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# ADSORPTION DEHUMIDIFIER WITH CONDENSER

## L4

USER MANUAL



**Corroventa**<sup>®</sup>

Description: Manual L4 HP; L4 HP W			
Document Number: 1004237	Created By:	Revision Approval Date:	Revision: D

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## User instructions L4

### Area of use

L4 is an adsorption dehumidifier with air-cooled condenser, developed and designed for construction dehumidification and for drying water damage and is very practical for use in situations where it is difficult to extract wet air from a normal adsorption dehumidifier.

Using the adsorption principle, L4 also works at low temperatures and by condensing in the air-cooled condenser, the room is supplied with up to 400 W of extra heat.

L4 has a functional analogue control system that enables selectable fan speeds and allows an external hygostat. Furthermore, it has a built-in pump, integrated hose and cable wind, as well as flexible support feet that protect floor surfaces and at the same time allow stackability. Its robust design gives a long service life.

In addition to room drying, L4 can also be used together with turbines for drying layered constructions, both suction and pressure drying.

#### Properties:

• Energy efficient	• Service-friendly
• High capacity level	• Time and kWh meter
• Robust	• High and low speeds
• Low weight	• Quiet operation
• Easy to transport	• Hygostat connection
• Stackable	• Very compact
• Ergonomic	

### Delivery check

L4 is supplied with the following parts in the package:

Dehumidifier L4	1 x
Extra process air filter in addition to the one in the dehumidifier	2 x
Manual	1 x

### Manufacture directive

The machines in the L4 series are CE approved.

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### 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

The equipment can be used by children over 8 years old and people with reduced physical, sensory or mental capabilities, or by people who lack of experience or knowledge, on the condition that they have received guidance or information on how to use the equipment safely and understand the risks that may occur. Children must not be allowed to 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 installation of L4 must be done by a qualified electrician in accordance with local and national regulations.

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

1. The dehumidifier is only intended for indoor use.
2. The dehumidifier must not be powered on before installation is completed in accordance with this manual.
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, boracol 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 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 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. The dehumidifier 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 meet the dehumidifier's electrical components. If it does, ensure that they are dried thoroughly before the dehumidifier is used again.
19. Never open the dehumidifier for cleaning or service without first ensuring that the dehumidifier is disconnected from power.
20. Repairs and maintenance of the dehumidifier's electrical system must be performed by a qualified electrician.
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.

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## 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

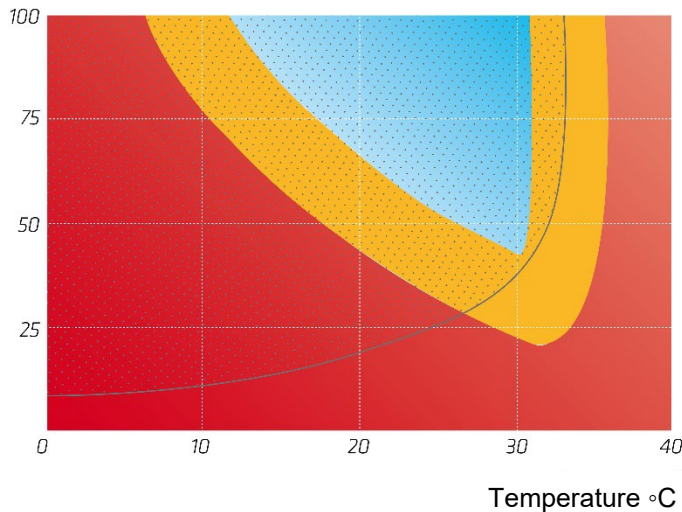
The adsorption principle has the advantage of not having the same temperature dependence as condensing dehumidification. Adsorption also works way below freezing, whilst condensing dehumidification capacity decreases sharply with decreasing temperature, which is illustrated in the graph below to the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

An adsorption dehumidifier with air-cooled condenser like L4, bridges these properties by working within a large area, including the primary area of the condensing dehumidifier. In other words, it is the best option for room drying at low temperatures, ideal for emergency damage and construction dehumidification.

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 dehumidifier air, i.e. provides a greater difference between the incoming and outgoing air's moisture content calculated in grams per cubic metre ( $\Delta X$ ), 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.

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Relative humidity (% RH)



The diagram shows the type of dehumidifier that works best in each climate.

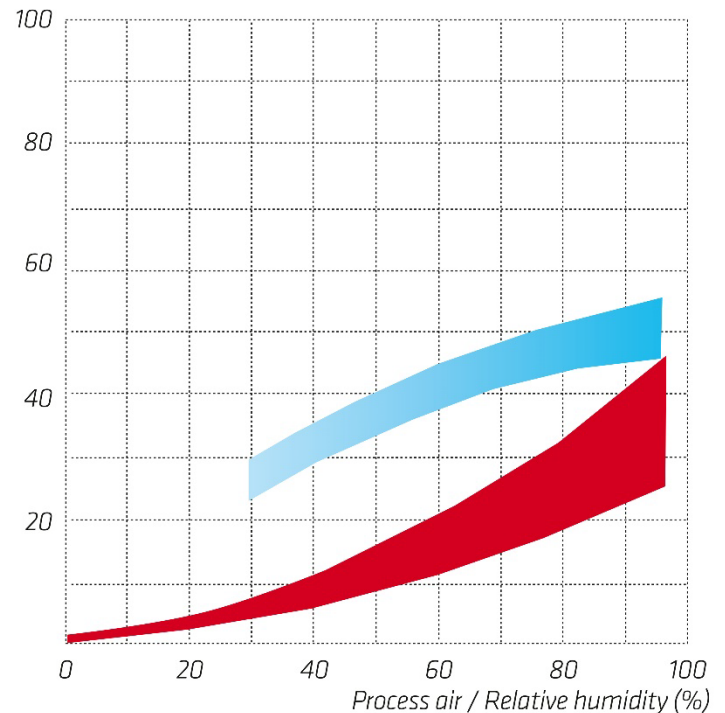
**■ Adsorption dehumidifier** – superior performance in the red area. Also works in the yellow and blue area.

**■ Adsorption dehumidifier with condenser** – functions in the dotted area.

**■ Condensing dehumidifier** – superior technology in the blue area. Does not work in the red area.

**■ Transition zone**

Dry air / Relative humidity (% RH)



### Dry air quality at 20°C

Example of basic differences between selecting a condensing dehumidifier or an adsorption dehumidifier.

As the graph above shows, condensing dehumidifiers are used in hot and humid spaces if room drying is required.

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## **This is how the dehumidifier works**

L4 is an adsorption dehumidifier with built-in air-cooled condenser through which cooled air from the surrounding area passes, driven by the process/cooled air fan.

The desiccant used in L4 is silica gel, which can be regenerated an almost unlimited number of times. Silica 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<sup>2</sup>. It 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 and passes a filter (2) by means of a process/cooling air fan (3).

The air then passes 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.

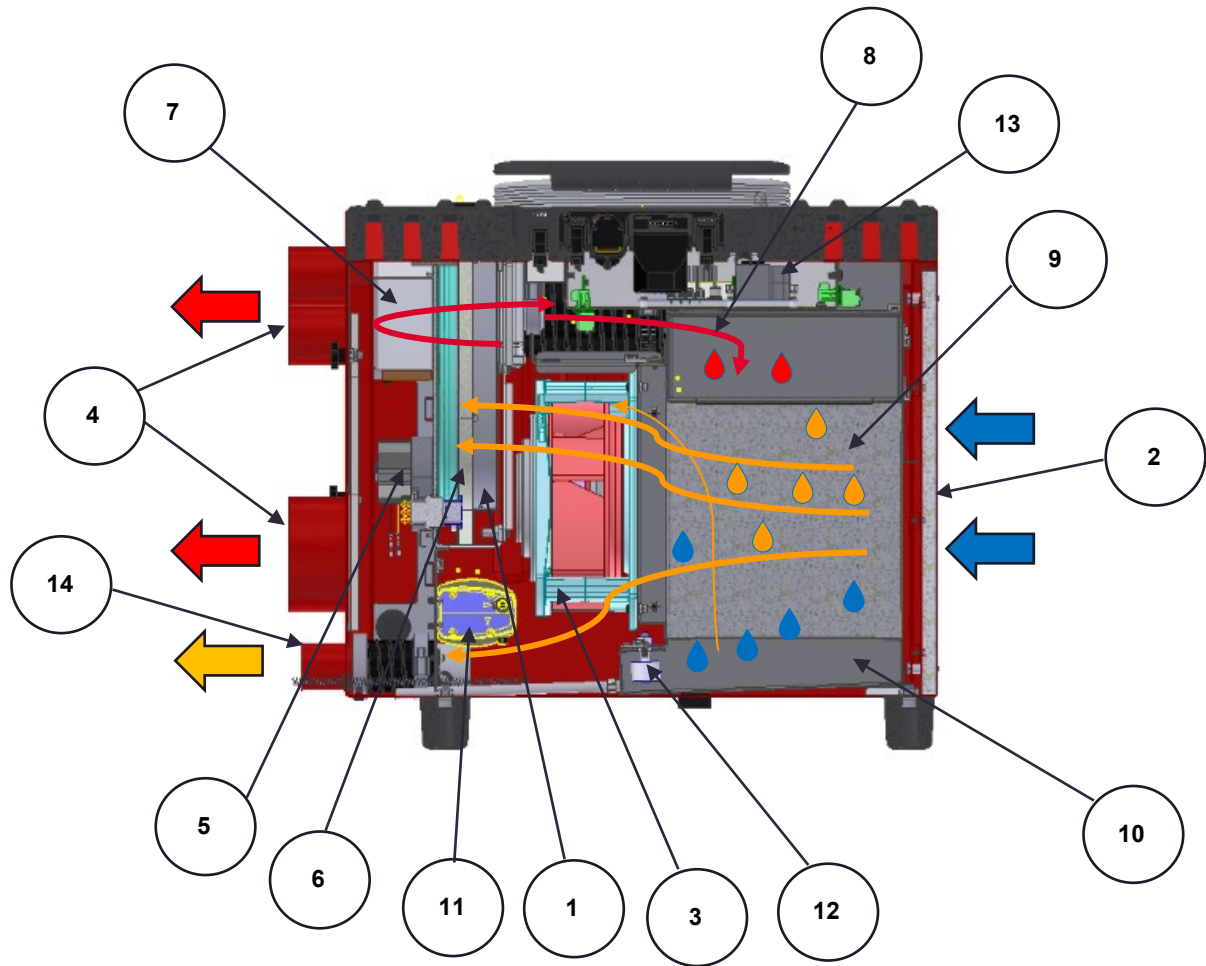
The rotor rotates by means of a drive motor (5) and a drive belt (6). The moisture that is adsorbed in the rotor is driven out by a small portion of the process air being heated by the heater (7) and then passing a smaller part of the rotor, which is thus regenerated and cleaned by the countercurrent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

The wet air is removed via the outlet (8) and led to the air-cooled condenser (9), where it is cooled by air from the surroundings and then resupplied to the dehumidifier as part of the new process air. The condensation water in the condenser runs down into the bottom tray (10) and is removed via the built-in pump (11).

The bottom tray is equipped with overflow protection (12) that shuts off the machine if the condensation water is not removed. The control electronics (13) are located in the cover. L4 is also equipped with a cooling air outlet (14). The cooling air ensures that the cooling air flow across the air-cooled condenser and outlet connection makes it possible to connect a cooling air hose to route the cooling air away. If there is a need to create negative pressure during the drying process, this is an energy efficient way of routing the cooling air out. The cooling air flow/The cooling air outlet must always be fully open.



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## Product overview

The images below present L4 with all external parts and controls.



Process/cooling air inlet with filter

Folding handle with integrated cable reel

Control panel

Folding carry/manoeuvring handle (only L4 HPW)

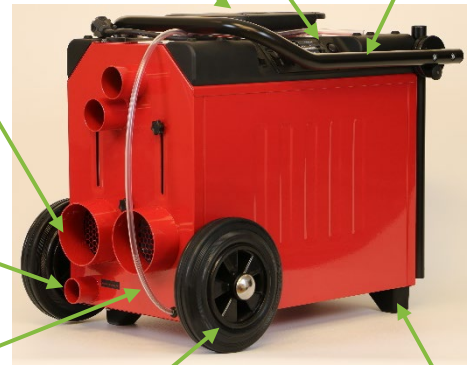
Dry air outlet with damper  
2 x 100 mm  
2 x 50 mm

Cooling air outlet

Condensation water hose

Wheels with roller bearings (only L4 HPW)

Durable Feet



LED Lamp:  
Overfill protection

Time and kWh meter

ON/OFF selector



Man/Hyg button/selector:

Manual: (continuous operation) or Hyg: Control via external hygrostat.

Connector: for connection of external hygrostat

High/low selector:  
High/low Fan speed/power

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## Installation

Place L4 on a flat and level surface, so that it cannot tip over causing damage to the machine or other property or injury to people.

L4 is very quick and easy to install, which makes it suitable as, for example an emergency machine that can quickly be on site after damage. It is positioned in the area to be dried in such a way that the best air circulation is obtained. The better the circulation of the air in the room, the better and faster the drying. The dehumidifier produces 400 m<sup>3</sup> of dry air per hour and because there should be a turnover of air between 1.5 and 2 times per hour, the machine is suitable for areas with a volume of up to 300 m<sup>3</sup>.

Do not position the machine closer than 0.5 to 1.0 metres to a wall as this can unnecessarily obstruct the air flows. Hoses can be connected to the dry air outlets to dry multiple areas simultaneously or to distribute the dry air further.

If negative pressure is required in the area to be dried, a hose can be connected to the cooling air outlet that is routed out of the area. This air is unheated, thus providing an energy efficient way of creating negative pressure. Ensure that the Cooling air from the cooling air outlet is not blocked.

As with all dehumidification, it is important that L4 is used to ensure that the space to be dried is well enclosed and cordoned off. Any doors and windows to the space must be closed and if there are not any, use plastic sheeting or another temporary solution. If the space is very small, it is important to remember that the machine can produce up 1,7 kW of heat, which, depending on the situation, can quickly lead to a large increase in temperature and thus a decreasing capacity of the machine. Optimum machine performance is achieved between 0 and 25°C.

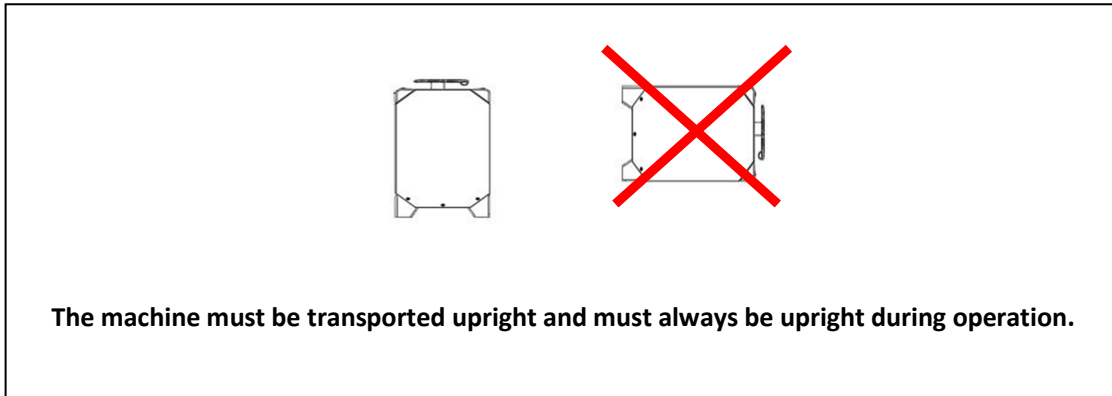
When drying wood or in other situations where there is a risk of drying occurring too quickly or at too low relative humidity, L4 can be used with a hygostat, which is available as an accessory. Using the hygostat, you set a threshold value for the relative humidity of the air at which the machine will switch off and stop dehumidification. If the humidity in the room rises again, the machine starts automatically.

The machine's condensation water hose is routed to a sewer, floor drain, sink, toilet or similar. The built-in pump can push the water up to five metres in height, which allows the drain to be higher than the machine.

**Do not use the machine at temperatures below 0°C as the condensation water can then freeze and damage the built-in pump.**

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- Operating range humidity: 20-100% RH
- Operating range temperature: +0°C to +30°C
- The dehumidifier must reach ambient temperature before starting, if stored in cold conditions.



Installation in brief (also see page 9, Overview, controls and connections):

- Place the dehumidifier in the area that is to be dried in such a way that good air circulation is achieved.
  - Do not position the machine closer to a wall than 0.5 to 1.0 metres, as this can unnecessarily obstruct the air flows.
  - If needed, use hoses to the dry air outlets to distribute the air.
  - Ensure that the dehumidifier is on firm and level ground so that it cannot tip over.
  - Route the condensation water hose to a suitable drain. The pump module can achieve a rise of up to five metres. Ensure that the hose is not pinched and that it is clear, so that the water can flow unrestricted
  - Connect the cable to 1-phase, 230 VAC electrical socket fused to 10A or maximum 16A.
  - For continuous operation, ensure that the machine is in Man mode – that Hyg is not selected on the button next to the cable on the control panel.
  - When drying wood, or in other situations where drying must not to occur too quickly or at too low a relative humidity, select Hyg on the button on the control panel and connect the hygostat at the desired setting.
  - Before leaving the dehumidifier, check, by looking into the dry air outlets, that the rotor is rotating, feel for air blowing out of both the dry air outlets and out of the cooling air outlets and that the dry air feels warmer than the surroundings. Check the latter in the upper outlets closest to the heat cover on the rotor insert. Note that when using a hygostat, the setpoint value may need to be lowered for a while for dehumidification to start – otherwise the heater and rotor will not run, and the air will not be hot.
- Regardless of the area of use, ensure that not all dry air outlets are closed at the same time and that the cooling air outlets are not blocked.

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When the work is to be completed, in order to avoid spilling condensation water on the floor or in the transport vehicle, the remaining condensation water from the condenser should be pumped out. Set the MAN/HYG switch to position HYG without the external hygrostat connected. Tilt L4 as illustrated and allow the pump to pump out the remaining condensation water from the condenser and bottom tray.

## Transportation

Secure the dehumidifier well when being transported.

If the machine toppled over during transportation, the machine must stand upright for at least 30 minutes prior to starting.



**The machine must be transported upright and must always be upright during operation.**

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## Storage

L4 can be stored stacked on top of each other as shown below, thus saving floor space.

The machine must always be stored upright and in a frost-free area.



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## Drying methods

The following outlines the basics of different drying methods that can be applied to L4 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

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



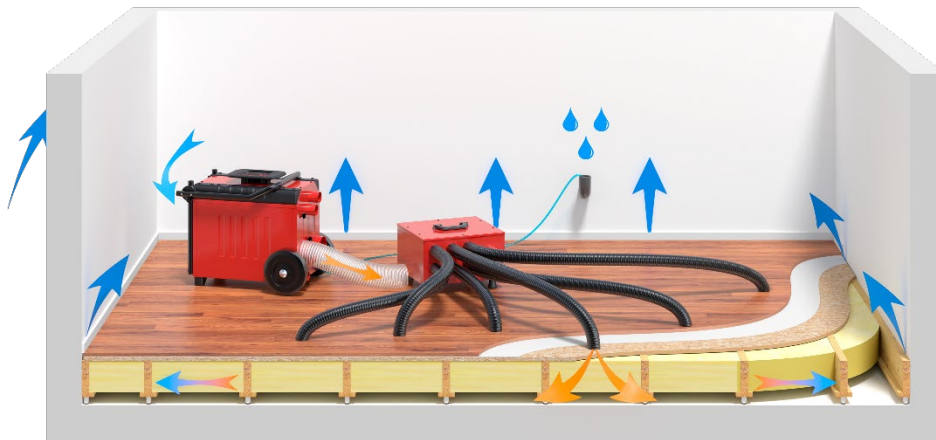
**COVER LOCAL DAMAGE WITH PLASTIC WHEN DRYING TO INCREASE THE DRYING RATE AND REDUCE ENERGY CONSUMPTION.**



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## Drying insulation in joists and walls

For framed flooring and beams with easy-to-dry insulation, for example, glass wool, L4 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 dehumidifier and therefore allow the fan to "draw the bad air". The diagram below shows this by the dry air hose from the dehumidifier 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 dehumidifier affecting its function and efficiency.



**DRYING BEAMS USING A FAN. NOTE THAT THE DEHUMIDIFIER TO THE RIGHT IS NOT DIRECTLY CONNECTED TO THE FAN. THE DRY AIR HOSE IS ONLY PLACED CLOSE TO THE FAN.**



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## Suction drying

When suction drying layered structures, use L4 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 dehumidifier in the room and route its condensation water 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 DEHUMIDIFIER 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.**

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## Pressure drying

When pressure drying, use L4 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 DEHUMIDIFIER AND FORCES IT INTO THE LAYERED STRUCTURE.**

During pressure drying, dry air is routed from L4 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 dehumidifier 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.

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.

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## Maintenance and service

### Filter replacement

The dehumidifier 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 dehumidifier.
2. Pull out the dirty filter from the machine and slide in the new one.
3. Reconnect the power to the dehumidifier.



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## Accessories and consumables

The following parts are available as accessories and consumables for L4:

Article number	Designation
9901100	Hygostat, HR1-5
1004010	Process air filter

## 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 condensation water 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 condensation water 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 dehumidifier does not start.	The dehumidifier is set to Hyg. without the hygostat connected.	Connect a hygostat, 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	Fan error.	Contact the dealer for repair.

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## Technical data

### L4 HP

Dry air volume High/Low (m <sup>3</sup> /h)	380/240
Cooling air volume High/Low (m <sup>3</sup> /h)	100/50
Drying capacity at 20°C, 60% High/Low (l/24 hrs.)	12/8
Max. Capacity (l/24 hrs.)	23
∅ dry air outlet (mm)	2 x 100, 2 x 50
Temperature range	0-30 °C
Sound level, High/Low dBA (3 m)	approx. 50-58*
Voltage	230 VAC/50 Hz
Rated power High/Low (W)	1300/750
Height x width x length (mm)	495 x 295 x 550
Weight, kg	23.5

\*Sound level varies depending on the installation.

### L4 HP W

Dry air volume High/Low (m <sup>3</sup> /h)	380/240
Cooling air volume High/Low (m <sup>3</sup> /h)	100/50
Drying capacity at 20°C, 60% High/Low (l/24 hrs.)	12/8
Max. Capacity (l/24 hrs.)	23
∅ dry air outlet (mm)	2 x 100, 2 x 50
Temperature range	0-30 °C
Sound level, High/Low dBA (3 m)	approx. 50-58*
Voltage	230 VAC/50 Hz
Rated power High/Low (W)	1300/750
Height x width x length (mm)	495 x 440 x 620
Weight, kg	30

\*Sound level varies depending on the installation.



## DO YOU HAVE QUESTIONS OR NEED HELP?

*Visit [www.corroventa.com](http://www.corroventa.com) or call us 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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