ADSORPTION DEHUMIDIFIER A15

USER MANUAL

CorroVenta®

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User Manual A15 ES

Intended use

The A15 ES is intended, and shall only be used for, dehumidification of air indoors and at normal atmospheric pressure. The machine is not to be used in environments where combustible gases can be present.

Other use of the A15 ES, including use in violation of the instructions and restrictions of this manual, may result in personal injury and/or damage to equipment and property

Introduction

The adsorption dehumidifier A15 ES is developed for construction drying and drying of water damages. The machine is of four-hole type and has a separate regeneration air flow allowing outdoor air to be used for regeneration if that is preferrable for energy efficiency or for minimized effect on air indoor air pressure. For maximal flexibility in the installation, the machine is equipped with stubs allowing easy attachment of hoses or pipes for the respective air flows.
By use of the control panel, the user can adjust and optimize the operation of the A15ES to the work to be undertaken, controlling the operation of the fan and selection of proper control mode using either the built-in or an external RHT sensor.
The A15 ES is also compatible with the SuperVision® 2.0 and can thus be remotely operated and controlled through use of smart phone, PC or tablet. The SuperVision® 2.0 collects and stores measurement data and allows the user easily to create the graphs required for progress analysis during the project as well as a complete and comprehensive report of entire project once it is competed.

The machine exterior is made from stainless steel for durability and to maintain a proper appearance even after numerous transports and installations. Its limited dimensions allow for the machine to be transported on a standard EUR-pallet and also for it to pass through standard doors which is important for construction as well as water damage restoration use. For easy relocation on site, the A15ES can also be equipped with a wheeled transport cage.

• High capacity	• Chassis made from stainless steel
• Energy efficient	• Digital control panel
• Robust	• kWh and hour counter – resettable work counters
• Easily maintained	• Compatible with SuperVision® 2.0

Manufacturing directive

A15 ES is CE approved.
The machine is manufactured in Bankeryd, Sweden, by Corroventa Avfuktning AB. The company is ISO 9001 certified.

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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Safety information

The appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given SuperVision® 2.0 or instruction.

Children shall be supervised to ensure they do not to play with the appliance.

Electrical installations made in connection with the installation of the A15 ES shall be made by authorized and qualified personnel in accordance with local and national regulations.

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

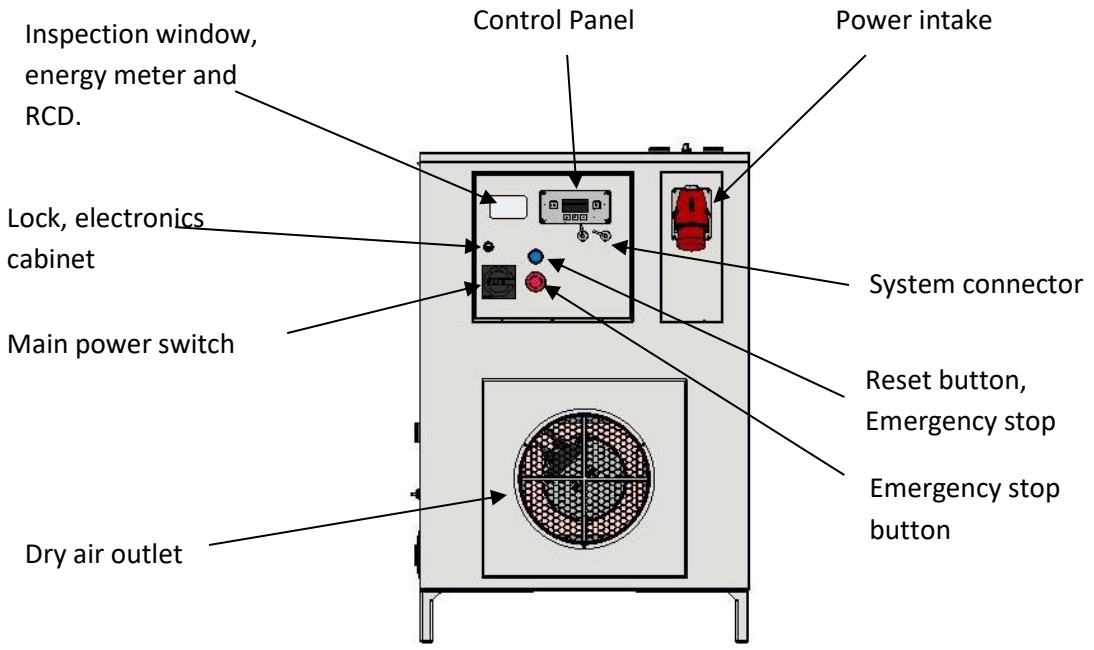
1. The dehumidifier is intended for indoor use only and for dehumidification of air at normal atmospheric pressure.
2. The dehumidifier must not be powered until the installation is finished in accordance with this manual.
3. The powered dehumidifier must not be covered as this can lead to overheating and fire hazard.
4. The dehumidifier must not be used as table, trestle, pallet or stool.
5. The dehumidifier must not be used to step or stand on or used as table, trestle pallet or stool.
6. Never use the dehumidifier without the filter installed as this can cause damage to it. Ensure that the filters are clean as cluttered filters can cause the dehumidifier 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 dehumidifier. It may damage the rotor.
8. The dehumidifier must not be used in spaces where combustible or explosive gases can be present, neither in the ambient air nor in the air flows through the machine.
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 dehumidifier steadily and leveled so that it cannot fall over.
11. Keep children, animals and spectators away from the workplace while installation is undertaken.
12. If the dehumidifier 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 dehumidifier by its cable or power intake.
15. To use electrical equipment in humid or wet environment can be dangerous. Never power the dehumidifier if it is standing in water.
16. The dehumidifier must only be connected to grounded power outlet with voltage and frequency in accordance with dehumidifier nameplate.
17. A residual-current device / ground fault circuit interrupter should be used to minimize the risk of electric shocks.
18. 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 and powered again.
19. The power must always be disconnected before the dehumidifier is opened.
20. Repairs and maintenance of the electronics and the electrical system of the dehumidifier must only be made by qualified electrician.
21. All work with the machine, including installation as well as repair and service shall be performed using all the personal protective equipment appropriate for the given task.

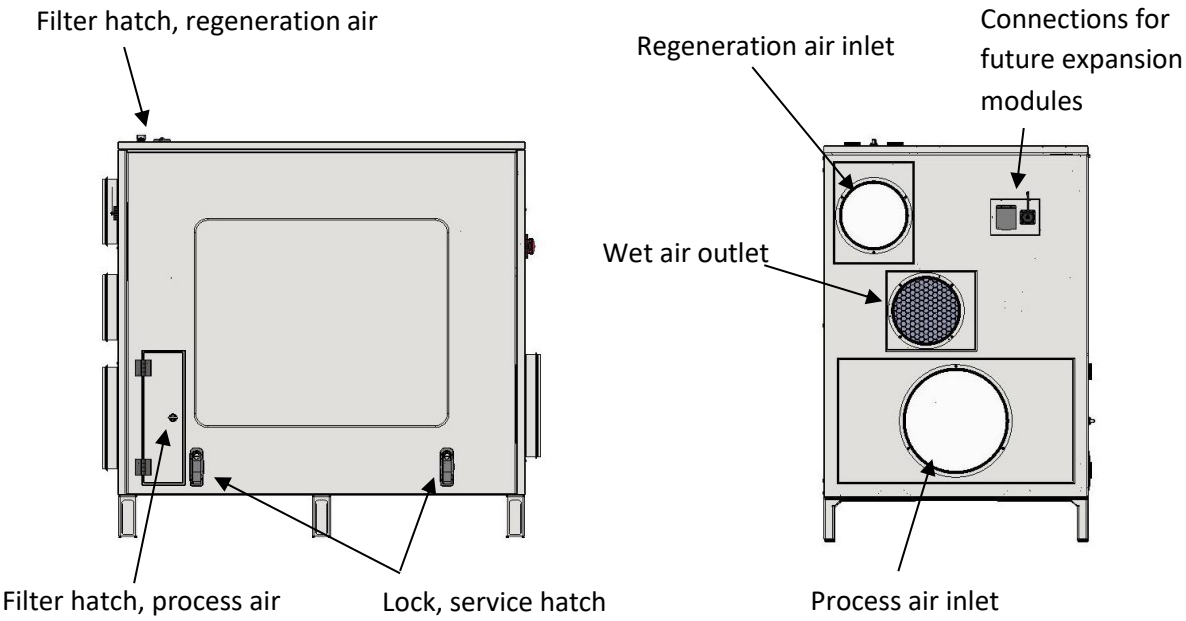
22. If the machine is in an elevated position, the rotor cassette must not be extracted as this will shift the center of gravity and potentially cause the machine to fall over. In elevated positions, the support integrated with the rotor cassette will not reach floor or other supporting surface and will thus not help prevent accident.
23. If the machine is equipped with transport cage, the wheels on the cage must be locked if the service hatch is to be opened and the rotor cassette to be extracted. Unlocked wheels can cause inadvertent movement and result in the machine tipping over.
24. Wet air hose/pipe that is used and connected to the dehumidifier must be corrosion-resistant and able to withstand 80°C heat.
25. The machine weighs more than 160kg and is too heavy to be lifted manually.
26. For transport and lift of the machine, only tested and approved/certified equipment shall be used respecting the weight of the machine given on the nameplate.
27. Prior to transport or lift of the machine, verify that the rotor cassette is protracted and locked in position. The service hatch, the filter hatches as well as the electronics cabinet shall be closed and locked.
28. For transport and lift, the machine must be appropriately secured and the risk area evacuated and continuously monitored.
29. The handles on the transport cage must not be used for lift of the machine as they are not dimensioned for that weight and purpose.
30. If after transport and/or lift, there is reason to believe the machine may have been damaged, it must not be powered and used until it has been inspected by qualified personnel.
31. The machine must not be installed in such a manner that other exterior equipment or machinery forces the air flows, neither pushes nor extracts air from the machine.
32. The machine must never be used with any other accessories than those listed in this manual or those specifically approved by Corroventa Avfuktning AB.

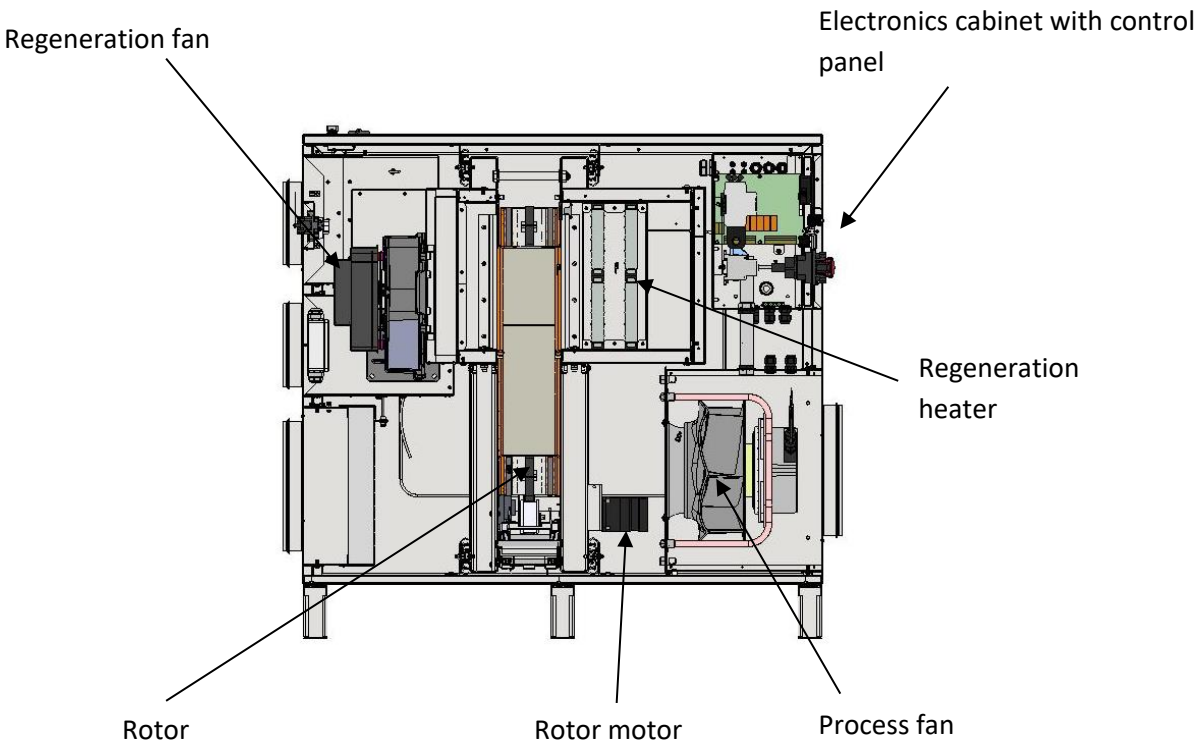
For further advice on product safety and use, please contact the supplier.

Product Overview

Main components of the machine

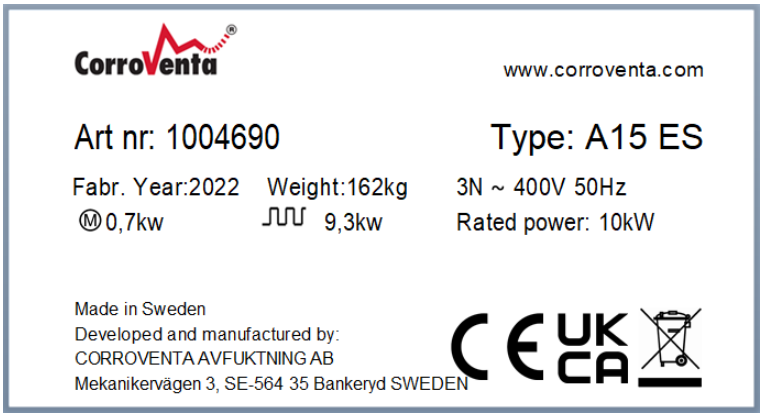






Name plate

The A15 ES nameplate is positioned to the left of the electronics cabinet. The information provided includes model and year of manufacture as well as relevant technical information.

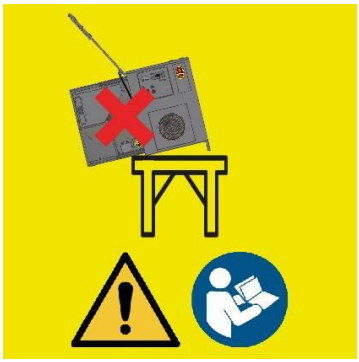


NOTE: The weight on the name plate refers to the machine itself and does not include the optional transport cage. Total weight including the transport cage is 183 kg.

Other labels and markings

At the bottom of the service hatch is found the below warning label. The intent of this is to inform and remind the user that the service hatch must be closed and locked during transportation and lift. Left open, the rotor cassette may slide out and shift the centre of gravity which could cause the machine to fall over.

Inside the machine, on the rotor cassette and clearly visible when the service hatch is open, the below warning label is found. The intent of this label is to inform and remind the user that the rotor cassette must never be extracted whilst the machine is in elevated positions, an example of which is a lift table. Extracting the rotor cassette will shift the centre of gravity and may cause the machine to fall over. The rotor cassette has an integrated support but in elevated positions, the support will not reach the floor or any other surface and will thus not help prevent an accident.



On the rotor cassette lock mechanism, at its centre by the floor of the machine, is a small warning symbol intended to remind the user of the above warning in case lighting conditions or other circumstances blocks it from view or if it has been forgotten.

In addition to the warning labels, inlets and outlets as well as filter hatches are marked with their respective functions so as to simplify installation and prevent mistakes.

Dehumidification theory and methods

Relative humidity and its effect on substances

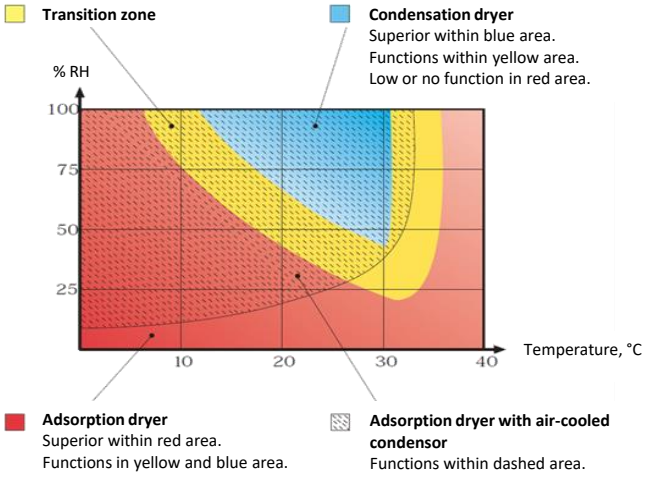
All air contains moisture, sometimes more, sometimes less although the naked eye cannot see it until it condenses in small droplets on, for instance, a metal or glass surface. Already before it is visible however, the moisture affects substances and production processes, causes corrosion and micro-organism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

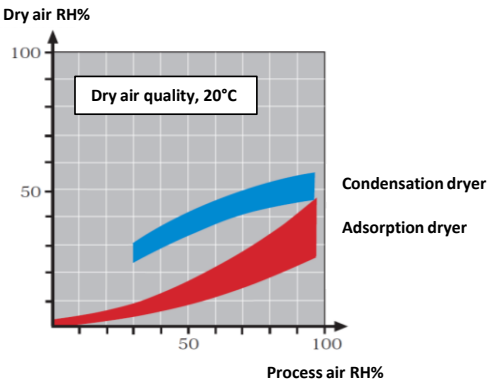
Air humidity is measured and referred to in terms of Relative Humidity (%RH) which is the ratio between how much water it does contain and how much it can contain at given temperature and pressure. The higher the temperature, the more water the air can contain but it is still the Relative Humidity that is important 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 dehumidifier 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 dehumidifier inevitably decreases rapidly with falling temperature, something that is depicted in the diagram below to the left.
As a rule of thumb, a general aid in the selection of type, it can be said that adsorption is the primary choice for drying of unheated spaces or when material is to be dried. Adsorption dehumidifier produces dehumidifier air, generates a greater reduction of water content measured in grams per kilogram (Δx), and consequently creates a greater water vapor pressure difference which is directly correlated to the drying speed. Drying of insulation such as floor structures are dried with combined use of turbines, high pressure fans, installed for either suction or pressure drying.





Condensation dehumidifiers are, 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 dehumidifier works

The A15 ES is an adsorption dehumidifier of four-hole type meaning that it has two fans and two entirely separated air flows. It is also provided with stubs on all four inlets and outlets for easy ducting of air flows and full flexibility in installation, allowing the machine to be positioned either inside or outside the space to be dried. Similarly, the easy ducting also allows for the regeneration air to be sourced from the most appropriate space, considering both the pressure balance as well as the energy consumption.

The principals of the dehumidification process implemented with the A15 ES can be described as follows:

> Process air to be dried is drawn into the machine via the process inlet and continues through the process air filter, removing dust and particles. In the next step, it passes through the rotor and is put in contact with the silica gel that adsorbs moisture and dries the air.
> In the final step, the dry air passes through the process fan and is pushed out through the dry air outlet, ready to be distributed to where it is needed.

In parallel with the drying process, to prevent the rotor from being saturated at which point the dehumidification would have stopped, the rotor is continuously regenerated through use of a completely separated air flow that functions as follows:

> Regeneration air is drawn into the machine through the regeneration air inlet and proceeds through a filter. The now cleaned air flow proceeds through a small segment of the rotor, a segment that was just regenerated and thus still heated. The regeneration air passing this segment will thus recycle portions of the already spent regeneration energy, increasing the temperature of the new regeneration air while cooling the rotor.
> The pre-heated regeneration air continues through the regeneration heaters, increasing its temperature and thus its regeneration power, before it again passes the rotor in the regeneration zone causing the rotor to release adsorbed moisture, thus regenerating it and making it capable of adsorb new moisture.
> The now humid air, normally referred to as wet air, is drawn through the regeneration fan and pushed out through the wet air outlet.

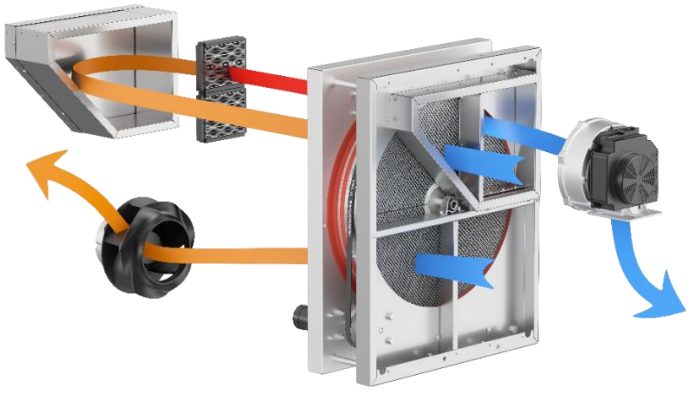


Illustration of dehumidification principal

Transport and lift

The weight of the machine supersedes 160 kg and must, to prevent injury, only be lifted by use of appropriate lifting equipment. The weight given on the name plate does not include optional transport cage. Total weight of machine including transport cage is 183 kg.

The distance between the feet of the machine allows it to be lifted with forklifts and pallet lifters intended for EUR-pallets. At all times and for all transport and lift, ensure that:

- The rotor cassette is retracted and locked in position and that the service hatch, the filter hatches and the electronics cabinet hatch are all closed and locked. The below label, intended to remind the user of this is found at the bottom of the service hatch.

- The forks of the lifting equipment (e.g forklift, pallet lifter) are long/big enough for the entire machine to rest securely on them.
- That the machine is secured in the manor appropriate to its weight and to the lifting and/or transportation equipment used to the purpose.
- That, for lifts, the centre of gravity of the machine is positioned securely, close to the centre, so as to prevent the machine from falling over.
- That the danger area that arises from the lift/transport is evacuated and secured.

Delivery inspection, inspection after transport/lift

When the A15 ES has arrived to the site at which it shall be installed and used, it shall be inspected to ensure that it has not been damaged from the transport and/or lift. If there are visual indications or other reasons to believe damage has occurred, the machine must not be powered and used until it has been inspected by qualified personnel.

Storage

For storage of the dehumidifier, prior to installation or between different installations, the following shall be observed so as to ensure maximum life length and avoid unnecessary damage and degradation:

- Store the dehumidifier indoors so that it is protected from dust, high humidity, rain, snow/frost and aggressive contaminants.
- Ensure that the dehumidifier is protected from physical damage such as forklift collisions etc.
- Position the dehumidifier upright, standing on its feet on a horizontal surface.

Installation

The installation of the A15 ES are, for best performance, planned so that the ductings required are kept as short as possible and also, for the two respective air flows, as well balanced as possible in that the respective lengths of the inlet ducting and the outlet ducting are similar.

Long ducting always comes with significant pressure drops, decreasing the capacities of the respective fans and thus also the dehumidification capacity and energy efficiency.

As a guideline to the installation planning, observe the following:

- Plan the installation and position the machine in such a way that the required ducting is as short as possible.
- Use the same and as big dimensions as possible of hoses/pipes for regeneration air and wet air and, respectively, for process air and dry air. The goal and emphasis shall be to get as small pressure drops as possible and that the pressure drop before and the pressure drop after, the machine are as similar as possible in the two respective air flows.
- Try to avoid leakages in joints and transitions as those constitute losses in performance.
- Ensure that wet air ducting slopes away from the machine rather than towards it so as to prevent possible condensation from flowing back into the machine. Place suitable drainage hole at low point of the ducting unless condensation can be allowed to continue through the ducting.
- Use insulated ducting to minimize condensation if there is risk of sub-zero temperatures or if ambient temperature still is foreseen to be below the dew point of the ducted air.
- Consider that vibrations/sound propagate through piping and its fixations and that, preferably, flexible tubes are used for the transition from the machine to fix installation.
- Regeneration air inlets outdoors are preferably made so that:
    - Dust, dirt, exhausts or other unsuitable/harmful gases are drawn into the machine.
    - Rain or snow is not drawn in.
    - Wire mesh with mask size of around 10mm is appropriate to prevent objects and animals from entering while still not causing excessive pressure drop.

- Is positioned so that the wet air from the machine will not be drawn back into the machine – preferably placed at least two meters or more away.

- Wet air outlets outdoors are made such that:
  - The ducting has a continuous slope outwards so that condensation will be allowed to exit or, if this is not possible, there is a drainage point( ) made at suitable low points.
  - Wire mesh with mask size of around 10mm is appropriate to prevent objects and animals from entering while still not causing excessive pressure drop

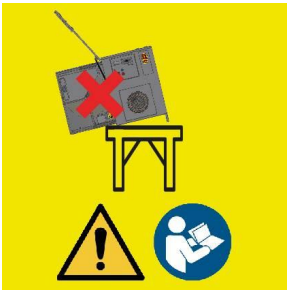
In the planning, with regards to the machine positioning, also consider that:

To allow for the service hatch to be opened for service and repair, a floor space with a depth of minimum of 850 mm is to be left free. In open position, the service hatch is raised vertically and thus the free height is most preferably 1900 mm.

The floor of the free space in front of the machine hatch is preferably of the same height as that of the floor on which the machine is positioned. The reason is that the extractable rotor cassette is provided a support to prevent the machine from falling over due to the shifted centre of gravity. An elevated position of the machine will

prevent the support from reaching the floor and thus the support will no longer prevent accidents.

On the rotor cassette, visible when the service hatch is opened, is a warning label intended to inform and remind the user about the risk described.



Summary of installation, main points:

1. Position the dehumidifier horizontally and stably so that it does not fall over and cause damage. Suitably, note the need for free space in front of the service hatch and that elevated positions are to be avoided as earlier described.
2. Connect required ducting for the respective airflows given the circumstances and observing the ducting instructions presented earlier.
3. Check that filters, both process and regeneration, are mounted and that these are clean and intact.
4. Check that service hatch, filter hatches and electronics cabinet are closed and locked.
5. Check that the power cable to be used is intact and without visual damage. Connect the machine to 16A 400V 3-phase supply, preferably protected by RCD.
6. Start the machine by turning the mains power switch clockwise to position 1. When the display starts up, push Resume to continue operation with the settings last used. Push of

Start will get the machine running at maximum capacity (Max mode) and with continuous operation (control mode Manual

7. Observe that the start sequence takes a few minutes. The last thing to start, at first at low speed and then slowly increasing to the intended level for the capacity mode selected is the regeneration fan.
8. Check that the air flows are as expected and that there are no leaks with the ducting.
9. If the machine is equipped with differential pressure sensor for balancing, continue by adjusting the fan speeds to the ducting by following the process described in chapter Adjusting air flow balanceI
10. If the machine is equipped with filter monitoring, verify and if required adjust the settings following the instructions provided in chapter Filter monitoring

Start and stop the machine

The machine is equipped with a mains power switch positioned in the lower left corner of the electronics cabinet hatch.

To start the machine:

1. Turn the mains power switch clockwise to position 1.
2. Await the control panel start-up.
3. Once the default view is presented on the control panel, there are two alternatives presented, Start to the left and Resume to the right.

   Select Resume to continue operation with the settings last used with the machine.

   Select Start for default operation ignoring previous settings and applying maximum capacity (Max mode) and continuous dehumidification (control mode Manual)

   Note: The machine will automatically resume operation after power outages. If this has happened or if last time the machine was used, its operation was not stopped through the control panel before the mains power switch was turned off, the default view will present a count down from 30 seconds after which the machine will automatically resume. If this is not desirable, the automatic restart can be stopped by push of Stop, the lower centre button of the control panel.

4. The machine will now start its components in sequence. The start procedure is automatic and takes about five minutes.

To stop the machine:

1. Push Stop on the control panel.

2. The machine enters a cool down phase, switching off the heaters while allowing the fans to operate. Time remaining is presented on the screen. Wait for this to be completed.
3. The machine is now in standby. For complete shutdown, proceed by turning mains power switch anti clockwise to position 0.

Emergency stop

The emergency stop button is positioned next to the mains power switch on the electronics cabinet hatch and it is engaged by a push.

To reset the emergency stop, first turn the emergency stop anti clockwise and then push the reset button located to the right.

Adjusting air flow balance

Note: This feature is optional and not present on all machines.

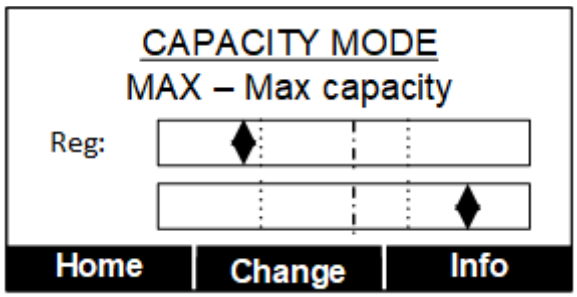
For optimum performance and dehumidification, at every new installation, the actual operation point of the machine shall be checked and if necessary, the respective fan speeds adjusted to compensate for the pressure drops of the ducting. To this purpose, available through the Capacity Mode menu, there is an adjustment guide graphically presenting the current operation point and supporting the user in the adjustment.

The capacity modes implemented with the machine are defined with fan speeds suitable for installations with limited ducting, situations where none of the air flows are subjected to significant pressure drops which reduces the fan capacities. A lowered regeneration air flow will also lower heat generated by the PTC heater which in turn reduces the capacity and the intent of the adjustment menu is to allow for the user to, if required, adjust the fan speeds to compensate for the ducting and if necessary, increase the regeneration air flow and thus the capacity. Doing so also comes with benefit that process air flow can be increased while still maintaining proper and correct pressure balance between the air flows.

Before adjustment is undertaken, ensure that the machine has been allowed to operate with intended capacity mode for at least 10 minutes, preferably more, so that it has warmed up and the power consumption of the machine has stabilized. The regeneration heaters of the machine are of PTC type which means that the initial power consumption is higher than what it is during normal operation when the machine interior is warmed up. Adjusting the operation too early can thus cause the user to do incorrect adjustments resulting in a strongly deviating operation point.

How to go about it?

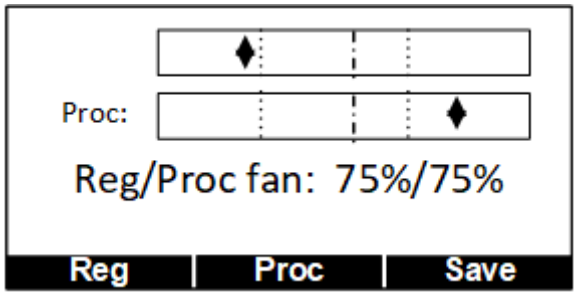
To commence the adjustment, step right in the menu tree using the upper right button until the Capacity mode screen with the below depicted appearance is reached. In this menu, where selected capacity mode also is presented, there are two horizontal indicators, one for the regeneration air flow and one for the process air flow. Each of them is provided a setpoint with dash dotted line and tolerances indicated with dashed lines. Current actuals are indicated with diamonds shaped symbols.



In the example above, the machine is operating in Max mode and both indicators are currently outside their allowed intervals. To adjust the operation, push Change and then confirm the selection of Max mode.

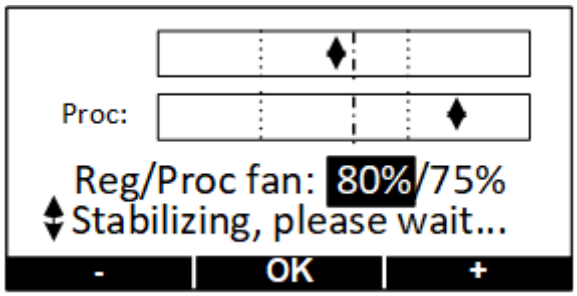
When this is done, the machine will present a reminder to say that the machine shall preferably be allowed to stabilize for a minimum of 10 minutes.

When continuing, having allowed for stabilization, the adjustment menu itself is presented and its appearance is exemplified below. The previously described indicators are there and below them, information on the respective fan speeds for regeneration and for process.



Begin by adjusting the regeneration fan, thus selecting Reg on the lower left button. The machine will now present a screen with the regeneration fan speed highlighted and minus and plus options on the lower left and right buttons. The minus button, lowering the speed of the fan, will move the current actual to the left while increasing the speed will move it to the right.

Make small incremental adjustments, wait for the machine to stabilize, and then re-evaluate. Whenever the machine detects rapid and big changes, it will present the text “Stabilizing, please wait…”.



The power developed by the PTC heaters is, as previously described, governed by how much they are cooled with the air flow. Thus, if the temperature of the regeneration air is expected to drop significantly during the operation, it is recommended to leave the regeneration operation point towards the lower end of the allowed interval.

When the regeneration fan speed is correctly adjusted, save the setting by pushing OK available with the lower centre button and then repeat the same procedure for the process air fan to complete the adjustment.

Once the adjustment is completed, observe and remember the following:

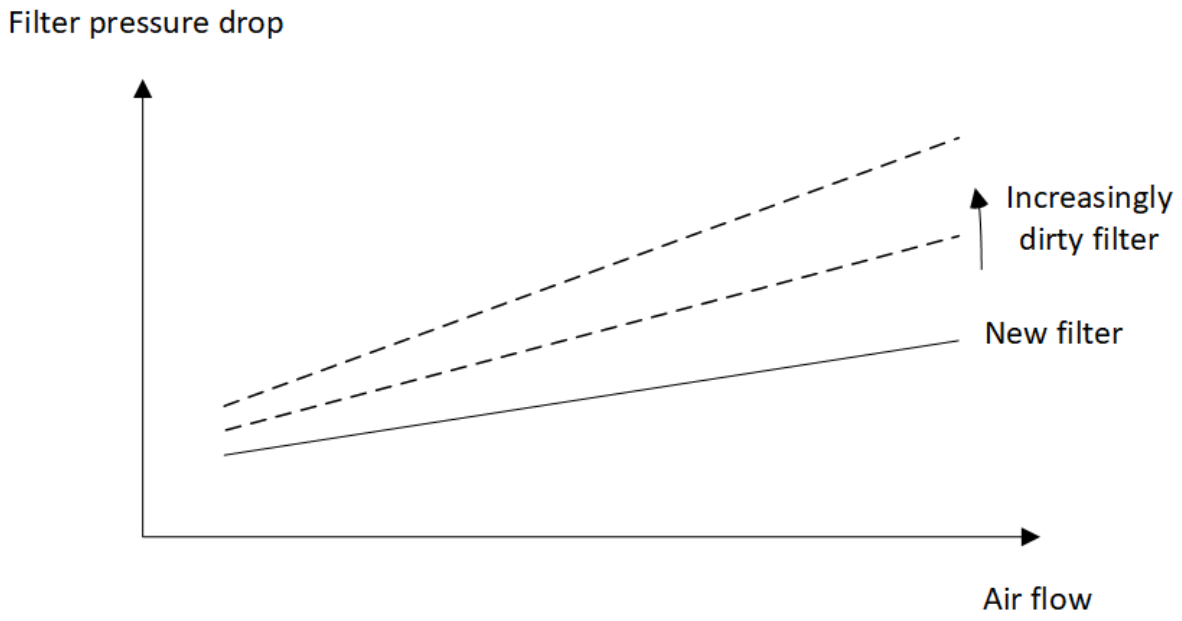
1. In situations where the fan speeds have been increased to overcome pressure drop with ducting, the filter alarm levels are preferably adjusted or else the dirty filter alarm is likely to come a bit too late. The reason for this is that the default settings with the machine reflect the fan speed to air flow ratios reflecting a machine with limited ducting.
2. When capacity mode is changed, the adjustment will have to be repeated. If the machine has temporarily been put in standby, select Resume to start it again with previous settings and adjustment. The other option, Start, makes the machine forget previous settings including adjustment and brings operation in MAX mode with continuous dehumidification (control mode Manual)
3. Note than whenever the operation point is outside the tolerances, this is indicated in the default view by a blinking exclamation point after the presentation of the current capacity mode in the upper right corner.

Filter monitoring

Note: Filter monitoring is not available with all machines.

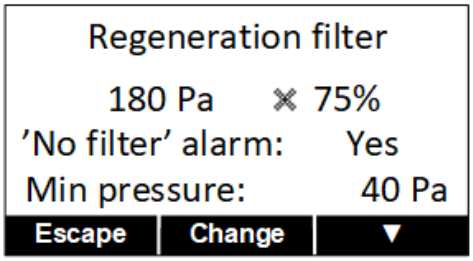
A15 ES implements built-in filter monitoring for both process and regeneration filters and can also be set to raise alarm if there is no filter installed. These alarm functions are individually selectable and adjustable to allow the user obtain desired functionality for the given installation, including its requirements on the air, the type of dust and dirt collected in the filters, the ducting used and also the changes over time that may come from updated or changed filter types.

The pressure drop over a filter of the type used in the A15 ES as a function of the air flow has the appearance depicted below. The pressure drop over the increasingly more dirty filter will increase more rapidly with an increase of the air flow as seen by the increasingly steep slope of the curve.



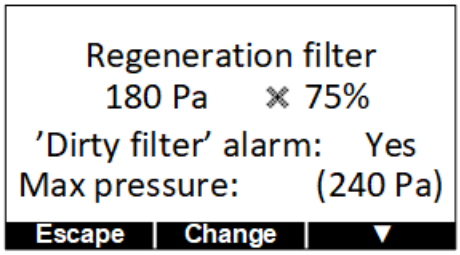
To get the alarms to trigger at the correct point in time with given installation will thus often require the pressure drop settings to be changed. Installations with long ducting will cause the actual air flows to change and, as a consequence, the user might find that the factory settings for the alarms do not quite fit requirements.

To check or to change the filter monitoring settings, step to **Setup** and **Maintenance menu** using the upper right button of the control panel. Select this menu and step down to find sub menu **Filter settings** under which both '**No filter**' and '**Dirty filter**' alarm settings for both regeneration and process filters are found.



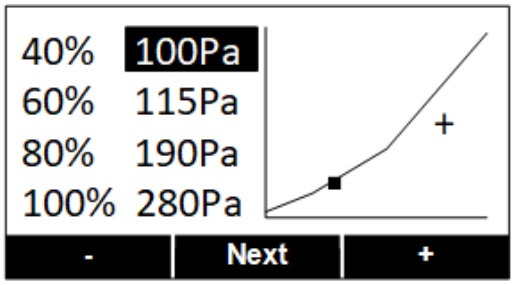
The settings for **'No filter'** have the above depicted appearance. At the top is presented what filter it is referring to, the current actual pressure drop and current fan speed. This information is followed by whether the alarm feature is selected to be active or not and the pressure drop below which the machine is to conclude that no filter is mounted. Ideally and in theory, if there were no filter mounted, the pressure drop should be zero but some margin is required to allow for turbulence, accuracy in measurement etc. To adjust settings, push **Change** and make the required changes.

With the down arrow option on the lower right button, one can step to the next of the four settings screens available.



The settings for **'Dirty filter'** have the above appearance and, as can be seen, it follows has the same overall structure. The difference is that that the last row, **Max pressure**, presents the pressure level that, if exceeded at given current actual fan speed, will trigger the alarm. A quick comparison of this value, 240 Pa in the example, and the current actual pressure drop of 180 Pa will give an indication of the filter status.

Push of **Change** in the above screen will at first present the user with the possibility of switching the alarm functionality on or off, Yes or No, whereafter the presentation automatically shifts to that depicted below. In sequence, the user can here adjust at what pressure drops the alarm shall trigger for the fan speeds given in the first column. To the right, the settings are presented in the form of a diagram with the pressure drop on the vertical y-axis and the fan speed on the horizontal x-axis. The point currently adjusted is highlighted and also presented with a square symbol in the diagram. The current actual, the pressure drop currently measured by the machine and the speed at which the fan is running is shown in the diagram with a plus sign.



Control panel menu and functions

The A15 ES is, in addition to mains power switch and emergency stop button with dedicated reset, also equipped with a control unit implementing an easily understood user interface with a display and five push buttons. The two larger buttons on the respective sides of the display are used to select between the different menus – no changes to the setup can ever be made with these buttons as they are for navigation only.

The three smaller buttons below the display are used for selection and editing and their respective functions are always presented in text and the bottom of the screen. At the top-level menus, the left of these buttons is named Home and a push on this button will immediately lead back to the default view. In many of the views there is an Info button which presents information that may be of use to the inexperienced user.

If the backlight of the display has timed out, the first button push serves only to light up the display.

After 10 minutes, if no button is pushed, a keypad lock is activated. The machine is then unlocked by simultaneous push of the two upper buttons, something that is presented in text as well as picture on the display.

Top left and right buttons –	**Menu navigation only. Never changes any settings.**
Home button	**Return to the default view**
Info button	**Presents information. On-board manual**

Capacity mode

Indicates what capacity mode is selected

Blinking exclamation point after the name indicates that the operation point of the machine is suboptimal and preferably adjusted

SuperVision® 2.0

Visible when the machine is connected to SuperVision® 2.0 for remote monitoring and control.

Network status

"Master" or "Slaved"

If the machine is connected to local network, this position indicates whether the machine is controlling the network, Master, or if it is controlled by other machine and thus Slaved.

Timer

Visible when machine is set to operate on Timer.

Slaved – indicates that the machine is controlled by other machine.

Drying indicator

Moving when drying is on-going.

Alarm

Machine has detected an error.

Fan indicator

Moving when fan is running.

Control mode

Indicates how the drying is controlled, if it is continuous (MAN - manual) or if it operates to defined setpoint Relative Humidity, RH, mixing ratio, MIX or Dew point, DEW. It can also be controlled by external hygrostat, HYG.

If external Relative Humidity and temperature sensor is used, this position reads E.RH, E.MIX or E.DEW.

Setpoint adjustment

indicates that the left and right buttons below the screen are used to increase and decrease the setpoint which is displayed with black background.

Fan mode

Cont - continuous fan. If not displayed, fan only operates when drying is required.

INT – intermittent fan operation, 5 minutes of every hour.

Read further important information in the following chapter.

Start up view

When the A15 ES starts up, the display presents the user with two options:

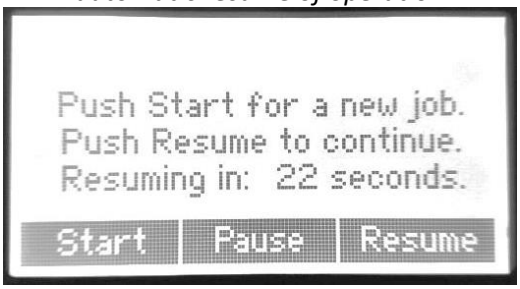
Resume: The machine resumes operation with the settings it had last time it was used and it is this feature that shall be used when a machine has already been adjusted and set up for a given task.

Start: Starts the machine with default settings, continuous operation with maximum capacity. Previous settings made such as the use of sensor control, Timer etc..

If, last time it was used, the user never pushed stop before the power was cut, the machine will automatically resume operation when the countdown has reached zero.
A push of Pause button will stop the countdown and the machine will remain in standby until manually started.

Normal start

Start after power out –
automatic resume of operation



Default View

When the machine is operating, it can always be stopped, set to standby, by use of the center button below the display.

When the machine is running with a control mode other than MAN, manual, the setpoint value which is highlighted with black background at the center of the screen can be increased and decreased by use of the minus (-) and plus (+) buttons respectively.

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Control Mode

The Control Mode determines whether the drying shall be continuous (MAN – manual mode) or if it shall operate only when required as determined by the ambient climate.

The selected control mode is displayed in the lower left corner of the default view.

The Control Mode selection screen is reached by one push of the upper right button.

The following basic control modes are available:

MAN	Manual, continuous drying.
RH	Drying down to selectable Relative humidity, %.
MIX	Drying down to selectable mixing ratio, g/kg.
DEW	Drying down to selectable dew point, °C
HYG	Drying controlled by external hygrostat connected to the machine.

Through its network capabilities, the machine can also connect to external RHT sensors and use their values to control the operation rather than using the built-in Relative Humidity and Temperature sensor. To this

purpose there are also the following External sensor modes:

E.RH	Drying down to selectable Relative humidity, % as given by external RHT sensor(s) connected to the machine.
E.MIX	Drying down to selectable mixing ratio, g/kg as given by external sensor(s) connected to the machine.
E.DEW	Drying down to selectable dew point, °C, as given by external sensor(s) connected to the machine.

The External control modes require the machine to be networked and connected to an external RHT sensor. If the machine is not networked already, the machine will ask if it shall create a network.
If there are multiple sensors in the network and alternative <All< is selected rather than one unique sensor, e.g. RHT61, the machine applies “worst case” and operates as long as any one of the sensors read a humidity above the setpoint.

When selecting mode other than MAN, the machine presents the user with the possibility of determining the setpoint.

When reaching the setpoint level, the drying automatically stops. Should the humidity later on rise above the setpoint level, drying operation is automatically resumed.

Hysteresis

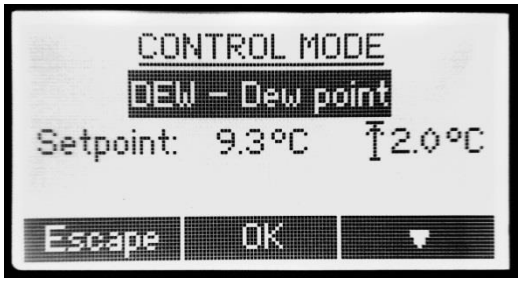
When selecting RH, DEW or MIX control modes, to the right in the display there is a symbol and a hysteresis value presented.
The symbol indicates the position of the setpoint in the operation span as presented below.

↕ - center

↓ - bottom

↑ - top

Alarm
At the bottom of the screen, there is a possibility of setting an alarm to be triggered and presented on screen should the humidity rise too high.



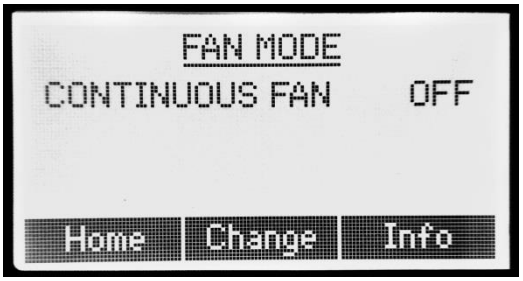
Fan Mode

The Fan mode determines whether the fans in the dehumidifier shall operate continuously, or they shall operate only when drying is required and ongoing.

If continuous fan is selected, the CONT is presented in the lower right corner of the default screen.

If possible, for optimal drying effect, use continuous fan to keep the air in constant motion.

Intermittent fan mode means that the fans are deactivated when dehumidification is not required as dictated by the control mode. The fans will however start and run for five minutes every hour and it is only during these five minutes that the machine will check and read the temperature and relative humidity. If, by these measurements, dehumidification is again required the machine will resume dehumidification. If, on the other hand, the measurements give that dehumidification is still not required, the fans will stop and the machine will again remain idle for 55 minutes. Intermittent fan mode does thus have a potential to save energy in situations where ducting and positioning of machine are such that the values provided by the RHT sensor by the machine's inlet cannot be trusted and considered relevant unless the fans are running. The user should however consider that the intermittent fan mode in combination with control mode based on the internal RHT sensor can cause a delay of the dehumidification of almost an hour when the humidity rises. If such a delay is not acceptable, it is recommended to use continuous fan mode or to use an external RHT sensor.



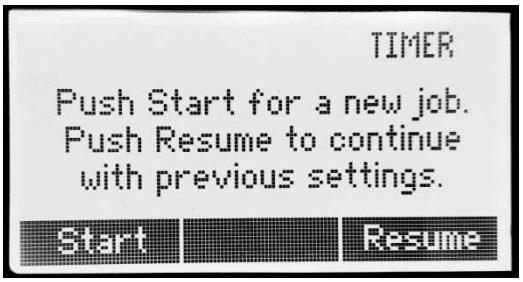
Capacity Mode

The drying capacity of the machine can be optimized to the given work and situation by use of two different operation modes.
When set to MAX, maximum, the machine operates to remove as much water as possible. When the full effect of the machine is not required, it can instead be set to ECO, eco-mode, where fan speeds and the power consumption are reduced.

When the machine has been installed at new site and when capacity modes are changed, machines equipped with air flow balancing function are preferably re - adjusted to ensure optimal performance.

Note that, as described in the chapter on air flow balancing, the adjustments are to be made when all ducting is installed and the machine has been allowed time to stabilize. Too early adjustments will inevitably result in suboptimal performance.

The A15ES has built-in timer functionality allowing the user to determine when the machine shall operate. When Timer function is used, the word Timer is presented in the top right corner of the default view as can be seen to the right.



To activate Timer, push the right arrow button four times to enter the Timer menu.
Push Activate.

When timer is activated, as a first step, the machine asks the user to verify that its time and date settings

are correct. If so, push OK. If changes are required, push edit to do the required changes before continuing.

In the next step, the user is allowed to set the time interval within which the machine shall operate. The machine remembers the timer settings from last time it was used and presents that data as default.

Network

Note: Install all the system cables before powering up the machines.

The A15 has networking capabilities allowing it to be remotely monitored and controlled through SuperVision® 2.0.

Once established, in the network menu, the presentation will toggle between the slave units which are referred to with type, for instance A4, and address on the bus, for instance 101.

To change the settings of a slave unit, press Edit and the select the given slave. As a confirmation of what unit was selected, the display backlight of the selected unit will start blinking.

The desired settings can still also be made on the respective machines themselves.

When all desired settings are made, start the Master machine and the slaves will be started automatically

within a minute. Similarly, when the machines are to be stopped, push Stop on the Master machine and the slaves will soon stop automatically.

As the Master machine is controlling the network, if a slave unit is started manually when the Master is in standby, the slave unit will be stopped. Similarly, if a slave unit is manually stopped while the Master is running, the slave unit will be started again.

Setup and Maintenance Menus

Under Setup and Maintenance, functions that are not required for normal operation are found.

Date and Time: Setting of system date and time. Format is YY:MM:DD / HH:MM.

Language: Selection of language for the interface.

Menu System: The menu system is by default set to Advanced with all functions visible and accessible. If set to Basic, the more advanced functions are removed from the menu system.

Key Pad lock: Possibility to activate/deactivate the key pad lock.

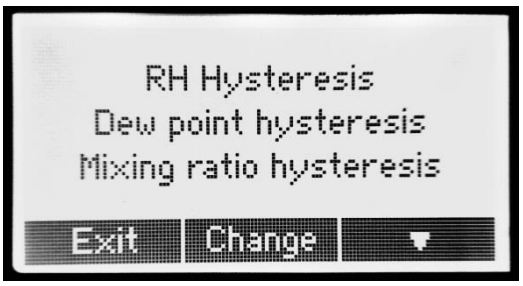
RH Hysteresis: Possibility to adjust the hysteresis settings for RH Control Mode. The position of the setpoint in the operation span can be set as well as the hysteresis value.

Dew point Hysteresis: Possibility to adjust the hysteresis settings for Dew point (DEW) Control Mode. The position of the setpoint in the operation span can be set as well as the hysteresis value.

Mixing ratio Hysteresis: Possibility to adjust the hysteresis settings for Mixing ratio (MIX) Control Mode. The position of the setpoint in the operation span can be set as well as the hysteresis value.

Filter setup (optional): Possibility of individually selecting and changing settings with the 'No filter' and 'Dirty filter' alarms for regeneration and process filter. The pressure levels can be adjusted to fit installed ducting, user preferences etc.

Example screens, configuration will vary with selected options etc.



Run built-in test: A built-in self test that is available for service technicians. **Reset Service Time:** The machine is set to give a service reminder once every 12 months. When service has been performed, this service reminder can be reset using this function. **Reset pressure sensors (optional):** Possibility of zeroing the differential pressure sensors used for filter monitoring and air flow balance. **View sensor data:** Functionality intended for service technicians. **USB settings –** possibility of activating and deactivating USB logging.	

Sensor In this menu, the current temperatures with the regeneration air inlet and the wet air outlet are presented. In a separate view is also presented the values provided by the temperature and relative humidity sensor by the process air inlet.	
Counters This screen presents the hour and energy counters. At the top, the resettable work counters are presented, followed by the date at which the counters were reset. After the date, the number of hours elapsed since this reset is presented so as to allow for a quick comparison. To reset the work counters, push Reset. Acknowledge the intent to reset the counters by push of OK in the following confirmation screen. At the bottom, the machine life time counters for energy and hours are presented. These counters are not resettable. The energy meter's display is visible through the inspection window of the electronics cabinet hatch.	 

Alarms In this screen, the machine presents identified alarms. As soon as an alarm is identified, this is also presented as a pop-up screen. Furthermore, as long as the error condition remains, in the top right corner of the default view there is a warning symbol. The alarms presented need not be erased by the user. Instead, as soon as the machine detects that the functionality is again in place, the alarm will disappear automatically.	

Control Modes and Hysteresis

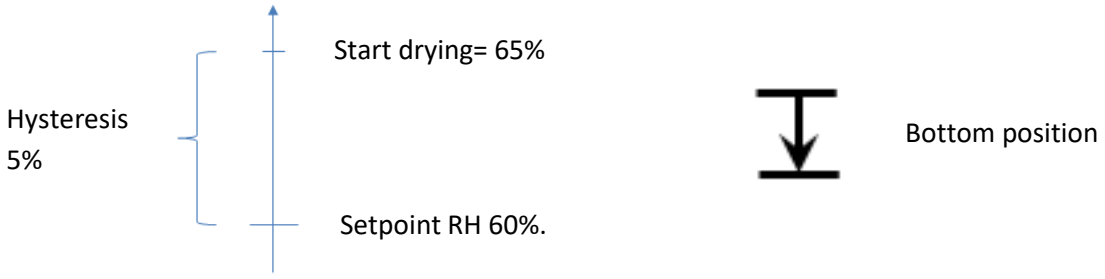
In addition to normal, continuous drying operation, the A15 ES operation can be controlled by use of its internal Relative Humidity and Temperature sensor, external hygrostat or external and networked sensor.

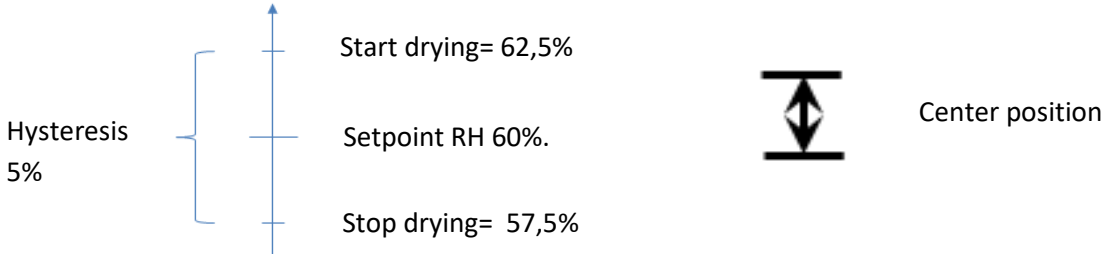
When using an electronic sensor, built-in or external, the machine applies a software-controlled hysteresis to make the operation of the machine stable and prevent excessive on- and off -switching.

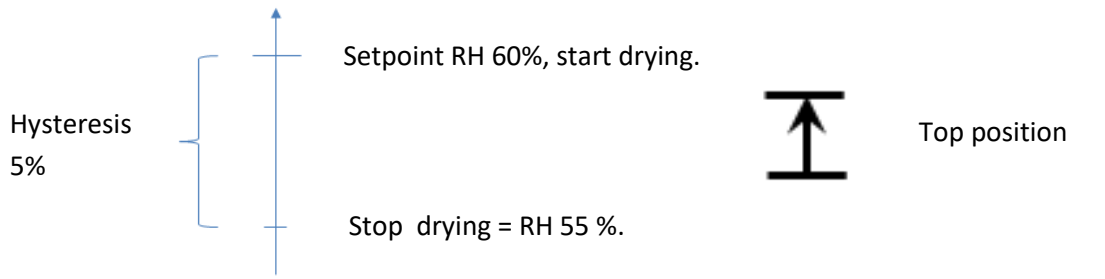
The table below presents the default settings of the machine. If changes are required, these can be made under the Setup and Maintenance menu.

Control mode	Hysteresis	Setpoint position
RH	4%	Bottom
Dewpoint	2°C	Top
Mix	0.5 g/kg	Bottom

The below illustrations describe the different hysteresis settings, bottom, center and top.







Alarms

If the machine detects an error, this information is presented in a pop-up screen and for as long as one or more problems exist, there is a warning symbol in the top right corner of the default view.

The alarms that can be displayed are the following, each presented with recommendation on what to do.

Alarm	Action / Advice
Mainboard connection failure	Internal error. If it remains, please contact service technician.
Rotor failure	The rotor sensor indicates the rotor is not turning and therefore the heaters have been switched off to prevent excessive temperature with the wet air. Please contact service technician.
Internal RHT sensor failure	Internal RHT sensor cannot be read. If not and if it remains, please contact service technician.
External RHT sensor failure	The machine has lost contact with the external RHT sensor(s). Please check that the cables are correctly mounted. When losing the external sensors, the machine automatically reverts to using the built-in RHT sensor.
One or more slaves are not responding	This alarm is presented when the machine, used as Master on a network, has lost connection with one or more of its slave machines. If it is presented, check all the system cables and the power to the respective machines. As soon as communication is re-established, the alarm will automatically disappear.
Ambient temperature too high!	The machine has shut off the heaters due to too high ambient temperature, above 40 degrees Centigrade. If continuous fan is selected, the fans will continue operating. The machine automatically resumes operation if the temperature drops.
Energy meter connection failure	The communication with the energy meter is failing and the machine can therefore not present the energy consumption. In other regards, the machine still functions normally. Provided the energy meter is still otherwise working, the life time energy consumption can still be read on its own display, visible through the inspection window.
Overheat alarm	The cause of this problem is likely that the overheat protection has triggered and cut the power to the heater contactors. The root cause of the overheat could be a problem, possibly intermittent, with the rotor operation and or a problem with the regeneration fan.

	If this alarm has occurred during normal operation and without apparent or known reason, the machine shall be checked by service technician before it is put back in operation. The overheat protection is mounted behind rubber grommet in the rotor cassette and is found above the rotor, within easy reach when the service hatch is opened. Please note that the mains power to the machine must be cut before the machine is opened.
Heater failure	The machine has detected a too low power consumption with the heaters and this could be caused by a problem with the regeneration air fan or with ducting as the the air flow is likely to be too low. If this alarm has occurred during normal operation and without apparent or known reason, the machine shall be checked by service technician before it is put back in operation.
High wet air temperature	The machine has detected a too high temperature with the wet air and has therefore stopped the heaters. If this alarm has occurred during normal operation and without apparent or known reason, the machine shall be checked by service technician before it is put back in operation.
High regeneration air inlet temperature	The machine has detected a too high temperature with the incoming regeneration air and has therefore stopped the heaters. If or when the temperature falls, the machine will automatically resume operation.
Regeneration air inlet temp. sensor failure	The temperature sensor cannot be read and therefore the heaters have been turned off.
Wet air temperature sensor failure	The temperature sensor cannot be read and therefore the heaters have been turned off.
Process air filter not installed	Stop the machine and replace the filter. If the alarm appears incorrect, check and if necessary, adjust the alarm settings available in the Filter settings menu under Setup and maintenance. See chapter Filter monitoring.
Dirty process air filter	Stop the machine and replace the filter.

	If the alarm appears incorrect, check and if necessary, adjust the alarm settings available in the Filter settings menu under Setup and maintenance. See chapter Filter monitoring.
Regeneration air filter not installed	Stop the machine and replace the filter. If the alarm appears incorrect, check and if necessary adjust the alarm settings available in the Filter settings menu under Setup and maintenance. See chapter Filter monitoring.
Dirty regeneration air filter	Stop the machine and replace the filter. If the alarm appears incorrect, check and if necessary adjust the alarm settings available in the Filter settings menu under Setup and maintenance. See chapter Filter monitoring.

To network machines

To network machines, for instance for use with SuperVision® 2.0, proceed as follows:

1. If the machines are powered, switch them off and then proceed by connecting the machines with system cables. The two connectors on the machines have the same functionality so it does not matter which one is used. If SuperVision® 2.0 is to be used, this too must be connected to one of the machines, it does not matter which one.
2. Power up the machines.
3. Select what machine shall be Master and on its control panel use the upper right arrow button to step to the Network menu depicted below.

   (If this menu is not found, the machine is set to Basic menu setting. To change this, select Setup and Maintenance menu and change the menu system setting to Advanced.)
4. In the Network menu, push <Create> and then wait while the machine sets up the network.
5. When the network is created, at the top of the screen the presentation will toggle between the different slaves. If SuperVision® 2.0 is connected, the text SuperVision® 2.0 will be presented at the bottom of the screen although it can take up to a minute before this is shown.

After having followed the steps above, all the slave machines are now controlled by the Master. This means that they will all be started and stopped with the Master. They still work with the same settings they had before the network connection so if these need to be changed, push Edit and then select the slave to be edited through the Master or do the necessary changes to the settings on the machine itself. When being edited through the Master, the slave machine will start to blink its display backlight so that the user can see what machine is selected.

Service Reminder

The machine is set to provide a service reminder once every six months. The reminder is presented as an alarm but it does not affect the operation of the machine. The service reminder function is reset under Setup and Maintenance.

Service and Maintenance

The need for service and maintenance strongly depends on the environment in which the machine is used as well as the usage profile, how often and how much it is used. The most obvious example of this is the filters which can deteriorate very quickly when the machine is used in dirty environment. For this reason, the A15ES can be delivered with filter monitoring functions that triggers alarms of the filters need replacing or if, in some situation and by mistake, no filter is present.

The service and maintenance work is to be carried out by authorised and qualified personnel adhering to a calendar based maintenance schedule and to support it, the machine itself shows a service reminder at every such even provided the service schedule is followed and the service alarm is reset after each performed service. In the schedule, approximate equivalent and corresponding operation hours has been added for reference only.

Every 6 months (4750 hours):

1. Inspection of, and if required replacement, of filters
2. Control of function
3. Zeroing of differential pressure sensors.

Every 12 months (9500 hours):

1. Inspection of, and if required replacement, of filters
2. Inspection and cleaning of machine interior including rotor
3. Control of function including check of air flows
4. Test of RCD. (Requires the machine to be powered whilst the electronics cabinet is open and thus it must be performed by personnel with required competence.)

Every 60 months:

In addition to the yearly, 12 months service above, the following tasks are added:

1. Check of power consumption with the regeneration heaters
2. Replacing the overheat protection
3. Check of capacity

If the cost and consequence of interruptions in machine operation warrants it, preventive replacement of:

4. Rotor motor
5. Fans

The machine is designed to safely manage failure with the rotor motor and/or the fans and therefore preventive replacementsof these are not mandatory.

Filter replacement

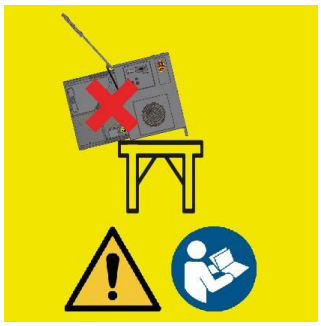
Filter replacement is performed as follows:

1. Stop the machine by pushing Stop on the control panel so that the machine enters the automatic cooling sequence.
2. Allow the cooling sequence to finish and wait until the count down on the display has disappeared and the fans have stopped.
3. Turn off the mains power switch by turning it anti clockwise to position 0. .
4. Open the filter hatches and remove the old filters.
5. Clean the filter compartments, preferably with a vacuum cleaner, so that the dust and dirt that have fallen off the filters is removed. If left in the machine, the dust and dirt will clog the new filters
6. Insert the new filters and close and lock the filter hatches.
7. Push Resume to have the machine start up with the same settings and adjustments as before. Preferably wait by the machine a few minutes to see that the operation is normal and that there are no alarms presented on the control panel.

Service and repair work including cleaning

For service and repair, at all times, the power must be disconnected from the machine. Stop the machine and let it cool down. Proceed by turning off the mains power switch and remove the power cable from the power intake. Ensure that no other personnel reconnects power to the machine while the work is ongoing.

The rotor cassette must not be extracted when the machine is in elevated position, such as on a lift table. The rotor cassette is provided with a support to prevent the machine from falling over and this feature will not help prevent accidents if the machine is raised from the floor.



If the machine is equipped with transport cage, the wheels on the cage must be locked if the service hatch is to be opened and the rotor cassette to be extracted. Unlocked wheels can cause inadvertent movement and result in the machine tipping over.

While cleaning the machine, as dust and particles collected from the air flows are likely to be present, use appropriate protective equipment.

The machine exterior is cleaned with a moist cloth. For the interior, use a vacuum cleaner with a brush head to remove dust and particles. Carefully and still with the brushed head to prevent damage to surface, the rotor is from both sides.

Accessories and consumables

The following are consumables and examples of accessories available for the A15ES.

Article number	Name
6000733	Filter, process air
1004717	Filter, regeneration air
1002749	System cable, 0.5 m
1002748	System cable, 5 m
1002816	Adapter cable, hygrostat
1002817	External RHT sensor, ES series
1005369	Transport cage A15 complete with wheels

Trouble shooting

Symtom	Trolig orsak	Åtgärd
Room is not getting dehumidified/low capacity.	Depending on the situation, the cause of the problem can be either incorrect installation such as obstructed ducting, clogged filters, incorrect settings	Begin trouble shooting as follows until the problem is identified: Check the installation – verify that all ducting is intact and not blocked, partially or completely. Ensure that the air flows are correct. If the air flow is weak, check and if necessary, replace the filters. Check the settings of the machine as follows: First, check that the water symbol in the left part of the screen is moving, an indication of on-going dehumidification. If it is not moving, check the control mode in the lower left corner of the display. For continuous drying, this should read MAN for manual mode. If external hygrostat is connected and used, HYG mode, check the setting of the hygrostat. If RH, DEW or MIX control mode is used, check the setpoint highlighted at the center of the display and adjust as required. Verify that the water symbol starts moving. If the control mode and its settings was not the problem, continue by checking the capacity mode presented in the top right corner of the default view. For maximum water removal, the text should read "MAX".
No air is blowing, the fans are not running.	The machine has been set in standby. The dehumidifier is set to a control mode other than MAN, manual, continuous fan function is off and the ambient humidity is so low that the machine is now in standby.	Push either Start to start the machine with default settings or Resume to start with the previous settings. Check the control mode in the lower left corner of the machine. For continuous operation, it should read MAN as in manual mode. If other mode is used, check the setpoint. For continuous fan, use right arrow button to step to the Fan mode menu and activate Continuous fan.

	The machine is operating on timer and currently in stand-by.	If applicable, adjust the set point of the humidistat.

Technical data

Capacity	
Capacity (liters/24 hours) at 20˚/RH 60%	190
Nominal dry air flow (m^3/h)	1500
Available static pressure dry air (Pa)*	450
Nominal wet air flow	460
Available static pressure wet air (Pa)*	450
**Requires air flow balancing function*	
Duct connections	
Regeneration and wet air, diameter (mm)	160
Process and dry air, diameter (mm)	250
Air filters	
Filter class regeneration/process	ISOePM1 55% (F7) /ISOePM1 55% (F7)
Power consumption	
Regeneration (W)	9300
Motors (W)	700
Rated power (W)	10000
Power connection	
Intake EC/CEE 5P 16A	3N~ 400V/50hz
Cable area, power cable minimum (mm^2)	2.5
Dimensions	
Length, width, height (mm) (excl stubs)	1000 x 670 x 988
Weight (kg)	162
Weight including transport cage (kg)	183

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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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