Cotes dehumidifier	**C30E/C30C**
Manual number:	140720
Revision:	K.3

COTES ALL-ROUND C30

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

CONTENTS

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.

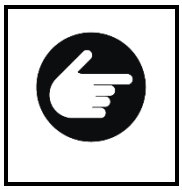
Anyone using Cotes dehumidifier units, or whose responsibilities include supervising their operation, will also benefit from reading this handbook and from consulting it as a practical help should the need arise.

Product number for this handbook

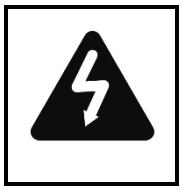
The product number of this particular service handbook is 140720.

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 C30 RANGE OF DEHUMIDIFIERS

The Cotes C30 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.

C30E units are configured to minimise the overall energy consumption of the dehumidification process. C30C units are specially designed to operate inside cold storage facilities.

The dehumidifiers in the C30 range are designed for easy cleaning, with configuration options that include a heat recovery module or a condensation module and additional filters, if needed.

Design priorities

The Cotes C30 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 C30 range currently features models with nominal air volumes of 300 m^3/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 0.9 kg/hour and 1.9 kg/hour.

At process air inlet conditions from -25°C to -18°C and 95% relative humidity (%RH), the capacities (the amount of water which can be removed from the air) of these units are between 0.15 kg/hour and 0.3 kg/hour.

Configuration priorities

The Cotes C30 range is available with three different configurations – BASIC, SENSOR and PLUS.

Configuration - BASIC

The BASIC 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 humidify control and sensors are not included as standard, but are available for purchase from Cotes
- Remote start/stop option

Configuration - SENSOR

In addition to the Configuration BASIC features, the Configuration SENSOR provides:

- Current sensor that provides you valuable information about the status of the regeneration filter, heating element and the regeneration fan.
- External fault signal
- External operation signal
- Constant process air flow

Configuration - PLUS

In addition to the Configuration SENSOR features, the Configuration PLUS provides:

- Rotor guard
- Process filter guard
- Efficient and adjustable EC fans for process and regeneration circuit

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

The unit is intended for use in residential, commercial and industrial environments.

Operating conditions – standard models (E)

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

Relative humidity	0–100%
Temperature	0–40°C
Pressure	Ambient ± 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.

Operating conditions – Cold store models (C)

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

Relative humidity	0–100%
Temperature process	-25 - 0°C (can be used up to 40 C)
Temperature regeneration	-25 - 40°C
Pressure	Ambient ± 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.

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 air then passes through a slowly turning rotor (C) 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 leaves the rotor containing less moisture (humidity) than when it entered (E). And because the adsorption process releases energy to the air, the temperature increases during the process. The process air is controlled by a process air fan (D).

The regeneration process (F to J)

The second air flow (the regeneration air) (J) is filtered by a regeneration air filter (K), and heated by heating elements (I) to reduce its relative humidity. On its way through the rotor (H), this heat 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 (F). The regeneration air is controlled by a regeneration air fan (G).

Fans

All units in the C30 range of adsorption dehumidifiers are fitted with two fans as standard.

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 particular Cotes dehumidifier, see page 20.

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 C30 units as standard in order to filter the incoming process and regeneration air.

For details about the filters fitted to this particular Cotes dehumidifier, see page 20 .

Heating units

Cotes C30 dehumidifiers are fitted with electrical heating units of the PTC-type, in order to control the temperature of the regeneration air entering the unit.

For details about heating units fitted to this particular Cotes dehumidifier, see page 20 .

Heat recovery unit (HR module)

Cotes adsorption dehumidifiers can be fitted with a heat exchanger to make sure that part of the thermal energy from the regeneration air leaving the unit is extracted, and reused for preheating the incoming regeneration air. The heat exchanger is placed in an external box equipped with inlets and outlets for the incoming and outgoing regeneration air.

The heat recovery unit can save as much as 20–25% on energy consumption, but you have to install the appropriate ducting and damper for outgoing regeneration air.

For details about the heat recovery unit fitted to this particular Cotes dehumidifier, please contact your Cotes dealer, or Cotes.

Water condensation unit (LK module)

Cotes adsorption dehumidifiers can be fitted with water condensation units in order to condense some of the water from the regeneration air leaving the dehumidifier. This is beneficial when a regeneration air outlet is not a good idea or cannot be fitted.

When a water condensation unit is installed, the regeneration air forms a closed circuit, using ambient air passing through heat exchangers to cool the regeneration air to below condensation temperature.

For details about the water condensation unit fitted to this particular Cotes dehumidifier, please contact your Cotes dealer, or Cotes.

FEATURES AND BENEFITS

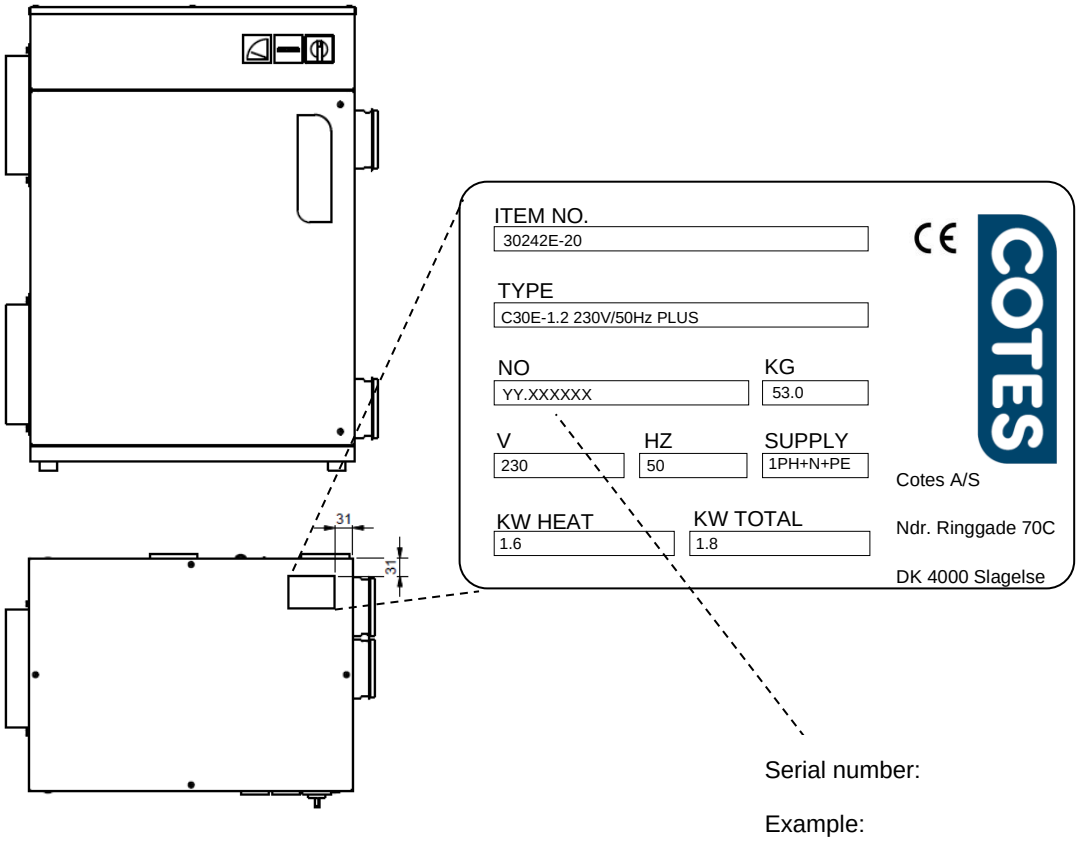
Highlighted features	How customers benefit
Appearance/cabinet	
Eye-catching industrial design appearance.	Visually attractive units that can be mounted in highly visible positions.
Robust structure.	Longer service life. Better return on investment.
Equipment configurations inside the cabinet	
All fans are mounted inside the cabinet.	Can be mounted in a wider range of positions and structures, even where there is public access, etc.
Easy to mount additional insulation and noise suppression equipment.	Configurations individually customised to each project/installation.
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 bushes.	Savings on maintenance and service work. Greater operating efficiency.
Access	
Large door that provide rapid, easy access.	Savings on maintenance and service work. Less downtime means greater operating efficiency.
Filters are easy to dismount and replace.	Savings on maintenance and service work. Greater operating efficiency.

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 particular model is located in the top of the dehumidifier (see drawing below).



Serial number:

Example:

18.12345

12345 = Serial number

18 = Year of production

SPECIFICATIONS

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

Table 1 Technical data C30E/C30C

	Type	C30E			C30C
	Model	0.9	1.2	1.9	0.3
Dry air, nominal	m^3/hour	300	300	300	300
Regeneration air, nominal	m^3/hour	50	65	85	50
External pressure, dry air (at nominal air flow)	Pa	200	200	200	200
External pressure, regeneration air (at nominal air flow)	Pa	150	180	140	150
Capacity at 20ºC, 60% relative humidity	kg/hour	0.9	1.2	1.9	-
Capacity at -18ºC /-25ºC 95% relative humidity	kg/hour	-			0.3 / 0.15
Electric heater, maximum	kW	1.2	1.6	2.7	1.2
Fuse, min	A	10	10	5	1.0
Fuse, max	A	10	10	16	10
Maximum connected load	kW	1.4	1.8	2.9	1.4
Voltage	V	230	230	400	230
Frequency	Hz	50	50	50	50
Electrical connection		PH+N+PE	PH+N+PE	3PH+N+PE (3PH+PE)	PH+N+PE
Sound pressure ISO11201 (with ducts mounted)	dB(A)	52	54	54	50

Table 2 Measurements

	Type	C30E			C30C
	Model	0.9	1.2	1.9	0.3
L x W x H cabinet	mm	398 x 554 x 771			
L x W x H total	mm	437 x 631 x 789			
Weight	kg	52	53	53	53
Regeneration air outlet	mm	Ø100			
Regeneration air inlet	mm	Ø100			
Process air inlet	mm	200x180 (ø200)			
Process air outlet	mm	200x180 (ø200)			

ASSEMBLIES AND COMPONENTS

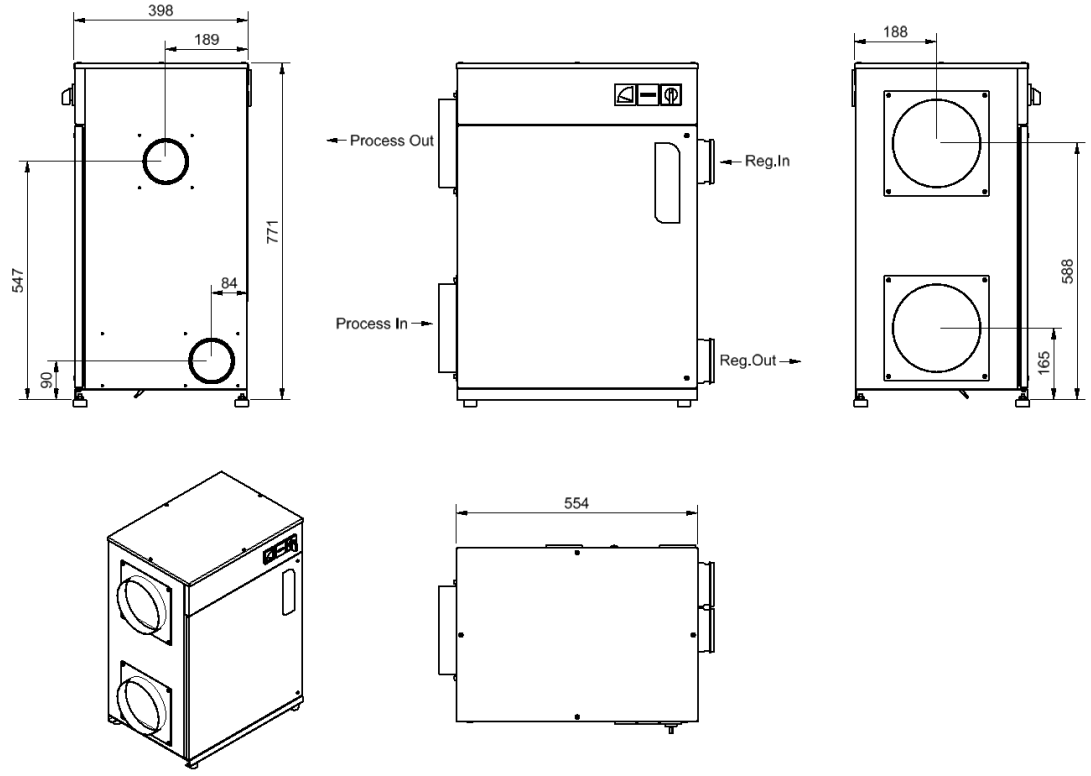
Customised to meet your needs

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.

Your Cotes C30 dehumidifier has been configured to meet the particular requirements of your installation.

Dimensions

C30E/C30C dehumidifier



Spare parts

C30E/C30C dehumidifier

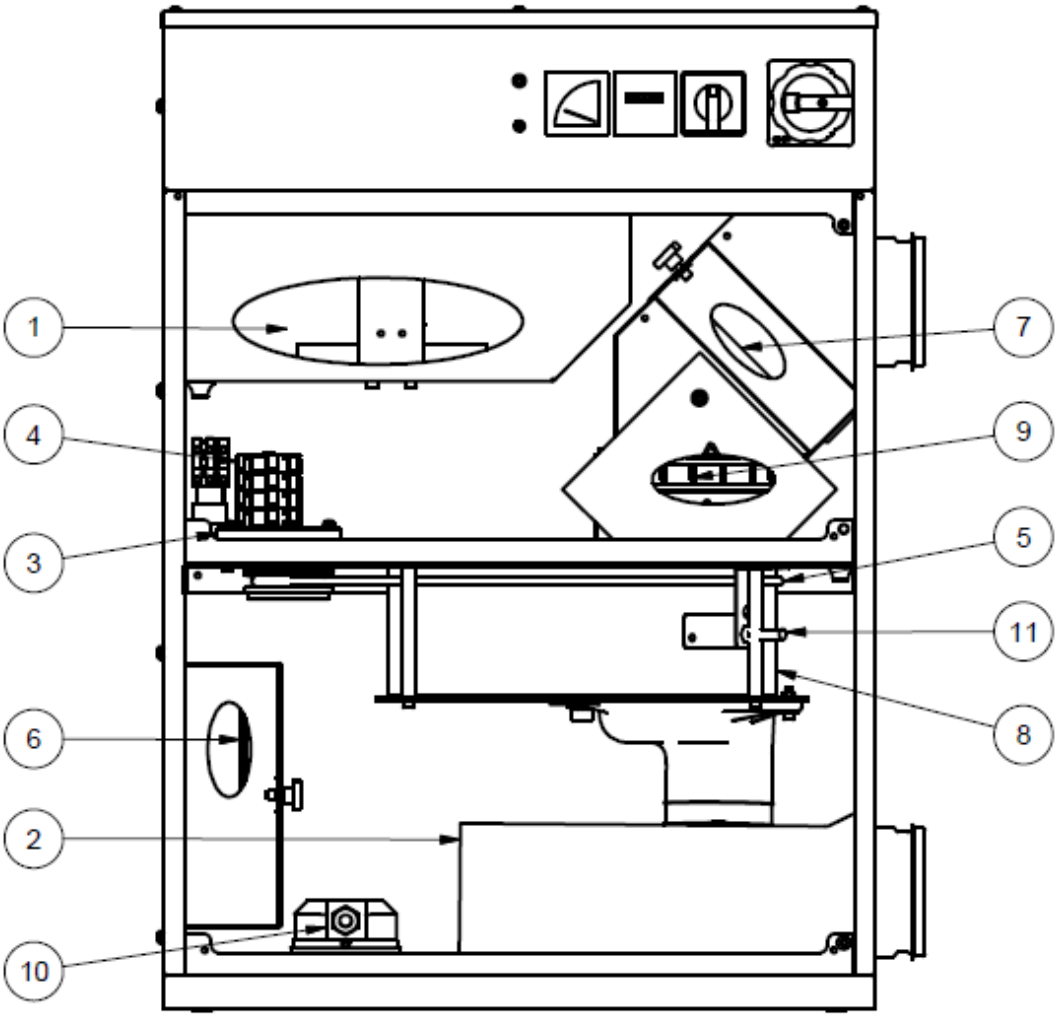


Table 3 Spare parts C30E/C30C

Type		C30E			C30C
Pos.	Part	0.9	1.2	1.9	0.3
1	Process air fan (**Plus)	111641 (801716**)			111641
2	Regeneration air fan ** Plus version	621371 614379**	621372 614379**		621371
3	Gear	110414			110414
4	Gear motor	110404			110404
5	Drive belt	132109			132109
6	Process air filter	130350			130350
7	Regeneration air filter	130268			130350***
8	Rotor	124055	124058		124058
9	Heater	111468		614188	111468
Configuration - PLUS					
10	Pressure switch for process air filter	126843			-
11	Rotor guard	823188			-

*** Mounted externally before duct heating element.

See the “Additional information for C30C dehumidifiers (Cold store model)” section for more details.

SOUND LEVELS

Sound dampening and silencers

Please check the maximum sound level permitted for the particular 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.

Sound levels for each particular dehumidifier can be found on page 16.

Measuring sound levels

Sound levels for Cotes dehumidifiers are measured in accordance with the provisions of the ISO11201 standard.

While the sound level is being measured, the dehumidifier is placed on the floor. Ducts for regeneration air and for incoming air/outgoing air are installed and led out of the measuring room.

The sound level is then measured 1 metre outside the front of the cabinet (outside the large cabinet cover), and 1.5 metres above the floor.

SECTION 4 / INSTALLATION

HOW TO INSTALL A C30 DEHUMIDIFIER

Removing the packaging

Cotes C30 dehumidifier units are delivered in a cardboard box. Please dispose the 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.

Note the weight of the dehumidifier as specified on page 17. We recommend that you use a forklift to move the dehumidifier around and place it in position.

Where to mount this dehumidifier

Cotes adsorption dehumidifiers are designed for installation indoors.

The back of the dehumidifier should be placed against an outer wall to make it easier to install the regeneration air ducts.

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

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 ductwork for the process air should be selected with regard to the external pressure available from the process air fan and the space available for ducting. A 200mm-diameter duct is normally recommended for the process air flow.

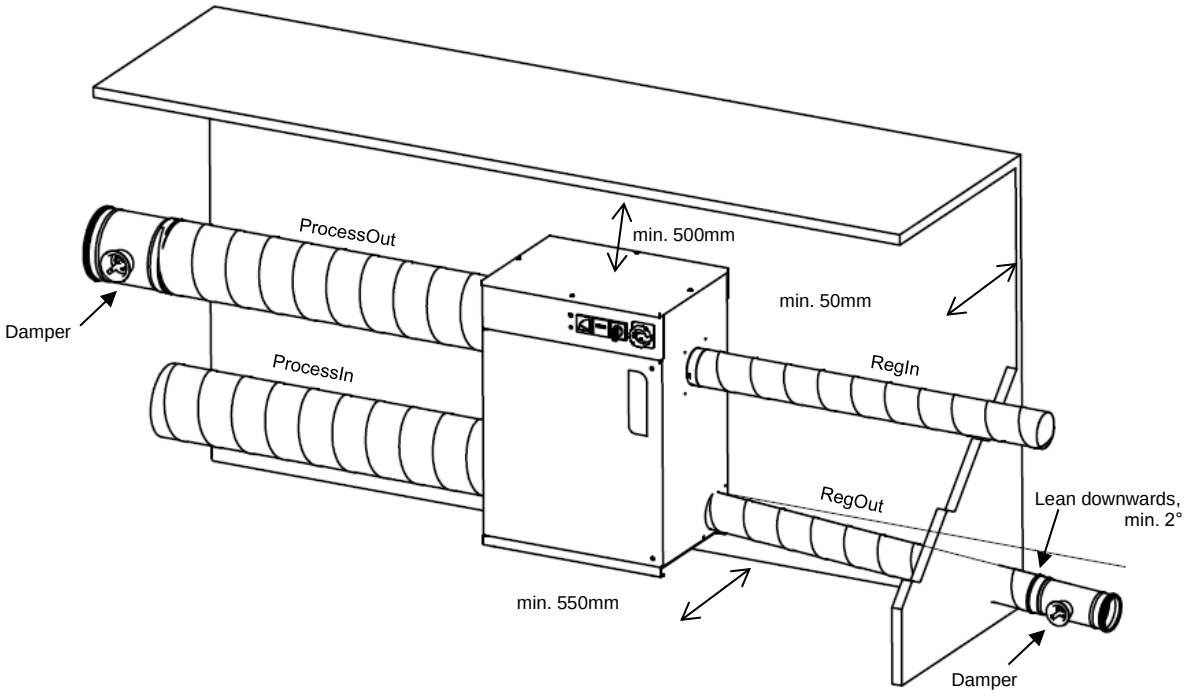
When installed, the process air flow should be adjusted by means of a damper.

The regeneration air should be led to and taken from the outdoors.

The ductwork for the regeneration air should be selected with regard to the external pressure available from the regeneration air fan and the space available for ducting. A 100mm-diameter duct is normally recommended for the regeneration air flow.

The regeneration air outlet should be made to drain downwards towards the outlet, to allow any condensate to run out.

There must be at least 500mm unrestricted access above the dehumidifier for easy access.



If this draining downwards is not possible, drill a ø6mm hole in the lowest part of the duct, so that any accumulated water can drain away.

NOTE

The regeneration air outlet should be made to drain downwards towards the outlet for draining.

If this is not possible, drill a ø6mm hole in the lowest part of the duct, so that any accumulated water can drain away.

A damper for adjusting the regeneration air flow must be installed on the outlet in order to adjust the regeneration air flow. If not, 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 air flow according to specifications from page 16.

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 C30E range weigh approximately 45–56 kg and should therefore only be moved using a forklift or similar equipment

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.

ADDITIONAL INFORMATION FOR C30C DEHUMIDIFER (COLD STORE MODEL)

Where to mount this dehumidifier

Cotes C30C adsorption dehumidifiers are specially designed for installation inside cold storage facilities.

Where <u>not</u> to mount it

The unit must not be installed outside the cold storage space unless this has been arranged with Cotes and special adjustments have been made to the unit.

Connections needed – electrical

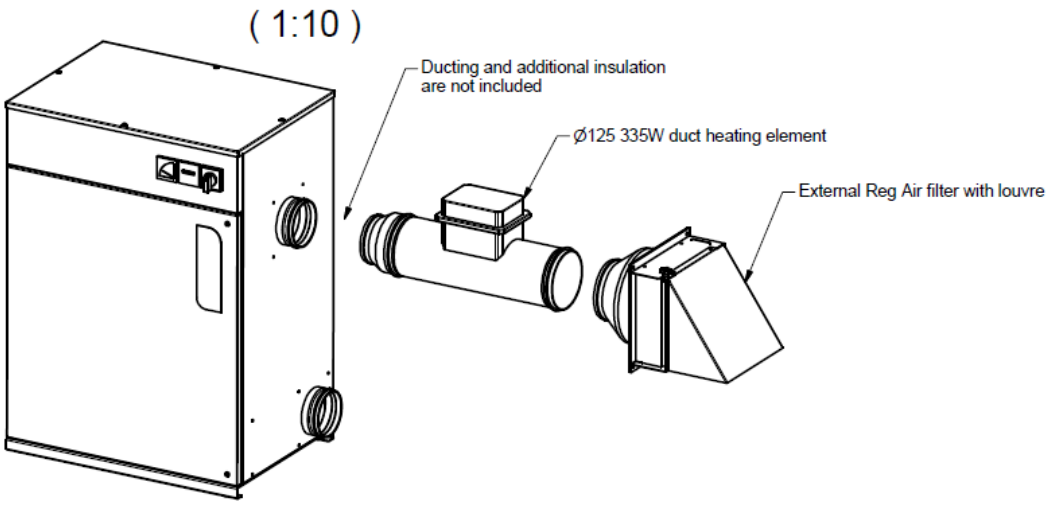
First, make sure that the 335W external heater is connected to 230V/50Hz, as described in the electrical diagram on page 300 for the C30C cold storage model. The external heater pre-heats the regeneration air before it enters the C30C dehumidifier.

NOTE

A 30-minute timer is activated when the main switch is turned on.

Connections needed – ductwork

The regeneration air must be led to and taken from the outdoors. The ductwork must always be insulated from and to the cold storage. Such insulation is not included when purchasing a C30C dehumidifier.



If this draining downwards is not possible, drill a ø6mm hole in the lowest part of the duct, so that any accumulated water can drain away.

NOTE

The regeneration air inlet and outlet ductwork must be insulated at all times within the cold store. Furthermore, the external heater, filter frame and electrical box must be installed according to specifications.

A damper for adjusting the regeneration air flow must be installed on the outlet in order to adjust the regeneration air flow. If not, 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 air flow according to specifications from page 16.

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 mains switch.

Procedure

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

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

NOTE

You should never just turn off the power to the dehumidifier while it is running.
The correct procedure is to switch the rotary switch to neutral position,
after which the machine runs a cooling cycle before the regeneration air fan stops.

b) To check the connected duct system

- Is the recommended damper installed in the regeneration air outlet duct
- Is the recommended damper installed in the process air outlet duct
- Do the regeneration air outlet ducts drain away from the dehumidifier, to make sure that any condensed water flows away?
- If the regeneration air outlet does not drain 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 damper positions/air flow settings at commissioning

Dampers/settings should be set in the following positions.

- Damper at process air outlet: Fully open.
- Damper at regeneration air outlet: Fully open.

NOTE

To ensure stable operation of the dehumidifier with condensation or heat recovery unit the regeneration filter – found in the dehumidifier – must be removed.

d) Once the dehumidifier is operating, you should adjust the air flows

Adjust the dampers on process air and regeneration air so the incoming air flow matches the nominal values given on page 16. Check the air flows using a suitable instrument (pitot pipe/thermo-anemometer or similar) in the duct.

If it is difficult to measure the flow in the regeneration pipe, the regeneration flow may be adjusted by the current consumption on the machine. As a PTC-type heater is used, the current consumption of the dehumidifier is dependent on the flow. Adjustment of flow by current is a less accurate method.

The nominal current is:

Model	C30E - 0.9	C30E - 1.2	C30E - 1.9
Nominal Current [A]	5,6	7,2	4,1

Adjusting the current sensor relay

The current sensor relay is monitoring the current used by the PTC heating element. If the regeneration flow is reduced or stopped (by a damaged fan) the current uptake by the heater drops. The reduced flow is often caused by a blocked filter but it can also be caused by a damaged heater or regeneration fan.

The sensor is adjusted from factory but it is recommended to do an adjustment on site. The adjustment of the sensor is done after adjusting the flow (see above) by:

1. Read power consumption on the ampere meter on the front of the machine.
2. Unplug the machine or turn off the main switch.
3. Open electrical board by removing multiple screws in the top.
4. Adjust relay to 80-90 % of measured (1) depending on how big margin you wish.
   90 % is the recommended value.

SECTION 5 / OPERATION

HOW TO OPERATE THE C30 DEHUMIDIFIER

The C30 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 AND STOPPING THE DEHUMIDIFIER

The dehumidifier is ready to operate when the green signal lamp on the front panel is lit up.
For this to happen, you need to do the following:

- 230V – Plug the power cable attached to the machine to an electrical socket
- 400V – Connect the power cable to the main switch, and then turn the main switch ON

For the dehumidifier to start operating you must either turn the rotary switch to manual or auto.
Please note, that to run dehumidifier in auto mode, you have to connect the hygrometer first.

Turn the rotary switch back to neutral position to stop the dehumidifier.

HOUR COUNTER

The mechanical hour counter is located on the front of the machine.

ALARM

The red signal lamp in the front of the panel lights up if an alarm occurs and the external alarm relay is closed.

The dehumidifier cannot provide information about what type of alarm has been triggered. An alarm can be triggered by (for example) malfunctions in gear, heater or the regeneration air fan. The alarm can also be triggered by a blocked process filter. Furthermore, a switch or relay may have been deactivated and needs to be activated again.

The alarm is reset by switching off the machine.

CONSTANT PROCESS AIR FLOW

The main purpose of this feature is to enable air circulation even though dehumidification is not required. To activate CPF feature, move the selector switch to position “Aut.  ”.

EXTERNAL HUMIDITY MANAGEMENT

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

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.
- Check that the fans are operating (by listening to check whether they are turning).

Once a year

We also recommend the following annual checks.

- Check the working hours of any component inside. 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: 30,000 hours
    - Regeneration air fan: 25,000 hours
    - Motor and gear for rotor: 25,000 hours
    - Heaters: 40,000 hours
    - Rotor: 50,000 hours
    - Electrical board: 50,000 hours
- External humidity sensor should be calibrated or replaced (with recycled instruments)
- 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.
- 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 recover of electricity.

Safety instructions

Before opening the dehumidifier, make sure that the electric current is switched off at the mains before you open top cover or front door.

For 400V models the safety switch should also be switched OFF and locked

You should never just turn off the power to the dehumidifier while it is running. The correct procedure is to switch the rotary switch to neutral position, after which the machine runs a cooling cycle before the regeneration air fan stops. Turning off the dehumidifier properly prevents any over-heating.

WARNING

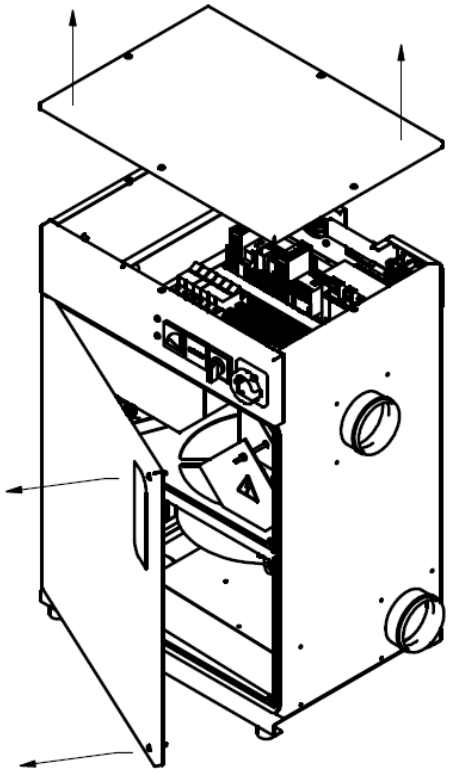
Make sure that electric current is switched off at the mains before you open top cover or front door

The safety switch should also be switched off and locked.

Easy access for quick service

The electrical switchboard (contacts, fuse breakers, thermal relays, etc.) is placed in the electrical box in the top of the dehumidifier cabinet, directly under the top cover, to make them easy to get to.

All other electrical components (fan motors, gear motor, heating elements, etc.) are easy to access when the service door for these parts is opened.



Connecting 230V motors

All C30 dehumidifiers are fitted with 230V AC electric motors for the fans. This means it doesn't matter how the phase/neutral cables are connected.

Nevertheless, the gear motor must be connected correctly and you must check that the rotor turns clockwise when connected.

Replacing fans

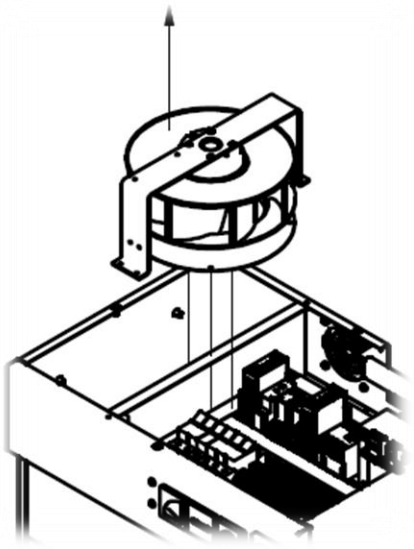
The following is standard procedure for replacing the process air fan;

- Remove top cover
- Disconnect cables for process air fan
- Remove the screws on the fan bracket
- Remove the screws on the fan
- Remove the fan bracket
- Remove the fan
- Replace the process air fan

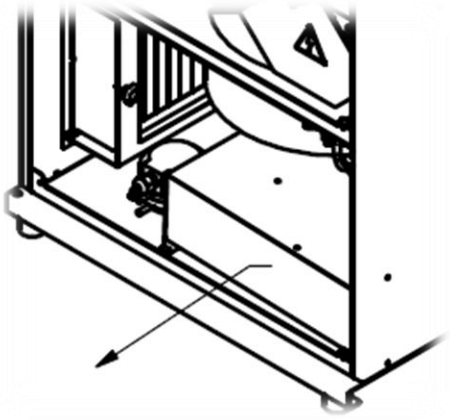
The following is standard procedure for replacing the regeneration air fan:

- Disconnect cables for regeneration air fan
- Dismount screw clamp fastened to the regeneration air fan box
- Remove the regeneration air fan box
- Insert a replacement regeneration air fan box, or remove the screws on the regeneration air fan box and replace the regeneration air fan

Process air fan



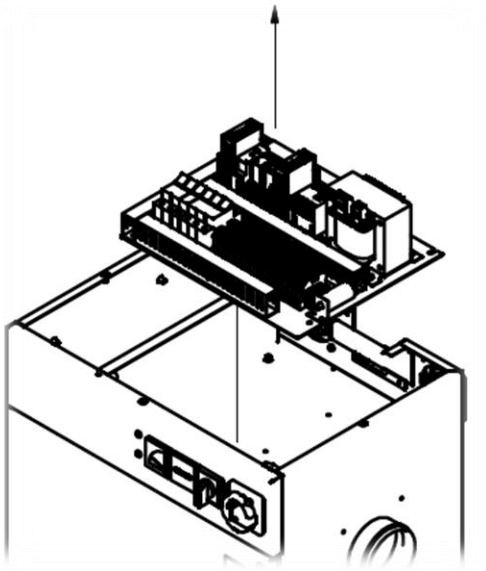
Regeneration air fan



Replacing electrical board

The following is standard procedure for replacing an electrical board

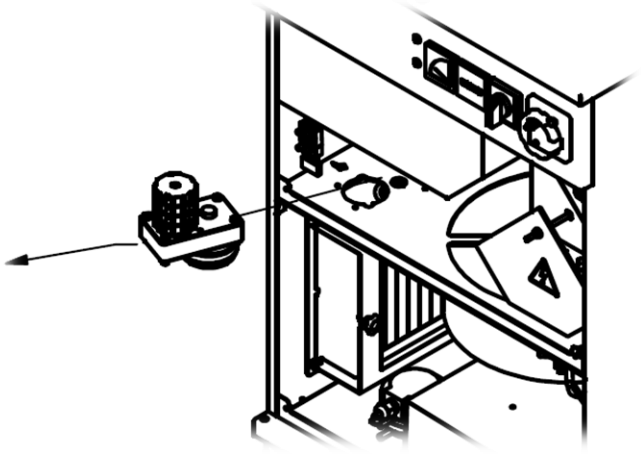
- Open the top cover
- Disconnect all cables and sensors connected to the electrical board
- Remove the screws fastening the electrical board to the cabinet
- Replace the electrical board



Replacing gear motor

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

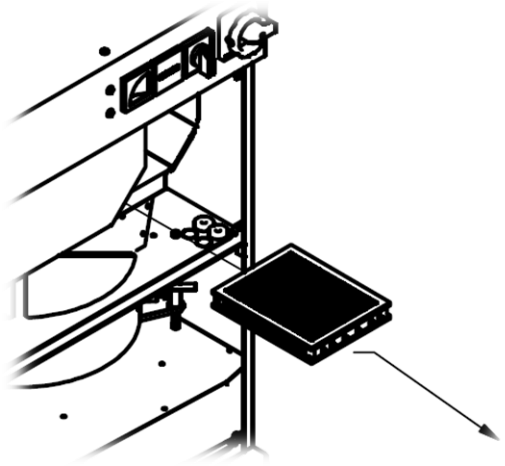
When re-starting the unit, check that the rotor is moving. If not, swap the two cables on the motor.



Replacing electric heater

The electric heater is mounted under the regeneration air filter box of the dehumidifier.

To replace that unit, disconnect the wiring, unscrew the protection plate and unscrew regeneration heater box. You can then withdraw the heater from the heater box.

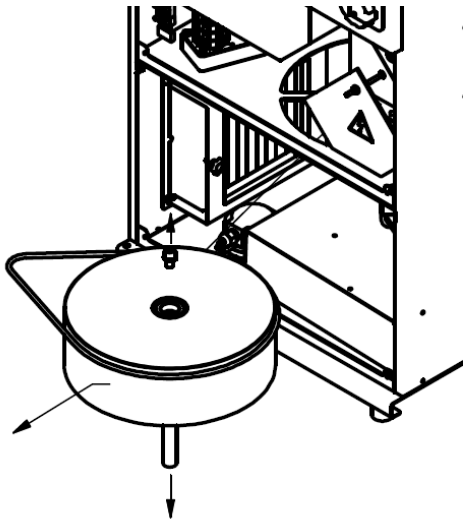


Replacing rotor and shaft

The following is standard procedure for replacing the rotor.

- Open door at the front of the cabinet
- Remove the drive belt from the pulley
- Remove the screws for the rotor shaft
- Remove the screws for the lower divider and spacers in-between the dividers

Carefully slide out the rotor (including rotor shaft) before the rotor shaft can be dismounted at the front.

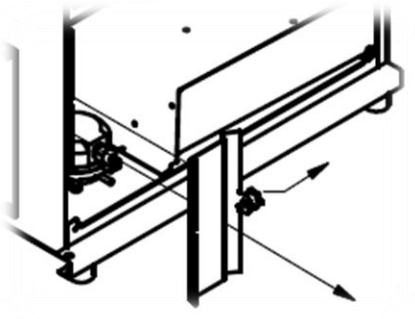


Replacing filters

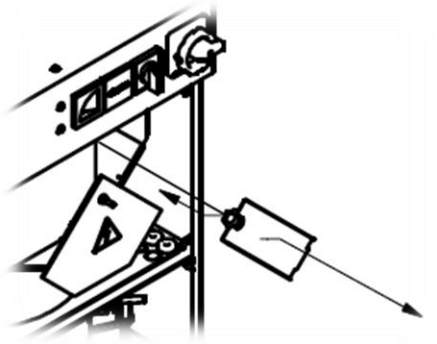
The following is standard procedure for replacing the filters:

- Open front door
- Loosen the finger screws on the filter doors
- Replace the filters

Process air filter



Regeneration air filter



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	The rotor is not turning	If the drive belt is intact, change the gear motor
	The regeneration air temperature is lower than expected	Check that the regeneration air flow is not too high Check that all heating elements are functioning
	The regeneration air flow is too low	Check that the regeneration air filter is not clogged
The regeneration air temperature has large variations	The regeneration air flow is too low	Check that the regeneration air filter is not clogged

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

SECTION 7 / CONDENSATION OR HEAT RECOVERY UNIT

RECOMMENDED COMBINATIONS OF DEHUMIDIFIERS AND MODULES

Using an additional module alongside the dehumidifier unit might affect some of the nominal figures provided in the data sheet. Key points are listed below.

The **HR module** is not fully compatible with all the dehumidifier units in the range, and it is important to realize that the addition of a HR module will affect some of the nominal figures provided in the data sheet. This applies particularly to the figures for available external pressure, which will no longer apply because some pressure will be lost through the module itself. This loss of external pressure is because the airflow must be increased and because the heat exchanger in the module itself adds a resistance to the flow of air.
Note that the energy consumption of a Cotes dehumidifier in BASIC configuration will remain the same with a HR module. However, the running time will fall due to the increased capacity when using a HR module without modulating heat.

The **LK module** is not fully compatible with all the dehumidifier units in the range. The LK module will impact the operating conditions for the dehumidifier.

The following guidelines with regard to compatibility must be respected:

Model	Compatibility with the LK module	Compatibility with the HR module
C30E-0.9	Fully compatible	Fully compatible
C30E-1.2	Fully compatible	Fully compatible
C30E-1.9	Fully compatible	Fully compatible
C30C-0.3	Not compatible	Not compatible

SPECIFICATIONS, ASSEMBLIES AND COMPONENTS

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

Table 4 Technical data C30LK

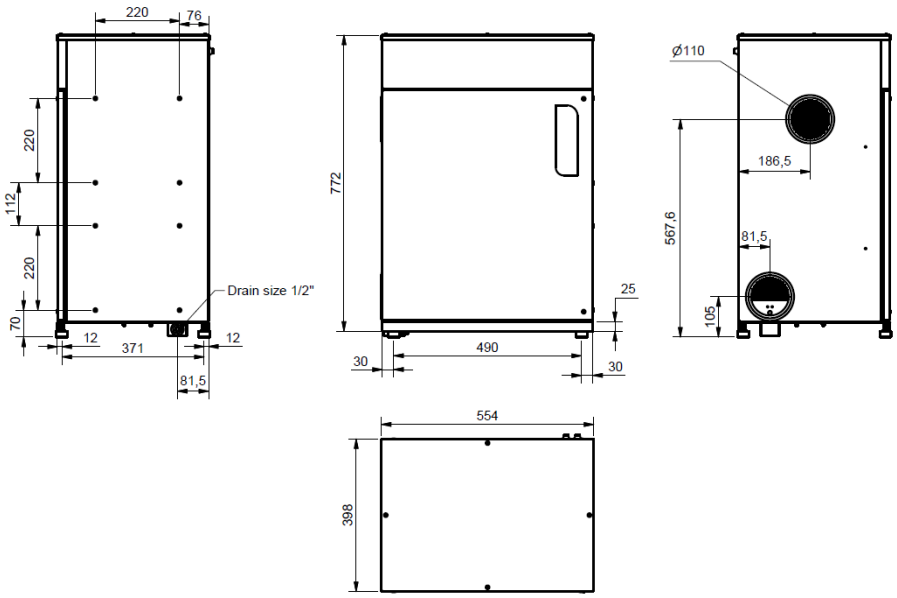
	Type	LK
Maximum connected load	kW	0.05
Voltage	V	230
Frequency	Hz	50
Electrical connection		PH+N+PE

Table 5 Measurements C30LK/C30HR

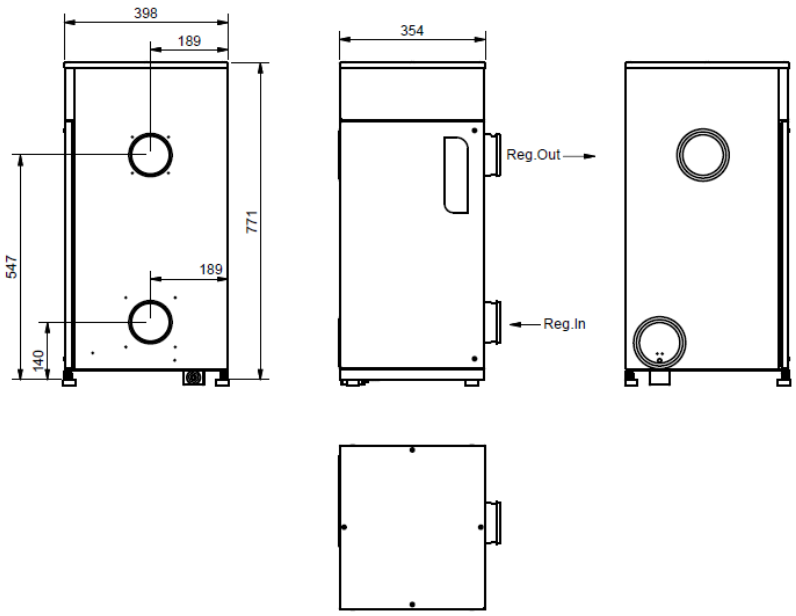
	Type	LK	HR
L x W x H cabinet	mm	398 x 554 x 771	398 x 354 x 771
L x W x H total	mm	409 x 555 x 790	398 x 391 x 789
Weight	kg	35	21
Regeneration air outlet	mm	200x180 (ø200)	Ø100
Regeneration air inlet	mm	200x180 (ø200)	Ø100
Drain size	inch	1/2"	1/2"

Dimensions

Condensation module

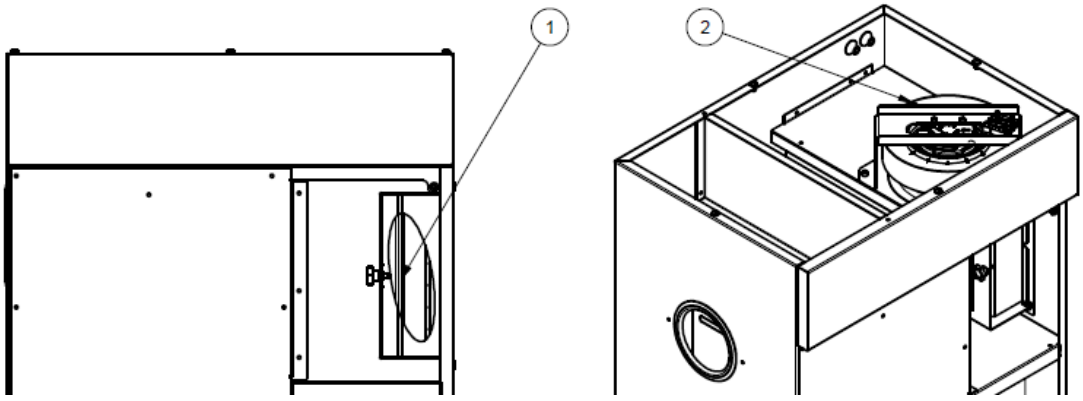


Heat recovery module



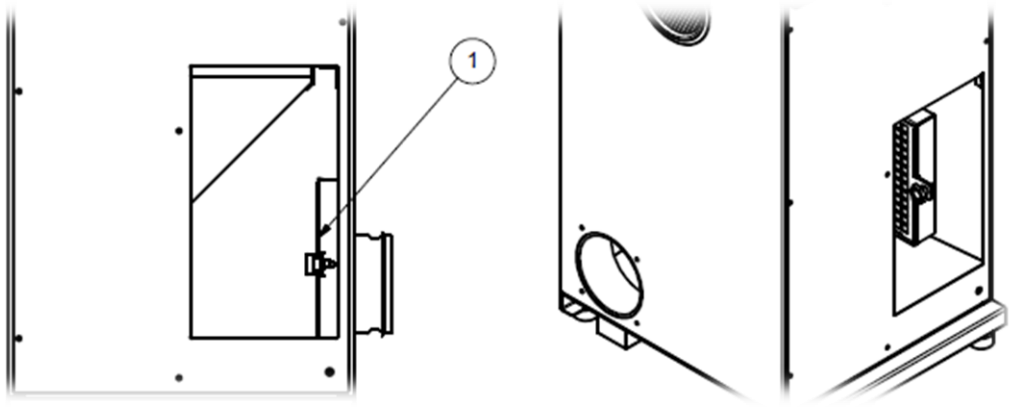
Spare parts

Condensation module



CONDENSATION UNIT		
1	Condensation air filter	130268
2	Condensation fan	801715

Heat recovery module



HEAT RECOVERY UNUT		
1	Regeneration air filter	130268

HOW TO INSTALL A CONDENSATION UNIT OR HEAT RECOVERY UNIT

Removing the packaging

Cotes condensation units (LK module) and heat recovery units (HR module) are delivered in a cardboard box. Please dispose the packaging responsible, and recycle it if possible.

Handling

Cotes condensation units and heat recovery units are built to be very robust, so there is no need for special handling, apart from normal sensible care and attention.

Note that the weight of the condensation unit is 35 kg and the weight of the heat recovery module is 21 kg. We recommend that you use a forklift to move such units around and to place them in position.

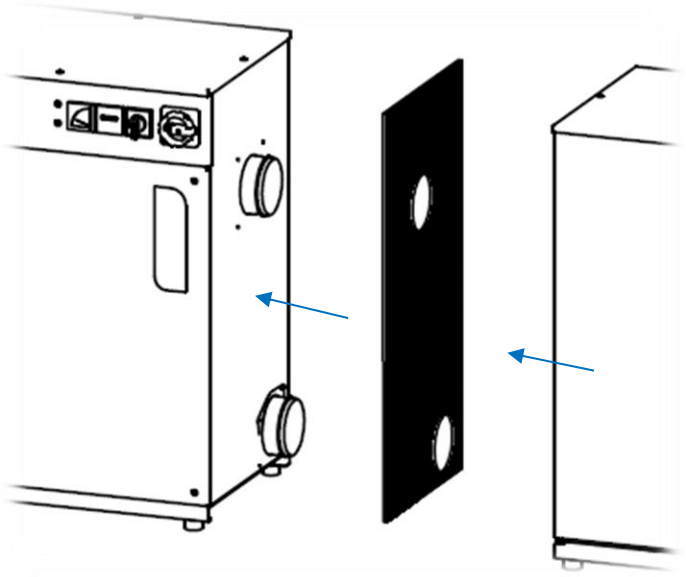
Where to mount the condensation or heat recovery unit

The condensation and heat recovery units are designed for indoor installation mounted directly onto the Cotes adsorption dehumidifier on the right side connecting the units to the regeneration air flow.

Note that both units cannot be mounted on the dehumidifier at the same time. The condensation or heat recovery unit must be installed 0–5 mm away from the C30 dehumidifier.

To ensure stable operation of the dehumidifier with condensation or heat recovery unit the regeneration filter – found in the dehumidifier – must be removed. No filter is needed for regeneration circuit when using a condensation unit and for heat recovery unit a filter is found at the inlet in the bottom.

Place the foam insulation sheet between the dehumidifier and LK module to lower the risk of external condensation.



Connection need for condensation (LK)- and Heat Recovery (HR) unit – Drain

When installing a HR or LK unit, the unit must be placed in an upright position, with the bottom plate parallel to the horizontal plane. It is critical that the unit is positioned correctly, otherwise the water condensate will not be sufficiently drained.

The heat recovery unit HR is equipped with one drain connection that has to be guided to the drain in the building as minor condensate may get formed inside the unit.

The condensation unit LK is equipped with two drain connections found on the bottom of the unit. The drain connection to the left (seen from the front) is the main drain.

For both the Heat recovery unit, and the LK unit, a hose must be mounted to the drain connections that guides water to a drain in the building. The hose that is connected to the drain pipe, must be of sufficient size and mounted on the outside of the drain pipe (see illustration on the next page).

Minimum internal diameter of the Hose = 14mm

For the LK/HR unit's main drain, an "air-lock" must be made with, or in connection with, the drain hose, and must be minimum 30mm below the drain. For the LK unit, if an 'air-lock' is not in place, the low relative pressure inside the unit will pull outside air in, and stop the water from draining.

The secondary drain does not need an air-lock.

We recommend keeping some free space below the module to make sure it is easy to install drain hose(s) and an air-lock. An additional floor or wall bracket can be provided to make sure there is enough space. For details, please contact your Cotes dealer, or Cotes.

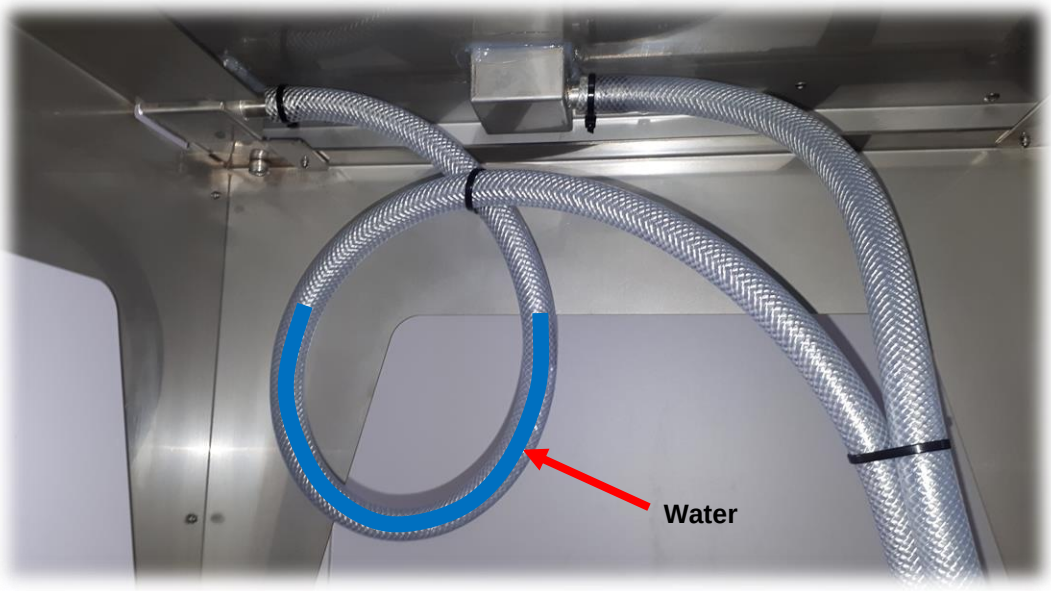
NOTE

Before the machine is started, the 'air-lock' must be filled with water, otherwise the unit may not function properly.

NOTE

The two drain must not be connected by a Y connection and guided in one common hose to the drain in the building. Water has to float independently from each of the LK drain connections to the drain in the building.

Illustration of the Airlock:



Connections needed for the condensation unit – electrical

First, make sure that the main switch is OFF.

The condensation unit has a pre-mounted cable connected to the condensation air fan. This cable must be directly connected to the terminals 306X1 1-2-PE in the electrical board located in the C30 dehumidifier.

SECTION 8 / 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

Terms

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EU DECLARATION OF CONFORMITY

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VAT no. DK 15 20 03 32

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

C30, C35, C65, C105

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 **between** and 125W to 500kW

EMC Directive 2014/30/EU

RoHS 2011/65/EC

Aarhus, Denmark, 01/12/2020

Thomas Rønnow

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/increased filter class

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 a 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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