

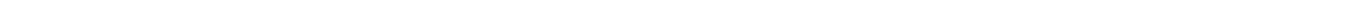
Cotes dehumidifier C105E/C105D

Manual number: 140739

Revision: D

COTES ALL ROUND C105

How to install, set up, operate and service your
Cotes dehumidifier



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SECTION 1 / GENERAL BACKGROUND

ABOUT THIS HANDBOOK

This is the installation and service handbook for your Cotes dehumidifier.

You should read the whole handbook before installing and/or starting the dehumidifier unit for the first time. It is important that you and your colleagues are familiar with the correct operating procedures and all precautionary safety measures, in order to avoid any damage to the surroundings, materials or installations, as well as to prevent any personal injury.

This handbook is mainly intended for use by technicians who install and operate this Cotes dehumidifier unit, who carry out preventive maintenance and who replace defective parts.

Anyone using Cotes dehumidifier units, or whose responsibilities include supervising their operation, will also benefit from reading this handbook and from consulting it as a practical help should the need arise.

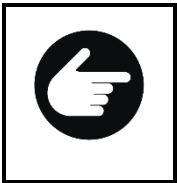
Product number for this handbook

The product number of this service handbook is 140739.

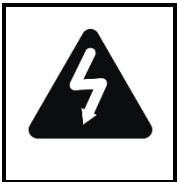
This is the number you need to give us if you would like to order additional copies for your staff, colleagues or service personnel, or for technical staff from outside your company.



SYMBOLS USED IN THIS HANDBOOK



This tells you to perform a particular action



Important to note, because items in the dehumidifier can cause injury or affect people's health



You need to pay special attention to this

NOTE

It is each operator's responsibility to read and understand this manual and other information and to employ the correct operating and maintenance procedures.



ABOUT COTES

Cotes humidity management technology – cost-effective and energy-efficient

The moisture in the air all around us has surprising – and often costly – effects on the materials, structures and processes at the heart of virtually all business processes and industrial activity.

Cotes humidity management technologies enable you to control the levels of moisture in the air inside any building, installation or facility, using only a bare minimum of energy.

And effective control of the basic parameters for your operations is good business.

World leader

Cotes is one of the world's leading experts in the field of adsorption dehumidification, providing technology and expertise that enable companies to achieve better control of the humidity always present in the air.

Better management of the humidity in the air also makes it possible to improve and optimise a wide range of industrial processes, prevent damage and corrosion in many types of structures, and reduce energy consumption in all kinds of installations where air specifications are important.

Big benefits

Cotes dehumidification units provide exceptional advantages.

- Our know-how and experience make sure each customer gets the right equipment to tackle all the practical needs and operating priorities associated with the specific installation
- Our units are exceptionally reliable, and can withstand even harsh treatment unusually well
- They are very easy to maintain and service
- They only use a minimum of energy in order to achieve maximum effect.

We aim to provide our customers with the most technically effective and energy-efficient solution for the best price. This ensures the best possible return on investment, as well as peace of mind about having made the best decision.

SECTION 2 / THE DEHUMIDIFIER

ABOUT THE COTES C105 RANGE OF DEHUMIDIFIERS

The Cotes C105 range of dehumidifiers is designed and configured for a wide range of industrial uses. Prominent among these is humidity management in storage facilities and basement areas, in water works and in many kinds of process industry in which stable, well-controlled air conditions are crucial.

C105E units are specifically configured to minimize the overall energy consumption of the dehumidification process, whereas C105D units are configured to make sure the air flow is as dry as possible.

Dehumidifiers in the Cotes C105 range are designed for high serviceability and easy cleaning, with add-on configuration options that include cooling/heating coils and/or a heat recovery module.

Design priorities

The Cotes C105 range features an eye-catching modern industrial design appearance, along with exceptional reliability.

It is designed to ensure the unhindered passage of air through the unit, which reduces

- energy consumption
- pressure losses
- noise levels

All the components, ancillary equipment and features are optimised for better performance, exceptional service life and ease of maintenance.

Capacities

The Cotes C105 range currently features models with air volumes of between 4000 m³/hour and 8800 m³/hour.

At process air inlet conditions of 20°C and 60% relative humidity (%RH), the capacities (the amount of water which can be removed from the air) of these units are between 25 kg/hour and 51 kg/hour.

Configuration priorities

The Cotes C105 range is available with four different control configurations – Configuration-A, Configuration-B, Configuration-C and Configuration-D.

Control Configuration-A is stripped down to a minimum of features and is therefore not equipped with a PLC screen interface.

Configuration-A/BASIC PLR

The Configuration-A configuration provides:

- High dehumidification capacity
- High energy efficiency
- Stainless steel cabinet
- Easy installation
- Low-noise running
- Low maintenance costs, reducing the overall operating cost
- Easy cleaning
- Hour counter, to keep track of how long the unit has been in operation
- Attachment of external humidity sensor (external humidity control and sensors are not included as standard, but are available for purchase from Cotes)
- Over-heating alarm
- Remote start/stop option
- External fault signal and operation signal
- Manually adjustable process and regeneration air fans, making installation easier

Configuration-B

In addition to the Configuration-A features, the Configuration-B provides:

- Attachment of one external humidity sensor
- 5.7-inch touch display
- Service indication, to keep track of any need for maintenance
- Hour counter, to keep track of how long the unit and components has been in operation
- Mechanical service alarm for rotor and filters
- Control of regeneration air fan from the PLC menu, making installation easier
- Capacity control / modulating heat control
- Measuring and controlling dew point temperature
- Data logging for keeping track of conditions in the space where the unit is installed
- Timer program
- Network connectivity (optional)
- Monitoring and control via smartphone app (optional)
- Monitoring and control by Cotes service centre (optional)

Configuration-C

In addition to the Configuration-B features, the Configuration-C provides:

- Automatic adjustment of process and regeneration air fans based on the selected program
- Monitoring and control of air flows [m³/hour]
- Energy-saving program, for situations where energy consumption is the prime consideration
- Low-noise program, for situations where silence is the prime consideration
- CUSTOM program, for situation where dehumidifier parameters needs to be controlled

Configuration-D

In addition to the Configuration-C features, the Configuration-D provides:

- Accurate control of humidity level, whether % relative humidity or specific humidity [g/kg]
- Continuous measurement of capacity
- Detailed energy-saving program, for situations where energy consumption is the prime consideration

Configuration combinations with optional modules

The table below shows the possible combinations of optional modules with C105, depending on configuration.

The “Alternative Heating” modules are built into the C105 dehumidifier and thus cannot be retrofitted or changed after purchase.

The Pre-module, Post-module and HR-modules are all external modules and can be purchased together with the C105 dehumidifier or can be retrofitted to an existing C105 installation.

In case you would like to add an external module to you C105 dehumidifier, please contact your local COTES dealer, or contact COTES directly, for more information.

Module	Type	BASIC	PLC B	PLC C	PLC D
Alternative Heating	Steam			X	X
Alternative Heating	EW (Electric + Water)			X	X
PRE – module	Cooling		X	X	X
PRE – module	Heating		X	X	X
PRE – module	Cooling/Heating		X	X	X
POST - module	Cooling		X	X	X
POST – module	Heating		X	X	X
POST – module	Cooling/Heating		X	X	X
HR – Module	HR module (Only HR)		X	X	X
HR – Module	HR module w. Pre-cooling		X	X	X
HR – Module	HR module w. Pre-heating		X	X	X
HR – Module	HR module w. Pre-cooling/heating		X	X	X

Intended use of dehumidifier

The dehumidifier is designed for dehumidifying/conditioning atmospheric air only – filtered with at least a G4 filter. Unless specifically stated in the manual or in a separate agreement with Cotes or a Cotes dealer, this dehumidifier must not be used for the following purposes:

- Conditioning of gases other than atmospheric air at ambient pressure
- Conditioning of air contaminated with any chemical or other aggressive/corrosive elements including salt (sodium chloride)
- Conditioning of explosive or flammable air – including using the dehumidifier in ATEX-classified zones.

The unit is intended to be installed in industrial environments and conforms with the EMC emission limits for environments of this kind. Please take appropriate remedial measures to ensure compliance with the requirements that apply in your specific residential, commercial or light industry environment.

Operating conditions – standard models (E and D)

For the process and regeneration air inlet, the following operating conditions must be respected:

Relative humidity	0–100%
Temperature	0–40°C
Pressure	Ambient \pm 100 Pa

It is only possible to deviate from these ranges if such deviations were specifically mentioned when the order was placed, and special considerations have been incorporated into the unit in order to deal with this.

Depending on configuration the actual sensor range may be limited to 5-100 %.



NOTE

Operating conditions for the air inlet flows must be respected.

Storage conditions

For storing the dehumidifier, the following conditions must be respected:

Relative humidity	0–90%
Temperature	-20°C to 50°C

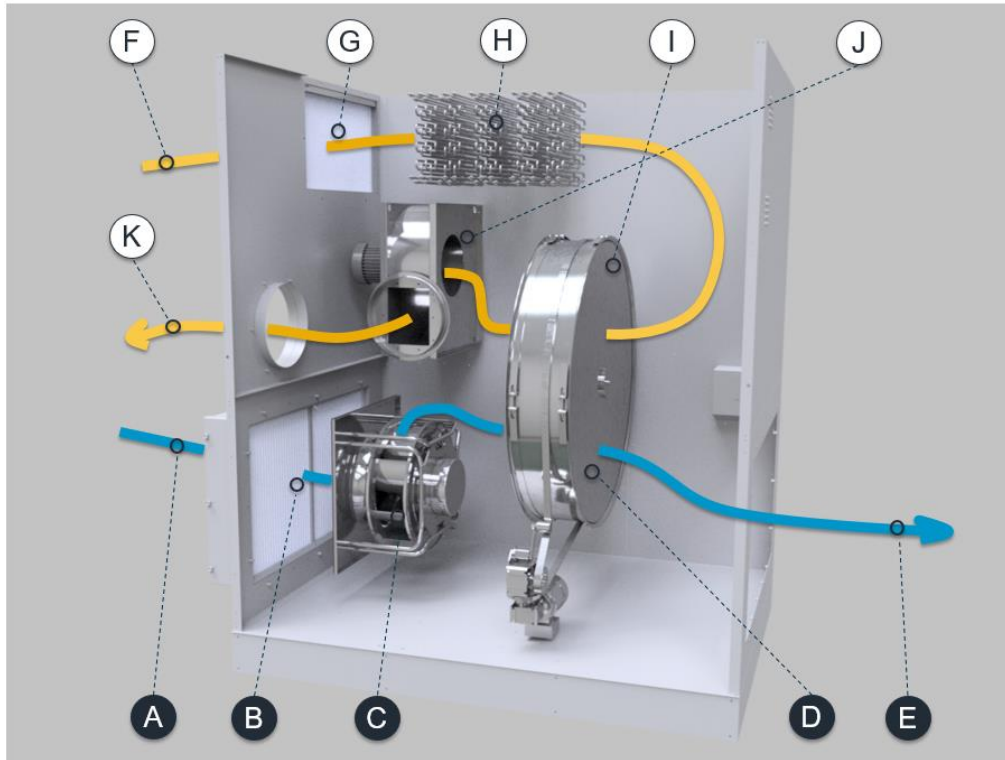
It is only possible to deviate from these ranges if such deviations were specifically mentioned when the order was placed, and special considerations have been incorporated into the unit in order to deal with this.



NOTE

Storage conditions for the dehumidifier must be respected.

HOW IT WORKS



Two flows of air

The effect of Cotes adsorption dehumidifiers basically stems from the action of two flows of air.

The drying process (A to E)

The incoming moisture-laden flow of air (process air) (A) enters one side of the cabinet and gets filtered by a process air filter (B). The process air is controlled by the process fan (C) which builds up a pressure difference and forces the air through the dehumidifier. The air passes through a slowly turning rotor (D) whose inner surfaces are coated with desiccant silica crystals that attract the water molecules passing through.

When the moist air passes through the rotor, water molecules are adsorbed and lodge in the pores on the surface of the silica gel. This means the air (E) leaves the rotor containing less moisture (humidity) than when it entered. And because the adsorption process releases energy to the air, the temperature increases during the process.

The regeneration process (F to K)

The second air flow (the regeneration air) (F) is filtered by a regeneration air filter (G), and heated by heating elements (H) to reduce its relative humidity. On its way through the rotor (I), the energy from the hot air evaporates the moisture previously adsorbed by the silica crystals in the rotor. The resulting water vapour now leaves the dehumidifier in the outgoing regeneration air (K). The regeneration air is controlled by a regeneration air fan (J).

Fans

All units in the C105 range of adsorption dehumidifiers are fitted with two fans as standard.

Configuration-B: With this configuration, the speed of the regeneration air fan can be controlled.

Configuration-C and Configuration-D: With these configurations, the flow of process air and regeneration air can be controlled manually or automatically (standard). See "Extended PLC manual" for details.

Cotes adsorption dehumidifiers are always configured with a certain amount of "external pressure" to make sure that ducting does not cause a reduction in the amount of air.

For details about the fans fitted to this dehumidifier, see page 24.

Filters

All models of Cotes adsorption dehumidifiers are fitted with filters to remove undesirable particles or other pollutants from the incoming process and regeneration air.

Filters of the G4 class are fitted to Cotes C105 units as standard in order to filter the incoming process air.

For details about the filters fitted to this dehumidifier, see page 24.

Heating units

Cotes C105 dehumidifiers are fitted with electrical heating units, as standard, to control the temperature of the regeneration air entering the unit.

Cotes C105 dehumidifiers can be fitted with steam heating units or hot water + electrical heating units, on request. In such cases, certain characteristics of the dehumidifier will change.

If your Cotes dehumidifier is fitted with these heating units, see "Appendix – Alternative heating sources" to find out which points differ from standard.

For details about Cotes dehumidifiers fitted with alternative heating units, please contact your Cotes dealer, or Cotes.

For details about heating units fitted to this dehumidifier, see page 24.

FEATURES AND BENEFITS

Highlighted features	How customers benefit
Appearance/cabinet	
Eye-catching industrial design appearance.	Visually attractive units that can be mounted in highly visible positions.
Robust structure.	Longer service life. Better return on investment.
Equipment configurations inside the cabinet	
All fans are mounted inside the cabinet.	Can be mounted in a wider range of positions and structures, even where there is public access, etc.
Key components are standardised units easily available throughout the world.	Less downtime. Savings on maintenance and service work.
Most effective rotor currently available anywhere in the world.	Most humidity removed from the flow of air at lowest cost.
Highly durable rotor bushings.	Savings on maintenance and service work. Greater operating efficiency.
Air flow	
Available with frequency-controlled ventilator.	Savings on energy costs. Less noise

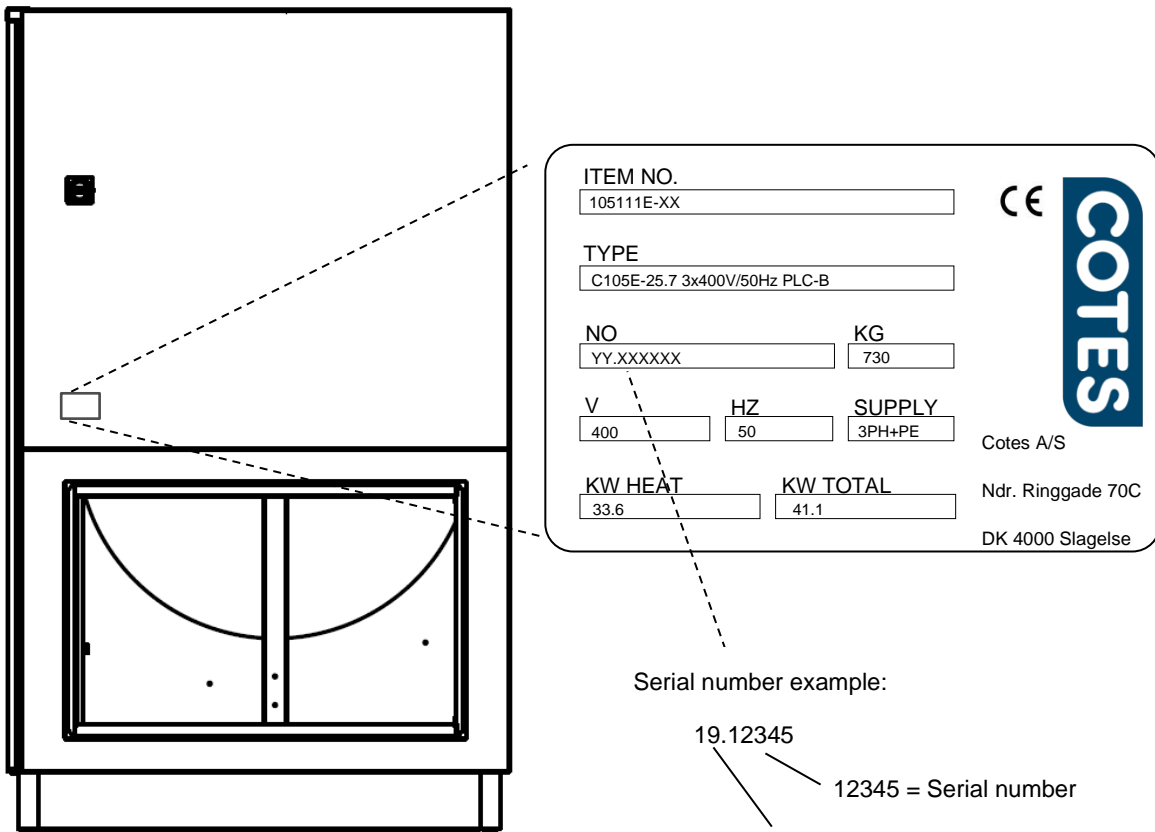
Access	
Large door that provide rapid, easy access.	Savings on maintenance and service work. Less downtime means greater operating efficiency.
Filters that are easy to get out, and quick to change.	Savings on maintenance and service work. Greater operating efficiency.
Connectivity	
Compatible with common electrical voltages and frequencies <ul style="list-style-type: none"> • 400V • 50Hz 	Savings on installation costs. More rapid commissioning.
Designed for compatibility with modern PLC and web-based control and warning systems.	Easy to control and monitor from virtually anywhere.
Modular design prepared for installation of control systems, heaters, cooling systems, hygrometers, sensors, etc.	Rational, cost-effective dehumidification installations. Maximum reliability.
Energy sources	
Thermal recovery installations can be fitted.	Savings on energy costs Improved environmental footprint.

SECTION 3 / TECHNICAL DETAILS

SERIAL NUMBER/IDENTIFICATION

This is the installation and service handbook for your Cotes dehumidifier.

The serial number/identification code for your specific model is located on the right side of the dehumidifier (see drawing below).



SPECIFICATIONS

Please note that specifications and controls given in this handbook are in some situations approximate.

Table 1 Technical data C105E/C105D

Type	C105E					C105D	
Model	25	31	39	46	51	32	44
Dry air, nominal** [m ³ /hour]	4100	6100	8800	8800	8800	4000	6000
Regen. air, nominal* [m ³ /hour]	1100	1350	1650	1900	1900	1350	1900
External pressure, dry air [Pa] (at nominal air flow)	400	400	400	400	400	400	400
External pressure, regen. air [Pa] (at nominal air flow)	400	400	400	400	400	400	400
Capacity at 20°C, 60% relative humidity [kg/hour]	25.1	31	39.1	45.8	50.5	31.7	43.5
Electric heater, max. [kW]	33.6	42	50.4	58.8	67.2	42	58.8
Maximum Fuse [A] (3x400V)	125	125	125	125	125	125	125
Minimum Fuse [A]	60	75	90	100	110	70	95
Max nominal power consumption [kW]	38	49	59	67	75	47	66
Voltage [V]	400						
Frequency[Hz]	50 / 60						
Ground	3PH+PE						
Preliminary Sound level with ducts [dB(A)] ***	<60	<66	<75	<75	<75	<60	<66

* Adjustable in Configuration-B and fully controlled in Configuration-C and Configuration-D.

Also adjustable in Configuration-A with Reg. Air Fan Kit installed.

** Fully controlled in Configuration-C and Configuration-D.

*** The dB values for noise levels are guidelines only and not exact values, because these depend on the specifics of each installation. If exact values are needed, professional noise measurements must be carried out at the actual site and installation.

NOTE

Due to the noise levels during normal operation, any personnel continuously exposed to this noise must wear hearing protection.



Table 2 Measurements

Type		C105E					C105D	
	Model	25	31	39	46	51	32	44
L x W x H cabinet	mm	1985 x 1320 x 2152						
L x W x H total	mm	2090 x 1320 x 2152						
Weight	kg	710	710	745	745	745	710	745
Regeneration air outlet	mm	Ø315						
Regeneration air inlet	mm	647x420 (Ø315)						
Process air inlet	mm	998x695						
Process air outlet	mm	998x695 (Ø630)						
Power cable size *	mm	Cable glands: 2xM63 – Cable size / sealing range: 36-48						

* Power cables are not part of the Cotes delivery.

If the selected cable is smaller than sealing range, install a suitable cable gland.

ASSEMBLIES AND COMPONENTS

Customised to meet your needs

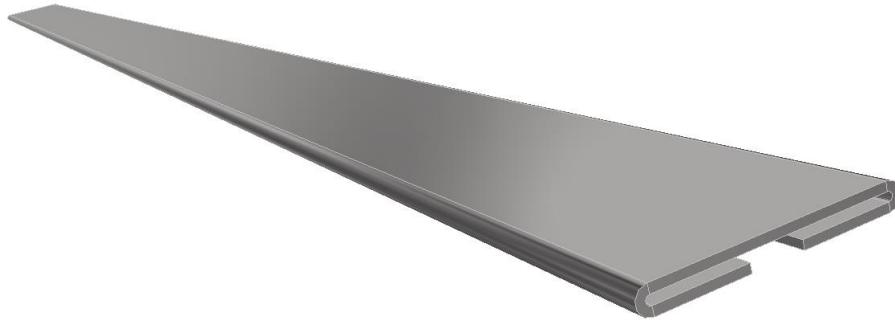
Cotes dehumidifier units are based on a modular design that enables our customers to select from a broad range of carefully selected components and assemblies, to meet specific installation and operating requirements.

If purchased through Cotes or an official Cotes dealer, the Cotes C105 dehumidifier can be configured to meet the specific requirements of your installation.

Dimensions and duct connections

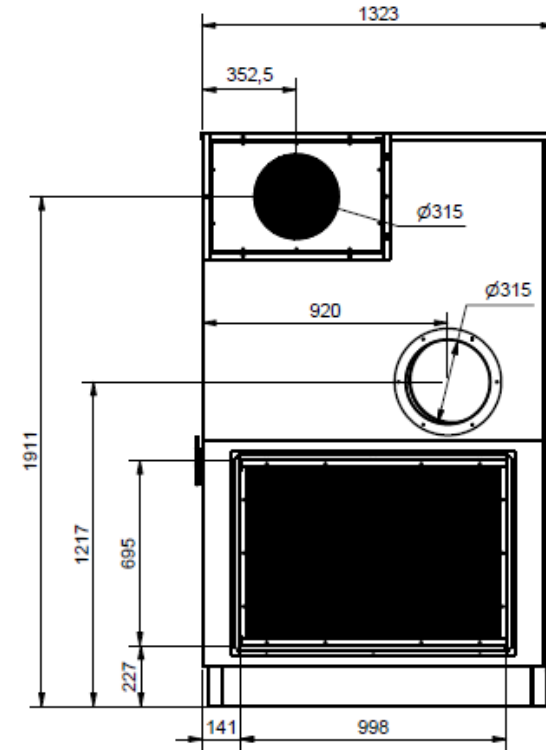
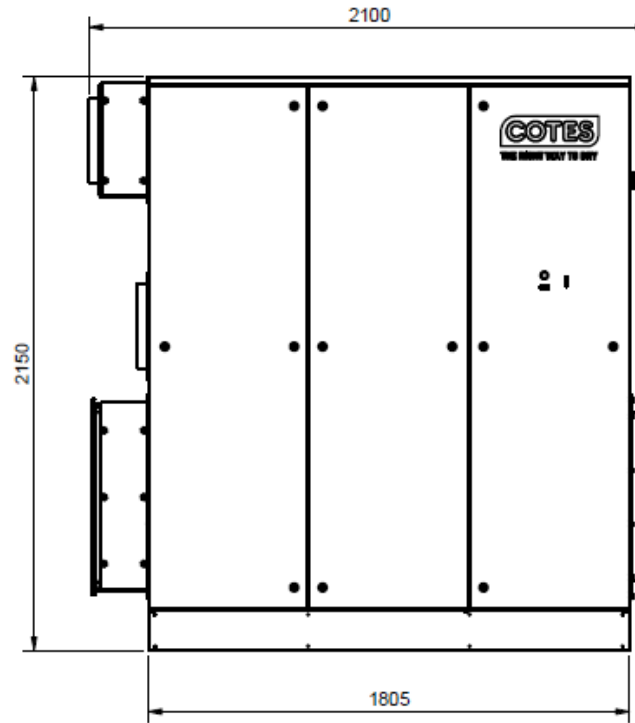
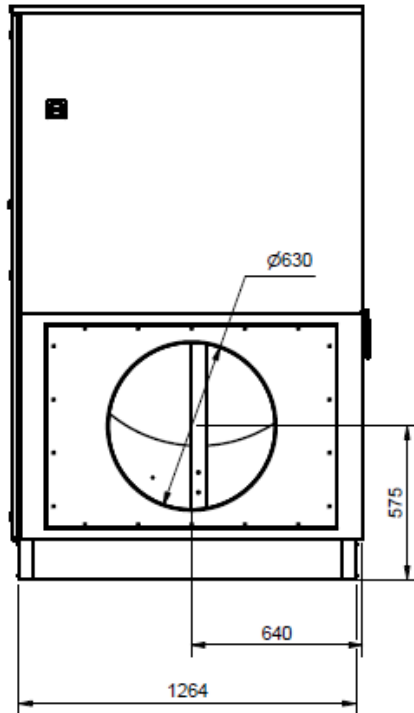
The C105 dehumidifier can be purchased with a connection kit for either rectangular or round ducts.

The rectangular duct connection kit has been designed to fit with standard rectangular air ducts and connected using standard 20 mm “C”-shaped drive cleats. (Note: the 20 mm is measured over the back of the drive cleat, so that the width of the drive cleat is 20 mm). The length of the “C”-shaped drive cleat should be matched to the full length of the connected section on the air ducts. For details about the rectangular duct connection kit, see detail “AB” in the lower left corner of the illustration below.



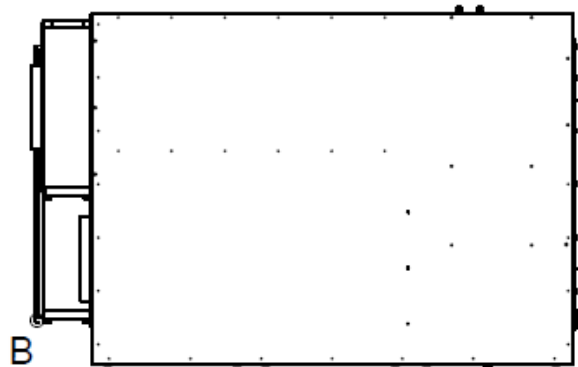
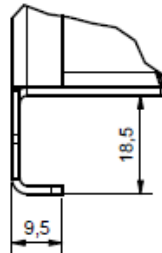
Please see the following illustrations with the dimensions of the dehumidifier and the duct connections:

C105 - BASIC
w. Circular Duct Kit.

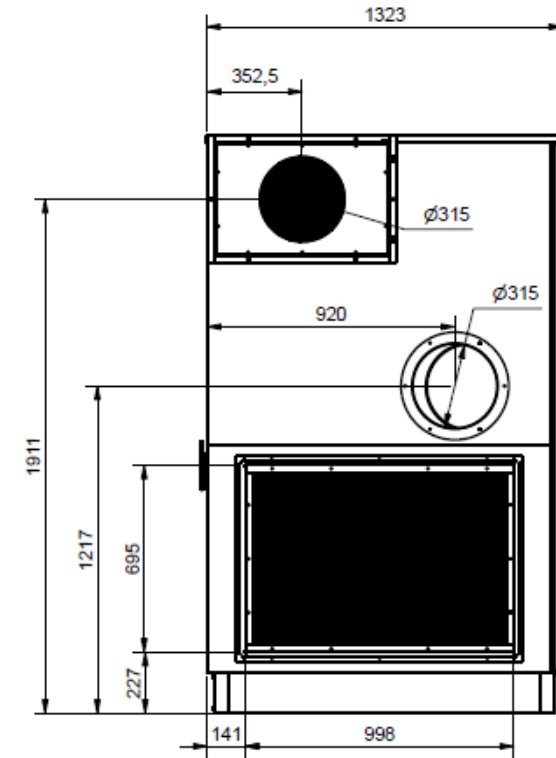
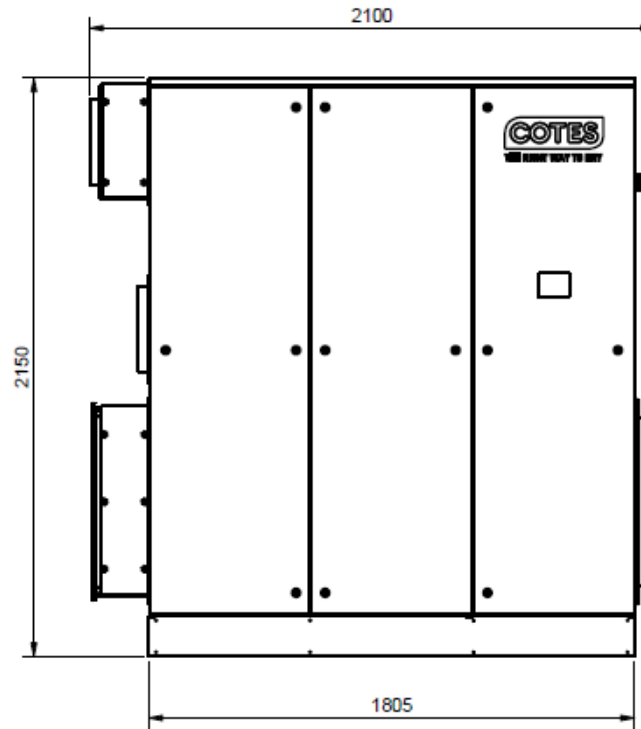
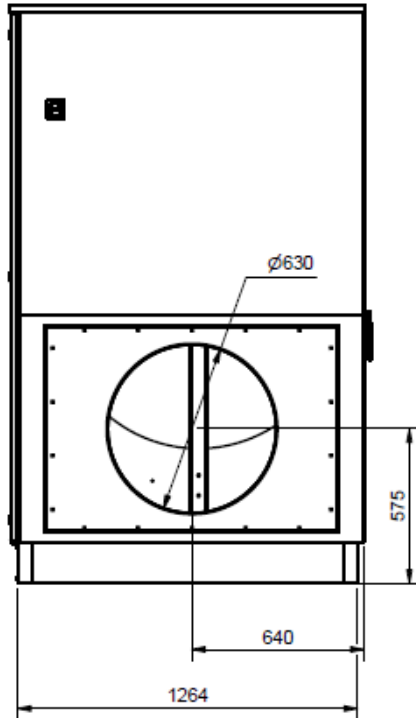


B (1:1)

Use a 20mm "C"-shaped drive cleat, to connect the Rectangular ducts.

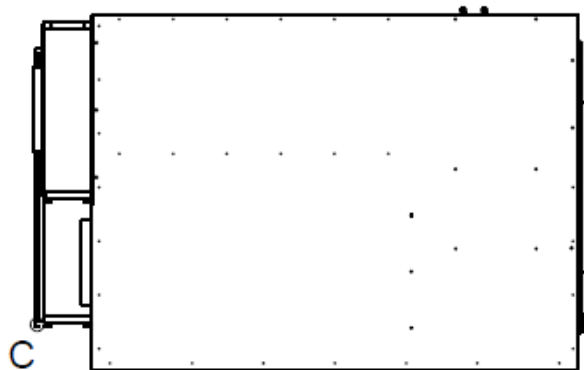
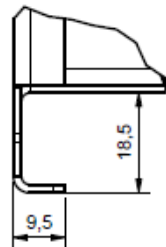


C105 - PLC
w. Circular Duct Kit.

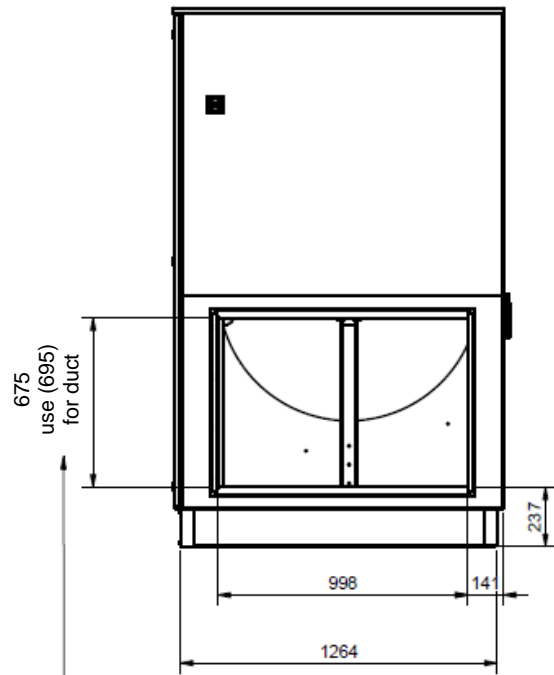


C (1:1)

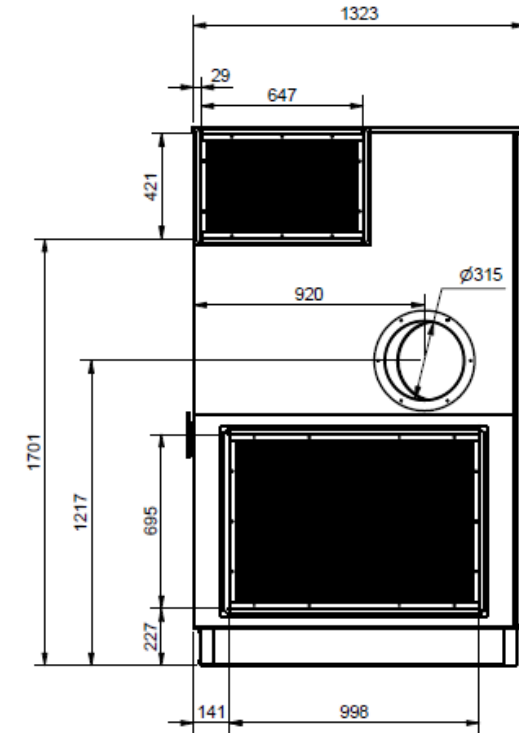
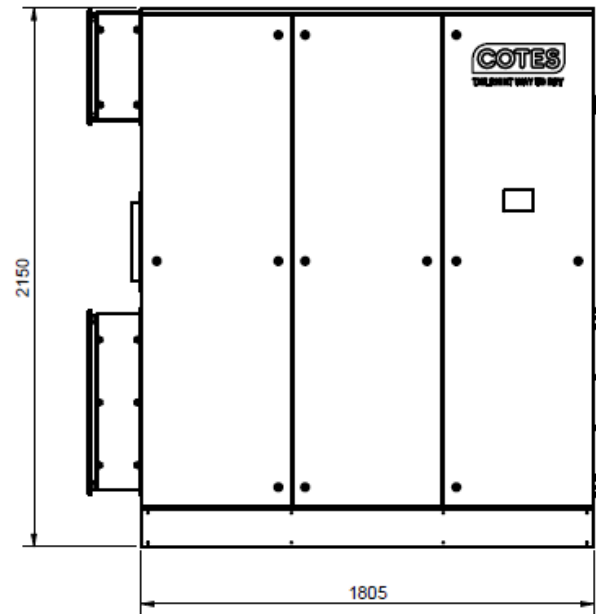
Use a 20mm
"C"-shaped drive
cleat, to connect the
Rectangular ducts.



C105 w. Optional Rectangular Duct Kit.

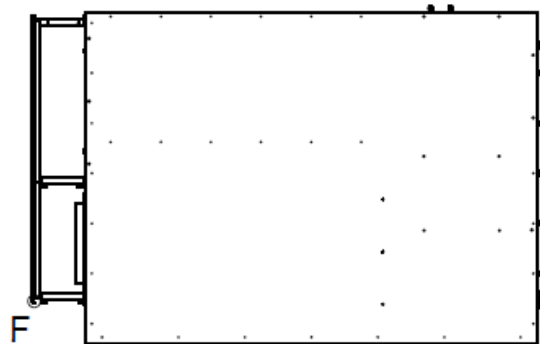
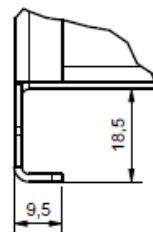


Use the same duct dimensions as for Process air inlet (998x695). The connection has been made to fit this dimension (998x695).



F (1:1)

Use a 20mm "C"-shaped drive cleat, to connect the Rectangular ducts.



SPARE PARTS

C105E/C105D dehumidifier

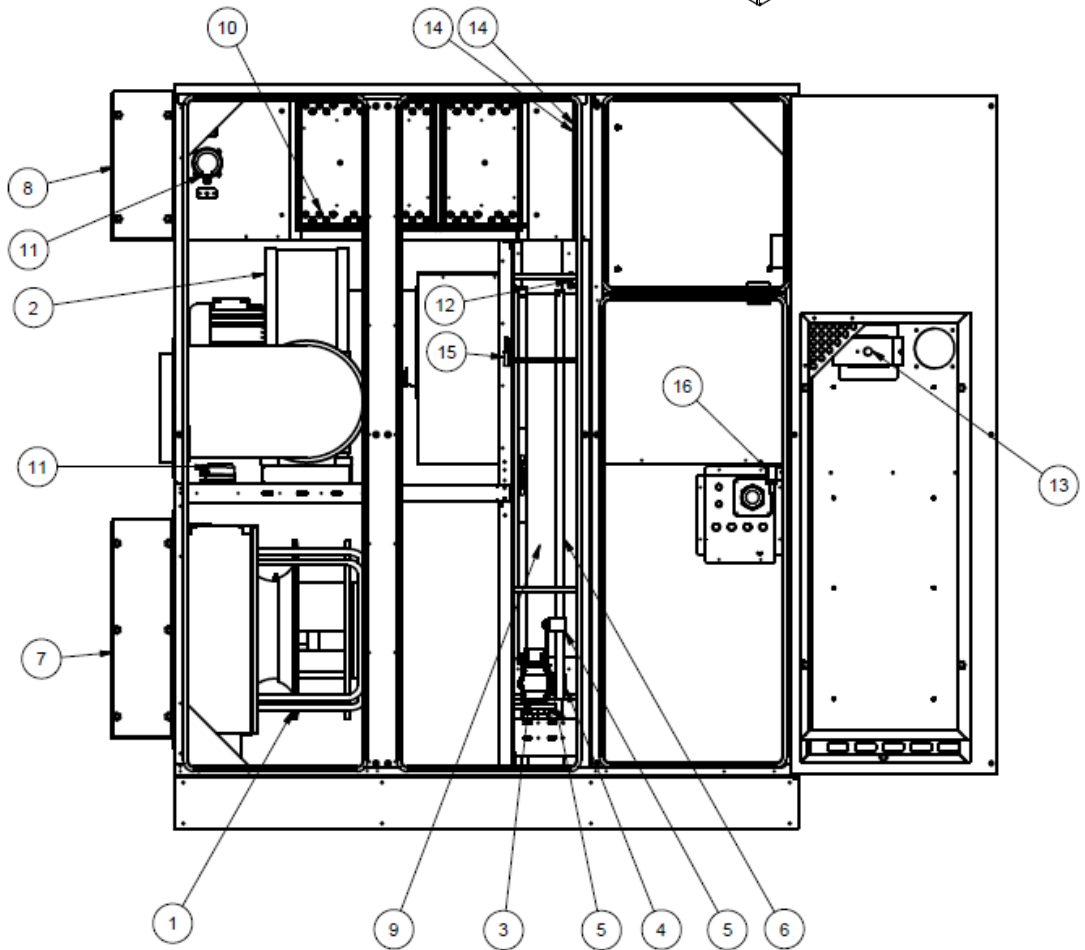
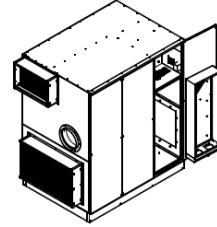


Table 3: Spare parts list C105E/C105D

Type		C105E					C105D		
Pos	Part	25	31	39	46	51	32	44	
1	Process air fan	777331	777332	777333			777331	777332	
2	Regeneration air fan	777341		777342			777341	777342	
3	Gear motor	777271							
4a	Pulley	120405							
4b	Taper Bush	127010							
5	Belt tensioner	127102/127103							
6	Drive belt	645428							
7	Process filter	G4 class: 131113 / F7 class: 131114							
8	Regeneration air filter	G4: 645825							
9	Rotor	777351			777352				
10	Heating group 1 (left)	777361	777361	777361	777361	777361	777361	777361	
	Heating group 2 (centre)	777363	777362	-	777362	777362	777362	-	
	Heating group 3 (right)	-	-	77361	777364	777361	-	777361	

Configuration B		
	Humidity sensor (not shown)	140655
11	Pressure switch for filters	126844
12	Rotor guard	Sensor: 823182, Cable: 823183
13	PLC	140621
Configuration C + Configuration D		
	I/O board (not shown, placed on the electrical board)	112086
14	Pressure transmitter (pressure drop, rotor)	140624
Configuration D		
15	Process air in sensor	140625
16	Process air out sensor	140651

SOUND LEVELS

Sound dampening and silencers

Please check the maximum sound level permitted for the installation you are working with and select the sound dampening and silencers needed for the dry air outlet duct and the regeneration air outlet duct accordingly. These are not included with the C105 dehumidifier.

Measuring sound levels

The sound/noise levels for the dehumidifier are shown on page 17.

The dB values for noise levels are guidelines only and not exact values, because these depend on the specifics of each installation. If exact values are needed, professional noise measurements must be carried out at the actual site and installation.

The sound level in the specifications was measured 1 metre outside the front of the cabinet (outside the large cabinet cover), and 1.6 metres above the floor.

The dehumidifier was placed on the floor inside a large room with the air ducts for the incoming/outgoing air led out of the room/away from the sound measuring point.

SECTION 4 / INSTALLATION

HOW TO INSTALL A C105 DEHUMIDIFIER

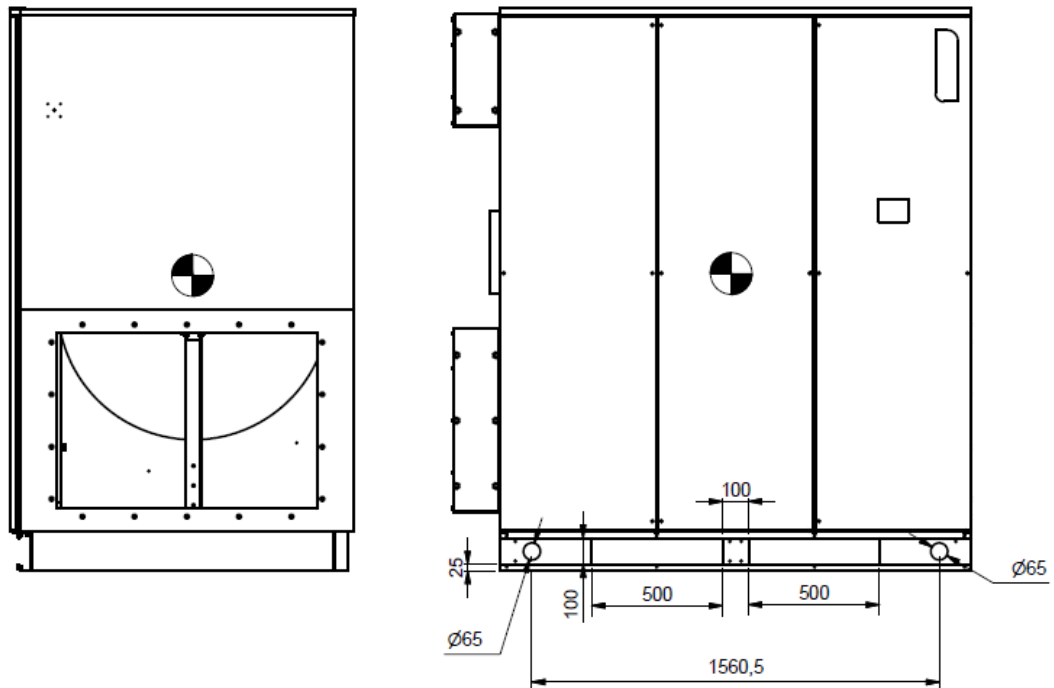
Removing the packaging

Cotes C105 dehumidifier units are delivered in a wooden box. Please dispose of this packaging responsibly and recycle it if possible.

Handling

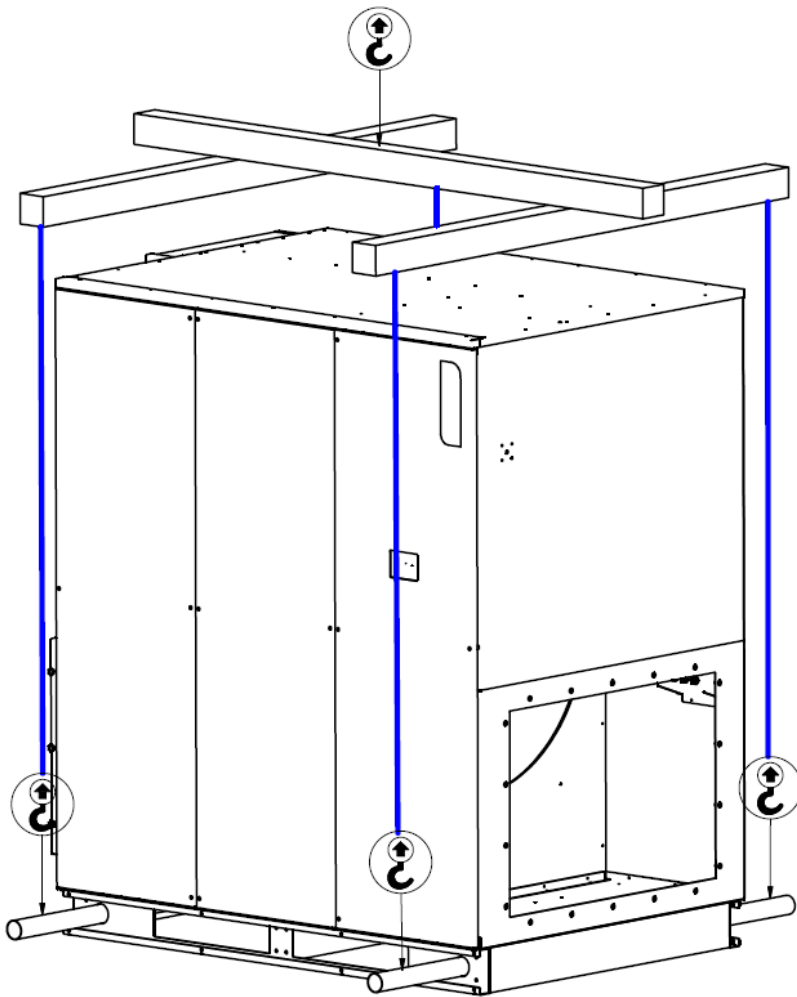
Cotes dehumidifiers are built to be very robust, so there is no need for special handling, apart from normal sensible care and attention. See the next two pages for lifting and handling instructions, and note the measurements on the drawing below.

Note the weight of the dehumidifier as specified on page 18.



Lifting by H-beam:

The dehumidifier is designed to be lifted with lifting pipes with straps and chains, using an H-beam lifting frame. The lifting pipes that go through the floor frame of the unit, or the H-beam lifting frame, are not part of the dehumidifier unit and are not delivered by Cotes. The unit must be lifted evenly at all four corners to prevent the unit from toppling over. Lifting the unit must be done by a professional.



NOTE

The unit must be lifted evenly at all four corners, to avoid any dangerous situations. Lifting must be done by a professional.

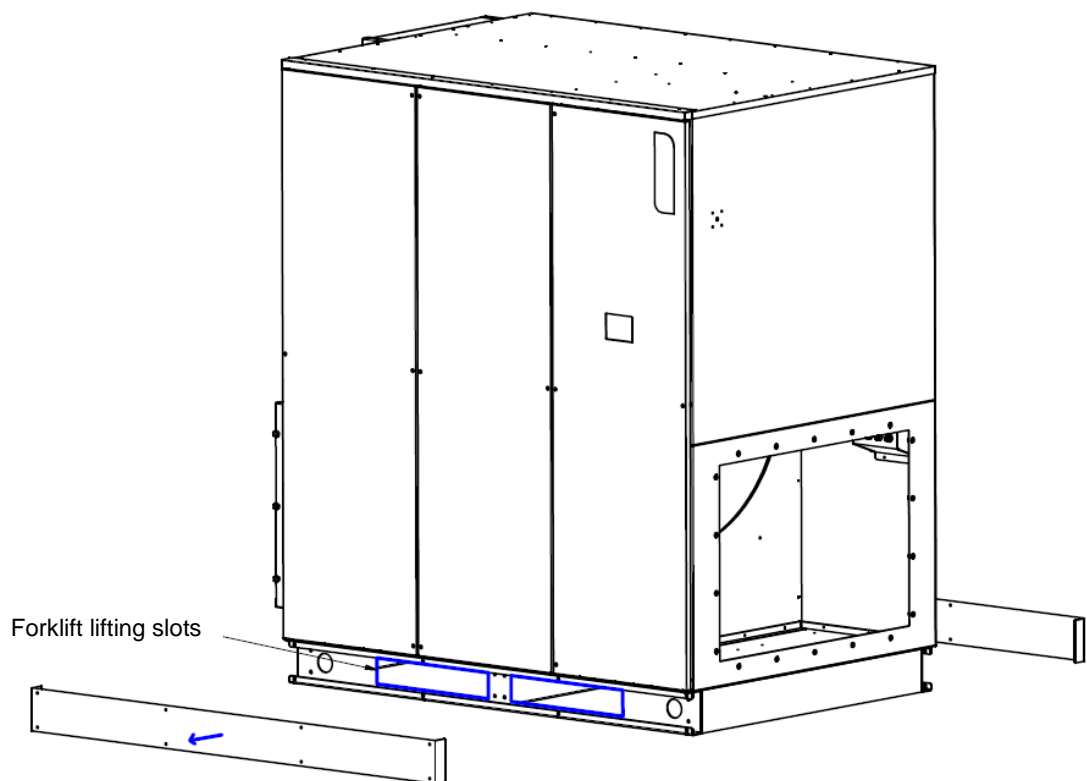


Lifting by forklift:

The unit can also be moved by a forklift using the specified lifting slots. Remove both the front and back cover plates on the floor frame to provide access to the forklift lifting slots.

When lifting the unit with a forklift, make sure the forklift blades go all the way through the unit, so it is being lifted at the front AND at the back at the same time.

Lifting must be done by a professional.

**NOTE**

The forklift blades must go all the way through the slots and through the other side of the floor frame. Lifting must be done by a professional.

Where to mount this dehumidifier

Cotes adsorption dehumidifiers are designed for indoor installation.

The back of the dehumidifier can be placed against an outer wall to make it easier to install the regeneration air ducts. However, you should leave a gap of at least 100 mm to the wall to provide enough space for wires and the main power cable.

The three other sides of the unit should have at least 1 metre of unobstructed access, for easy service and maintenance.

Where not to mount it

Unless it has been arranged with Cotes and special considerations have been made, the unit should not be placed outdoors.

The unit should not be placed inside an office or in other locations where the sound pressure level must be kept to a minimum.

NOTE

The Dehumidifier must be placed indoors and protected from rain and water.

**Things to be careful about**

Electrical work should only be carried out by an authorised electrician.

NOTE

Electrical work should only be carried out by an authorised electrician.



Connections needed – electrical

First, make sure that the main switch is OFF.

**NOTE**

Make sure power is switched off before installing and servicing.

Now the power circuit cable can be connected to the main switch of the dehumidifier.

**NOTE**

The electrical board may include circuits that can retain a charge even if the mains power is disconnected. Detailed information about these electrical circuits is provided in the electrical diagram on drawing no. 270

Connections needed – ductwork**NOTE**

To ensure low pressure drop and low sound pressure levels, please request assistance from a company that specialises in ductwork.

The C105 dehumidifier is available with either a rectangular duct connection kit, or a circular duct connection kit. Please see the illustrations on page 20-21 for the measurements of duct connections.

Process air:

The ductwork for the process air should be selected with regard to the external pressure available, supplied by the process air fan, and the space available for ducting.

If the C105 dehumidifier is selected/purchased with the BASIC configuration, or Configuration-B, the process fan can be adjusted manually (see the "Commissioning" section of this manual), so that the process air flow can be adjusted to specifications.

In Configuration-C and -D, the process air fan will be adjusted automatically by the PLC.

Regeneration air:

The ducts connected to the regeneration air intake should suck in air from the outdoors. The ducting for the outgoing humid regeneration air should lead the air back outside the building.

NOTE

It is important that the ducting for the outgoing used regeneration air is positioned so that the air is not sucked back into the regeneration air inlet.
Keep a minimum distance of 2 metres between the regeneration air outlet and the inlet for both regeneration and process air.



The ductwork for the regeneration air should be selected with regard to the external pressure, supplied by the regeneration air fan, and the space available for ducting.

It is important that the ducting for the regeneration air outlet slopes downwards slightly in order to drain any water away from the dehumidifier, so that any condensate runs out. If a reduction is needed at the regeneration air outlet, the reducer must be eccentric, so that any condensation is led out throughout the ductwork.

If it is not possible to get the ducting to slope slightly downwards away from the dehumidifier, drill a $\varnothing 6$ mm hole in the lowest part of the duct, so that any accumulated water can drain away.

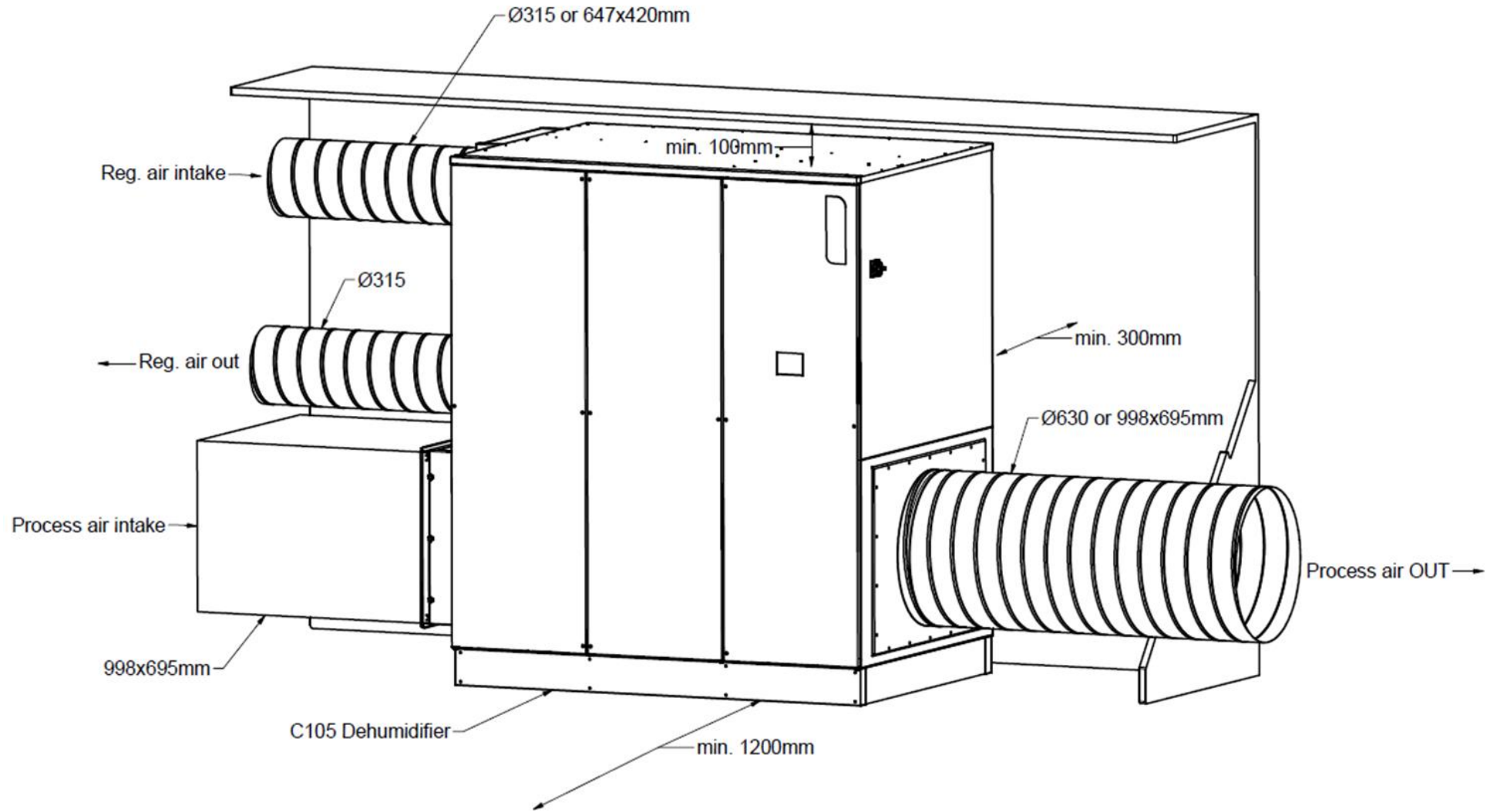
NOTE

It is important that the ducting for the regeneration air outlet slopes downwards slightly in order to drain any water away from the dehumidifier.

If this is not possible, drill a $\varnothing 6$ mm hole in the lowest part of the duct, so that any accumulated water can drain away.



There must be at least 1200mm unrestricted access in front of the dehumidifier for easy access.



Note that dimensions for the rectangular ducts are *internal* measurements.

If the C105 dehumidifier is selected/purchased with the BASIC-configuration, the speed of regeneration air fan must be manually adjusted on the Variable Speed Drive, so that the regeneration air flow has nominal value. See section "HOW TO COMMISSION THIS DEHUMIDIFIER" for further instructions.

If the regeneration air fan speed is not adjusted, the regeneration air flow will – in most cases – be too high, making it impossible to reach the desired temperature for the regeneration air and thus making the unit less efficient. Use a standardised tool for measuring the velocity according to specifications.

In Configuration-B, the speed of regeneration air fan can be adjusted via the touch-screen interface, making the installation easier.

In Configuration-C and Configuration-D, the flow of process and regeneration air will adjust automatically.

The regeneration air inlet and outlet must be placed with sufficient distance to each other to avoid rebreathing. If possible, Cotes recommends placing the regeneration inlet and outlet on each side of a corner – or some similar location – to reduce the risk further. If nothing is done to prevent the regeneration air from "short-circuiting", a capacity loss is possible and the risk of condensation inside the regeneration circuit will increase dramatically. Cotes recommends extending the inlet ductwork (rather than the outlet) to keep the risk of condensation in the outlet to a minimum.

NOTE

To avoid capacity losses and condensation issues, the regeneration air inlet and outlet must be placed with sufficient distance to each other.

**Safety precautions**

Dehumidifiers in the C105 range weigh approximately 690–730 kg and should therefore only be moved using a forklift or similar equipment. See the illustration at the start of this section, for lifting and handling instructions.

Any work in the electrical box should only be carried out by authorised electricians.

Any duct connections to and from the dehumidifier should only be carried out by authorised plumbers.

HOW TO COMMISSION THIS DEHUMIDIFIER



NOTE

Only trained/authorised electricians are allowed to carry out any work required in the electrical box of this Cotes dehumidifier.

When the cover of the electrical box is open, the power supply must be switched off at the main switch (load switch).

Procedure

a) Check the electrical installation before starting the dehumidifier, switch on the load switch.

- Check the voltage between the terminals L1, L2, L3 (= 400V)
- Check one of the phases and Neutral (= 230V)
- Is the ground cable connected, and of the correct specifications?
- Is any hygrometer (if fitted) correctly connected?

b) To check the connected ducting system

- Do the air ducts connected to the regeneration air outlet, slope downwards away from the dehumidifier, to drain any accumulated water away?
- If the air ducts, connected to the regeneration air outlet, are not sloping downwards as to drain water away from the dehumidifier, check whether there is a 6mm-diameter hole drilled in the lowest part of the duct, so that any accumulated water can drain away.

c) Suggested fan speed / air flow settings at commissioning

Note: The following settings should only be considered as a starting point for the commissioning of this dehumidifier.

The speed of process and regeneration air fans must be adjusted based on the actual measured air flows. If the air flows are not adjusted to nominal values, the dehumidifying capacity may be reduced or can cause damage to the dehumidifier (i.e. if the regeneration air flow is much lower than nominal).

Before starting the commissioning, the fan speed settings must be set to the following:

- Configuration-A:
 - Regeneration air fan speed: 100% - See section f)
 - Process air fan speed: 100% - See section g)
- Configuration-B:
 - Regeneration air fan speed 100% - See section f)
 - Process air fan speed: 100% - See section g)
- Configuration-C and Configuration-D:
 - Process air fan automatically adjusts to pre-set air flow (no damper needed)
 - Regeneration air fan automatically adjusts to pre-set air flow (no damper needed)

d) If the dehumidifier starts up as described above, then go to e)

If the dehumidifier does not start, you should check the humidity set point (Configuration-B, Configuration-C and Configuration-D only). If set point is higher than measured by the humidity sensor, the dehumidifier will not start (unless the “Always On” program has been chosen – see section “HOW TO OPERATE WITH PLC BASED DEHUMIDIFIER” on page 44).

e) Once the dehumidifier is operating, you must adjust the air flows

Configuration-A:

- Check the air flows using a suitable instrument (pitot pipe/thermo-anemometer or similar) in the duct. Measure at several points over the cross-section of the ducts and use the average.
- Adjust the incoming regeneration air flow to the nominal values given on page 17.
 - Follow the instructions in section f) on page 37, to adjust the Regeneration Fan speed on the Variable Speed Drive.
- Adjust the Process fan speed, until the Process air flow matches the nominal values given on Page 17.
 - Follow the instructions in section g) on page 39, to adjust the process fan speed by adjusting the potentiometer.
 - Note: The door must be closed when measuring the process air flow.

Configuration-B:

- Check the air flow using a suitable instrument (pitot pipe/thermo-anemometer or similar) in the duct. Take measurements at several points over the cross-section of the ducts and use the average.
- Adjust the incoming regeneration air flow to the nominal values given on page 17.
 - Follow the instructions in section f) on page 37, to adjust the Regeneration Fan speed on the Variable Speed Drive.
- Adjust the Process fan speed, until the Process air flow matches the nominal values given on Page 17.
 - Follow the instructions in section g) on page 39, to adjust the process fan speed by adjusting the potentiometer.
 - Note: The door must be closed when measuring the process air flow.

Configuration-C and Configuration-D:

- In the Configuration-C and Configuration-D, the dehumidifier is self-adjusting, and adjusts according to default air flows and sensor measured conditions.

f) How to adjust the Regeneration air fan using the Variable Speed Drive:

Note that the regeneration fan speed must be adjusted based on the actual measured air flow. If the regeneration air flow is not adjusted to nominal values, the dehumidifying capacity may be reduced or cause damage to the dehumidifier (if the air flow is much lower than nominal).



NOTE

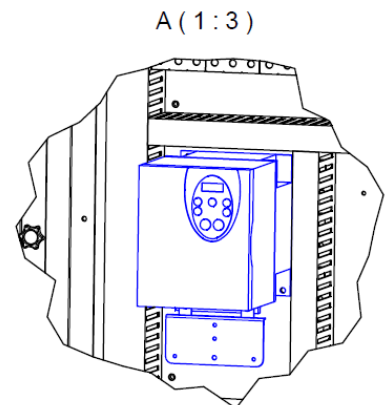
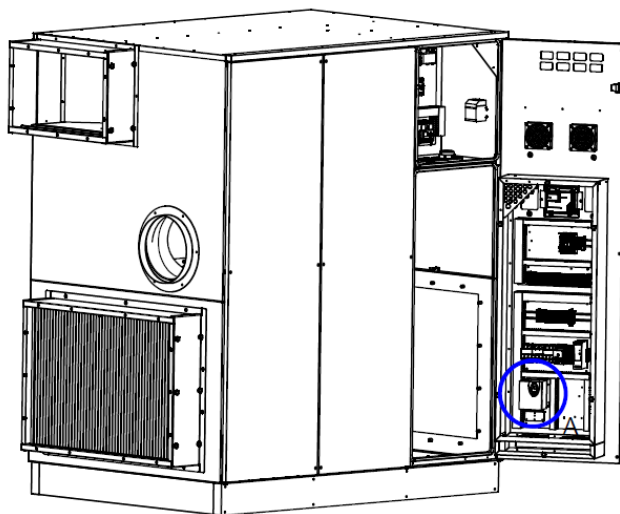
To adjust the Variable Speed Drive setting, the power must be ON!

Only trained/authorised electricians with the proper safety equipment are allowed to carry out any work required in the electrical box of this Cotes dehumidifier.

Power supply:	Regeneration fan setting:	40%	50%	60%	70%	80%	90%	100%
50Hz	Variable Speed Drive setting:	20Hz	25Hz	30Hz	35Hz	40Hz	45Hz	50Hz
60Hz	Variable Speed Drive setting:	24Hz	30Hz	36Hz	42Hz	48Hz	54Hz	60Hz

Follow the steps below to adjust the Variable Speed Drive:

- Open the Electrical door
- Remove the cover to electrical boards on the door.
- Adjust the Variable Speed Drive:
 - Follow the instructions below.
 - Use the table above to help select the Variable Speed Drive setting.
 - If the measured regeneration air flow is too high, lower the Hz setting on the variable speed drive to slow down the regeneration fan, and vice versa.



NOTE
 Change only parameters given in this instruction, any other changes can damage the machine.



To setup everything,
 use the buttons shown on the picture
 (**up** and **down arrow**, **MODE** and **ENT**).



		HOW TO ADJUST FAN SPEED:
Steps:	What you see on the screen:	What to do:
1		Press MODE to go to "Programming mode"
2		Press ENT to go to "Quick menu"
3		Now using the up and down arrows select the parameter "UL".
4		To change the parameter press ENT .
5		Using the up and down arrows to enter the new fan speed in [Hz]. Press ENT to save the new fan speed.
6		Press MODE to go back to main menu.
7		Press MODE again two times to go to "Monitor mode" and then back to "Run mode"
8		Congratulations you finished setting your frequency inverter for the Cotes Dehumidifier.

g) How to adjust the Process air fan using the Potentiometer:

Note that the process fan speed must be adjusted based on the actual measured air flow. If the process air flow is not adjusted to nominal values, the dehumidifying capacity may be reduced.

The doors must be closed when measuring the process air flow.



NOTE

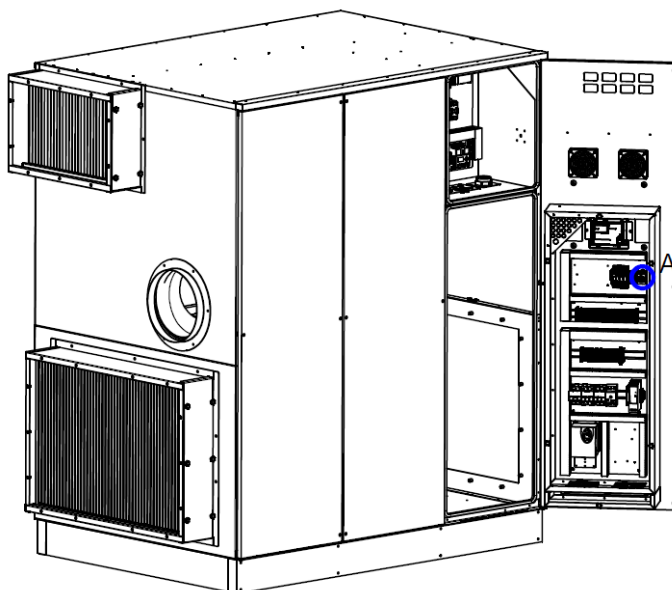
Only trained/authorised electricians are allowed to carry out any work required in the electrical box of this Cotes dehumidifier.

When the cover of the electrical box is open, the power supply must be switched OFF at the main switch (load switch).

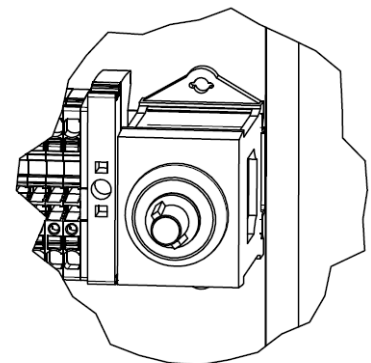
Power supply:	Process fan setting:	40%	50%	60%	70%	80%	90%	100%
50Hz	Potentiometer setting:	4	5	6	7	8	9	10
60Hz	Potentiometer setting:	4	5	6	7	8	9	10

Follow the steps below to adjust the Process Fan:

- Open the Electrical door.
- Remove the cover to electrical boards on the door.
- Adjust the process fan by adjusting the potentiometer.
 - Use the table above to help select the potentiometer setting.
 - If the measured process air flow is too high, lower the setting on the potentiometer to slow down the process fan, and vice versa.



A (1:1)



SECTION 5 / OPERATION

HOW TO OPERATE WITH BASIC-PLR BASED DEHUMIDIFIER

Configuration-Basic PLR is designed for maximum dehumidification, and the standard setting is that it is kept running at all times. This configuration is kept as simple as possible, which is why there is no dehumidification management installed.

STARTING THE DEHUMIDIFIER

Rotate main switch to power on dehumidifier. After a short period, the dehumidifier is ready to operate. When the main switch is on, the integrated LED strip displays a single green diode at the lower end of the strip.



To turn the dehumidifier on, press the button on the left of the main switch. Press the button again to turn the dehumidifier off.

When the dehumidifier is operating, the entire LED strip is green.



HOUR COUNTER

Mechanical hour counter located on the front of the machine counts time, which machine is dehumidifying.



ALARM

The LED strip in the front of the panel turns red if an alarm occurs.



Detailed information about what caused the alarms is displayed on the HMI display. All possible alarms are listed in Troubleshooting table on page 61.

EXTERNAL HUMIDITY MANAGEMENT

You can purchase an external humidity hygostat to manage when the dehumidifier is operating or not. Contact Cotes or your Cotes dealer for more information.

HMI PANEL

The HMI panel is mounted into main PLR module inside the electrical cabinet.

During normal operation, the main screen will be on. The name of the machine family is showed in the first row. The second row shows current temperature in the regeneration air channel. If 'constant process flow' is active, this information will show in the third row. Machines designed to work in cold environments will have additional information shown in the fourth row.

Other information can be accessed from the main menu. Basic PLR versions register the hours that the regeneration air fan, process air fan and rotor have been in operation. These times are shown while pressing the "OK" button. To access information about software revisions, press the left and right arrows at the same time, when the dehumidifier unit is not running.



Main screen



Service time screen



Software version screen





CONSTANT PROCESS FLOW FEATURE

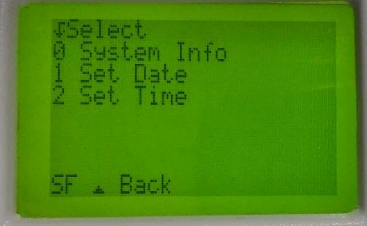



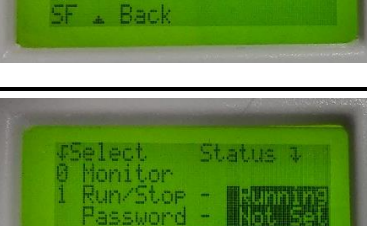
Cotes dehumidifiers provide a constant process air flow (CPF) mode. This means the process fan is always on, regardless of humidity levels.

To activate this constant process air flow mode, you stop the dehumidifier with the start/stop button on the front panel, then press the “0” and “3” buttons at the same time. To turn off this constant process air flow mode, press the “0” and “4” buttons at the same time.

DATE/TIME SETTINGS

To change current date or time follow the steps below.

Screen	Action
	<p>To access the setup menu, press “shift” and “OK” simultaneously</p>
	<p>Next step is to switch the controller to stop mode. To do this, press button “1” on the number keyboard.</p>
	<p>After this you will be asked for confirmation. Press “0” to confirm.</p>
	<p>The controller should display status as “Stopped”. Now you can adjust the time/date settings. <u>If you skip the previous steps, the controller will refuse the new values in the control menu!</u> Next press “4” to go to setup menu.</p>

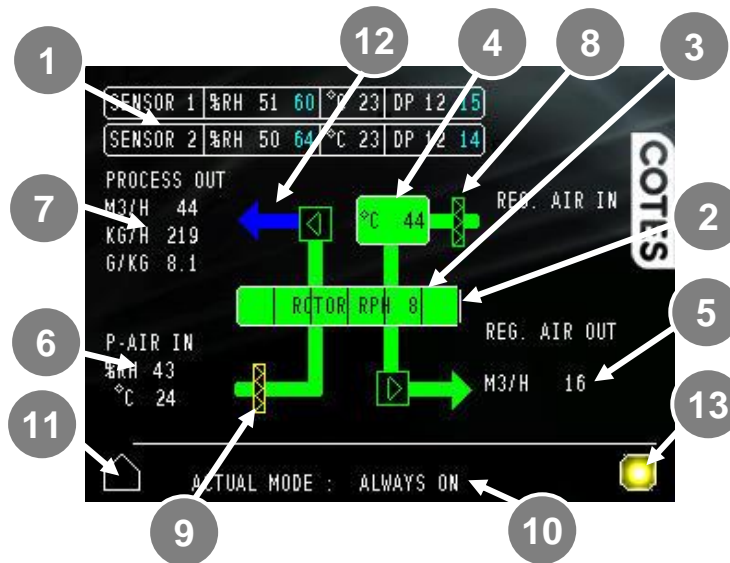
	<p>To change current date press “1” and to change current time press “2”.</p>
	<p>Enter the correct date values in the order: day/month/year. To “jump” from dd to mm to yy, press the “right arrow” next to the “OK” button. To leave the menu without saving press simultaneously “SHIFT” and “UP arrow”.</p> <p>Confirm correct values by pressing “OK”. If everything is done correctly, the controller will go back to setup screen, otherwise CPU will not react to pressing “OK” (i.e. if controller is still in run mode, or bad values)</p>
	<p>Fill in the correct values in the order: hours/minutes/seconds. To “jump” from hh to mm to ss, press the “arrow RIGHT” next to the “OK” button. To leave the menu, press simultaneously “SHIFT” and “UP arrow”.</p> <p>Confirm correct values by pressing “OK”. If everything is done correctly, the controller will go back to setup screen, otherwise CPU will not react to pressing “OK” (i.e. if controller is still in run mode, or bad values)</p>
	<p>After adjustments, you must switch the controller to “Run” mode.</p> <p>Press simultaneously “SHIFT” and “UP arrow” to go back.</p>
	<p>Press button “1” to return the controller to run mode.</p> <p>Before You choose Run mode please be sure that the On/Off button on front panel of the machine is OFF! Otherwise the machine will start operating immediately after you select Run mode!</p> <p>If the entered adjustments were correct, and the controller is in Run mode. you should see main menu.</p>

HOW TO OPERATE WITH PLC BASED DEHUMIDIFIER

The dehumidifier needs to be turned on at the main switch.

After a while the PLC overview screen will appear.

Overview menu



- Actual measurement and target value for % relative humidity and temperature** – within the space concerned (as registered by external sensors that are not part of the dehumidifier). The blue number is the **target value**. Pressing this will send you to the humidity menu.

In Configuration-B, only one sensor is available. Configuration-C and Configuration-D can be equipped with a second room sensor. Both sensors can calculate the dew point required in the humidity adjustment process.
- Rotor** – If the rotor is turning, this moves.
- Rotor speed** – in revolutions per hour (RPH).
- Regeneration air temperature** – Shows the temperature of the heated regeneration air. If the temperature is shown in red, an overheating alarm was triggered.
- Regeneration air flow** (Configuration-C and Configuration-D) – Shows the current air flow based on internal measurements. In Configuration-B, the percentage of the maximum speed of the fan is shown.
- Inflow process air conditions** (Configuration-D) – Actual process air inlet conditions measured in % relative humidity and temperature. This measurement is taken directly after the process air has passed through the process filter.
- Process air flow** (Configuration-C and Configuration-D) – Shows the current process air flow, based on internal measurements. These are in different units, depending on configuration values.

8. **State of the regeneration air filter** – If this is yellow, the filter should be replaced soon. If this is red, the service interval has been exceeded. A mechanical pressure switch triggers a warning (yellow alarm) if the set point is reached. The set point can be manually adjusted at the pressure switches inside the dehumidifier..
9. **State of the process air filter** – If this is yellow, filter should be replaced soon. If this is red, the service interval has been exceeded. A mechanical pressure switch triggers a warning (yellow alarm) if the set point is reached. The set point can be manually adjusted at the pressure switches located inside the dehumidifier.

The setting on the pressure switches must not exceed **200 Pa** for standard G4 class filters and **300 Pa** for special F7 class filters. Be aware that the available external pressure (or flow) will decrease as the filters get dirtier. Also note that higher air flows will reduce the expected lifetime of filters.

10. **Actual mode** – Indication of chosen program.
11. **Return to main menu**
12. **Pre-Post unit settings** – Blue arrow is only visible if any pre-post module is active. If you press this shortcut, you will go to directly to the module settings.
13. **Alarm/warning** – Shows the state of the dehumidifier unit:
 - Green = everything is OK.
 - Yellow = warning = a service will soon be required (the dehumidifier continue to operate).
 - Red = alarm = there is a fault or malfunction somewhere (the dehumidifier stops immediately).

Note that if you attempt to change values, you will be asked to enter an operator code (1234).

MAIN menu

START/STOP Turn the dehumidifier on and off.

HUMIDITY Setup target for relative humidity and/or dew point..

PROGRAMS menu. This is where you decide how you want the dehumidifier to operate:

- Always On, RH On/Off (all configurations)
- Capacity Control (Configuration-B),
- Energy, Quiet, Custom programs (Configuration-C and Configuration-D),
- Energy+ (Configuration-D).

INFO. This provides information about this particular dehumidifier product, including the dehumidifier type, serial number, build date, software revision and running hours, as well as contact information to the dealer and the manufacturer. A performance log is available to provide indications of % relative humidity and dew point. This performance log registers data every hour.

SERVICE. This is where you can see the status of the dehumidifier components and their life expectancy. There is also a diagnostics menu. Here you can also reset the timer after a time-expired component has been replaced.

Yellow = service is needed (the dehumidifier continues to operate).

Red = critical alarm and service is needed immediately (the dehumidifier stops operating).

ALARM This is where you check any alarms or warnings detected by the control system (yellow flashing = warning detected, red flashing = alarm detected). Alarms also have to be manually reset after fixing the fault.

SETUP This is where you can change the settings for your dehumidifier.

First setup of PLC dehumidifier

The basic programs for Cotes dehumidifiers are ALWAYS ON and RH ON/OFF. You should choose the program best suited to your needs. The ALWAYS ON program is the simplest – it runs the dehumidifier at full capacity all the time. You should use this if you have an external hygrostat fitted and do not need any additional functions, but wish to keep all the safety features of the PLC unit. The RH ON/OFF program uses the room sensor (temperature and relative humidity) included with the dehumidifier in order to maintain the target relative humidity and/or dew point at the place where the sensor is located. For details on the other programs, please consult the extended PLC manual. Step-by-step instructions about how to set up your dehumidifier for the RH ON/OFF program are provided below:

<p>ALWAYS ON ENERGY RH ON/OFF QUIET CAPACITY CONTROL CUSTOM CONSTANT PROCESS AIR CUSTOM SETUP</p> <p>PROGRAMS</p>	<ol style="list-style-type: none"> 1. Go to the programs menu and choose the RH ON/OFF program: 2. If you are not logged in, you will be asked for the operator's code (1234) Enter this code and press log in, then select the desired program again. 3. Go back to Main menu 4. Select the target humidity level 										
<p>SENSOR 1 INDIVIDUAL SENSOR 2 AVERAGE PROCESS AIR HUMIDITY</p> <p>HUMIDITY</p>	<ol style="list-style-type: none"> 5. This shows settings for SENSOR 1 (and SENSOR 2 if included) 										
<p>RELATIVE HUMIDITY DEW POINT</p> <table border="1"> <tr> <td>ACTUAL 46 %RH</td> <td>ACTUAL 11 TDP</td> </tr> <tr> <td>ACTUAL 24 °C</td> <td></td> </tr> <tr> <td>TARGET 60 %RH</td> <td>TARGET 15 TDP</td> </tr> <tr> <td>MIN 55 %RH</td> <td>MIN 13 TDP</td> </tr> <tr> <td>MAX 65 %RH</td> <td>MAX 17 TDP</td> </tr> </table> <p>SENSOR 1</p>	ACTUAL 46 %RH	ACTUAL 11 TDP	ACTUAL 24 °C		TARGET 60 %RH	TARGET 15 TDP	MIN 55 %RH	MIN 13 TDP	MAX 65 %RH	MAX 17 TDP	<ol style="list-style-type: none"> 6. Select SENSOR 1 7. Use this menu to select your control conditions – relative humidity and/or dew point. You can select the target value here as well as setting the minimum and maximum values. The dehumidifier will start working if the measured value is above the maximum setting and will stop when it measures a value below the minimum setting. If you choose both control conditions options, the dehumidifier will start when either of the conditions are outside the selected range, and will continue to work until both measurements are again inside the selected range. 8. You can go back to the main menu and start the dehumidifier.
ACTUAL 46 %RH	ACTUAL 11 TDP										
ACTUAL 24 °C											
TARGET 60 %RH	TARGET 15 TDP										
MIN 55 %RH	MIN 13 TDP										
MAX 65 %RH	MAX 17 TDP										

For more details about operation of PLC dehumidifier, see :
 “PLC EXTENDED OPERATING HANDBOOK”.

SECTION 6 / SERVICE AND REPAIR

HOW TO SERVICE AND REPAIR THIS DEHUMIDIFIER

Service and maintenance work on this dehumidifier

Cotes designs its dehumidifier units so that they are as robust as possible, and only need a minimum of service and maintenance.

None of the components require lubrication or adjustment.

The only maintenance work you need to do is listed below.

Once a month

- Check or replace the filters for incoming air and regeneration air. For Configuration-B, Configuration-C and Configuration-D, the filter guard will automatically provide a warning if there are problems.
- Check or replace the filters for the cooling fans to the two electrical cabinets.
- Check that the fans are operating (by listening to check whether they are turning).
- Check that the rotor is turning during operation. Do this by shutting off the dehumidifier and then turn off the load switch, open the middle door, and put a marking on the rotor. Close the door and turn on the load switch and start the dehumidifier for 10–20 seconds. Turn off the dehumidifier and turn off the load switch, open the middle door again, and check that the marking has moved, indicating that the rotor is turning during operation.

Once a year

We also recommend the following annual checks.

- Check the service indication menu in the PLC controller. Are the working hours of any component inside near their time-to-change limit? If so, replace. See time-to-change limits below:
 - Process air filter. Depends on the working environment. Specified for 8,700 hours under normal conditions.
 - Regeneration air filter. Depends on the working environment. Specified for 8,700 hours under normal conditions.
 - Air filter for electrical box. Depends on the working environment. Specified for 8,700 hours under normal conditions.
 - Process air fan: 40,000 hours
 - Regeneration air fan: 30,000 hours
 - Motor and gear for rotor: 30,000 hours
 - Heaters: 40,000 hours
 - Filter guard (if installed): 40,000 hours
 - Manometer (if installed): 40,000 hours
 - Rotor, including gaskets: 60,000 hours
 - Electrical board including PLC controller: 60,000 hours
- External humidity sensor should be calibrated or replaced (with recycled instruments)
- Internal humidity sensor (only Configuration-D) should be replaced (with recycled instruments)

- Check the wear on the rotor gaskets, especially the gasket placed on the circumference of the rotor. The red side of the gasket is made of Teflon®, and this coating must be intact over its entire surface.
- Check the inside of the cabinet for any signs of dirt or corrosion. Check that the drive belt for the rotor is still tight and that no parts of it are too worn or close to the breaking point.
 - Tension of drive belts: deviation 8 mm at 7N.
- Check the internal flexible hoses
- Check that the insulation on all electrical cables is intact, with no mechanical or heat damage.
- Check that the insulation on the electric heater(s) is intact.
- Check that all cables inside the electrical box are properly attached, all miniature circuit breakers (MCBs) are switched on and all components are intact.
- Test that all electric components are working as intended – for example by following the instructions in the “Commissioning” section of this handbook.

Service/repair work on this dehumidifier

Service area must be clear at all time.

Diagrams and manual must be kept near the machine.

Machine will automatically startup in case of power loss and a following regain of electricity.

Safety instructions

Before opening the dehumidifier, make sure that the electric current is switched off at the mains before you open the cover of the electrical box or the covers for the electric heater, process air fan and rotor.

The 10Q1 load switch should always be switched OFF and locked with a padlock before any service is done.

You should never just turn off the power to the dehumidifier while it is running. The correct procedure is to press STOP C105 DEHUMIDIFIER (Configuration-A; press the operating button), after which the machine runs a cooling cycle before the regeneration air fan stops. Turning off the dehumidifier properly prevents any over-heating.



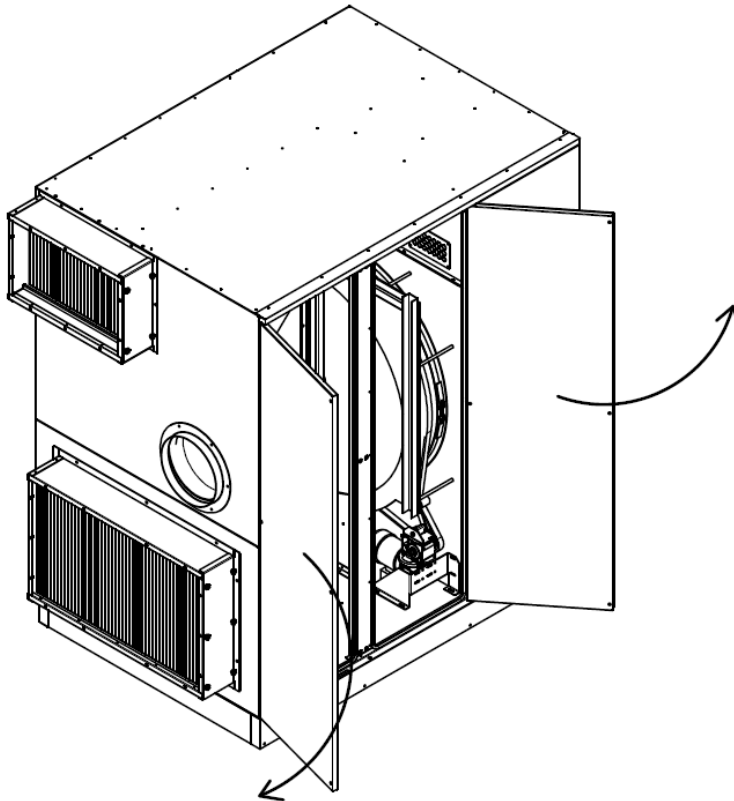
WARNING

Make sure that electric current is switched off at the mains before you open the cover of the electrical box or the covers for the electric heater, process air fan and rotor.

The 10Q1 safety switch should always be switched OFF and locked with a padlock.

Easy access for quick service

The C105 dehumidifier features three service doors, which are easy to open and close. All parts that need service can be accessed from the front, through these doors. Behind the first two doors are the rotor, heating elements, fans, gear motor, etc.

**WARNING**

The C105 dehumidifier has a high floor frame. Be aware of this before entering the unit.

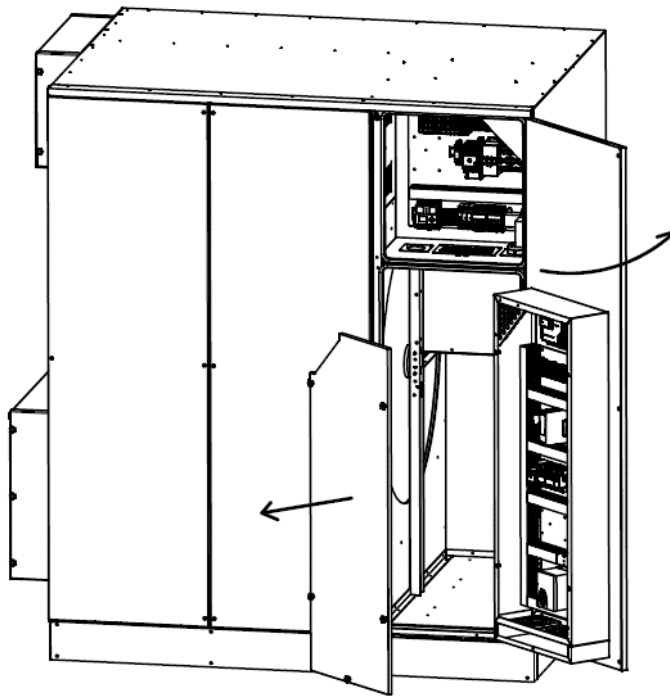
The 10Q1 safety switch should always be switched OFF and locked with a padlock.



The electrical switchboard is divided into two separate electrical switchboards (where the contacts, fuse breakers, thermal relays, etc. are mounted). The first switchboard is the "control board" that determines how the dehumidifier runs. The second switchboard is the "cascade heating board", which controls the heating elements.

The control board is located in the electrical cabinet mounted on the door.

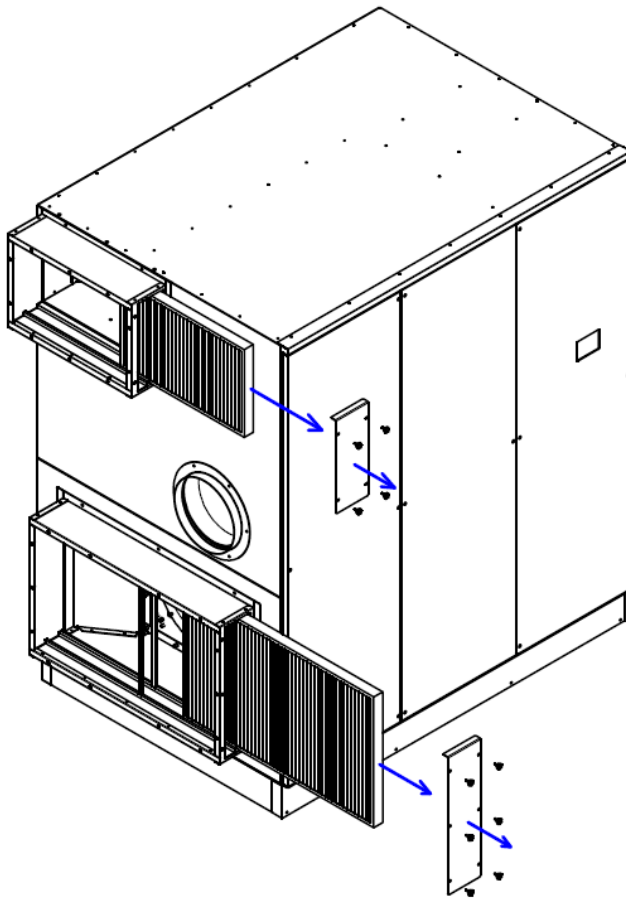
The cascade heating board is located in the top electrical cabinet.



Replacing filters

The following is standard procedure for replacing the filters:

- Loosen the finger screws on the filter doors
- Replace the filters



Replacing fans

All C105 dehumidifiers are fitted with a 400V EC electric motor (for the process air fan) and a 400V Norm electric motor (for the regeneration air fan). It is critical that the regeneration fan is connected correctly, to prevent it rotating the wrong way. Please check that the regeneration fan is rotating counter-clockwise when seen from the motor side.

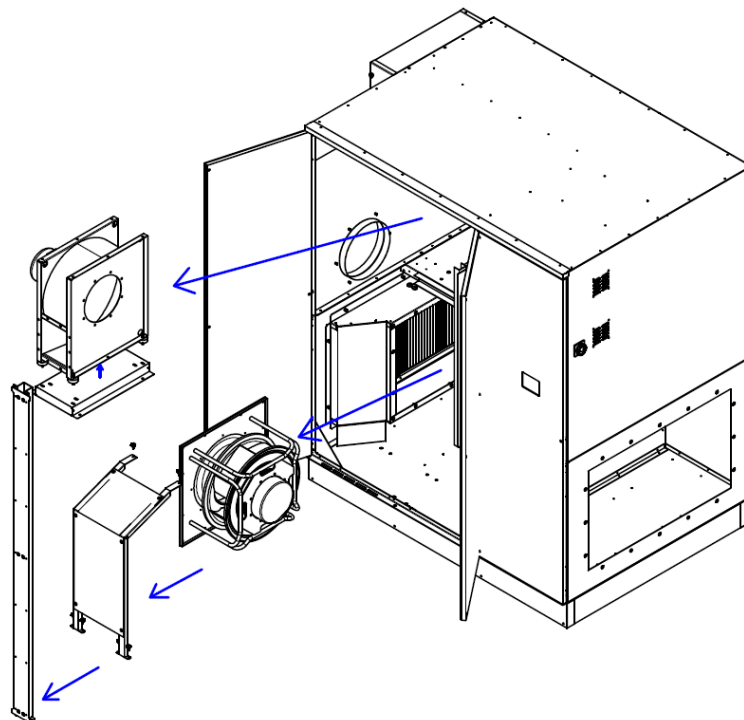
The following is standard procedure for replacing the process air fan;

- Open front doors
- Remove the front beam
- Remove the metal safety mesh cover by loosening the finger screws
- Disconnect cables for process air fan
- Remove the screws on the fan bracket
- Remove the fan
- Replace the process air fan

The following is standard procedure for replacing the regeneration air fan:

(Note: due to the weight of the fan (35/47kg) it can be advantageous to remove the process fan first)

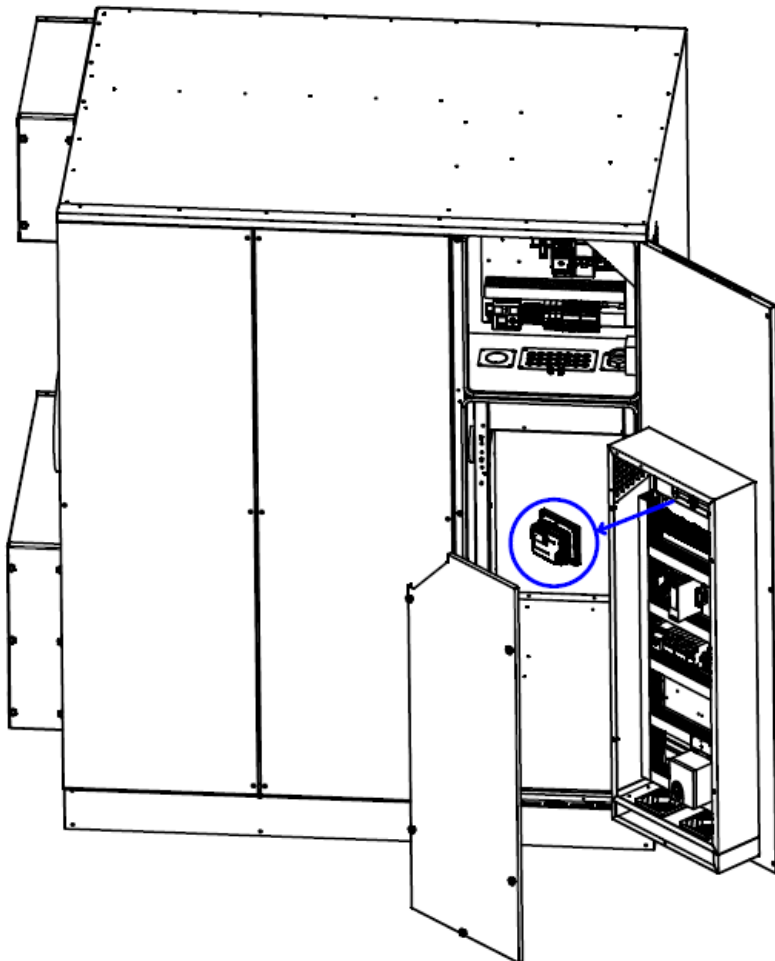
- Disconnect cables for the regeneration air fan
- Dismount the clamps holding the flexible tubes
- Remove the screws holding the regeneration fan support box
- Remove the regeneration air fan with the support box
- Mount a replacement regeneration air fan on the support box, and install in the dehumidifier



Replacing PLC

The following is standard procedure for replacing the PLC unit.

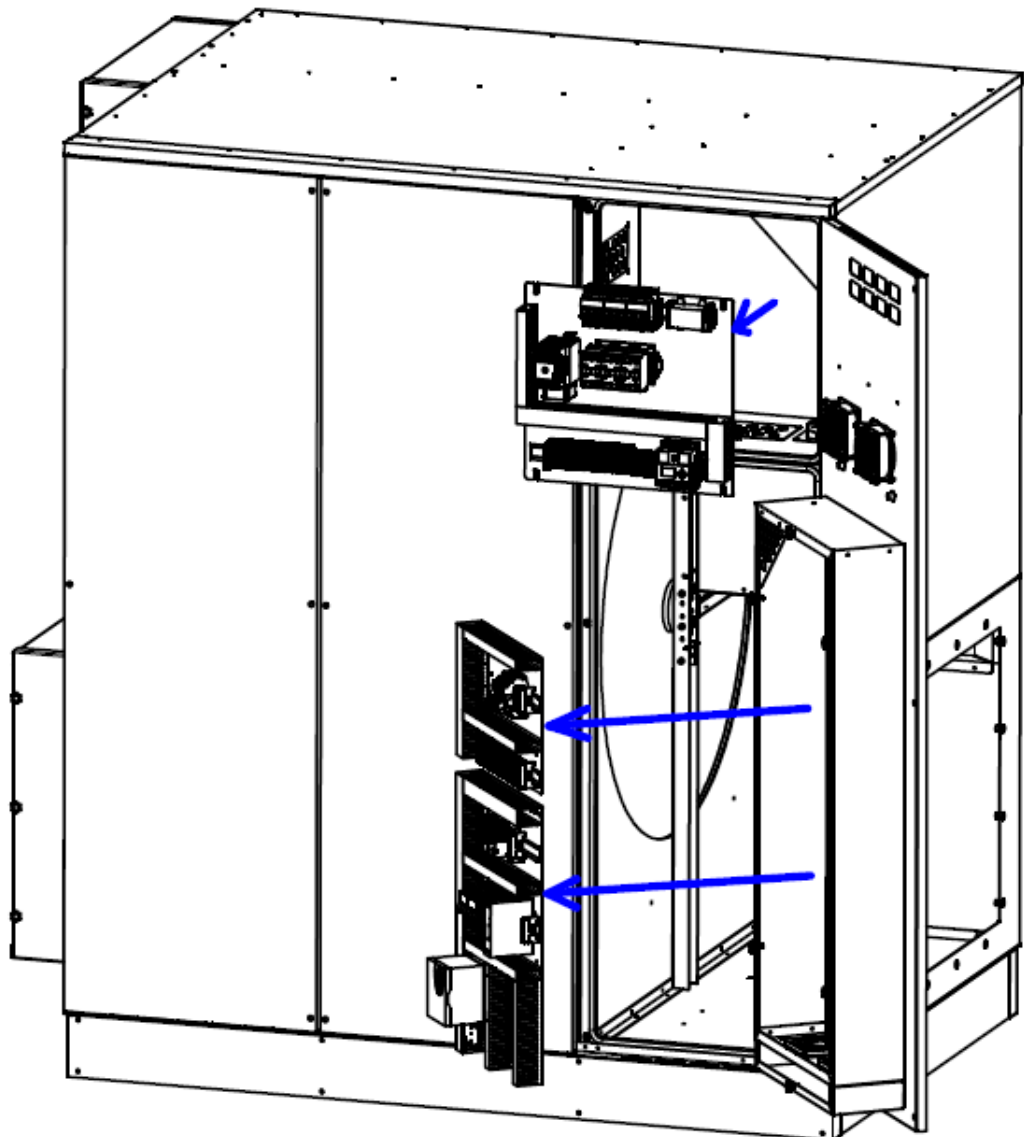
- Open the right door
- Remove the cover of the electrical cabinet on the door.
- Disconnect cables for the PLC
- Remove the screws for the PLC bracket
- Replace the PLC



Replacing electrical board

The following is standard procedure for replacing an electrical board

- Open the right door
- Remove the cover plate on the electrical cabinet on the door
- Disconnect all cables and sensors connected to the electrical board
- Remove the screws fastening the electrical board to the cabinet
- Replace the electrical board

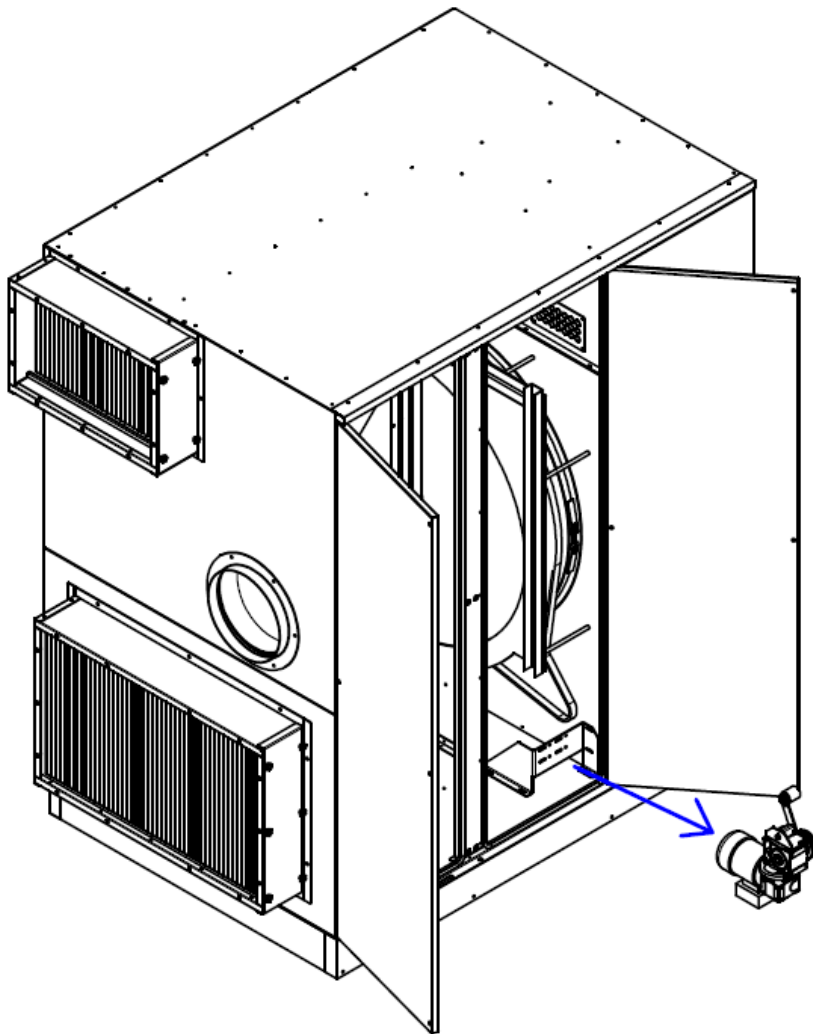


Replacing gear motor

Remove the drive belt from the pulley, and then remove the gear motor after disconnecting all electrical connections. You can then fit a replacement gear motor.

When re-starting the unit, check that the rotor is moving. If not, check the connections to the motor.

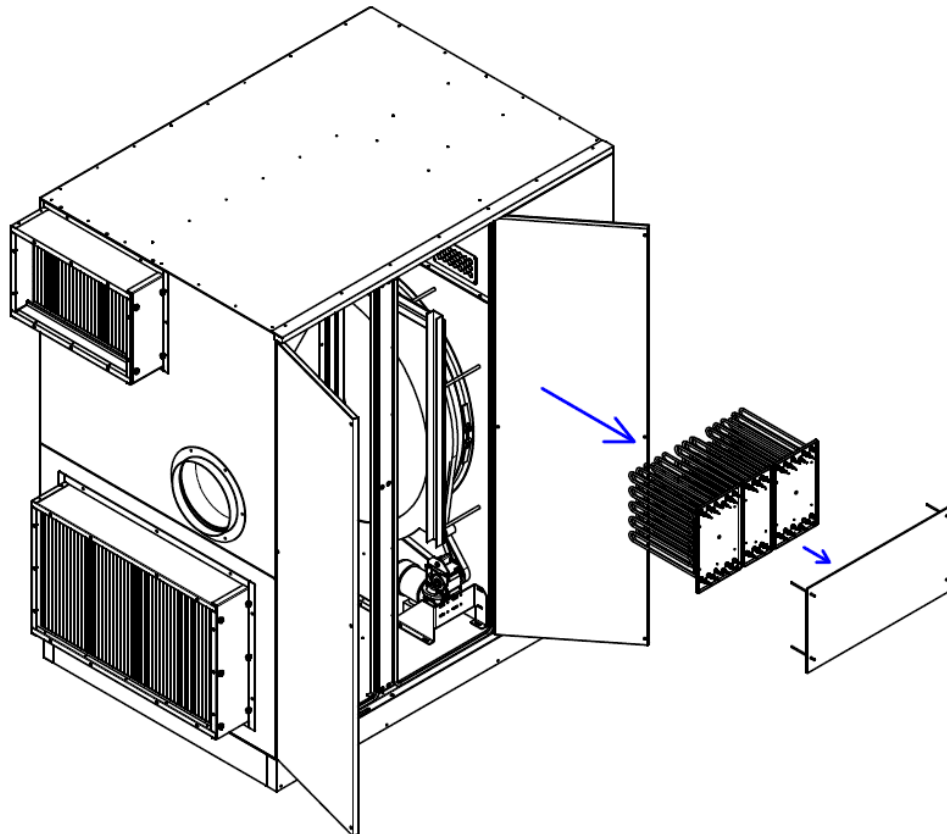
It is important that the rotor rotates upwards, when viewed from the front.



Replacing electric heaters

All electric heaters are mounted from the front in the heater section, in the top of the dehumidifier.

To replace these units, remove the cover plate, disconnect the wiring and unscrew the heater plates. You can then withdraw the plate and heaters from the heating section.



Replacing rotor gaskets

You do not need to remove the rotor to replace the rotor gaskets. You simply place the new gasket on the rotor and fix it in place with the three-part expansion ring. You then turn the rotor, which presses the gasket against the departing plates until only half of the gasket is on the rotor. The expansion ring then fastens.

The following is standard procedure for replacing rotor gaskets.

- Open door at the front of the cabinet
- Remove the drive belt from the pulley
- Remove the rotor gaskets
- Mount new rotor gaskets

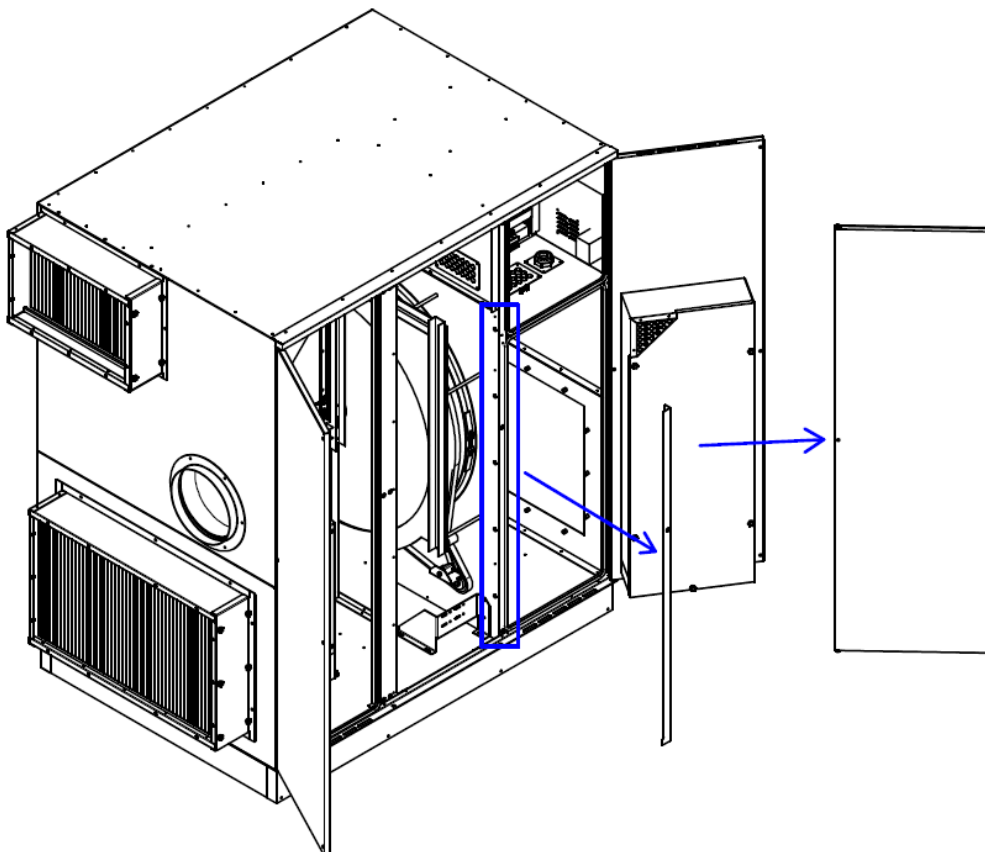
You *can* remove the rotor and mount new gaskets on it, but it is much easier to mount new gaskets *without* removing the rotor.

Replacing the rotor and shaft

The following is standard procedure for replacing the rotor.

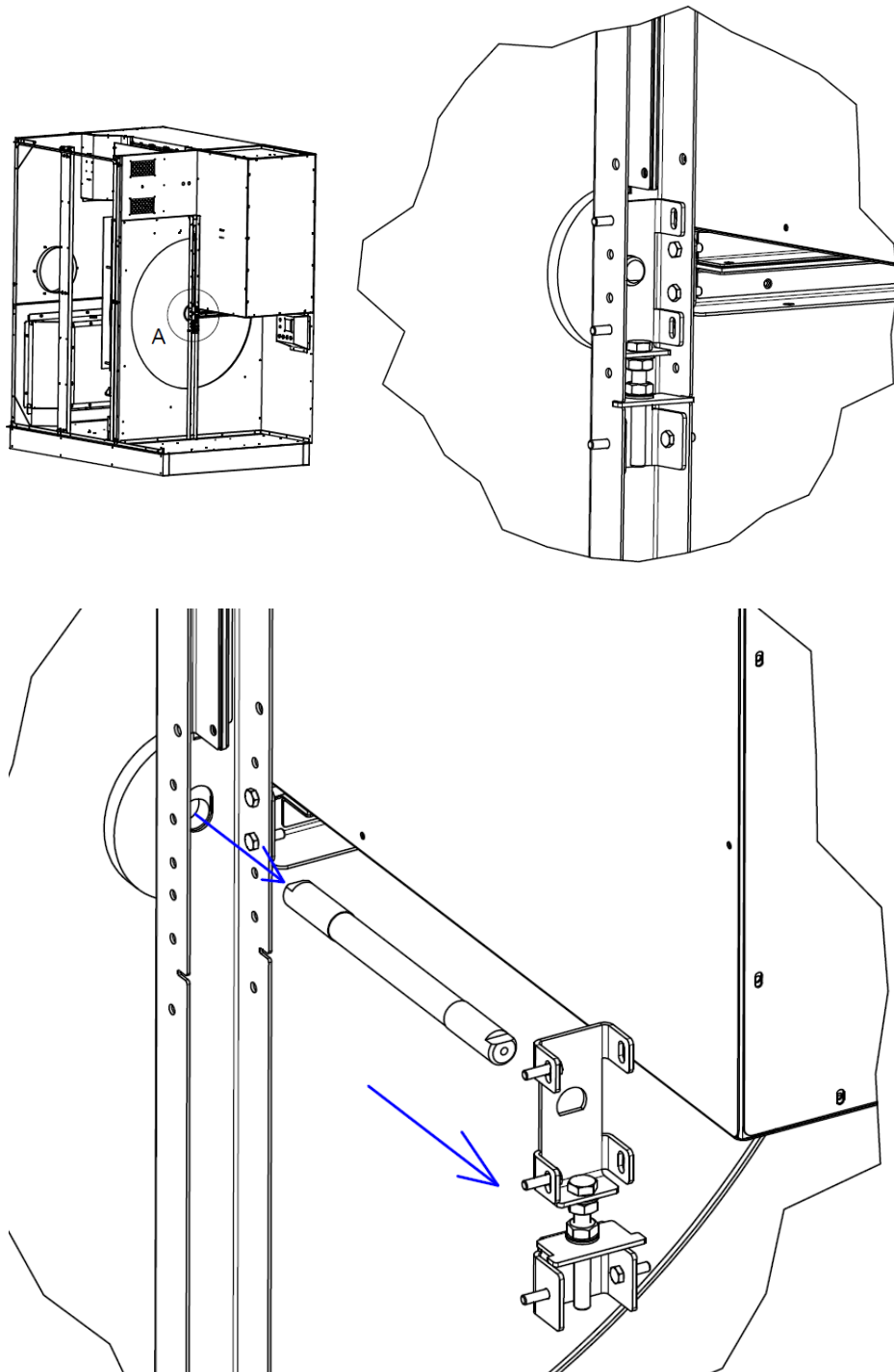
- Open all three doors
- Remove the middle door completely by removing the bolt, that acts as a hinge, in the bottom of the door.
- Remove the rubber door seal for the middle door
- Remove the bracket in front of the rotor
- Remove the drive belt from the pulley and remove the gear (see "Replacing gear motor" section).
- Remove the two rotor gaskets (on the round surface)

(continues on next page)



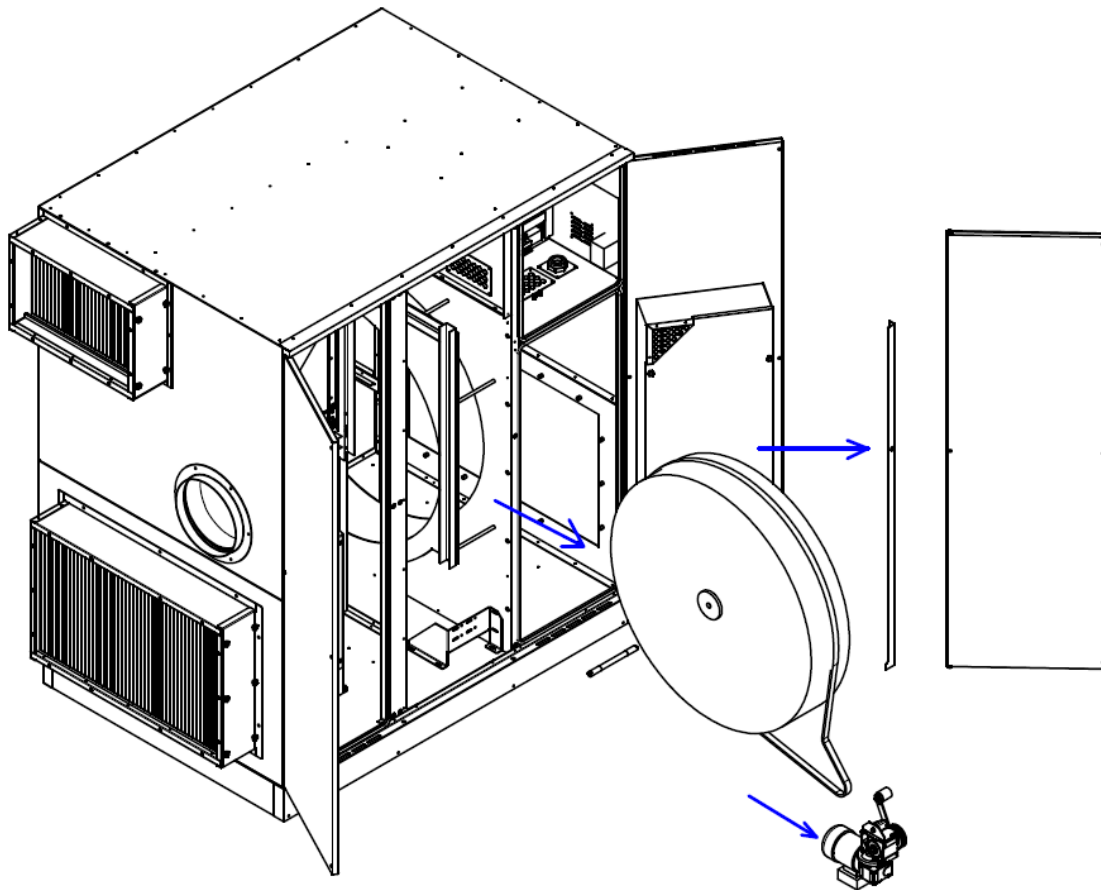
The next step is to remove the rotor shaft. This can be done from either side, but Cotes recommends removing it from the right (the electrical cabinet side). The rotor shaft is held in place by a bracket on both sides of the rotor. You only need to remove the bracket on one side.

- Remove the bracket holding the rotor shaft, by removing the bolts holding it in place
- Raise the rotor 5mm by supporting it underneath
- Pull out the rotor shaft (see illustrations below), and remove the Teflon® discs on both sides of the rotor

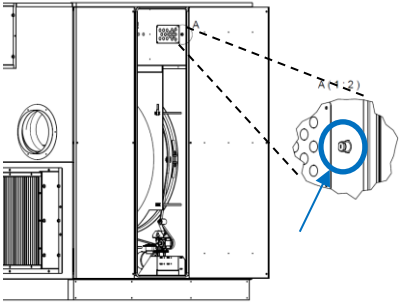


With the rotor shaft removed, the rotor can now be pulled out.

Carefully slide out the rotor (including the Teflon® discs).



TROUBLESHOOTING

Problem	Cause	Action
The unit (or parts of it) will not start after a power surge/an electrical short circuit	One or more fuse breakers have been triggered	Turn all fuse breakers on
The air is not as dry as expected	<p>The rotor is not turning</p> <p>The regeneration air temperature is lower than expected</p> <p>The regeneration air flow is too low</p>	<p>If the drive belt is intact, change the gear motor</p> <p>Check that the regeneration air flow is not too high</p> <p>Check that all heating elements are functioning</p> <p>Check that the regeneration air filter is not clogged</p>
The regeneration air temperature has large variations	The regeneration air flow is too low	Check that the regeneration air filter is not clogged
<p>PLR Screen displays "Machine overheated"</p> <p>The PLC Alarm menu displays "Overheating Alarm"</p>	<p>The 252ST1 safety switch has been triggered and must be deactivated</p> <p>Temperature in heating box was higher than 176°C</p>	<p>Deactivate the safety switch by pressing the small green button. The switch is located inside the dehumidifier next to the cable glands in the top right corner. Access it through the middle door.</p>  <p>Check that the regeneration air flow is not too low</p> <p>Check whether the filters should be changed</p>

<p>PLR Screen displays "Process air fan (100M1) error"</p>	<p>One or more circuit breakers have been triggered</p> <p>Wires to or from the fan or circuit breakers have become disconnected</p> <p>Wire connections inside the RH25C process fan have become disconnected</p> <p>The fan is broken</p>	<p>Turn all circuit breakers on</p> <p>Check that all the wire connections comply with the electrical diagram</p> <p>If all the wire connections are connected correctly, replace the fan</p>
<p>PLR Screen displays "Regeneration air fan (102M1) error"</p>	<p>One or more circuit breakers have been triggered</p> <p>Wires to or from the fan or circuit breakers have become disconnected</p> <p>The fan is broken</p>	<p>Turn all circuit breakers on</p> <p>Check that all the wire connections comply with the electrical diagram</p> <p>If all wire connections are connected correctly, replace the fan</p>
<p>PLR Screen displays "Rotor circuit breaker (104F1) error"</p>	<p>Rotor stall or issue with drive</p>	<p>Check drive belts. Remove drive belts and move rotor in counter clockwise direction. Observe that the rotor is turning smoothly.</p>
<p>PLR Screen displays "Phase sequence error! (104K1)"</p>	<p>Main power supply phase sequence error.</p> <p>Main power supply asymmetry.</p>	<p>Check connection to the electro-energetic system.</p> <p>Check voltage between phases.</p>

If you have any queries or questions, please contact your Cotes dealer.

SECTION 7 / FORMALITIES AND GENERAL/LEGAL INFO

WARRANTIES

Warranty conditions

The Cotes factory warranty is only valid if a documented programme of service and preventive maintenance has been carried out.

Maintenance must have been carried out at intervals of six months or less. Documentation for this must be in the form of a written log/journal, with attested entries.

All spare parts must have been purchased from Cotes or an authorised Cotes dealer.

LEGAL NOTICES

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EU DECLARATION OF CONFORMITY

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Declares at its own liability that the following models of Cotes adsorption dehumidifiers:

C30, C35, C65, C105

are covered by this declaration complying with the following directives:

Machinery Directive 2006/42/EC

Ecodesign 327/2011 directive 2009/125/EF **as regards the eco-design fans driven by motors with input power and 125W to 500kW.**

EMC Directive 2014/30/EU

RoHS 2011/65/EC.

DK-Slagelse, 02.01.2019

A handwritten signature in blue ink, appearing to read 'Thomas Rønnow Olesen'. The signature is written in a cursive, flowing style.

Thomas Rønnow Olesen

CEO

HOW TO UPDATE AND IMPROVE THIS COTES DEHUMIDIFIER

Energy recovery

An energy recovery system can be placed beside the dehumidifier to reduce the amount of energy needed for heating the regeneration air.

Extra insulation

The doors of the Cotes dehumidifier can be insulated to ensure that the sound pressure level of the unit is reduced and to ensure that all energy (both cooling and heating) is kept inside the unit.

Additional cooling/heating coil

A pre-cooling coil can increase the amount of moisture removed, especially when very dry air is needed.

Additional post cooling/heating

A post cooler/heater unit can be attached to the dehumidifier to control the temperature downstream from the dehumidifier.

Additional/better filters

If cleaner air is needed, it is possible to replace the fitted filter with a different filter featuring other specifications. If an additional filter is required, please contact Cotes expert and find out how the unit can be changed for this to be done.

Next step

Please contact Cotes or a Cotes dealer to find the best solution.

WHOM TO CONTACT

Help when and where you need it

Contact Cotes in Denmark or your local dealer:

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