruction is for the operator to, while the machine is still running, carefully lean it forwards and then backwards. This will cause any water still left in the condenser to pour into the pump module and be evacuated by the pump. As the machine weights 47 kg, do not lean it too much as it then will be hard to keep from falling over.

Transport

Before transportation and while the machine is still running, follow the instructions on the lable below the handle to empty the condenser of any water.

For transportation, the machine can be loaded standing up or laying on its back, carriage handle down. If the machine has not been emptied, laying it down can cause water spill.

Maintenance and service

Filter replacement, process air filter and cooling air filter

To maintain good capacity and to avoid overheating, the dryer's process air filter and cooling air filter must be replaced regularly. The cooling air filter is washable which may allow reuse. It is recommended that the filters are washed/replaced for every new work. When used in dirty environment, the filters may have to be replaced more often.

Filter replacement is done with the machine powered off.

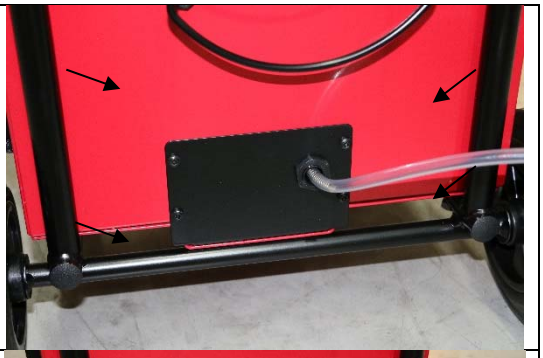
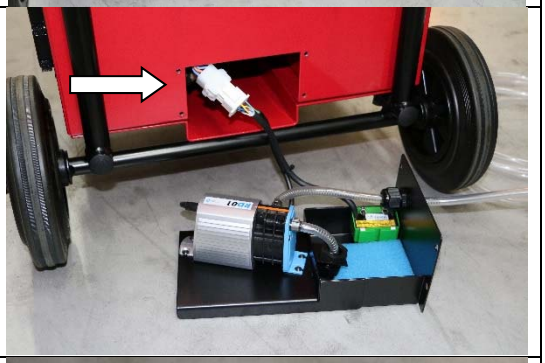
For process air filter replacement, the knob on the filter hatch is turned anti-clockwise. The hatch is opened, the old filter pulled out and the new inserted. The hatch is closed by turning the knob clock-wise.

The cooling air filter is pulled up, out of its holder and then cleaned or replaced. The filter to be used is slid in from above.

Filter replacement and cleaning, pump module

When required, normally more seldom than the replacement of the other filters, the pump module can be cleaned and its filter either cleaned or replaced. This is done in accordance with the following instructions.

When the pump module shall be removed for cleaning or replacement, the dryer must be disconnected from power.

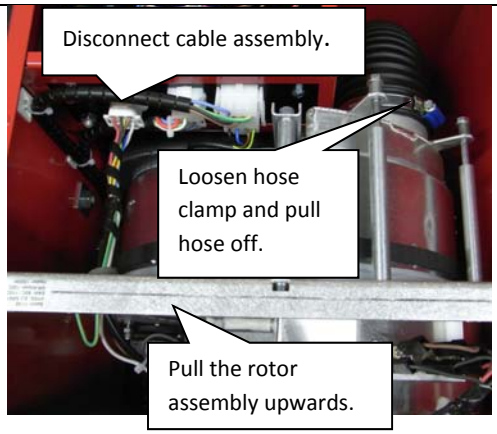
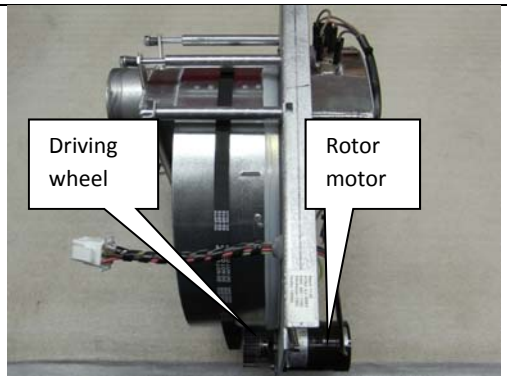
1. **Pull out the cable from the socket so that there is no power to the dryer.** Remove the four screws that hold the pump module.	
2. Pull out the pump module and disconnect the cable assembly.	
3. Remove filter and the basket holding it and clean them with warm water.	
4. Reassemble the dryer by following the instructions in reverse order.	

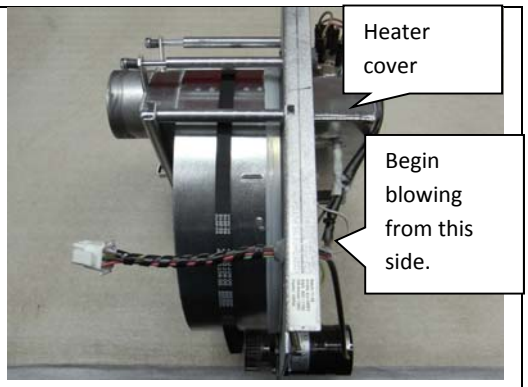
Cleaning of rotor

When required, yearly or after use in very dirty environment, it is recommended to clean the rotor with pressurized air. The rotor can be clogged by dirt resulting in lowered air flow and capacity. To clean the rotor, follow these instructions:

When the rotor shall be cleaned, the dryer must be disconnected from power.

Always use a suitable protective mask and stand outdoors when cleaning the rotor.

1. **Pull out the cable from the socket so that there is no power to the dryer.** Remove the four screws that hold the top lid of the dryer. Remove the lid.	
2. Loosen the hose clamp that holds the wet air hose to the reg. cover and pull the hose off the spigot. Carefully disconnect the cable assembly by separating the white connector to the left indicated in the picture. Pull the entire rotor assembly upwards to lift it out of the machine. Be careful not to damage the rotor interior when handling the rotor assembly.	
3. Lift the belt off the driving wheel by first pulling the motor forward in its track in order to loosen the belt tension.	

4. *Note: Always use a suitable protective mask and stand outdoors when cleaning the rotor.* With pressurized air, carefully blow the rotor interior clean. Hold the nozzle approximately 15cm from the rotor and begin by blowing from the heater cover side of the rotor. This way, the air will flow through the rotor in the opposite direction of what it usually does which will prevent further dirt from getting stuck inside. When later cleaning from the other side, avoid blowing into the heater cover as the dirt will not be evacuated. Only blow on the rotor where the opposite side is free and unobstructed.	
5. When the rotor is cleaned, assemble the dryer in the reverse order, thus: • Mount the belt • Carefully lower the rotor assembly into the machine. • Reconnect the wire assembly • Reattach the wet air hose. Verify that the reg. cover is held tightly against the rotor on both sides sot that air does not leak into the dryer. If it is not, loosen the hose clamp again and pull the wet air hose back a little bit, tighten the clamp and verify again. • Put the lid back on the dryer and tighten the four screws.	
6. Inspect and verify the good function of the dryer as follows: Connect power to the dryer and put it in manual mode. Verify that it starts, that the fan starts running. Verify, by looking into the wet air outlet that the rotor is rotating. Put one hand in front of the wet air outlet and verify that the air feels warm, thus that the heater is functioning. This is best felt by the right dry air outlet which is closest to the heater.	

Accessories and consumables

The following articles are available as accessories and consumables to the CTR LKV 1000XT:

Artikelnummer	Benämning
01100	Humidistat, HR1-5
21044	Cooling air filter, black
20184	Process air filter, white
1002079	Water filter (pump module)

Fault finding

Symptom	Probable cause	Action
The dryer has stopped working, the yellow error indicator is lit.	The dryer cannot evacuate the water.	Check the condensate evacuation hose, that it is not squeezed or clogged with dirt but that the water can flow freely. If the above does not eliminate the problem, clean the pump module and if required, replace its filter, in accordance with the instructions of this manual. If the problem remains, the pump module has failed and is in need of repair. Please contact your retailer.
The dryer seems to work, air is blowing out of it, but no water is produced. The yellow error indicator is not lit.	The climate might be so dry that no water is produced. If humidistat is used, its set point can be above the ambient relative humidity why the dryer is not operating. The ambient temperature can be outside the interval within which the dryer has its best performance, 0 – 25°C. Below 0°C the water in the pump module can freeze and damage the pump. The dryer fan, heater or rotor motor is faulty.	After having checked the temperature is within the interval and that ambient humidity is such that water should be produced, proceed as follows: Check, and if necessary replace process air filter and cooling air filter in accordance with the instructions of this manual, section Maintenance and Service. Check that both fans or working by placing one hand in front of the dry air outlets and the cooling air outlet. In both places air shall blow and if any of the fans is not working, contact your retailer for repair. Check, by looking into the dry air outlet that the rotor is rotating anti-clockwise. If it is not rotating, the belt can be incorrectly mounted. Follow the instructions for cleaning of rotor to rectify that. If the belt is correctly mounted and the rotor still does not rotate or rotate clockwise, the rotor motor is faulty. Please contact your retailer for repair.

		Check that the heater is functioning, preferably by feeling the temperature of the air from the right dry air outlet. The air shall be warm and if it is not, please contact your retailer for repair. Clean the rotor in accordance with the instructions of this manual.
Symptom	Probable cause	Action
When the dryer is powered on, the operation indicator is lit and the rotor is rotating but nothing else happens.	The dryer's overheat sensor has been triggered as a consequence of serious hardware failure.	Please contact your retailer for repair.
The rotor is rotating clockwise, as seen through the dry air outlet, or not rotating at all.	The motor or its capacitor is faulty.	Please contact your retailer for repair.

Technical data

Typ LAF 50 LAF 50E LAF 50E2 LAF 100 LAF 100E LAF 150 LAF 150E

Dry air volume (m^3/hr)	**450**
Cooling air volume (m^3/hr)	***550***
Total air volume (m^3/hr)	***1 000***
Drying capacity at 20°C, 60% RH (liters/day)	***20***
Pump capacity, maximum elevation (m)	**4**
Noise level, dBA (3m)	**approx. 66***
Voltage	**230 VAC / 50 Hz**
Rated power (W)	***1 760***
Power, normal operation (W)	***approx. 1 500***
Height x width x length (mm)	***930 x 560 x 470***
Weight, kg	***47***

**Noise level varies with installation.*

DO YOU HAVE ANY QUESTIONS OR DO YOU NEED OUR SUPPORT?

Please visit www.corroventa.com or call us at +44 (0)161-244 95 23 and speak to 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 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.

www.corroventa.com

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