ADSORPTION DEHUMIDIFIER

A4 110V

USER MANUAL

CorroVenta®
MAKING DRYING SMARTER™

Contents

User instructions A4 110V

Area of use

The A4 110V adsorption dehumidifiers have been developed and designed for water damage restoration and construction drying. This A4 110V in particular is intended for use on construction sites where 110VAC, 50Hz is used instead of the standard European mains power. For ease of use, the A4 110V is equipped with the same robust analogue control system as the other members of the family.

The A4 110V dehumidifiers have a folding handle with a holder for the electrical cable, while their light weight means they are easy to carry and install. The durable but flexible feet protect the floor surfaces and also make it possible to stack the machines. The driers have a naturally robust construction that gives a long service life.

The efficiency of adsorption dehumidifiers like the A4 110V do not have the same temperature dependence as condensing drier do and thus they work well even below the freezing point. Furthermore, adsorption dehumidifiers are capable of creating drier air, achieving a greater difference between the water content of incoming and outgoing air than condensing driers do. This drier air makes the dehumidifiers suitable not only for drying rooms but also for drying layered constructions, where turbines are applied to achieve both suction as well as pressure drying.

Properties:

• Energy efficient	• Service-friendly
• High capacity level	• Hour counter
• Robust	• Very quiet

Delivery check

A4 110 V is supplied with the following parts in the package:

Drier A4 110V	1 x
Extra process air filter in addition to the one in the dehumidifier	2 x
User manual	1 x

Manufacture directive

The machines in the A4 110V range are CE approved.

Limitation of Liability

- Incorrect installation and/or incorrect use can cause property damage as well as injury.
- The manufacturer assumes no liability for property damage or injury incurred as a result of failing to follow these instructions, the machine being used for purposes other than those intended or failure to observe these warnings. Such damage, injury or liability is not covered by the product warranty.
- The product warranty does not cover consumable parts or normal wear.
- The purchaser is responsible for checking the product upon delivery and before use to ensure it is in good condition. The product warranty does not cover damages resulting from the use of defective products.
- No changes or modifications to the machine may be performed without written consent
- 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 applicable intellectual property laws. No part of these user instructions may be reproduced, stored in a retrieval system or transmitted to third parties in any form or by any means without the prior written consent of Corroventa Avfuktning AB.

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Safety information

This device is not intended for use by persons with reduced physical, mental or sensory impairments nor other persons lacking the necessary skills or experience, unless supervised or instructed by another person with responsibility for their safety.

Children may only use the device under the supervision of an adult to ensure that the device is not used as a toy.

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

In addition, the following warnings and instructions must be read and followed:

1. The drier is only intended for indoor use.
2. The drier must not be powered on before installation is completed in accordance with this manual.
3. The drier must not be covered because this may lead to overheating and fire.
4. The drier must not be used as a work table, trestle or stool.
5. The drier is not intended to be stood or climbed on.
6. Never operate the drier without installing the filter as this may damage the drier. Ensure that the filter is clean. If it is blocked, the machine may overheat.
7. Do not allow the drier to draw in alkaline chemicals or organic substances with a high boiling point, such as oil, grease, solvents, boracol or similar. These can damage the rotor.
8. The drier 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 drier and injure people.
10. Place the drier on a firm and flat surface so that it cannot overturn.
11. Keep children, animals and bystanders away from the workplace.
12. Contact the supplier if the drier 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 drier by the cable.
15. Using electrical equipment in very damp or wet conditions can be dangerous. Do not operate the drier if it is standing in water.
16. The drier may only be connected to a grounded socket with voltage according to the rating plate.
17. It is recommended to use an earth-fault breaker to minimise the risk of electric shock.
18. Water must not come into contact with the drier's electrical components. If it does, ensure that they are dried thoroughly before the drier is used again.
19. Never open the drier for cleaning or service without first ensuring that the drier is disconnected from power.
20. Repairs and maintenance of the drier's electrical system must be performed by a qualified electrician.
21. Wet air hoses/pipes used and connected to the drier must be corrosion resistant and able to withstand heat of 80°C.
22. The drier must not be used with accessories other than those described in this manual or approved by Corroventa Avfuktning AB.

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

Relative humidity and its impact on materials

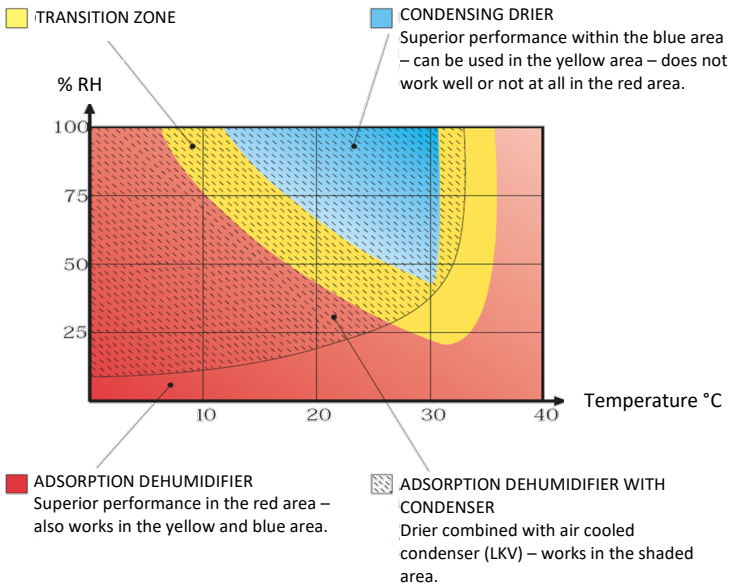
All air contains a greater or lesser degree of moisture. We can't see it with the naked eye until it appears in the form of small water drops against a cold metal or glass surface for example. However, before it is visible, moisture is already causing problems by affecting materials and manufacturing processes, causing corrosion and growth of micro-organisms.

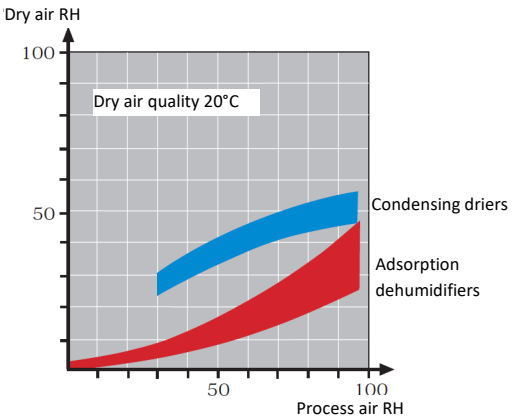
Air moisture is measured and usually given in relative humidity (% RH). It is a measurement of how much water vapour the air contains over how much it can hold in total at a given temperature and pressure. The higher the temperature, the more water the air can hold, but it is the relative humidity that is calculated and must be controlled to prevent corrosion or mould growth.
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.

How to select dehumidification technology for a given situation

The adsorption principle has the advantage of not having the same temperature dependence as condensing dehumidification. Adsorption also works way below freezing whilst condensing dehumidification capacity decreases sharply with decreasing temperature, which is illustrated in the graph below to the left.

As a general tip when choosing the technique for the relevant drying situation, it can be said that adsorption dehumidification is the primary choice for drying in unheated spaces or when material drying is required. The latter is justified by the adsorption dehumidifier producing drier air, i.e. provides a greater difference between the incoming and outgoing air's moisture content calculated in grams per cubic metre (ΔX), which can be seen using the graph to the right below and which is decisive for the rate of drying. Layered structures are dried by the machine being installed, with the turbine, for suction or pressure drying.





As the graph above shows, condensing driers are used in hot and humid spaces as long as room drying is required.

This is how the drier works

The desiccant used in A4 110V is silicate gel, which can be regenerated an almost unlimited number of times. Silicate gel is a crystal with a lot of microscopic pores that make the total surface very large. A single gram has an active surface of 500 to 700 m^2. Silicate gel is very powerful and can absorb a volume of water of up to 40% of its own weight. It is not water soluble and therefore cannot be washed away or diverted to the passing air.

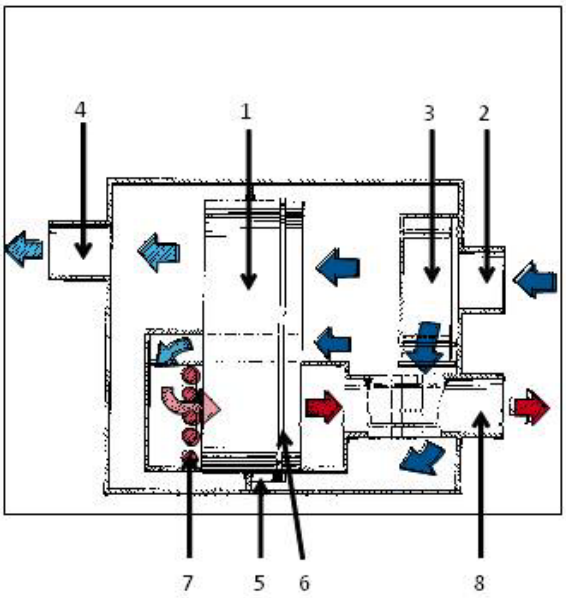
Dehumidification process

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 cleaned by the countercurrent principle.

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



Product overview

The images below present A4 110V with all external parts and controls.

Control panel

Folding handle with integrated cable reel

Dry air outlet with damper
1 x 100 mm
2 x 50 mm

Support feet made of durable polyurethane

Process air inlet with cover and filter

Wet air outlet

Hour counter

ON/OFF

Man/Hyg button/selector

Manual (continuous operation) or control via connected hygrostat (Hyg).

Connection for hygrostat

High/low fan speed

Drying methods

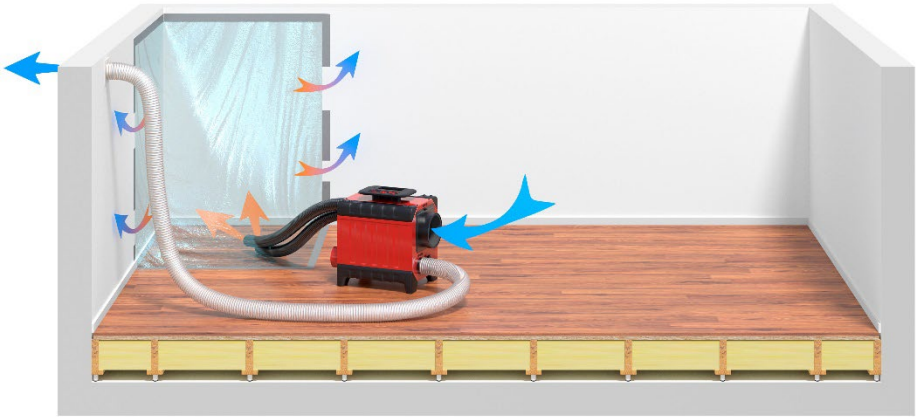
The following outlines the basics of different drying methods that can be applied to A4 110V and, in some cases, additional equipment from Corroventa's product range. The descriptions are only an overview, and in the event of any doubt about how any given situation should be handled please consult an experienced dehumidification technician.

General drying, room dehumidification

An adsorption dehumidifier like A4 110V produces such dry air that an air turnover of between one and two times per hour are sufficient, compared with condensing driers where turnover should instead be between three and four times per hour. Approx. 300 m^3/h is enough for a room with a 50 to 60m^2 area if the roof height is 2.5 metres.

As with all dehumidification, regardless of type or model, it is important to ensure that the area to be dehumidified is well sealed so that the process is performed as fast and as energy efficiently as possible. Windows and doors to the area must be closed, and if there are not any, plastic or other temporary partitions must be used.

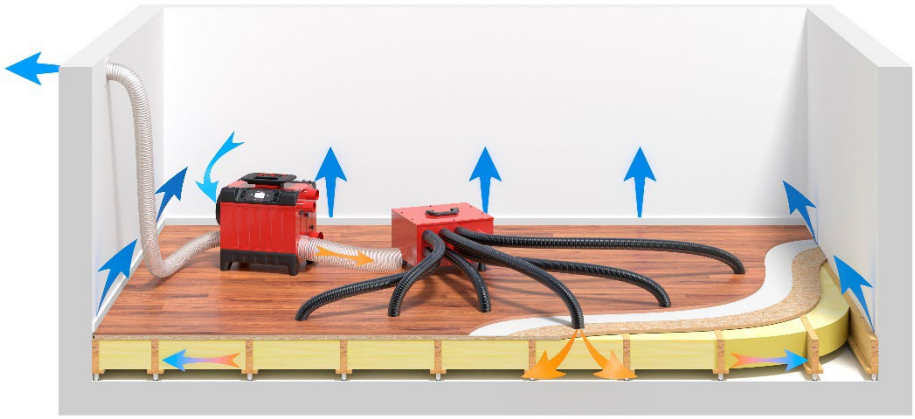
If the spread of the damage is limited it is advisable to cover it with plastic and let the dry air flow in under the plastic via hose. Leave openings at the edges where the air can exit. This makes the process faster and consumes less energy.



Cover local damage with plastic when drying to increase the drying rate and reduce energy consumption.

Drying framed flooring and beams

For framed flooring and beams with easy-to-dry insulation, for example, glass wool, A4 110V can be used with a high-pressure fan such as HP2000 according to the schematic diagram below. Remember that the capacity of this fan far exceeds that of the drier and therefore allow the fan to "draw the bad air". The diagram below shows this by the dry air hose from the drier to the right not being connected directly to the fan, but placed next to it instead. In this way, the fan can draw enough air without drawing excess air through the drier affecting its function and efficiency.



Drying beams using a fan. Note that the drier to the right is not directly connected to the fan. The dry air hose is only placed close to the fan.

Suction drying

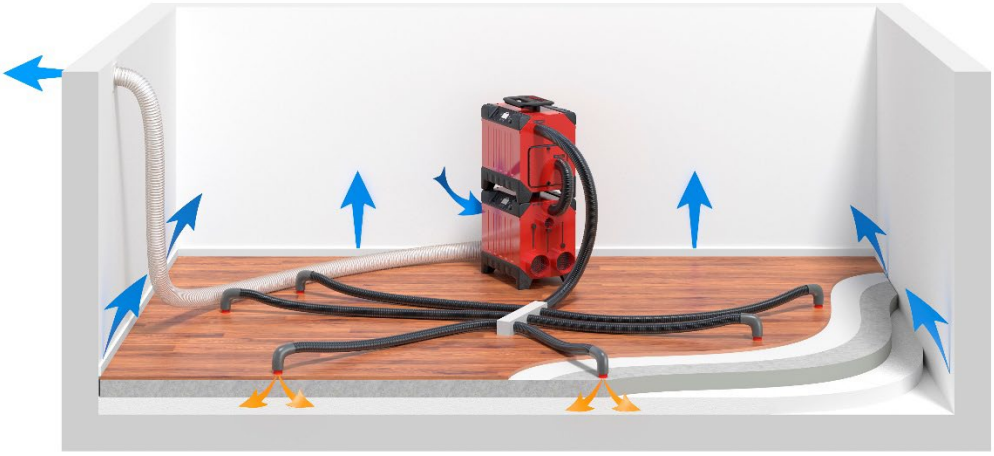
When suction drying layered structures, use A4 110V together with a turbine according to the schematic diagram below. Connect the turbine or turbines so that they draw air out of the layered structure via hose system, water separator and filter, and then evacuate the air via the hose out to the surroundings. Place the drier in the room and route its wet air hose out of the room normally. In this way, the turbine will draw in dry air into the layered structure and this is how the method got its name.

Use of a water separator is crucial to prevent water being sucked into the turbine and damaging the motor.

Suction drying. The drier dries the air in the space and the turbines draw air out of the layered structure, resulting in dry air being drawn down into it.

Pressure drying

When pressure drying, use A4 110V together with a turbine according to the schematic diagram below. Pressure drying is two to four times faster than suction drying and is therefore the primary choice for a layered structure, if there are no obstructions.



Pressure drying. The turbine is fed with dry air from the drier and forces it into the layered structure.

During pressure drying, dry air is routed from A4 110V to a turbine and then forces this air into the layered structure. In this way, warm and dry is forced down into the structure, which achieves the material temperature and thus increases the rate of the drying process. Wet and cool air leaks into the room through the gaps between the floor and the wall or via drilled check holes, and is then re-sucked into the drier as process air.

Before starting pressure drying, suction drying is required to evacuate all free-flowing water so that this is not forced into other parts of the structure. Furthermore, it is important to balance the turbine capacity with the drier's so that not too much air is drawn through the latter, which interferes with its function and performance.

Pressure drying may release fibres/particles from the layered structure into the indoor air and if this is a potential problem another method should be applied.

Installation

Place A4 110V on a flat and level surface, so that it cannot tip over causing damage to the machine or other property or injury to people.
Connect a hose to the wet air connector to lead the wet air out of the space to be dried. The wet air hose should have a smooth inside and should be as short as possible, no longer than 5 metres, for optimum function and highest capacity. If a longer wet air hose is necessary for the installation, the high static pressure that the machine has is capable of dealing with a hose of up to ten metres but the dry air must then be restricted, which can be done without tools or instruments and yet with sufficient precision as follows:

1. Connect a 5 metre long hose and blow the wet air into your face to get an idea of the airflow.
2. Now connect the longer hose, up to ten metres, and restrict the dry air using the damper until the flow to the face feels as strong as with the shorter hose.

In the event of problems with condensation in the wet air hose, if best solution of shortening the hose is not possible, this can be alleviated by restricting the dry air slightly, which leads to an increased volume of wet air. Performance is reduced slightly so this method must be evaluated from case to case. Another method is to make holes in the hose for the condensation and to use a container.

The wet air must always be evacuated via hose out from the space to be dried. The image shows room drying.

Installation in brief (also see page 7, Overview, controls and connections):

1. Place the drier in a location where the wet air hose reaches the intended evacuation point. Ensure that it is on firm and level ground so that it cannot tip over.
2. Connect the cable to 1-phase, **110 VAC, 50Hz** electrical socket fused to maximum 16A. As the machine is usually used in damp, wet areas, the use of a earth-fault breaker is strongly recommended.
3. Set the machine to Manual (Man) mode with the left button on the control panel. Check that the fan starts by the machine blowing air. Look into the wet air connector and check that the rotor rotates anti-clockwise. Hold your hand by the wet air connector and check that the wet air feels warm. Note that the machine needs to run a few minutes before this can be checked.
4. Connect the wet air hose and route it out through the intended evacuation point (hole in the wall, window, or whatever is relevant). Ensure that the hose not trapped or obstructed anywhere.
5. Connect any dry air hoses, turbine or whatever is relevant for the situation. Room and suction drying usually occurs with the 100 mm dry air connector open and the 50 mm connectors closed. The latter can be used to lead dry air to a separate area if necessary. During pressure drying, ensure that the turbine or turbines total capacity (m^3/h) does not exceed that of the drier. Connect the turbine(s) to one of the 50mm dry air outlets, leave the second 50mm outlet

open while closing the 100mm outlets. Regardless of the area of use, ensure that not all dry air connectors are closed at the same time.

6. If using a hygrometer, connect it to the hygrometer connector on the control panel and set the desired setpoint value. The red Man/Hyg button must also be in the Hyg. position. Verify that the Ventilation button is in the ”On” position, provided there is no special reason it should not be. If this is off, the fan only runs when dehumidification is in progress, which reduces the noise further, but it also means that the air does not circulate continuously, which can reduce the drying effect.
7. Inspect the installation and if there are no faults and, if not already connected, reconnect the cable in the electrical socket so that the drier starts.

Maintenance and service

Filter replacement

The drier filter should be replaced regularly, preferably between each work assignment in order to maintain energy efficiency and to avoid overheating. If the air filter is extremely dirty it must be replaced more often.

1. Disconnect the power from the drier.
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 drier.

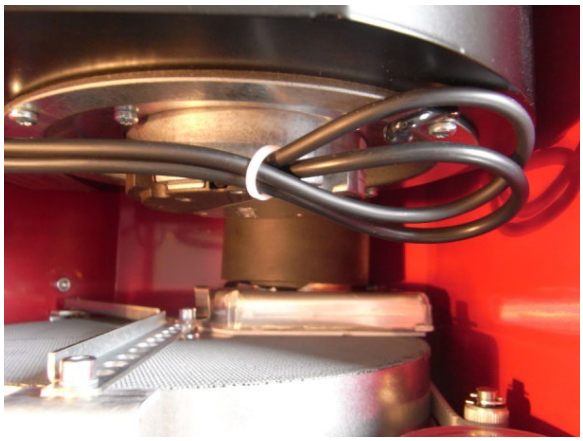
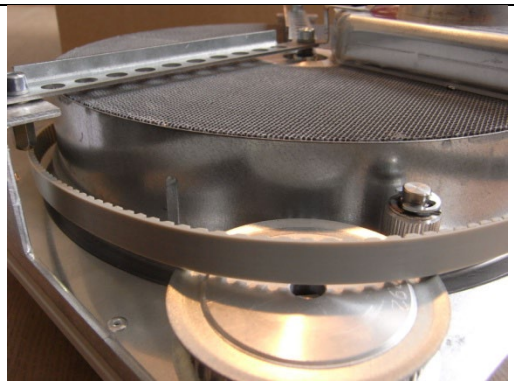
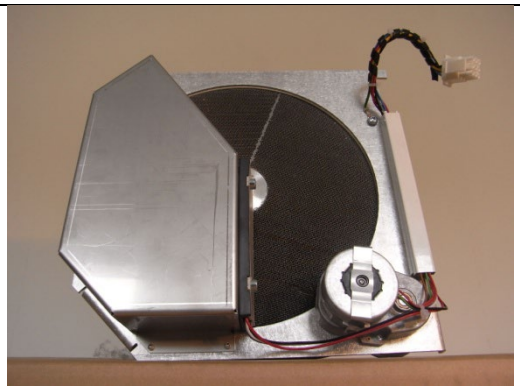
Cleaning the rotor insert

If necessary, it is advisable to clean the rotor in the drier with compressed air annually or after use in very dirty environments. Otherwise the rotor's ducts can become blocked, causing restricted air flow and reduced capacity. To clean the rotor, follow the instructions below:

Disconnect the power from the drier when cleaning the rotor!

Always wear a protective mask when cleaning the rotor and perform the work outdoors.

1. Disconnect the machine from the mains supply. Remove the four screws holding the upper cover of the drier.	
2. Carefully lift up the cover so that the two cable connections along the front of the machine are accessible. Disconnect the connections.	

3. With the A4 110V one must insert one's hand between the fan and the rotor unit and pull off the internal wet air hose from the nipple. Pull the entire rotor unit up and lift it out of the machine. Take care not to damage the rotor.	
4. Press the tensioning wheel backward on the rotor unit and slide the belt off the wheel so that the rotor can rotate freely.	
5. *Note! Always use a suitable protective mask when cleaning the rotor and perform the work in a suitable location outdoors.* Carefully blow clean the inside of the rotor using compressed air. Hold the nozzle about 15 cm from the rotor and start blowing from the heat shield side of the rotor. In this way, the air will flow through the rotor in the opposite direction to normal. This prevents more dirt from getting stuck inside. When you later clean from the other direction, do not blow air into the heat shield, otherwise dirt will accumulate inside. Only blow on the rotor where the opposite side is free and unobstructed.	
6. Assemble the drier in reverse order when the rotor has been cleaned: • Install the belt.	

• Carefully lower the rotor unit into the machine. • Reinstall the wet air hose. • When the cover is in place and its four screws installed, ensure that the tag washers, one at each end of the machine are also installed.	

Accessories and consumables

The following parts are available as accessories and consumables for A4 110V:

Part number	Designation
9901100	Hygrostat, HR1-5
1002720	Air filter 1002720 (Process air)

Fault tracing

Fault symptom	Probable cause	Actions
Premises not dehumidified/low capacity.	Depending on the situation, the cause of the problem could be incorrect installation, e.g. because of obstructed wet air hose, clogged filter, incorrect settings on the machine or machine fault.	Perform fault tracing as follows until the problem has been identified: Check the installation - check that the wet air hose is not obstructed, that the dry air damper is in the correct position and that the hose used on the dry air side is not trapped or clogged. Ensure that the air flow is correct. If the air flow is weak, check the process air filter and replace if necessary.
The drier does not start.	The drier is set to Hyg. without the hygrostat connected.	Connect a hygrostat, or switch to Man. mode.
The rotor rotates anti-clockwise (seen through the dry air outlet) or not at all.	Fault with rotor motor or motor capacitor.	Contact the dealer for repair.
No air flow, low air flow	Fault with fan or fan capacitor.	Contact the dealer for repair.

Technical data

A4 110V

Drying capacity at 20°C, 60 % RH MAX mode (litres/day)	*17*
Dry air volume (m^3/h)	*250/200***
Nominal dry air flow rate (m^3/h)	*250*
Noise level, normal operation dBA (3 m)	*approx. 50-55**
Supply voltage	*110 VAC/50 Hz*
Rated power (W)	*1250*
Power consumption at 20°C, 60 % RH (W)	*1200/950***
Ø Dry air outlet (mm)	*2 x 50, 2 x 100*
Ø Wet air outlet (mm)	*1 x 80*
Power cord length (m)	*5*
Weight, kg	*19.6*
Length x Width x Height (mm)	*475 x 295 x 430*
Article number	*1006585*

** Depending on selected operating mode and installation.*
***High/low speed.*

DO YOU HAVE QUESTIONS OR NEED HELP?

Visit www.corroventa.com or call us at +44 (0)161-244 95 23 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 rents high quality products for dealing with water damage, moisture, odours and radon. We are one of the market leaders and specialists 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. All our products are manufactured in Bankeryd, Sweden.

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